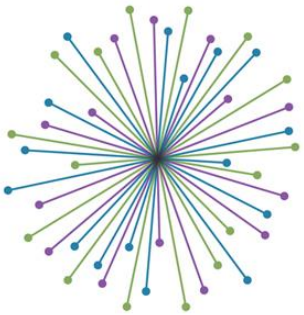


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An investigation of pedigree dog breeding and ownership in the UK: experiences and opinions of veterinary surgeons, pedigree dog breeders and dog owners

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Thesis submitted to the University of Nottingham for the degree of Doctor of Philosophy

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“A person can learn a lot from a dog, even a loopy one like ours. Marley taught me about living each day with unbridled exuberance and joy, about seizing the moment and following your heart. He taught me to appreciate the simple things-a walk in the woods, a fresh snowfall, a nap in a shaft of winter sunlight. And as he grew old and achy, he taught me about optimism in the face of adversity. Mostly, he taught me about friendship and selflessness and, above all else, unwavering loyalty”

— John Grogan, Marley and Me: Life and Love with the World's Worst Dog

Abstract

Pedigree dog welfare in the United Kingdom is a controversial subject. This PhD aimed to investigate small animal veterinary surgeons' (VS), pedigree dog breeders' (PDB) and owners' perceptions surrounding canine health, their roles, information acquisition and the quality of online resources available to new dog owners.

Via a mixed-methods approach VS and PDB were asked about their perceptions of pedigree dog welfare using online questionnaires. Focus groups were then used to explore these parties' opinions on advising dog owners and buyers. Dog owners were administered an online questionnaire to explore drivers of dog acquisition and sourcing of information about canine health. A further sample of dog owners provided possible internet search terms they would use to find information on how to care for a new dog. These terms were used for a scoping review to examine the quality of available information.

The VS and PDB exhibited varied perceptions relating to pedigree dog breeding, inherited disease and health screening programmes. Each group considered themselves the most knowledgeable on these topics and lacked clarity on how their roles interrelated. Focus groups showed conflicting views on advising dog owners and buyers. Dog owners varied in their drivers for ownership, from whom they obtained information and the internet search terms used when looking for information online. The scoping review identified a lot of easy to understand, poor quality information.

VS and PDB need to better understand and appreciate each other's' roles, perspectives and knowledge to instigate effective collaboration and improve pedigree dog health. Owners are diverse and require a multifaceted educational approach to improve knowledge. The quality of online information for owners needs to be made clear and a coordinated approach involving all stakeholders is required to enable dissemination of practical, evidence-based information on pedigree dog health.

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Table of Contents

Abstract.....I

Acknowledgments II

Table of Contents.....III

Table of Figures.....X

Table of Tables..... XV

List of Abbreviations XX

Research Timeline.....I

Chapter 1 – Literature Review and Introduction.....1

1.1 Introduction 1

1.1.1 Dog breeding – past and present 2

1.1.2 Potential welfare concerns.....4

1.2 Dog breeding strategies.....6

1.3 Inherited diseases.....7

1.4 Health screening programmes 11

1.4.1 The British Veterinary Association (BVA)/Kennel Club (KC)/International Sheep Dog Society (ISDS) Eye Scheme 11

1.4.2 Biochemical screening 11

1.4.3 DNA testing.....12

1.4.4 British Veterinary Association (BVA)/Kennel Club (KC) hip and elbow scoring schemes.....12

1.4.5 Other methods of clinical screening.....13

1.4.6 Recommended health schemes for the UK's ten most registered breeds 14

1.5 Inherited disease epidemiology and data collection.....16

1.5.1 The Veterinary Companion Animal Surveillance System (VetCompass)....17
1.5.2 The Small Animal Veterinary Surveillance Network (SAVSNET)..17
1.5.3 Reporting of surgical alterations to the Kennel Club (KC)....17
1.5.4 British Veterinary Association (BVA)/Kennel Club (KC) health schemes....18
1.5.5 'Dogslife' research project....18
1.6 Pedigree Dogs Exposed....19
1.7 Key reports....20
1.7.1 Pedigree dog breeding in the UK: a major welfare concern? 20
1.7.2 A Healthier Future for Pedigree Dogs....21
1.7.3 A Healthier Future for Pedigree Dogs (Update Report) 2012 21
1.7.4 Independent Inquiry into Dog Breeding....22
1.7.5 Other reports of interest....23
1.7.6 Outcomes and developments....24
1.8 Advisory Council on the Welfare Issues of Dog Breeding....25
1.9 High profile breeds and Breed Watch....27
1.10 Veterinary health checks and The Canine Alliance....28
1.11 Key stakeholder roles in canine welfare....29
1.11.1 The role of veterinary surgeons....30
1.11.2 The role of the Kennel Club....32
1.11.3 The role of dog breeders....34
1.11.4 The role of dog owners and puppy purchasers....36
1.12 General methodology and rationale for study approach....39
1.12.1 Questionnaire-based studies....40
1.12.2 Focus group and interview-based studies....42

1.12.3 Reviews of online information resources....42
1.13 The purpose of this thesis – the gap in existing knowledge....44
1.13.1 Thesis working hypothesis and aims....46
1.13.2 Objectives and thesis outline....48
Chapter 2- Questionnaire-based study of veterinary surgeons' and pedigree dog breeders' attitudes to pedigree dog breeding, inherited disease and health screening programmes in the United Kingdom....51
2.1. Introduction....51
2.1.1. Study aims and objectives....53
2.2. Materials and Methods....54
2.2.1. Sample selection and obtaining contacts....54
2.2.2. Questionnaire development....58
2.2.3. Questionnaire distribution....62
2.2.3.2. Pedigree dog breeders distribution....67
2.2.4. Incentives....69
2.2.5. Data collection....69
2.2.6. Questionnaire data analysis....70
2.3. Results....73
2.3.1. Response rates....73
2.3.2. Participant demographics....75
2.3.3. Pedigree dog health and breeding....80
2.3.4. Awareness of health screening tests....83
2.3.5. Sources of information....88
2.3.6. Perceptions of knowledge....93
2.3.7. Perceived responsibilities....95
2.3.8. Health promotion actions....97

2.3.9. Common health issues.....99
2.3.10. Perceived trends in pedigree dog health.....102
2.3.11. Further findings.....103
2.4. Discussion.....104
2.5. Conclusion and future research.....120
Chapter 3 - Focus group studies of veterinary surgeons' and pedigree dog breeders' perceptions of their roles and responsibilities in promoting pedigree dog health in the United Kingdom.....121
3.1. Introduction.....121
3.1.1. Study objectives.....123
3.2. Materials and methods.....124
3.2.1. Developing focus group questions.....124
3.2.2. Initial focus group planning.....124
3.2.3. Incentives.....125
3.2.4. Trial recruitment.....125
3.2.5. Final recruitment.....127
3.2.6. Data collection and handling.....132
3.2.6.1. Data cleaning.....132
3.2.6.2 Data analysis.....133
3.3. Results.....135
3.3.1. Pedigree dog breeders' focus group findings.....135
3.3.2. Vets focus group findings.....146
3.4. Discussion.....156
3.5. Conclusion.....174

Chapter 4 - Dog ownership and information sourcing in the United Kingdom: a cross-sectional, questionnaire-based study of pedigree and non-pedigree dog owners 177

4.1. Introduction 177

4.1.1. Aims 179

4.1.2. Objectives 179

4.2. Materials and Methods 180

4.2.1. Selecting samples, obtaining contacts and associated considerations 180

4.2.2. Questionnaire development.....182

4.2.3. Developing ideas and study piloting.....183

4.2.4. Final questionnaire content and layout 187

4.2.5. Questionnaire distribution 188

4.2.6. Incentives.....190

4.2.7. Data collection 190

4.2.8. Questionnaire data analysis 190

4.3. Results.....194

4.3.1. Response outcome and attainment 195

4.3.2. Demographic profile of respondents 198

4.3.3. Reasons for getting a dog 202

4.3.4. Seeking information pre-acquisition of a dog 203

4.3.5. Deciding where to get a dog from and influencing factors.....205

4.3.6. Seeking information during a dog's lifetime 209

4.3.7. Perceptions of knowledge 212

4.3.8. Awareness of the Kennel Club and their perceived role.....213

4.3.9. Further results 214

4.4. Discussion 215

4.5. Conclusion.....228

Chapter 5 - What terms or expressions do dog owners use when searching online for information on how to care for a new dog and what online resources are generated as a result? 229

5.1. Introduction 229

5.1.1. Study objectives.....232

5.1.2. Study design.....232

5.2. Materials and methods.....233

5.2.1. Stage 1 (cross-sectional questionnaire based study) 233

5.2.2. Stage 2 (scoping review of online resources generated by searches) 236

5.3. Results.....243

5.3.1. Stage 1 (cross-sectional questionnaire based study) 243

5.3.2. Stage 2 (scoping review of online resources).....246

5.4. Discussion 252

5.5. Conclusion.....260

Chapter 6 – Final discussion and conclusions.....261

Chapter 7 – Bibliography 274

Appendix 1 – Veterinary surgeons' questionnaire 289

Appendix 2 – Pedigree dog breeders' questionnaire 297

Appendix 3 – Vets' and breeders' data summary 307

Appendix 4 – Focus group master sheet 324

Appendix 5 - Pedigree dog breeders' OSOP 327

.....327

Appendix 6 – Veterinary surgeons OSOP 328

Appendix 7 – Dog owners' questionnaire 329

Appendix 8 – Dog owners' data summary.....345

Appendix 9 – Grouping of dog owner internet search terms……356

Table of Figures

Figure 1: Research timeline from study commencement to thesis completion..I

Chapter 1

Figure 2: Diagrammatic representation of key stakeholders involved in canine welfare as adapted from a report commissioned by the RSPCA: "Pedigree dog breeding in the UK: a major welfare concern?" (Rooney and Sargan, 2009) * Parties of greatest interest to this thesis depicted in blue. 30

Figure 3: Study summary showing Chapters 1-6 and their coverage of the overall thesis objectives 47

Chapter 2

Figure 4: Diagram showing a representation of the selected sample of pedigree dog breeders (5) in relation to the study population and wider target population. * not to scale 58

Figure 5: Proposed timeline and strategy for maximising the distribution of final questionnaires to veterinary practices.....62

Figure 6: Diagram showing the exchange of information to initiate completion of the final questionnaire in one distribution 63

Figure 7: Strategy and timeline for maximising the number of vet participants. Three batches of questionnaires were distributed to a selected sample of small animal and mixed practice vets taken from the Royal College of Veterinary Surgeons Register of Practices in 2011. PC = practice contact; wk = week. 64

Figure 8: The distribution of questionnaire login details to Vets Now vets.....65

Figure 9: The distribution of questionnaire details to veterinary surgeons from the Centre for Evidence-based Veterinary Medicine (CEVM) list 66

Figure 10: The method of data collection from pedigree dog breeders sourced through the Champdogs website 68

Figure 11: Screenshot from Excel 2007 showing the unique identification number assigned to breeders and the additional column added to clarify the breed bred 70

Figure 12: Percentage frequency of veterinary surgeon participants (n=150) graduating between the years of 1965 and 2011. 75
Figure 13: Frequency of pedigree dog breeder participants (n=351) who had been breeding pedigree dogs between 1 and 52 years based on 2011 questionnaire findings from 2011. PDB = pedigree dog breeder. 77
Figure 14: Health schemes veterinary surgeons (VS) (n=143) and pedigree dog breeders (PDB) (n=347) were aware of in the promotion of general pedigree dog health; based on questionnaire findings from 2011. Haem/Immuno = Haematological or Immunological. *Health schemes have been grouped by body system. 83
Figure 15: Health schemes pedigree dog breeders (PDB) use to evaluate their dogs prior to breeding based on questionnaire findings from 2011 (n=340). Haem/Immuno = Haematological or Immunological. *Health schemes have been grouped by body system. 84
Figure 16: Ocular health schemes pedigree dog breeders were (a) aware of to promote general pedigree dog health (n=347) and (b) used to evaluate their dogs prior to breeding (n=340); based on questionnaire findings from 2011. PDB = pedigree dog breeder.....86
Figure 17: Musculoskeletal health schemes pedigree dog breeders were (a) aware of to promote general pedigree dog health (n=347) and (b) used to evaluate their dogs prior to breeding (n=340); based on questionnaire findings from 2011. PDB = pedigree dog breeder. 86
Figure 18: Cardiovascular health schemes pedigree dog breeders were (a) aware of to promote general pedigree dog health (n=347) and (b) used to evaluate their dogs prior to breeding (n=340); based on questionnaire findings from 2011. PDB = pedigree dog breeder. 87
Figure 19: Neurological health schemes pedigree dog breeders were (a) aware of to promote general pedigree dog health (n=347) and (b) used to evaluate their dogs prior to breeding (n=340); based on questionnaire findings from 2011. PDB = pedigree dog breeder. 87
Figure 20: Veterinary surgeons' (n=137) and pedigree dog breeders' (n=289) opinions on the trend of pedigree dog health over the last 10 years based on

questionnaire findings in 2011. VS = veterinary surgeons; PDB = pedigree dog breeders.....102
Figure 21: Veterinary surgeons' (n=137) and pedigree dog breeders' (n=289) opinions on the trend of pedigree dog health over the next 10 years based on questionnaire findings from 2011. VS = veterinary surgeons; PDB = pedigree dog breeders.....103
Chapter 3
Figure 22: An example of how the flash cards were laid out on the table during the focus groups. This particular arrangement was used for 'What do you feel vets' roles and responsibilities are in pedigree dog health?.....130
Figure 23: Example room plan depicting how the pedigree dog breeders' focus groups were laid out and the positioning of the facilitator and assistant facilitator. Table = central rectangle; focus group participants = green; Dictaphones = red.....131
Figure 24: Method through which qualitative data analysis was carried out using the principles of Grounded Theory and the 'One Sheet of paper' (OSOP) technique.....133
Figure 25: Veterinary surgeons' roles in pedigree dog health as reported by both small animal vets and pedigree dog breeders in four focus group interviews carried out in 2012.....158
Figure 26: Pedigree dog breeders' roles in pedigree dog health as reported by both small animal vets and pedigree dog breeders in four focus group interviews carried out in 2012.....162
Chapter 4
Figure 27: Diagrammatic representation of the pedigree dog owners (a), non-pedigree dog owners (c) and owners of both pedigree and non-pedigree dogs (b) who this study hopes to target. Study populations are shown in (a -c), with the intended population from which the convenience sample will take place depicted in green.* not to scale 181
Figure 28: Plan for data collection from three possible groups of dog owners using online questionnaires and proposed plan to carry out both an initial

analysis of each individual group (to look for statistical differences) along with a combined analysis of all dog owners.....182
Figure 29: Diagrammatic overview of the changes to the final questionnaires and their intended targets. The Group A 'Paws4pedigrees' questionnaire has remained the same whilst the questionnaires for groups B and C have been merged into a single Group B 'Paws4pups' questionnaire (redefined in blue) to be filled in by either owners of non-pedigree dogs or owners of both pedigree and non-pedigree dogs.....186
Figure 30: Diagram showing the total responses, exclusion criteria, breed reallocation and final useable responses of two questionnaires (Paws4pedigrees and Paws4pups) administered to owners of pedigree and non-pedigree dogs in the United Kingdom in 2013. 195
Figure 31: Method through which participating dog owners had heard about the study questionnaire. Expressed as percentages and based on questionnaire data from the Paws4pedigree and Pups4pups questionnaires administered in 2013. 197
Figure 32: Geographical distribution of dog owner questionnaire participants as indicated by postcode data provided. Map generated using online geo-coding software (http://www.gpsvisualizer.com).....198
Figure 33: Percentage age ranges of responding dog owner participants. Group A = dog owners residing in the United Kingdom who own only pedigree dogs. Group B = dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees. 199
Figure 34: Percentage lengths of time for which owners had been keeping dogs in years, based on questionnaire data from 2013. Group A = dog owners residing in the United Kingdom who own only pedigree dogs. Group B = dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees.....200
Chapter 5
Figure 35: Two-stage study designed to identify which search terms or expressions owners use to search the internet for information on how to care for a new dog followed by a review of the results generated. 232

Figure 36: Screenshot showing the single question administered to owners of both pedigree and non-pedigree dogs in October 2013 to explore which words of phrases they would use when searching the internet for information on how to care for a new dog.....234
Figure 37: Diagram demonstrating the method through which search terms or strings identified from the dog owners' questionnaire data were interpreted into more general search expressions for use in a scoping review of online resources. 236
Figure 38: Diagram demonstrating the method through which the search results generated were sorted, inclusion and exclusion criteria were applied and duplicate data entries were removed. 239
Figure 39: Diagram demonstrating the method through which search terms or strings identified from the dog owners' questionnaire data were interpreted into more general search expressions for use in a scoping review of online resources (shown in blue). 245
Figure 40: Diagram demonstrating with numerical values how the search results generated were sorted, inclusion and exclusion criteria were applied and duplicate entries were removed……246

Table of Tables

Chapter 1

Table 1: 'The Five Welfare Needs' as outlined by the Department for Environment, Food & Rural Affairs (DEFRA) in their Code of Practice for the Welfare of Dogs. 5

Table 2: Inherited and predisposed diseases associated with the top ten most registered dog breeds in the UK (based on Kennel Club registrations for 2010). This is not a comprehensive list but a condensed summary of the most notable conditions. 9

Table 3: Health schemes required or recommended for featured breeds as outlined by the Kennel Club for members of the Assured (Accredited) Breeders Scheme in January 2014*. 15

Chapter 2

Table 4: Break down of selected sample sizes per breed including a) breeders who advertise current health tests and b) those that do not within each of the ten breeds. PDBs = pedigree dog breeders. 57

Table 5: Summary of the content featured in the veterinary surgeons' questionnaire.....59

Table 6: Summary of the content featured in the pedigree dog breeders' questionnaire.....60

Table 7: Questionnaire response rates for pedigree dog breeders of ten selected breeds in the United Kingdom in 2011. PDB = pedigree dog breeders. 74

Table 8: Categories selected by pedigree dog breeders (n=298) to best describe the purpose of the dogs kept, based on questionnaire findings from 2011. *Some breeders may be represented more than once for different breeds within this dataset. 79

Table 9: Pedigree dog breeders' (n=341) opinions on a range of questions relating to pedigree dog health and breeding. 81

Table 10: Rated comfort in managing a number of aspects of pedigree dog care based on veterinary surgeon opinion (n=150) in 2011. 1 = very uncomfortable and 10 = very comfortable. 82

Table 11: The top 5 sources of information veterinary surgeons use based on vet (n=149) and breeder (n=327) opinion. 88

Table 12: The top 5 sources of information pedigree dog breeders use based on vet (n=147) and pedigree dog breeder (n=334) opinion. PDB =pedigree dog breeder; VS= veterinary surgeon.....89

Table 13: The amount of information available on pedigree dog health and breeding based on veterinary surgeon (n=149) and pedigree dog breeder (n=334) opinion in 2011. 1 = none at all and 10 = enough.....90

Table 14: Veterinary surgeons (VS) and pedigree dog breeders (PDB) perceptions of VS, PDB and pedigree dog owners (PDO) knowledge on various topics relating to pedigree dog health; based on responses from veterinary surgeons (n=145) and pedigree dog breeders (n=316) in 2011. 1 = very poor knowledge and 10 = very good knowledge 93

Table 15: Parties perceived responsible for promoting various aspects of pedigree dog welfare based on veterinary surgeon (n=140) and pedigree dog breeder (n=312) opinion in 2011. VS = veterinary surgeon; PDB = pedigree dog breeder. ()=%. 96

Table 16: Veterinary surgeons' (n=140) and pedigree dog breeders' (n=306) opinions on the importance of various actions to control hereditary disease in pedigree dogs. VS = veterinary surgeons; PDB = breeders; PDO = owners. () = % 98

Table 17: Most common health issues reported in each of the ten most registered breeds in the United Kingdom, based on veterinary surgeon and pedigree dog breeder opinion in 2011. CV = Cardiovascular; DERM = Dermatological; ENDO = Endocrine; GI = Gastrointestinal; HAEM = Haematological/Immunological; MSK = Musculoskeletal; NEURO = Neurological; OC = Ocular; URI = Renal and urinary; RESP = Respiratory; OTHER = an issue for which a category was not provided; * = results too low to be reported (≤ 1 respondents). () = %. 100

Table 18: Health issues with the biggest perceived impact on the welfare of each of the ten most registered breeds in the United Kingdom, based on veterinary surgeon and pedigree dog breeder opinion in 2011. CV = Cardiovascular; DERM = Dermatological; MSK = Musculoskeletal; NEURO = Neurological; OC = Ocular.....101

Chapter 3

Table 19: Adapted from Table 15, page 96. Vets and pedigree dog breeders' perceptions of their own and each other's responsibilities regarding various aspects of pedigree dog health. Based on veterinary surgeon (VS) (n=140) and pedigree dog breeder (PDB) (n=312) opinion as expressed in a 2011 questionnaire. ()=%.....122

Table 20: Key research questions highlighted by the questionnaire findings in Chapter 2 and subsequently selected for discussion in vets' and pedigree dog breeders' focus groups. 124

Table 21: Number of questionnaire participants who (a) expressed an interest in participating in the focus groups and (b) received an invite to attend a focus group.....126

Table 22: Breeds that pedigree dog breeder focus group participants were, or had been, involved with. Care was taken to ensure there was a mix of breed experience in both groups A and B.....129

Chapter 4

Table 23: Summary of the initial design of each questionnaire prior to piloting, with a breakdown of the questions included. * Group A = designed for owners of pedigree dogs only. **Group B = designed for owners of both pedigree and non-pedigree dogs. ***Group C = designed for owners of non-pedigree dogs only. 184

Table 24: Summary of the final content featured in both the Paws4pedigrees and Paws4pups questionnaires. * Group A = designed for owners of pedigree dogs only. **Group B = designed for owners of either non-pedigree dogs only or a mix of pedigrees and non-pedigrees.....187

Table 25: Online methods used to promote study questionnaires to dog owners in February and July 2013. A request for study participation was posted on each

of these sites along with a hyperlink to the study homepage, which featured information about the study and descriptive links to the relevant questionnaires. 189
Table 26: Reported reasons for dog owners acquiring a dog. Results reported as percentage of total responses collected. Group A = dog owners residing in the United Kingdom who own only pedigree dogs. Group B = dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees.....202
Table 27: Methods through which dog owners in the United Kingdom found out that their dog(s) were available for purchase or re-homing as reported by questionnaire data collected in 2013. Multiple choice data presented as the total (n) of the whole dataset and percentage of all responses. 203
Table 28: Information sources dog owners use prior to purchasing their dogs as reported in questionnaires administered to both pedigree and non-pedigree dog owners in the United Kingdom in 2013. Multiple choice data presented as the total (n) of the whole dataset and percentage of all responses. 204
Table 29: Parties or places dog owners in the United Kingdom acquired their dog(s) from as reported by questionnaire data collected in 2013. Multiple choice data presented as the total (n) of the whole dataset and percentage of all responses. 205
Table 30: Reasons dog owners acquired their dog(s) from a certain person or place as reported by questionnaire data collected in 2013. Multiple choice data presented as the total (n) of the whole dataset and percentage of all responses. 206
Table 31: Percentage responses indicating how many dog owner participants had at least one or more dogs that were insured, vaccinated or neutered when they bought or rehomed them. 207
Table 32: Influence of whether dogs were insured/vaccinated/neutered on owners' decisions to buy or re-home them, based on rating scale responses where 1= no influence and 10= complete influence/reason for getting dog.208
Table 33: Information sources dog owners use to research all aspects of their dog during its lifetime as reported in questionnaires administered to both

pedigree and non-pedigree dog owners in the United Kingdom in 2013. Multiple choice data presented as the total (n) of the whole dataset and percentage of all responses. 209

Table 34: Parties from whom dog owners seek advice about their dogs' health and care based on owners' questionnaire responses. As multiple responses could be given for each question, results are presented as an overall percentage of all responses given. 211

Table 35: Pedigree dog owners' perceptions of vets' (VS) and pedigree dog breeders' (PDB) knowledge compared to their own (PDO) on various topics relating to pedigree dog health (1 = very poor knowledge and 10 = very good knowledge). 212

Table 36: Dog owners' perceived roles of the Kennel Club as indicated by free text questionnaire data obtained in 2013. 214

Chapter 5

Table 37: Inclusion and exclusion criteria used to establish which online dog owner resources formed part of the scoping review 237

Table 38: Critical appraisal sheet used for reviewing online resources available to new dog or puppy owners 241

Table 39: The top ten most popular words featured in the terms and expressions 204 dog owners reported they would use to search the internet on how to care for a new dog or puppy. 243

Table 40: The frequency with which different aspects of dog care were mentioned by 204 dog owner respondents in the questionnaire data collected. Data are presented as the total (n) and percentage of all responses relating to specific aspects of dog care. 244

Table 41: Parties and organisations from which the internet search hits on information on how to care for a new dog originated 248

Table 42: The aspects of dog and puppy care covered by the online resources reviewed (total n= 121) 250

List of Abbreviations

ABS	Assured Breeders Scheme (Accredited Breeders Scheme)
AHT	Animal Health Trust
APGAW	Associate Parliamentary Group for Animal Welfare
AS	Aortic Sternosis
ASPCA	American Society for the Prevention of Cruelty to Animals
B	Boxer
BAER	Brainstem Auditory Evoked Response (hearing test)
BBC	British Broadcasting Corporation
BOAS	Brachycephalic Obstructive Airway Syndrome
BOB	Best of Breed
BSAVA	British Small Animal Veterinary Association
BVA	British Veterinary Association
BVA AWF	British Veterinary Association Animal Welfare Foundation
CA	Canine Alliance
CAWC	Companion Animal Welfare Council
CKCS	Cavalier King Charles Spaniel
CLAD	Canine leukocyte adhesion deficiency
CM	Chiari-like malformation
CPD	Continuous professional development
CS	English Cocker Spaniel
CV	Cardiovascular conditions
DEFRA	Department for Environment, Food and Rural Affairs
DERM	Dermatological conditions
DNA	Deoxyribonucleic acid
EBV	Estimated Breeding Values
ECS	English Cocker Spaniel
EFRACom	The Environment, Food and Rural Affairs Committee
ENDO	Endocrine conditions
ESS	English Springer Spaniel
FAWC	Farm Animal Welfare Council
FN	Familial Nephropathy
fuco	Fucosidosis
GI	Gastrointestinal conditions
GR	Golden Retriever
GSD	German Shepherd Dog
HAEM	Haematological conditions
HC-HSF4	DNA test for hereditary cataracts
HPB	High Profile Breed

IMMUNO	Immunological conditions
ISDS	International Sheep Dog Society
KC	Kennel Club
L2-HGA	DNA test for L-2-hydroxyglutaric aciduria
LR	Labrador Retriever
MRI	Magnetic resonance imaging
MSK	Musculoskeletal conditions
MVD	Mitral Valve Disease
NOAH	National Office of Animal Health
OC	Ocular conditions
OptiGen	Diagnostic lab service for genetic diseases in pedigree dogs
PC	Practice contact
PDB	Pedigree dog breeder
PDE	Pedigree Dogs Exposed
PDF	Portable Document Format
PDSA	People's Dispensary for Sick Animals
PFMA	Pet Food Manufacturers Association
PHPV	Persistent Hyperplastic Primary Vitreous
PKF	Phosphofructokinase Deficiency
PRA	Progressive Retinal Atrophy
PRA cord 1	DNA test for cord1 mutation
prcd-PRA	DNA test for progressive rod-cone degeneration
RCVS	Royal College of Veterinary Surgeons
RESP	Respiratory conditions
RSPCA	Royal Society for the Prevention of Cruelty to Animals
RVC	Royal Veterinary College
SA	Sebaceous adenitis
SAVSNET	Small Animal Veterinary Surveillance Network
SBT	Staffordshire Bull Terrier
SM	Syringomyelia
SVMS	School of Veterinary Medicine and Science
UFAW	Universities Federation for Animal Welfare
UK	United Kingdom
UKAS	United Kingdom Accreditation Service
UoN	University of Nottingham
URI	Urinary conditions
VeNom	Veterinary Nomenclature
VetCompass	Veterinary Companion Animal Surveillance System
VS	Veterinary surgeon

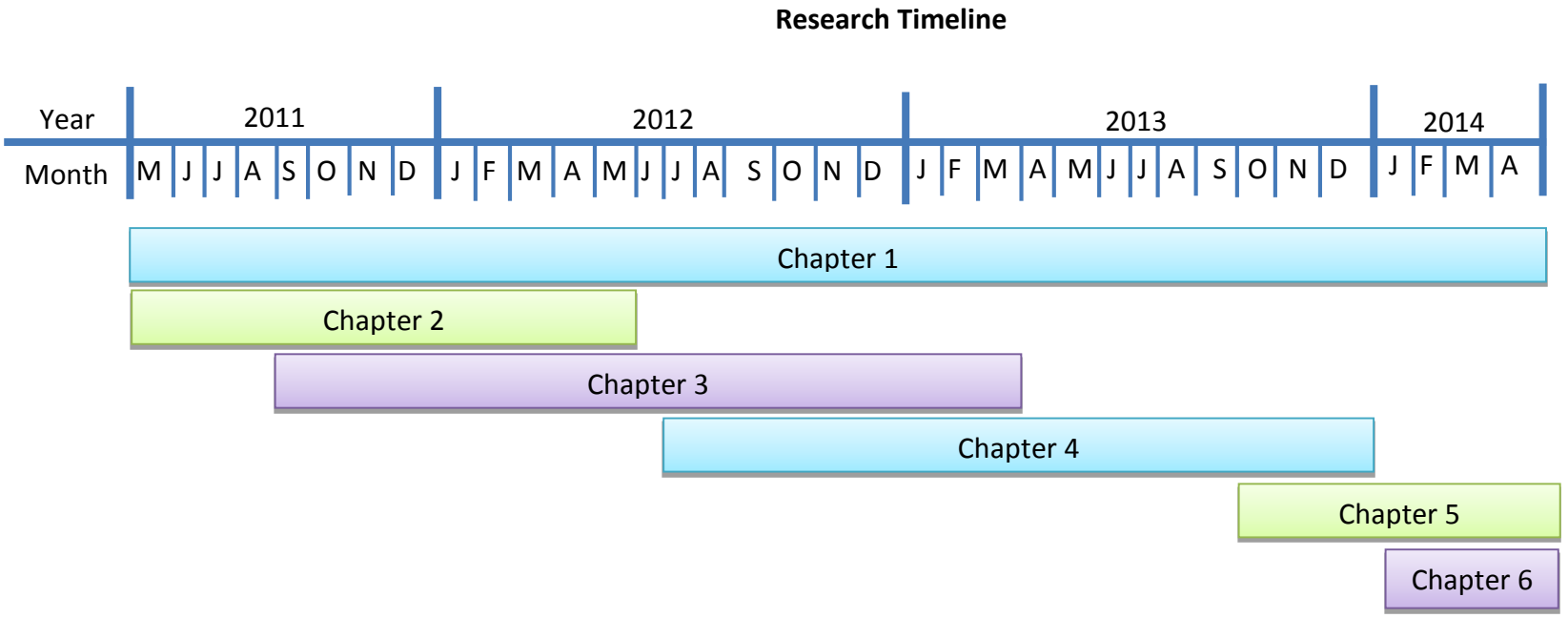


Figure 1: Research timeline from study commencement to thesis completion

Chapter 1 – Literature Review and Introduction

1.1 Introduction

Dogs are one of the most popular pets owned in the United Kingdom (UK), with around 23% of the population estimated to own one (PDSA, 2013). Although the exact size of the canine population is unknown, it is estimated to be between 7.8 and 10 million (Murray *et al.*, 2010, Asher *et al.*, 2011, PDSA, 2013, PFMA, 2013a). The exact ratio of pedigree to none pedigree dogs is unknown but a recent report conducted by the PDSA approximated that around 64% of dogs are pedigree, 31% are crossbreed, 2% are deemed 'designer crossbreeds' and 3% are of unknown breed or type (PDSA, 2013). For many years the inherited and congenital health problems experienced by some breeds of dog have been known (CAWC, 2006, Crispin, 2011, Veterinary Record, 2012e). However, publicity concerning this issue has peaked in recent years as a result of two exposé style documentaries: 'Pedigree Dogs Exposed' (PDE) in 2008 and 'Pedigree Dogs Exposed: 3 years on' screened by the British Broadcasting Corporation (BBC) (The BBC Press Office, 2008, The BBC Press Office, 2011). These documentaries aimed to 'lift the lid on the welfare problems in pedigree dogs' and explore resulting steps to improve pedigree dog welfare (Passionate Productions, 2008, Passionate Productions, 2012). Although these documentaries received mixed responses from stakeholders involved in pedigree dog welfare (see 1.6), they succeeded in initiating public debate on pedigree dog health and as a result three key reports were commissioned to further explore this area and suggest recommendations for improvement (see 1.7) (APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010).

In reality the subject of pedigree dog welfare in the UK is a multifaceted one. Whilst many health concerns with a genetic link manifest more clearly in the pedigree dog population, such issues are not limited solely to this population and can also be found in the crossbreed population and particularly, in the 'designer crossbreed' population (RSPCA, 2014b). The term 'welfare' is defined as 'the health, happiness, and fortunes of a subject' (Oxford Dictionaries,

2014b), relating to canines, it can be better defined by the fulfilment of 'The Five Welfare Needs' (DEFRA, 2009) (see Table 1). If pedigree dog welfare in the UK is to be improved, this issue extends beyond simply improving breeding practices to areas such as improving education, awareness and collaboration on this subject. The UK is frequently cited to be a nation of animal lovers; pets are held in high regard and often treated as family members (Ancestory.com, 2013). Ensuring good pedigree dog welfare is therefore a key concern; however this is a complex and challenging field which can be approached from many angles.

1.1.1 Dog breeding – past and present

'Selective breeding' refers to the selection of breeding animals based on desirable attributes, whether behavioural or physical, with the intention of transferring these traits to subsequent offspring (Turner, 2010). Whilst literature on domestic dogs is extensive (Bateson, 2010), sources suggest that the discriminatory breeding of dogs began 3000 to 5000 years ago (Case, 2013), with the main focus being on the selection of behavioural traits conducive to retrieving and herding (Overall, 2006). Today it is apparent that the most radical modifications to pedigree dogs have occurred through intensive line breeding and inbreeding (see 1.2) in the last 150-200 years (Case, 2013). Such breeding to create novel aesthetics accounts for the fact that no other species exhibits the degree of variation demonstrated in the dog and consequently more than 400 breeds are now recognised (Bateson, 2010). Of these 210 breeds are recognised by the Kennel Club in the United Kingdom (The Kennel Club, 2014i). Further, many breeds exhibit a more restricted gene pool than once thought (Atter, 2010) and research indicates that genetic diversity continues to be lost with every generation (Calboli *et al.*, 2008).

Today dogs can be classified under one of three descriptions: pedigree, crossbreed (including the 'designer crossbreed' or 'designer dog') and mongrel. A pedigree dog is described by the Kennel Club as a dog originating from a dam and sire that are both of the same breed and eligible for registration with a breed club or society (The Kennel Club, 2013o). Conversely, a crossbreed dog

can be defined as a dog with pedigree parents of different breeds (Barnes, 2004) (for example, a Labrador Retriever-Poodle cross otherwise known as a 'Labradoodle'). Finally, the term 'mongrel' is anecdotally used to describe dogs of unknown parentage or undefinable breed (Oxford Dictionaries, 2014a).

Selective breeding over the years has resulted in a number of anatomical extremes and an increased incidence of inherited disease within some of the canine population (Rooney, 2009). Whilst many dogs in both the United Kingdom (UK) and across the world live long, healthy lives, some recognised breeds of dog have a notably reduced lifespan when compared to their crossbred counterparts (Egenvall *et al.*, 2000). With no evidence to suggest a disparity in the care given to pedigree and non-pedigree dogs (Rooney, 2009), evidence of lower annual treatment costs for mongrels and higher annual treatment costs for breeds such as the Great Dane (data from Churchill Insurance Company cited in K9 magazine, 2007) indicate that fewer health issues may be experienced by breeds which are more genetically diverse.

The term 'hybrid vigour' is used to describe the genetic advantage of hybrid offspring when compared to their parents and this term may be used synonymously with 'heterosis' which describes the process through which vigour is achieved (Miglani, 2005). Existing breeding strategies (see 1.2) are likely to have contributed to the fact that pedigree dogs do not exhibit as much vigour as their out-bred or non-pedigree equivalents (Rooney, 2009) and thus for some breeds, this has impacted negatively upon health. This observation can be described as the 'founder effect' in which a reduction in hybrid vigour is witnessed when a new population is created from a limited number of individuals (Provine, 2004). This phenomenon can be identified in a number of well-established pedigree breeds. For example, research carried out by the Imperial College, London in 2008 showed a population of 20,000 Boxer dogs to exhibit the genetic diversity of around 70 individuals (Gallagher, 2008) and this concern is not just limited to pedigree dogs. In a recent study the UK Labradoodle population was shown to have a greater prevalence of multifocal retinal dysplasia than that of Labrador Retrievers ($P<0.0001$), a parent breed

from which they originated (Oliver and Gould, 2012). Findings such as this are a grave concern and indicate the importance of protecting genetic diversity and taking suitable steps to avoid propagation of inherited diseases if canine welfare is to be safeguarded in the future.

1.1.2 Potential welfare concerns

Pedigree dog welfare has become increasingly topical in recent years. It has been estimated that the UK pedigree dog population alone consists of 5 million dogs (Rooney, 2009) and in 2013 alone the Kennel Club registered 223,770 pedigree dogs (The Kennel Club, 2013e). With this in mind, the health effects induced by certain breeding practices have the potential to be broad reaching if health is not a primary focus. For breeds with less genetic variety, health problems may be passed between generations and in the most severe cases may be of consequence throughout the dog's entire life (Companion Animal Welfare Council, 2006). Whilst in no way generalizable to the overall population, some dogs are still bred despite a very real risk that their welfare may be compromised to the extent that they can never meet the criteria of 'The Five Welfare Needs'; an acknowledged indicator of animal welfare outlined by the Department for Environment, Food & Rural Affairs (DEFRA) in their Code of Practice for the Welfare of Dogs (DEFRA, 2009). These criteria are further outlined below in Table 1.

Table 1: 'The Five Welfare Needs' as outlined by the Department for Environment, Food & Rural Affairs (DEFRA) in their Code of Practice for the Welfare of Dogs.

	The Five Welfare Needs
1	The need for a suitable environment
2	The need for a suitable diet
3	The need to be able to exhibit normal behaviour patterns
4	The need it has to be housed with, or apart from, other animals
5	The need to be protected from pain, suffering, injury and disease

Some welfare issues may arise by too greater focus being placed on achieving desirable aesthetic attributes instead of selecting primarily for health, temperament and functionality (McGreevy and Nicholas, 1999). It should further be noted that a number of inherited conditions are common to the breeding of both pedigree and non-pedigree dogs (Crispin, 2011) and this is of particular concern given the rise in the number of 'designer crossbreeds' seen in recent years. A recent post on the RSPCA's official blog stressed that whilst there has been a 'huge rise' in the popularity of 'designer crossbreeds' (for example, Labradoodles, Puggles and Cockapoos), these designer dogs are not necessarily exempt from the inherited and behavioural issues that affect their pedigree counterparts (RSPCA, 2014b). Many of the welfare issues relating to the breeding of all dogs can largely be attributed to breeders and owner responsibilities (Crispin, 2011) and attention should still be paid to choosing a dog based on good health and welfare (RSPCA, 2014b).

The four notable modes of disease inheritance in dogs include autosomal dominant, autosomal recessive, sex-linked recessive and polygenic inheritance (Oberbauer and Sampson, 2001) and the resulting effects can be variable. Professor Steve Dean (vet and Kennel Club Chairman) further described the variation of genetic diseases seen at BVA Congress in 2009. Some diseases were described by Dean as inducing serious effects directly influencing the dog's longevity; these included boxer cardiomyopathy, syringomyelia and seizures. Dean described other conditions as chronic and whilst not necessarily directly shortening life, these were described as inducing discomfort and compromising

welfare. Such conditions included hip dysplasia, elbow dysplasia and entropion (cited by Jarvis in the Veterinary Record, 2009). There is, however, a lack of data to allow the comparison of such conditions with regards to their relative severity or level of acceptability with regards to welfare (Rooney, 2009).

1.2 Dog breeding strategies

There are three main breeding strategies used by dog breeders:

- Inbreeding
- Line breeding
- Outcrossing (otherwise known as outbreeding)

McNeil and Abel Ponce De Leon (1992) describe inbreeding as a process through which two closely related individuals, e.g. father and daughter are mated. This strategy allows for the preservation of certain characteristics within a breed, but increases the likelihood of boosting homozygous recessive characteristics by bringing dogs with similar deleterious genes together. This technique results in an increased inbreeding coefficient and in many cases will result in increased homozygosity within the population, which may lead to amplified deleterious recessive genes and an increase in young born with inherited abnormalities and predispositions.

Line breeding is a less intense strategy than inbreeding and is used to strengthen certain attributes of a dog's ancestors (McNeil and Ponce de Leon, 1992). This is done by breeding two related dogs who are more than one generation apart e.g. second or third cousins (Case, 2013). Although line breeding increases the level of homozygosity in a population it does so more gradually than inbreeding, meaning that breeding strategies can be altered as soon as problems occur, reducing the risk of long term damage to the bloodline (McNeil and Ponce de Leon, 1992).

Outcrossing (or outbreeding) involves the mating of unrelated individuals of the same breed who have no common ancestors in the first three generations and who are of lesser relation to each other than the breed average (McNeil

and Ponce de Leon, 1992). However, realistically for many breeds there will always be a degree of inbreeding involved due to the common and limited genes present in any two dogs of the same pedigree breed (McNeil and Ponce de Leon, 1992). In some cases outcrossing may also therefore refer to the introduction of genes from a similar or closely related breed and the KC is now encouraging outcrossing for circumstances in which it is considered to be advantageous to health. For example, the KC recently registered an imported Dalmatian which had originated from a breeding programme in the USA to outcross Dalmatians with Pointers in order to produce low uric acid Dalmatians and thus improve health (The Kennel Club, 2013m).

1.3 Inherited diseases

Genetic factors may be responsible for a number of inherited disorders, for example congenital malformations (conditions present at birth), metabolic disorders, immune disorders, disorders related to aging and cancer (Canine Inherited Disorders Database, 2004). Currently there are in excess of 370 known canine diseases that are either inherited or have a major hereditary component (Patterson, 2000) and more than 130 of these demonstrate simple Mendelian inheritance (Brooks and Sargan, 2001). These figures are suggested to be substantial underestimations (Sargan, 2004) as accurate epidemiological data is lacking (see 1.5) and additional diseases are reported every year (Stafford, 2006). This fact is emphasised by the existence of more inherited canine diseases than those witnessed in any other species with the exception of humans (Sargan, 2004). This is a problem for which many factors can be held accountable, such as the long history of pedigree breed registries, use of closed studbooks and the recognition of a limited number of founding animals, which ensured the restriction of breed gene pools and initiated limited genetic variation (Case, 2013). The establishment of many inherited diseases has been further aided by genetically isolating pedigree dog breeds from the general canine population through vigorous selective breeding practices (Sargan, 2004).

Evidence suggests that numerous diseases exhibit a greater prevalence in some breeds (Padgett, 1998) and further to this that the canine genome has amassed a variety of mutations since domestication (Ott, 1996). Whilst some of these mutations have been used to enhance the qualities of certain breeds without influencing health, others have induced significant disease (Stafford, 2006). It is in this instance that the diseases and deformities created through inbreeding have been referred to as a 'cash-cow for the pet-repair type of veterinary practice' (Ott, 1996). With genetic disease rated among the most common causes of morbidity addressed in practice (Sargan, 2004), this issue is of significant concern.

Limited peer-reviewed papers exist documenting the prevalence or incidence of specific health issues (see 1.5). However, the plethora of veterinary literature on managing such conditions, for example Brachycephalic Obstructive Airway Syndrome (BOAS), indicate the existence of these problems and their impact on pedigree dog welfare (Rooney, 2009). There is said to be an annual increase in the variation of genetic disease seen in dogs, making it hard for veterinary surgeons presented with dogs in practice to judge whether a disease is inherited or not based on the clinical signs of an individual patient (McNeil and Ponce, 1992).

Although much literature on canine inherited disease exists, Table 2 depicts a summary of the hereditary diseases associated with the top ten most popular pedigree dog breeds in the UK, based on Kennel Club registrations for 2010 (Gough and Thomas, 2004).

Table 2: Inherited and predisposed diseases associated with the top ten most registered dog breeds in the UK (based on Kennel Club registrations for 2010). This is not a comprehensive list but a condensed summary of the most notable conditions.

Breed of Dog	Associated Inherited Diseases
Labrador Retriever	Haemophilia A Haemophilia B Elbow dysplasia Hip dysplasia Labrador Retriever myopathy (centronuclear myopathy) Epilepsy Narcolepsy – cataplexy Cataracts Entropion Progressive retinal atrophy Retinal dysplasia
English Cocker Spaniel	Generalised progressive retinal atrophy Glaucoma Brachyury Ectropion/Entropion Cardiomyopathy Cataracts Distichiasis Familial nephropathy Hip dysplasia Rage Syndrome
English Springer Spaniel	Patent ductus arteriosus Factor XI deficiency Haemophilia A Phosphofructokinase deficiency Hip dysplasia Fucosidosis Cataracts Entropion Progressive retinal atrophy Glaucoma Retinal Dysplasia
German Shepherd Dog	Familial vasculopathy Exocrine pancreatic insufficiency Haemophilia A Haemophilia B Von Willebrand's disease Elbow dysplasia

	Hip dysplasia
	Degenerative myelopathy
	Epilepsy
	Cataracts
	Chronic superficial keratitis (pannus)
Cavalier King Charles Spaniel	Mitral Valve Disease
	Cataracts
	Fly-catching phenomenon
	Patellar luxation
	Entropion
	Syringomyelia
	Progressive retinal atrophy
	Retinal dysplasia
	Brachycephalic syndrome
Staffordshire Bull Terrier	Brachycephalic syndrome
	Persistent hyperplastic primary vitreous (PHPV)
	Cataracts
	Organic aciduria
Border Terrier	Cataracts
Golden Retriever	Aortic sternosis
	Haemophilia A
	Elbow dysplasia
	Hip dysplasia
	Muscular dystrophy
	Epilepsy
	Cataracts
	Entropion
	Progressive Retinal Atrophy
	Glaucoma
	Retinal dysplasia
Boxer	Aortic stenosis
	Arrhythmogenic right ventricular cardiomyopathy
	Dilated cardiomyopathy
West Highland White Terrier	Pyruvate kinase deficiency
	Legg-Calves-Perthes disease
	Cranio-mandibular osteopathy
	Patellar luxation
	Cataracts
	Persistent papillary membranes

*Adapted from 'Breed Predispositions to Disease in Dogs and Cats' by Gough and Thomas (2004) and The Henston Small Animal Veterinary Vade Mecum (2005)

1.4 Health screening programmes

Whilst many known breeding patterns have helped to establish inherited disease, they can now be used as a tool in overcoming this problem, particularly when the genotypes of breeding dogs are known (Sampson, 2005). In ascertaining the dogs' genotypes prior to mating, breeders can select against carrier dogs which will pass mutations to their offspring (Sampson, 2005). A number of current health schemes are available and these are outlined below.

1.4.1 The British Veterinary Association (BVA)/Kennel Club (KC)/International Sheep Dog Society (ISDS) Eye Scheme

Presently in the region of 15 inherited ocular conditions have been described and these are relevant to around 50 different canine breeds (Irving *et al.*, 2006). It is based on these diseases that the BVA/KC/ISDS Scheme has been set up, comprising of Schedule A (a list of breeds and associated eye conditions) and B (a list of breeds showing an increased frequency of certain eye complaints which are under investigation) (Irving *et al.*, 2006). A team of ophthalmology specialists work under the scheme to perform standardised examinations of the dogs' eyes with the aim of providing a certificate of the dogs' eye status at the end (Irving *et al.*, 2006). At the time of examination, dogs are usually certified as 'affected' or 'unaffected' for conditions the breed is known to suffer from (The Kennel Club, 2013h). This information is stored on the KC database and as some dog breeds may have a predisposition to diseases with varied ages of onset, regular annual eye examinations may be recommended (Irving *et al.*, 2006). All information collected can then be considered alongside other breeding choices.

1.4.2 Biochemical screening

When dogs possess a mutant allele it may in some cases be detected by abnormal levels of protein generated by the defective gene (Irving *et al.*, 2006). Gene mutations will usually be indicated by abnormally low protein levels in carrier dogs or absence of the protein in those affected (Irving *et al.*, 2006). Examples of this type of screening include that for inherited blood disorders

such as von Willebrand's disease, haemophilia and also assays for the detection of enzyme deficiencies such as Phosphofructokinase deficiency (PKF) (Irving *et al.*, 2006). However biochemical screening is limited due to overlap of protein levels between healthy animals and those affected, making border line results hard to classify (Irving *et al.*, 2006).

1.4.3 DNA testing

At present DNA testing is available for a selection of monogenic diseases (Indrebo, 2007). However, modern advances in the level of knowledge about canine molecular genetics, alongside the development of further genome tools allows for the possibility for many more disease-causing genes to be identified in future years (Sampson, 2005). Once a genetic mutation has been discovered, developing a DNA test to detect the mutant allele is relatively straightforward (Irving *et al.*, 2006). DNA testing may be carried out via oral swabs collected by the owner or blood samples collected by a vet (OptiGen, 2008, OptiGen, 2013). An example of such screening is used for the detection of CLAD (canine leukocyte adhesion deficiency) in Irish Setters. The utilisation of test results (i.e. clinically affected, carrier or clear) in breeding decisions up until 2006 saw such a dramatic decrease in the number of Irish Setters carrying the CLAD mutation, that this disease is now of very little concern to the breed (Irving *et al.*, 2006).

1.4.4 British Veterinary Association (BVA)/Kennel Club (KC) hip and elbow scoring schemes

Both the hip and elbow scoring schemes are based on the analysis of radiographs by specialists who assign a numerical score to the joints being evaluated. Both schemes require the dog to be over a year old to participate (Irving *et al.*, 2006) and are usually only done once for each dog (The Kennel Club, 2013h).

Hip dysplasia is a disease influenced by both genetic and environmental factors (Lewis *et al.*, 2010). The hip scheme requires one radiograph of both hips to be taken by the dog's vet and submitted to the BVA for independent evaluation by two specialists (Irving *et al.*, 2006). Each hip is assigned a numerical score of

up to 53 and these are summated to assign a total hip score up to a maximum of 106: a lower score indicates a better hip conformation (Irving *et al.*, 2006). This information is then shared with the KC and recorded. Breeders are advised that only dogs with a hip score below the breed average should be used for breeding (Irving *et al.*, 2006). The only way to address the prevalence of osteoarthritis resulting from hip dysplasia (which is irreversible) is via informed genetic selection to protect future generations (Lewis *et al.*, 2010). Research to date has identified a slow and consistent improvement in Labrador Retriever hip scores over the past ten years and thus there is promise for further improvement in the future (Lewis *et al.*, 2010). Despite this, there is no way of ensuring radiographs from dogs with hip disease will be submitted for scoring, making it hard to judge the accuracy of these figures.

Under the Elbow scoring scheme two radiographs are taken of each elbow by the dogs' vet, who then submits the radiographs to the BVA for assessment by a specialist (Irving *et al.*, 2006). Each joint is graded between 0-3, with the larger grading being the score assigned (Irving *et al.*, 2006). This information is then shared with the KC and recorded; under the elbow scheme it is recommended that only dogs with a score of 0-1 should be used for breeding (Irving *et al.*, 2006).

1.4.5 Other methods of clinical screening

Whilst all of the main screening programmes available have been discussed in 1.4.1 to 1.4.4, a number of breed clubs have made provisions to screen for further breed specific inherited conditions (Irving *et al.*, 2006). Examples of such breed club specific screening include heart schemes for Mitral Valve Disease (MVD) in Cavalier King Charles Spaniels and Aortic Stenosis (AS) in Boxers; both of which rely on auscultation to check for heart murmurs (Irving *et al.*, 2006). Skin biopsies are also conducted in Poodles to test for sebaceous adenitis (SA) and the Brainstem Auditory Evoked Response (BAER) test has been developed to test for unilateral and bilateral deafness in breeds such as the Dalmatian and English Setter (Irving *et al.*, 2006). As of 2012 the BVA and KC have also launched a new scheme to screen for Chiari-like malformation and

syringomyelia in a number of breeds including Cavalier King Charles Spaniels (Bonner, 2012a). Screening for these conditions involves an MRI scan and subsequent evaluation by neurological and radiological experts of the BVA's panel (The Kennel Club, 2013g).

1.4.6 Recommended health schemes for the UK's ten most registered breeds

Whilst the current health schemes available for the UK's top ten most registered breeds (based on KC registrations for 2010) are extensive, Table 3 depicts a summary of the schemes currently recommended by the UK KC under the Assured Breeders Scheme (formally known as the Accredited Breeders Scheme).

Table 3: Health schemes required or recommended for featured breeds as outlined by the Kennel Club for members of the Assured (Accredited) Breeders Scheme in January 2014*.

Breed of Dog**	Required health schemes	Recommended health schemes
Labrador Retriever	Hip scoring Annual Eye Testing	Elbow grading DNA test - prcd-PRA
English Cocker Spaniel	Annual Eye Testing DNA test - prcd-PRA DNA test - FN	Hip scoring Eye Testing - Gonioscopy
English Springer Spaniel	DNA test - PRA cord 1 Annual Eye Testing Eye Testing – Gonioscopy DNA test - fuco	Hip scoring DNA test – PFK No litters from bitches <20months No more than 1 litter/year per bitch
German Shepherd Dog	Hip scoring	Elbow grading Annual Eye Testing Breed club - haemophilia testing for males No litters from bitches <2 years old No studs used <18 months old
Cavalier King Charles Spaniel	Annual Eye Testing	Breed club - heart testing (MVD) BVA/KC CM/SM Syringomyelia test DNA test – Episodic Falling DNA test - Curly Coat/Dry Eye
Staffordshire Bull Terrier	Annual Eye Testing DNA test - HC-HSF4 DNA test L2-HGA	Litter eye screening for PHPV
Border Terrier	None considered necessary	
Golden Retriever	Hip scoring Annual Eye Testing	Elbow grading No litters from bitches <18months No more than 1 litter/year per bitch
Boxer	None	Hip scoring Breed club - heart testing (aortic stenosis)
West Highland White Terrier	None considered necessary	

*Adapted from 'Breed-specific requirements and recommendations including health screening' PDF for Assured Breeders Scheme members.

** Top ten breeds relevant to this research based on Kennel Club registrations for 2010

*** see list of abbreviations for full terms (page XX-XXI)

1.5 Inherited disease epidemiology and data collection

One of the biggest problems in tackling inherited diseases and thus improving pedigree dog welfare is due to the lack of consistent, broad reaching epidemiological data on the extent of health conditions and their prevalence within certain breeds or types of dog. It has been recognised for some time that the collection and analysis of accurate data on canine disease is greatly needed to better inform breeding programmes (Crispin, 2012). However, little is also known about the number of puppies bred in the UK each year and further, the number that are imported from overseas (Crispin, 2011). There is also no definitive data on the true size of the canine population in the UK and as a result estimates vary (Murray *et al.*, 2010, Asher *et al.*, 2011, PDSA, 2013). Few up-to-date surveys exist to indicate the prevalence of health conditions associated with breeding practices and those that do may be limited by a number of biases (Crispin, 2012). Whilst pedigree dog registrations offer greater information than can be found on the crossbreed population, existing data is often inaccurate and lacking in detail (Crispin, 2011, Bloomfield and Scott, 2013) (see 1.5). Therefore, more extensive, good quality data collection is greatly needed, particularly relating to aspects such as quality of life assessment (Crispin, 2011). Well planned epidemiological studies, designed to answer specific questions about a distinct population would be the ideal. Currently several initiatives exist through which valuable data can be collected including VetCompass, SAVSNET, reporting of surgical alterations to the KC, the BVA/KC health schemes and research projects such as 'Dogslife'. There are limitations to all of these projects, especially where the amount of information about the denominator varies. Further detail is given below.

1.5.1 The Veterinary Companion Animal Surveillance System (VetCompass)

The Veterinary Companion Animal Surveillance System (VetCompass) is a disease surveillance project based at the Royal Veterinary College (VetCompass, 2013). The project aims to collect data on the frequency of small animal diseases in the UK via recruitment of both veterinary practices and practice management software providers. Data collection originates from the clinical notes vets make in practice. Via practice management systems (the computer systems which record patient information), data on signalment, vets' clinical notes and veterinary nomenclature (VeNom) codes (standardised veterinary terms for breeds, diagnoses, therapeutics etc) can be extracted for analysis (VetCompass, 2013). This initiative aims to investigate the prevalence, geographical spread and risk factors associated with disease and create a baseline resource for general disease surveillance (VetCompass, 2013).

1.5.2 The Small Animal Veterinary Surveillance Network (SAVSNET)

The Small Animal Veterinary Surveillance Network (SAVSNET) is a research initiative based at the University of Liverpool which aims to provide information on the frequency of disease occurrence in the vet-visiting population of pets (predominantly dogs, cats and rabbits) (SAVSNET, 2014). SAVSNET encompasses two complementary projects which carry out a dual approach to disease surveillance including both analysis of disease test results (carried out at veterinary diagnostic laboratories) and real-time in-practice diagnostic data (recorded by vets at the end of their consultations in practice and submitted to SAVSNET via the practice management system, along with relevant clinical notes) (SAVSNET, 2014). This initiative aims to monitor the present and future disease status of pet animals in the UK, promote health and welfare and provide information on disease levels to relevant parties including owners, veterinary charities and other organisations (SAVSNET, 2014).

1.5.3 Reporting of surgical alterations to the Kennel Club (KC)

The KC encourages the reporting of conformation-altering surgeries and Caesarean sections in registered dogs. To enable vets to report such procedures to the KC without breaching their professional obligation to

maintain client confidentiality, two significant changes were made to KC rules (The Kennel Club, 2013i). The first change occurred in 1990 and meant that the registration of any dog was conditional on owner consent for any surgeries altering conformation to be reported to the KC by the dog's vet. The second change was made in 2010, which extended the conditions of registration to owners also consenting to the reporting of Caesareans in registered dogs (The Kennel Club, 2013i). Information provided by reports to the Kennel Club is used to detect emerging problems in breed lines, deter bad breeding choices (for example, excessive use of Caesarean sections) and to help ensure dog show judges are aware of any surgical corrections that have been carried out on dogs being exhibited (The Kennel Club, 2013i). However, many sources have suggested the system of reporting such surgical alterations (particularly Caesarean sections) in KC registered dogs is underutilised by many vets, limiting the effectiveness of this process (The Kennel Club, 2013i)

1.5.4 British Veterinary Association (BVA)/Kennel Club (KC) health schemes

At present the British Veterinary Association (BVA) and the Kennel Club (KC) offer health schemes for hip dysplasia, elbow dysplasia and inherited eye diseases (see 1.4.1 and 1.4.4). The results of these screening tests are recorded on the KC database and are also published in the KC's Breed Records Supplement and on offspring registration certificates (The Kennel Club, 2013h). The KC website indicates that greater than 30,000 results are generated from the schemes each year (The Kennel Club, 2013h).

1.5.5 'Dogslife' research project

Collaboration of several parties including the Roslin Institute and the Royal (Dick) School of Veterinary Studies at The University of Edinburgh, Centre for Integrated Genomic Medical Research at the University of Manchester, Faculty of Veterinary Science at the University of Liverpool and The Kennel Club has resulted in the establishment of a clinical research project 'Dogslife' (Dogslife, 2014). Via the UK KC, this project aims to recruit a birth-cohort of Labrador Retrievers and evaluate risk factors which affect health via analysis of health data submitted online by the dogs' owners (Dogslife, 2014). This is a novel

project which has currently recruited a cohort of over 4000 Labrador Retrievers and subsequently expressed its potential for expansion to include other breeds (Dogslife, 2014).

1.6 Pedigree Dogs Exposed

In August 2008 'Pedigree Dogs Exposed' (PDE) was screened by the BBC (The BBC Press Office, 2008). This was an exposé style documentary described as lifting 'the lid on the extent of health and welfare problems in pedigree dogs, caused by decades of inbreeding and breeding primarily for "beauty" rather than health and function' (Passionate Productions, 2008). The programme featured testimony from top experts (Passionate Productions, 2008) and expressed that greater action needed to be taken to ensure that breeders prioritised health over aesthetics (Dudley, 2012). Examples such as syringomyelia in Cavalier King Charles Spaniels and the inability for many bulldogs to mate and whelp naturally were used to highlight the negative welfare concerns affecting some pedigree breeds (Higgins and Nicholas, 2008). The contentious issues raised by this programme were described as generating a widespread outcry, increasing publicity (Higgins and Nicholas, 2008) and encouraging greater interest in methods to tackle welfare complaints associated with some breeding practices (Veterinary Record, 2012e).

In response to PDE, the British Veterinary Association (BVA) described the programme as exposing the very worst aspects of dog breeding (Higgins and Nicholas, 2008) and confirmed it would continue to collaborate with the KC on canine genetics research funded by the KC Charitable Trust (Higgins and Nicholas, 2008). The KC however felt that PDE had followed 'a very specific agenda repeating prejudices, providing no context for the debate and failing to put forward any constructive proposals' (Higgins and Nicholas, 2008). Further, the KC felt the programme had portrayed to viewers that health problems were common to all pedigree dogs and further that the dog community had taken no action to address such health concerns (Higgins and Nicholas, 2008). Consequently the KC submitted a complaint to Ofcom alleging that the

programme had been unfair in its representation (Higgins and Nicholas, 2008). Despite mixed responses, PDE prompted the KC to review its breed standards and three independent inquiries were commissioned as a result to explore the welfare issues associated with dog breeding (Veterinary Record, 2012e) (see 1.7). As a follow up to PDE, 'Pedigree Dogs Exposed – 3 years on' was screened in February 2012 to explore the positive changes which had taken place since the screening of the original documentary and highlight areas of ongoing concern (Passionate Productions, 2012). This programme recognised that progress had occurred subsequent to the screening of PDE, for example via the KC's review of breed standards, but overall concluded that a great deal more had to be done in this area (Veterinary Record, 2012e).

1.7 Key reports

1.7.1 Pedigree dog breeding in the UK: a major welfare concern?

This independent scientific report was commissioned by the RSPCA and identified a number of breeds of dog suffering from compromised welfare due to certain selective breeding practices. Two main welfare concerns were identified by the report including the effects of extreme conformations on quality of life and an increase in inherited disease (Rooney and Sargan, 2009). Many findings of this report support those of the CAWC report conducted in 2006 (see 1.7.5.1). The report recognised these issues to be complex with many affiliated stakeholders and many possible avenues for change (Rooney and Sargan, 2009). The report further proposed that existing measures to address known welfare concerns had been limited in their effectiveness due to inconsistency in the use of available screening programmes for diseases (Rooney and Sargan, 2009). The report proposed a number of recommendations including the systematic collection of canine morbidity and mortality data; the prevention of registration of puppies produced from first and second degree relatives; open stud books; monitoring steps to improve breeding practice; ethical review of the health and welfare of existing breeds; improvement of diagnostic tests and screening; promotion of genetic diversity; production of Codes of Practice for breeders; training and accreditation of

judges; cultivation of good welfare as a desirable trait amongst the puppy buying public; the development of an independent panel of experts to facilitate improvements in pedigree dog welfare and the creation of schemes for calculating Estimated Breeding Values (EBVs) for genetic conditions (Rooney and Sargan, 2009).

1.7.2 A Healthier Future for Pedigree Dogs

This report investigated the health and welfare issues associated with pedigree dog breeding. Overall the report identified serious concerns surrounding the health and welfare of pedigree dogs for which it urged direct action was required (APGAW, 2009). However, the report acknowledged a lack of information to indicate the scale of the problem or the number of dogs affected (APGAW, 2009). Similarly, it recognised the lack of any restriction on sire use and the potential of this to propagate inbreeding. The report also acknowledged that health screening was not being fully utilised and further that the development of unique breeding strategies was required for different breeds based on the pooled knowledge of an array of relevant stakeholders (APGAW, 2009). It proposed that breed standards should be based on function as opposed to aesthetics and that vets should keep up-to-date with genetic information and incorporate client and breeder education into their daily practice (APGAW, 2009). Further recommendations included that health screening be made a legal requirement for breeding dogs; that dogs should not be awarded champion status without having been subject to health screening; that the word 'pedigree' should only be associated with high welfare breeding standards; that an independent body should be set up to advise the Kennel Club and its associated breed clubs; that a Puppy sale contract should be introduced and that DEFRA should implement a campaign for better public awareness (APGAW, 2009).

1.7.3 A Healthier Future for Pedigree Dogs (Update Report) 2012

This update report was issued to review the progress made since publication of the original report in 2009 and to generate a resultant action plan for continued improvements to pedigree dog welfare. Findings of this report

indicated that whist continued action was being taken to implement improvements to canine welfare, for example through the work of the Advisory Council and the formation of a Puppy Contract, many initiatives were simply taking too long to produce a significant effect and the need for more extreme controls was therefore suggested (APGAW, 2012). The report also found that awareness of the work carried out in this area was not always being disseminated from larger stakeholders to smaller parties working with puppy buyers and breeders and the need for good communication and collaborative efforts was therefore encouraged (APGAW, 2012). The action plan generated by the report featured a number of considerations including the generation of continued funding for the Advisory Council and its potential to become a regulatory body; implementation of compulsory micro-chipping; implementation of licensing for breeders of three or more litters per year; adoption of the Advisory Council's Breeding Standard by the Kennel Club; improved public education at all levels including the coverage of animal welfare within the school curriculum; the need for coverage of breeding and inherited disease within the DEFRA Codes of Practice for canine welfare and the united stakeholder support of the RSPCA Puppy Contract (APGAW, 2012).

1.7.4 Independent Inquiry into Dog Breeding

This peer-reviewed inquiry was funded by both Dogs Trust and the Kennel Club (Bateson, 2010). The report found current pedigree dog breeding practices to produce inadequate welfare standards for dogs through a variety of different means including inbreeding; poor husbandry or management; insufficient thought to breeding decisions; propagation of inherited diseases and through the selection of aesthetic extremes which result in an unsatisfactory quality of life (Bateson, 2010). The inquiry consequently made a number of recommendations including the establishment of a non-statutory, independent advisory council to develop strategies to address welfare issues in individual breeds; recognition of breeders who strive to meet high welfare standards; the need for a computerised system to collect diagnoses from veterinary practices and thus provide statistically significant prevalence data

for each breed; the need for permanent identification of dogs e.g. via micro-chipping; the need for a puppy education and awareness campaign to inform puppy buyer behaviour; a system for dog breeder accreditation with United Kingdom Accreditation Service (UKAS) approval and the need for new Animal Welfare Act regulations to oblige dog breeders to prioritise the health and welfare of their breeding animals and offspring (Bateson, 2010).

1.7.5 Other reports of interest

1.7.5.1 Companion Animal Welfare Council (CAWC) Report on Breeding and Welfare in Companion Animals (2006)

This report acknowledged the detrimental welfare implications associated with selective breeding. Further recognising that such implications could be serious and broad reaching, affecting animals not just throughout their lives with pain, discomfort and anxiety but compromising the welfare of subsequent generations also (CAWC, 2006). Further, the report raised concern that these welfare issues had been largely overlooked in the past and thus had not been sufficiently addressed (CAWC, 2006). The report recommended that a code (adapted from the wording of the Council of Europe Convention in 1987) should be adopted by all those breeding companion animals. This code stated that breeding decisions should be subject to careful consideration and not progress if likely to put the welfare of mother or offspring at risk (CAWC, 2006). The report further acknowledged that a number of parties, including breeders and vets, have key roles to play in addressing both current inherited diseases and conditions which may emerge in the future (CAWC, 2006).

1.7.5.2 Environment, Food and Rural Affairs Committee (EFRACom) Report on Dog Control and Welfare

The third section of this report gives an overview of canine breeding and welfare and suggests potential recommendations. The report recognised the actions of organisations and breeders to initiate change to improve canine health and welfare but recognised that despite this, progress was slow and inconsistent (EFRACom, 2013). The report suggested that an over-reliance

existed on voluntary action within in the dog community and that this posed a challenge when approaches were at odds with scientific evidence (EFRACom, 2013). Changes proposed by the report included licensing of those breeding greater than two litters a year by the local authority; a focus on disease eradication by all parties involved in breeding dogs; the use of health screening results to inform breeding plans; increased awareness of the Puppy Contract (see 1.7.6) and the implementation of outcrossing for breeds with the most serious health conditions (EFRACom, 2013). Further, the report argued the need for better enforcement, suggesting the Advisory Council on the Welfare Issues of Dog Breeding should have a regulatory role (EFRACom, 2013).

1.7.6 Outcomes and developments

A number of positive interventions and initiatives have been introduced subsequent to the publishing of the reports outlined above (see 1.7.1 - 1.7.5). An overview of some of these developments is provided below:

- Formation of the Advisory Council on the Welfare Issues of Dog Breeding (see 1.8)
- UKAS Accreditation of the Kennel Club Assured Breeder Scheme (The Kennel Club, 2014a)
- The introduction of High Profile Breeds and veterinary checks at Crufts (see 1.9 and 1.10)
- A review of Kennel Club Breed Standards and the creation of health plans for individual breeds (The Kennel Club, 2013m)
- Kennel Club restrictions on matings between closely related dogs (The Kennel Club, 2014e)
- Generation of disease prevalence data via veterinary practices (see 1.5.1 and 1.5.2)
- The re-launch of the Puppy Index by the Pet Industry Federation (formerly the Pet Care Trust) in 2010 to help educate prospective pet owners and to help retailors and pet specialists bring together prospective puppy buyers and approved breeders (Pet Industry Federation, 2013)

- Initiatives to educate the general public including the RSPCA's "Get Puppy Smart" Campaign (RSPCA, 2011a), the Dog Advisory Council's Guide to Buying a Puppy (Advisory Council on the Welfare Issues of Dog Breeding, 2012a) and the introduction of Puppy Awareness Week by the Kennel Club (The Kennel Club, 2013n)
- Development of a Puppy Contract and Puppy Information Pack by the RSPCA and BVA Animal Welfare Foundation (AWF) to assist puppy purchasers in buying and caring for a puppy (RSPCA and BVA AWF, 2012)
- Introduction of compulsory micro-chipping of all dogs by law from 2016 (British Veterinary Association, 2013)
- Formation of a Kennel Club Dog Health Group and the introduction of their 'Fit for Function' strapline (The Kennel Club, 2013m)
- The introduction of Breed Watch by the Kennel Club to allow show judges to feedback health concerns they are witnessing (see 1.9)
- The introduction of the Mate Select database by the Kennel Club and Animal Health Trust (AHT) to allow breeders to test the impact potential matings on genetic diversity, thus informing their breeding decisions (The Kennel Club, 2014g)

1.8 Advisory Council on the Welfare Issues of Dog Breeding

As a result of the three reports commissioned in the aftermath of PDE (see 1.7) in February 2010 a consortium of dog welfare organisations formed an interim review board through which the recommendations of the three reports could be developed; it was unanimously agreed that the formation of an independent advisory council should take precedence (Advisory Council on the Welfare Issues of Dog Breeding, 2012b). The Advisory Council on the Welfare Issues of Dog Breeding (Dog Advisory Council) was therefore created as a non-statutory group (relying on grants and donations) to provide advice to the government and other relevant parties (Crispin, 2011). Professor Sheila Crispin was appointed as founding chairman of the council and a further nine members were announced in November 2010 (Advisory Council on the Welfare Issues of

Dog Breeding, 2012b). The council has followed recommendations from the Bateson Inquiry relating to three specific areas: inbreeding, inherited disease and selection for extreme morphologies, inadequate management and provision of breeding dog care and substandard methods of buying and selling dogs (Crispin, 2012). In December 2010 the council held its first meeting (Advisory Council on the Welfare Issues of Dog Breeding, 2012b) from which a number of priorities were agreed including a review of existing legislation and enforcement, the production of a simple guide on how to buy a dog or puppy, the definition of good breeding practice, the utilisation of retrospective health data and the best method for data collection in the future (Crispin, 2011).

Overall the council has a number of aims including the provision of independent, expert advice and generation of recommendations relating to surveillance, research and development, breeding strategies, legislation and regulation, education and publicity (Advisory Council on the Welfare Issues of Dog Breeding, 2011, Crispin, 2011). In undertaking these aims, alongside the advice of experts the council has identified a number of priority issues resulting in reduced welfare and proposed ways to combat them (Crispin, 2012). A report issued by the Dog Advisory Council in 2012 highlighted eight key health concerns: ocular problems, breathing difficulties, syringomyelia and Chiari-like malformation, idiopathic epilepsy, heart disease of suspected inherited origin, breed related and inherited skin conditions, limb defects (including hip and elbow dysplasia) and separation related behaviours (Veterinary Record, 2012b). A number of recommendations were made in relation to the issues identified, including the breeding and showing of dogs with extreme conformation, better uptake of health schemes, increased research and promotion of collaboration between key stakeholders (Veterinary Record, 2012f).

The council has also been involved in creating an interactive ‘How to buy a puppy guide’ (Advisory Council on the Welfare Issues of Dog Breeding, 2012a), development of a puppy health check form and the creation of a set of standards for breeding dogs (Crispin, 2012) which will be regularly updated

based on the most current science (Veterinary Record, 2012h). As the council's chair, Sheila Crispin has also liaised with the KC on issues such as the reporting procedures for surgical alterations, the BVA/KC/International Sheep Dog Society (ISDS) Eye Scheme, dog owner and breeder education and the need for vet checks to be carried out at dog shows (Crispin, 2012). Despite the work carried out by the council it has no regulatory powers and thus the need for a more powerful body has been argued (Crispin, 2012). In 2012, this issue was raised at the Environment, Food and Rural Affairs Committee (EFRACom) where both the BSAVA president and BVA president spoke to MPs on their belief that the Dog Advisory Council should be made a regulatory body and that legislation surrounding dog breeding needed to be modified to promote better welfare (Veterinary Record, 2012g).

1.9 High profile breeds and Breed Watch

A High Profile Breed (HPB) is defined in the KC's Show Regulation Guidelines as 'a breed from time to time designated by the General Committee as requiring particular monitoring by reason of visible conditions(s) which may cause health or welfare concerns' (The Kennel Club, 2013l). Breeds may be added to the high profile list if significant concerns are raised by parties such as the general public, veterinary specialists, scientists or welfare organisations (The Kennel Club, 2013l). At present thirteen breeds are considered to be HPBs and these include the: Basset Hound, Bloodhound, Bulldog, Clumber Spaniel, Chow Chow, Dogue De Bordeaux, German Shepherd Dog, Mastiff, Neapolitan Mastiff, Pekingese, Pug, Shar Pei and St. Bernard (The Kennel Club, 2013k). Information on the conditions relevant to these breeds can be found on the Breed Watch page of the Kennel Club website (The Kennel Club, 2014d). Chinese Crested Dogs and French Bulldogs had also previously been considered HPBs but have recently been removed due to actions to improve health within the breeds (RSPCA, 2014a). In February 2013, the KC hosted its first HPB education day for relevant parties to showcase the improvements being made to improve the health of HPBs (Veterinary Record, 2013f).

Breed Watch is an initiative designed to be an 'early warning system' indicating particular areas of health concern for different breeds (The Kennel Club, 2014d). It enables all stakeholders with an interest in dogs, particularly those judging at dog shows, to research specific breed-related conformation issues which might impact negatively on health (The Kennel Club, 2014d). Individual conditions are known as 'points of concern' for which three categories exist (The Kennel Club, 2014d):

- **Category 1** - refers to breeds for which no current issues are reported
- **Category 2** - refers to breeds which exhibit breed watch points of concern
- **Category 3** - refers to breeds which have visible conditions negatively affecting their health (this term is now used to describe HPBs).

1.10 Veterinary health checks and The Canine Alliance

In 2012 the KC introduced veterinary health checks for HPB Best of Breed (BOB) winners at Crufts (RSPCA, 2014a). The introduction of these checks meant that BOB dogs' continuation in the show was conditional on them passing a veterinary health check (RSPCA, 2014a). These checks were introduced by the General Committee on the advice of the Kennel Club's Dog Health group to initiate improvement in the show ring by only rewarding healthy dogs (Veterinary Record, 2011b). Veterinary checks are based on visual observation and opinion and aim to establish whether the dog's health or welfare is negatively affected in such a way that it should be deemed ineligible to continue competing in the competition (The Kennel Club, 2012c). The first year of vet checks at Crufts saw six out of the fifteen HPB fail their vet checks and be denied BOB awards (Cooper, 2012a). The vets conducting the health checks at the time described the KC as providing great support in respecting the vets' decisions: 'no attempt whatsoever was made to influence our decisions in anyway: we could have passed or failed each and every one of the 15 dogs quite freely' (Skipper and Jeffels, 2012). The following year at Crufts 2013, all 14 BOB winners passed their veterinary health checks (Veterinary Record, 2013c) and

again this year (2014) all 13 HPB passed (Dogworld Newspaper, 2014), suggesting a change in emphasis to better health in the show ring.

Many breeders were discontent with the introduction of HPB BOB veterinary health checks at Crufts 2012 and the six breeds that were disqualified as a result (Bonner, 2012b). A protest group was set up as a result called Canine Concern (Bonner, 2012b). On the 16th May 2012 the Kennel Club was forced to revote on a motion to suspend vet checks, this was overturned 92 votes to 56 (Bonner, 2012b).

The Canine Alliance (CA) is an organisation that was formed due to discontent surrounding the veterinary health checks (The Canine Alliance, 2014). The CA has a number of aims including the protection and support of pedigree dog wellbeing, upholding the ethics of dog breeding and the promotion of more widespread health checks for all dogs exhibited at KC licensed shows (The Canine Alliance, 2014). The CA state on their website that they feel that health checks should occur before dogs compete, rather than being carried out on dogs that have already been awarded a prize (The Canine Alliance, 2014). The CA has further stated its intention to initiate talks with the KC regarding basic health checks. In order to give Kennel Club registration greater meaning, the CA feel parent dogs should be subject to basic health checks before offspring can be accepted for registration (The Canine Alliance, 2014). Finally the CA feels that KC membership should be more open and thus, more representative of the average breeder (The Canine Alliance, 2014).

1.11 Key stakeholder roles in canine welfare

A number of key stakeholders have been identified as having a key role in improving the welfare of pedigree dogs (Rooney and Sargan, 2009); although the role of many of these parties or organisations is actually applicable to the improvement of general canine welfare (see Figure 2). Parties of direct interest to this thesis are depicted in blue and will be discussed further below.

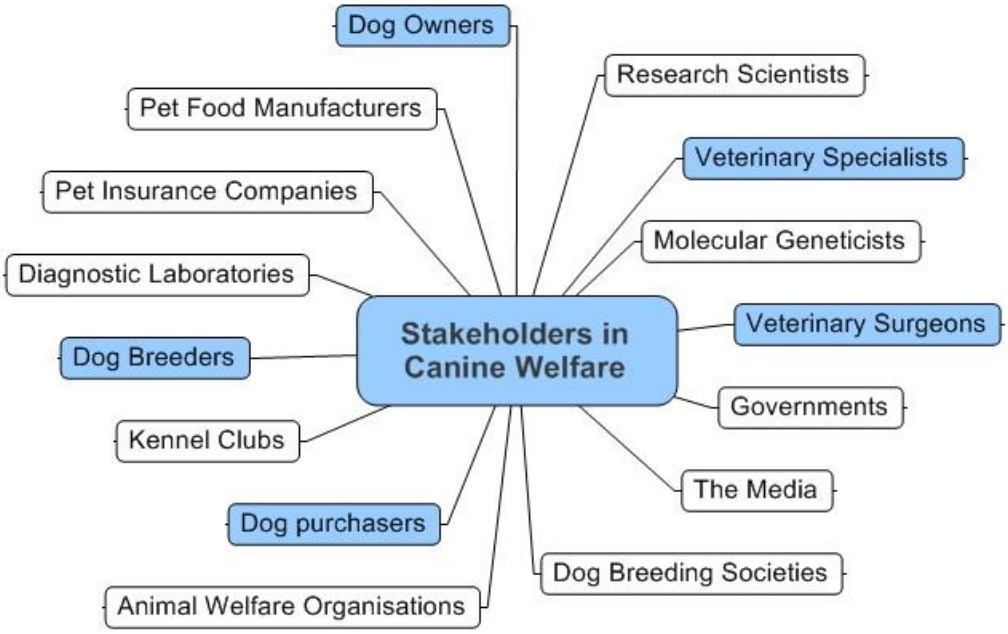


Figure 2: Diagrammatic representation of key stakeholders involved in canine welfare as adapted from a report commissioned by the RSPCA: "Pedigree dog breeding in the UK: a major welfare concern?" (Rooney and Sargan, 2009) * Parties of greatest interest to this thesis depicted in blue.

1.11.1 The role of veterinary surgeons

Veterinary surgeons oversee a number of key roles for their canine and non-canine patients alike. Such roles include the diagnosis and treatment of disease, the provision of preventive care, neutering, general health checks, euthanasia when deemed necessary and the provision of advice to owners on the diet and management of their pets (National Careers Service, 2012, RCVS, 2014a). Patient welfare should be a primary consideration for practising vets as outlined by the Royal College of Veterinary Surgeons (RCVS) Code of Conduct and the oath sworn by all veterinary surgeons in the UK upon entering the profession (The Alternative Veterinary Medicine Centre, 2007, RCVS, 2014a). The RCVS Code of Conduct also addresses the expectation for vets to be open and honest with their clients, providing independent and impartial advice (RCVS, 2014a). A webinar regarding vets' roles in promoting pedigree dog welfare, conducted by Harvey Locke in 2012 suggested vets' roles to include the promotion of puppy contracts, the provision of advice for breeders, the promotion of health schemes, the reporting of surgical alterations, the

provision of pre-purchase advice for prospective owners, assisting with research and promoting micro chipping services (Locke, 2012a). A poll conducted during the same webinar found that, of the veterinary audience, 30% already offered free consultations for pre-puppy purchase advice and 57% would consider offering this service (Locke, 2012a). Many sources have suggested the importance of vets in educating both dog owners and those intending to buy a dog (Blayney, 2011, Locke, 2012b). Further, it has been questioned whether vets should be more instrumental in promoting such free consultations, to enable prospective dog owners to meet with a vet or vet nurse in order to discuss the right dog for their circumstances and lifestyle (Locke, 2012b).

The Bateson Inquiry suggested several recommendations for the roles vets could fulfil in improving pedigree dog welfare. These included the importance of data collection from practices, providing expert support for the enforcement of breeding and sales legislation and the role of assisting, supporting and informing moves to reduce the incidence of inherited conditions (Bateson, 2010). The potential for vets to assist with data collection may be achieved by more practices working with research initiatives such as SAVSNET and VetCompass, via the reporting of surgical alterations to the KC and by encouraging client participation in studies such as Dogslife (see 1.5.1, 1.5.2, 1.5.3 and 1.5.5). Further, the Bio-Acquisition Research Collaboration (BARC) is a recent initiative that has been introduced to encourage collaboration between clinicians and researchers, allowing researchers to request samples they need from practices for current studies (The Kennel Club, 2013d). Other roles of veterinary surgeons include that of taking an active role in reporting surgical alterations to the KC (Westgate, 2012) and further being aware of and promoting health schemes, for example the BVA/KC scheme for Chiari-like malformation and syringomyelia (Locke, 2012b). Similarly, vets should also consider the genetic population as well as the individual dog when advising on breeding strategies (Brockman, 2011).

A number of initiatives now exist to promote responsible breeding and inform breeding choices which vets can make their clients aware of. Such tools include the KC's Health Test Results Finder and Mate Select Tool (which uses a computerised virtual breeding to indicate the inbreeding coefficient of puppies produced from various hypothetical matings) (The Kennel Club, 2014g, The Kennel Club, 2014f). By understanding such tools, vets can encourage better use of these tools amongst their clients and ultimately better inform decision making amongst those looking to breed their dogs (Locke, 2012b). It is also important that vets are aware of the KC's Assured Breeders Scheme (formally the Accredited Breeders Schemes) to enable them to direct prospective puppy buying clients to responsible breeders (Locke, 2012b). Staying up-to-date with the most current advice and information relating to pedigree dog welfare should also be an important consideration for vets.

1.11.2 The role of the Kennel Club

The KC describes themselves as the 'largest organisation in the UK devoted to dog health, welfare and training' (The Kennel Club, 2013a). Their main objective is described as ensuring 'that dogs live healthy, happy lives with responsible owners' (The Kennel Club, 2013a). The KC oversees the largest canine registration database in the UK for both pedigree and non-pedigree dogs (Crispin, 2011, The Kennel Club, 2013a). It also runs the Petlog microchip database; certifies and monitors members of the UKAS accredited Assured Breeders Scheme; runs the Good Citizen Dog Training Scheme; organises the annual Crufts dog show and more than 4500 other shows and events per year; supports research relating to canine disease and welfare via the KC Charitable Trust; collaborates with the British Veterinary Association to provide health screening schemes and also funds The Kennel Club Genetics Centre at the Animal Health Trust (The Kennel Club, 2013a).

The KC has undertaken a number of actions to improve pedigree dog welfare via collaborative efforts with other stakeholders in recent years. These actions include formation of the KC's Dog Health Group, petitioning for the values of the ABS to be applicable to all breeders (not just those under the scheme) and

further, educating breeders outside of the scheme (The Kennel Club, 2013m). Additionally, the KC has refused to register more than four litters from any given bitch and no more than two litters born by Caesarean to any bitch with the exception of specific approved circumstances (The Kennel Club, 2013m). Further, the KC have recognised the need for, and are active in, the provision of education for puppy buyers, delivering such information through Discover Dogs, the Breed Information Centre on their website and through the introduction of National Puppy Awareness Week (The Kennel Club, 2013m). The club have also created a veterinary manual to assist vets by providing necessary information on individual breeds and their associated conditions and recommended health tests (The Kennel Club, 2013m).

Other actions to improve pedigree dog health include the development of the online Mate Select tool for breeders to examine the potential outcomes of intended matings with regards to genetic diversity; encouraging outcrossing where necessary, for example in the development of low (normal) uric acid Dalmatians; allowing the registration of dogs of unverified parentage, subject to them resembling a recognised breed to allow for greater genetic diversity and only allowing puppies to be registered if their parents have been subject to appropriate health screening tests under the Assured Breeders Scheme (The Kennel Club, 2013m). Additionally, Kennel Club breed standards have also been reassessed and are described to be subject to continual development and review (The Kennel Club, 2013m). The KC has also developed Breed Watch to allow breeders and judges to report health concerns (see 1.9) and Breed Health Coordinators have been appointed within individual breed clubs to provide a network of health feedback monitored by the KC (The Kennel Club, 2013m). With regards to dog shows, greater focus has been placed on pedigree dog health and veterinary checks have been introduced to enforce this (see 1.10) (The Kennel Club, 2013m). Finally, the KC expresses a hope that many of the initiatives they have introduced will benefit not just pedigrees, but also crossbreeds and mongrels (The Kennel Club, 2013m).

1.11.3 The role of dog breeders

Breeders, like any other animal owner have an obligation to ensure the welfare of dogs in their care as outlined by 'The Five Welfare Needs' (DEFRA, 2009) (see 1.1.2, Table 1) and the Animal Welfare Act of 2006 (Animal Welfare Act, 2006). The breeders of dogs also have a number of ethical responsibilities to fulfil, ensuring that they promote good welfare, breed the healthiest dogs possible and take available measures to screen for and manage inherited disease (Bell, 2011, Veterinary Record, 2012b). It has been argued that animal welfare should be a central consideration of breeding practice and that quality of life considerations and scientific evidence should influence breeding choices (Crispin, 2011).

Although there is little regulation of general dog breeders in the UK, for those registered with the KC's Assured Breeders Scheme, expectations are clearly defined. The KC website states that Assured breeders must meet a number of obligations, including registering all of their breeding stock with the KC and ensuring they are permanently identified, following KC policy regarding the number and frequency of litters and the maximum age for breeding, using relevant health screening schemes, properly socialising puppies, providing new owners with relevant information and a contract of sale in a Puppy Sales Wallet at the point of sale and providing reasonable post-purchase advice (The Kennel Club, 2013c). In recent years the KC and Dogs Trust have introduced a 'Puppy Plan' as a pilot scheme amongst assured breeders (Veterinary Record, 2012d). The scheme aims to improve the future life of dogs and owners via a step-by-step socialisation plan which aims to prevent behavioural problems later in life (Veterinary Record, 2012d). As socialisation starts whilst the puppies are still under the breeders' care it is up to breeders to be involved in this scheme and other initiatives which promote better welfare amongst companion dogs.

Breeders possess a great deal of responsibility for the dogs they breed, the owners they sell to and society as a whole (Indrebo, 2007) and as such the knowledge of breeders should encompass a number of areas including basic puppy care, socialisation, training and decision making regarding homing

puppies with suitable owners (Indrebo, 2007). With reference to breeding strategies, breeders' goals should be to produce dogs which are functional, healthy and express temperaments typical of their breed (Indrebo, 2005). It is important that breeders are aware of the effects of their breeding strategies on the wider gene pool of their breed (Bell, 2011), meaning both the individual dog and the breed should be considered hand in hand (Indrebo, 2005). Breeders should aim to making breeding decisions which improve the quality of the breed's health, temperament, conformation and ability to fulfil its purpose whilst preserving good genetic variation (Bell, 2011). An interesting paper by the Veterinary Scientific Director at the Norwegian Kennel Club in 2007, outlined a number of basic recommendations for breeding healthy dogs which included: not re-mating any bitch with an inability to give birth naturally, regardless of breed; not re-mating any bitch that was unable to take care of new born puppies (whether due to health or behavioural issues) and not excluding more than 50% of breeding stock when selecting dogs for breeding programmes (Indrebo, 2007). Many of these considerations are also applicable to UK breeders; however difficulties arise when considering breeds such as the Bulldog in which an estimated 86% of puppies are born by elective Caesarean (Evans and Adams, 2010).

A further consideration for those breeding dogs should be the importance of breeding and raising dogs with a sound temperament and this should be a factor considered when making breeding decisions and establishing a suitable environment in which to raise puppies in their first few months of life (Indrebo, 2005). With regards to achieving good pedigree dog welfare, the need for good breeding practice has been described (Bell, 2011, Veterinary Record, 2012b), alongside the need for good collaboration between breeders themselves but also with other parties such as vets, scientists, the Kennel Club and Breed Clubs (Indrebo, 2005, Indrebo, 2007). Knowledge, education, honesty and cooperation have been described as key considerations in achieving this goal (Indrebo, 2005).

Unfortunately not all dog breeders are responsible ones and the fact that dog breeding is such a lucrative business despite the vast quantity of puppies being produced raises questions regarding the adequacy of current legislation (Crispin, 2012). Concerns exist regarding breeders who breed exclusively for profit and such individuals have been described as lacking attachment to the dogs in their care and the breed as a whole (Thompson, 2008). Further, concerns have been raised regarding a noted tendency for increased numbers of sickly puppies to be imported from abroad due to relaxation in pet travel laws which occurred in January 2012 (Veterinary Record, 2013d).

1.11.4 The role of dog owners and puppy purchasers

Research has shown the majority of people to keep companion animals for social reasons, with companionship being the most frequently identified motivation for acquiring a pet (Endenburg *et al.*, 1994). In recent years the benefits of dog ownership have been advertised, including aiding child development, reducing depression, improving owner health, fitness and reducing stress (Dogs Trust, 2011). As with all pet owners, dog owners are legally obliged to adequately care for their dogs, for example, through the provision of food, water, veterinary care and a suitable home environment in accordance with the Animal Welfare Act of 2006 (Animal Welfare Act, 2006). All dog owners are also obliged to ensure their dogs are properly identified at all times through use of an identity tag and collar under the Control of Dogs Order, 1992 (The Control of Dogs Order, 1992) and as of 2016 the micro-chipping of all dogs will also become compulsory by law (British Veterinary Association, 2013).

The UK has been described as a nation of animal lovers (PDSA, 2013), with 77% of UK pet owner participants (n = >2000) believing their pets' health to be equally or more important when compared to their own (NOAH, 2014). However reports conducted by the People's Dispensary for Sick Animals (PDSA) over the last few years have highlighted that at times owners' knowledge of their dogs' needs are lacking and consequently result in lower welfare standards (PDSA, 2011, PDSA, 2012, PDSA, 2013). In the most recent PDSA

report conducted, the number of dogs experiencing daily exercise off the lead had decreased by 7% from 2011; only 17% of owners considered body condition score and weight in relation to feeding their dog; 58% of dogs had not been to training classes at a young age and the number of dogs regularly left alone for five or more hours had risen by 7% (PDSA, 2013). Other research has identified further areas in which dog owner knowledge is lacking, for example, regarding dangerous dog legislation (Oxley, 2012). Furthermore, a study by Packet and others in 2012 showed many owners of brachycephalic breeds to consider breathing problems to be a normal characteristic (Packer *et al.*, 2012).

Whilst pet owners have been shown to seek advice from a variety of parties, of which vets, the internet and friends or family were key sources of advice (PDSA, 2013), evidence has indicated a lack of pre-purchase research to be carried out prior to acquisition of a dog or puppy (PDSA, 2013). A survey of puppy owners (n = >2000) commissioned by Ceva Animal Health found that 40% of new puppy owners had failed to carry out any research before acquiring their puppy, despite almost 90% agreeing that acquiring a new puppy was comparable to raising a child (Veterinary Record, 2013a). This research also found that only 40% of new puppy owners had investigated which breeds were known to be good with children (Veterinary Record, 2013a). Furthermore, 59% of respondents were of the view that they were not completely prepared for acquiring a puppy with 55% confessing it to be more stressful than they had expected (Veterinary Record, 2013a). Data collected by an RSCPA survey also showed similar findings, with 40% of respondents (n=7272) only researching for one week or less before acquiring a puppy and 56% buying a puppy without seeing its mother (The University of Bristol, 2011).

The RSPCA has recently voiced the concern that if dog owners are not undertaking sufficient research, they may be buying puppies likely to suffer from health problems and compromised welfare (RSPCA, 2011b). These concerns are supported by PDSA data, which indicated that 26% of respondents would consider getting a dog from a puppy farm (PDSA, 2013). Considerations

such as those discussed above may also contribute to increases in dog relinquishment; RSPCA data published in 2011 indicated almost 20% of people who had acquired a puppy in the two years previous to data collection no longer owned it (The University of Bristol, 2011). In the aftermath of PDE, a common finding of all three key reports was the need for better education of the puppy buying and dog owing public (APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010). There is therefore a need for puppy purchasers and existing owners to make use of the tools available to advise them on this matter, for example, the RSPCA's 'Get Puppy Smart' tool (RSPCA, 2011a), the Advisory Council's Guide to Buying a Puppy (Advisory Council on the Welfare Issues of Dog Breeding, 2012a) and the KC's Puppy Buying Guide App (The Kennel Club, 2014h).

1.12 General methodology and rationale for study approach

Two main types of research design exist and these can be described as quantitative and qualitative research methods. Quantitative research methods tend to be structured with predefined considerations such as the study objectives, design and sample (Kumar, 2005). Data collection for quantitative studies is often mainly numerical (although can comprise text) and forms the basis for statistical analysis (Shields and Twycross, 2003). Examples of this type of research include experimental tests, clinical trials, epidemiology and intervention studies (Shields and Twycross, 2003). Conversely, qualitative studies tend to be less structured and can provide insight into poorly understood areas by identifying the range of opinions or beliefs relating to phenomena and explaining why certain behaviours and attitudes exist (Britten and Fisher, 1993). Behaviour may also be an important consideration and qualitative research often examines interactions between participants (Silverman, 2011). Qualitative research does not involve numerical data or statistics and instead uses words, descriptions and quotes as an avenue of exploring meaning (Shields and Twycross, 2003). Types of qualitative research include phenomenology, grounded theory, ethnography and case studies (Merriam, 2002) and may compromise research methods such as observation, interviews and focus groups (Hancock *et al.*, 1998, Christley and Perkins, 2010). For example, a focus group study by Coe *et al.* explored vets' and pet owners' perceptions of client expectations with respect to the monetary aspects of veterinary care (Coe *et al.*, 2007).

Interviews are a good research method for complex situations for which in-depth information is required (Kumar, 2005). Focus groups interviews particularly are also good for exploring how different points of view are formed and expressed (Kitzinger and Barbour, 1999). They also allow the generation of data via group interaction where participants can discuss each other's experiences and points of view (Kitzinger and Barbour, 1999). It is not assumed that focus group participants will be representative of the wider population, however whilst the results generated may be unique to the particular focus

groups conducted, they may be able to contribute to a more generalised theory to explain the study focus (Christley and Perkins, 2010).

Qualitative data analysis is both an inductive and iterative process which identifies patterns or themes (Creswell, 2012). Whilst quantitative research usually begins with a hypothesis, qualitative research generates hypotheses from the data collected (Silverman, 2011).

Some data collection tools may be either quantitative or qualitative in their function, for example questionnaires or reviews (Dohoo *et al.*, 2009, Armstrong *et al.*, 2011). Quantitative questions are structured and designed to collect information about the study respondents and their environment (Dohoo *et al.*, 2009). Conversely, qualitative 'explorative' questionnaires may have open questions to allow participants to express their views on a subject; such questionnaires are often used at the hypothesis generating stage of research (Dohoo *et al.*, 2009). In the case of reviews, data generated from the research question can be interpreted quantitatively or qualitatively, combining descriptive statistics with contextual meaning (Armstrong *et al.*, 2011). In many studies there is a need to combine both quantitative and qualitative approaches (Kumar, 2005) and when combined, this research design can be described as a mixed-methods approach (Bryman, 2007). Several quantitative and qualitative studies which have influenced the design of this PhD project are described and evaluated below:

1.12.1 Questionnaire-based studies

Several questionnaire-based studies have been identified in the literature and are of relevance to this research. Just over 15 years ago, Leppanen and colleagues carried out three connected studies of Finnish vets, breeders and owners. These studies aimed to explore vets', breeders' and owners' knowledge of canine inherited diseases and health screening programs along with their compliance towards such programs (Leppanen *et al.*, 1999, Leppanen *et al.*, 2000a, Leppanen *et al.*, 2000b). All data were collected via mailed questionnaires (one separate questionnaire for each of the three

groups), contained five parts and ranged from 7-21 pages long, with a total of 26-40 closed and free text questions (Leppanen *et al.*, 1999, Leppanen *et al.*, 2000a, Leppanen *et al.*, 2000b). Vets were sourced through the Finnish Veterinary Association whilst breeders and owners were sourced through the Finnish Kennel Club's Registration Data (Leppanen *et al.*, 1999, Leppanen *et al.*, 2000a, Leppanen *et al.*, 2000b). The response rates received via this method were 46.9% for vets, 36% for breeders and 35.6% for owners (Leppanen *et al.*, 1999, Leppanen *et al.*, 2000a, Leppanen *et al.*, 2000b). These studies collectively identified a number of findings including that both vets and breeders felt they could influence other parties and promote health programs; vets estimated their own knowledge on canine inherited disease and control programs poorly; breeders felt their own knowledge on canine inherited disease and control programs was quite good; owners felt that their own knowledge could be better but had faith in vets' and breeders' ability to inform them; all parties believed health programs at the time to be having a positive effect on preventing inherited disease. However, it was thought that information directed towards vets, breeders and other key parties could further improve this (Leppanen *et al.*, 1999, Leppanen *et al.*, 2000a, Leppanen *et al.*, 2000b).

In 2005, a questionnaire-based study of pedigree dog breeders was conducted by Leroy and colleagues in France (Leroy *et al.*, 2007). This study was questionnaire based and aimed to examine breeders' breeding practices and goals (Leroy *et al.*, 2007). Unlike the studies conducted by Leppanen *et al.* this research differed slightly in that the questionnaire was developed from preparatory interviews before piloting. Despite this both studies hold some similarities, for example both utilised a KC mailing list for their distribution. Many aspects of such research could be updated and adapted to explore the perceptions of vets, breeders and owners in the UK. For example, questions could be included on the BVA/KC schemes; who dog owners seek advice from about different aspects of their dogs' care and the parties vets, breeders and owners perceive to be most responsible for various actions to improve

pedigree dog welfare. More focus could also be placed on these groups working together to improve pedigree dog health as a collective unit.

1.12.2 Focus group and interview-based studies

Several focus group studies looking at vets and dog owners have been identified in the veterinary literature. Coe and colleagues published two focus group studies of vets' and pet owners' perceptions of client expectations and the challenges associated with vet-client communication and the monetary aspects of veterinary care (Coe *et al.*, 2007, Coe *et al.*, 2008). Both studies were qualitative in design and consisted of six pet owner focus groups (32 owners in total) and four vet focus groups (24 small animal vets in total) (Coe *et al.*, 2007, Coe *et al.*, 2008). The focus group interviews in each study consisted of standardised open-ended questions and the use of follow up probes; the resultant transcripts were subject to content analysis (Coe *et al.*, 2007, Coe *et al.*, 2008). The results of both studies identified a number of challenges in vet-client communication (Coe *et al.*, 2007, Coe *et al.*, 2008). In contrast to the approach described above, in 2006 and 2007 Lund and colleagues conducted a study on the changes in the relationships between dogs, owners and veterinarians in Norway and Iceland (Lund *et al.*, 2009). Rather than using just questionnaires, they adopted a multidisciplinary approach including observations, informal talks, semi-structured interviews and standardised questionnaires (Lund *et al.*, 2009). Semi-structured interviews were then used as a means of supplementing the questionnaire findings, to provide qualitative data and elaborate on participants' attitudes and experiences (Lund *et al.*, 2009). Via this multidisciplinary approach both qualitative and quantitative data were collected. These studies therefore offer potential for adaptation to examine vets', breeders' and owners' perceptions of pedigree dog welfare, their differences in opinion and approach when managing pedigree dog health and the complexity of the relationship they collectively hold.

1.12.3 Reviews of online information resources

Whilst review studies of the information resources available to new dog owner are lacking within the veterinary literature, several similar studies exist which

are comparable to this concept. One such study of interest was identified in human health care field. This study was a systematic review of online radiology patient information sources which aimed to evaluate the internet as a useful resource for radiology patients seeking information on procedures (Smart and Burling, 2001). The study methods involved a systematic search of the general internet via four different search engines using predefined key phrases, for example, 'patient information radiology'. The first 50 hits for each search were identified for review and the material provided was evaluated based on inclusion criteria, exclusion criteria and a predefined checklist relating to procedure considerations, links to additional websites, visual support for provided text and the availability of author contact details (Smart and Burling, 2001). Readability was also evaluated using the Flesch Kincaid Reading Score (Smart and Burling, 2001). A systematic review of patient inflammatory bowel disease resources conducted by Bernard and others in 2007 also followed similar methodology (Bernard *et al.*, 2007). However, online resources were instead evaluated by using a Quality Evaluation Instrument for specific information on inflammatory bowel disease, a 5-point global quality score, readability scores and a 6-point integrity score (Bernard *et al.*, 2007). A further veterinary study of online resources for owners of dogs with osteoarthritis again followed similar methods but differed in the analysis of the websites generated; relying on experts to provide a standardised evaluation of each resource (Jehn *et al.*, 2003).

The concepts used by these studies are fairly novel and many such aspects could be applied to a similar study of the information resources available to dog owners or puppy buyers. However, none of the studies described above first researched the search terms patients or dog owners would actually use when searching the internet. Little consideration was also given to general indicators of research quality such as reference to existing literature, the provision of dates on resources or the provision of a reference list. Resource assessment also failed to utilise existing methods of critical appraisal such as those used by the Cochrane Collaboration (The Cochrane Library, 2014) or the

Joanna Briggs Institute (Joanna Briggs Insitute, 2011). These issues would need to be addressed if such studies were to be adapted for use in evaluating dog owner online resource quality. Exploring dog owner or puppy buyer search terms via an online questionnaire prior to conducting searches and utilising tools such as the critical appraisal sheets used by the CEVM (adapted from the Joanna Briggs Institute) may be of use in overcoming such challenges and ensuring a more consistent approach to resource evaluation.

1.13 The purpose of this thesis – the gap in existing knowledge

The issue of improving pedigree dog welfare in the UK is a complex one which encompasses a multitude of factors. Three key reports have been commissioned in recent years (APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010), from which a number of key recommendations were made to improve pedigree dog welfare (see 1.7). However, to date no research has been undertaken specifically exploring the grassroots stakeholders central to this issue in the UK such as vets, dog breeders and dog owners. Fully exploring the roles of such parties, the perceptions that govern their actions and the interactions they share is important to understand their subsequent behaviours and to enable effective targeting of policies aimed at these groups consequently underpinning further research. Although three questionnaire-based studies of this nature were carried out in Finland between 1997 and 1998 (Leppanen *et al.*, 1999, Leppanen *et al.*, 2000a, Leppanen *et al.*, 2000b), these results are outdated and are of limited applicability to the UK. These studies do however highlight how such research methods could be applied to an exploratory study of UK stakeholders and this holds potential for further development. A common finding of all three reports conducted in the aftermath of PDE was that of providing better education to the puppy buying public (APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010). As a result several new information resources have been introduced (RSPCA, 2011a, Advisory Council on the Welfare Issues of Dog Breeding, 2012a). However, a great deal of information already exists online and is freely accessible. Despite this, little is known about the quality of pre-existing information on acquiring

and caring for a dog, how useful owners consider it to be, how good prospective owners are at searching the internet for relevant information, owners' abilities to judge the reliability of information on the internet or whether existing information is being fully utilised. Further, existing evidence indicates that only a minority of owners actually seek pre-purchase advice (RSPCA, 2011b, PDSA, 2013), suggesting that either more needs to be done to encourage owners to seek pre-purchase advice or educatory interventions may be best implemented post-purchase. Whilst reviews of online resources exist in the medical literature (Smart and Burling, 2001), no such studies have been carried out in the veterinary literature regarding online resources for dog owners. This is also therefore a potential area for research development, subject to establishing dog owners' search methods for retrieving information online. Such research would better inform the implementation of a public education campaign as outlined by report recommendations (APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010) and better inform advisory parties such as vets and breeders on how to most effectively share information with their dog owner clients online.

1.13.1 Thesis working hypothesis and aims

The overarching working hypothesis for this thesis is that conflicting perceptions, inconsistent collaboration and poor owner education are likely to pose major limitations in the instigation of a unified effort to improve pedigree dog health and welfare. This research will therefore explore the perceptions of veterinary surgeons, pedigree dog breeders and dog owners relating to key elements of canine welfare including dog acquisition, breeding, inherited diseases, health schemes and use of information resources. The second aim of this study is to establish how dog owners search the internet for information on how to care for a new dog and to review the quality of the information resources generated as a result of such searches. A study summary is provided in Figure 3 and the individual study objectives are outlined in further detail, chapter by chapter, overleaf (see 1.13.2).

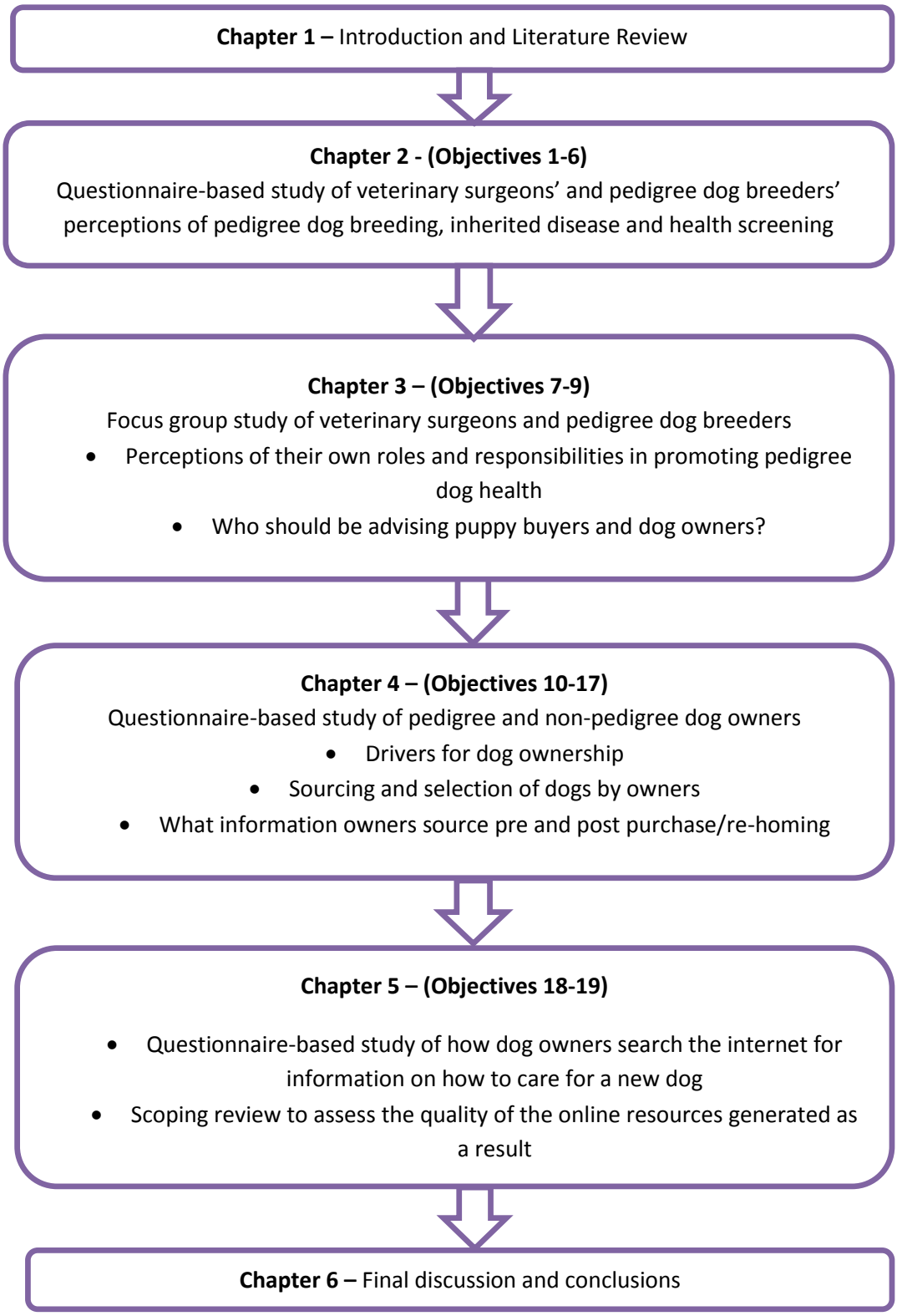


Figure 3: Study summary showing Chapters 1-6 and their coverage of the overall thesis objectives

1.13.2 Objectives and thesis outline

Chapter 1

Introduction and literature review

Chapter 2

Questionnaire-based study of vets and pedigree dog breeders

To document and report:

1. Vets' and pedigree dog breeders' awareness of health schemes and perceptions concerning pedigree dog health management
2. Where vets and pedigree dog breeders source information on pedigree dog health from and what information sources they perceive each other to use
3. Who vets and breeders perceive to carry the most knowledge with regards to pedigree dog breeding, canine hereditary diseases and screening programs
4. Who vets and breeders perceive to carry the most responsibility for various actions relating to the promotion of pedigree dog health
5. How vets and breeders rate the importance of health-promotion actions for the control of canine hereditary diseases
6. Which conditions are most commonly seen by vets and breeders in the top ten most registered pedigree dog breeds in the UK

Chapter 3

Focus group interviews with vets and pedigree dog breeders

To document and report:

7. Vets' and pedigree dog breeders' perceptions of their own individual roles in promoting pedigree dog health
8. Vets' and pedigree dog breeders' perceptions of each other's roles in promoting pedigree dog health
9. Why vets and pedigree dog breeders might differ in their opinions of who should advise pedigree dog owners and puppy buyers

Chapter 4

Questionnaire-based study of pedigree and non-pedigree dog owners

To document and report:

10. What motivates owners to get a dog in the first place?
11. Through which source is an owner is most likely to find out that a dog is available for purchase or re-homing?

12. Where do owners get their dog(s) from and what influences their choice?
13. Where do owners source information, if any, about their dog(s)?
    i. Prior to purchase of the dog(s)?
    ii. During the dog(s) life?
14. In what form do owners prefer to receive information?
15. Is there a difference in who owners specifically seek information from regarding particular aspects of their dog(s) care
16. How do owners rate vets and breeders against their own perceived knowledge of dog breeding, inherited disease and screening programs?
17. Have owners heard of the Kennel Club and what role do they perceive it to play?

Chapter 5

Two-part study comprising an initial questionnaire of dog owners and follow up scoping review of online resources

To document and report:

18. The search terms or expressions owners use when searching online for information on how to care for a new dog
19. Which online resources are generated as a result of such searches including their relevance, format, usability and readability

Chapter 6

Overview of key results and recommendations for future research

For the purposes of this thesis any further reference to breeders can be interpreted as referring specifically to pedigree dog breeders unless stated otherwise. Similarly any reference to vets is specifically referring to veterinary surgeons.

Chapter 2- Questionnaire-based study of veterinary surgeons' and pedigree dog breeders' attitudes to pedigree dog breeding, inherited disease and health screening programmes in the United Kingdom

2.1. Introduction

Awareness of pedigree dog welfare and associated breeding practices has grown in recent years and several key reports have offered recommendations on how to address welfare issues and safeguard better health and wellbeing for future generations of dogs (APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010). The issue of canine welfare is a complicated one for which a great many stakeholders can be held accountable. Both veterinary surgeons and pedigree dog breeders have been identified as being amongst these stakeholders, with important roles to play in instigating positive change within the dog breeding world (APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010). Veterinary surgeons oversee many roles in relation to the care of their canine and non-canine patients alike (see 1.11.1) (National Careers Service, 2012, RCVS, 2014a). With specific reference to pedigree dog health, vets have been described as having involvement in areas such as promotion of puppy contracts; the provision of advice for breeders; the promotion of health schemes; the reporting of surgical alterations; the provision of pre-purchase advice for prospective owners; assisting with research and promoting micro chipping services (Locke, 2012a).

Breeders, like any other pet owner, have to provide care for their dogs in line with the Animal Welfare Act of 2006 (Animal Welfare Act, 2006). They have a number of ethical responsibilities to fulfil, ensuring that they promote good welfare, breed the healthiest dogs possible and utilise available measures to screen for and manage inherited disease (see 1.11.3) (Bell, 2011, Veterinary Record, 2012b). Such roles exhibit some degree of overlap with those of vets and as such these two stakeholder groups often maintain ongoing professional interaction. Several key reports (see 1.7) have identified the need for stakeholder collaboration to maximise progress towards improved pedigree dog welfare through the development of new breeding strategies (Rooney and

Sargan, 2009) and ensuring understandable and consistent advice is disseminated to puppy buyers (APGAW, 2012); tasks both vets and breeders share.

A study of Finnish vets and pedigree dog breeders carried out over 15 years ago (see 1.12.1) showed vets and breeders to exhibit different attitudes towards their own knowledge on inherited diseases, the perceived importance of certain conditions to canine well-being and further, regarding the information sources available to them (Leppanen *et al.*, 1999, Leppanen *et al.*, 2000a). However, no similar, up-to-date research has been undertaken in the UK or the rest of Europe, specifically focussing on vets' and breeders' perceptions of topics such as pedigree dog breeding, inherited disease and screening programmes. Further, no research is available on the complexities of human influence on pedigree dog health, nor how conflicting attitudes of key stakeholder groups such as vets or breeders may hinder progress towards the common goal of improving pedigree dog health both inside and outside the consulting room. Thus, more information is required to fully explore this topic in the UK and identify potential areas for future improvements and interventions.

2.1.1. Study aims and objectives

The aim of this study is to collect and compare vets' and breeders' perceptions on topics relating to pedigree dog health including pedigree dog breeding, canine inherited disease and current health screening programmes.

The specific aims of this chapter are to document and report the following:

I. Vets' and breeders' awareness of health schemes and their perceptions of pedigree dog health management
II. Vets' and breeders' sources of information on pedigree dog health and the information sources they perceive each other to use
III. Who vets and breeders perceive to carry the most knowledge with regards to pedigree dog breeding, canine hereditary diseases and screening programs
IV. Who vets and breeders perceive to possess the most responsibility for various actions relating to the promotion of pedigree dog health
V. How vets and breeders rate the importance of health-promotion actions for the control of canine hereditary diseases
VI. Which health conditions are most commonly seen by vets and breeders in the top ten most registered pedigree dog breeds in the UK

2.2. Materials and Methods

2.2.1. Sample selection and obtaining contacts

2.2.1.1. Veterinary surgeon sampling population

Veterinary surgeons were recruited for this study in three ways:

(1) Via the Royal College of Veterinary Surgeons Register of Practices

Vets were sourced via practices using the Royal College of Veterinary Surgeons (RCVS) Register of Practices for 2010. For inclusion in the study, practices had to undertake either small animal or mixed-species work and further, had to have an email address.

(2) Via the Vets Now Newsletter

Vets working for the Vets Now out of hours service provider were recruited via an article in the October 2011 edition of the Vets Now newsletter.

(3) Via a list compiled by the Centre for Evidence-based Veterinary Medicine (CEVM), University of Nottingham.

The CEVM had previously amassed a list of vets interested in participating in future research. All vet contacts on this list had provided an email address through which they could be contacted on this basis. A sampling frame of 727 vets was selected for inclusion in this study.

2.2.1.2. Pedigree dog breeder sampling population

The sampling population selected for this study was breeders of the top ten most frequently registered pedigree dog breeds in the UK based on Kennel Club (KC) registrations for 2010 (The Kennel Club, 2010).

These breeds were:

- Labrador Retrievers
- English Cocker Spaniels
- English Springer Spaniels
- German Shepherd Dogs
- Cavalier King Charles Spaniels
- Staffordshire Bull Terriers
- Border Terriers
- Golden Retrievers
- Boxers
- West Highland White Terriers

A number of considerations had to be taken into account when selecting an appropriate sample of breeders:

(1) The total population of general dog breeders and specifically, pedigree dog breeders in the UK is unknown

(2) The exact geographical distribution of breeders in the UK is also unknown

(3) Whilst organisations such as the KC, veterinary practices, insurance companies and microchip registries have contact data for owners whose dogs are registered with them, data may not identify what proportion of these owners are breeders (with the exception of the KC). Further, those breeders who have not registered their dogs with any of these organisations are unaccounted for.

This study aimed to target both breeders who registered puppies with the KC and those who did not. As a result, breeders could not be sourced solely through the KC mailing list and were instead sourced through the Champdogs website (Champdogs ®) due to its large members base and freely available breeder contact information. This was intended to allow for data collection from a more representative sample of pedigree dog breeders.

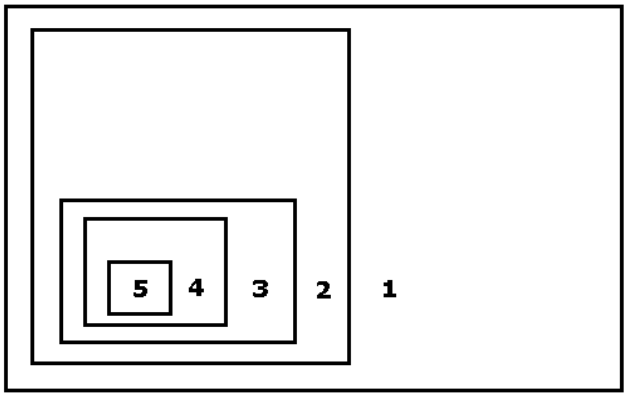
The total number of breeders advertising on the Champdogs website for each of the ten selected breeds was recorded. A maximum of 300 breeders for each breed were selected for inclusion, as deemed feasible by the time and financial restraints of this study. Where a breed did not comprise of 300 advertising breeders, all breeders of that breed were selected for the sample. For breeds with over 300 advertising breeders, the website's filter function was used to determine the proportion of breeders within each breed who stated that they health screened their dogs against the proportion of breeders who did not. The ratio of breeders who health tested their dogs to those who did not was then applied when selecting the top 300 breeders on each of the websites' breed lists. For example, if 500 out of 1000 listed breeders within a breed stated that they health tested their dogs, the randomly selected sample would contain 150 breeders who health tested and 150 breeders who did not to maintain the same 50/50 ratio and thus a more comparable sample (see Table 4).

As Champdogs randomises its contact lists to give advertising breeders equal turns to be first viewed by potential puppy buyers, further randomisation was not considered necessary. Instead, desired n values for each sample were selected from the top of the list (refer to Table 4). Collection of breeder contact information for each breed took place over no greater than a 48 hour period to avoid the weekly re-randomisation of each breeds' contact list.

Table 4: Break down of selected sample sizes per breed including a) breeders who advertise current health tests and b) those that do not within each of the ten breeds. PDBs = pedigree dog breeders.

Breed	Total no. of PDB registered on Champdogs website	PDBs advertising current health tests		PDBs not advertising current health tests		Sample size	No. of PDBs advertising current health tests in sample	No. of PDBs not advertising current health tests in sample
		n	**%**	**n**	**%**			
Labrador retriever	932	311	33.4	621	66.6	300	100	200
English Cocker Spaniel	566	116	20.5	450	79.5	300	62	238
English Springer Spaniel	208	17	8.2	191	91.9	208	17	191
German Shepherd Dog	581	160	27.5	421	72.5	300	83	217
Cavalier King Charles Spaniel	297	35	11.8	262	88.2	297	35	262
Staffordshire Bull Terrier	735	194	26.4	541	73.6	300	79	221
Border Terrier	248	2	0.8	246	99.2	248	2	246
Golden Retriever	814	322	39.6	492	60.4	300	119	181
Boxer	350	20	5.7	330	94.3	300	20	280
West Highland White Terrier	115	1	0.9	114	99.1	115	1	114
Totals	4846	1178		3668		2668	518	2150

Participant data were selected and amassed on a Microsoft Excel 2007 database between 02/06/11 and 22/06/11. For each breeder in the selected sample, information was recorded on which of the ten selected breeds they bred and also how many times they appeared on the study's mailing lists under different breeds. A diagrammatic representation of the selected sample is further illustrated in Figure 4.



1) All dog breeders in the UK
2) All pedigree dog breeders (PDBs) in the UK
3) Target population - all PDBs who breed the 10 breeds selected for this study
4) Study population - all PDBs who advertise these dogs on the Champdogs website
5) Sample - PDBs who were selected to participate in the study

Figure 4: Diagram showing a representation of the selected sample of pedigree dog breeders (5) in relation to the study population and wider target population. * not to scale

The inclusion criteria for this study meant that (a) breeders had to be registered on the Champdogs website, (b) they had to breed one or more of the ten breeds selected for this study and (c) that they had to have an email address.

2.2.2. Questionnaire development

2.2.2.1. Ideas and design

A study group was held with members of staff at the Centre for Evidence-based Veterinary Medicine (CEVM), the University of Nottingham (UoN) to generate ideas about potential questions for the study questionnaire. Both the vets' and breeders' questionnaires were then drafted using Microsoft Word 2007, before being transferred into SurveyMonkey (an online questionnaire design and delivery tool) (SurveyMonkey™).

Both the vets' and breeders' questionnaires were designed to cover the same or closely related subject areas as outlined in 2.2.2.1.1 and 2.2.2.1.2 Both questionnaires consisted of a range of question types including multiple choice

questions, matrix tables, drop-down menus, Likert scales, rating scales, long and short answer questions. Both questionnaires were designed to only allow forward navigation, preventing respondents from returning to previous questions to alter responses. It was estimated that the questionnaires would take vets and breeders in the region of 20 minutes to complete.

2.2.2.1.1. Veterinary surgeons' questionnaire design

The vets' questionnaire (Appendix 1) comprised of 35 questions divided into 9 sections. It explored a variety of topics relating to pedigree dog health and breeding, a detailed breakdown for which is shown in Table 5.

Table 5: Summary of the content featured in the veterinary surgeons' questionnaire

Section	Content
1	Vet demographics
2	Health schemes and the management of pedigree dog health in practice
3	Where do vets and their breeder clients source information on pedigree dog health from?
4	Who do vets perceive to carry the most knowledge with regards to pedigree dog breeding, canine hereditary diseases and screening programs?
5	Who do vets perceive to carry the most responsibility for various actions relating to the promotion of pedigree dog health?
6	How do vets rate the importance of health-promotion actions for the control of canine hereditary diseases?
7	Which conditions are most commonly seen by vets in the top ten most registered pedigree dog breeds in the UK?
8	Information on dog(s) owned or bred by vets, specialist qualifications and Kennel Club membership
9	Further comments

2.2.2.1.2. Pedigree dog breeders' questionnaire design

The breeders' questionnaire (see Appendix 2) comprised of 16 pages and 37 questions within 9 sections. Questions explored the similar topics to those of the vets' questionnaire. A detailed breakdown of each of the sections included in the questionnaire is shown in Table 6.

Table 6: Summary of the content featured in the pedigree dog breeders' questionnaire

Section	Content
1	Breeder demographics
2	Awareness and use of health schemes. What are breeders' perceptions regarding current pedigree dog health and breeding practices?
3	Where do breeders source information on pedigree dog health from and what sources do they think vets use?
4	Who do breeders perceive to carry the most knowledge with regards to pedigree dog breeding, canine hereditary diseases and screening programs?
5	Who do breeders perceive to carry the most responsibility for various actions relating to the promotion of pedigree dog health?
6	How do breeders rate the importance of health-promotion actions for the control of canine hereditary diseases?
7	Which conditions are most commonly seen by breeders in the top ten most registered pedigree dog breeds in the UK?
8	Information on additional dog(s) owned or bred by breeders, any veterinary qualifications, Kennel Club membership and registrations
9	Further comments

Unlike the vets' questionnaire, for section 7, in which pedigree dog breeders were questioned regarding health conditions commonly seen in pedigree dogs, the drop down options available were simplified to assist in respondent understanding. For example, where vets were given the option 'Neurological', breeders were given the option 'Nerve and brain problems (including epilepsy)'.

2.2.2.2. Pilot studies

2.2.2.2.1. Veterinary surgeons' pilot study

In July 2011 an email requesting participation in the vets' questionnaire pilot study was sent to 29 UoN staff, 26 of whom were small animal vets within the School of Veterinary Medicine and Science (SVMS). A reminder email was then sent to prompt non-responders approximately 2 weeks later. In total 9 responses providing feedback were received from 5 vets, 1 member of staff and 3 further respondents who chose to remain anonymous. As a result 23 changes were made to existing questions, 7 questions were removed and 1 question was added. Any questions which were removed from the vets' questionnaire, if identical, were also removed from the draft breeder questionnaire to maintain comparability.

2.2.2.2.2. Pedigree dog breeders' pilot study

An email was sent to all staff and students at the SVMS, UoN in August 2011 requesting help in sourcing dog breeders to complete the pilot questionnaire. In total 29 contacts replied and 18 were suitable to assist in the pilot as they either bred dogs or could pass the pilot questionnaire on to someone that did. As a result 7 breeders were contacted directly regarding the pilot study and 11 replies were forwarded to breeders by people who had replied to the initial email and agreed to pass the pilot details on. Of the 11 respondents who said they knew a breeder, 5 said they would be able to pass information about the pilot study onto 1 breeder and 6 said they were able to distribute the pilot information to more than 1 breeder. Breeders of the ten breeds selected for the actual study were excluded from providing pilot feedback to prevent the risk of duplicate participation. The pilot study was completed by 12 breeders in total and of these, eight provided feedback. As a result 4 questions were amended. It was noted that 3 breeders failed to answer Question 27 on the top three health issues most commonly seen in their breed and the health issue they considered to have with the biggest impact on welfare. A total of 4 breeders failed to complete the questionnaire.

2.2.3. Questionnaire distribution

2.2.3.1. Veterinary surgeons distribution

A proposed timeline was formulated to plan the distribution of final questionnaires and prompting of practices who failed to respond to the request for participation (see Figure 5).

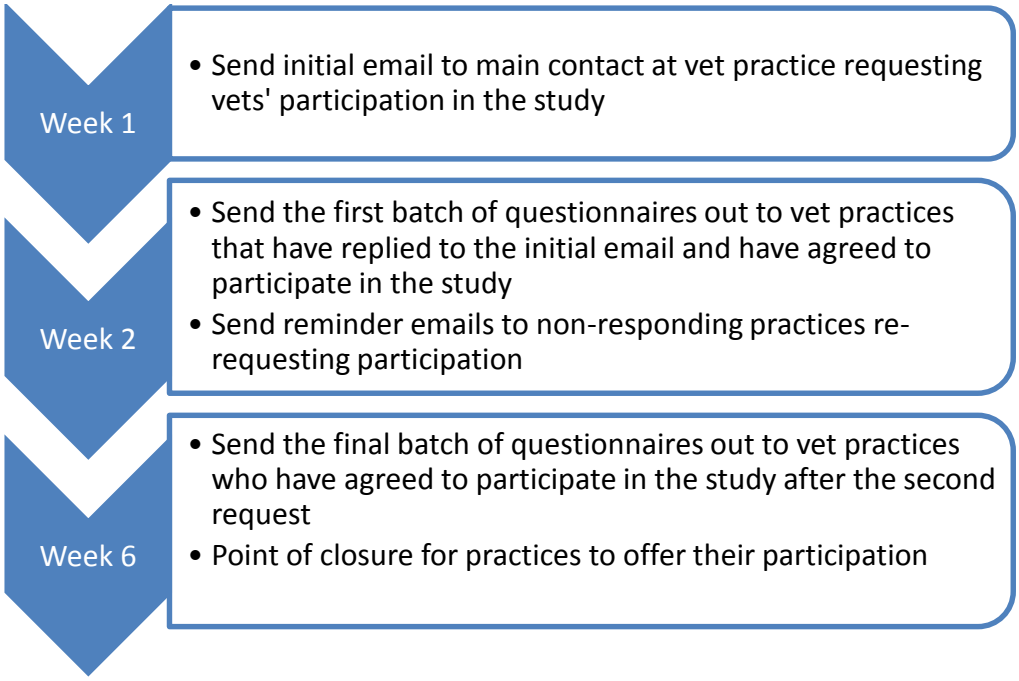


Figure 5: Proposed timeline and strategy for maximising the distribution of final questionnaires to veterinary practices

2.2.3.1.1. RCVS Register of Practices

Examination of the RCVS Register of Practices revealed that 2841 practices were seeing small animal clients. These practices were contacted by email in early September 2011 requesting vets' participation in the study. Responding practices were asked to confirm that: a) they wished to take part in the study and b) the number of vets doing small animal work at the practice. Participating practices were then emailed again approximately 3 weeks later with their own unique login code and details of how to access the questionnaire (paper copies were also available upon request). A further email was then sent another 3 weeks later to prompt non-responding practices. Figure 6 gives an overview of

the exchange of information needed to initiate completion of the questionnaire(s) in one distribution.

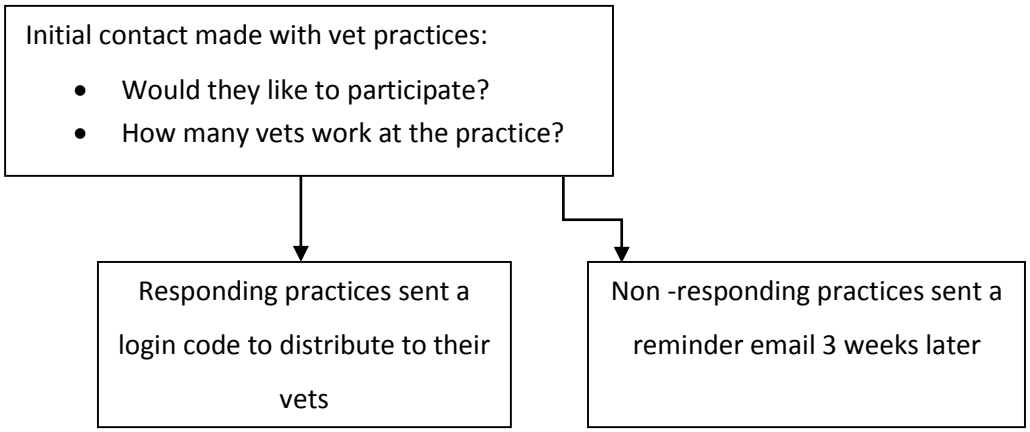


Figure 6: Diagram showing the exchange of information to initiate completion of the final questionnaire in one distribution

The above process was then repeated twice more to encourage a greater response. The first repeat distribution took place at the end of September 2011 and responding practices were sent a login code two weeks later. The final distribution took place in mid-October 2011 and this time practices were emailed back with a login code as soon as they agreed to participate. Using this method, practices were contacted up to a total of 3 times. Data collection continued until the allocated cut-off point (18/12/11). Figure 7 illustrates this further.

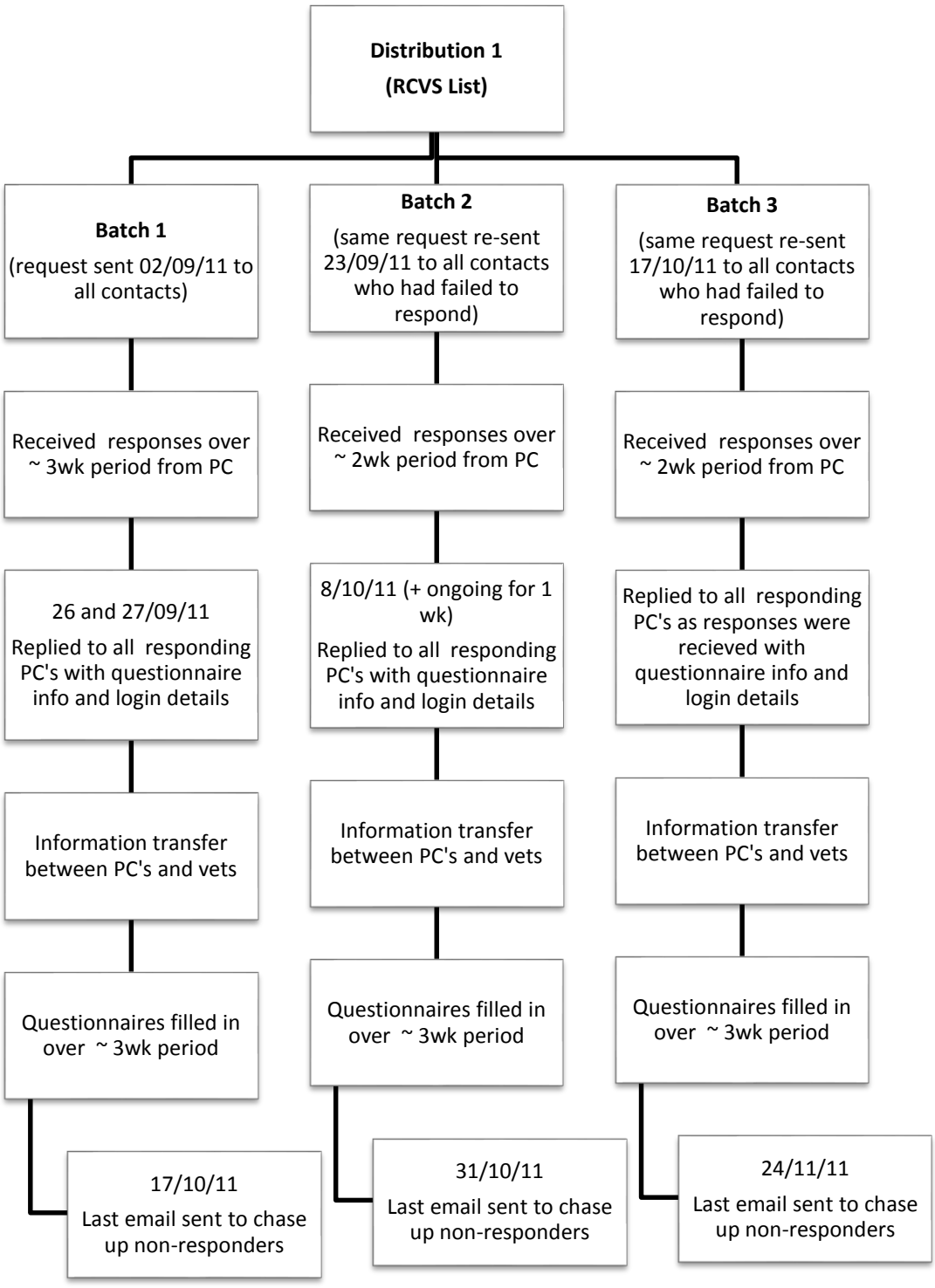


Figure 7: Strategy and timeline for maximising the number of vet participants. Three batches of questionnaires were distributed to a selected sample of small animal and mixed practice vets taken from the Royal College of Veterinary Surgeons Register of Practices in 2011. PC = practice contact; wk = week.

2.2.3.1.2. Vets Now Newsletter

After sending an email in early September 2011 requesting vets' participation in the study, an email was received from Vets Now offering to distribute information about the questionnaire to Vets Now vets via the monthly newsletter. This newsletter was sent out at the end of October to 50 different practices representing approximately 150 vets. All Vets Now vets were assigned a unique login code to access the questionnaire online (paper copies were also available upon request). Data collection continued until the allocated cut-off point (18/12/11). Figure 8 further illustrates the exchange of information with Vets Now concerning the questionnaire.



Figure 8: The distribution of questionnaire login details to Vets Now vets

2.2.3.1.3. Centre for Evidence-based Veterinary Medicine (CEVM) mailing list

To increase veterinary surgeon responses, at the end of October 2011 727 CEVM sourced vets were emailed requesting participation in the study. The email content comprised information about the study and the questionnaire hyperlink (paper copies were also available upon request). Responses submitted through this link went to a separate collector to that of the RCVS Register of Practices respondents. Questionnaire results were collected over approximately a 3 week period and 3 weeks later a further email was sent out to chase up non-responders. Data collection continued to the allocated cut-off point (18/12/11). Figure 9 illustrates the steps in this distribution.

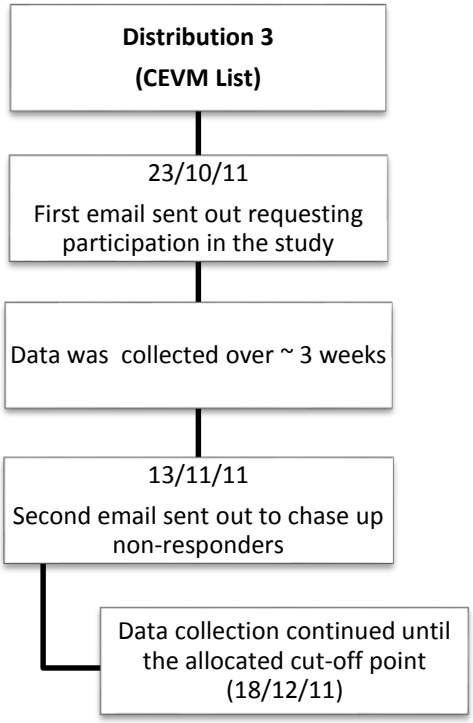


Figure 9: The distribution of questionnaire details to veterinary surgeons from the Centre for Evidence-based Veterinary Medicine (CEVM) list

2.2.3.2. Pedigree dog breeders distribution

As ten different breeds were included in this study, the breeders of each breed were sent a questionnaire hyperlink that was unique and identifiable to their breed. Whilst the questionnaire all breeders completed was identical, answers provided by breeders of different breeds were sent to separate online collectors thus facilitating later identification and analysis. Breeders who bred more than one of the 10 breeds selected for this study and who were contacted a second time, were asked to complete a second 1 page questionnaire to declare which breed(s) they had already provided information on. Consequently, a breeder who had, for example, already completed a 'Labrador copy' of the questionnaire and in that questionnaire had also provided information on their English Cocker Spaniels, could give notice of this via the one page questionnaire without filling in the complete questionnaire a second time.

In mid-October 2011 an email was sent to 2537 breeders, representing the ten breeds selected for this study, with details of how to access the relevant questionnaire(s) and/or request paper copies if necessary. Any queries from individual respondents were dealt with as they arose via email or telephone. At the start of November 2011 a second email requesting breeder participation in the study was sent out to prompt non-responders. Responses were then collected until the allocated cut-off point (18/12/11). Figure 10 further illustrates the process of data collection from breeders.

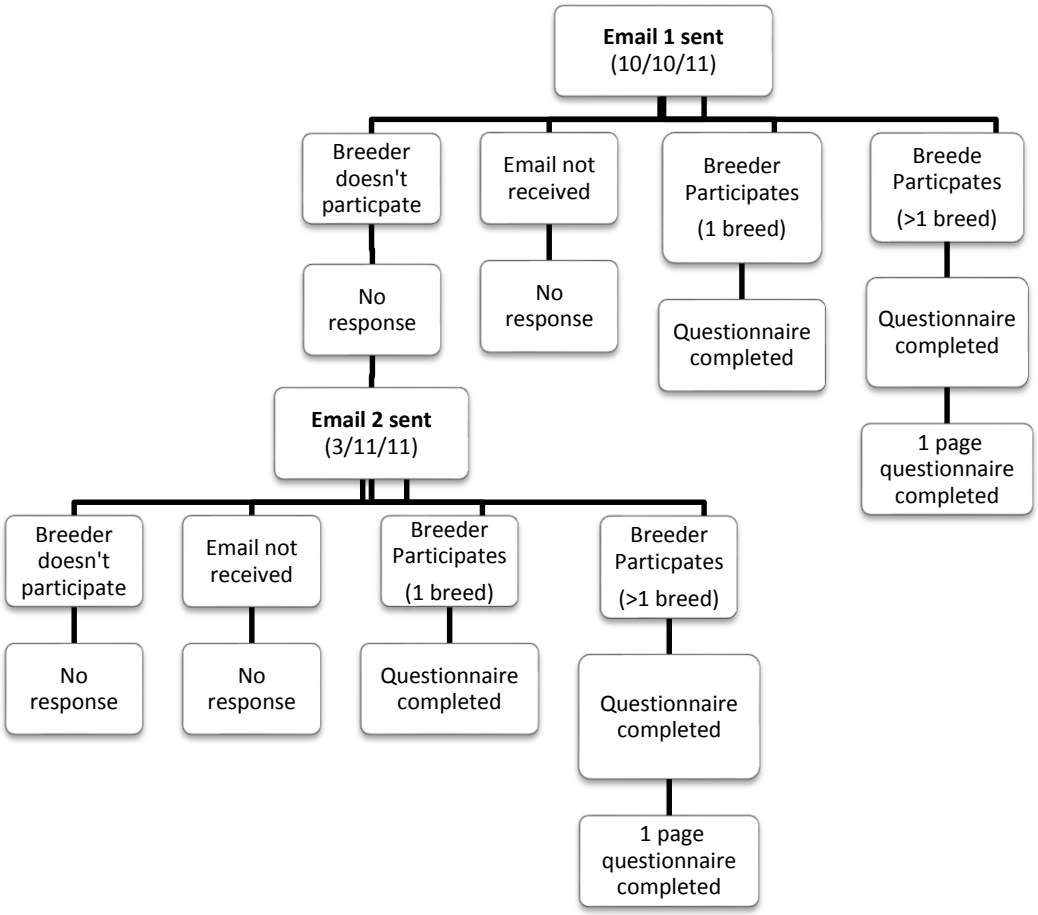


Figure 10: The method of data collection from pedigree dog breeders sourced through the Champdogs website

Whilst data collection was intended to be limited to only the sample of breeders taken from the Champdogs website, the author was notified that the hyperlink to the German Shepherd Dog questionnaire had been forwarded to 14 other German Shepherd Dog breeders. As this may have also happened within additional breeds without the author being notified, it is possible an accurate response rate cannot be calculated for this method of distribution.

2.2.4. Incentives

Both the vets' and breeders' questionnaires were incentivised to encourage study participation. Participation in the vets' questionnaire was incentivised in a number of ways. Firstly, for all practices who responded to any of the emails requesting participation in the study, the responding practice contact was entered into a prize draw to receive £50 of vouchers of their choice. Further, all vets who completed the questionnaire were entered into a prize draw to win £350 worth of CPD of their choice. In addition, practices in which all the vets completed the questionnaire were entered into a further prize draw to win £100 worth of vouchers of their choice (with a total of 3 prizes available). Completion of the breeders' questionnaire was incentivised by the chance to be entered into a prize draw to win a hamper of treats for themselves and their dog worth £100 (with a total of three of these prizes available).

2.2.5. Data collection

Data collection for the vets' questionnaire began at the start of September 2011 and collection for the breeders' questionnaire started just over a month later in mid-October. Data accumulated within SurveyMonkey as responses to both the vets' (all distributions) and breeders' questionnaires were received. Any paper copies of the questionnaire that were received were stored securely. A cut-off point for all responses was set at 18/12/11 and on this day both the vets' and breeders' questionnaires were disabled. All data were then downloaded and amassed onto a Microsoft Excel 2007 spread sheet. Data from paper questionnaires was then inputted manually.

2.2.6. Questionnaire data analysis

2.2.6.1. Data cleaning

All data that had been amassed over the collection period (refer to 2.2.5) were stored in a Microsoft Excel 2007 spread sheet database, with vets and breeders data managed separately. The data were then cleaned and blank rows or columns were removed. Further, any vet or breeder participants who had started the questionnaire but had failed to provide any information which could be used in the analysis (e.g. they had got as far as accessing the questionnaire but had failed to complete their details at the start) were also removed. Each respondent was assigned a unique identifier code and a new column was also created to indicate which distribution list vets were from and which breeds breeders bred (see Figure 11 for a screenshot example).

	A	B	C	D	E	F	G	H
1		Source	Q1	Q2	Q3	Q4	Q5	Q6
2	ID			Years:	Visits/Mth:			
3	PDB001	Boxer	Male	7	0-1	HIP DYSP	HEART, H	2
4	PDB002	Boxer	Female	40	0-1	Heart scor	Boxer Aort	2
5	PDB003	Boxer	Female	51	3	Aortic sten	Heart Dise	2
6	PDB004	Boxer	Male	10	0-1	Heart	Heart	1
7	PDB005	Boxer	Female	30	0-1	All stock te	See previo	0

Figure 11: Screenshot from Excel 2007 showing the unique identification number assigned to breeders and the additional column added to clarify the breed bred

2.2.6.2. Data recoding

Once the data were cleaned, text answers for each closed question were given numerical values using the sort, filter, find and replace tools in Excel (e.g. Male=1, Female=2 etc.) The original meanings for all recoded answers were recorded both electronically (in a Microsoft Office 2007 document) and manually (on master paper copies of the questionnaires). Between all recoding changes, new versions of the individual vets' and breeders' spreadsheets were created and saved so that changes could be traced back and previous work recovered if any problems arose. These data were then copied into ISS SPSS version 19 for statistical analysis.

Free text responses to open questions were sorted manually and arranged in an Excel spread sheet that was compatible for upload onto QSR NVivo version 9. Free text responses were then read and common initial themes or answers were grouped and coded using the NVivo software. The coded text was then re-read and where appropriate further sub-themes were identified and coded. For questions relating to health conditions identified in pedigree dogs and health screening programmes, the answers provided were grouped by body system. For example, hip dysplasia was coded under musculoskeletal, progressive retinal atrophy under ocular etc. Upon completion of the coding process, NVivo's query function was used to generate frequency tables of the main findings for each question. Where appropriate these data were uploaded to SPSS for further analysis.

2.2.6.3. Statistical analysis

SPSS version 19 was used to run basic descriptive statistics on the recoded vets' and breeders' data. Response frequencies were calculated for all data. Both n values and percentages were reported for categorical variables and the median, minimum and maximum values reported for data generated from rating scales. For questions where participants were able to give more than one answer to a given question the results are presented as the total (n) of the whole dataset and percentage of all responses (see 2.3.5.1 and 2.3.5.4).

A priori comparisons were planned to examine vets' and breeders' opinions of pedigree dog health over the past and future decade and whether these groups varied on the knowledge ratings they assigned various parties on pedigree dog breeding, inherited disease and health schemes. The expectation was that vets might exhibit a more pessimistic attitude towards pedigree dog health than pedigree dog breeders and further, that vets and pedigree dog breeders would rate themselves as more knowledgeable than each other. Chi squared analysis was carried out to identify whether or not a statistically significant difference existed between vets and breeders opinions of pedigree dog health over the past and future decade (see 2.3.10). A Kruskal-Wallis test was used to analyse the variance between knowledge ratings vets and breeders assigned various parties on pedigree dog breeding, inherited disease and health schemes (see 2.3.6). For both the Chi-squared and Kruskall-Wallis tests, a p value of <0.05 was considered significant. Further, *post hoc* pairwise analyses of the Kruskall-Wallis tests were performed via Mann-Whitney tests for which a Bonferroni correction was applied to reduce the rate of Type 1 errors (significance level: $p=0.01$, $0.05/3=\alpha/k$ where k is the number of pairwise comparisons, accounting for three paired tests comparing knowledge ratings awarded to vets and breeders, breeders and owners, vets and owners). A *post hoc* sample size analysis was performed using Raosoft (http://www.raosoft.com/samplesize.html).

2.3. Results

2.3.1. Response rates

2.3.1.1. Veterinary surgeon responses

A total of 198 responses were received from the three methods of questionnaire distribution to veterinary surgeons. Of these 150 were suitable for analysis (57 from the RCVS distribution, 4 from the Vets Now distribution and 89 from the CEVM distribution). A further breakdown of response rates is provided below:

Distributions used:

1) RCVS Register of Practices distribution

Two thousand, eight hundred and forty-one emails were sent to small animal and mixed practices on the RCVS practice list and 72 practices agreed to participate (response rate: 2.5%). Of the 72 practices that responded 60 provided information on how many vets worked for them (a total of 215), however 12 failed to provide this information (although each must have had a minimum of 1 vet). It was therefore assumed that the approximate number of vets represented by these practices was 227 (215 + 12). Via this method 60 vets completed the final questionnaire; 56 online and 4 via paper copies (approximate response rate: 26.4%). Of these 3 responses were excluded from the final analysis for the reasons outlined in 2.2.6.1 (approximate useable response rate: 25.1%).

2) Vets Now distribution

The Vets Now newsletter containing the questionnaire login details was delivered to 50 clinics representing approximately 150 vets. Nine questionnaires were completed via this method with a response rate of approximately 6%. Of these 5 responses were excluded from the final analysis for the reasons outlined in 2.2.6.1 (approximate useable response rate: 2.6%).

3) Centre for Evidence-based Veterinary Medicine (CEVM) list distribution

Seven hundred and twenty-seven vets from the CEVM list were emailed regarding participation in this research. One hundred and twenty-nine vets responded (17.7%). Of these 40 responses were excluded from the final analysis for the reasons outlined in 2.2.6.1 (useable response rate: 12.2%).

2.3.1.2. Pedigree dog breeder responses

Two thousand, five hundred and thirty seven breeders were emailed regarding participation in this study; a further 14 were forwarded questionnaires by other participants (total of 2551). A total of 385 breeders completed questionnaires (response rate: 15.2%). Of these 34 responses were excluded from the final analysis for the reasons outlined in 2.2.6.1, leaving 351 useable responses (useable response rate: 13.8%). A breakdown of the individual breed response rates is shown in Table 7.

Table 7: Questionnaire response rates for pedigree dog breeders of ten selected breeds in the United Kingdom in 2011. PDB = pedigree dog breeders.

Breed	Total no. of PDB emailed	No. of responses	Response rate (%)	% of total sample
Labrador Retrievers	296	55	18.6	14.3
English Cocker Spaniels	295	46	15.6	11.9
English Springer Spaniels	190	30	15.8	7.8
German Shepherd Dogs	300 +14	54	17.2	14.0
Cavalier King Charles Spaniels	266	32	12	8.3
Staffordshire Bull Terriers	300	28	9.3	7.3
Border Terriers	224	23	10.3	6.0
Golden Retrievers	300	66	22	17.1
Boxers	300	40	13.3	10.4
West Highland White Terriers	97	11	11.3	2.9
TOTAL (n)	**2582**	**385**		**100**

2.3.1.3 Samples sizes

Post hoc analysis showed that with an estimated population of over 20,000 for both pedigree dog breeders and vets, working on a margin of error of 5% and a 95% confidence interval (with a response distribution of 50%), the minimum sample size needed to provide the study with sufficient power to draw significant results was at least 377 respondents for each survey.

2.3.2. Participant demographics

2.3.2.1. Veterinary surgeon demographics

Of 150 responding vets 61.3% were female (n=92) and 38.7% were male (n=58).

All responding vets had graduated between 1965 and 2011 (see Figure 12) and 79.3% (n=119) had completed their veterinary degree within one of the 7 vet schools in the UK: London (23.5%, n=28), Bristol (20.2%, n=24), Edinburgh (16%, n=19), Liverpool (14.3%, n=17), Cambridge (13.4%, n=16), Glasgow (11.8%, n=14), Nottingham (0.8%, n=1). Of the 20.7% of respondents (n=31) who completed their veterinary degree overseas, Ireland (27.8%, n=5) and Germany (16.7%, n=3) were the most frequently mentioned countries of study.

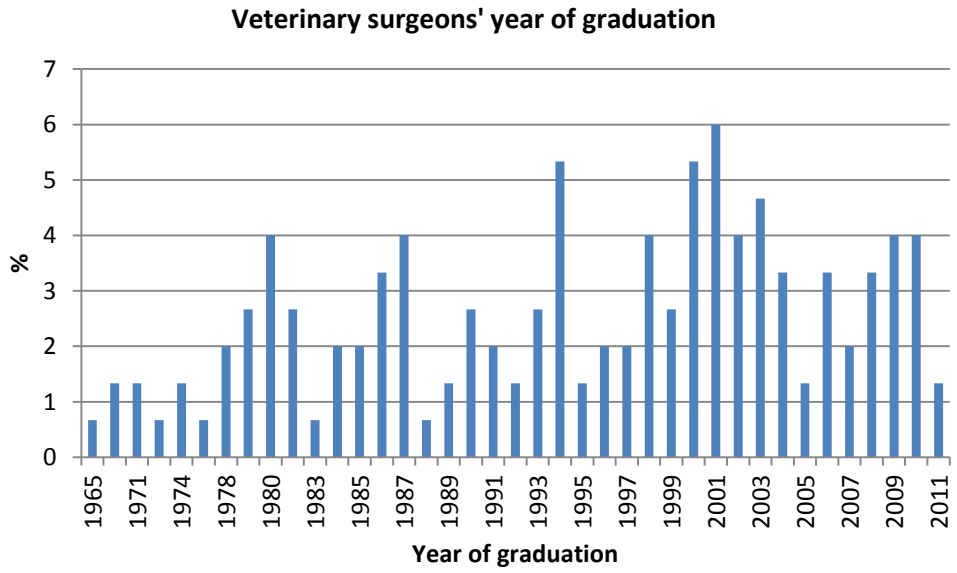


Figure 12: Percentage frequency of veterinary surgeon participants (n=150) graduating between the years of 1965 and 2011.

The type of work carried out by vets was predominantly 100% small animal (79.3%, n=119) and the estimated caseload of pedigree dogs seen varied between 10 and 90% (mean = 39.7; median = 35). Vets were divided when asked about the frequency of breeders seen in practice: 26% (n=39) answered 'Daily', 25% (n=38) answered 'Weekly', 33.3% said they saw breeders monthly (n=50) and 10.7% (n= 16) answered 'Yearly'. Just under 5% (n=7) saw breeders less often than yearly or did not know.

2.3.2.1.1. Post-graduate qualifications and veterinary experience

Of the vets participating in this questionnaire 30.9% (n= 42) had completed some form of post graduate qualification. Sixteen vets who completed this questionnaire declared specialist qualifications they felt may influence their answers. Of these, the most frequent qualifications to increase the caseload of pedigree dogs seen were in the areas of orthopaedics (n=2), ophthalmology (n=2) and dermatology (n=4).

2.3.2.1.2. Veterinary Surgeon Kennel Club Membership

The minority of vets who completed this questionnaire (6.8%, n=9) said they were Kennel Club members, 93.2% (n=123) were not.

2.3.2.1.3. Veterinary surgeon dog ownership and breeding

Overall, the majority of vets did not own a pedigree dog (59.6%, n=81) and had never bred pedigree dogs themselves (75.7%, n=103), although 24.3% said they had bred pedigree dogs at some point (n=33). The breeds of dog owned and bred by vets were highly variable, but the three most popular were: Labrador Retrievers (owned: n=18; bred: n=13); Border Collies (owned: n=7; bred: n=1); and Border Terriers (owned: n=4; bred: n=3).

2.3.2.2. Pedigree dog breeder demographics

Of 351 responding breeders, 84.9% (n=298) were female and 15.1% (n=53) were male. Responding breeders had been breeding pedigree dogs for between 1 and 52 years (median= 13) (see Figure 13).

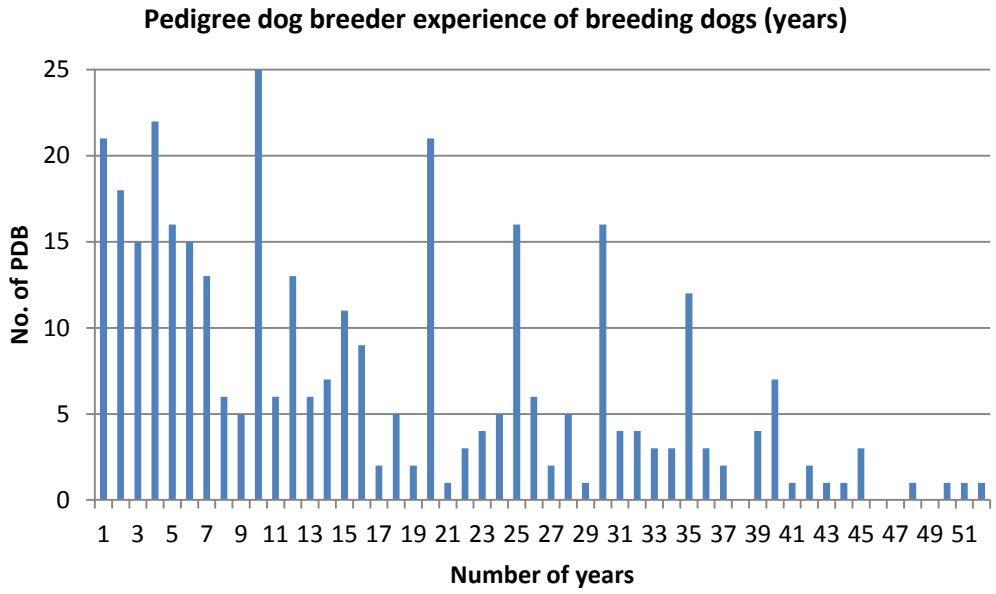


Figure 13: Frequency of pedigree dog breeder participants (n=351) who had been breeding pedigree dogs between 1 and 52 years based on 2011 questionnaire findings from 2011. PDB = pedigree dog breeder.

The majority of breeders visited their vet 0-1 times per month (88.6%, n=311). Thirty-two breeders saw their vet 2-4 times per month (9.1%). The minority saw their vet more often than this and only 4 breeders saw their vet ten or more times per month (1.1%).

2.3.2.2.1. Additional pedigree dog breeder experience

Of the participating breeders, 4 had veterinary qualifications which may have influenced their answers. Of these, there were 2 veterinary nurses, 1 student veterinary nurse and 1 vet.

2.3.2.2.2. Kennel Club membership and registrations

Fifty-one percent of breeders reported that they were members of the Kennel Club. Of the remaining breeders, 43.4% (n=128) said they were not members and 5.4% said they would prefer not to answer (n=16). The majority of breeders (95.3%, n=281) registered all of the dogs they bred with the Kennel Club. Thirteen breeders (4.4%) said they only register some of the dogs they breed and 0.3% (n=1) said they would prefer not to answer.

2.3.2.2.3. Pedigree dog breeder dog ownership and breeding

When asked to categorise their dogs as show, working, pet or a combination of these categories, responding breeders gave varied answers of which 'show and pet' was the most frequently selected category across all ten breeds (see Table 8).

Table 8: Categories selected by pedigree dog breeders (n=298) to best describe the purpose of the dogs kept, based on questionnaire findings from 2011. *Some breeders may be represented more than once for different breeds within this dataset.

	Show/working/ pet n (%)	Show/ pet n (%)	Show/working n (%)	Working/pet n (%)	Show n (%)	Working n (%)	Pet n (%)
Labrador Retrievers (n= 44)	9 (20.5)	17 (38.6)	2 (4.5)	5 (11.4)	6 (13.6)	3 (6.8)	2 (4.5)
English Cocker Spaniels (n= 42)	0 (0)	20 (47.6)	0 (0)	7 (16.7)	5 (11.9)	6 (14.3)	4 (9.5)
English Springer Spaniels (n= 24)	0 (0)	6 (25)	0 (0)	7 (29.2)	4 (16.7)	7 (29.2)	0 (0)
German Shepherd Dogs (n= 44)	16 (36.4)	9 (20.5)	2 (4.5)	7 (15.9)	0 (0)	7 (15.9)	3 (6.8)
Cavalier King Charles Spaniels (n= 28)	1 (3.6)	19 (67.9)	0 (0)	1 (3.6)	3 (10.7)	0 (0)	4 (14.3)
Staffordshire Bull Terriers (n= 21)	1 (4.8)	18 (85.7)	0 (0)	0 (0)	2 (9.5)	0 (0)	0 (0)
Border Terriers (n= 10)	1 (10)	3 (30)	1 (10)	0 (0)	1 (10)	1 (10)	3 (30)
Golden Retrievers (n= 50)	12 (24)	23 (46)	0 (0)	3 (6)	3 (6)	0 (0)	9 (18)
Boxers (n= 30)	5 (16.7)	14 (46.7)	0 (0)	0 (0)	6 (20)	1 (3.3)	4 (13.3)
West Highland White Terriers (n= 5)	0 (0)	1 (20)	0 (0)	1 (20)	1 (20)	0 (0)	2 (40)
All breeds (n= 298)	**45 (15.1)**	**130 (43.6)**	**5 (1.7)**	**31 (10.4)**	**31 (10.4)**	**25 (8.4)**	**31 (10.4)**

2.3.2.2.4. Number of adult dogs owned

The number of dogs kept by breeders ranged from one to more than 10; the majority of breeders keeping two (16.8%, n=48), three (16.1%, n=46) or four (16.8%, n=48) dogs.

2.3.2.2.5. Number of litters per year

The majority of breeders stated that they bred one (71.9%, n=218), two (16.5%, n=50) or three (7.3%, n=22) litters per year. Four percent (n=12) of breeders bred 4 or 5 litters per year and only 0.3% of breeders (n=1) bred more than ten litters per year.

2.3.2.2.6. Other breeds owned and bred

Of participating breeders, 20.2% (n=71) owned one or more breeds of dog other than the ten breeds selected for this study. Other breeds owned varied, however slightly more popular breeds included: Border Collies (n=8), Chihuahuas (n=5) and Great Danes (n=4). In total 16.2% (n=57) of breeders also bred one or more breeds in addition to those selected for the study. These additional breeds were also varied with no breed exhibiting particular popularity.

2.3.3. Pedigree dog health and breeding

2.3.3.1. Pedigree dog breeder opinions on health screening

When presented with a number of questions regarding pedigree dog health and breeding, breeders expressed a variety of opinions. Overall, breeding from dogs which had not been health screened was seen as unacceptable by breeders. Pedigree dog breeder expertise was seen as equally important to health screening status when choosing breeding dogs. Overall, breeders felt breeder reputation was improved by health screening breeding dogs and that the introduction of health screening programmes gave a positive portrayal of a breeds' health (see Table 9).

Table 9: Pedigree dog breeders' (n=341) opinions on a range of questions relating to pedigree dog health and breeding.

Statement	Responses			
	More easily n (%)	**Just as easily n (%)**	**Less easily n (%)**	**I don't know n (%)**
In your opinion, do puppies from health screened parents sell more or less easily than puppies from non-screened parents?	186 (54.5)	119 (34.9)	6 (1.8)	30 (8.8)
	More	**The same**	**Less**	**I don't know**
In your opinion, will puppy buyers spend more or less on puppies from health screened parents?	180 (52.8)	135 (39.5)	2 (0.6)	24 (7)
	Acceptable	**Neither acceptable or unacceptable**	**Unacceptable**	**I don't know**
In your opinion, is breeding from dogs which have not been health screened acceptable or unacceptable?	10 (2.9)	40 (11.7)	289 (84.8)	2 (0.6)
	Of greater importance	**Of equal importance**	**Of lesser importance**	**I don't know**
In your opinion, is breeder expertise more or less important than health screening status when choosing breeding dogs?	22 (6.5)	262 (76.8)	55 (16.1)	2 (0.6)
	Improved	**Unchanged**	**Reduced**	**I don't know**
In your opinion, is a breeder's reputation improved or reduced by health screening the dogs they breed?	296 (86.8)	39 (11.4)	1 (0.3)	5 (1.5)
	Positive portrayal	**Unchanged portrayal**	**Negative portrayal**	**I don't know**
In your opinion, does the introduction of health screening programs give a breed's health a positive or negative portrayal?	260 (76.2)	47 (13.8)	27 (7.9)	7 (2.1)

2.3.3.2. Veterinary surgeon perceptions in practice

When asked to rate on a scale from 1-10 how comfortable they were when dealing with various aspects of pedigree dog health in practice, vets rated themselves as being most comfortable when advising puppy buyers on pedigree dog health. Vets reported that they were next most comfortable with dealing with pedigree dog breeders in practice and diagnosing and managing hereditary diseases in pedigree dogs. Vets were less comfortable with discussing breeding options with pedigree dog breeder clients and advising on screening programs for canine hereditary disease (Table 10).

Table 10: Rated comfort in managing a number of aspects of pedigree dog care based on veterinary surgeon opinion (n=150) in 2011. 1 = very uncomfortable and 10 = very comfortable.

Aspect of pedigree dog care	Rated comfort in managing task	
	Median	Min, Max
Dealing with breeders in practice	7	1,10
Discussing breeding options with breeder clients	6	1,10
Advising puppy buyers on pedigree dog health	8	1,10
Diagnosing hereditary diseases in pedigree dogs	7	1,10
Managing hereditary diseases in pedigree dogs	7	1,10
Advising on screening programmes for canine hereditary disease	6	1,10

2.3.4. Awareness of health screening tests

2.3.4.1. Health scheme awareness and use

Of the schemes vets and breeders identified themselves as being aware of, the four most frequently mentioned (grouped by body system) were: ocular, musculoskeletal, neurological and cardiovascular. The least mentioned were respiratory and reproductive. See Figure 14 for a more detailed breakdown.

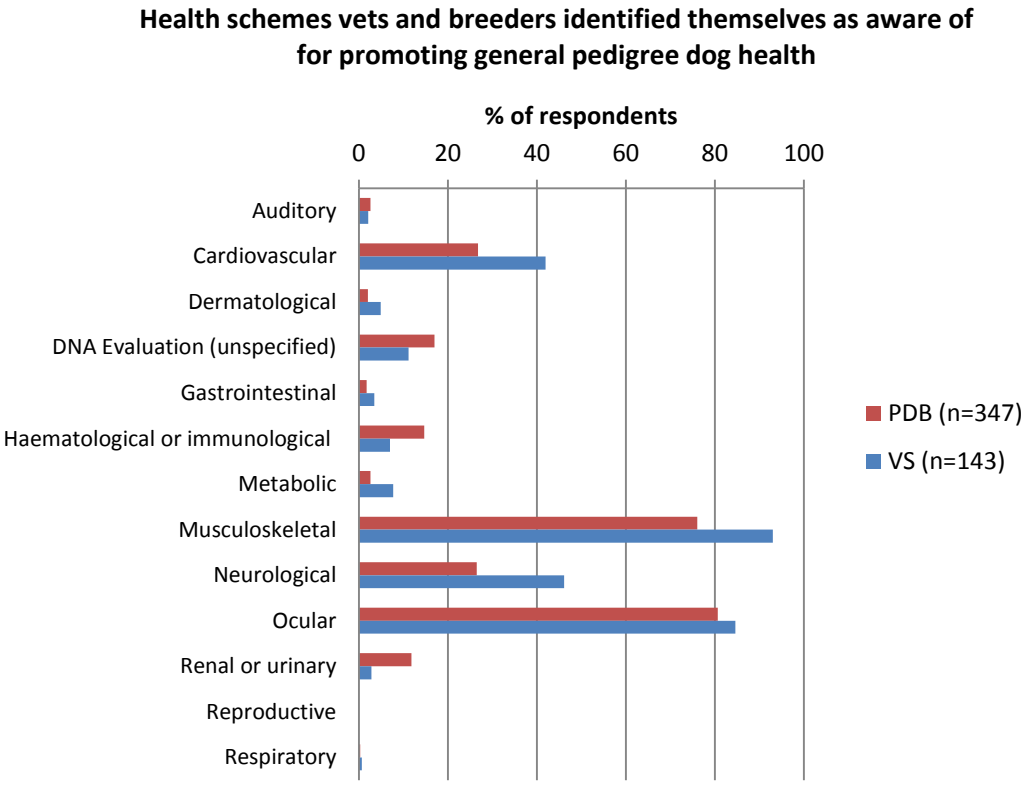


Figure 14: Health schemes veterinary surgeons (VS) (n=143) and pedigree dog breeders (PDB) (n=347) were aware of in the promotion of general pedigree dog health; based on questionnaire findings from 2011. Haem/Immuno = Haematological or Immunological. *Health schemes have been grouped by body system.

When breeders were asked which schemes, screening programmes or tests they actually used to evaluate their dogs prior to breeding, similar answers were reported to those of vets. Again the most frequently mentioned (by body system) were (i) ocular, (ii) musculoskeletal, (iii) neurological and (iv) cardiovascular (see Figure 15). A further breakdown of the four most frequently mentioned schemes (i-iv) by breed of dog bred is shown in Figures 16-19.

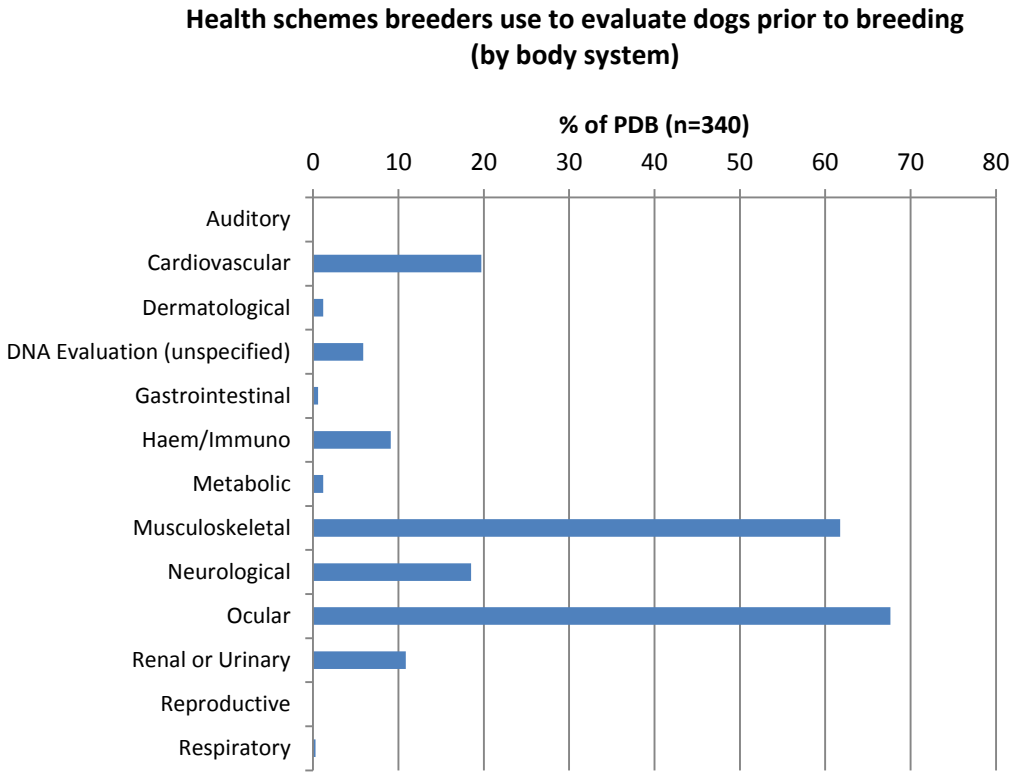


Figure 15: Health schemes pedigree dog breeders (PDB) use to evaluate their dogs prior to breeding based on questionnaire findings from 2011 (n=340). Haem/Immuno = Haematological or Immunological. *Health schemes have been grouped by body system.

2.3.4.1.1. Ocular schemes

Of the 280 breeders who stated they were aware of ocular schemes, 233 (83.2%) also reported that they use ocular screening to evaluate their dogs prior to breeding. A further breakdown by breed is shown in Figure 16.

2.3.4.1.2. Musculoskeletal schemes

A total of 264 breeders stated they were aware of musculoskeletal schemes. Of these, 213 (80.7%) also reported that they use musculoskeletal screening to evaluate their dogs prior to breeding. Refer to Figure 17.

2.3.4.1.3. Cardiovascular schemes

Ninety-three breeders stated they were aware of cardiovascular schemes and of these, 67 (72%) also reported that they use cardiovascular screening to evaluate their dogs prior to breeding. A further breakdown by breed is shown in Figure 18.

2.3.4.1.4. Neurological schemes

In total 92 breeders stated they were aware of neurological schemes, and of these 64 (69.6%) also reported that they use neurological screening to evaluate their dogs prior to breeding. See Figure 19

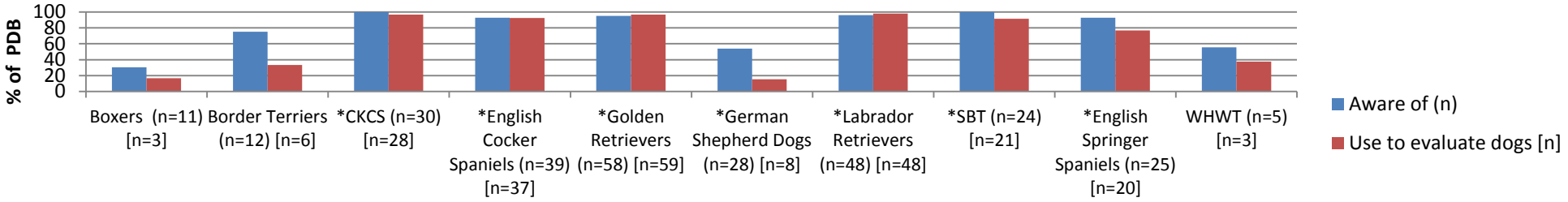


Figure 16: Ocular health schemes pedigree dog breeders were (a) aware of to promote general pedigree dog health (n=347) and (b) used to evaluate their dogs prior to breeding (n=340); based on questionnaire findings from 2011. PDB = pedigree dog breeder

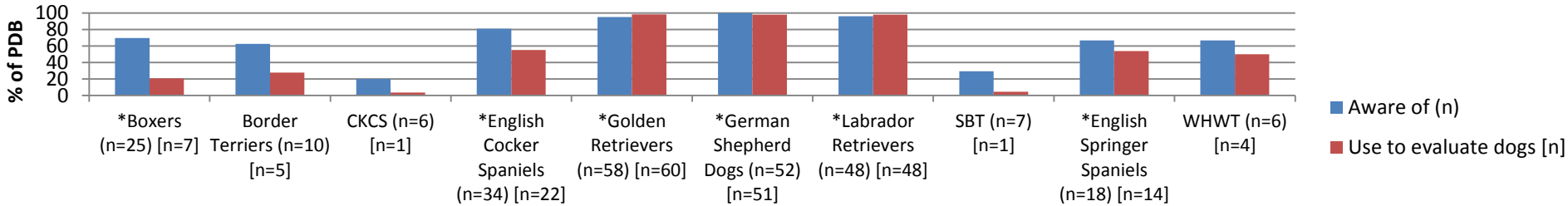


Figure 17: Musculoskeletal health schemes pedigree dog breeders were (a) aware of to promote general pedigree dog health (n=347) and (b) used to evaluate their dogs prior to breeding (n=340); based on questionnaire findings from 2011. PDB = pedigree dog breeder.

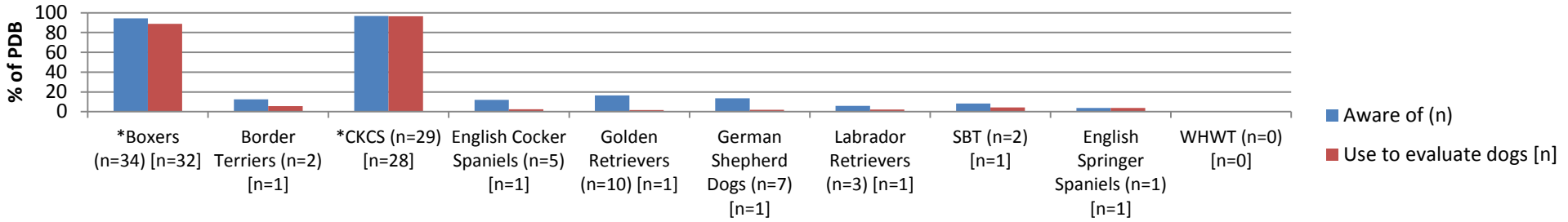


Figure 18: Cardiovascular health schemes pedigree dog breeders were (a) aware of to promote general pedigree dog health (n=347) and (b) used to evaluate their dogs prior to breeding (n=340); based on questionnaire findings from 2011. PDB = pedigree dog breeder.

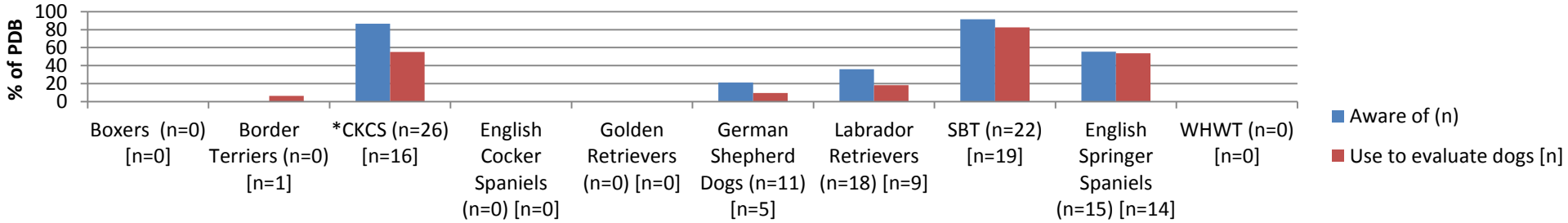


Figure 19: Neurological health schemes pedigree dog breeders were (a) aware of to promote general pedigree dog health (n=347) and (b) used to evaluate their dogs prior to breeding (n=340); based on questionnaire findings from 2011. PDB = pedigree dog breeder.

2.3.5. Sources of information

2.3.5.1. Vets' and pedigree dog breeders' sources of information on pedigree dog health

Similarities were seen between the sources vets actually reported they used and those breeders perceived vets to use for information on pedigree health (see Table 11).

Table 11: The top 5 sources of information veterinary surgeons use based on vet (n=149) and breeder (n=327) opinion.

Ranking	Information sources on pedigree dog health for vets					
	Vets about vets			Breeders about vets		
	Source	n	%	Source	n	%
1	Veterinary organisation manuals e.g. BSAVA manuals	138	11.2	Veterinary organisation manuals e.g. BSAVA manuals	257	16
2	Journals/scientific papers	137	11.1	Journals/scientific papers	206	12.8
3	Veterinary websites	138	11.2	Veterinary websites	201	12.5
4	Books	120	9.7	Contact a referral vet/specialist	176	10.9
	Contact a referral vet/specialist	119	9.7			
5	Vet colleagues	111	9	Vet colleagues	151	9.4
	Total (n) for all sources	1232			1607	

A small number of vets stated that they sourced information from owners (2.9%, n=36) and breeders (2.4%, n=29). Interestingly, breeders thought vets were more likely to source information from owners (4.2%, n=67) than breeders (3.4%, n=54). Fewer breeders (3.9%; n=62) felt that vets sourced information from books, although 9.7% (n=120) of vets recognised books as an information source that they use. In total, more vets use the Kennel Club website (a) (6.4%, n=79) and breed club websites for information on pedigree dog health (b) (4.4%, n=54) than breeders perceive they do ([a]: 3.2%, n=51; [b]: 1.4%; n=22).

Breeders were asked where they sourced information on pedigree dog health from and these answers were then compared to those of vets who had been asked where they perceived breeders to seek information on this topic. A summary of findings is shown in Table 12.

Table 12: The top 5 sources of information pedigree dog breeders use based on vet (n=147) and pedigree dog breeder (n=334) opinion. PDB =pedigree dog breeder; VS= veterinary surgeon.

Ranking	Information sources on pedigree dog health for breeders					
	Breeders about breeders			Vets about breeders		
	Source	n	%	Source	n	%
1	Other breeders	254	9.5	Other breeders	136	9.4
2	Kennel Club literature/publications	249	9.3	Dog magazines/newspapers	116	8
				Breed Club newsletters	115	8
3	Relevant breed club websites	217	8.1	Dog shows	113	7.8
	The Kennel Club website	216	8.1			
4	Breed club newsletters	198	7.4	General internet search	109	7.5
				Relevant breed club websites	109	7.5
5	General internet search	186	7	Online forums and blogs	101	7
	Total (n) for all sources	2670			1445	

Six percent of breeders stated that they sourced information on pedigree dog health from vets (n=166) and 2.8% (n=76) sourced information from owners. Vets also felt breeders were more likely to source information from vets (3.9%, n=57) than owners (2%, n=29). More breeders described themselves as using journals/scientific papers (a) (4.1%, n=110), veterinary organisation manuals (b) (4.3%, n=114) and veterinary websites (c) (3.5%, n=94) for information on

pedigree dog health than vets perceived they did ([a]: 0.3%, n=4; [b]: 0.1%, n=2; [c]: 0.6%, n=8).

2.3.5.2. Amount of information available

When asked to rate how much information was available on the selection of suitable pedigree dogs for breeding, hereditary disease testing for pedigree dogs and breed-associated hereditary disease, breeders felt there was more information available to them than vets did. See Table 13.

Table 13: The amount of information available on pedigree dog health and breeding based on veterinary surgeon (n=149) and pedigree dog breeder (n=334) opinion in 2011. 1 = none at all and 10 = enough.

Topic	Rated information available			
	Veterinary Surgeons		Pedigree Dog Breeders	
	Median	Min, Max	Median	Min, Max
Selection of suitable pedigree dogs for breeding	5	1,10	8	1,10
Hereditary disease testing for pedigree dogs	5	1,10	8	1,10
Breed-associated hereditary diseases	6	1,10	8	1,10

2.3.5.3. Receiving information from specific organisations

Both vets (42.4%, n=64) and breeders (48.5%, n=164) said they would prefer to receive information about pedigree dogs via email from the Kennel Club (KC), Advisory Council on the Welfare Issues of Dog Breeding or associated organisations. Vets and breeders both agreed that the next most favourable method of receiving information would be via a website (vets: 30.5%, n=46; breeders: 21.9%, n=74). The third most preferred choice for receiving information from organisations was leaflets for vets (11.3%, n=17) and letters or reports for breeders (11.8%, n=40).

When asked how often they would use information provided by these organisations the majority of vets and breeders felt they would use it monthly or more frequently (Monthly: vets: 59.9%, n=88; breeders: 46.5%, n=154; Weekly: vets: 25.2%, n=37; breeders: 26%, n=86).

2.3.5.4. Sharing information with others

2.3.5.4.1. Conveying information to dog owners

When conveying information on pedigree dog health to pedigree dog owners both vets (28.4%, n=145) and breeders (20.3%, n=278) rated verbal communication to be the most frequently used method. Vets rated directing owners to a commercial website e.g. a BVA/KC health scheme site to be the second most frequent choice (17.4%, n=89), followed by providing pre-prepared hand-outs (13.1%, n=67). Breeders were divided in their methods of conveying information to pedigree dog owners: sending them emails (13.5%, n=185), providing written/typed instructions at their request (13.5%, n=185), directing them to breed club websites (12.6%, n=173), providing pre-prepared hand-outs (12%, n=164) and directing them to commercial websites (12%, n=164).

When asked to select a single preferred option of conveying information to pedigree dog owners both vets and breeders selected verbal communication (vets: 60.3%, n=88; breeders: 40.5%, n=128). Providing pre-prepared hand-outs was rated the second most preferred choice by vets (19.9%, n=29), whereas sending owners emails was the second most preferred choice for breeders (20.6%, n=65).

2.3.5.4.2. Conveying information to pedigree dog breeders

When asked about the most frequently used methods for conveying information to breeders, both vets and breeders again selected verbal communication as the most frequently used method (vets: 30.1%, n=140; breeders: 27.8%, n=246). Breeders rated sending emails as their second most frequently used method of conveying information to other breeders (20.9%, n=185), whereas vets chose directing breeders to a commercial website as the next most frequently used method (20%, n=93).

The single most preferred method by vets and breeders for conveying information to breeders was again via verbal communication (vets: 51.2%, n=63; breeders: 49.8%, n=142). Directing breeders to a commercial website was rated the second most popular preferred choice by vets (30.9%, n=38), whereas sending other breeders emails was the second most preferred choice for breeders (29.8%, n=85). When asked for their own, preferred method of obtaining information from their vet, verbal communication was also the most popular choice for the breeders who completed this questionnaire (80.5%, n=264).

2.3.6. Perceptions of knowledge

When asked to rate vets', breeders' and owners' knowledge of pedigree dog breeding, canine hereditary disease and hereditary disease screening programmes, vets rated themselves to be the most knowledgeable party each time, followed by breeders and then pedigree dog owners. When asked to carry out the same task, breeders rated themselves to be the most knowledgeable party, followed by vets and then owners. A breakdown of results is shown in Table 14.

Table 14: Veterinary surgeons (VS) and pedigree dog breeders (PDB) perceptions of VS, PDB and pedigree dog owners (PDO) knowledge on various topics relating to pedigree dog health; based on responses from veterinary surgeons (n=145) and pedigree dog breeders (n=316) in 2011. 1 = very poor knowledge and 10 = very good knowledge

Topics	Groups	Ratings assigned			
		Veterinary Surgeons respondents		Pedigree Dog Breeders respondents	
		Median	Min, Max	Median	Min, Max
Pedigree dog breeding	VS	6	2,10	5	1,10
	PDB	6	1,10	9	1,10
	PDO	3	1,8	4	1,10
Canine hereditary diseases	VS	7	2,10	7	1,10
	PDB	6	1,10	9	1,10
	PDO	3	1,8	4	1,10
Hereditary disease screening programmes	VS	7	2,10	8	1,10
	PDB	6	1,10	9	1,10
	PDO	3	1,8	4	1,10

Kruskall-Wallis analysis showed a significant difference between the knowledge ratings veterinary surgeons awarded vets, pedigree dog breeders and pedigree dog owners on pedigree dog breeding ($H(2)= 162.7$, $p=<0.001$), inherited diseases ($H(2)= 211.5$, $p=<0.001$) and health screening programmes ($H(2)= 214.2$, $p=<0.001$). Mann-Whitney tests were used for *post-hoc* pairwise

analysis of these findings with a Bonferroni correction applied (significance level: p=0.01, 0.05/3=α/k where k is the number of pairwise comparisons). Paired comparisons of vets and breeders, breeders and owners and vets and owners knowledge ratings on these three topics showed significant differences for all (p=<0.001), with the exception of vets verses breeders knowledge ratings on pedigree dog breeding (U=8743, r=-0.07, p=0.2) and health screening programmes (U=8364, r=-0.11, p=0.06).

Kruskal-Wallis analysis similarly showed a significant difference between the knowledge ratings pedigree dog breeders awarded vets, pedigree dog breeders and pedigree dog owners on pedigree dog breeding (H(2)= 369.9, p=<0.001), inherited diseases (H(2)= 388.8, p=<0.001) and health screening programmes (H(2)= 162.7, p=<0.001). Mann-Whitney tests were again used for *post-hoc* analysis of these findings with a Bonferroni correction applied. Paired comparisons indicated significant differences for all (p=<0.001).

2.3.7. Perceived responsibilities

When questioned on the parties most responsible for various actions relating to the promotion of pedigree dog welfare, a number of similarities and differences were seen in the answers provided by vets and breeders (Table 15).

Vets and breeders shared similar views on the responsibilities of the Kennel Club and genetic/research scientists. Despite this, differences were seen when advising pedigree dog owners and puppy buyers. In this instance, both parties felt they independently held most responsibility. A similar response was seen regarding education of the public. Whilst the KC was rated the most responsible party by both groups, both vets (28.6%, n=40) and breeders (25.6%, n=80) still rated themselves independently as the next most responsible party. With regards to the party most responsible for advising vets and breeders, differing opinions were again seen. In total, 32.9% (n=46) of vets thought they should be responsible for advising breeders; a view shared by only 5.4% of breeders (n=17). With regards to advising vets, 14.7% of breeders felt they should be responsible; no vets shared this view.

Table 15: Parties perceived responsible for promoting various aspects of pedigree dog welfare based on veterinary surgeon (n=140) and pedigree dog breeder (n=312) opinion in 2011. VS = veterinary surgeon; PDB = pedigree dog breeder. ()=%.

Possible Parties	**Perceived responsibility n (%)**																	
	Advising pedigree dog OWNERS		Addressing pedigree dog breed standards		Educating the public		Data collection on hereditary diseases		Advising pedigree dog BREEDERS		Addressing genetic diversity of individual breeds		Promoting responsible dog breeding		Advising puppy buyers		Advising the veterinary profession	
	VS	PDB	VS	PDB	VS	PDB	VS	PDB	VS	PDB	VS	PDB	VS	PDB	VS	PDB	VS	PDB
The Kennel Club	26 (18.6)	62 (19.9)	112 (80)	209 (67.0)	71 (50.7)	179 (57.4)	36 (25.7)	102 (32.7)	77 (55)	158 (50.6)	52 (37.1)	86 (27.6)	89 (63.6)	183 (58.7)	20 (14.3)	71 (22.8)	7 (5)	50 (16.0)
Pedigree dog breeders	25 (17.9)	171 (54.8)	7 (5)	86 (27.6)	3 (2.1)	80 (25.6)	1 (0.7)	14 (4.5)	1 (0.7)	20 (6.4)	22 (15.7)	51 (16.3)	10 (7.1)	118 (37.8)	10 (7.1)	227 (72.8)	0 (0)	46 (14.7)
Pedigree dog owners	2 (1.4)	4 (1.3)	0 (0.0)	4 (1.3)	1 (0.7)	4 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	3 (2.1)	1 (0.3)	0 (0.0)	1 (0.3)	0 (0)	2 (0.6)
Individual vets	**83** (59.3)	**25** (8.0)	3 (2.1)	0 (0.0)	25 (17.9)	10 (3.2)	6 (4.3)	8 (2.6)	46 (32.9)	17 (5.4)	2 (1.4)	3 (1.0)	25 (17.9)	5 (1.6)	**102** (72.9)	**3** (1.0)	1 (0.7)	5 (1.6)
Geneticists or research scientists	0 (0.0)	12 (3.8)	3 (2.1)	11 (3.5)	0 (0.0)	3 (1.0)	65 (46.4)	137 (43.9)	3 (2.1)	59 (18.9)	52 (37.1)	145 (46.5)	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	30 (21.4)	189 (60.6)
The veterinary profession	4 (2.9)	38 (12.2)	15 (10.7)	2 (0.6)	40 (28.6)	36 (11.5)	32 (22.9)	51 (16.3)	13 (9.3)	57 (18.3)	12 (8.6)	27 (8.7)	13 (9.3)	4 (1.3)	8 (5.7)	10 (3.2)	102 (72.9)	20 (6.4)

2.3.8. Health promotion actions

When vets and breeders were asked to rate various actions which could be used to control hereditary disease in pedigree dogs nearly all promotion actions were rated as important or very important. Increased selection of healthy breeding dogs by breeders was seen as very important by the majority of vets (81.4%, n=114). The majority of breeders (72.2%, n=221) felt that increased health demands by the public were very important in controlling inherited disease in pedigree dogs. The only action that was rated as of little to moderate importance by vets and breeders was limitations on the number of pedigree dogs registered. A summary of the results is shown in Table 16.

When asked to suggest any other health promotion actions which were not already listed in the question both vets and breeders suggested a variety of actions. Of these, allowing only puppies from health tested parents to be KC registered was the most frequently suggested (vets: n=4; breeders: n=21). Other suggestions included: better education of the public (vets: n=3; breeders: n=8), stopping puppy farms (vets: n=0, breeders: n=5), introducing a two tier system for KC registration to distinguish between screened and unscreened dogs (vets: n=0, breeders: n=4), compulsory health screening of dogs (vets: n=1, breeders: n=4) and greater emphasis on temperament in the selection of breeding dogs (vets: n=0, breeders: n=5).

Table 16: Veterinary surgeons' (n=140) and pedigree dog breeders' (n=306) opinions on the importance of various actions to control hereditary disease in pedigree dogs. VS = veterinary surgeons; PDB = breeders; PDO = owners. () = %

Actions to control hereditary canine disease	Perceived importance of each action n (%)											
	Unimportant		Of little importance		Moderately important		Important		Very Important		Total (n)	
	VS	PDB	VS	PDB	VS	PDB	VS	PDB	VS	PDB	VS	PDB
Limitations on the number of pedigree dog registrations	21 (15)	60 (19.6)	48 (34.3)	72 (23.5)	40 (28.6)	74 (24.2)	25 (17.9)	57 (18.6)	6 (4.3)	43 (14.1)	140 (100)	306 (100)
More specific teaching in vet schools	3 (2.1)	2 (0.7)	6 (4.3)	8 (2.6)	45 (32.1)	33 (10.8)	64 (45.7)	137 (44.8)	22 (15.7)	126 (41.2)	140 (100)	306 (100)
Increased exchange of information between the KC and VS	3 (2.1)	4 (1.3)	2 (1.4)	6 (2.0)	13 (9.3)	28 (9.2)	59 (42.1)	90 (29.4)	63 (45.0)	178 (58.2)	140 (100)	306 (100)
Increased exchange of information between the KC and PDB	2 (1.4)	0 (0)	2 (1.4)	9 (2.9)	11 (7.9)	22 (7.2)	55 (39.3)	86 (28.1)	70 (50.0)	189 (61.8)	140 (100)	306 (100)
Increased exchange of information between the VS and puppy buyers	1 (0.7)	6 (2.0)	3 (2.1)	17 (5.6)	21 (15.0)	64 (20.9)	56 (40.0)	121 (39.5)	59 (42.1)	98 (32.0)	140 (100)	306 (100)
Increased exchange of information between the KC and PDO	4 (2.9)	6 (2.0)	9 (6.4)	30 (9.8)	37 (26.4)	87 (28.4)	55 (39.3)	104 (34.0)	35 (25.0)	79 (25.8)	140 (100)	306 (100)
Increased exchange of information between the VS and PDB	1 (0.7)	0 (0)	6 (4.3)	1 (0.3)	22 (15.7)	24 (7.8)	64 (45.7)	104 (34.0)	47 (33.6)	177 (57.8)	140 (100)	306 (100)
Increased awareness of all parties to the information resources available	1 (0.7)	1 (0.3)	1 (0.7)	2 (0.7)	11 (7.9)	18 (5.9)	39 (27.9)	80 (26.1)	88 (62.9)	205 (67.0)	140 (100)	306 (100)
Obligatory health screening for hereditary diseases	1 (0.7)	0 (0)	1 (0.7)	4 (1.3)	23 (16.4)	18 (5.9)	42 (30.0)	77 (25.2)	73 (52.1)	207 (67.6)	140 (100)	306 (100)
Increased selection of healthy breeding dogs by PDB	1 (0.7)	5 (1.6)	2 (1.4)	14 (4.6)	2 (1.4)	46 (15.0)	21 (15.0)	111 (36.3)	114 (81.4)	130 (42.5)	140 (100)	306 (100)
Increased health demands by the general public	2 (1.4)	0 (0)	3 (2.2)	1 (0.3)	22 (15.8)	9 (2.9)	36 (25.9)	75 (24.5)	76 (54.7)	221 (72.2)	139 (100)	306 (100)
Increased education of puppy buyers	2 (1.4)	0 (0)	1 (0.7)	4 (1.3)	9 (6.4)	20 (6.5)	37 (26.4)	76 (24.8)	91 (65.0)	206 (67.3)	140 (100)	306 (100)

2.3.9. Common health issues

2.3.9.1. Top three most common health issues seen per breed

There were a number of differences in the health issues identified by vets and breeders. In English Cocker Spaniels (ECS), English Springer Spaniels (ESS) and Staffordshire Bull Terriers (SBT), vets rated the most common affected body system to be dermatological (ECS: 29.5%, n=110; ESS: 24.3%, n=83; SBT: 30.4%, n=103) but breeders identified ocular problems (ECS: 33.3%, n=36; ESS: 30.8%, n=20; SBT: 26.7%, n=16). In Golden Retrievers (GR) and German Shepherd Dogs (GSD) both vets and breeders identified musculoskeletal conditions to be most common ([GSD] VS: 32.6%, n=123; PDB: 27.3%, n=39; [GR] VS: 32.4%, n=117; PDB: 25%, n=41). Similar results were seen for Labrador Retrievers, vets rated the most common issue to be musculoskeletal (35.8%, n= 135), whereas breeders rated musculoskeletal (MSK) and ocular (OC) issues to equally be of greatest frequency (MSK: 32.2%, n=49; OC: 32.2%, n=49). A summary of results is provided in Table 17.

Table 17: Most common health issues reported in each of the ten most registered breeds in the United Kingdom, based on veterinary surgeon and pedigree dog breeder opinion in 2011. CV = Cardiovascular; DERM = Dermatological; ENDO = Endocrine; GI = Gastrointestinal; HAEM = Haematological/Immunological; MSK = Musculoskeletal; NEURO = Neurological; OC = Ocular; URI = Renal and urinary; RESP = Respiratory; OTHER = an issue for which a category was not provided; * = results too low to be reported (≤ 1 respondents). () = %.

Breed	Most common conditions identified (by body system) n (%)					
	Veterinary Surgeons			Pedigree Dog Breeders		
	Issue 1	Issue 2	Issue 3	Issue 1	Issue 2	Issue 3
Labrador Retrievers	MSK 135 (35.8)	DERM 99 (26.3)	GI 40 (10.6)	MSK/OC 49 (32.2)	DERM 16 (10.5)	NEURO 11 (7.2)
English Cocker Spaniels	DERM 110 (29.5)	OC 78 (20.9)	HAEM 42 (11.5)	OC 36 (33.3)	URI 22 (20.4)	DERM 18 (16.7)
English Springer Spaniels	DERM 83 (24.3)	MSK 73 (21.4)	HAEM 58 (17)	OC 20 (30.8)	DERM 10 (15.4)	HAEM/MSK 7 (10.8)
German Shepherd Dogs	MSK123 (32.6)	GI 81 (21.5)	DERM 62 (16.4)	MSK 39 (27.3)	GI 28 (19.6)	NEURO 23 (16.1)
Staffordshire Bull Terriers	DERM 103 (30.4)	MSK 80 (23.6)	OTHER 22 (6.5)	OC 16 (26.7)	DERM 15 (25)	NEURO 13 (21.7)
Cavalier King Charles Spaniels	CV 125 (33.3)	NEURO 95 (25.3)	DERM 66 (17.6)	CV 31 (32.6)	OC 27 (28.4)	NEURO 24 (25.3)
Golden Retrievers	MSK 117 (32.4)	DERM 93 (25.8)	GI 36 (10)	MSK 41 (25)	OC 39 (23.8)	DERM 22 (13.4)
West Highland White Terriers	DERM 139 (38.5)	RESP 56 (15.5)	ENDO 33 (9.1)	DERM 8 (42.1)	ENDO 2 (10.5)	*
Boxers	CV 96 (25.8)	DERM 61 (16.4)	NEURO 36 (9.7)	CV 36 (37.9)	URI 16 (16.8)	OTHER 15 (15.8)
Border Terriers	DERM 140 (43.9)	ENDO 64 (20.1)	NEURO 20 (6.3)	NEURO 6 (25)	CV 4 (16.7)	OC 3 (12.5)

2.3.9.2. Health issues perceived to impact on welfare

Fewer differences in opinion were seen in vets' and breeders' opinions of health issues perceived to affect welfare. Both vets and breeders of Cavalier King Charles Spaniels (CKCS) and Boxers (B) rated cardiovascular issues as the biggest welfare issue ([CKCS] vets: 68.7%, n=79; breeders: 50%, n=13; [B] vets: 45.8%, n=49; breeders: 47.6%, n=10). Likewise, musculoskeletal problems were rated as the biggest welfare issue in Labrador Retrievers (LR), German Shepherd Dogs (GSD) and Golden Retrievers (GR) ([LR]:vets: 87.6%, n=106; breeders: 72.1%, n=31; [GSD]: vets: 73.5%, n=86; breeders: 33.3%, n=13; [GR]: vets: 74.5%, n=82; breeders: 30.6%, n=11). Despite this, differences were seen regarding English Cocker Spaniels, with vets rating dermatological issues to be of the most impact on welfare (58.1%, n=68) as opposed to ocular issues which were reported to be of the most impact by breeders (37%, n=10). Differences were also seen regarding English Springer Spaniels and Staffordshire Bull Terriers (see Table 18).

Table 18: Health issues with the biggest perceived impact on the welfare of each of the ten most registered breeds in the United Kingdom, based on veterinary surgeon and pedigree dog breeder opinion in 2011. CV = Cardiovascular; DERM = Dermatological; MSK = Musculoskeletal; NEURO = Neurological; OC = Ocular.

Breed	Biggest welfare concern identified (by body system)	
	Veterinary Surgeons	Pedigree Dog Breeders
Labrador Retrievers	MSK (87.6%, n=106)	MSK (72.1%, n=31)
English Cocker Spaniels	DERM (58.1%, n=68)	OC (37%, n=10)
English Springer Spaniels	DERM (43%, n=46)	OC (23.1%, n=3)
German Shepherd Dogs	MSK (73.5%, n=86)	MSK (33.3%, n=13)
Staffordshire Bull Terriers	DERM (50%, n=50)	NEURO (23.5%, n=4)
Cavalier King Charles Spaniels	CV (68.7%, n=79)	CV (50%, n=13)
Golden Retrievers	MSK (74.5%, n=82)	MSK (3.6%, n=11)
West Highland White Terriers	DERM (92.1%, n=105)	DERM (66.7%, n=2)
Boxers	CV (45.8%, n=49)	CV (47.6%, n=10)
Border Terriers	DERM (32.7%, n=32)	CV (50%, n=2)

2.3.9.3. Other health issues identified

When vets and breeders were asked about other health issues experienced in these breeds, neoplasia (vets: n=13; breeders: n=22), obesity (vets: n=3; breeders =2) and behavioural problems (vets: n=7; breeders: n=5) were the most frequently mentioned 'other' issues identified.

2.3.10. Perceived trends in pedigree dog health

2.3.10.1. In the past 10 years...

Overall, vets felt that pedigree dog health had worsened over the last 10 years (37.2%, n=51). In contrast, chi-squared analysis showed breeders were significantly more likely to feel that pedigree dog health had improved (67.4%, n=201, p=<0.001). Further, 27% of vets (n= 37) felt pedigree dog health had remained unchanged in the past decade and 24.1% (n= 33) felt it had improved. Only 13.4% of breeders (n=40) felt pedigree dog health had worsened (see Figure 20).

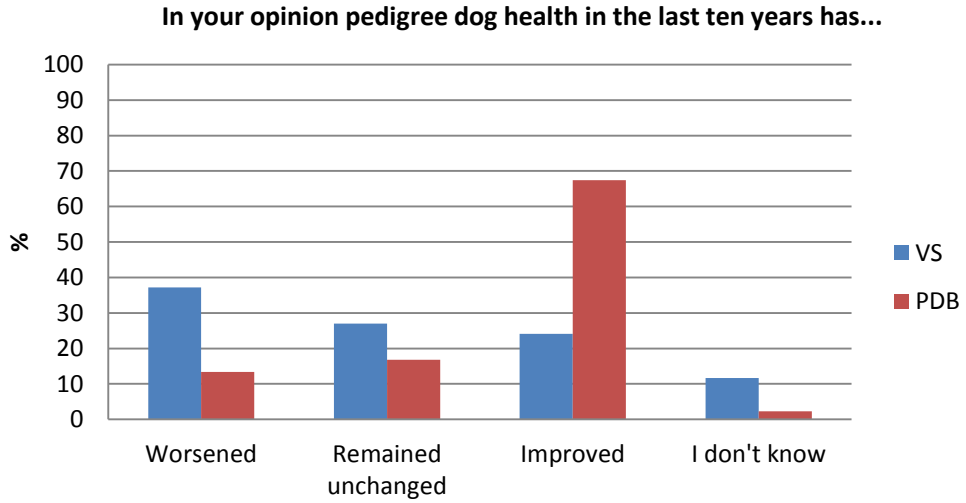


Figure 20: Veterinary surgeons' (n=137) and pedigree dog breeders' (n=289) opinions on the trend of pedigree dog health over the last 10 years based on questionnaire findings in 2011. VS = veterinary surgeons; PDB = pedigree dog breeders.

2.3.10.2. In the next 10 years...

Overall, both vets (47.4%, n=65) and breeders (72.5%, n=216) felt that pedigree dog health would improve over the next ten years. Chi-squared analysis showed breeders were significantly more likely to hold this view than vets (p=<0.001). Only 14.6% of vets (n=20) and 5.4% of breeders (n=16) felt that pedigree dog health would get worse in the future decade (see Figure 21).

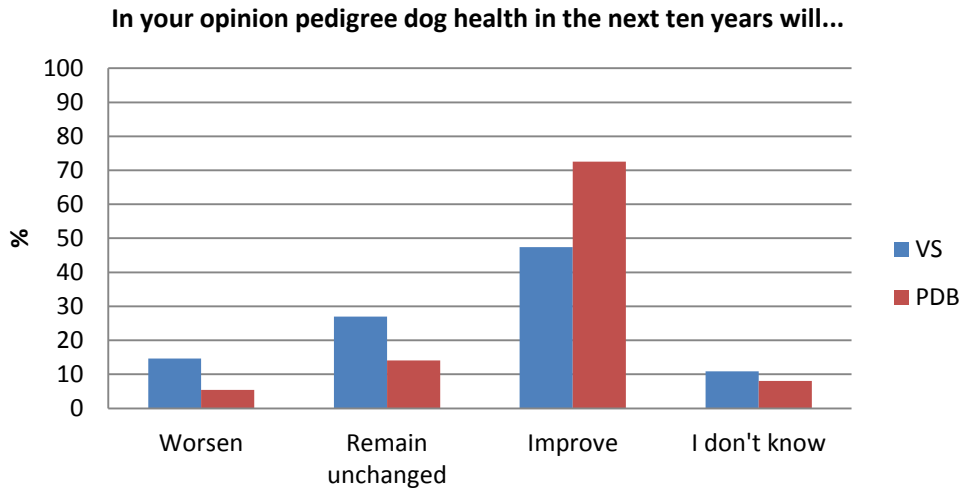


Figure 21: Veterinary surgeons' (n=137) and pedigree dog breeders' (n=289) opinions on the trend of pedigree dog health over the next 10 years based on questionnaire findings from 2011. VS = veterinary surgeons; PDB = pedigree dog breeders.

2.3.11. Further findings

A breakdown of both the complete vets' and breeders' questionnaire findings is provided in detail in Appendix 3.

2.4. Discussion

This study has explored both vets' and breeders' perceptions, perceived knowledge, information seeking behaviours and views on pedigree dog breeding, canine inherited disease and health screening programmes. Key findings suggest that vets and breeders differ in their sources of information on pedigree dog health, with breeders rating there to be more information available to them on pedigree dog health and breeding than vets did. Verbal communication was vets and breeders preferred method of conveying information on pedigree dog health to others. Both vets and breeders rated their own knowledge of pedigree dog breeding, canine hereditary disease and hereditary disease screening programmes highly. Each independently felt themselves to be most responsible for advising dog owners and puppy buyers. The majority of health promotion actions were rated to be important by both vets and breeders. Regarding health conditions, breeders appeared to focus more on inherited conditions whereas vets appeared to focus on both inherited and acquired conditions. However, fewer differences were seen regarding conditions affecting welfare. Both vets and breeders thought pedigree dog health would improve over the next decade. These findings will be discussed further below.

Study recruitment and respondents

The majority of vets and breeders who participated in this study were female. Evidence has suggested that women are more likely to respond to mail and phone surveys than men are (Seller, 2000), which may offer some explanation for this. Further, in recent years the veterinary profession has seen an increase in the number of female vets both in the UK and overseas (Lofstedt, 2003, Smith, 2006, RCVS, 2011). A recent report conducted by the RCVS showed that 77% of veterinary students starting in 2010 were female and that 64% of vets under the age of forty-five practising in the UK were also female (RCVS, 2011). Further, a recent survey of the profession comprising 4842 veterinary surgeons showed 60% to be female, the majority of vets doing small animal work and

40% reporting they had some sort of post graduate qualification (Nielsen *et al.*, 2014). Comparably the data from this study indicated 31% of respondents to have post graduate qualifications. Although not completely dissimilar, such findings raise a number of questions about the degree to which this dataset represents the wider population of vets in small animal work. Little evidence exists on whether breeding dogs is a predominantly male or female hobby but previous questionnaire-based studies of breeders and owners have also found the majority of respondents to be female (Leppanen *et al.*, 2000a, Leppanen *et al.*, 2000b, Lund *et al.*, 2009). This may be attributable to the increased likelihood of females to answer questionnaires or simply that women are over represented within this sample population. The breeders who participated in this research mostly kept their dogs for a variety of reasons of which 'show and pet' was the most frequent. Most breeders bred a relatively small number of dogs and although the majority of breeders registered the dogs they bred with the KC only 51% were KC members. Whilst some comparison can be made to the Finnish study conducted by Leppanen and colleagues, a lack of comparable information to other UK breeders makes it difficult to tell the extent to which this demographic profile is applicable to the wider population beyond those registered on Champdogs.

Pedigree dog health screening and breeding

Study data have indicated that some breeders think that health screening status affects the sale of puppies while others do not. This was an interesting finding which may be attributable to a number of factors. Firstly, not all breeds included in this study were associated with recommended health tests and thus health screening may not be considered a crucial factor. Secondly, the public may be unaware of the need to check whether a puppy is from health tested parents or not. Evidence suggests that the knowledge of puppy buyers is at times lacking, as reflected by the need for better public and dog owner education identified by several reports (APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010). Such findings may mean puppies' health status is subject to less consideration than it should be and consequently may have little or no

impact on how easily puppies sell. No legal requirement exists for dog breeders to screen their breeding stock and Kennel Club registration is not always based on the condition that such tests have been performed (The Kennel Club, 2012a). It is therefore possible that whilst many breeders do utilise the availability of these tests, a proportion are profiting from selling unscreened but at-risk puppies under the public misconception that Kennel Club registration is a sign of quality.

When breeders were asked for their opinions on health screening use, the majority felt breeding from unscreened dogs was unacceptable and breeder expertise was seen to be of equal importance to health screening status when choosing breeding dogs. This finding may be explained by the fact that health screening status is not a sole consideration when making breeding decisions. Other factors, for example, the parent dogs' temperament, conformation, working or show ability and suitability as a companion also need to be considered. Secondly, for breeds which do not have any recommended health screening programmes, it is likely that breeders will instead use the expertise gathered through experience when evaluating health-based breeding decisions. Quantifying the knowledge and expertise of different breeder clients may also prove difficult for vets within the time restraints of a consultation. Such challenges may create frustration and barriers in communication if information is not targeted at the right level to breeder clients. This is a complex topic, for which further qualitative analysis is required to ascertain the consequence of these opinions with regards to vets' and breeders' management of pedigree dog health across the UK.

Study data indicated vets to rate themselves as relatively comfortable with dealing with various aspects of pedigree dog care in practice. Vets rated themselves as being most comfortable with advising puppy buyers on pedigree dog health, whilst discussing breeding options with breeder clients and advising on screening programmes for canine inherited diseases were rated as tasks vets felt less comfortable with. Possible explanations for this may be that vets tend to possess a broader knowledge of a variety of species and dog breeds

and thus their in-depth knowledge of dog breeding and health screening is unlikely to rival that of an experienced pedigree dog breeder dealing with one or just a few breeds of dogs. Further, data collected in a separate question indicated that vets felt less information was available to them on pedigree dog breeding and health screening than breeders did. Such findings suggest that better provision of information to vets may increase their comfort in dealing with experienced breeder clients and thus facilitate better vet-breeder interaction in the consult room.

Awareness and use of health schemes

Of the health schemes vets and breeders stated they were both aware of and actually used the most frequent were musculoskeletal, ocular, neurological and cardiovascular. This may be due to the fact that the most established schemes such as those for hip dysplasia, elbow dysplasia and ocular evaluation are in these categories. It would be very interesting to know why breeders who are aware of schemes may still choose not to carry them out. This may also highlight how these schemes can be promoted most effectively in the future and what breeds should be the subject of most focus. As an extension of this analysis, musculoskeletal, ocular, neurological and cardiovascular health schemes were broken down on a breed by breed basis. The results indicated that a higher proportion of breeders of breeds with health schemes recommended by the Kennel Club were both aware of and carrying out such schemes. Although care was taken not to use examples of health schemes in the delivery of these questions to minimise response bias, this qualitative analysis was only intended to provide basic exploratory data and the results should therefore be interpreted with caution.

Sources of information on pedigree dog health

Vets and breeders expressed varied opinions on where they each sourced information on pedigree dog health from. Vets rated their top three information sources to be veterinary organisation manuals, journals/scientific papers and veterinary websites. Similar results were seen in a study conducted

on vets' information seeking behaviour which found of the 66% of vets using the internet, 79% used veterinary information websites to some extent (Wales, 2000). Additionally, it was found that journals, textbooks and conferences were the top rated sources by vets for drug, diagnostic and therapeutic information (Wales, 2000). Further, a study by Leppanen *et al.* in 1997 asked vets to rate the most important information sources on inherited disease and control programs. Findings indicated that veterinary literature, KC information and the KC magazine were most important to Finnish vets at the time (Leppanen *et al.*, 1999). However, as the Leppanen study was conducted overseas, over 15 years ago and in a country where 95% of dogs are estimated to be registered with the KC (Leppanen *et al.*, 2000a), direct comparisons are limited. The three most popular sources of information on pedigree dog health rated by breeders were: other breeders, Kennel Club literature or publications, relevant breed club websites and the Kennel Club website. Similar findings were found by Leppanen *et al.* in 1998, with Finnish breeders ranking breed club and KC magazines as the most important information sources (Leppanen *et al.*, 2000a). Such findings may suggest that the KC is a more influential source of information for breeders both at home and overseas than it is for their veterinary counterparts and this may be linked with the fact that breeders may have greater contact with the Kennel Club in connection with dog registrations and BSAVA/KC health schemes.

Interestingly, the present study showed breeders to be much more aware of vets' sources of information than vets were of the information sources breeders use. If these findings are true of the whole profession, this may pose a barrier when offering advice to breeders in practice. Interestingly it was found that both vets and breeders rated each other very poorly as sources of information, suggesting less information exchange takes place between these parties than it potentially could. Further, the fact that both vets and breeders rated their own knowledge highly in relation to dog breeding, inherited diseases and health schemes may imply that these parties feel they have little

to learn from each other and therefore improved recognition of what each party is able to contribute is required.

Preferred methods of receiving information

Vets and breeders both selected 'email' as their preferred method of receiving information from dog organisations; the second preferred choice was via a website. The majority of vets and breeders felt they would use information delivered in these ways monthly or more frequently. These findings were of particular interest given the increasing trend in online communication; there are now estimated to be around 2.5 billion internet users in the world (Internet World Stats, 2012). Although both the Kennel Club and Advisory Council have websites, further research may be necessary to ascertain how aware people are of these websites and the information they contain. Future interventions for vets and breeders could involve email alerts or text messages sent out each month to update them on any new pedigree dog health information or research available.

Preferred methods of conveying information to others

When conveying information on pedigree dog health specifically to pedigree dog owners and (other) breeders, verbal communication was both the most frequently used and preferred method of information exchange chosen by vets and breeders. This is perhaps of no surprise as in 2011, a British Telecom sponsored study conducted by the University of Cambridge showed that 90% of respondents felt communicating face to face was the best way of voicing information they considered important (British Telecom Press Release, 2011). It should be noted that although providing information verbally was the preferred method stated, these parties were not asked whether they would use any of these methods of conveying information in conjunction with each other. For example, providing supplementary written information alongside verbal advice may help to ensure information is properly understood and can be revisited at a later date. This is something which should be encouraged and could be further explored in future research. Further research is also needed

to ascertain how owners would actually prefer to receive information. Arguably, both dog owners and puppy buyers have a great deal of potential as consumers to positively influence the pedigree dog breeding market. Therefore enabling vets and breeders to provide information in the most effective way to this demographic is integral to improved education and awareness. However, further research involving dog owners and puppy buyers would be required to inform how best to achieve this. If possible, such informed interventions may assist prospective owners in making good choices when buying or homing dogs in order to phase out the niche in which puppy farms currently exist.

Perceptions of knowledge

Vets and breeders differed in their opinion of each other's knowledge regarding pedigree dog breeding, canine inherited disease and current hereditary disease screening programmes. Both vets and breeders rated their own knowledge on all three topics highly, suggesting that each party may be unaware of the other's strengths in terms of knowledge. This may be symptomatic of a lack of mutual recognition and a factor which needs to be addressed in order to promote more effective collaboration between these parties. Breeders rated themselves to be the most knowledgeable party overall and may have specialist knowledge based on considerable experience. The breeders in this study were very confident in their own knowledge, which may also be due to the number who were KC members and KC registered all of their dogs. However, it is also possible that these breeders are unconsciously incompetent; meaning they are over confident in their own knowledge and are consequently unaware of their limitations. These findings bear some similarity to those of the study conducted by Leppanen and colleagues in 1998, which found breeders rated their personal knowledge good to excellent (Leppanen *et al.*, 2000a). In the present study it appeared that breeders in the UK were much more confident in their knowledge of these topics than vets and higher median ratings for breeder knowledge were reflective of this.

Vets, like breeders, rated themselves as the most knowledgeable party regarding canine hereditary diseases and screening programmes, although their total knowledge ratings were lower than that of their breeder equivalents. As discussed previously, data collected in a separate question indicated vets to feel less information was available to them on pedigree dog breeding and health screening than breeders did which may account for these findings. Interestingly, vets also rated themselves and breeders to possess equal knowledge on pedigree dog breeding. This may be attributable to a number of reasons. For example, in recent years, increased media attention surrounding pedigree dog breeding and health has meant that the general awareness of issues surrounding breed standards and breeding practices in the context of welfare has increased (Collins *et al.*, 2010). Further, a Norwegian study on the relationship between dogs, owners and vets, showed owners to expect vets to have a good knowledge of every aspect of veterinary medicine (Lund *et al.*, 2009).

The fact that the knowledge ratings vets awarded themselves were lower than their breeder equivalents may indicate that vets are consciously incompetent on these subjects and thus more realistic when evaluating their own knowledge. Alternatively, vets also require a broad knowledge of all species and will therefore have spent less time focussing solely on this particular area of expertise. The vets' findings from the present study were very different to those of Leppanen *et al.*, in which Finnish vets rated their knowledge of canine inherited diseases and control programs to be poor overall (Leppanen *et al.*, 1999). Unfortunately however, a limited comparison can be drawn between these studies as they were undertaken in different countries over 15 years apart. Whilst these data are useful in demonstrating opinions of knowledge and offering possible explanations for why information is exchanged in the way it is, it is not possible to quantify how much these stakeholders actually know. This could have been explored further by introducing questions to test knowledge, such as Leppanen *et al.*'s method of questioning vets on how many breeds have an official control program (Leppanen *et al.*, 1999). However, it

was decided that such methods may encourage social acceptability bias within the responses, particularly as the questionnaire was completed online and respondents could access online resources to assist them with their answers.

Stakeholder responsibilities

Vets and breeders shared different views on who should advise puppy buyers and pedigree dog owners, with the majority of both vets and breeders rating themselves to have most responsibility for this role. This was a very interesting finding and may correlate with vets and breeders beliefs about themselves independently possessing the most knowledge on topics relating to pedigree dog breeding and health. There are no other studies with which these results can be compared but these data raise questions about how information and guidance is shared between these parties, who should be responsible for overseeing such tasks and the actual roles vets and breeders feel they play in educating prospective owners. Such questions would lend themselves well to further qualitative investigation in order to better understand the reasons behind these findings.

Whilst some vets and breeders felt they had a role to play in advising the other, this view was poorly shared each time by the recipient party suggesting a lack of clarity regarding the roles vets and breeders should play and a reluctance to receive guidance from each other. Other possible reasons for the conflicting opinions of breeders and vets regarding each other's roles include different professional priorities; pride in self-expertise; lack of understanding between both parties and an uncertainty about what advice is needed and how it should be directed. These conflicting opinions may act as a barrier for future health promotion if clarity cannot be reached regarding the roles required of vets and breeders. Further research is therefore required to explore this issue and the origins from which such opinions are formed.

Actions to promote pedigree dog health

Vets and breeders rated all actions given to control hereditary disease in pedigree dogs (see Table 16) as either important or very important. This may be explained by the fact that both parties clearly have a vested interest in promoting pedigree dog health, even if they at times demonstrate conflicting opinions on how best to do this. It would also be beneficial to collect pedigree dog owners' opinions on these promotion actions as they are the largest purchaser of pedigree dogs and have a great deal of potential to positively influence puppy sales. Interestingly, in a survey carried out as part of the RSPCA's Report 'Pedigree Dog Breeding in the UK: A Major Welfare Concern?', collection of morbidity and mortality data from registered dogs, revision of registration rules to prevent puppies of first degree (e.g. between parent and offspring or between full siblings) and second degree matings (e.g between grandparents and grand-offspring or between half siblings) being registered and the introduction of open stud books were ranked as the top 3 of 36 potential actions by experts (Rooney and Sargan, 2009). Considering this, an alternative way of conducting the present study may have been to ask vets and breeders to rank health promotion actions. This would have been more informative and indicated the perceived value of health promotion actions in relation to each other as opposed to just confirming all to be of perceived benefit.

Common health issues identified

Vets' and breeders' opinions on the common health issues identified in the breeds selected for this study varied. For some breeds vets and breeders appeared to be in agreement over the body systems subject to health issues, for example both vets and breeders identified musculoskeletal conditions to be most common in Labrador Retrievers and German Shepherd Dogs and this finding was shared by the studies of Leppanen and colleagues (Leppanen *et al.*, 1999, Leppanen *et al.*, 2000a). Regarding Labradors this finding was further shared by the morbidity data collected by the Purebred Health survey (Kennel

Club/BSAVA Scientific Committee, 2004b). Further although not breed specific, a study conducted in the UK by Asher *et al.* in 2009 showed of the 396 inherited diseases identified in the literature, the body systems primarily affected were musculoskeletal and integument (Asher *et al.*, 2009). In other breeds such as English Cocker Spaniels, vets rated the most common body system subject to health issues to be dermatological; whereas the breeders of English Cocker spaniels identified ocular problems as the most common, rating dermatological conditions third. Interestingly, in the vets' and breeders' studies conducted by Leppanen *et al.* similar results were found, as Finnish vets named the main health issue in English Cocker Spaniels to be dermatological (Leppanen *et al.*, 1999). In contrast, the questionnaire of Finnish breeders in 1998 showed skeletal and eye issues as the most serious, again bearing resemblance to the present findings (Leppanen *et al.*, 2000a). Interestingly morbidity data from the Purebred dog health survey showed ocular issues to be next most common issue in English Cocker Spaniels after reproductive issues (Kennel Club/BSAVA Scientific Committee, 2004a). Dermatological issues were third on the list (Kennel Club/BSAVA Scientific Committee, 2004a). A further development of this research could be to do a more detailed comparison with the results of the Kennel Club's Pure Bred Dog Health survey for each of the breeds featured in the study in order to assess the similarities and differences in the most common conditions reported.

Such differences in the opinions expressed by vets and breeders towards the different health conditions seen may be symptomatic of the different experiences and information sources used by these parties. Breeders may tend to focus on inherited conditions whereas vets may focus more on both acquired and inherited disease. It is however hard to tell whether these opinions reflect prevalence, particularly as disease data are largely lacking (Crispin, 2011, Bloomfield and Scott, 2013). Interestingly, both vets and breeders were in agreement over the single health issue with the biggest impact on welfare in 6 of the 10 breeds featured in this study. This was a positive finding suggesting vets and breeders may possess some mutual

recognition of compromised welfare. Speculatively this may be due to the fact that conditions in which welfare is compromised are likely to involve both vet and breeder intervention and thus their awareness of conditions affecting welfare may be better matched.

Trends in pedigree dog health

Breeders were significantly more likely than vets to hold the view that pedigree dog health had improved over the past ten years and would continue to do so during the following decade. However, vets also felt pedigree dog health would improve in the next ten years. Despite recent reports focussing on the challenges associated with pedigree dog breeding (APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010), it is not possible to know if pedigree dog health has actually worsened over the past ten years without substantial clinical data collected from veterinary practices and breed clubs. It is unknown whether the increased focus on pedigree dog health in recent years is derived from the fact that the health of pedigree dogs in the UK has generally got worse or whether inherited diseases and their effects on welfare are now more easily identifiable. Vets and breeders may possess different views on this subject due to their different exposures to pedigree dog health. Vets tend to witness both inherited and acquired disease, whereas breeders may focus more on the individual dogs they own and the measures taken to address inherited disease within their breed and thus may have a more positive outlook. One further development of this study would have been to look at whether the opinions of vets towards pedigree dog health over the last ten years were influenced by the number of years that they had been graduated. This would have helped to indicate whether the data provided were more likely to be based on experience or perception (in the case of new graduates).

Sampling considerations and study limitations

Post hoc analysis indicated the sample sizes of both veterinary surgeons and pedigree dog breeders surveyed in this study to be inadequate in order to draw meaningful conclusions from the data regarding the wider target populations.

With a sample size of 150 veterinary surgeons, the margin of error was shown to be 8.0% and thus this study is of inadequate power to draw generalised conclusions. This consideration was also true of the pedigree dog breeders sampled, however with a sample size of 351 these data were not as far off the 377 target. As a result, this part of the study was better powered (margin of error = 5.2%), despite not being generalizable to all pedigree dog breeders in the UK. Whilst participants were not asked if the incentivisation offered encouraged them to take part in the study, research has indicated incentivising questionnaires improves the response rates achieved (Edwards *et al.*, 2002). Further research has also indicated that offering solely monetary incentives can achieve better response rates still (Edwards *et al.*, 2002) and this could therefore be a consideration for future research as an alternative to offering vouchers or hampers.

There is no sampling frame for breeders in the UK and use of the Champdogs website (Champdogs ®) to recruit breeders in the UK was an untested approach. An alternative option for recruiting breeders would have been to use the KC's mailing lists, however this would not have allowed for data collection from those who were not registered with Breed Clubs. By avoiding use of the KC mailing lists it was also hoped that breeders would express their views freely and this was further aided by the confidential nature of the questionnaire. Despite this, two out of the ten breeds selected for inclusion in this study had been featured in 'Pedigree Dogs Exposed' in August 2008 (The BBC Press Office, 2008) and were subsequently featured again in 'Pedigree Dogs Exposed: Three years on...' in February 2012 (The BBC Press Office, 2011), which may have had an impact on the willingness of these breeders to participate in this study. Data analysis has since shown that even by sourcing breeders from Champdogs, 51% considered themselves Kennel Club members, with 95.3% of breeder respondents registering all puppies bred with the KC. This suggests that breeders either feel it is more socially acceptable to say they register their dogs with the KC or the majority of dog breeders do actually register puppies with the KC. This finding may also suggest a link to puppy sales with KC registered

puppies potentially selling more easily. It is also possible that those who KC register puppies consider themselves responsible and thus are more willing to participate in research.

Whilst this questionnaire did not ask respondents whether or not they were part of the Assured Breeders Scheme (ABS), this information would have been interesting to have and may have helped to indicate how accessible this group are for research purposes. Due to the lower numbers of ABS breeders this population may be harder to reach and thus underrepresented. For example, 175 Assured breeders of Cocker Spaniels are listed on the Kennel Club website (The Kennel Club, 2014j) and on the Champdogs website alone 966 Cocker Spaniel breeders are listed (Champdogs ®, 2014); in reality there are many more. Alternative methods of sourcing breeders in a more inclusive way for future studies could include adverts in newspaper columns, pet shops and groomers although these methods may still present similar challenges to those outlined above.

There is no database of all vets in the UK that is accessible for research. There is also a general need for more vets to get involved with research, such as that carried out by the CEVM, SAVSNET and VetCompass (see 1.5.1 and 1.5.2) (VetCompass, 2013, SAVSNET, 2014). In this study, recruitment of vets posed a challenge and this is reflected by the low response rate achieved. It is uncertain how many studies have recruited vets for research via the RCVS Register of Practices and Vets Now, however this method yielded low response rates. A study conducted by Edwards and colleagues in 2003 similarly used a national list to recruit vet practices to assist in research targeted at dog owners and achieved a comparably higher participation rate of 61% (Edwards *et al.,* 2004). The reasons for lower response rates in the present study may have been due to lack of time, lack of interest in the research topic, poor communication between the main practice contact and the potential vet participants or a preference for owner-based research as in Edwards' and colleagues' study. The CEVM mailing list distribution proved to be much more effective in recruiting vets and as anticipated, a greater proportion of

responses were received via this method. This highlights the value of utilising vets with whom a good working relationship has been developed as a tool in providing initial exploratory data. Retrospective discussion with colleagues has suggested that recruitment of vets via conferences and CPD events may have proved a more successful method of recruiting vets.

In the planning stages of this research it was decided not to include pedigree dog owners in this study due to the time restraints faced and the difficulty in sourcing both vet-visiting and non-vet-visiting owners of pedigree dogs. Such data retrospectively would have been valuable in the present study for analysis alongside the findings of the vets' and breeders' questionnaire. Further, interesting comparisons could then have also been made with the work of Leppanen and colleagues who looked at vets, breeders and pedigree dog owners (Leppanen *et al.*, 1999, Leppanen *et al.*, 2000a, Leppanen *et al.*, 2000b). A possible continuation of this research could therefore involve data collection from both vet-visiting and non-vet-visiting pedigree dog owners.

The online method for distributing these questionnaires was chosen because it was known to be inexpensive and efficient, allowing for large sample sizes and data entry was automatic (Gosling *et al.*, 2004) thus, saving time and reducing the risk of human error. Despite these advantages, limitations were encountered with the SurveyMonkey software used (SurveyMonkey™) and not all question types could be translated from paper into the programme in the intended format. A key example of this was that questions which were intended to be presented as visual analogue scales, instead had to be presented in a Likert scale format. As this only allowed for interval data, as opposed to continuous data to be gathered it may have reduced the richness of the data collected. When interpreting the results of these questionnaires it should be considered that this can be an emotive topic to some; respondents who took the time to participate clearly had something to say whether with genuine interest, passion or anger. This was reflected in the some of the free text responses, for example one breeder responded that vets sourced information from 'cloud cuckoo land' and whilst careful analysis of this sort of

qualitative data needs to take place, it is clear that this is a questionnaire of the keen and the results should be treated as such.

2.5. Conclusion and future research

The results of this chapter have shown that vets and breeders share a similar desire to improve the welfare of pedigree dogs and optimism that pedigree dog health will improve in the future. However, vets and breeders sometimes exhibit different and even opposing views towards pedigree dog health and their roles in advising puppy buyers and dog owners. Both vets and breeders perceive themselves to possess more knowledge on pedigree dog breeding, inherited disease and health schemes and this may signal a lack of clarity regarding each other's existing knowledge and what their individual roles should actually be. Vets and breeders are both key stakeholders in improving pedigree dog welfare and whilst exploratory, the results of this study are important in better understanding these parties' perceptions and providing a foundation for future research in an area where little investigation has previously been carried out. The findings of all three key reports published in the aftermath of PDE called for the need for greater education and awareness of the puppy buying public (APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010) and vets and breeders are well placed to have significant roles in this process. Owners and puppy buyers, as the main purchasers of pedigree dogs, have a great deal of potential to influence pedigree dog welfare for the better. Further investigation is therefore required to better understand dog owners, the sources of information available them and how vets and breeders can be best utilised to assist in interventions promoting positive change and responsible ownership. Some of these considerations will therefore form the basis for further qualitative investigation in Chapter 3. Specifically this will explore:

I. Vets' and pedigree dog breeders' perceptions of both their own individual roles and each other's roles in promoting pedigree dog health
II. Why vets and pedigree dog breeders might differ in their opinions of who should advise pedigree dog owners and puppy buyers

Chapter 3 - Focus group studies of veterinary surgeons' and pedigree dog breeders' perceptions of their roles and responsibilities in promoting pedigree dog health in the United Kingdom

3.1. Introduction

Veterinary surgeons by definition play a key role in safeguarding the health and welfare of their patients, including pedigree dogs, by overseeing preventative care and providing medical and surgical interventions when necessary (National Careers Service, 2012, RCVS, 2014a). Whilst an exact definition of breeders' roles is hard to find, ethically those breeding dogs have a duty to breed to good welfare standards and home their puppies and dogs appropriately. For those breeders who are part of the Kennel Club's (KC) Assured Breeder Scheme (ABS), certain stipulations are made, including that all breeding stock are registered, permanently identified, that puppy buyers are provided with support and advice, that KC policy on the maximum age and the number and frequency of litters produced is followed and that breeders make use of the relevant health schemes (The Kennel Club, 2013b). A difficulty however lies in the fact that not all breeders are Kennel Club or Breed Club registered and in this instance are both undefined and unregulated, although such breeders should still have to meet the criteria of the 2006 Animal Welfare Act (Animal Welfare Act, 2006). Despite the recognised roles carried out by vets and breeders, findings from the previous two chapters (see 2.3.7) have indicated that these parties may have different ideas of their own responsibilities within the context of pedigree dog health (see Table 19). Key findings from chapters 2 showed vets and breeders to each perceive themselves as being more responsible than the other for advising dog owners, puppy buyers and the public (see 2.3.6 and 3.3). Whilst both parties saw themselves to have a role in advising the other, each party rated the others' role in advising them to be relatively low. The reasons behind these findings will form the basis for further investigation in the present chapter.

Table 19: Adapted from Table 15, page 96. Vets and pedigree dog breeders' perceptions of their own and each other's responsibilities regarding various aspects of pedigree dog health. Based on veterinary surgeon (VS) (n=140) and pedigree dog breeder (PDB) (n=312) opinion as expressed in a 2011 questionnaire. ()=%.

Perceived responsibility for…	Possible parties responsible			
	Veterinary surgeons		Pedigree dog breeders	
	VS responses n (%)	PDB responses n (%)	VS responses n (%)	PDB responses n (%)
Advising pedigree dog owners	83 (59.3)	25 (8.0)	25 (17.9)	171 (54.8)
Addressing pedigree dog breed standards	3 (2.1)	0 (0.0)	7 (5)	86 (27.6)
Educating the public	25 (17.9)	10 (3.2)	3 (2.1)	80 (25.6)
Data collection on hereditary diseases	6 (4.3)	8 (2.6)	1 (0.7)	14 (4.5)
Advising pedigree dog breeders	46 (32.9)	17 (5.4)	1 (0.7)	20 (6.4)
Addressing genetic diversity of individual breeds	2 (1.4)	3 (1.0)	22 (15.7)	51 (16.3)
Promoting responsible dog breeding	25 (17.9)	5 (1.6)	10 (7.1)	118 (37.8)
Advising puppy buyers	102 (72.9)	3 (1.0)	10 (7.1)	227 (72.8)
Advising the veterinary profession	1 (0.7)	5 (1.6)	0 (0)	46 (14.7)

Although questionnaires allow capture of information quickly, easily and with participant anonymity (Kumar, 2005), the use of closed questions such as those featured in Table 19 may inadvertently simplify issues which in reality are much more complex (Dohoo *et al.*, 2009). Whilst questionnaires can indicate the number of people who hold a given opinion or perception, focus groups are more beneficial for exploring how perceptions are formed and expressed (Kitzinger and Barbour, 1999). Unlike individual interviews, focus groups rely on group interaction to prompt discussion in order to reveal not just what people think of a topic, but how they think and why they hold particular views

(Kitzinger, 1995). This method is therefore an essential tool in revealing the perceptions that underpin decision-making behaviours (Christley and Perkins, 2010) and allowing survey results to be further explored when the reasons behind data collected are insufficiently understood (Morgan, 1997). This type of research methodology therefore lends itself well to further exploration of the above data, however qualitative research methods such as this are largely underutilised in the veterinary literature (Mabey, 2011). At present, two focus group studies exist looking at vet-client communication and both vets' and pet owners' perceptions of the cost of veterinary care (Coe *et al.*, 2007, Coe *et al.*, 2008). However, to date no focus group studies have been conducted specifically focussing on the roles vets and breeders perceive themselves to play in pedigree dog health, or the rationale behind the perceptions reflected in Table 19 (last search conducted 26th November 2013). This study will therefore comprise the following objectives:

3.1.1. Study objectives

To document and report:

I. Vets' and pedigree dog breeders' perceptions of their own individual roles in promoting pedigree dog health
II. Vets' and pedigree dog breeders' perceptions of each other's roles in promoting pedigree dog health
III. Why vets and pedigree dog breeders might differ in their opinions of who should advise pedigree dog owners and puppy buyers

3.2. Materials and methods

3.2.1. Developing focus group questions

As described in 3.1, focus group interviews were intended to further explore some of the data collected in Chapter 2. One of the key areas of interest within the existing dataset was the conflicting views expressed by vets and breeders regarding their individual roles in promoting pedigree dog health (see 2.3.7, Table 15). Focus group questions were therefore based around this observation to gain further exploratory insight into the possible reasons behind the results recorded (refer to Table 20).

Table 20: Key research questions highlighted by the questionnaire findings in Chapter 2 and subsequently selected for discussion in vets' and pedigree dog breeders' focus groups.

Task	Question	Approximate time allocated (minutes)
1	What do you feel vets' roles are in pedigree dog health?	15
2	What do you feel breeders' roles are in pedigree dog health?	15
3	Evidence has shown that vets and breeders differ in their opinion of who should advise pedigree dog owners and puppy buyers. What are your thoughts on this?	30
*	What do you feel owners' roles are in pedigree dog health?	Additional question – time allowing

3.2.2. Initial focus group planning

It was decided that it would be most appropriate for vets' and breeders' focus groups to be held on separate nights, with the pedigree dog breeders' focus groups held at a location external to the School of Veterinary Medicine and Science (SVMS), The University of Nottingham (UoN). Focus group structure was pre-planned, with standardised open ended questions to ensure

consistency between the individual sessions. A master sheet was produced with an overview of the intended structure, questions and timings (Appendix 4). Focus group sessions were planned to last for one hour although an extra half an hour was planned within each session to allow for interruptions, potential technical issues etc. All focus groups were recorded using two digital Dictaphones with both a facilitator and assistant facilitator/time keeper present. Flash cards were also used to assist the session and to provide a visual aid for the topics being discussed (Figure 22).

3.2.3. Incentives

Breeder focus groups were incentivised via the provision of refreshments at the focus group venue. Individual participants were also provided with a £20 Amazon voucher and a bag of SVMS and Centre for Evidence-based Veterinary Medicine (CEVM) merchandise for taking part in the study. Vets' focus groups were not as heavily incentivised, as they were conducted as a convenience sample in conjunction with other meetings. However, vet participants were given complementary CEVM merchandise as a token of appreciation for their participation.

3.2.4. Trial recruitment

Two separate focus group sessions were planned for December 2011, the first for breeders and the second for vets, both of whom had volunteered in the questionnaire stage of the study.

From both the vets' and breeders' questionnaires all participants that had (a) expressed an interest in participating in the focus group sessions and (b) provided a contact email address by 03/11/11 were amassed in a Microsoft Excel 2007 spread sheet. In total 31 vets and 114 breeders expressed an interest in participating in the focus group sessions. Of these, all interested vets and 60 randomly selected pedigree dog breeders (assigned using the random number generator and filter tools in Excel 2007) were selected to receive an invitation to the focus group interviews (further breakdown shown in Table 21).

Table 21: Number of questionnaire participants who (a) expressed an interest in participating in the focus groups and (b) received an invite to attend a focus group.

Survey Participants	(a) Number of participants interested in participating in a focus group	(b) Number of participants invited to participate in a focus group	Total number of participants invited to represent each group
Vets from the RCVS practice list	15	15	31
Vets from the CEVM contact list	16	16	
Labrador breeders	17	*9	60
English Cocker Spaniel breeders	15	*8	
English Springer Spaniel breeders	13	*7	
German Shepherd Dog Breeders	19	*10	
Cavalier King Charles Spaniel Breeders	11	*6	
Staffordshire Bull Terrier Breeders	10	*5	
Border Terrier Breeders	7	*4	
Golden Retriever	19	*5	
Boxer Breeders	12	*6	
West Highland White Terrier Breeders	0	0	

*= sample randomly selected.

In mid-November both the selected groups of vets and pedigree dog breeders outlined above were sent an email invitation to the focus group evenings. Responses were then collected.

3.2.4.1. Change in approach

The approach described in 3.2.4 was unsuccessful in securing enough focus group participants for the sessions to go ahead. As no vets responded to say they could attend the focus group session and only 4 breeders expressed an interest in participating, it was decided to postpone the focus groups until a later date.

3.2.5. Final recruitment

The focus groups were rescheduled for the start of 2012. It was decided that a different approach would be followed to try to increase the number of respondents. New potential breeder focus group participants were sourced using the search tools on the Champdogs website (Champdogs ®). This allowed the identification of the nearest 200 Champdogs breeders (20 for each of the 10 breeds selected for this study), within a 50 mile radius, who were contacted regarding focus group participation. The additional criterion for sourcing participants was that they needed to have an email address. The 4 pedigree dog breeders who had expressed an interest in participating in a focus group previously were also re-contacted (see 3.2.4 and 3.2.4.1).

Vet focus group participants were sourced from within a 20 mile radius of where the focus group would be held using the online Royal College of Veterinary Surgeons' (RCVS) 'Find a Vet' search tool for animal owners (RCVS, 2014b). One hundred and eleven practices within a 20 mile radius of the SVMS, UoN were identified. All suitable practices were amassed into a Microsoft Excel 2007 database and potential vet participants were sourced from this list.

At the start of December 2011 an email was sent to all potential vet and breeder participants inviting them to participate in the rescheduled focus groups. The email contained a link to a one page online questionnaire which could be accessed to confirm that (a) the vet/breeder wanted to participate in the focus group and (b) which day of the week starting the 9th of January 2012 they were available to attend. Vets were also provided with paper slips and a pre-paid returns envelope to be completed by hand if preferred. Replies were

received over a four week period. In total 5 vets and 15 breeders answered the online questionnaire or returned a paper slip to confirm that they wanted to attend. As the number of vets willing to attend was still low and participants had very varied availability, it was decided that the vets' focus group would again be rescheduled for a later date. However, it was decided that there was adequate uptake for the breeders' focus groups to go ahead.

3.2.5.1. Pedigree dog breeders focus groups (A and B)

In total 15 breeders who had expressed an interest in participating in the breeders' focus groups were again contacted to check their availability to attend the most popular date from the response questionnaire (12/01/12 at 6.30-7.30pm). Thirteen breeders confirmed that they could attend this session and on the 05/01/12 were provided with details of the session schedule and directions to the focus group venue.

The breeders' focus groups were held on 12/01/12 at a hotel 2 miles from the SVMS, UoN. Twelve out of the 13 breeders who had agreed to participate in the breeders' focus groups attended. No reasons were provided for non-attendance. All 12 breeders were given a brief introduction to the research, although care was taken to not disclose information which may have affected the answers given in the focus groups. The 12 participants were assigned into 2 groups (A and B) of 6 participants for the focus groups interviews and care was taken to have a mix of breeders of different breeds in each group (see Table 22). All participants were made aware of the fact that they were being recorded and were guaranteed anonymity in the final transcripts.

Table 22: Breeds that pedigree dog breeder focus group participants were, or had been, involved with. Care was taken to ensure there was a mix of breed experience in both groups A and B.

Focus Group A		Focus Group B	
Breeder	**Breed(s) involved with**	**Breeder**	**Breed(s) involved with**
A	King Charles Spaniels Japanese Chins	**F**	Labradors
B	Labradors English Cocker Spaniels American Cocker Spaniels Irish Setters Basset Hounds	**G**	Irish Setters Border Collies Cavalier King Charles Spaniels Belgian Shepherds King Charles Spaniels Japanese Chins
C	German Shepherds	**H**	English Cocker Spaniels American Cocker Spaniels
D	German Shepherds Border Collies Tibetan Terriers	**I**	Labradors
E	Labradors Dalmatians	**J**	Border Collies German Shepherds
		K	German Shepherds

Both groups were then given three questions to discuss based on vets' and breeders' roles relating to pedigree dog breeding, inherited disease and screening programs (see Table 20). Flash cards were also arranged on the table for each group to provide a visual aid for the discussion (see Figure 22 for an example).

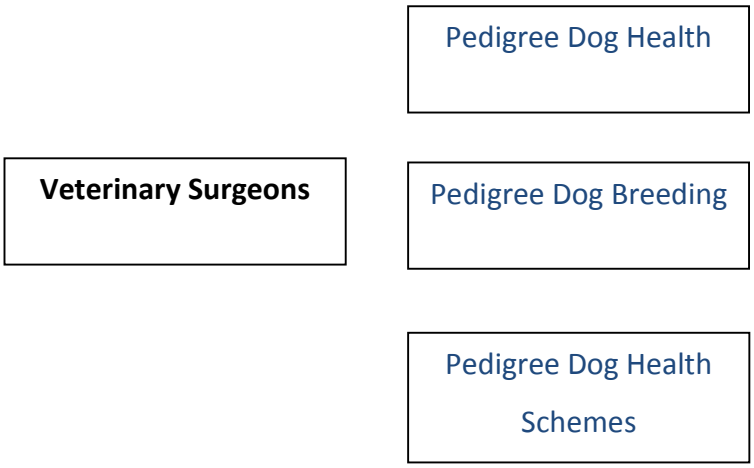


Figure 22: An example of how the flash cards were laid out on the table during the focus groups. This particular arrangement was used for 'What do you feel vets' roles and responsibilities are in pedigree dog health?

Both a facilitator and assistant facilitator were present in each focus group, with the facilitator facilitating and prompting the group discussion and the assistant facilitator note taking, time keeping and making ethnographic observations where necessary. An example room plan of how the focus groups were laid out is provided in Figure 23. Both focus groups lasted for approximately 1 hour and each discussion was recorded using two digital Dictaphones. Questions 1-3 were covered during these sessions, however there was not enough time available to discuss the time-dependent question on owners' roles in pedigree dog health (see Table 20). At the end of the session all 12 breeders regrouped and had the chance to ask questions about the research and receive payment of a £20 Amazon voucher per participant.

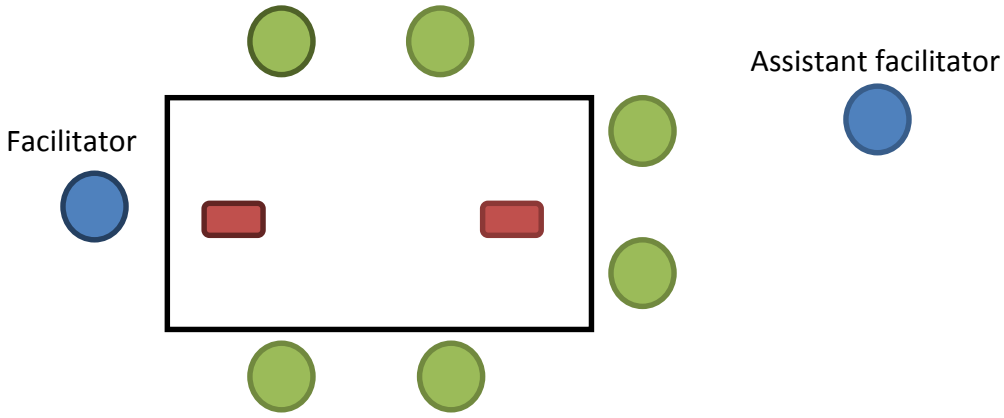


Figure 23: Example room plan depicting how the pedigree dog breeders' focus groups were laid out and the positioning of the facilitator and assistant facilitator. Table = central rectangle; focus group participants = green; Dictaphones = red.

3.2.5.2. Veterinary surgeons focus groups (C and D)

3.2.5.2.1. Focus Group C (Vets Now Vets)

On the 24/05/12 a single focus group was held with a convenience sample of 5 vets working for Vets Now. The focus group was held immediately after a staff meeting which had been previously arranged with colleagues at the CEVM and the vets had been contacted prior to the meeting to see whether they would be happy to participate in the study. Despite the different location, the focus group proceeded with a structure consistent to that used for the pedigree dog breeders' focus groups (see 3.2.5.1) and identical flash cards were again used to guide the discussion (see Figure 22). The same master sheet was used to lead the focus group and both a facilitator and assistant facilitator were present. Enough time was available in this session to cover Q1-3, plus the additional question on owners' roles (see Table 20).

3.2.5.2.2. Focus Group D (Cats Protection Vets)

A further vets' focus group was held on 07/11/12, again using a convenience sample of nine vets from general practice who also did work for Cats Protection. The focus group was held on site within the SVMS, UoN after a pre-arranged meeting with colleagues from the CEVM. Vets were contacted prior to the focus group to gain consent for the study. This focus group also followed the same structure as those previously conducted (see 3.2.5.1 and 3.2.5.2.1). Again the same master sheet (Appendix 4) was used to facilitate the focus group within the allotted time and flash cards were used as a visual aid (see Figure 22 for an example). For this focus group only a facilitator was present. As with the previous vets' focus group, enough time was available in this session to cover Q1-3, plus the additional question on owners' roles.

3.2.6. Data collection and handling

Electronic data were collected using digital Dictaphones. Digital sound files were then transferred on to a Microsoft Windows computer and saved in MP3 format. These electronic files were then sent to an external transcriptionist for full transcription into Microsoft Word files. All participants were anonymised either at the point of recording or during the transcription process via the allocation of a different letter for each participant. Both audio and Microsoft Word files were treated as strictly confidential.

3.2.6.1. Data cleaning

Microsoft Word transcripts were reformatted to be compatible with upload on to NVivo qualitative data analysis software (QSR International Pty Ltd. Version 9, 2010). The auto-coding function was then used for the identification of each participant upon upload. This allowed for the creation of a classification system to associate individual participants with both their demographic information and the answers they had provided for use in the analysis.

3.2.6.2. Data analysis

Data were analysed using the principles of Grounded Theory in NVivo qualitative data analysis software (QSR International Pty Ltd. Version 9, 2010). Sound files were first listened to against the transcripts to check they had been accurately transcribed. Each of the four transcripts was then read and primary observations and ideas were noted. Once initial observations made, open coding was carried out within NVivo, the first five pages of which were cross-checked by a colleague at the CEVM to assess consistency in the coding and check for potential coding bias. This cross check showed no notable differences in the codes identified and as a result, further more focussed coding of all transcripts was completed. Once the transcripts were coded they were then reread and compared several times to identify and explore emerging sub-themes. As the analysis continued to develop, axial coding was used to identify potential relationships between the subthemes identified and overarching themes were then developed. This iterative process continued with the aim of reaching theoretical saturation. An overview of this process is shown in Figure 24.

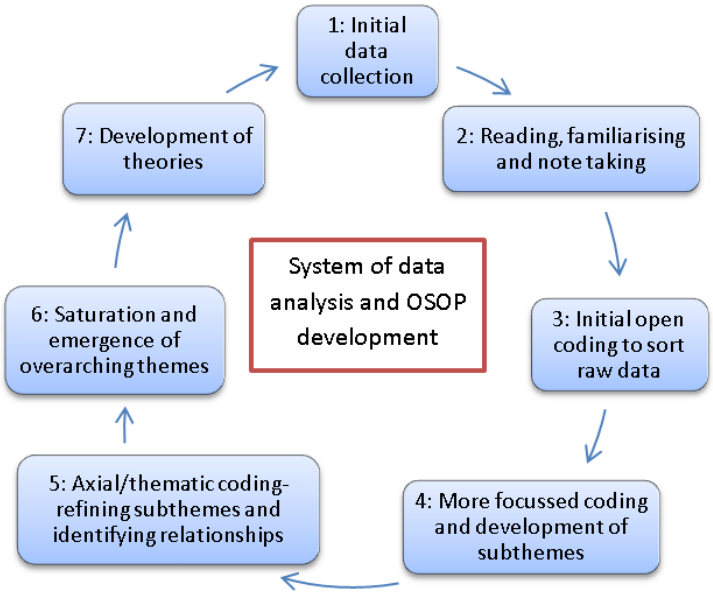


Figure 24: Method through which qualitative data analysis was carried out using the principles of Grounded Theory and the 'One Sheet of paper' (OSOP) technique

Identified themes, subthemes and their associated relationships were then compiled to generate a conceptual map of both vets' and breeders' responses using the 'One Sheet of Paper' technique (OSOP) from which resultant theories could be generated and discussed (see Appendices 5 and 6).

3.3. Results

Data collected from both the vets' and breeders' focus groups were diverse, covering topics beyond those addressed in the initial focus group questions posed. The main themes identified by both vet and breeder focus groups related to the responsibility of many parties in pedigree dog health, including vets (study objective 1), breeders (study objective 2), prospective and existing dog owners and the Kennel Club. The vet-breeder relationship was another key theme identified and the perceived interactions between vets, breeders and dog owners formed the basis for a number of subthemes (study objective 3). Key findings relating to the study objectives are presented below.

3.3.1. Pedigree dog breeders' focus group findings

3.3.1.1. Breeders' perceptions of vets' roles (Objective 1)

Perceptions relating to vets' roles in health, screening and preventative care

One of the main roles of vets identified by breeders was that of treating sick animals and providing preventative care:

> *"I personally feel that vets should do what vets are trained to do and that's to treat sick animals, that they should leave the breeding of healthy animals to us with the testing that we've got available"*

Breeders identified vets to have a role in carrying out health screening, although at times this was mentioned with specific reference to specialist vets. In the case of less experienced breeders, it was acknowledged that vets should have a role in advising on health screening results:

> *"I would want the vet in that case, to say the bitch had a very high hip score or over the median score, I would expect the vet to say well this is a higher than average score, my advice would be maybe don't breed from it but please go back to the breeder, tell them it's got a high score and try and find out a little bit more about the family".*

It was recognised that vets should have a role in identifying and advising on breed specific conditions. It was however perceived that vets may not have the depth of breed knowledge possessed by pedigree dog breeders:

> *"The breeder is more of a specialist, the vet, unless he breeds the breed himself, he can only have a general overview can't he?"*

The role of vets in reporting hereditary conditions and alterations to the Kennel Club was also discussed along with the potential for vets' records to be linked to the Kennel Club's system in order for better health data to be collected:

> *"Can I tell you what the problem is? There's no connection between vets and the [Kennel Club] registration system"*

Perceptions relating to vets' roles in advising pedigree dog owners and puppy buyers (objective 3)

Breeders identified the potential for vets to advise prospective dog owners. It was perceived by participating breeders that vets should have a role in providing advice and information to those seeking a dog:

> *"I mean [the vet] can advise. He can give [out] leaflets. Instead of saying it's all on the internet or whatever. If you're at the sharp end it's a case of right, they don't know what breed to get, here's your information, this will tell you breeds suitable for children, suitable for the elderly. [The vet's] in a prime position"*

However one breeder commented:

> *"You don't go to the vet when you're going to buy a puppy. I don't think many people go to the vet when they're thinking about buying a puppy or any animal come to that. Most people now will go on the internet and have a look or go to the Kennel Club website or just go in and Google the animals that they're looking for"*

Whilst it appeared largely accepted that vets should provide advice on health issues, some deliberation occurred over the provision of breeding advice by vets:

> *"I don't think they should contribute to breeding at all. The vet's role as far as I'm concerned is to treat a sick animal"*

Another breeder commented:

> *"I mean they either advise on everything to do with dog breeding or they don't advise at all"*

Perceptions relating to vets roles' in advising dog breeders and the vet-breeder relationship

Participating breeders felt vets had a role in providing supplementary information to breeders, referring them when necessary:

> *"A good vet will always point you in the right direction"*

It was also acknowledged that experienced breeders did not expect vets to know everything about breed specific issues and health tests:

> *"The vet can't possibly know every single problem that every single breed is prone to"*

However, vets were expected to admit when they were unable to help:

> *"You also need a vet that will say 'actually that's beyond my level of expertise, I need to go and either ask someone else in the practice or find out somewhere"*

It was recognised by participating breeders that vets would have more of an educational and advisory role when working with fledgling breeders or those having a single litter from a family pet:

> *"Say somebody comes with their pet and they'd like it to have a litter, which is fine, so they have it hip scored and it's got a high hip score, then*

it's up to the vet to advise them on whether it was suitable for breeding or not"

Whilst the majority of breeders had very good relationships with their vets, breeders talked about disagreements with vets over issues such as the best age to neuter dogs, correct breed weights and an inability for some vets to identify even common breeds:

"Some vets are so bad that there are only two breeds of dog and one of those is a cat"

The perception that breeders are disliked by vets was also discussed:

"Vets don't like pedigree dog breeders. They don't like dog shows. They don't like show breeders in general. That's the feeling I get"

Another breeder described the perceived implication they felt this had on vets and breeders working together:

"If you get this attitude of pedigree dog breeders, you know, we don't want you, get out the garlic and the stakes through the heart job, you're never going to get anywhere because your vet's a big asset when you're a dog breeder. You need to be able to go and talk to your vets and say 'Look we've got this problem, or this problem or whatever'. You need someone you can talk to about that problem"

Further issues were identified surrounding the cost of veterinary treatment:

"It's a gold mine at the end of the day. That's what it is. Money, money, money, money, money now"

It was identified that some breeders were willing to travel further to visit a vet that they liked:

"It's less than a quarter of a mile away the [nearest] vets and I travel eighteen miles"

However, the majority of breeders were happy with the vet they currently used, with many saying that their vet recommended them to clients seeking a puppy:

> *"Well I do know my vet puts my name forward if I've got pups for anybody who comes in wanting one"*

The opinion that vets and breeders had a "complementary role" in working together was also discussed:

> *"They should be closer together and they should be talking and understanding. More education for the vets, breeders talking to vets, vets talking to breeders..."*

One breeder also referred to vets as "the lynchpin" when assisting with breeding.

3.3.1.2. Breeders' perceptions of breeders' roles (Objective 2)

Perceptions relating to breeders' roles in breeding, health and screening tests

Participating breeders identified themselves as having a role in carrying out health screening:

> *"I think breeders have an absolute… They really must take screening the dogs into consideration and take it seriously"*

The responsibility of breeders to breed the healthiest dogs possible was also discussed:

> *"We should be responsible for breeding the healthiest, soundest pedigree dogs we can. Make sure that we consider all of the options"*

Another breeder commented:

> *"The majority of people that show dogs love their dogs and they want to breed happy, healthy dogs"*

The selection of dogs with a good temperament was also considered:

"Temperament and character is a vital consideration"

Perceptions relating to breeders' roles in assessing prospective dog owners

The role of assessing prospective owners was a subtheme identified from breeders' discussion of their own roles in pedigree dog health:

> *"I think we should seriously vet and advise people that come to us and be absolutely sure that we're happy that our dog is the right dog for them. Maybe we should be saying perhaps have a look at other breeds? We need to be putting all the information upfront"*

This view was shared by other participants with another commenting:

> *"I'd never entertain selling a puppy to anybody that told me that they work full-time or they've got kids under two"*

The need for those breeding show dogs to find suitable homes for puppies they did not wish to keep was also discussed:

> *"Obviously if you're breeding for show, for show purposes, you are going to have excess. You'd be very lucky if you just bred your bitch and she had two dogs and they were all perfect for showing, but there is always surplus in a litter that you've got to get rid of and it's ultimately the breeder's responsibility to make sure that those dogs have a long, healthy and happy life"*

Perceptions relating to breeders' roles in advising pedigree dog owners and puppy buyers (objective 3)

Breeders discussed their perceived role in educating the public:

> *"It's our responsibility to educate the public into breeding; that we are breeding good, sound, healthy dogs and we're the people that we should be buying from"*

One breeder suggested advising new owners should be a task shared by both vets and breeders to ensure consistency:

> *"I think that both [vets and breeders] should advise the new owner and if they got their heads together and talked about it, the advice should overlap and be the same. And if you regard them both as a business, then it's in both their interests to get a common story and advise on similar things"*

When discussing their role in advising owners, breeders identified the role of puppy packs, websites and information resources. Participating breeders used puppy packs as a key way of conveying information to new owners:

> *"In the puppy pack that I give out with my puppies, which is about as long as a book, it states quite clearly that if you have any health issues with this puppy at all, please inform me because this will help me with my future breeding plans"*

It was also clear that the participating breeders saw themselves to be offering the new owner support and advice throughout the puppy's lifetime not just at the point of sale:

> *"You just offer a lifetime's advice and support and you're always there for them and that's what we do"*

3.3.1.3. Additional themes identified from the breeders' focus groups

During the breeders' focus groups a number of additional topics arose beyond those initially addressed in the focus group questions. These related to parties such as dog or puppy purchasers, existing dog owners and the Kennel Club. Key findings are outlined below.

Perceptions relating to vets' interactions with owners (objective 3)

Some breeders perceived vets to unnecessarily scare new owners:

> *"I think vets do a lot of scaremongering amongst new puppy owners"*

It was also recognised that at times breeders felt vets misinformed owners over issues such as breed specific problems, diseases, neutering and vaccinations:

> *"The vast majority of vets now say don't buy a Red Cocker; it'll have rage syndrome. Take a puppy in that's bad-tempered and its gold, it's immediately it's got rage syndrome. Now vets in my mind shouldn't be doing that"*

Another breeder noted:

> *"[vets and breeders are] never going to agree on spaying and neutering at six months"*

Breeders also made several references to the perception that owners held vets in high regard:

> *"Whatever the vet says to some of our owners, they're gods"*

Another breeder commented:

> *"If the vet said, you know, you've got to tie a pink ribbon round your dog's tail, you know, a pet owner would think well the vet said I've got to do that"*

Perceptions relating to the role of prospective and existing dog owners in pedigree dog health

Breeders identified a number of subthemes relating to the roles of owners and the general public in pedigree dog health, many of which related to owners' lack of knowledge about certain aspects of pedigree dog health:

> *"They [owners] sometimes have very little knowledge and they want to know more"*

It was also noted that breeders perceived prospective owners to lack understanding about some inherited diseases and health tests. One breeder described receiving a phone call inquiring whether her eight week old puppies had been hip scored:

> *"I said, 'Well it's not generally accepted to hip score them until they're over a year old' and then they said 'Well my neighbour said not to buy a puppy unless it's hip scored' and I said 'I think you must mean don't buy a puppy unless it's parents are hip scored'"*

Despite this, some breeders perceived owners to be becoming more prepared with information when seeking a dog:

> *"I do think the public are more aware of the issues. Certainly, you know, the knowledge of in-breeding, the knowledge of what can go wrong. People are asking more questions much earlier. They're coming armed with the knowledge"*

The tendency for some owners to buy with their eyes was also commented on:

> *"I've noticed dog owners change dramatically over thirty years. They now go for their eye. They look, 'Oh, I'd like one of those' and it doesn't matter how much research they do, they've already convinced themselves"*

Perceptions relating to the role of the Kennel Club in pedigree dog health

Breeders' discussion about the Kennel Club's role in pedigree dog health was largely focussed on the potential for the Kennel Club to report health problems in certain lines back to Assured Breeders:

> *"The Kennel Club could [advise breeders] by saying look, you're a breeder, you're an Assured Accredited Breeder with us, though our information in your area, this dog or this line is suspect"*

However, this idea was not accepted by all and one breeder questioned:

> *"No, but that's slander isn't it?"*

The Assured Breeders' scheme was also discussed with its perceived strengths and weaknesses:

> *"Well what got me was a friend was in it… I won't say, but I mean she was an Accredited Breeder for two years before she even bred a litter"*

Further, the system for pedigree dog breeders to report health issues to the Kennel Club also received some criticism. This was particularly true in the case of dogs which weren't permanently identified:

> *"People do things as dishonest as taking dog A and having it hip scored and calling it dog B"*

Breeders also discussed the perception that the Kennel Club needed to 'get some teeth' in order to makes changes:

> *"They've got teeth if they choose to use them because we can't show if we don't apply and abide by their regulations. So if they wanted, they could do a lot more than they actually do if they really wanted to"*

Breeders wanted the Kennel Club's support in dealing with issues such as public education on puppy buying and combating misconceptions about the responsible dog breeding community:

"What breeders really do need is help from the Kennel Club in educating the public on how to buy a puppy, because you get programmes like Pedigree Dogs Exposed that shows people who show dogs and breed them are absolute monsters and they're breeding unhealthy mutant pets, but it's the puppy farmers and commercial breeders who are the problem, because they're the people who breed with profit in mind"

3.3.2. Vets focus group findings

3.3.2.1. Vets' perceptions of vets' roles (Objective 1)

Perceptions relating to vets' roles in health, screening and preventative care

A number of subthemes were identified relating to the roles vets perceived themselves to play in pedigree dog health, ranging from vets' roles in treating sick animals through to carrying out health screening on potential breeding dogs. One vet acknowledged:

> *"One of the big things that only comes to us to do though is to treat the dogs once they've been bred if they've got problems. We can't influence whether they're here or not, but once they're here, if they end up with health problems, we mop that up and treat it. I think that's probably what we do most"*

Regarding health screening it was also acknowledged that vets should have a promotional role:

> *"We should be pushing the health schemes"*

One vet commented that whilst vets could carry out the tests, it was up to breeders to act on the results and take advice on board:

> *"Some will ask our advice and I think it's up to us to be on the ball to give them advice. A reasonable percentage of them do listen to what we have to say, but I think a reasonable number don't listen"*

Vets saw themselves as having a role in encouraging owners to take out pet insurance for their dogs. One vet described the situation of being presented with a puppy likely to suffer ongoing health issues. In this instance her reaction had been to say to the owner:

> *"I hope you're going to have lifetime insurance for this dog"*

An additional role vets perceived themselves to have was that of reporting alterations back to the Kennel Club:

"We influence pedigree dog health. We influence all dog health and hopefully we're reporting, and hopefully we're brave enough to report, those alterations, confirmations, those caesareans, you know, things that are going to make a difference"

Despite this it was recognised that knowing what alterations to report was at times a "very grey area".

Perceptions relating to vets' roles in advising pedigree dog owners and puppy buyers (objective 3)

One of the key themes identified by participating vets in relation to their perceived role in pedigree dog health was their role in working with owners and puppy buyers. With regards to this role, the discussion frequently came back to vets' roles as educators:

"I think our job is educating people that are looking to buy puppies and mentioning about healthcare schemes and promoting healthcare schemes"

Vets' potential to educate and advise pedigree dog owners and puppy buyers through interventions such as puppy parties and free pre-puppy purchase consultations was also discussed:

"Puppy Parties are great. Well you get a selection of different owners in and you generally have all different breeds and one of the things I went through was I went round the ring and was like, 'Right. Your puppy has the potential to suffer from this. Your puppy has the potential to suffer from this.' And then my next statement would be to go on to go, 'Right. Let's talk about insurance now'"

Regarding pre-puppy purchase consultations, one vet commented:

"Maybe we all need to be a little more proactive and not wait until we're asked the question, but maybe go out and try to push the message a bit harder"

It was recognised by vets that practice support was required for such initiatives:

> *"You'd need to get your practices behind you… because I think to make it work you would have to advertise free pre-puppy consultations"*

Vets felt that owners often failed to seek a veterinary consultation until they had already purchased a dog or puppy:

> *"Unfortunately most of the time the education comes as they turn in and it's sat on the table and you go, 'Ah'"*

One vet stated:

> *"There needs to be another forum for vets to be providing that information but consulting rooms don't seem to be the place where people come"*

Another commented:

> *"We've got a massive role but people don't use us. Like you say, they don't come and ask us. But we could help an awful lot of people, but they never come in and ask"*

Perceptions relating to vets roles' in advising dog breeders and the vet-breeder relationship

Participating vets perceived themselves to have a role in working with breeders and a number of subthemes were identified relating to this role, including providing general education and advice for breeders, guiding inexperienced breeders, advising on reducing the incidence of inherited disease and where appropriate questioning breeding motives and raising the realities of breeding, rearing and homing dogs suitably. It appeared that, at times, vets felt a number of difficulties arose due to the relationships they had with breeder clients. One vet described the perception that breeders thought they knew best or over looked veterinary knowledge:

> *"My thing whenever I have dealt with pedigree dog breeders is they always think they know they're right and best. So they come to you already knowing everything about their dog in every term of their dog"*

A further vet commented:

> *"The bit that I found really hard dealing with breeders, were the ones that said: 'Your clinical opinion is of nothing to me'"*

A further subtheme identified from the vets' discussion was the perception that as a general rule, breeders chose to seek advice from other breeders:

> *"[when making breeding decisions], they go back to the breeders and the people at the breed society to tell them what dog they should use and we haven't got that kind of information, which lines to pick, what lines carry what"*

The tendency for breeders to actively source a compliant vet was also discussed:

> *"I can think of several breeders where I've tried to influence what they're doing and the way they view things and they just go to somebody else*

who tells them what they want to hear rather than what they don't want to hear"

Disagreements on issues such as Caesarean sections were also considered and the perception that vets and breeders have different motivations was also noted. Further discussion surrounded the many different types of breeder:

"I think there obviously is a spectrum between… you will get some people… Well usually they are fanatical about the breed and their sort of desire to be well-respected amongst breeders of that particular breed. So some of them have a desire to breed the best dogs for that reason and then there are others that have a monetary desire"

Vets further discussed the negative experiences they had had with some breeders in practice, one vet described:

"We had one [breeder] who every single bitch that whelped, you had to give it oxytocin whether they needed it or not and I had an argument with this breeder, because I was like, 'I'm not happy giving your dog oxytocin because of the risk of causing X, Y and Z problems'. 'I don't care. If you don't do it, I'll do it myself'"

It was also acknowledged that there were many good breeders who genuinely care about their dogs. One vet raised the question:

"Are we tarring them all with the same brush?"

Another acknowledged that vets may have a skewed perception of breeding as their profession by default meant seeing a large proportion of the dogs with health conditions:

"Obviously we only ever see the ones that have got problems though. I mean we don't see the ones that haven't had problems. So our view is probably a bit skewed as well".

3.3.2.2. Vets' perceptions of breeders' roles (Objective 2)

Perceptions relating to breeders' roles in breeding, health and screening tests

Carrying out health screening tests and acting on the results was a key subtheme identified by vets in relation to breeders' roles in pedigree dog health:

> *"We've got a few good breeders. If the screen comes up showing something, the pet's in and neutered"*

The role of honesty and transparency were also discussed in relation to this:

> *"They have a big role to act on what is uncovered by their screening tests rather than stick them in a cupboard and forget about them and just going on ahead with their initial plans".*

Another vet voiced:

> *"I do think they have a responsibility to be open and honest when they see problems, when they see health problems".*

Perceptions relating to breeders' roles in assessing prospective dog owners

The role of breeders in assessing potential owners was one of the main subthemes identified from vets' conversations regarding breeders' roles in pedigree dog health:

> *"Some breeders will actually vet the prospective puppy's owner and I think a lot of the respect side of it comes from that. My last dog - I had to go and be vetted by the breeder before they'd let me have the puppy. It was a case of, 'Where's it going when you're at work?"*

However, it was recognised that such evaluation may not be carried out as thoroughly by all breeders:

> *"There's a real difference in breeders as to how much they'll quiz the new potential owners about what they're planning on doing with the dog"*

Perceptions relating to breeders' roles in advising pedigree dog owners and puppy buyers (objective 3)

A key subtheme identified by vets was the breeders' role in educating owners and advising them honestly:

> *"Breeders' roles at the moment are educating clients"*

However, it was recognised that:

> *"[breeders do] not necessarily educate them on the same things we [vets] would educate them on"*

Honesty was also mentioned as an important consideration when breeders were giving advice to owners.

3.3.2.3. Additional themes identified from the vets' focus groups

During the vets' focus groups a number of additional topics arose beyond those initially addressed in the focus group questions. Key findings are outlined below.

Perceptions relating to breeders' interactions with owners (objective 3)

In some instances vets felt that breeders misinformed owners and further that they carried more influence than vets did. Breeders were referred to as 'pedantic' over the dos and don'ts for their breed and one vet described a situation where:

> *"The owner was absolutely beyond themselves when they were told [their dog] would need an anaesthetic. 'My breeder has said these dogs die if they're given an anaesthetic!'"*

Several vets also carried the perception that breeders were held in very high esteem by owners:

> *"They are revered amongst their owners, which is true because you do find that they have called their breeder before they called us"*

Perceptions relating to the role of prospective and existing dog owners in pedigree dog health

Vets' discussion surrounding owners' roles in pedigree dog health was largely focussed on owners' motivations for getting a dog, the information sourced and the knowledge possessed. Regarding owners' reasons for getting a dog, several subthemes were identified including: pity, the perception of the dog or breed being good with children, general aesthetics, fashion and a desire to stick with the same breed the individual or family had always owned regardless of suitability:

> *"Lots of people, if they've had one breed, even though it might have quite a few faults, they seem to stick with the breed. They'll keep coming back for the same one again and again"*

Regarding owners' sourcing of information about their dog or puppy, vets' discussion related to owners' tendency to ask family or friends for help and carry out an internet search:

> *"I think a lot of families have an uncle or a granny or someone who's the doggy person. They go and ask the doggy person"*

However, one of the biggest subthemes vets identified relating to the role owners played in pedigree dog health was the implication of the general lack of knowledge possessed:

> *"I wouldn't say they get that much advice. I think on a whim they go out, they say, 'That's what I want'. It's a society now where you see it, you want it, you buy it and that's what they do"*

A further vet voiced:

> *"It's often you'll find people that have got like a King Charles Cavalier Spaniel with the list [of conditions] and they've had it six months and they had no clue about all the potential problems, because the breeder isn't going to list them all the potential problems…"*

Perceptions relating to the role of the Kennel Club in pedigree dog health

A number of subthemes were identified relating to the roles participating vets perceived the Kennel Club to play in pedigree dog health including those relating to the role of breed clubs, the judging of dogs, the role of the Kennel Club as a regulatory body and the showing of dogs. However, the main discussion relating to the role of the Kennel Club was linked to the system of reporting surgical alterations. It was noted that vets were perhaps not being as proactive as they could be in reporting cases back to the Kennel Club:

> *"So we're falling down as vets on that side. Maybe the Kennel Club has provided [the information] and we're not following it through. So maybe we're to blame"*

It was however recognised that failure to make reports was due to advice surrounding making such reports being "woolly and loose" and the concern that taking such steps may simply drive some clients away.

3.4. Discussion

This chapter has addressed both vets' and breeders' perceptions of their own and each other's roles in pedigree dog health with regards to dog breeding, inherited disease and health schemes. Further, this chapter has explored why vets and breeders may have different opinions on who should be responsible for advising dog owners and puppy buyers. As expected, data collected were broad and extended beyond the initial topics highlighted by the focus group questions. Key themes identified included the role of vets, breeders, dog owners and the Kennel Club in pedigree dog health. Vets' and breeders' roles in advising dog owners and puppy buyers were also discussed, along with the implications of the relationships between vets and breeders in practice. These findings are discussed further below.

Vets' roles in pedigree dog health (objective 1)

A number of key subthemes relating to vets' roles in pedigree dog health were identified (see Figure 25). One of the main subthemes identified by both vets and breeders regarding vets' roles in pedigree dog health was the role of vets in treating sick animals and providing preventative care. This finding was to be expected given that the care of sick animals is largely accepted to be a key role of the veterinary profession (National Careers Service, 2012, RCVS, 2014a) with vets having a key role in the diagnosis, detection and control of inherited disease as quoted by Steve Dean at BVA Congress 2009 (Jarvis, 2009). In the context of specifically treating pedigree dogs , an apparent frustration was expressed by vets concerning the perceived expectation of breeders and clients for them to 'mop up' certain health problems which, in some cases, vets perceived would have been preventable if veterinary guidance had been sought at the start. For example, where puppies were presented with health concerns having been bred from a dog the vet would have deemed unsuitable for breeding based on health. The roles carried out by vets are diverse and are recognised to encompass advisory and educatory roles (Locke, 2012a), however findings from this study indicated vets to be underutilised in this

respect despite a willingness to provide guidance and information to their clients. During the breeders' discussion of vets' roles, the task of treating sick animals was at times implied to be the solitary role of vets. In one instance this perception was used alongside the phrase '*vets should do what vets were trained to do and that's treat sick animals'* and an assertion by some that breeding dogs was the breeders' job. Such views may be attributed to a number of factors. For example, breeders may be unaware of vets' potential to provide valuable advice or the fact that many vets do have a desire to be involved in breeding decisions, suggesting a lack of mutual recognition as suggested in Chapter 2. Alternatively, anecdotal evidence suggests that some vets and breeders hold strong and potentially different views on pedigree dog breeding practices. Therefore, the perception that vets and breeders should carry out independent roles may serve as a mechanism for avoiding such disagreements, with some breeders choosing not to consult their vet and instead solely oversee their breeding decisions. The importance of unity between key parties involved in pedigree dog health was noted by Aimee Llewellyn (health information manager at the KC), when speaking at the British Small Animal Veterinary Association (BSAVA) Conference in 2013. Llewellyn spoke of the need for a collaborative effort between all parties, including vets and breeders and the potential progress which could be achieved via a pooled effort (Veterinary Record, 2013b). Vets who participated in this study were largely of the perception that they should be active in promoting health initiatives and this view was shared in a BSAVA Congress article in which Harvey Locke (a veterinary surgeon and past president of BSAVA), argued that vets should be doing more to promote health schemes (Locke, 2012b).

The promotion of pet insurance was another subtheme identified by vets with regards to the role they perceived themselves to have in pedigree dog health. On several occasions reference was made to the tendency for vets to see badly bred puppies and as a result, actively encourage the owners to take out insurance to ensure they had the financial means to address any probable health problems. This finding may be explained by the fact that pedigree dogs

and cats are known to be predisposed to certain medical conditions (Gough and Thomas, 2004), for which veterinary treatments can cost hundreds or thousands of pounds (Petplan, 2013) and as a result their insurance premiums tend to be higher accounting for the issues which may arise (The Guardian, 2011). Breeders' views on pet insurance were quite different to those held by the vets. In some cases pet insurance was looked upon unfavourably as a means of money making and, alongside the costs of veterinary treatment, breeders frequently made reference to rising veterinary costs and the perception that monetary gain was at times too high on the veterinary profession's agenda. Similar views on the cost of vets' fees were also noted in another focus group study looking at vets' and owners' perceptions of the monetary aspects of veterinary care in 2007, in which pet owners were found to have an expectation for care of the animal to come before monetary interest of the vet (Coe *et al.*, 2007). In the case of participating breeders, such perceptions may originate from negative encounters between breeders and their vets, or from the fact that dog breeding is an expensive hobby when carried out correctly and thus responsible breeders are much more aware of their expenditure.

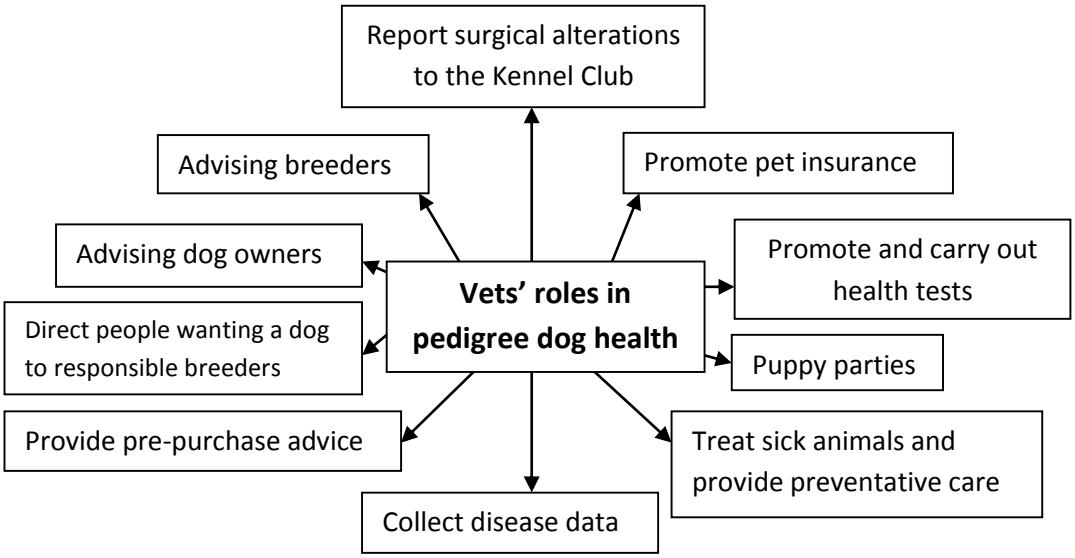


Figure 25: Veterinary surgeons' roles in pedigree dog health as reported by both small animal vets and pedigree dog breeders in four focus group interviews carried out in 2012.

The responsibility of vets to report pedigree dogs' surgical alterations and Caesareans to the Kennel Club was a further subtheme identified by vets. Whilst participating vets were aware that they had an obligation to carry out this task, there seemed to be a great deal of uncertainty surrounding when it was appropriate to do such. This may offer an explanation for why some vets have been failing to report conformation-altering surgeries and Caesareans despite other parties urging them to do so (Locke, 2012b, Veterinary Record, 2013e). These findings are supported by the KC having written to veterinary surgeries highlighting vets' obligations to make such reports and clarifying that KC registration is conditional on a declaration that vets are able to report alterations back to the Kennel Club without first seeking the owners' permission (Westgate, 2012). The fact the Kennel Club has been reported to take such steps to raise vets' awareness on this matter confirms that some degree of uncertainty exists amongst vets in performing this task and understanding that they can make reports without breaking client confidentiality. Participating vets were also concerned about the potential for clients to leave the practice if unhappy with their decision to report certain procedures, raising the issue of ethical obligation versus an overriding concern about driving clients away. This consideration is one which has also been recognised by the Advisory Council on the Welfare Issues of Dog Breeding and appeared in their 2013 review of regulation discussion paper (Advisory Council on the Welfare Issues of Dog Breeding, 2013). Whilst such reporting systems exist for KC registered dogs, non-Kennel Club registered breeders may also breed dogs requiring surgical alterations for which no reporting system exists and this impairs both widespread health monitoring and data collection.

Whilst the vets' focus groups concentrated on the reporting of surgical alterations, participating breeders seemed to focus more on the potential for vets' records to be linked to the Kennel Club register in order for better epidemiological disease data to be collected. This may be explained by the fact that important breed-specific data on the prevalence of certain diseases in pedigree dogs is lacking (Crispin, 2011, Bloomfield and Scott, 2013) (see 1.5).

Whilst at present it is not possible for all vet practices' records to be linked to the Kennel Club database, initiatives such as the Veterinary Companion Animal Surveillance System (VetCompass) and the Small Animal Veterinary Surveillance Network (SAVSNET) are collecting passive disease surveillance data via veterinary records (VetCompass, 2013, SAVSNET, 2014). Unlike active surveillance which actively seeks out cases of disease within a population, these initiatives do not indicate the presence of disease in non-vet visiting dogs or the incidence of conditions such as brachycephaly which are considered normal for some breeds and thus are not routinely recorded. Despite the limitations of this type of surveillance, these initiatives offer organisations such as the Kennel Club insight into breed disease prevalence amongst the practices they liaise with; offering data where little already exists. Breeders' awareness of such initiatives is unknown, although such data would benefit also benefit them with regards to the common conditions seen within their breed(s).

Both vets and breeders identified vets as having a role in advising pedigree dog breeders, although the views conveyed by both parties did differ. The identification of vets' roles in advising pedigree dog breeders has also been noted by other parties (Jarvis, 2009, Locke, 2012b, Locke, 2012a). Discussions indicated that vets felt they had a role in providing general education and advice for breeders, highlighting the realities of breeding, advising on reducing inherited disease and providing advice to breeders on screening, but it was noted that they felt this advice was not always taken on board. A potential reason for breeders to underutilise vets' advice may have been conveyed by the breeders' focus group discussions, which indicated they perceived vets to have a more prominent role in advising inexperienced breeders or those breeding a single litter from a family pet. The potential for vets to advise more experienced breeders was not really discussed and instead it appeared that in this instance, vets were used for the provision of supplementary information and to initiate referrals to specialists when necessary. This gave the impression that experienced breeders wanted to share in decision making regarding their dogs as opposed to accepting a more paternalistic relationship with their vet.

Participating breeders largely considered themselves to be practised and knowledgeable in dog breeding. This may account for their perception that first opinion vets may be of limited use when advising on health schemes and it was, on several occasions, noted that they did not expect their vet to know everything about every condition specific to every breed. This perception is supported by vet and Kennel Club Chairman, Steve Dean's view that a 'prevailing misunderstanding' exists among the veterinary profession regarding genetics and inherited diseases and that perhaps better education of vets is needed on these topics and tools available to combat them (Veterinary Record, 2013b).

Pedigree dog breeders' roles in pedigree dog health (objective 2)

Several key subthemes relating to breeders' roles in pedigree dog health were identified (see Figure 26). Both vets and breeders identified breeders' roles in carrying out health tests on their breeding stock to be a key responsibility in promoting pedigree dog health. Vets identified the need for breeders to promote welfare, act on test results and be honest about health problems experienced in their breed(s). Breeders were in agreement over the importance of these tests, describing health screening as 'an absolute', along with acknowledging the importance of acting on the results. This finding was in support of the data collected from breeders in Chapter 2, in which the majority of breeders perceived it unacceptable to breed from an unscreened dog (see 2.3.3.1, Table 9). Participating breeders described a sense of responsibility in breeding the healthiest dogs possible. These findings were consistent with the view that breeders should make sure "good welfare drives their ambitions, that the dogs they breed are healthy, that they have taken sensible steps to reduce the risk of infectious and non-infectious disease and that they are aware of any health issues" (Crispin, 2012). The significance of making decisions to ensure the sound temperament of dogs bred was also discussed and deemed to be an important consideration. Similarly, canine temperament was also a matter of concern raised by the Environment, Food and Rural Affairs Committee's (EFRACom) inquiry into the Government's dog control and welfare policies. The

committee expressed concern regarding the under reporting of dog attacks on humans and other animals, incidents of irresponsible ownership and the reasons behind relinquishments (Veterinary Record, 2012c), situations where behavioural issues may serve as key contributors. Breeders further discussed the Assured Breeders Scheme (formerly the Accredited Breeders Scheme) and its associated strengths and weaknesses. Whilst this scheme was largely deemed to be a positive initiative, it was not considered to be without its weaknesses and it was suggested that tighter monitoring of its members was required, a task which the Kennel Club has since undertaken (The Kennel Club, 2014a).

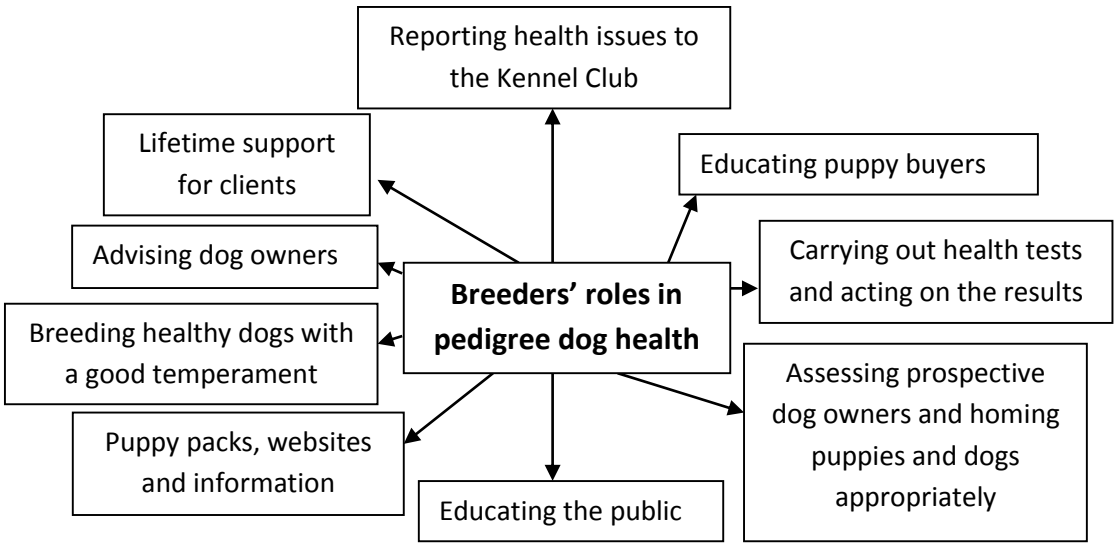


Figure 26: Pedigree dog breeders' roles in pedigree dog health as reported by both small animal vets and pedigree dog breeders in four focus group interviews carried out in 2012.

Breeders' roles in assessing the suitability of prospective owners were also noted to be of importance by both participating vets and breeders. Vets acknowledged the key role breeders played in carrying out assessments of those wishing to purchase their dogs and the significance of this process to ensure dogs were homed appropriately owners who which would meet their welfare needs. This concern is based on good evidence as RSPCA figures in 2011 indicated that 19% of those who had bought a puppy no longer had it after 2 years (The University of Bristol, 2011). Further, the 2011 PDSA Animal

Wellbeing Report showed many dogs to be living in situations where they lacked adequate companionship, with around 1.9 million dogs being left alone for longer than the recommended time every day (PDSA, 2011). Similar issues were also identified in reports conducted in 2012 and 2013 (PDSA, 2012, PDSA, 2013). The need for honesty on the part of breeders can therefore be deemed an important factor in preventing homing of dogs to unsuitable owners or lifestyles. Vets further noted that the extent to which breeders assessed the suitability of those wishing to buy dogs or puppies varied greatly. Whilst vets noted that responsible breeders did take precautions to suitably home their dogs, it was recognised that those breeding solely for monetary gain may carry out little, if no assessment of those purchasing dogs from them. The inappropriate sale of dogs to unsuitable owners can however be considered a two-pronged problem. As Sheila Crispin, Chair of the Dog Advisory Council has argued, "breeding excessive numbers of dogs in conditions far from ideal is only profitable because of the ignorance and attitudes of a significant number of potential purchasers" (Crispin, 2011). Such viewpoints reflect the need for a better public awareness campaign, as suggested by several key reports (APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010) (see 1.7) to encourage owners to go to dependable breeders, who breed responsibly and can help them make educated choices. Breeders were largely in agreement with vets regarding the importance of their role in assessing owners, also acknowledging that unsuitable owners should be turned away or redirected to a more suitable breed. Ensuring dogs were homed into a situation where they could have a long, happy, healthy life was described as ultimately being the responsibility of the breeder.

Vets and pedigree dog breeders' roles in advising dog owners and puppy buyers (objective 3)

Both the vets' and breeders' focus groups recognised vets and breeders to have important roles in providing advice to pedigree dog owners and puppy buyers.

The potential for vets to advise those seeking a dog or puppy was a frequent topic of discussion. Vets described their roles in educating those wishing to own a dog and further promoting that relevant health schemes had been conducted. Of the subthemes identified in relation to this role, puppy parties and pre-puppy purchase consults were discussed as potential interventions to impart relevant information and provide prospective owners with guidance. The potential for vets to drive a "sea-change" by providing pre-purchase advice and educating prospective owners was voiced by vet Emma Goodman-Milne at BVA Congress 2011 (Cooper, 2011). However, despite participating vets acknowledging the potential benefits of free pre-puppy consultations, it was recognised that prospective dog owners seldom sought information from vets prior to getting a dog or were aware that this was a possibility. As a result, vets did not have the opportunity to perform this educatory role. Data collected from vets in an interactive webinar with Harvey Locke in 2012 reflected similar findings, with 30% of participating vets offering free consults for pre-puppy purchase advice and 57% saying that they would consider offering such a service (Locke, 2012a). Data such as this reflects the potential for such initiatives if successful uptake by prospective owners could be achieved. In the same webinar Locke discussed potential reasons for owners' reluctance to consult vets pre-puppy purchase, including a lack of awareness regarding this service, worries about financial cost and the fact that some owners may simply think they know best (Locke, 2012a). However, to establish the reasons behind these findings, research specifically targeting owners' views on this topic would need to be carried out and further used to inform how best to promote sourcing veterinary advice pre-acquisition of dogs and puppies. Whilst participating vets saw initiatives such as pre-puppy purchase consults to be of benefit, vet and Kennel Club Chairman, Steve Dean has suggested the

expectation for people to come to vets for advice comparable to “pushing water uphill”, instead suggesting that vets would be better to promote existing resources (Veterinary Record, 2013b). Participating breeders also agreed that vets had a role to play in providing advice to those seeking a dog. However, it appeared breeders deemed that this to be a more feasible role than participating vets voiced it to be, with only the minority of breeders voicing that they didn’t think vets got the opportunity to perform this role.

Vets identified pedigree dog breeders to have a role in educating owners and providing honest advice. It was further recognised by participating vets that vets and breeders may not always provide advice on the same things. This finding may be explained by vets’ and breeders’ different professional considerations, for example, veterinary surgeons are more likely to advise on health related issues and the concerns relating to breed specific disease, whereas breeders may centre more on responsible ownership, feeding, training, puppy socialisation etc. Breeders identified education of the public as a key subtheme relating to this topic. This was an interesting finding as the general public encompasses both dog owners and non-dog owners, suggesting that participating breeders felt a sense of responsibility in advising and educating outside of their client base. One breeder suggested that the role of advising new owners should be shared between breeders and vets to ensure consistency and this view regarding the benefits of collaboration that has been expressed by other parties (Bateson, 2010, Veterinary Record, 2013b). When discussing their roles in advising owners and puppy buyers, key subthemes identified by breeders included puppy packs, websites and the provision of information sources. Breeders also saw themselves as offering a lifetime of support to those who purchased a dog from them, a finding that was reflective of the responsible demographic of breeders recruited.

Despite the mutual recognition expressed by both vets and breeders concerning their roles in advising owners and puppy buyers, these interactions were not always regarded positively. Interestingly, in some cases vets felt that breeders misinformed owners. Breeders were, at times, described by vets as

being pedantic. Further, they were described as not always accurately conveying information about their breed, for example, the breed's ability to cope with anaesthesia which later resulted in the owners' unnecessary stress when the dog required a procedure. Participating vets saw owners as holding breeders in very high esteem, in some cases carrying more influence than vets; it was reported that owners often contacted the breeder before making a veterinary appointment. Interestingly, similar views were shared by breeders concerning their veterinary counterparts' roles in providing advice to owners and puppy buyers. Breeders reported that some vets misinformed owners over issues such as breed specific diseases, behavioural problems, neutering and vaccinations. A further point of disagreement noted by breeders concerned the best age to neuter dogs, with breeders feeling that six months was much too young for a dog to be neutered. It should however be noted that the recommended age to neuter is breed dependant and this may contribute to such debates. Whilst it may be suitable to neuter small breeds at 6 months old or younger, neutering at less than 6 months old in large-breed dogs has been identified as a risk factor for conditions such as cranial cruciate ligament disease (Duerr *et al.*, 2007). Such disagreements may be avoidable if veterinary and dog breeding organisations could come together to take such debates out of the consult room and into an open forum for discussion. The generation of standard guidelines for such situations, published and made available to both parties may be of use in overcoming such conflicts. Thus, further research to better understand these disagreements and where such interventions are needed would be beneficial. In contrast to views expressed by vets, breeders saw owners as holding vets in very high regard, willing to accept any information that was conveyed to them by their vet regardless of its value. Many of the views expressed by both vets and breeders are likely to relate to isolated events, however such negativity, if generalised, may have direct bearing on the way vets and breeders who have had such experiences, interact in practice. Situations such as this may serve as a barrier in enabling vets and breeders to work together in a constructive way and further qualitative

research on this specific concept would be beneficial to see how obstructive such interactions are in achieving unity between both groups.

The vet-breeder relationship (objective 3)

Whilst the focus group discussions suggested the majority of participating vets and breeders do share good relationships, various subthemes identified indicated that this relationship was not always a straightforward one. Frustration was at times voiced regarding the vets' perception that some breeders had a tendency to overlook veterinary knowledge and as a result vets felt their clinical opinion was undervalued. Some breeders were described to enter the consult room with the belief that they already knew everything about their dogs and as a result, vets reported it to be very difficult to communicate with them. This issue was also identified in relation to disagreements surrounding topics such as Caesareans and oxytocin use. Such situations can detrimentally impact vets' perceptions of breeder clients, negatively affecting their future expectations for this type of client. One of the main issues identified by vets in relation to the difficulties they faced with their breeder clients was the perceived tendency for breeders to source a compliant vet. Disagreements simply resulted in breeders changing vet, which made some vets reluctant to push disagreements. The tendency for breeders to seek advice from other breeders was also discussed, with one vet pointing out that other breeders had more specific information on breed lines and could therefore give information with which vets could not compete. Vets recognised there to be a diverse spectrum of breeders. This finding may highlight a difficulty for vets in judging the level of experience possessed by breeder clients within the limited time of a consultation, thus making it more difficult to target information at the right level. Whilst vet participants acknowledged there to be many good breeders, one vet questioned whether it was too easy to tar all breeders with the same brush and whether vets simply had a skewed perception. This view has also previously been expressed by the Kennel Club through its perception that some vets placed a great deal of blame on pedigree dog breeders for cases presented to them (Irving *et al.*, 2006). However, as the nature of the veterinary

profession involves dealing largely with sick animals, this may result in vets having a negative bias in their opinions of breeders and inflated views on the tendency for pedigree dogs to become sick.

Breeder participants largely seemed happy with the relationship they held with their vet. However, like vets they identified disagreements between both parties regarding the right age to neuter, correct breed weights and an inability for some vets to identify common breeds. Participating breeders also voiced the perception that they did not perceive the veterinary profession to look favourably upon dog breeders or dog showing. This perception may account for some of the difficulties in communication experienced between these parties and participating breeders indicated this to be a perceived limiting factor in vets and breeders working together. One breeder described vets as an asset to breeders and the need for vets and breeders to be able to discuss problems and work together was discussed as a necessary consideration. The cost of veterinary treatment was another issue identified which, at times, caused breeders to look upon vets less favourably. Such findings have also been reflected in another study, which found monetary issues to cause negative feeling on the part of clients when they were perceived to be of higher priority than the animal's care (Coe *et al.*, 2007). Participating breeders acknowledged that they were willing to travel further to visit a vet that they liked, rather than use a local vet with whom they disagreed, or whose veterinary care they considered inadequate. Such factors showed the relationship between vets and breeders to be a complicated one, subject to change based on the experiences they shared. Such factors may, in some cases, restrict the communication between these parties, due to vets' concern regarding disagreements driving breeder clients away and resulting in loss of business. Most breeders however expressed themselves to be happy with the vet they were currently using and knew their vet to recommend them to clients wishing to get a puppy. It was largely agreed that vets and breeders should have a complementary role in working together and that if this could be achieved, they could learn from each other.

Other parties responsible for pedigree dog health

The role of the prospective and existing dog owners in pedigree dog health

Both vets and breeders identified dog owners as having roles in pedigree dog health. Vets identified owners as having a variety of motivations for getting a dog, ranging from pity to following the fashion of the time. Vets noted a general lack of knowledge amongst those wishing to get a dog, with people tending to buy on a whim without carrying out the appropriate research. This view is supported by the Dog Advisory Council's perception that many pursue acquiring a dog in the same manner as an inanimate object (Crispin, 2012). A lack of owner knowledge was described by participating vets, in one instance with specific reference to Cavalier King Charles Spaniels, with vets reporting many new owners of this breed to have no idea about the potential for this breed to develop heart problems. Such situations have also been noted by other organisations such as the RSPCA; James Yeates (Head of the RSCPA's Companion Animal Department) was reported to have voiced that the organisation receives many calls from owners "forced to spend hundreds of pounds on veterinary bills for their dogs" which have been ill since they were brought home (Cooper, 2012b). Vets also discussed the inclination for those wishing to get a dog to consult their friends and family as a primary source of information rather than coming to a vet. The propensity for owners to stick with the same breed regardless of its suitability was also noted and vets seemed to largely agree that the culture was for people to simply 'see it, want it, buy it' without sufficient thought. Participating pedigree dog breeders, like vets, also identified a lack of owner knowledge with regards to inherited diseases and health tests. One breeder described an owner phoning to ask whether her eight week old puppies had been hip scored after receiving misinformed advice from her neighbour, suggesting greater public education on this topic is required as supported by the findings from several key reports (see 1.7) (APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010). Breeders, like vets, also described a culture of prospective owners 'buying with their eyes' with people choosing to get a dog based on its appearance without researching

its breed characteristics or requirements. Despite the perceived lack of knowledge exhibited by some prospective owners, breeders did acknowledge that some prospective owners seemed to be doing more research and asking questions earlier. This finding may in part, be due to the increased number of information resources now available to prospective owners such as the PFMA's Pet Education resources (PFMA, 2014), the UFAW Genetic Welfare Problems of Companion Animals website (UFAW, 2012) and the Dog Breed Health website (Dog Breed Health, 2014). However, little is known about how dog owners go about seeking information or the preferred information sources they actually use.

The role of the Kennel Club in pedigree dog health

The KC describes itself as 'the largest organisation in the UK devoted to dog health, welfare and training' with the objective of ensuring that 'dogs live healthy, happy lives with responsible owners' (The Kennel Club, 2013a). KC roles include acting as a registration system, overseeing the Petlog microchip database, monitoring the ABS, running dog training programmes, dog shows and sporting events, providing education and advice, supporting canine health research and running health screening schemes (The Kennel Club, 2013a). Vets correctly identified the KC to have a number of key roles including that of breed clubs, judging of dogs, serving as a regulatory body and overseeing dog shows. One of the main subthemes discussed was the system for vets to report surgical alterations back to the KC, with participating vets recognising that they were perhaps not as proactive in carrying this out as they could be, a finding that has been observed by a number of other parties (Locke, 2012b, Locke, 2012a, Westgate, 2012, Veterinary Record, 2013e). The main reason for participating vets' failure to consistently report alterations was described as a lack of advice on when it was appropriate to make such reports, an issue that Harvey Locke (past BVA president) argued may be overcome by the production of a comprehensive list on what procedures should be reported to provide greater clarity (Veterinary Record, 2011a). Vets concern about the potential for such actions to drive clients away was recognised at the BVA Council meeting in July

2011, in which the relationship between vets and their clients were described to be a complicated one by Dan Brockman (Head of Veterinary Clinical Sciences at RVC), leading to the profession at times turning a blind eye to certain situations (Veterinary Record, 2011a).

One of the main areas of discussion concerning breeders' perceptions of the KC's roles was the potential for them to report health problems in certain lines back to breeders, although some considered this slanderous. Such viewpoints may be explained by the social politics within the breeding world, an issue touched on by breeder focus group participants, and the potential for breeders to be subject to negative interactions and potentially ostracised by their peers. Such politics may make breeders nervous about the implications of certain health issues within their breed(s) being publicised and the potential for resulting social stigma within their hobby. However, it was recognised by Clare Rusbridge (Reader in Veterinary Neurology at the University of Surrey) that the publication of test results should be viewed as a positive measure, protecting good breeders who are taking measures to breed the best dogs possible (Bonner, 2012a). The Assured Breeders Scheme was discussed at length by breeder participants with its associated strengths and weaknesses. Whilst this scheme was overall deemed to be a good initiative, breeders perceived it to lack uptake and vigour due to poor policing of checks for its members. Evidence of this was recently demonstrated by an RSPCA neglect case in which two breeders were banned for keeping animals for 10 years (Coates, 2013). However, the Kennel Club has since announced that all Kennel Club Assured Breeders will have to be inspected to ensure they are meeting certain requirements (The Kennel Club, 2014a).

The system for breeders to report health issues back to the Kennel Club also received some criticism during the breeders' discussions, with breeders noting the difficulty of ensuring honesty when not all dogs were permanently identified. However, as of 6th April 2016, the micro chipping of all dogs will be a legal obligation in the UK (British Veterinary Association, 2013) and as a result this initiative should help to overcome such loopholes. Participating breeders

further discussed the need for the Kennel Club to 'get some teeth'. Whilst the Kennel Club has recognised it's lack of legislative power (Veterinary Record, 2012a), breeders felt the club could do a lot more to enforce certain measures if it wanted to, using the example of exhibitors not being able to show if they didn't abide by the club's rules as an example of the control they could exert. Finally, breeders wanted the Kennel Club's support in areas such as public education and the cost of health screening and these were roles that breeders thought the club could take action in fulfilling. Some such steps have been undertaken by the Kennel Club with initiatives such as Puppy Awareness Week (The Kennel Club, 2013n) and the provision of certain health screening test discounts for Kennel Club Assured Breeders (The Kennel Club, 2014b).

Study limitations

It was initially anticipated that the vets and breeders who participated in the focus groups would be recruited from the initial survey respondents in Chapter 2, however recruiting for sessions proved increasingly difficult, particularly in the case of the vets (see 3.2.4.1). As a result, the participating pedigree dog breeders were eventually sourced from a new sample, also taken from the Champdogs website (Champdogs ®), but instead within a 50 mile radius of the vet school. Vets were sourced using two convenience samples after exhausting other methods of recruitment. These challenges in recruitment, combined with the fact that only four focus groups were held have meant that the data collected, whilst useful at an exploratory level, may not be representative of the study populations initially targeted. Further, as participating breeders voiced themselves to be good, responsible breeders, this sample only indicates the views of a certain demographic of breeder. Of the general population of breeders in the UK, a proportion are known to be carrying out practices such as puppy farming, breeding for monetary gain and failing to prioritise welfare (Crispin, 2012). However, unscrupulous breeders are unlikely to participate in focus group research due to concerns regarding the social and legal repercussions of such practices. Thus, data collection from this demographic is unlikely to be achieved.

Although focus groups were the chosen method of data collection for this study, individual interviews would have been an alternative option for collecting qualitative data and may have reduced the risk of social acceptability bias and the potential for strong personalities in the groups to lead the discussion. Session timings were much tighter for the breeder focus groups as the discussions tended to be broader and less focussed. Consequently, whilst vets had time to specifically discuss the additional question concerning the roles of owners in pedigree dog health, breeders were not directed to this question (although this topic was raised in both sessions anyway). This difference in the way questions concerning owners' roles were raised might have influenced the data collected, with vets having more time to specifically cover owners' roles.

Finally, although the principles of Grounded Theory were used in analysing these data, it was unlikely theoretical saturation had been adequately reached as some new themes were still emerging. Existing literature indicates that theoretical saturation can occur at 4-6 focus groups (Morgan, 1996). However, this number is applicable when looking at one particular demographic and therefore a potential argument could be made for doubling, or tripling the number of focus groups carried out in this study to allow for 4-6 groups for both vets and breeders.

Considerations for a continuation of this research

This study has provided an exploratory foundation on which a future focus group study could be based. To overcome the recruitment issues experienced during this study, a future expansion of this work would be best undertaken by an organisation with the funding and influence to encourage good participation, over a larger geographical area and comprising a greater number of focus groups. Such a continuation of this work would benefit from an alternative method of enrolment to ensure better attendance and a more clearly defined sample. One potential option would be for focus group interviews held at events known to have good vet or breeder attendance such

as the BSAVA Congress or Crufts dog show. As less scrupulous breeders are unlikely to come forward for studies such as this, an alternative method for engaging this demographic may be an anonymous, qualitative questionnaire posted on dog or puppy sales sites. Furthermore, future qualitative research could encompass other stakeholder groups such as the KC, current and prospective puppy or dog owners. A further option for expansion of this study would be to conduct focus groups consisting of both vet and pedigree dog breeder participants in the same room. This would allow active demonstration of the interactions between these groups and how they address differences in opinion. Focus group material could be based on case scenarios for example, based around breeding decisions, with participants discussing their ideal approaches and concerns. Data output could then be used to establish the challenges faced by these parties and further, to influence strategies to encourage unified approaches to case management. Such findings could then be utilised at breed education seminars organised for both parties by organisations such as the Kennel Club.

3.5. Conclusion

The findings of the previous chapter showed vets and breeders do at times hold different opinions on their own and each other's roles in pedigree dog health. This study was designed to explore why such differences in opinion might exist, particularly relating to the roles of vets and breeders in educating puppy buyers and dog owners. As expected with qualitative research, the data collected were broad and extended beyond the initial research questions posed. Vet and breeder focus group participants identified a number of vets' roles including: treating sick animals, providing preventative care, promoting and advising on health schemes, promoting pet insurance, reporting surgical procedures to the Kennel Club and advising dog owners, puppy buyers and breeders. Key breeder roles identified by both the vet and breeder focus group participants were: carrying out health screening tests and acting on the results, being honest about health problems, promoting good welfare and assessing prospective dog owners.

In Chapter 2 both vets and breeders perceived that they should independently be the most responsible party for advising dog owners and puppy buyers. Interestingly this study has highlighted the existence of some opposing opinions relating to these roles, with both parties not always viewing the others' involvement in undertaking this task positively. Although vets and breeders voiced some agreement over the roles they and each other should play in pedigree dog health, this study revealed some vets and breeders to disagree passionately over a number of issues such as elective Caesareans and the best age to neuter. Disagreements such as these have the potential to cause breakdowns in communication between these parties and ultimately lead to some breeders sourcing an alternative vet. Such findings are of concern and may impede collaborative efforts between these parties when trying to approach pedigree dog health management in a consistent and informed way.

Whilst prospective and current dog owners were seen as parties with a role in pedigree dog health by vets and breeders, a perceived lack of knowledge about specific breeds, inherited diseases and health schemes was identified as a key obstacle in relation to this party positively influencing health. Whilst a lack of dog owner knowledge has been recognised by some welfare organisations, little extensive research has been carried out on this demographic regarding the drivers of dog acquisition, the process through which dogs are sourced, from who owners seek advice or what information sources they use. Such information would be beneficial, in conjunction with the data collected from vets and breeders, to develop a better understanding of not just owners themselves but when and how vets, breeders and owners interact and the potential for welfare interventions involving all three of these parties at a grassroots level. This will therefore form the basis for further investigation in Chapter 4, which will comprise the following objectives:

I. What motivates owners to get a dog in the first place?
II. Through which source an owner is most likely to find out that a dog is available for purchase or re-homing

III. Where do owners get their dog(s) from and what influences their choice?

IV. Where do owners source information, if any, about their dog(s)?

    i. Prior to purchase of the dog(s)?

    ii. During the dog(s) life?

V. In what form do owners prefer to receive information?

VI. If there is a difference between whom owners specifically seek information from regarding particular aspects of their dog(s) care?

VII. How do owners rate vets and breeders against their own perceived knowledge of dog breeding, inherited disease and screening programs?

VIII. Have owners heard of the Kennel Club and what role do they perceive it to play?

Chapter 4 - Dog ownership and information sourcing in the United Kingdom: a cross-sectional, questionnaire-based study of pedigree and non-pedigree dog owners

4.1. Introduction

Many consider the UK to be a nation of animal lovers, with dogs being one of the most popular pets owned (PDSA, 2013). Research has shown many owners to value the health of their pets highly (NOAH, 2014) and to consider them as family members (Ancestory.com, 2013). Companionship has been identified as a key reason for pet ownership (Endenburg *et al.*, 1994) and dog ownership has also been both shown to have a number benefits to health, mental wellbeing and family life (Thorpe *et al.*, 2006, Knight and Edwards, 2008, Dogs Trust, 2011). A number of considerations have been associated with dog ownership including geographical location, type of housing, owner social class, the number of family members, presence and age of children or young adults in the home and whether or not there are cats in the home (Westgarth *et al.*, 2007, Downes, 2010). Dog owners have a number of legal obligations to fill with regards to both the basic and veterinary care they provide for their dogs (Animal Welfare Act, 2006). However, research has shown that at times, owners' knowledge regarding their dogs' care may be lacking, resulting in reduced standards of welfare relating to aspects such as exercise, diet and companionship (Buckland *et al.*, 2013, PDSA, 2013). Further research has also suggested a lack of research is carried out by those wishing to acquire a new puppy (The University of Bristol, 2011, Veterinary Record, 2013a) and that in some cases where pre-purchase research is carried out, it is very brief (The University of Bristol, 2011). Vets have also been shown to be underutilised as a source of advice prior to the purchasing of a pet (PDSA, 2013); however the results of Chapter 2 showed that both vets and pedigree dog breeders feel they were independently most responsible for advising puppy buyers and dog owners. Chapter 3 further confirmed vets and pedigree dog breeders to perceive themselves as carrying out these roles.

It is arguable that better education of prospective dog owners would enable more informed decision making at the point of sale or acquirement and would increase emphasis on good welfare throughout the dogs' lives. Whilst tools such as the RSPCA's 'Get Puppy Smart' tool (RSPCA, 2011a), the Advisory Council's Guide to Buying a Puppy (Advisory Council on the Welfare Issues of Dog Breeding, 2012a), the KC's Puppy Buying Guide App (The Kennel Club, 2014h) and the Pet Industry Federation's Puppy Index (Pet Industry Federation, 2013) exist, it is not known to what extent these tools are utilised. Such interventions have the potential to positively influence puppy sales; prioritising health and decreasing irresponsible breeding by reducing the financial viability of breeding in this way. Many questionnaire-based studies of dog owners exist in the literature, for example, on dog behaviour (Hsu and Serpell, 2003), quality of life (Wiseman-Orr *et al.*, 2004) and owner attitudes to neutering (Blackshaw and Day, 1994). However, one similar study which has looked at topics such as why owners acquired a certain breed, why they got their dog from a chosen place and what information resources they used was that carried out in Finland in 1998 (Leppanen *et al.*, 2000b). Leppanen and colleagues found owners to hold positive views towards health programmes, to believe in breeders and vets as a source of advice and to regard temperament and behaviour as important considerations, only second to health when choosing a puppy (Leppanen *et al.*, 2000b). However, this study is now outdated and the fact that the data were collected overseas may limit its application in the UK. Despite many influential reports pushing for better education and awareness of the general public (Rooney and Sargan, 2009, Bateson, 2010, APGAW, 2012), no research has been carried out in the UK specifically looking at what information, if any, owners source before acquiring a dog, where they source their dog(s) from and who they go to for advice. This research is vital to understanding the process of dog acquisition in the UK, informing future policy making and providing accessible, understandable information for prospective owners to promote welfare. This study will therefore explore some of these factors via an online questionnaire administered to UK dog owners.

4.1.1. Aims

To explore dog ownership in the UK with particular emphasis on the drivers of dog acquisition, the process of sourcing dogs and relevant information about their care and owners' perceptions of key stakeholders involved in canine health. To compare the responses of those who own only pedigree dogs against those who own either non-pedigree dogs only or a mix of pedigree and non-pedigree dogs.

4.1.2. Objectives

To document and report:

I. What motivates owners to get a dog in the first place?
II. Through which source an owner is most likely to find out that a dog is available for purchase or re-homing
III. Where do owners get their dog(s) from and what influences their choice?
IV. Where do owners source information, if any, about their dog(s)?
    a) Prior to purchase of the dog(s)?
    b) During the dog(s) life?
V. In what form do owners prefer to receive information?
VI. If there is a difference between whom owners specifically seek information from regarding particular aspects of their dog(s) care?
VII. How do owners rate vets and breeders against their own perceived knowledge of dog breeding, inherited disease and screening programs?
VIII. Have owners heard of the Kennel Club and what role do they perceive it to play?

4.2. Materials and Methods

4.2.1. Selecting samples, obtaining contacts and associated considerations

The target population selected for this study was owners of both pedigree and non-pedigree dogs in the United Kingdom. The three particular study populations of interest were those who owned only pedigree dogs (Group A), those who owned a combination of pedigrees and non-pedigrees (Group B) and those who owned non-pedigree dogs only (Group C).

Sourcing of potential participants was subject to a number of considerations:

- The exact size of the owned dog population is unknown but has been estimated in recent years to be somewhere between 8.5 -10.5 million (Murray *et al.*, 2010, Asher *et al.*, 2011, PFMA, 2013a) with around 23% of households owning a dog (PDSA, 2012).
- The exact ratio of pedigree dogs to non-pedigree dogs owned is also unknown but PDSA data collected from owners in 2013 indicated 64% of dogs to be pedigree, 31% to be crossbreeds and 2% to be designer crossbreeds (PDSA, 2013). However, the number of pedigree dogs may actually be slightly higher; a recent study carried out on clinical data of deceased vet-visiting dogs found 78% to be pedigree (O'Neill *et al.*, 2013).
- A further unknown is the exact geographical spread of dogs and their owners. PFMA data from 2013 indicated there to be a fairly even spread of dogs owned between regions (making up 21-33% of pets owned by those in surveyed areas), the only exception being London where proportionally less dogs were owned (7%) (PFMA, 2013b).
- Despite vet practices, insurance companies, microchip registries and the Kennel Club all possessing data on certain demographics of dog owner, there is no existing comprehensive (and thus representative) list of dog owners in the UK from which potential participants can be contacted.

- There is no research 'gold standard' for surveying dog owners. The Pet Food Manufacturers Association carries out a public survey of pet owners each year, which claims to be 'nationally representative of households in the UK' (PFMA, 2013b), however the exact methods behind this is not publically available (Downes *et al.*, 2013).

Due to the considerations and potential challenges outlined above it was decided that to reach as many dog owners as possible, within the time and financial restraints of the study, potential participants would be sourced via an online link to the study questionnaire posted on relevant social networking sites. Whilst the initial target population for this study was all dog owners in the UK, as the questionnaire was promoted online, the specific study population was those who a) owned dogs and b) used the internet. A diagrammatic representation of this is shown in Figure 27.

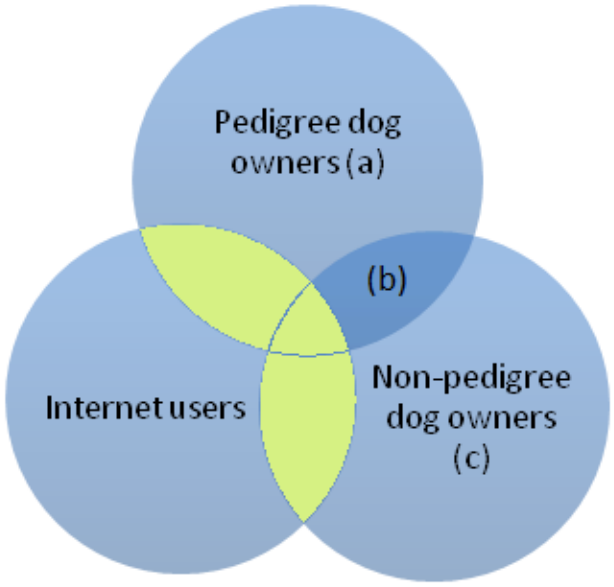


Figure 27: Diagrammatic representation of the pedigree dog owners (a), non-pedigree dog owners (c) and owners of both pedigree and non-pedigree dogs (b) who this study hopes to target. Study populations are shown in (a -c), with the intended population from which the convenience sample will take place depicted in green.* not to scale

4.2.2. Questionnaire development

Questionnaires were developed based on existing literature (Leppanen *et al.*, 2000b) and the vets' and breeders' questionnaires carried out in Chapter 2. Online questionnaires aimed at helping owners to decide on the most appropriate breed of dog (Animal Planet, 2012, Pet Planet, 2012, Purina, 2012, The Canine Information Library, 2012) were used to generate ideas as the methodologies from other research questionnaires, such as those used in the PFMA's pet population research were not publically available (Downes *et al.*, 2013). It was decided that in order to look at both dog owners generally and then any potential differences between those that owned different combinations of pedigree and non- pedigree dogs, it would be most straightforward to administer three separate questionnaires. The results of these could then be analysed both individually (to see if any statistical comparisons can be made) and in combination as outlined in Figure 28.

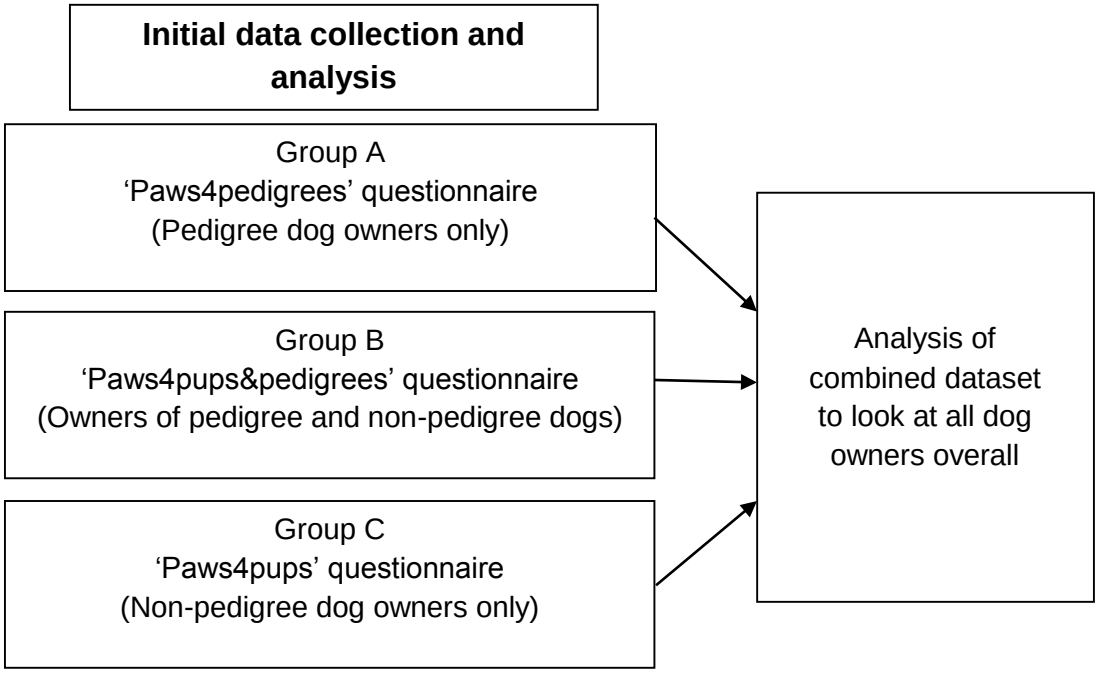


Figure 28: Plan for data collection from three possible groups of dog owners using online questionnaires and proposed plan to carry out both an initial analysis of each individual group (to look for statistical differences) along with a combined analysis of all dog owners

4.2.3. Developing ideas and study piloting

Questionnaires were designed using SurveyGizmo, an online questionnaire software tool (SurveyGizmo, 2013). This software was comparable to the SurveyMonkey software used in Chapter 2, but allowed additional functions such as presenting visual analogue scales as a sliding bar to make delivery of some questions more straightforward for dog owner participants. The initial proposed structures for the Paws4pedigrees (Group A), Paws4pups&pedigrees (Group B) and Paws4pups questionnaire (Group C) questionnaires varied between 9-11 sections and 29-39 questions. All three questionnaires featured questions exploring a variety of topics relating to the drivers for dog ownership, where people get a dog from and what information they source about their dog(s) pre and post purchase. The main differences between the questionnaires were that the Paws4pups questionnaire (i.e. that aimed at non-pedigree dog owners) did not contain irrelevant questions such as those regarding pedigree certificates, health testing and assured breeders. The Paws4pups questionnaire design also did not include the question regarding vets', breeders' and owners' knowledge on various topics relating to pedigree dog health as featured in the other two questionnaires. A more detailed summary of all three initial questionnaire structures is shown in Table 23.

Table 23: Summary of the initial design of each questionnaire prior to piloting, with a breakdown of the questions included. * Group A = designed for owners of pedigree dogs only. **Group B = designed for owners of both pedigree and non-pedigree dogs. ***Group C = designed for owners of non-pedigree dogs only.

Content	Included in questionnaire?		
	Paws4 pedigrees (Group A)*	Paws4pups& pedigrees (group B)**	Paws4pups (Group C)***
Reasons for getting a dog	✓	✓	✓
Information about number and type of dogs owned and how long the participant has kept dogs for	✓	✓	✓
How participant first found out that their dog(s) were available for purchase/homing. What information was sourced pre-purchase/acquisition?	✓	✓	✓
Where did the participant get their dog(s) from and what influenced their decision?	✓	✓	✓
Have participants heard of the Kennel Club and what do they perceive their role to be?	✓	✓	✓
Did the dog(s) come with a pedigree certificate? Were they from an Assured breeder and were their parents' health screened? What influence did this have on the decision to buy/re-home them?	✓	✓	
Where does the participant look for information about their dog during its lifetime?	✓	✓	✓
How do owners prefer to receive information about their dogs and who do they go to for advice about different aspects of their dog(s) care?	✓	✓	✓
How do owners rate their knowledge of dog breeding, inherited disease and health schemes against that of vets and breeders?	✓	✓	
Demographic information including breeding experience, occupations involving dogs and Kennel Club membership	✓	✓	✓
Further comments	✓	✓	✓

At the end of July 2012, an email was sent to staff at the UoN's CEVM containing hyperlinks to the drafted online owners' questionnaires described. Members of the CEVM were asked to give feedback and then a discussion group was held in mid-August to review the developing questionnaires and allow for the provision of feedback by the discussion group. This feedback was recorded and used to make alterations to the wording and user-friendliness of the questionnaires prior to piloting.

In September 2012 a subsequent email was circulated around the UoN, SVMS to identify dog owners. The email contained three hyperlinks through which the questionnaires could be accessed. These hyperlinks were made available to pilot participants for a 5 day period. Pilot participants were asked to complete the questionnaire, time how long it took them and provide feedback. A total of 98 responses were received; (a) 52 from pedigree dog owners, (b) 26 from the owners of non-pedigree dogs, (c) 14 from those who owned a mix of pedigree and non-pedigree dogs and (d) 6 from those who did not specify which type(s) of dogs they kept or which version of the questionnaire they completed. Of these a total of 36 provided written feedback: (a) 16, (b) 9, (c) 5 and (d) 6. As a result ten changes were made to both the Paws4Pedigrees and Paws4Pups&Pedigrees questionnaire and nine changes were made to the Paws4Pups questionnaire. One question about participant age was removed from all three questionnaires and an additional question was added in its place. The average time taken to complete the questionnaires was 11.2 minutes (based on 13 pilot respondents supplying this information).

4.2.3.1. Post-pilot development

As a result of the pilot study feedback and a subsequent discussion regarding how many questionnaires to run, it was decided to only launch two questionnaires, one for those who owned pedigree dogs (Group A: Paws4pedigrees questionnaire) and one for those who owned either non-pedigrees or a combination of pedigrees and non-pedigrees (Group B: Paws4pups questionnaire). An overview of this amendment is shown in Figure 29, where Group B is redefined. With respect to user-friendliness and clarity it was decided to run the survey links through a homepage on the CEVM website containing information about the study and a description of which questionnaire participants should fill in based on which dog(s) they own. It was planned for this homepage web link to then be posted, with information requesting study participation on relevant pages of social networking sites.

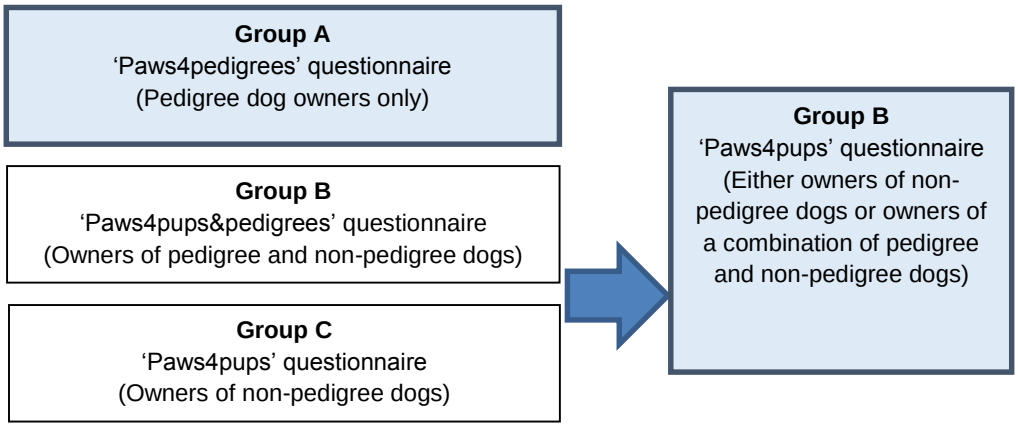


Figure 29: Diagrammatic overview of the changes to the final questionnaires and their intended targets. The Group A 'Paws4pedigrees' questionnaire has remained the same whilst the questionnaires for groups B and C have been merged into a single Group B 'Paws4pups' questionnaire (redefined in blue) to be filled in by either owners of non-pedigree dogs or owners of both pedigree and non-pedigree dogs.

4.2.4. Final questionnaire content and layout

The Paws4pedigrees questionnaire contained 10 sections and 33 questions and the Paws4pups questionnaire contained 9 sections and 30 questions. Both questionnaires featured questions exploring a variety of topics relating to the drivers for dog ownership, where people get a dog from and what information they source about their dog(s) pre and post purchase. A more detailed summary of both questionnaire structures is shown in Table 24. For a full copy of the Paws4pedigrees questionnaire see Appendix 9.

Table 24: Summary of the final content featured in both the Paws4pedigrees and Paws4pups questionnaires. * Group A = designed for owners of pedigree dogs only. **Group B = designed for owners of either non-pedigree dogs only or a mix of pedigrees and non-pedigrees

Content	Included in questionnaire?	
	Paws4pedigrees (Group A)*	Paws4pups (Group B)**
Reasons for getting a dog	✓	✓
Information about the number and type of dogs owned and how long the participant has kept dogs for	✓	✓
How participant first found out that their dog(s) were available for purchase/homing. What information was sourced pre-purchase/acquisition?	✓	✓
Where did the participant get their dog(s) from and what influenced their decision?	✓	✓
Where does the participant look for information about their dog during its lifetime?	✓	✓
How do owners prefer to receive information about their dogs and who do they go to for advice about different aspects of their dog(s) care?	✓	✓
How do owners rate their knowledge of dog breeding, inherited disease and health schemes against that of vets and breeders?	✓	
Have participants heard of the Kennel Club and what do they perceive their role to be?	✓	✓
Demographic information including breeding experience, occupations involving dogs and Kennel Club membership	✓	✓
Further comments	✓	✓

Both of the dog owners' questionnaires used a range of question types including single answer, multiple choice answer, drop-down menus, matrices of check boxes, rating scales, short and long answer questions. It was estimated that the questionnaires would take each dog owner in the region of 15-20 minutes to complete.

4.2.5. Questionnaire distribution

The questionnaire distribution took place over a seven month period between February and August 2013. During this time two rounds of questionnaire promotion took place, during which the hyperlink to the study homepage was posted onto dog relevant pages of social networking sites or requested for 'retweets' on Twitter with the aim of reaching 1000 plus responses. A definition of 'pedigree' dogs was not provided for respondents, meaning owners were left to self-categorise based on their belief of whether their dog was pedigree or not, for example, if they perceived their designer crossbreed to be a pedigree dog. A list of sites used to promote the study is shown below in Table 25. It should be noted that this is not a comprehensive list as promotion of this study relied on snowballing of the study hyperlink. The sites listed were chosen for a number of reasons, for Facebook and Twitter a search for 'dogs' was conducted within each social networking website and the most relevant hits were taken (40 from Twitter and 15 from Facebook). An additional 7 Twitter pages and 4 Facebook pages were also used as they were already known by the author. For forums a Google search for 'dog forums' was conducted and the top ten most relevant hits were used. Participants were asked to share and repost links beyond the primary sites featured here. In some cases it was asked that the study was not promoted more than once on a particular site and a second promotion was therefore not possible.

Table 25: Online methods used to promote study questionnaires to dog owners in February and July 2013. A request for study participation was posted on each of these sites along with a hyperlink to the study homepage, which featured information about the study and descriptive links to the relevant questionnaires.

Method of distribution	Page or user profile	Study promotion 1 (February 2013)	Study promotion 2 (July 2013)
Facebook	Nottingham Veterinary Society	✓	✓
	Nottingham Final Year Vet Students	✓	✓
	Dogs Trust	✓	
	Park Bench	✓	✓
	Pets at Home	✓	✓
	Guide Dogs	✓	✓
	PDSA	✓	✓
	Battersea Dogs Home	✓	✓
	For the Love of Dogs	✓	
	The Kennel Club	✓	✓
	Vets4Pets	✓	✓
	Champdogs	✓	
	The University of Nottingham		✓
	Fish4dogs		✓
	The Blue Cross		✓
	Pedigree UK		✓
	Royal Canin		✓
	Burns Pet Nutrition		✓
	Eukanuba UK		✓
Twitter	The University of Nottingham @UniofNottingham	✓	
	Nottingham Vet School @NottinghamVets	✓	✓
	UoN Student News @UoNStudentNews	✓	
	Dogs Trust @DogsTrust	✓	✓
	Pet Plan @Petplan	✓	
	Pets at Home @PetsatHome	✓	✓
	PDSA @PDSApressoffice	✓	✓
	Pedigree UK @wearefordogs	✓	✓
	RSPCA England @RSPCA_England	✓	✓
	Battersea Dogs and Cats @BDCH	✓	✓
	Park Bench Dogs @Park_Bench_Dogs	✓	✓
	Diva Dogs UK @DivaDogsUK	✓	
	Dogs and Puppies.co.uk @dogs_puppies	✓	
	The Kennel Club @KCLovesDogs	✓	✓
	Guide Dogs @guidedogs	✓	✓
	Veronika Jordan @LUVDogsUK	✓	
	Hearing Dogs UK @HearingDogs	✓	✓
	Dog Training @TalkingDogsUK	✓	
	Alfie the Yorkie @TwoDogsUK	✓	
	Adolescent dogs UK @Jenny_Trigg	✓	
	Marc Abraham @Marcthevet	✓	
	Wood Green Animal Shelter @wood_green	✓	✓
	Rescue Dogs UK @rescuedogs189	✓	✓
	WSPCA UK @wspauk	✓	
	City Pups @City_Pups	✓	
	Oldies Club @oldiesclub	✓	
	Walking the Dog UK @walkingthedoguk	✓	
	Active Dogs @ActiveDogsUK	✓	✓
	Dolly Dog UK @DollyDogUK	✓	
	The Team @TheGoodDogGuide	✓	
	All Dogs Matter @AllDogsMatter	✓	✓
	Dogs Corner @dogscornerUK	✓	✓
	Dog Friends UK @DogsFriendsUK		
	D for Dog @DforDog	✓	✓
	Nick Jones MA @ukdogtrainer	✓	
	The Deaf Dog Network @DeafDogNetwork	✓	✓
	Beverley Cuddy @beverleycuddy	✓	
	Dog Beds UK @DogBedsUK	✓	
	Yellow Dog UK @YellowDogUK	✓	✓
	Endangered Dogs @EndangeredDogs	✓	
	Dogs for Autism @dogsforautism	✓	
	Wagging Tails @WaggingTailsUK	✓	
	UK Pet Food @ukpetfood	✓	✓

	Victoria Stilwell @itsmeorthedog Stacey Solomon @StaceySolomon Ben Fogle @Benfogle Eukanuba @Eukanuba	✓ ✓ ✓	 ✓
Forums and Blogs	Dog forum (www.dogforum.co.uk) Pet forums (www.petforums.co.uk) The Dog Rescue Pages (www.dogpages.org.uk) Tilly and Tam Forum (www.tillyandtam.com/forum/) Unleashed Forum (http://www.unleashedforum.co.uk) Your Dog Magazine Forum (http://yourpetforums.co.uk) Dog Forums (http://www.dogforums.com) Pet Dog Forum (www.petdogforum.com) Champdogs blog (www.champdogs.co.uk/blog) Dog Club – Internet Dog Directory (www.dogclub.co.uk)	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	 ✓ ✓

4.2.6. Incentives

To increase the response rate, the dog owners' questionnaires were incentivised. All dog owners who completed a questionnaire could choose to be entered into a prize draw to win a hamper of treats for themselves and their dog worth £100 (with a total of two of these prizes available – one for each of the two questionnaires running).

4.2.7. Data collection

Data collection from the online questions began on 22/02/13. Data received from participating dog owners accumulated within the Survey Gizmo website during the data collection period. The website was also checked weekly to monitor questionnaire uptake and check for potential running problems with the software. The predetermined cut-off point for responses was 22/08/13 and on this day both questionnaires were closed. The data were then downloaded into a Microsoft Excel 2010 spread sheet and PDF summary reports were also downloaded to provide a paper copy backup of the original data set.

4.2.8. Questionnaire data analysis

Data analysis of this questionnaire involved cleaning the original datasets, recoding the data for upload on to the chosen statistical package (SPSS version 21) and carrying out the statistical analysis. These three steps are outlined in more detail below.

4.2.8.1. Data cleaning and organisation

All data collected were stored in a Microsoft Excel 2010 database, with Paws4pedigrees (Group A) and Paws4pups (Group B) data managed separately. Both datasets were then cleaned and any blank rows where participants had started the questionnaire but failed to provide any information which could be used in the analysis were removed. Overseas participants who had completed the questionnaire were also excluded. Any participants who had completed the questionnaire but failed to supply a postcode, or whose IP address could not identify where they lived were assumed to be UK residents as per the requirements of taking part in the study. Once all unusable entries had been removed, the breeds of dogs owned by owner participants were checked to make sure they appeared in the correct dataset (Group A: dog owners residing in the United Kingdom who own only pedigree dogs. Group B: dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees). Any designer crossbreeds or breed types (e.g. Cockapoo or Jack Russell) in the Group A dataset were left if the participating owner perceived them to be pedigree, however any entries referring to the dogs as crossbreeds or non-pedigrees were moved to group B (n=153). Similarly any entries containing pedigree dogs which appeared in the Group B dataset were moved across to the Group A dataset (n= 37) (4.3.1).

4.2.8.2. Data recoding

Once both datasets had been cleaned the answers for all closed questions were re-coded with numerical values using the sort, filter, find and replace tools on Excel (e.g. Male=1, Female=2 etc.) The original meanings for all recoded answers were recorded on master paper copies of the questionnaires. As each question was recoded, a new version of each of the spreadsheets was saved for troubleshooting purposes should any problems arise and previous versions of the dataset need to be retrieved. The final, fully recoded spreadsheets were then uploaded into ISS SPSS version 21 for statistical analysis.

4.2.8.3. Descriptive and statistical analysis

Descriptive statistics were run on the recoded data from the owners' questionnaires using SPSS version 21. Response frequencies were calculated for all data. For categorical variables n values and percentages were reported, with median, minimum and maximum values reported for data recorded using rating scales. For questions where participants were able to provide multiple answers to a question, the responses are presented as the total (n) of the whole dataset and percentage of all responses. For example, if a single question answered by 100 respondents allowed up to four possible answers, the maximum number of responses could be 400 and the minimum 100 with the total used as the denominator for the resultant values. Postcode data provided by those dog owners who wished to share them were copied into online geo-coding software in order to give a visual representation of the geographical spread of the data collected.

A priori comparisons were planned to examine whether a greater number of owners from Group A (owners of pedigree dogs only) had been made aware that their dog was available for purchase/rehoming via the Kennel Club than those in Group B (owners of non-pedigree dogs only or a combination of both pedigrees and non-pedigrees) and further, whether those in Group A would be more likely to seek advice from breeders than those in Group B on their dogs' health and breeding. A further *a priori* comparison was also planned to look at whether owners in Group A would rate themselves less knowledgeable than vets and pedigree dog breeders on pedigree dog breeding, inherited disease and health schemes. Chi squared analyses were carried out to identify whether or not a statistically significant difference existed between the responses of Groups A and B on the following:

a) Whether they found out their dog was available for purchase/rehoming via the Kennel Club or another source (see 4.3.4) and

b) Whether Groups A or B would be more likely to go to their vet or breeder for advice on their dogs' general health, health when ill or breeding (see 4.3.6.2).

A Kruskal-Wallis test was also used to analyse the variance between knowledge ratings pedigree dog owners assigned vets, breeders and dog owners on pedigree dog breeding, inherited disease and health schemes (see 4.3.7). For both the Chi-squared and Kruskall-Wallis tests a p value of <0.05 was considered significant. Further, *post hoc* pairwise analyses of the Kruskall-Wallis tests were performed via Mann-Whitney tests for which a Bonferroni correction was applied to reduce the rate of Type 1 errors (significance level: $p=0.01$, $0.05/3=\alpha/k$ where k is the number of pairwise comparisons, accounting for three paired tests comparing knowledge ratings awarded to vets and breeders, breeders and owners, vets and owners). A *post hoc* sample size analysis was performed using Raosoft (http://www.raosoft.com/samplesize.html).

Free text was managed within Microsoft Excel 2010. All answers were sorted and a numerical code was assigned to any answers that were the same or equivalent to each other (e.g. 'I love dogs', 'I just love dogs', I have always loved dogs' = 1). The meanings of these numerical codes were recorded using a master key. Any truly unique responses were assigned to an 'other' category. For answers which should have been included in a closed question and not the subsequent free text component of it (e.g. respondent stated they had acquired their dog for working purposes in the free text 'other reasons for acquiring a dog' section instead of selecting 'working' in the closed part of the question), data were recorded separately and then incorporated with the closed data set. Once all data had been analysed, the total frequency of free text responses was calculated within Excel along with total percentage values.

4.3. Results

The data collected from groups A and B will be presented individually alongside the combined total responses for each question. Where indicated group A and Group B are defined as follows:

Group A: Dog owners who reside in the UK and own only pedigree dogs. This group was asked to fill in the Paws4pedigrees questionnaire.

Group B: Dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees (i.e. crossbreeds or mongrels). This group was asked to fill in the Paws4pups questionnaire.

The differences between the two questionnaires that were administered are described in Table 24 (see 4.2.4).

4.3.1. Response outcome and attainment

A total of 1336 responses were collected, of which 842 owners had completed the Paws4pedigrees questionnaire (Group A) and 494 owners had completed the Paws4pups questionnaire (Group B). A number of responses were excluded: 89 responses were removed due to failure to provide any data (Group A: n= 61, Group B: n= 28) and 80 responses were excluded as participants were not UK residents (Group A: n= 55, Group B: n= 25). Of the total responses received 1167 were therefore useable for the analysis (Group A: n= 726, Group B: n= 441). Upon further analysis of the breeds owned it was apparent that 190 respondents (16.3%) had completed the wrong version of the questionnaire, for example, clearly stating they had a crossbreed dog having filled in the pedigree only version of the questionnaire (Group A: n= 153, Group B: n= 37). As a result these responses were sorted and reallocated to the correct groups (Group A: n=610 [52.3%], Group B: n=557 [47.7%]). See Figure 30.

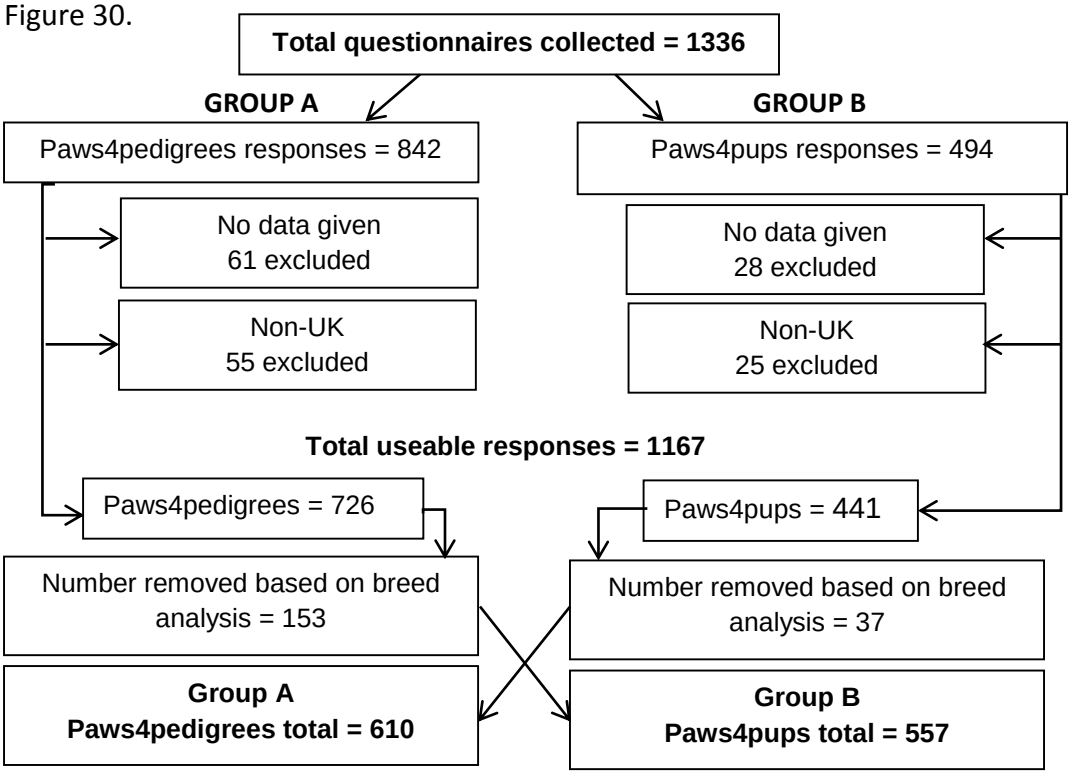


Figure 30: Diagram showing the total responses, exclusion criteria, breed reallocation and final useable responses of two questionnaires (Paws4pedigrees and Paws4pups) administered to owners of pedigree and non-pedigree dogs in the United Kingdom in 2013.

Post hoc analysis showed that with an estimated population of over 20,000 dog owners, working on a margin of error of 5% and a 95% confidence interval (with a response distribution of 50%), the minimum sample size needed to provide the study with sufficient power to draw significant results was at least 377 respondents.

Of the total owners (groups A and B) who provided information on how they were made aware of the study questionnaire, the majority heard about the questionnaire via social networking sites (48.3%, n=443) and online forums (38.6%, n= 354). Of these methods, the three most common sources through which owners became aware of the study questionnaire were Facebook (22.1%, n= 203), Twitter (15.3%, n= 140) and the Dog Rescue Pages Forum (12.6%, n= 116). A further breakdown is provided in Figure 31.

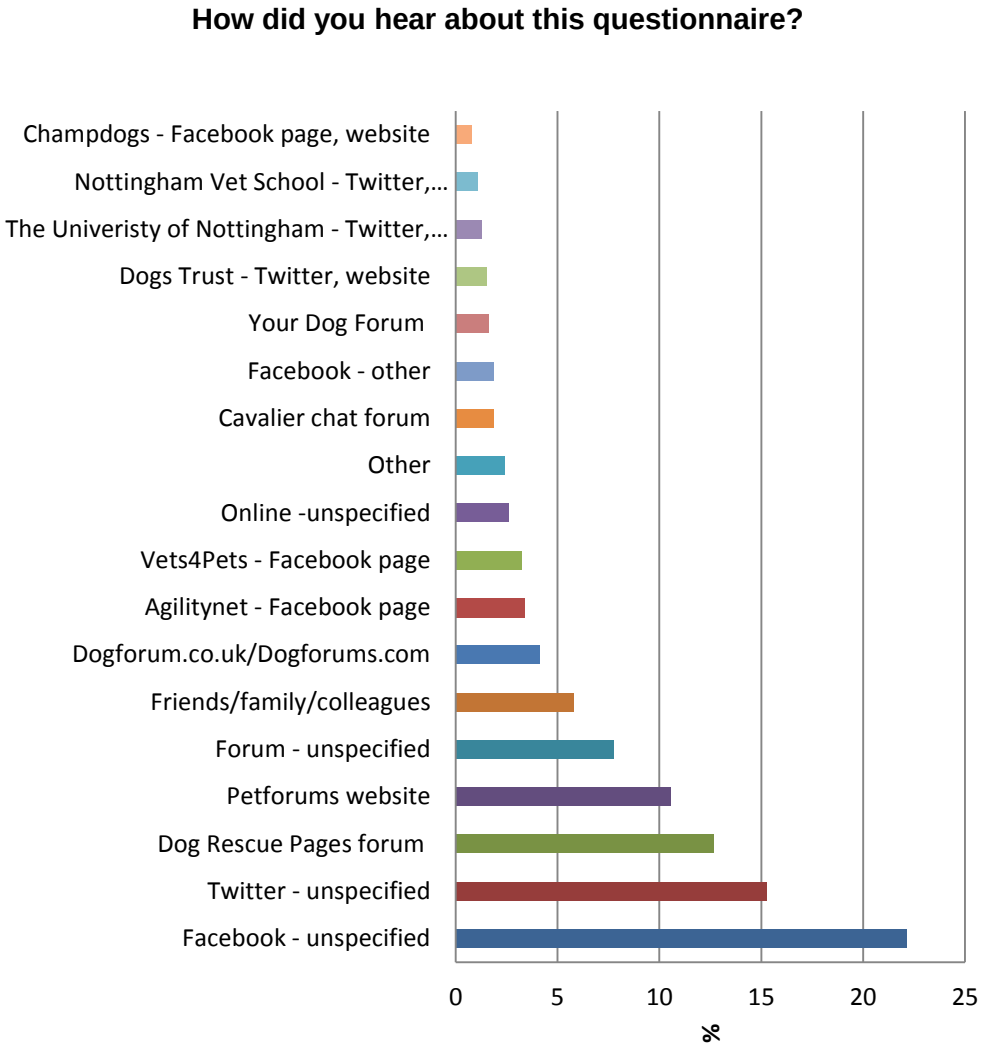


Figure 31: Method through which participating dog owners had heard about the study questionnaire. Expressed as percentages and based on questionnaire data from the Paws4pedigree and Pups4pups questionnaires administered in 2013.

4.3.2. Demographic profile of respondents

4.3.2.1. Location, gender, age and length of time keeping dogs

Postcode data provided by participating owners indicated them to be located all over the UK (see Figure 32).

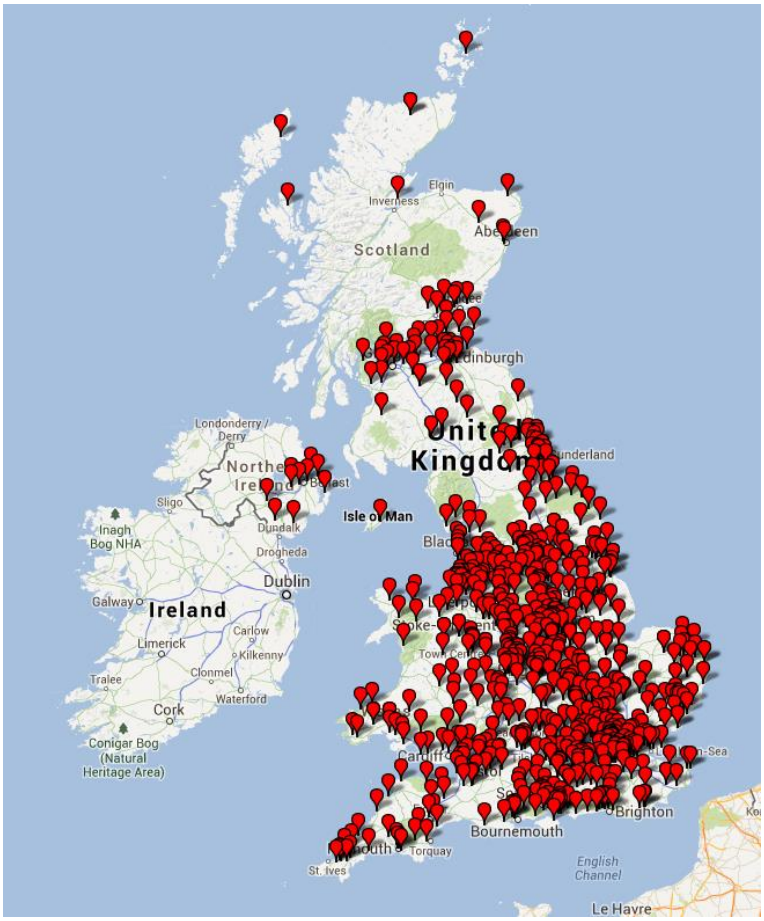


Figure 32: Geographical distribution of dog owner questionnaire participants as indicated by postcode data provided. Map generated using online geo-coding software (http://www.gpsvisualizer.com).

Of the 949 participants who provided information about their gender the majority were female (92.2%, n = 875) with only 7.8% of male respondents (n= 74). In Group A: Females: 91.7%, n = 444; Males: 8.3%, n= 40; and Group B: Females: 92.7%, n = 431; Males: 7.3%, n= 34. Participants across both groups ranged in age from under 18 years old to over 70 years old (see Figure 33).

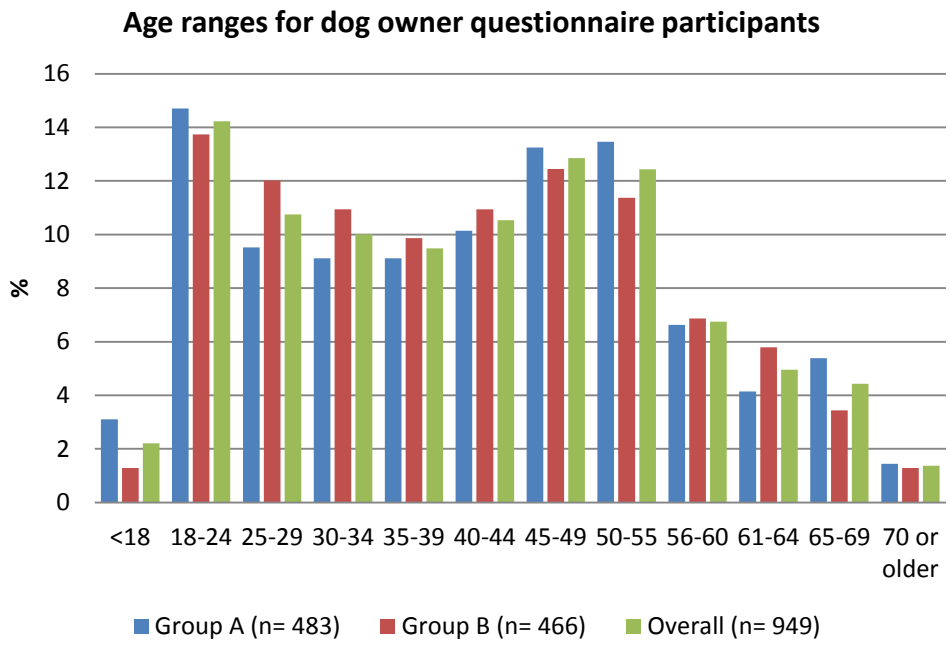


Figure 33: Percentage age ranges of responding dog owner participants. Group A = dog owners residing in the United Kingdom who own only pedigree dogs. Group B = dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees.

The lengths of time (in years) for which owners had been keeping dogs varied anywhere between less than one year and greater than 50 years, with the majority of participants having kept a dog for between 1 and 15 years (Group A: 60.4%, n= 329; Group B: 51.7%, n= 267; Overall: 56.2%, n= 596). See Figure 34.

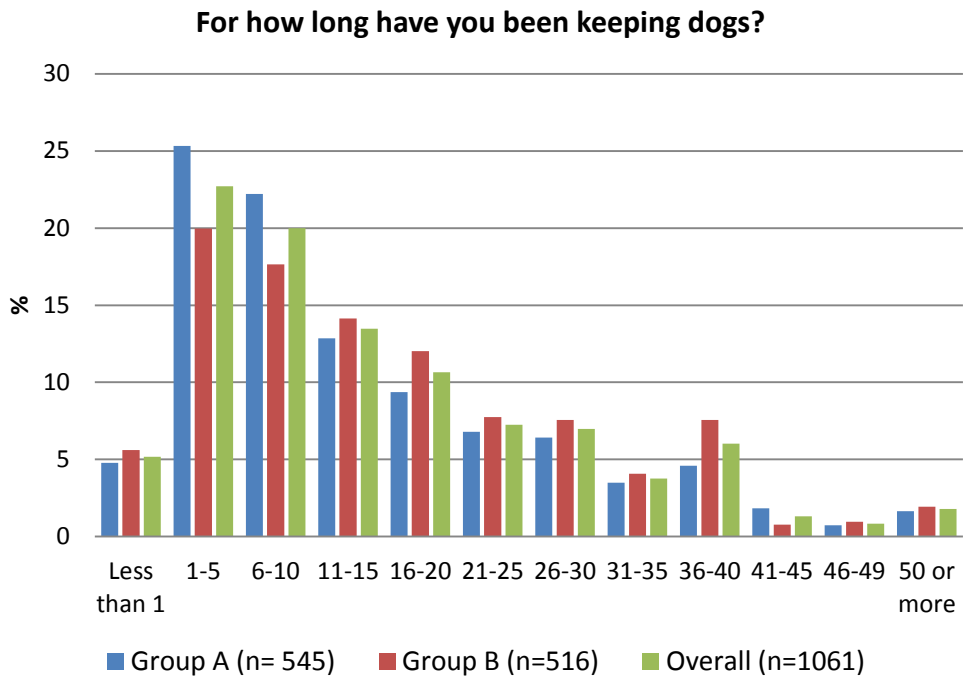


Figure 34: Percentage lengths of time for which owners had been keeping dogs in years, based on questionnaire data from 2013. Group A = dog owners residing in the United Kingdom who own only pedigree dogs. Group B = dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees.

4.3.2.2. Number and type of dogs owned

Of the dog owners surveyed, respondents owned between one and greater than 20 dogs. However, the majority of owners owned between one and five dogs (Group A: 94.4%, n= 522; Group B: 96.9%; n= 507; Overall: 95.6%, n= 1029), with the majority owning just one (Group A: 43.8%, n= 242 ; Group B: 40.3%; n= 211; Overall: 42.1%, n= 453) or two (Group A: 30%, n= 166 ; Group B: 33.5%; n= 177; Overall: 31.7%, n= 341).

Of the dogs owned by participants in Group A, the three most common breeds kept were Cavalier King Charles Spaniels (n=99), Border Collies (n= 94) and Labradors (n= 75) and the ages of all reported breeds ranged from less than a year to 18 years old with a median age of 5. Of the participants in Group B, 69.3% (n= 386) owned non-pedigree dogs only with the remaining 30.7% (n=171) owning a mix of pedigree and non-pedigree dogs. The dogs owned by this group varied in age from 1 week to 17 years old with a median age of 5.

4.3.2.3. Kennel Club membership, breeder status and experience of working with dogs

Of the dog owners surveyed the majority were not Kennel Club members (85.4%, n= 810) but more owners of pedigree dogs only (Group A) were Kennel Club members than those in Group B (Group A: 14.5%, n=71; Group B: 8.3%, n= 38). Overall 3.1% of respondents did not to answer this question.

When asked whether they had ever worked with dogs, the majority of respondents had not (Group A: 65.2%, n= 321; Group B: 64.2%, n= 305; Overall: 64.7 %, n= 626). Of those participants who were currently working with dogs, the three most frequently reported occupations were dog training, vets or veterinary students and volunteer/paid work at animal rescues/shelters/charities. Regarding past work carried out with dogs, responses indicated kennel work, volunteering/paid work at animal rescues/shelters/charities, dog training work and 'other' work to be the most frequently reported. See Appendix 8 for a detailed breakdown.

The majority of participating dog owners reported that they had not bred from any of their dogs (Group A: 75.2%, n= 369; Group B: 86.2%, n= 407; Overall: 89.2%, n= 776). It was also noted that slightly more owners of pedigree dogs only had bred an occasional planned litter (Group A: 10.2%, n= 50 vs. Group B: 3.6%, n= 17).

4.3.3. Reasons for getting a dog

The main reasons participating owners reported for getting a dog were companionship for themselves or their family (Group A: 38.9%, n= 583; Group B: 39.5%; n= 540; Overall: 39.2%, n= 1123) and exercise (Group A: 18.8%, n= 281; Group B: 19%; n= 260; Overall: 18.9%, n= 541). Further key reasons for getting a dog also included companionship for another animal, social benefits and hobbies and sports (see Table 26).

Table 26: Reported reasons for dog owners acquiring a dog. Results reported as percentage of total responses collected. Group A = dog owners residing in the United Kingdom who own only pedigree dogs. Group B = dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees

Reason for acquiring dog(s)	Group A* (n=609) % (n)	Group B* (n=557) % (n)	Overall (n=1166) % (n)
Companionship –family	33.8 (583)	33.5 (540)	33.7 (1123)
Exercise	16.3 (281)	16.1 (260)	16.2 (541)
Other	13.2 (227)	15.1 (244)	14.1 (471)
Companionship – another animal	8.2 (142)	10.5 (169)	9.3 (311)
Social benefits	9 (156)	8.3 (133)	8.7 (289)
Hobbies and sports	7.9 (136)	8.3 (133)	8.1 (269)
Guarding	3 (52)	3 (48)	3 (100)
Working	2 (34)	1.5 (24)	1.7 (58)
Showing	2.6 (45)	0.7 (12)	1.7 (57)
Gift	0.9 (16)	1.6 (25)	1.2 (41)
Breeding	1.7 (30)	0.3 (5)	1 (35)
Personal protection	1 (18)	0.9 (15)	1 (33)
Assistance dog	0.2 (4)	0.2 (3)	0.2 (7)
Total (n)	**1724**	**1611**	**3335**

* Group A = dog owners residing in the United Kingdom who own only pedigree dogs.
**Group B = dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees.

4.3.4. Seeking information pre-acquisition of a dog

The majority of dog owner respondents became aware that their dogs were available for purchase or re-homing via animal shelters, charities or rescues, friends, family or colleagues or online adverts. Chi-squared analysis showed significantly more owners of pedigree dogs found out about their dogs through the Kennel Club (p=0.0001) when compared to owners of non-pedigrees only or a combination of pedigrees and non-pedigrees. Other methods owners reported of finding out dogs were available for purchase or rehoming were varied and are detailed in Table 27.

Table 27: Methods through which dog owners in the United Kingdom found out that their dog(s) were available for purchase or re-homing as reported by questionnaire data collected in 2013. Multiple choice data presented as the total (n) of the whole dataset and percentage of all responses.

Method of hearing dog(s) were available for purchase/re-homing	Group A* (n = 437) % (n)	Group B** (n= 344) % (n)	Overall (n= 781) % (n)
Animal shelter/charity/rescue	16.4 (140)	34.6 (260)	24.9 (400)
Breeder	31.0 (265)	10.0 (75)	21.2 (340)
Friends, family or colleagues	17.5 (150)	21.8 (164)	19.6 (314)
Online advert	16.8 (144)	16.2 (122)	16.6 (266)
Newspaper/magazine advert	6.2 (53)	7.2 (54)	6.7 (107)
Other	3.9 (33)	4.4 (33)	4.1 (66)
The Kennel Club	2.6 (22)	0.1 (1)	1.4 (23)
Vet practice	1.3 (11)	1.3 (10)	1.3 (21)
Pet shop	0.8 (7)	1.1 (8)	0.9 (15)
Breed club/society	1.4 (12)	0.3 (2)	0.9 (14)
Forum/website	0.6 (5)	1.2 (9)	0.9 (14)
Dumped or stray	0.4 (3)	1.3 (10)	0.8 (13)
Own dog had a litter	1.2 (10)	0.4 (3)	0.8 (13)
Total n	**839**	**740**	**1606**

* Group A = dog owners residing in the United Kingdom who own only pedigree dogs.
**Group B = dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees.

Of the owners surveyed the vast majority had sourced information about their dog(s) before getting them (Group A: 85.6%, n= 468; Group B: 71.9%, n= 373; Overall: 78.9%, n= 841). This information came from a variety of sources, of

which general internet searches (Overall: 18.8%, n= 576), books (Overall: 15.6%, n= 478), breeders (Overall: 12.1%, n= 371) and friends and family (Overall: 11.3%, n= 347) were amongst the most popular. 'Other' sources stated in the free text were varied but the most frequently mentioned were 'career related knowledge, training and courses' (n= 13), 'online forums' (n= 12) and 'other owners' (n=9) (see Table 28).

Table 28: Information sources dog owners use prior to purchasing their dogs as reported in questionnaires administered to both pedigree and non-pedigree dog owners in the United Kingdom in 2013. Multiple choice data presented as the total (n) of the whole dataset and percentage of all responses.

Pre-purchase source of information	Group A* (n= 490) % (n)	Group B** (n= 405) % (n)	Overall (n= 895) % (n)
General internet search	18.0 (340)	20.1 (236)	18.8 (576)
Books	15.9 (300)	15.2 (178)	15.6 (478)
Breeders	14.5 (274)	8.3 (97)	12.1 (371)
Friends/family who own dog	10.6 (201)	12.4 (146)	11.3 (347)
Animal shelter/rescue/charity	5.5 (105)	16.3 (191)	9.7 (296)
Breed Club	10.9 (207)	6.0 (70)	9.0 (277)
The Kennel Club	10.8 (204)	5.2 (61)	8.6 (265)
Dog magazine/newspaper	7.3 (138)	7.9 (93)	7.5 (231)
Vet practice	3.5 (66)	4.3 (51)	3.8 (117)
Other	2.0 (37)	2.6 (30)	2.2 (67)
Previous experience and own knowledge	0.6 (11)	1.0 (12)	0.8 (23)
Pet shop	0.5 (9)	0.7 (8)	0.6 (17)
Total n	**1892**	**1173**	**3065**

* Group A = dog owners residing in the United Kingdom who own only pedigree dogs.
**Group B = dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees.

4.3.5. Deciding where to get a dog from and influencing factors

Participating owners reported the main parties or places they had acquired their dogs from to be breeders (Overall: 39.4%, n=557) and animal shelters, charities or rescues (Overall: 27.9%, n=394). Other reported sources of acquiring a dog were diverse but the most frequently reported were veterinary surgeries (Overall: 0.6%, n=8) and farms/farmers (Overall: 0.5%, n= 7). A further breakdown is provided in Table 29.

Table 29: Parties or places dog owners in the United Kingdom acquired their dog(s) from as reported by questionnaire data collected in 2013. Multiple choice data presented as the total (n) of the whole dataset and percentage of all responses.

Party or place dogs were acquired from	Group A* (n= 519) % (n)	Group B** (n= 482) % (n)	Overall (n=1001) % (n)
Breeder	53.1 (390)	24.6 (167)	39.4 (557)
Animal shelter/charity/rescue	18.6 (137)	37.9 (257)	27.9 (394)
Directly from previous owner (not breeder)	10.2 (75)	16.2 (110)	13.1 (185)
Friend/family/colleague	6.7 (49)	12.5 (85)	9.5 (134)
A dog I already owned had puppies	5.7 (42)	2.4 (16)	4.1 (58)
Other	3.4 (25)	3.7 (25)	3.5 (50)
Found a stray	1.2 (9)	1.3 (9)	1.3 (18)
Pound	1.1 (8)	1.3 (9)	1.2 (17)
Total n	**735**	**678**	**1413**

* Group A = dog owners residing in the United Kingdom who own only pedigree dogs.

**Group B = dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees.

Reasons for acquiring a dog from a certain person or place were varied but those most frequently selected included specifically acquiring a rescue puppy or dog (19.5%, n= 417) and being influenced by the reputation of the breeder, seller or establishment (15.3%, n=327). A further breakdown is provided in Table 30.

Table 30: Reasons dog owners acquired their dog(s) from a certain person or place as reported by questionnaire data collected in 2013. Multiple choice data presented as the total (n) of the whole dataset and percentage of all responses.

Reasons for acquiring a dog from a person or place	Group A* (n= 538) % (n)	Group B** (n= 500) % (n)	Overall (n= 1038) % (n)
Puppy/dog was a rescue	12.6 (148)	28.9 (269)	19.5 (417)
Reputation of breeder/seller/establishment	20.3 (237)	9.7 (90)	15.3 (327)
Puppy/dog was available at a convenient time	15.0 (175)	15.1 (141)	14.8 (316)
Other	10.8 (126)	15.4 (143)	14.5 (310)
Puppy/dog came from health screened parents	18.8 (220)	7.0 (65)	13.3 (285)
Suitable travelling distance to collect puppy/dog	11.7 (137)	11.5 (107)	11.4 (244)
Puppy/dog was affordable	5.6 (65)	8.8 (82)	6.9 (147)
Already had a dog from this person/place	5.3 (62)	3.7 (34)	4.5 (96)
Total n	**1170**	**931**	**2142**

* Group A = dog owners residing in the United Kingdom who own only pedigree dogs.
**Group B = dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees.

Free text responses on 'other' reasons for acquiring a dog from a given person or place were very variable but among the top reported were 'the availability of a desired breed or type' (9.9%, n= 37), 'dog or puppy was unwanted or needed to be rehomed' (8.9%, n= 33) and that respondents 'knew the breeder or seller' (7.8%, n= 29).

4.3.5.1. Vaccinations, neutering and provision of insurance

The majority of dogs owned by survey participants were not insured or neutered when they were bought or re-homed, although the majority were vaccinated (see Table 31).

Table 31: Percentage responses indicating how many dog owner participants had at least one or more dogs that were insured, vaccinated or neutered when they bought or rehomed them.

Insured	**Group A* (n= 535)**		**Group B** (n=509)**		**Overall (n=1044)**	
	n	**(%)**	**n**	**(%)**	**n**	**(%)**
Yes	238	44.5	137	26.9	375	35.9
No	263	49.2	348	68.4	611	58.5
I don't know	34	6.4	24	4.7	58	5.6
Vaccinated	**Group A* (n= 532)**		**Group B** (n=504)**		**Overall (n=1036)**	
	n	**(%)**	**n**	**(%)**	**n**	**(%)**
Yes	304	57.1	314	62.3	618	59.7
No	214	40.2	174	34.5	388	37.5
I don't know	14	2.6	16	3.2	30	2.9
Neutered	**Group A* (n= 531)**		**Group B** (n=502)**		**Overall (n=1033)**	
	n	**(%)**	**n**	**(%)**	**n**	**(%)**
Yes	95	17.9	169	33.7	264	25.6
No	435	81.9	331	65.9	766	74.2
I don't know	1	0.2	2	0.4	3	0.3

* Group A = dog owners residing in the United Kingdom who own only pedigree dogs.

**Group B = dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees.

When owners were asked to rate to what extent the fact that their dog(s) were insured, vaccinated or re-homed influenced their decision to acquire them, the median rating for all three considerations across both groups A and B was 1 meaning these considerations were largely perceived to have no influence (min,max: 1,10). A further breakdown is shown in Table 32.

Table 32: Influence of whether dogs were insured/vaccinated/neutered on owners' decisions to buy or re-home them, based on rating scale responses where 1= no influence and 10= complete influence/reason for getting dog.

Status when bought or re-homed	Level of influence rated							
	Group A*				Group B**			
	n	Median	Min, Max	I don't know n (%)	n	Median	Min, Max	I don't know n (%)
Insured	271	1	1,10	12 (4.2)	89	1	1,10	1 (1.1)
Vaccinated	364	1	1,10	5 (1.4)	242	1	1,10	4 (1.63)
Neutered	121	1	1,10	4 (3.2)	134	1	1,10	2 (1.5)

* Group A = dog owners residing in the United Kingdom who own only pedigree dogs.

**Group B = dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees.

4.3.6. Seeking information during a dog's lifetime

Participating owners reported using a variety of information sources to research about their dogs during their lifetime. Popular sources of information included the general internet (Overall: 11%, n= 776), vets (Overall: 10.3%, n= 722) and books (Overall: 9.4%, n= 661). A further breakdown of the data collected is shown in Table 33.

Table 33: Information sources dog owners use to research all aspects of their dog during its lifetime as reported in questionnaires administered to both pedigree and non-pedigree dog owners in the United Kingdom in 2013. Multiple choice data presented as the total (n) of the whole dataset and percentage of all responses.

Information source	Group A* (n= 537) % (n)	Group B** (n= 539) % (n)	Overall (n= 1076) % (n)
General internet search	10.3 (390)	11.9 (376)	11.0 (776)
Your vet	9.5 (359)	11.2 (354)	10.3 (722)
Books	9.1 (346)	9.7 (306)	9.4 (661)
Online forums and blogs	8.0 (302)	9.9 (311)	8.8 (621)
Other owners	7.1 (269)	7.7 (244)	7.4 (520)
Friends or relatives	5.5 (208)	7.0 (222)	6.2 (435)
Behaviourists or dog/puppy trainers	4.9 (187)	6.4 (202)	5.6 (394)
Dog magazines and newspapers	4.9 (184)	4.7 (147)	4.8 (336)
Breed club websites	5.4 (205)	2.0 (62)	3.9 (272)
Animal shelter/charity/rescue	2.5 (95)	5.2 (164)	3.7 (262)
Veterinary websites	3.7 (140)	3.7 (116)	3.7 (260)
Social networking sites	3.0 (113)	3.7 (117)	3.3 (233)
The Kennel Club website	3.9 (147)	2.0 (63)	3.0 (214)
Dog breeders	4.4 (167)	1.3 (42)	3.0 (213)
Scientific papers and journals	2.7 (103)	2.8 (88)	2.8 (194)
Kennel club literature and publications	3.2 (123)	1.6 (51)	2.5 (177)
Dog shows	2.7 (102)	2.1 (66)	2.4 (171)
Television	1.4 (53)	2.1 (66)	1.7 (120)
Breed health committees	2.7 (102)	0.4 (14)	1.7 (119)
Groomers	1.5 (55)	1.5 (47)	1.5 (103)
Pet shops	1.1 (42)	1.4 (45)	1.3 (88)
Breed club newsletters	1.8 (67)	0.3 (10)	1.1 (79)
Other	0.7 (28)	1.3 (40)	1.0 (69)
Total n	**3787**	**3153**	**7040**

*Group A = dog owners residing in the United Kingdom who own only pedigree dogs.
**Group B = dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees.

4.3.6.1. Preferred method of receiving information

The majority of participating dog owners reported verbal communication to be their preferred method of receiving information (Overall: 56.1%, n= 565) followed by emails (Overall: 16%, n=161) and posts on websites, blogs and forums (Overall: 15.5%, n=156).

4.3.6.2. Seeking information from others

Overall vets were the main party from which information was sought regarding dogs' general health (52.2%, total n=761), health when ill (79.1%, n=987), vaccinations (74.3%, n=885), worming (69.3%, n=816) and micro-chipping (67.4%, n=770). Friends, family and colleagues were indicated to be the second most popular source of information after vets concerning dogs' general health. Regarding behaviour, information was sought from 'other' parties (32.4%, n=453), friends, family and colleagues (27.1%, n=379) and vets (22.6%, n=316). Information on diet and exercise was sought from both vets and 'other' parties (Diet: vets: 36.9%, n=483; other: 25.6%, n=336; Exercise: vets: 26%, n=326; other: 20.8%, n=261), although 20.3% of respondents (n=254) indicated that information on exercise was not always sought. Information on breeding was not required by 48% of participants (n=552), although those that required this information sought it from vets (15.3%, n=174), breeders (13.1%, n=149) or not at all (12.9%, n=147).

Chi squared analysis showed a significant difference between the opinions of owners of pedigree dogs only (Group A) and those who owned either non-pedigree dogs, or a mix of pedigree and non-pedigree dogs (Group B). Those in Group A were significantly more likely than those in Group B to seek advice from a breeder as opposed to a vet on their dogs' general health ($p=<0.0001$), health when ill ($p=<0.0001$) and breeding ($p=0.0004$). See Table 34.

Table 34: Parties from whom dog owners seek advice about their dogs' health and care based on owners' questionnaire responses. As multiple responses could be given for each question, results are presented as an overall percentage of all responses given.

			Subject																	
			General health		Health when ill		Behaviour		Diet		Exercise		Breeding		Vaccinations		Worming		Micro chipping	
			n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Potential source of information	Vet	A	383	49.6	505	77.3	151	21.4	248	36.2	174	26.5	105	17.2	455	72.9	422	67.6	395	66.6
		B	378	55.2	482	81.1	165	23.9	236	37.8	152	25.4	69	13.1	430	75.8	394	71.2	375	68.3
		Overall**	761	52.2	987	79.1	316	22.6	484	39.9	326	25.9	174	15.3	885	74.3	816	69.3	770	67.4
	Breeder	A	**101***	13.1	**41***	6.3	94	13.5	91	13.5	85	13	**117***	19.1	36	5.8	36	5.8	40	6.7
		B	23	3.4	10	1.7	24	3.5	22	3.5	23	3.8	32	6.1	7	1.2	3	0.5	9	1.6
		Overall**	124	8.5	51	4	118	8.4	113	9.3	108	8.6	149	13.1	43	3.6	39	3.3	49	4.3
	Friends/ family/ colleagues	A	162	21	58	8.9	182	25.7	112	16.3	126	19.2	39	6.4	40	6.4	46	7.4	30	5.1
		B	174	25.4	62	10.4	197	28.5	121	19.4	122	20.4	16	3	37	6.5	40	7.2	34	6.2
		Overall**	336	23	120	9.6	379	27.1	133	10.9	248	19.8	55	4.8	77	6.5	86	7.3	64	5.6
	Other	A	99	12.8	47	7.2	210	29.7	162	23.6	123	18.8	33	5.4	68	10.9	80	12.8	53	8.9
		B	83	12.1	38	6.4	243	35.2	174	27.8	138	23.1	20	3.8	67	11.8	70	12.7	61	11.1
		Overall**	182	12.5	85	6.8	453	32.4	336	27.7	261	20.8	53	4.6	135	11.3	150	12.7	114	9.9
	I don't know	A	0	0	1	0.2	2	0.3	3	0.4	2	0.3	3	0.5	1	0.2	0	0	0	0
		B	1	0.1	0	0	2	0.3	0	0	0	0	4	0.8	0	0	0	0	0	0
		Overall**	1	0	1	0	4	0.2	3	0.2	2	0.1	7	0.6	1	0	0	0	0	0
	I don't source advice	A	24	3.1	1	0.2	45	6.4	57	8.3	119	18.1	69	11.3	18	2.9	33	5.3	48	8.1
		B	21	3.1	1	0.2	38	5.4	58	9.3	135	22.6	78	14.9	19	3.4	34	6.1	36	6.6
		Overall**	45	3	2	0.1	83	5.9	115	9.5	254	20.3	147	12.9	37	3.1	67	5.7	84	7.4
	Not applicable	A	3	0.4	0	0	23	3.3	13	1.9	27	4.1	246	40.2	6	1	7	1.1	27	4.6
		B	5	0.7	1	0.2	22	3.2	14	2.2	28	4.7	306	58.3	7	1.2	12	2.2	34	6.2
		Overall**	8	0.5	1	0	45	3.2	27	2.2	55	4.4	552	48.5	13	1	19	1.6	61	5.3

Group A = dog owners residing in the United Kingdom who own only pedigree dogs. Group B = dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees. * p=<0.001. **Overall = Groups A and B combined.

4.3.7. Perceptions of knowledge

Participating pedigree dog owners (Group A) rated themselves to be the least knowledgeable party on pedigree dog breeding, canine hereditary disease and hereditary disease screening programmes. Breeders were rated to be more knowledgeable than vets on dog breeding, although vets were rated to be more knowledgeable than breeders on hereditary disease screening programmes. Vets and breeders were perceived to be equally knowledgeable concerning canine hereditary diseases (see Table 35).

Table 35: Pedigree dog owners' perceptions of vets' (VS) and pedigree dog breeders' (PDB) knowledge compared to their own (PDO) on various topics relating to pedigree dog health (1 = very poor knowledge and 10 = very good knowledge).

Topic	Groups	Pedigree dog owner responses			
		Median Rating	Min, Max	No. of respondents that gave a rating	No. of respondents that answered 'I don't know' (n)
Pedigree dog breeding	VS	7	1,10	473	120
	PDB	8	1,10	502	90
	PDO	6	1,10	533	56
Canine hereditary diseases	VS	8	1,10	543	49
	PDB	8	1,10	511	80
	PDO	6	1,10	548	41
Hereditary disease screening programmes	VS	9	1,10	526	68
	PDB	8	1,10	491	102
	PDO	6	1,10	519	67

Kruskal-Wallis analysis showed a significant difference between the knowledge ratings pedigree dog owners awarded vets, pedigree dog breeders and pedigree dog owners on pedigree dog breeding ($H(2)= 207.9$, $p=<0.001$), inherited diseases ($H(2)= 205.8$, $p=<0.001$) and health screening programmes

(H(2)= 223.5, p=<0.001). Mann-Whitney tests were used for *post-hoc* analysis of these findings with a Bonferroni correction applied (significance level: p=0.01, 0.05/3=α/k where k is the number of pairwise comparisons). Paired comparisons of vets and breeders, breeders and owners and vets and owners knowledge ratings on these three topics showed significant differences for all (p=<0.001).

4.3.8. Awareness of the Kennel Club and their perceived role

When asked whether they had heard of the Kennel Club, 98.4% of the 977 owners who responded said they had heard of this organisation (A: 99.4%, n= 495; B: 97.3%, n= 466).

Free text responses indicated owners' perceived roles of the Kennel Club to vary. Of those roles given, 'Approval of responsible breeders/breeding practice' (35.4%, n=233), 'Defining breed standards' (29.9%, n=197) and 'Promoting responsible dog ownership/welfare' (22.9%, n=151) were among the most popular roles reported. See Table 36.

Table 36: Dog owners' perceived roles of the Kennel Club as indicated by free text questionnaire data obtained in 2013.

Perceived role of Kennel Club	Group A* (n=334) % (n)	Group B** (n=324) % (n)	Overall (n=658) % (n)
Approval of responsible breeders/breeding practice	36.5 (122)	34.3 (111)	35.4 (233)
Defining breed standards	24.9 (83)	35.2 (114)	29.9 (197)
Promoting responsible dog ownership/welfare	25.4 (85)	20.4 (66)	22.9 (151)
Judging and regulating dog shows/agility/racing	23.7 (79)	21.6 (70)	22.6 (149)
Providing advice, support, information and education	26.3 (88)	18.2 (59)	22.3 (147)
Promoting health and well-being (including health schemes)	27.2 (91)	15.1 (49)	21.3 (140)
Registry of breeds and dogs	1.8 (6)	27.2 (88)	14.3 (94)
Regulatory body	7.2 (24)	6.2 (20)	6.7 (44)
I don't know	3.0 (10)	7.1 (23)	5.0 (33)
Promoting pedigree dogs	4.5 (15)	5.6 (18)	5.0 (33)
Training	4.2 (14)	2.5 (8)	3.3 (22)
Protecting the interests of breeders	1.8 (6)	3.4 (11)	2.6 (17)
Lobbying/political voice for dogs	2.7 (9)	1.5 (5)	2.1 (14)
Breeding clubs	1.8 (6)	0.9 (3)	1.4 (9)
Other	3.3 (11)	1.9 (6)	2.6 (17)

* Group A = dog owners residing in the United Kingdom who own only pedigree dogs.
**Group B = dog owners who reside in the UK and own either non-pedigree dogs only or a mix of pedigrees and non-pedigrees.

'Other' roles of the Kennel Club included 'general improvement of dogs', 'funding of research', 'marketing', 'representing dog owners' and 'pet insurance'.

4.3.9. Further results

A complete breakdown of the owners' questionnaire findings is provided in detail in Appendix 8.

4.4. Discussion

This chapter has investigated dog ownership in the UK with specific emphasis on the drivers of dog acquisition and the process through which dogs are sourced, along with relevant information about their care. Owners' perceptions of key stakeholders involved in canine health have also been explored. Study results have indicated companionship to be a key reason for acquiring a dog. The vast majority of owners had sourced information pre-acquisition of their dog(s) from a variety of sources of which the general internet was most popular. Key factors influencing owners' decisions to acquire a dog from a given place were the specific desire to acquire a rescue dog, considerations relating to the reputation of the seller and the dog or puppy being available at a convenient time. Participating owners reported using a variety of sources to seek information about their dogs during their lifetime, of which the internet was again the most popular source. Owners perceived breeders to be more knowledgeable than vets regarding dog breeding, but vets to be more knowledgeable than breeders concerning hereditary disease screening programmes. Vets and breeders were perceived by owners to have equal knowledge concerning canine hereditary diseases. The vast majority of owners had heard of the Kennel Club, perceiving it to have varying roles including the approval of responsible breeders, defining breed standards and promoting responsible ownership. These findings will be discussed in further detail below.

Response attainment and participant demographics

The overall population of dog owners in the UK is largely unknown and thus it was not possible to do a census of this target population. Instead data were collected via a convenience sample. This however meant that it was impossible to calculate a response rate, as the number of owners who had opted out of the research was unknown. *Post hoc* analysis indicated the sample size of dog owners obtained for this study to be adequate in order to draw meaningful conclusions from the data collected; however it is possible this calculation may not be suitable for all questions and this should therefore be taken into account

when interpreting the results. Of the participating dog owners, slightly more respondents owned pedigree dogs than non-pedigree dogs (610 vs. 557). As the exact ratio of pedigree dogs to non-pedigree dogs in the UK is unknown, along with owners' tendencies to own either pedigrees or non-pedigree dogs only or a combination of both, it is difficult to tell how representative these results are of the wider population. Whilst participants were not asked if the incentivisation offered encouraged them to take part in the study, research has indicated incentivising studies improves the response rates achieved (Edwards *et al.*, 2002). Further research has also indicated that offering solely monetary incentives can achieve better response rates still (Edwards *et al.*, 2002) and this could therefore be a consideration for future research as an alternative to offering vouchers or hampers.

The majority of participants had heard about the study questionnaire via social networking sites and dog forums, suggesting social networking to be an effective method of recruiting internet-using dog owners. Most respondents were female, a finding similar to that of both the vets' and breeders' studies in Chapter 2. This may be attributed to a number of factors such as more women owning dogs, a greater tendency for women to use social networking sites and forums or simply a greater tendency for women to undertake online research. Participants varied in age, the number of dogs they kept and the length of time they had kept dogs for, suggesting a spectrum of knowledge and experience. The majority of participants had been keeping dogs for between 1-15 years and this may correlate with the younger generations that are competent internet users. Finally, the majority of participants had not worked with dogs, were not Kennel Club members and had not bred from any of their dogs. Such findings suggest that this study was successful in recruiting a sample of 'ordinary' owners, the majority of whom are unlikely to possess conflicting interests or specialist knowledge beyond that of the normal dog owning population.

Pedigree dog data collected indicated participants kept a variety of dogs of which Cavalier King Charles Spaniels, Border Collies and Labradors were the most common. Similarly, Kennel Club data on the top 20 breeds in 2012

indicated that Labradors were the most common breed. Cavalier King Charles Spaniels appeared ninth on the list; however, Border Collies were not featured at all (The Kennel Club, 2012b). Conversely, breed popularity in relation to Google hits, indicated the top three most popular breeds (based on the number of online searches conducted) to be Bulldogs, Chihuahuas and Poodles (Yahoo, 2013), with the 'Collie type' featuring eighth. One possible explanation for Border Collies being a popular breed kept in this study may be attributed to the fact that a proportion of the data collection for this questionnaire occurred through agility pages on social networking sites, with border collies being a popular breed kept for this hobby. The ages of pedigree dogs kept ranged from 1-18 years, a result which seems realistic given the summary results of the Purebred Dog Health Survey for all breeds indicated the median age at death across all breeds to be 11 years and 3 months for pedigree dogs (BSAVA Scientific Committee and The Kennel Club, 2004). Postcode data provided by participating owners indicated them to be located all over the country, a finding that suggests the data are, from a geographical point of view, representative. Whilst the exact spread of dogs and their owners is unknown, data collected by the Pet Food Manufacturers Association (PFMA) in 2013, supported this finding indicating there to be a fairly even spread of dogs owned between regions, with the only exception being London where proportionally less dogs were owned (PFMA, 2013b).

Reasons for acquiring a dog, finding a dog and pre-acquisition research

Of the reasons reported by owners for getting a dog, companionship for themselves or their family and exercise were among the most frequently selected options. Similarly, PFMA data indicated companionship as one of the top five reasons for people owning a cat or dog (PFMA, 2012). Interestingly, in 2008, PFMA data indicated 60% of single people in the UK bought a pet for companionship (PFMA, 2012). These findings may be due to the increased promotion of the benefits of dog ownership in recent years (Dogs Trust, 2011), along with proposed benefits to health, social and emotional well-being (Thorpe *et al.*, 2006, Knight and Edwards, 2008). Owners of pedigree dogs more

frequently reported acquiring their dogs for breeding and showing, when compared to owners who owned non-pedigrees only or a mix of pedigree and non-pedigree dogs. This may be explained in part by the fact that more owners of pedigree dogs only also reported either being a breeder or having the occasional planned litter. Furthermore, whilst any breed of dog can be shown at fun companion dog shows, to participate in breed shows dogs must be deemed pedigree and adhere to the breed standards (The Kennel Club, 2013f).

Dog owners participating in this study most frequently reported that they had become aware that their dog(s) were available for purchase or re-homing via an animal shelter, charity or rescue. As the study surveys were promoted successfully through a number of forums, including sites such as the Dog Rescue Pages forum (http://www.dogpages.org.uk) which lists a number of breed rescues and rescue centres, this may explain why so many owners had heard about their dogs in this way. When the owners of pedigree dogs only were analysed independently from those who owned either crossbreeds or a mix of pedigrees and non-pedigrees, individual results showed that owners of pedigree dogs more frequently reported that they had become aware of their dog(s) through a breeder, these owners were also significantly more likely to have heard their dogs were available for purchase/acquisition via the KC. This was a logical finding for those seeking a specific breed of pedigree dog, especially since the majority of those owning pedigree dogs only had later reported sourcing their dog(s) directly from a breeder.

The majority of owners reported sourcing information prior to getting their dog(s) but a fifth did not. This is similar to PDSA data collected in 2013 which found 26% of owners do no research at all before taking on a pet (PDSA, 2013). These findings may be attributed to any number of factors, for example, these owners may have perceived themselves to have sufficient experience not to need to carry out research prior to getting a new dog or they may simply have acquired their dog within a time frame which did not allow for prior research. Of those owners who did source pre-acquisition information, sources were varied, with very few indicating a proportion of pre-acquisition information

would be sought from vet practices. This finding is comparable to data collected by the PDSA which indicated only 5% of owners go to their vet for pre-purchase advice (PDSA, 2013). Further, in a survey of 459 vets and vet nurses undertaken by the PDSA, 33% of veterinary respondents were concerned about the lack of pre-purchase education (PDSA, 2013). Findings such as this suggest that perhaps owners do not want to consult their vet before getting a new pet, do not know that they can ask their vets for advice on this topic or are concerned that they may be charged for this service.

Deciding where to get a dog from and influencing factors

Participating owners reported the main parties or places they had acquired their dogs from to be breeders and animal shelters, charities or rescues. These findings were perhaps of no surprise given that for pedigree dog owners, breeders are a likely source of acquiring a dog. Further, 'other' data later indicated the desire to rescue a dog to be an influencing factor in deciding where to get a dog from, an inclination which would take prospective owners to rescues or shelters. Similarly, data collected by the PFMA in 2008 indicated the main places dog owners acquired their dogs from to be rescue centres (32%), from a friend or acquaintance (25%) or from a recommended breeder (16%) (PFMA, 2012). Other reasons for acquiring a dog from a certain person or place were varied, but included 'because the dog or puppy was available at a convenient time' or 'being influenced by the reputation of the breeder, seller or establishment' suggesting both convenience and responsibility play a part in decision making. Similar findings were seen in a study conducted by Leppanen and colleagues in 1998, in which Finnish dog owners identified considerations such as the puppy being available at a suitable time and the breeder's good reputation as key factors affecting their choice of litter and breeder (Leppanen *et al.*, 2000b).

The majority of dogs owned by survey participants were not insured or neutered when they were bought or re-homed, although the majority were vaccinated. However, when owners were asked to rate to what extent these

factors influenced their decision to acquire the dog or puppy, these considerations were largely perceived to be of little influence. This may be attributed to number of reasons, for example, these factors may not be considered as important to some owners, some puppies might be considered too young to be neutered at the point of sale or owners may simply plan to neuter or insure in the future regardless of the dog's status at the point of purchase or rehoming. This explanation would fit with PDSA data indicating that in 2013, 84% dogs were vaccinated, 80% micro-chipped and 73% neutered, an increase on the previous year although such data may be subject to positive response bias and should therefore be interpreted cautiously.

Seeking information during a dog's lifetime

Owners reported using a variety of information sources to research about their dogs during the dogs' lifetime including the general internet, vets and books. Data collected by a recent PDSA report showed similar findings, although unlike the results of this study 'vet or veterinary professional' was a more frequent source of pet care advice than the internet (PDSA, 2013). Interestingly, in a study carried out in Finland in 1998, when dog owners were asked where they sourced information specifically regarding inherited diseases and control programs, the top answers were the Kennel Club magazine, breed club magazines, vets and breeders (Leppanen *et al.*, 2000b). However, these findings are of limited comparison to the present study and raise the question of whether the internet was used less in Finland in 1998. Further it is possible that the resources owners use change depending on the topic of interest, meaning different answers may apply when considering different aspects of dogs' care.

For participating owners the preferred method of receiving information was via verbal communication, suggesting owners may particularly benefit from receiving information face to face from vets, breeders or other parties. These findings were comparable to those of Chapter 2 which found vets and breeders to prefer delivering information verbally. However, it should be noted that

owners were not asked whether they would prefer any of these methods of conveying information in conjunction with each other. For example, receiving supplementary written information alongside verbal advice may help owners to understand the information conveyed and allow information to be revisited at a later date. It is impossible to know if there would have been a difference in responses obtained if this question had been phrased differently, but this is an important consideration for future research. The next most popular sources of receiving information after verbal communication were online methods such as email, posts on websites, blogs or forums and via social networking sites. As several key reports (Rooney and Sargan, 2009, Bateson, 2010, APGAW, 2012) have voiced a need for better public education, these findings suggest that online methods hold potential for implementing the dissemination of quality information about canine welfare on a scale where verbal communication is not achievable. Such measures could also be supplemented by educational talks, for example, in schools or vet practices.

Regarding different aspects of their dog's care, owners reported vets to be the main party from whom information was sought on dogs' general health, health when ill, preventative care and micro chipping. These findings suggest that vets are well respected as a source of advice and utilised more than breeders. However this result may have been subject to social acceptability bias with owners answering this question based on whom they would like to consult for advice rather than who they actually go to. This consideration is difficult to control for with this type of data collection. Friends, family and colleagues were indicated to be the second most popular source of information after vets concerning dogs' general health. Similarly, 'friends and family' were rated as the third most popular source of pet care advice in a recent PDSA report (PDSA, 2013). Information on breeding was not required by nearly half of participants, a finding that was of little surprise given almost 90% of participants reported themselves to have never bred from any of their dogs. Overall slightly more participants would consult vets for advice on this topic, but when looking at pedigree dog owners specifically a slightly higher percentage would consult

breeders. Such findings indicate vets and breeders to both have a key role in advising on dog breeding. Owners of pedigree dogs were significantly more likely to seek advice from breeders than vets regarding their dogs 'general health, health when ill and breeding, when compared with those who owned either non-pedigree dogs or a mix of pedigree and non-pedigree dogs. This may be explained by the fact that owners of pedigree dogs were more likely to have acquired a dog from, and thus developed a relationship with, a breeder.

Perceptions of stakeholder knowledge

Pedigree dog owners rated vets to be more knowledgeable than breeders concerning hereditary disease screening programmes and breeders to be the most knowledgeable regarding dog breeding. Vets and breeders were perceived by owners to be equally knowledgeable concerning canine hereditary diseases and owners rated themselves to be the least knowledgeable party on all three topics. These findings are particularly interesting when compared to those of vets and breeders from Chapter 2. Like owners, vets and breeders perceived owners' knowledge on these topics to be less than that of vets or breeders. However, breeders considered themselves to be most knowledgeable on each topic. Vets too rated their knowledge highly, but regarded vets and breeders to have equal knowledge on dog breeding. Such differences in opinion may influence the way information is sourced and exchanged between these parties. Conflicting views regarding knowledge levels may also result in barriers to communication and further, foster confusion surrounding the roles vets and breeders should play in providing education and advice to owners.

Results from the present study also offer some similarity to results from the Leppanen study of dog owners, which indicated that 47% of Finnish owners rated their personal knowledge of canine inherited diseases and health control programmes to be average, with a further 27% estimating their knowledge to be below average (Leppanen *et al.*, 2000b). Further results indicated 54% of Finnish respondents to perceive they did not get enough information on these

topics (Leppanen *et al.*, 2000b). With regards to breeders, findings from the Leppanen study indicated 46% of owners to perceive breeders to have a high level of knowledge, with 63% perceiving breeders to have enough information on inherited diseases and control programs (Leppanen *et al.*, 2000b). The fact that this study is now over 15 years old and further was carried out overseas, limits comparisons with the present study. However, it raises the question of the reasons behind UK owners' perceptions of their own knowledge and whether, if asked, they too would feel they lacked information on the topics in question (a consideration which could form the basis for future research).

It is understandable that owners in the present study may perceive vets and breeders (who have acquired professional knowledge and experience in this area) to be more knowledgeable than themselves. Indeed, in a study carried out by Lund and colleagues, Norwegian and Icelandic dog owners expected small animal practitioners to keep up to date on every aspect of small animal medicine (Lund *et al.*, 2009), an expectation that may also be true of owners in the UK. A survey of the attitudes of UK rabbit owners found knowledge and attitudes to be significant factors in whether respondents adequately met their pets welfare needs on issues such as neutering and providing an appropriate companion (Edgar and Mullan, 2011) and a recent survey of stakeholders in canine welfare identified dog owner unawareness and ignorance as an adverse welfare issue (Buckland *et al.*, 2013). Therefore, dog owners' knowledge may similarly impact on canine welfare and, along with their perceptions of other stakeholders' knowledge, may influence the way information is sourced by owners, who they go to for advice and the decisions they make.

For the purposes of this study it was decided that these questions would only be answered by respondents who owned solely pedigree dogs (Paws4pedigrees questionnaire) and not those owning non-pedigrees or a mix of pedigree and non-pedigree dogs (Paws4pups questionnaire). This decision was firstly based on the assumption that those owning pedigree dogs were likely to have had contact with a pedigree dog breeder and thus would be able to rate breeder knowledge. Secondly this decision was made on the basis that

whilst some respondents completing the Paws4pups questionnaire may have felt able to answer these questions, a proportion might not (having never acquired a pedigree dog) and there would be no straight forward way to administer the questionnaire to account for this. Administering the questionnaire to both groups of respondents may have resulted in those who had no experience with pedigree dog breeders answering in the way they perceived they should, rather than based on experience, subjecting the results to social acceptability bias.

Awareness of the Kennel Club

The majority of participating owners had heard of the Kennel Club. Free text responses indicated that owners perceived the Kennel Club to have many roles of which approving responsible breeders, defining breed standards and promoting responsible dog ownership were the top three. These results were comparable with those of vets and breeders in Chapter 2, in which addressing breed standards, promoting responsible breeding and educating the public were indicated to be roles associated with the Kennel Club. Although the majority of owner respondents reported that they knew of the Kennel Club, the degree of variability in the data collected on its roles indicates that knowledge of this organisation varies greatly from owner to owner. In hindsight it would have been very interesting to find out how owners had become aware of the Kennel Club, particularly with regards to negative publicity such as that linked with Pedigree Dogs Exposed. These results indicate that whilst the existence of the Kennel Club is well known, more needs to be done to raise public awareness of the roles it actually carries out to ensure that owners are aware of the information and services it offers.

Study limitations and considerations

The research conducted in this chapter was open to several limitations. The overall population of UK dog owners is difficult to define. This raised a number of challenges regarding recruiting a representational sample of dog owners for this study. In 2012, 87% of people in the UK were reported to be internet users (Google, 2012), it was therefore decided to conduct an online questionnaire recruiting a convenience sample of dog owners through dog relevant web pages and social media. Although this method was limited to those with internet access, it was hoped recruiting in this way would also allow data collection from non-vet-visiting owners and those who owned dogs which were not micro-chipped, insured or Kennel Club registered. Despite aiming for the most representative sample possible, promotion of the questionnaire through certain dog web pages did introduce a degree of bias, for example, those with an active interest in rescuing dogs may be over-represented due to the questionnaire being distributed through dog rescue web pages. This issue highlights the difficulties of trying to recruit a diverse demographic of owners in the UK and raises questions on how to overcome this issue, for which there is currently no 'gold standard'. Further, respondents who did not supply postcode data were assumed to be UK residents as per the requirements of study participation. It is therefore possible that some of these responses may have come from outside the UK if owners did not read the study entry requirements, however this is a difficult consideration to overcome when convenience sampling.

After the pilot it was decided to deliver two questionnaires, one for pedigree owners (A) and one of owners of either non-pedigree dogs or both pedigrees and non-pedigrees (B). During the data collection it became apparent that some participants considered their crossbreed 'designer dog' a pedigree. This may be due to the tendency for such crosses to be assigned 'breed' names such as 'Cockapoos' or ''Dorkies' or the fact that some of these hybrids are sold at price comparable to the cost of pedigrees. In the context of this study, this made 'pedigree' a difficult term to define. As such, the definition of a pedigree

dog was not stipulated as the start of this questionnaire. It was instead decided that owners' perceptions of owning a pedigree dog, whether technically true or not, may be significant enough to affect their attitudes and subsequent answers. Owners meeting such criteria were therefore left to self-categorise and fill in the version of the questionnaire they felt most applicable to them. However, some participants still managed to fill in the wrong version of the questionnaire, for example, clearly stating that they owned a crossbreed dog but completing the pedigree only version of the questionnaire. Public perception of what a 'pedigree dog' actually is may also become increasingly relevant to future studies carried out in this area.

Questionnaires as a research tool are open to a number of potential limitations such as self-selecting bias, a limited opportunity to clarify question meaning and the fact that responses cannot be supplemented with additional information as with an interview or focus group (Kumar, 2005, Dillman and Groves, 2011). A requirement for taking part in the questionnaire was for owners to recall certain information from when they first acquired their dog(s). For those who owned a single older dog it is possible that not all of this information may have been recalled correctly. Further, the majority of questions featured in this questionnaire were closed and although free text boxes were provided for 'other' answers, the complexity of this topic may have been better explored via interviews or focus groups to enable richer data collection. As with many research methods, elements of this questionnaire may have also been open to social acceptability bias, particularly concerning health related questions and whether or not owners had sourced information about their dogs. This particular consideration is difficult to overcome, more so as internet users completing this questionnaire would have had easy access to internet resources at the same time. However, as online data collection allows for anonymity it can be hoped that participants felt able to provide honest answers.

Finally Chi-squared analyses were carried out on data relating to the parties from whom dog owners sought information on various aspects of their dogs'

care. Whilst interesting for developing hypotheses for future research, these values should be interpreted with caution as the degree to which this convenience sample is representational of the 'average' dog owning population is unknown. Further analysis of these data could have also involved separation of the Group B (Paws4pups) data into owners of non-pedigree dogs only and owners of both pedigree and non-pedigree dogs to allow for further statistical comparison with the data collected from Group A. Whilst the time allocated for this study did not allow for such a comparison this is a consideration which could be developed in a future extension of this study.

Future research

Findings from this study demonstrate that a lot is still unknown about the dog owning population in the UK and as a result it is difficult to target representative data collection from this demographic. Whilst the data collected offers a more informed insight into what information resources owners use, the circumstances in which they might choose to utilise different resources or avenues of advice is still unknown. Further, little is known about how, or if, owners appraise the information or advice they access. This chapter has raised a number of questions regarding the best methods to disseminate quality, useable and understandable information to prospective or current dog owners if better education of these groups is to be achieved. Results have indicated the internet to be a key resource used by owners both pre and post-purchase. This medium may therefore have the potential to be instrumental in implementing such educational initiatives. However, little is known about how owners use the internet, what they look for in relation to their dogs or the quality of the information generated as a result. These considerations could therefore form the basis of a further questionnaire based investigation or review of existing resources to better inform future policy making.

4.5. Conclusion

The results of this chapter have indicated owners' primary reasons for wanting a dog to be companionship, with very few breeding from the dogs they own. Further, owners' methods of acquiring dogs and the information and advice they source about their dogs are vast and come from a variety of sources. The key findings from this chapter suggest that advice for dog owners needs to be available in different forms and not just from individual parties such as breeders or vets. It is apparent that factors surrounding dog ownership are subjective and as a result the considerations or needs of each owner may be very different. This is a complex area and more needs to be done to understand the dog owning population if successful public education campaigns are to be implemented, as recommended by several key reports (Rooney and Sargan, 2009, Bateson, 2010, APGAW, 2012). For future interventions to be successful better access to dog owners is required. Relevant information needs to be delivered in a way that is useable, understandable and accessible and a multifaceted approach is required to achieve this. These results indicate that owners do source some pre-purchase information for which the internet is a key resource. Thus this medium offers a great deal of potential for enabling cheap, simple and widespread distribution of good quality information. However, whilst a great deal of information already exists on the internet, little is known about how UK dog owners search the internet, or the quality of the resources generated by their searches. This matter will be investigated further in Chapter 5 by exploring:

I. The search terms or expressions owners use when searching online for information on how to care for a new dog
II. The online resources generated as a result of such searches including their relevance, format, usability and readability
III. Critical appraisal of these resources for indicators of quality

Chapter 5 - What terms or expressions do dog owners use when searching online for information on how to care for a new dog and what online resources are generated as a result?

5.1. Introduction

Recent years have seen increased publicity regarding pedigree dog welfare, with concerns not just applicable to dogs bred in the United Kingdom (UK) but across the world. In 2008 Pedigree Dogs Exposed heightened public awareness of the negative welfare consequences of some selective breeding practices (see 1.6) (The BBC Press Office, 2008) and consequent discussion was ignited at many levels regarding the need for action to safeguard future canine welfare. Whilst many key stakeholders are involved in the health of pedigree dogs (Rooney and Sargan, 2009), the dog owning public may have a greater role in safeguarding the future welfare of dogs than the lack of research in this area implies. The three key reports outlined in 1.7.1, 1.7.2 and 1.7.4 agreed on the need for better public education and awareness regarding canine welfare, particularly concerning those wishing to acquire a dog or puppy (APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010). Yet whilst new educational initiatives have been created in the years subsequent to these reports, for example the RSPCA's 'Get Puppy Smart' tool (RSPCA, 2011a), no research was first undertaken to identify existing public knowledge on canine welfare, the quality of current information resources and the methods through which these resources are accessed by the public.

An update report issued by the APGAW in 2012 identified the belief that a more educated public would necessitate, via consumer demand, good breeding practice and promote responsible breeders (APGAW, 2012). With this in mind prospective dog owners are in a good position to initiate positive welfare changes, with exposure to quality information enabling good decision making, both at the time of purchase and throughout their dogs' lifetimes. A report issued by the PDSA in 2013 indicated that of the information sources used by owners, vets were rated to be the most common source of advice on pet care (76%), followed by the internet (50%) (PDSA, 2013). Interestingly, findings

from the previous chapter also indicated the internet to be a key source of advice for dog owners, with results indicating the internet to be the most frequently chosen source of advice both pre-purchase and during a dog's lifetime (see 4.3.4, Table 28 and 4.3.6, Table 33). Whilst verbal communication was dog owners' preferred method of receiving information, emails, posts on websites, blogs or forums and posts on social networking sites were the next most frequently selected methods (see 4.3.6.1). These results indicate the internet may have a key role in dog owners' acquisition and exchange of information and this medium may therefore offer a key contribution in shaping future knowledge and behaviours of UK of dog owners.

In 2013 in Britain it was estimated that 36 million adults (73%) accessed the internet every day, with those accessing the internet by mobile phone having doubled between 2010 and 2013 (Office for National Statistics, 2013). Increasingly more people were also using the internet as a means of seeking health information (Office for National Statistics, 2013). A recent public opinion survey conducted on behalf of www.ancestry.co.uk found that of 1172 pet owners, 89% considered their pet to be part of the family (Ancestory.com, 2013). Such perceptions may mean that, along with an increased tendency for people to access the internet as a means of sourcing health information for both themselves and their family members, people will also more frequently turn to the internet when making health care decisions about their pets (Murphy, 2006). In many ways veterinary medicine can be considered comparable to paediatric care, due to the limited communicative ability of both animals and young children and the consequent need for the client or parent to take a more significant role in decision making. A study conducted by Wainstein and colleagues in 2006 found a significant proportion of parents of hospitalised children turned to the internet as a means of obtaining information influential on decision making (Wainstein *et al.*, 2006). Such findings may be true of UK dog owners who are reported to often use the internet to educate themselves about their pet's health (Jehn *et al.*, 2003). Further, research conducted by Kogan and colleagues in both 2008 and 2012

predicted increased use of the internet in the future by pet owners as a means of obtaining pet health information (Kogan *et al.*, 2008, Kogan *et al.*, 2012).

A vast amount of information on dog care is available online, in many formats and varying greatly in quality. A wealth of reliable knowledge can be accessed via the internet with organisations such as the Kennel Club, Dogs Trust and Hill's Pet Nutrition supplying information for new dog owners (The Kennel Club, 2013j, Dogs Trust, 2014, Hills Pet Nutrition, 2014). However, there is no enforced system for quality control on the internet (Jehn *et al.*, 2003, Scarsbrook *et al.*, 2005) and despite reports that not all online resources originate from reputable sources, it is becoming increasingly more common to search for health information online (Sillence *et al.*, 2007). Therefore, online resources may be either beneficial or detrimental to those who make decisions based on the information they find (Bessell *et al.*, 2002), with some owners being misinformed or mislead by unreliable websites (Jehn *et al.*, 2003). Whilst it may be hard for lay people to evaluate how reliable website content is (Smart and Burling, 2001), knowledgeable owners looking for available information on specific diseases may be disappointed at the lack of accurate, detailed information available (Murphy, 2006). Such resources may benefit from critical appraisal guided by existing tools such as those used by the Joanna Briggs Institute or Cochrane Collaboration to assess quality and evaluate how such information resources could be improved (Joanna Briggs Insitute, 2011, The Cochrane Library, 2014).

These issues are exacerbated further by the fact that much accurate information lacks centralisation and is often shared between several independent websites. Whilst increasing research regarding human health information on the internet has been carried out, there is a lack of research concerning owners' use of the internet to source pet health information (Murphy, 2006, Kogan *et al.*, 2008). Investigation is therefore required on how dog owners search the internet for information on caring for a newly acquired dog, the information resources generated as a result of the searches they conduct and how this may influence owner behaviour and the welfare of the

dogs owned. This exploratory study therefore aimed to explore the objectives outlined below.

5.1.1. Study objectives

This study aimed to document and report:

I. Identify search terms or expressions owners use when searching online for information on how to care for a new dog
II. Collate online resources generated as a result of such searches including their relevance, format, usability and readability
III. Critically appraise the resources identified for indicators of quality

5.1.2. Study design

This study consisted of two stages; the first stage involved a cross-sectional questionnaire based study to establish the terms or expressions owners use when searching the internet for information on how to care for a new dog. The second stage involved a scoping review of the online resources generated as a result of the most popular search terms identified in Stage 1 (see Figure 35).

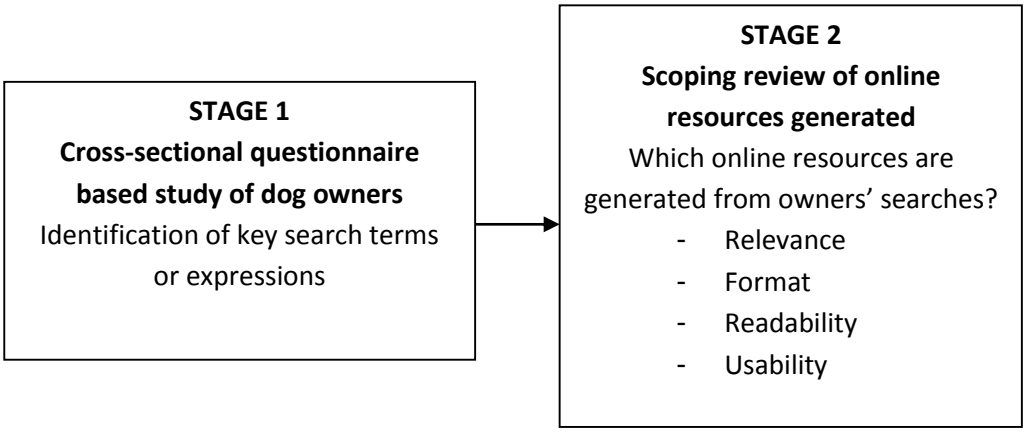


Figure 35: Two-stage study designed to identify which search terms or expressions owners use to search the internet for information on how to care for a new dog followed by a review of the results generated.

5.2. Materials and methods

5.2.1. Stage 1 (cross-sectional questionnaire based study)

Conducting an exploratory study of the expressions, words or phrases dog owners use when searching the internet for information on how to care for a new dog was considered necessary to inform the scoping review which would form the basis for Stage 2.

5.2.1.1. Sample selection

The target population was dog owners in the UK who had access to the internet. Participants were recruited via an email list of internet-using dog owners who had participated in a previous online questionnaire-based study and agreed to be involved in future research (see Chapter 4). An email list comprising of 264 pedigree dog owners and 254 owners of both pedigree and non-pedigree dogs) was therefore compiled through which the final questionnaire could be distributed. All dog owners on the list had expressed an interest in participating in further research conducted by the Centre for Evidence-based Veterinary Medicine (CEVM) and agreed to be contacted on this basis.

5.2.1.2. Questionnaire development and distribution

A single question was developed to collect any words or phrases dog owners reported that they would use to search the internet for information on how to care for a new dog (see Figure 36). It was decided that the final questionnaire would be administered via SurveyGizmo (SurveyGizmo, 2013). This software was chosen as it had received good feedback from the dog owners who completed the SurveyGizmo questionnaire in Chapter 4 and these were the same owners from whom the Chapter 5 participants would be sourced. Whilst comparable to SurveyMonkey used in Chapter 2, this software also allowed different formatting options and the end result was aesthetically better. This method of distribution was also both cheap and practical, particularly with regards to the time restraints of the study. The final questionnaire itself consisted of two pages. The first contained the question and the second

thanked owners of their participation and featured a hyperlink directing participants back to the CEVM website for further information regarding the study should it be required.

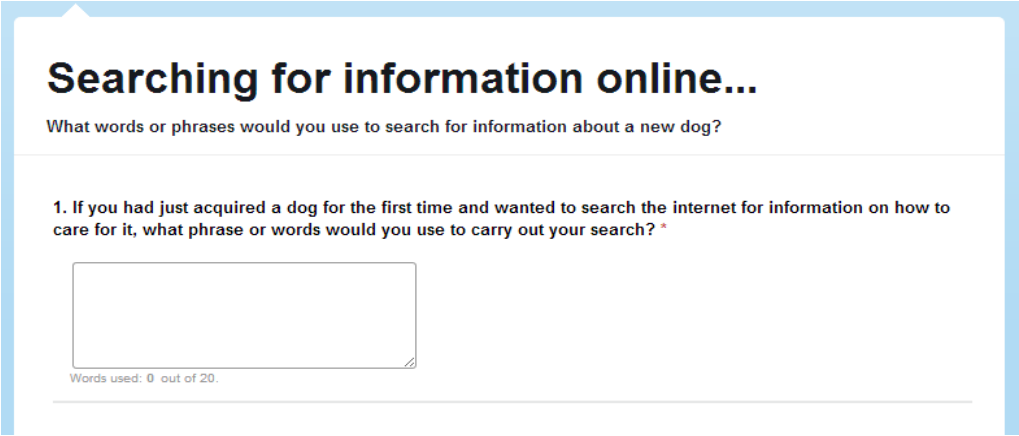


Figure 36: Screenshot showing the single question administered to owners of both pedigree and non-pedigree dogs in October 2013 to explore which words of phrases they would use when searching the internet for information on how to care for a new dog.

A total of 518 dog owners who had expressed an interest in participating in the study (see 5.2.2.1) were contacted by email at the start of October 2013. Recruitment emails contained both information about the study and a hyperlink directly to the study questionnaire which was estimated to take no more than 5 minutes to complete. The allocated data collection period was two weeks and after which the study questionnaire was closed and no further responses could be submitted.

5.2.1.3. Data collection and analysis

Responses were collected over two weeks. Once the allocated cut off point was reached the questionnaire was closed and responses were exported to a Microsoft Excel 2010 spreadsheet. The total number of responses was recorded and used to generate a response rate. Exclusion criteria were then applied to those who had failed to answer the question or simply provided a direct web address without stating any search terms. A useable response rate was then generated from the responses which were deemed to meet the study criteria. The frequency of words featured in responses and presence or absence

of punctuation was recorded. Analysis was also carried out to determine the most frequent words used and the number of respondents who had specifically mentioned them. The frequencies with which different derivatives of dog care e.g. nutrition, training, health care were mentioned was also recorded, along with those who had and had not mentioned carrying out breed specific searches.

Once the initial descriptive information was obtained, the data were sorted to identify individual search terms or expressions within the responses. Where punctuation or the use of capital letters indicated a break in the text e.g. 'New dog care New puppy care' or 'new dog care, new puppy care' these terms were considered to be individual search strings and were therefore separated ('new dog care' and 'new puppy care'). Where a respondent provided a string of words with no natural break in the text e.g. 'care look after new dog please help' this was considered to be a multi-word search string and left as such. Some responses lacked punctuation or capital letters but read in such a way that individual search terms could clearly be identified, in this instance responses were interpreted on an individual basis. Once all responses were sorted, individual search terms were listed in Microsoft Excel 2010 and the data were assessed to establish the most frequent terms or words used to form the basis for further categorisation. The sorting tool was used to alphabetise all terms and in conjunction with a manual search, the terms were sorted into four categories of which there was some overlap. These four categories of search terms related to: (1) dog and puppy care, (2) looking after a dog or puppy, (3) new or first time dog owner and (4) dog or puppy training. Collective terms were then interpreted to allow for the identification of more general search expressions which could be used to generate online resources for the subsequent scoping review (see Figure 37 and Appendix 9).

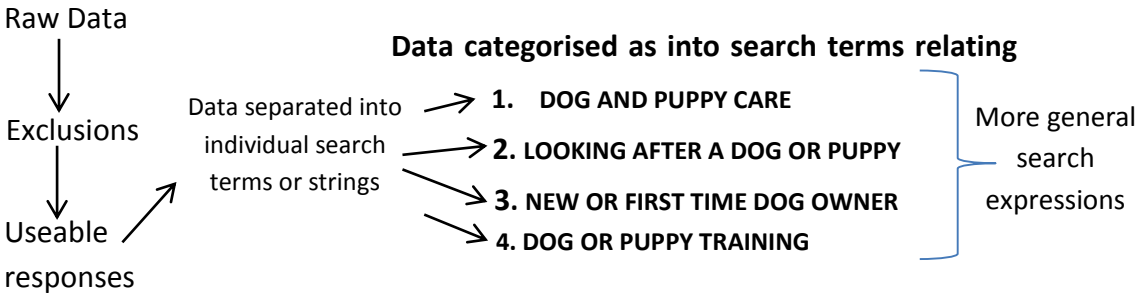


Figure 37: Diagram demonstrating the method through which search terms or strings identified from the dog owners' questionnaire data were interpreted into more general search expressions for use in a scoping review of online resources.

5.2.1.4. Identification of search expressions for use in Stage 2

As a result of the process depicted in Figure 37, the following search expressions were identified for use in Stage 2 of this study. A decision was made to exclude search expressions relating to dog or puppy training and the reasons behind this are further discussed in 5.4.

- "Caring for a new dog"
- "Caring for a new puppy"
- "Looking after a dog"
- "Looking after a puppy"
- "New dog owner information"
- "First time dog owner information"

5.2.2. Stage 2 (scoping review of online resources generated by searches)

In this section the term 'hit' is used to describe the retrieval of a website from an online search engine (in this instance, Google).

5.2.2.1. Search strategy and number of hits recorded

Google (www.google.co.uk) was selected as the search engine through which each of the searches described in 5.2.1.4 were conducted due to its status as the leading search engine in the UK (Hand, 2014) . It was decided to run the searches on a library computer, for which a unique login was assigned with a clear search history to avoid any potential search history bias which may have influenced the results generated. It was also decided to take the first 50 hits for

each individual search in sequential order based on the methodology used by similar studies (Smart and Burling, 2001, Jehn *et al.*, 2003, Bernard *et al.*, 2007). This method allowed up to a maximum of 300 hits in the search (50 hits for each of the six search phrases).

5.2.2.2. Inclusion and exclusion criteria

Prior to conducting the searches, a list of both inclusion and exclusion criteria were formed to establish which requirements resources had to meet to form part of the scoping review. These criteria are outlined below in Table 37.

Table 37: Inclusion and exclusion criteria used to establish which online dog owner resources formed part of the scoping review

Inclusion criteria	Exclusion criteria
➢ Written in English ➢ Applicable to UK dog owners ➢ Information resource for those who have recently acquired a dog of puppy	➢ Written in a language other than English ➢ Not relevant to UK dog owners e.g. overseas legislation ➢ Information on wrong species ➢ Information relating to pre-purchase considerations ➢ Website for a resource that is not available online e.g. a book for sale ➢ Not an information resource e.g. advertising for boarding kennels ➢ Information provided not considered relating to basic care e.g. specific diseases, rearing puppies etc. ➢ Website inaccessible or showing an error message

5.2.2.3. Data collection

Data collection took place over a one week period at the start of 2014. Three, two hour slots were booked for use of a computer at the local library on different days (in keeping with library policy) and internet searches were conducted during this time. Individual search expressions were typed into the Google search bar, without the use of punctuation and the first 50 hits were recorded for each in a Microsoft Excel 2010 spreadsheet along with the total number of hits showing. Care was taken to ensure that all search results for an individual search expression were recorded within the same computer session to maintain consistency. Upon finishing all of the searches, all six datasets were assigned a unique identifying number and amalgamated into a single Excel database for analysis.

5.2.2.4. Analysis and critical appraisal

All hits recorded within the final results database as described above in 5.2.2.3 were again reviewed and inclusion and exclusion criteria were applied as outlined in 5.2.2.2. All excluded data were then moved across into a different spreadsheet and the remaining data were checked for duplicates. Where found, these duplicate hits were removed, but before doing so an additional column was created within the spreadsheet to record any search expressions which had resulted in the same hit. The total number of unique hits could then be calculated and an overview of this process is shown in Figure 38.

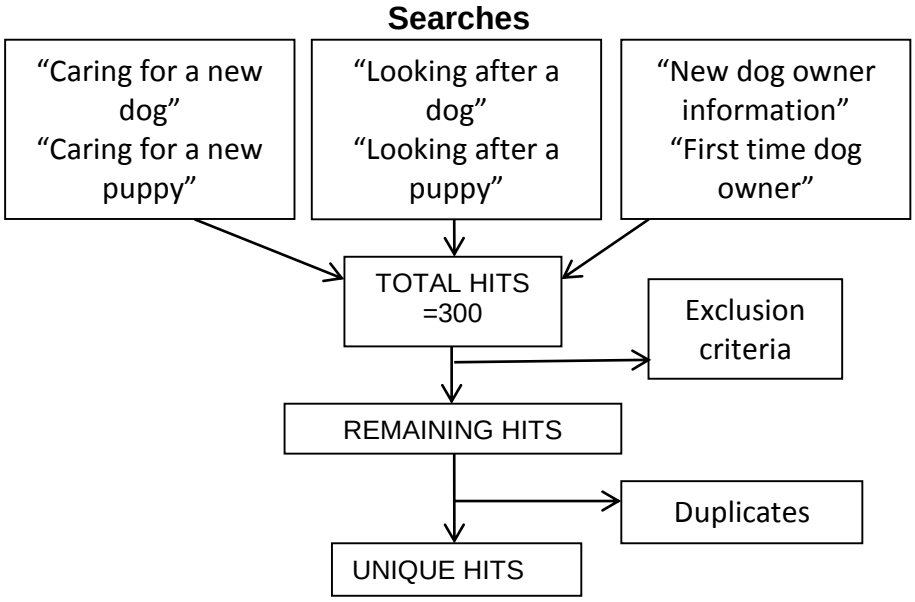


Figure 38: Diagram demonstrating the method through which the search results generated were sorted, inclusion and exclusion criteria were applied and duplicate data entries were removed.

Once established, unique hits were appraised to assess their relevance, format, readability, usability and quality. This process was carried out using a specially adapted critical appraisal sheet based on a critical appraisal tool for narrative text and websites used at the CEVM, UoN. This appraisal involved four stages, the first of which involved collecting general information about the online resource including details such as the URL, any keywords, the resource title and format. Stage 2 looked at what aspects of dog care were covered in the resource e.g. nutrition, behaviour or exercise.

For Stage 3 a readability test was carried out using one of two online tools (https://readability-score.com and http://read-able.com) to generate both a Flesch Kincaid Reading Ease and Grade Level score. The reliability of these formulae is indicated by their popularity amongst over 40 other existing formulae used to assess readability (Heydari, 2012) and their incorporation into Microsoft Office Word for wide scale use (Microsoft Office, 2014). Flesch Kincaid Reading Ease scores are generated via a formula incorporating information on the words, syllables and sentences comprised in the text to generate a numerical value (Flesch, 1979). This value is considered indicative

of how easy the text is to comprehend. Most numerical scores range from 0 (very difficult and almost unreadable) to 100 (indicating the text is extremely easy to understand) (Flesch, 1979), with the highest possible numerical score being around 120 (Koenig, 2012). From these values, Flesch Kincaid Grade level scores can be assigned to indicate the difficulty of the text in relation to the American grade system (Flesch, 1979). For example, a score of 90-100 would be easily understood by those in the 5th grade i.e. 10-11 year olds, whilst scores of 0-30 would be at the level of a college graduate (Dubay, 2004). The lowest theoretical score possible is -3.4 (Readability formulas, 2014). The score associated with plain English is 60 (Flesch, 1979) and Microsoft Outlook and Word recommend keeping standard text within a reading ease score of 60-70 and a grade level score of 7-8 to ensure text is easily understandable (Microsoft Office, 2014).

Finally in Stage 4, selected online resources were critically appraised. A guide sheet was created to ensure consistency between resources and featured four sections relating to general resource information, the aspects of dog care covered, text readability and indicators of resource quality (see Table 38).

Table 38: Critical appraisal sheet used for reviewing online resources available to new dog or puppy owners

Section 1 (general information)		**Description of action(s) taken**
URL:		Record URL
Keywords (as stated under website properties):		Record keywords stated under website properties if applicable
Title/resource name:		Record title/resource name
Origin (organisation, personal website etc.):		Record origin of resource e.g. RSPCA
Format (web page, PDF, video, scientific paper etc.):		Record resource format e.g. PDF, website
Additional information (print off puppy contracts, information leaflets etc):		Yes/No? Record format e.g. PDF, hotline
Links to other websites? Y/N		Yes/No?
Section 2 (does resource cover the below aspects? Y/N)		
Nutrition General health Lead and obedience training Grooming, claw clipping and dental care Vaccinations Behaviour Company and socialisation House training Exercise Toys ad enrichment Worming and flea treatments Neutering Micro-chipping Crate training Travel Pet insurance		Yes/No? For example, “Long hair can hide dirt, so make sure the fur between your puppy's toes and nails doesn't get too long” = Grooming, claw clipping and dental
Section 3 (readability)		
Readability score based on Flesch-Kincaid readability tests http://read-able.com/ or https://readability-score.com		Run tests using software. If non-compatible try both websites
Section 4 (critical appraisal based on CEVM website appraisal sheet)		

Is the author clearly identified named? (How many authors?)		Yes/No? Record number of authors stated
Does the author have a standing in this subject area? Relevant qualifications if applicable?		Standing assessed by whether the author is stated to be of influence on this subject or whether a Google search yields an association -> Yes/No/Unknown Record any qualifications listed
Are the authors' opinions clearly stated/identified?		Yes/No? Yes = phrases such as 'in my opinion' or 'I believe' used
Are key considerations the central focus of the resource? - Owners needs - Dogs needs		Dogs/Owners/Both? Does author specifically talk about the dogs' needs, the owners' needs or both?
Is information conveyed based on fact and/or experience? Is it clearly presented?		Fact/Experience/Both? – Recorded based on the presence of sentences such as 'in my experience' and the presence of references Yes/No/Difficult to determine fact from opinion or experience?
Is the information supported by any other evidence sources?		Yes/No?
Is there reference to other existing literature and/or evidence?		Yes/No?
Are any references quoted? If so are they appropriate?		Yes/No? Are stated references
Is there a date on the resource? How long ago was it written?		Yes/No? Record date stated

5.3. Results

5.3.1. Stage 1 (cross-sectional questionnaire based study)

A total of 215 dog owner respondents answered the questionnaire (response rate 41.5%), of these 204 responses were useable in the final analysis (useable response rate: 39.4%). No reasons were collected for non-response.

Dog owner responses contained between 1-20 words (median= 6) and a greater proportion of owners did not use punctuation in the responses they provided (n = 127, 62.3%) compared to those that did (n= 77, 37.7%).

Overall more dog owners made reference to generic dogs and puppies in the search terms they provided e.g. 'Dog care' or 'puppy care' (n = 157, 76.9) than those who made reference to breed specific search terms (n= 47, 23.1%) e.g. 'Siberian Husky care'. The most popular words used by dog owners in the search terms and expressions they provided were: dog, care, puppy, training, breed, owner, looking, health, feeding and advice. A breakdown of how frequently these words were used is shown below in Table 39.

Table 39: The top ten most popular words featured in the terms and expressions 204 dog owners reported they would use to search the internet on how to care for a new dog or puppy.

Word	Frequency of use by dog owner respondents n (%)*
Dog	149 (73)
Care	124 (60.8)
Puppy	62 (30.4)
Training	51 (25)
Breed	47 (23)
Owner	27 (13.2)
Looking	24 (11.8)
Health	19 (9.3)
Feeding	17 (8.3)
Advice	13 (6.4)

*= percentage of 215 dog owner respondents who used the words listed

Analysis of the different aspects of dog or puppy care mentioned showed derivatives such as behaviour, training and socialisation (42.9%, n= 54), nutrition (21.4%, n= 27) and general health (16.7%, n= 21) to be among the most frequent mentioned. See Table 40.

Table 40: The frequency with which different aspects of dog care were mentioned by 204 dog owner respondents in the questionnaire data collected. Data are presented as the total (n) and percentage of all responses relating to specific aspects of dog care.

Aspects of dog care	n	%
Behaviour, training and socialisation	54	42.9
Nutrition	27	21.4
General health	21	16.7
Exercise	8	6.3
Grooming, nail clipping and dental care	5	4
Vaccinations	4	3.2
Toys and enrichment	3	2.4
Worming and flea treatments	3	2.4
Breeding and showing	1	0.8
Total	126	

From the 204 responses collected, 435 individual search terms or strings were identified. Of the search terms of strings identified the most frequent (n= 210) were used to develop more generalised search expressions for use in the scoping review in Stage 2. A detailed breakdown of these results is provided in Figure 39.

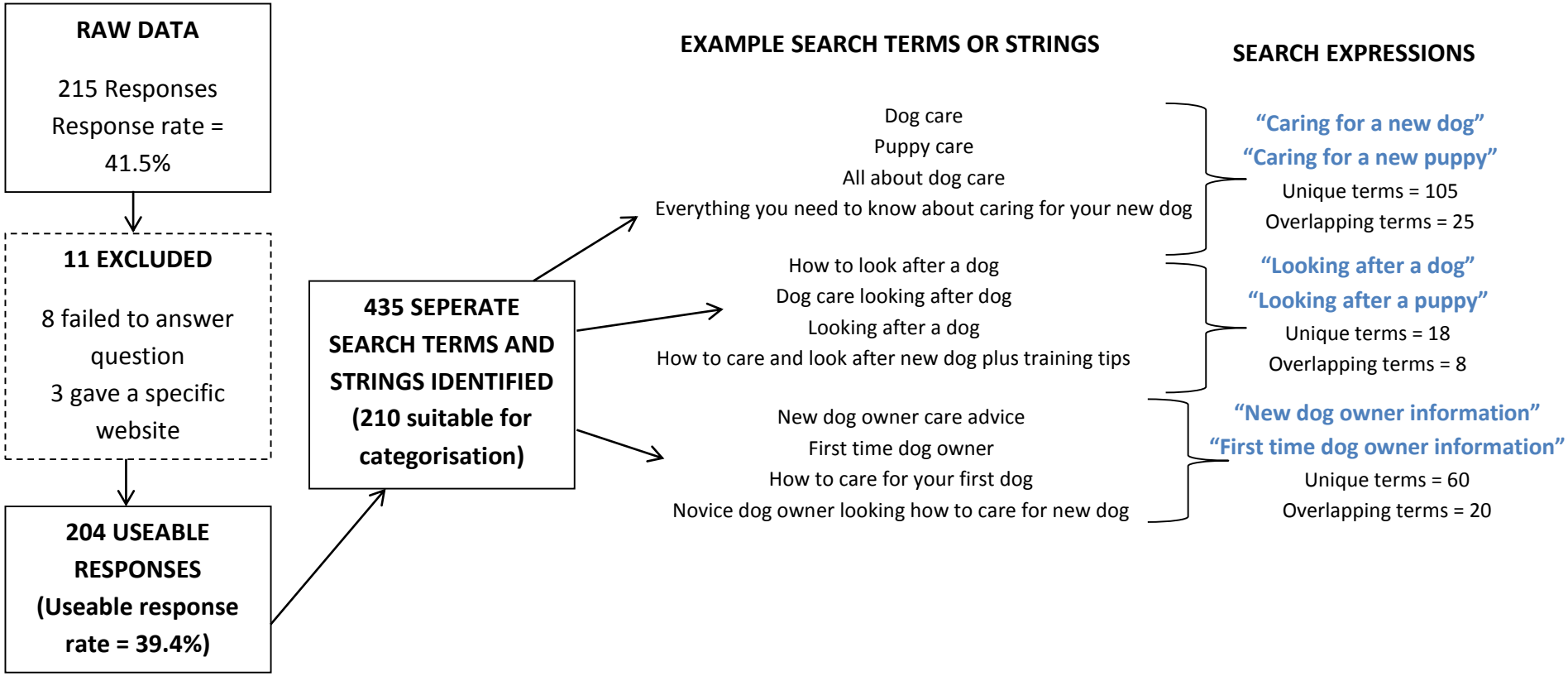


Figure 39: Diagram demonstrating the method through which search terms or strings identified from the dog owners' questionnaire data were interpreted into more general search expressions for use in a scoping review of online resources (shown in blue).

5.3.2. Stage 2 (scoping review of online resources)

5.3.2.1. Search Results

A total of 300 hits were obtained from the searches conducted (50 hits from each search). Of these hits, 143 were excluded based on the predetermined inclusion and exclusion criteria and a further 36 duplicates were also removed. In total, 121 unique hits were suitable for critical appraisal. Figure 40 provides a more detailed overview of this data.

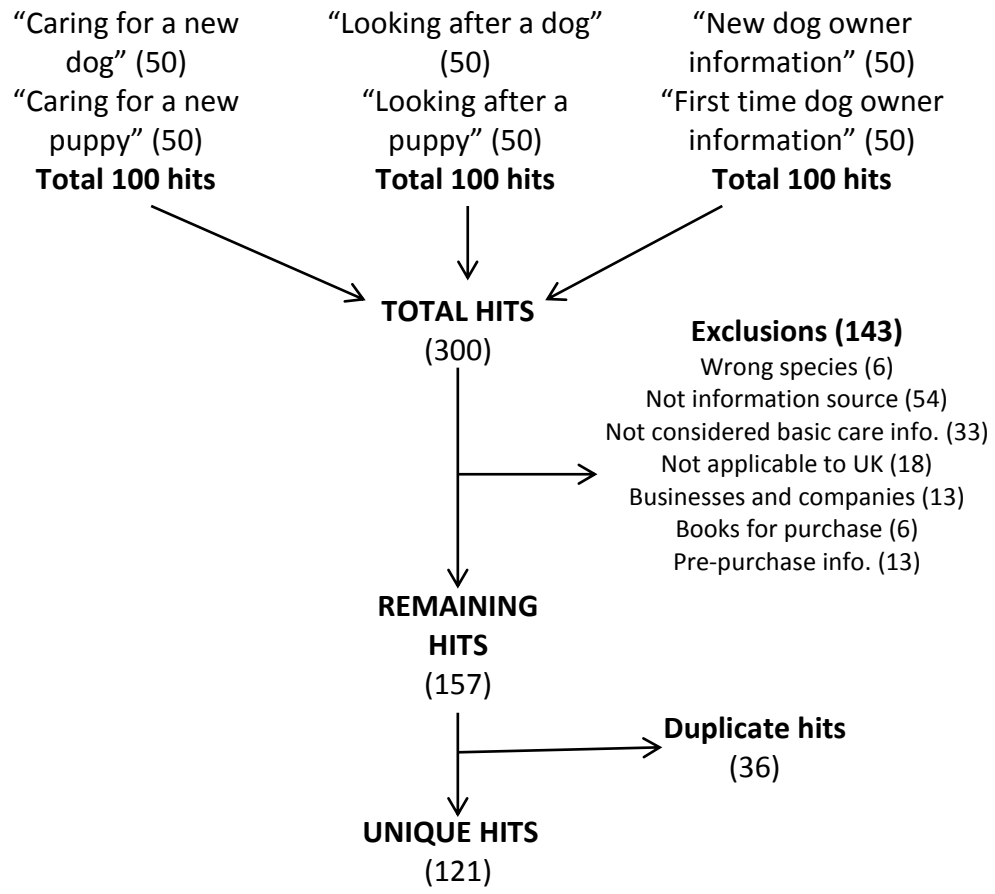


Figure 40: Diagram demonstrating with numerical values how the search results generated were sorted, inclusion and exclusion criteria were applied and duplicate entries were removed.

5.3.2.2. Review of resources generated

Of the 121 unique search hits generated, 99 hits (81.8%) were generated from a search using a single search expression, 19 hits (15.7%) featured in the results were generated by two different search expressions and 2 hits (1.7%) featured in the results generated by three search expressions. Only one website (0.8%) appeared using all six different search expressions (www.thekennelclub.org.uk). Of the 19 search hits that featured in the results generated by two search expressions, 13 (68.4%) of these were generated by using the search expressions "Caring for a puppy" and "Looking after a puppy". The total number of useable hits generated by each of the search expressions used is shown below:

- "Caring for a new dog" (32)
- "Caring for a new puppy" (42)
- "Looking after a dog" (21)
- "Looking after a puppy" (26)
- "New dog owner information" (13)
- "First time dog owner information" (16)

The search hits generated originated from a number of sources, with breeders or breed specific websites (13.2%, n=16), veterinary practices, hospitals and organisations (12.4%, n= 15) and rescue or rehoming organisations (11.6%, n=14) being among the most frequent. See Table 41.

Table 41: Parties and organisations from which the internet search hits on information on how to care for a new dog originated

Origin of search hits	n	%
Breeders or specific breed related websites	16	13.2
Veterinary practice, hospital or organisation	15	12.4
Rescue or rehoming organisations	14	11.6
Animal welfare organisation, society or charity	13	10.7
Information sharing website	12	9.9
Pet food manufacturer	10	8.3
Personal website	7	5.8
Pet supplies	7	5.8
Other	6	5
Government or council	5	4.1
Online dog journal, newspaper or magazine	5	4.1
Dog and pet care websites	4	3.3
Dog training website	4	3.3
Kennel Clubs (UK or overseas)	3	2.5
Total	**121**	

Websites were the most common format of information resources generated by the searches (89.3%, n=108). However, some resources were also in PDF (6.6%, n=8) and video (4.1%, n=5) format. The majority of resources took the form of a single website (76%, n=92) however 29 (24%) resources took the form of a central website which linked to further pages that were part of the same resource.

Most resources were applicable to dogs of all ages (57.9%, n=70), however a smaller proportion were specific to either puppies (38.8%, n=47) or senior dogs (3.3%, n= 4). The majority of resources were also applicable to all dogs (81%, n=98) as opposed to specific breeds (19%, n=23). For those that did apply to specific breeds, those that were most frequently mentioned were Akitas (n=2), Golden Retrievers (n=2) and Lhasa Apsos (n=2).

Just over half of the information resources generated did not supply any additional information beyond that which was displayed on the website itself (57%, n= 69). However 43% (n=52) provided additional information (alone or in combination) in the form of additional websites (n=42), PDF files (n=12), videos (n=4) and other formats (n=4). Only the minority of websites provided links to other useful independent websites (16.5%, n=20).

5.3.2.3. Aspects of dog care covered

Sixteen aspects of dog care were outlined in Section 2 of the critical appraisal sheet (see Table 38). Of the online resources analysed, the number of aspects of dog care covered in each resource varied between 1-16, with the majority covering at least half of the aspects listed (median=9). Nutrition (80.9%, n=98), general health (78.5%, n=95) and lead and obedience training (72.7%, n= 88) were the most frequently covered aspects. Travel (31.4%, n=38) and pet insurance (22.3%, n=29) were the least covered aspect of dog care. A total of 14 of the 121 resources (11.6%) covered all 16 aspects of dog care. Interestingly, only 6 of these were from well-known sources including The Kennel Club, American Society for the Prevention of Cruelty to Animals (ASPCA), Blue Cross, The Royal Society for the Prevention of Cruelty to Animals (RSPCA), Hills Pet Nutrition and dog trainer Cesar Millan. The remaining resources originated from personal websites, forums and information sharing websites. A full breakdown is provided in Table 42.

Table 42: The aspects of dog and puppy care covered by the online resources reviewed (total n= 121).

Aspects of dog and puppy care covered	n	%*
Nutrition	98	81
General health	95	78.5
Lead and obedience training	88	72.7
Grooming, nail clipping, dental care etc	83	68.6
Vaccinations	80	66.1
Behaviour	75	62
House training	74	61.2
Company and socialisation	74	61.2
Exercise	71	58.7
Toys and enrichment	70	57.9
Worming and flea treatments	65	53.7
Neutering	56	46.3
Micro-chipping	54	44.6
Crate training	46	38
Travel	38	31.4
Pet Insurance	29	24

*= percentage of 121 websites which covered the aspects of dog and puppy care listed

5.3.2.4. Readability scores

A total of 113 resources were suitable for the generation of Flesch Kincaid reading ease and grade level scores. The additional 8 were not compatible for analysis using the tools described in 5.2.2.4. Flesch Kincaid reading ease scores ranged from 31.2 to 121.2 with a median of 72.2. Flesch Kincaid grade level scores ranged from -3.4 to 12 with a median of 5.4. These values meant the majority of resources appraised should be understandable to 12-15 year olds.

5.3.2.5. Critical appraisal

Of the online resources critically appraised, only 23 stated an author (19%), whilst 98 (81%) stated no authorship. For those resources that did feature specific authors, thirteen were of unknown standing with regards to dog and puppy care, three had no standing, one had no standing but the information was reviewed by vets and six had a known standing in the area. Of those authors, one was a breeder, two held veterinary qualifications, one was a zoologist and two were dog trainers. Only one of the resources with no named author described the information as being expert reviewed.

Authors' opinions were clearly identified in the minority of resources (9.9%, n=12) via the use of phrases such as 'we recommend…' or 'from my experience…', but for the majority of cases they were unclear (90.1%, n=109). For the vast majority of resources both the dogs' and owners' needs were considered (95.8%, n=116) with the exception of the minority which focussed solely on the dogs (4.2%, n= 5).The majority of resources incorporated both fact and opinion/experience (98.3%, n=119). Only a single resource featured solely experience and another solely fact. For the vast majority of resources (95.8%, n=116) it was deemed difficult for the lay person to decipher fact from opinion.

The majority of resources were not supported by any evidence (95.8%, n= 116), made no in text reference to other evidence sources (95%, n= 115) and featured no reference list (96.7%, n=117). Of those that did have a reference list (n=4) three seemed appropriate, featuring at least three references linking to scientific literature and/or known dog or welfare organisations.

Ninety percent of online resources featured no date (n=109). Of those that were dated (10%, n=12) the age of the resources ranged between 4 days and 6 years with a mean age of 2 years, 10 months and a median of 3 years, 15 days.

5.4. Discussion

This chapter has investigated the search terms and expressions dog owners use when searching the internet for information on how to care for a new dog or puppy and the quality of the online resources generated as a result. This research has shown dog owners to adopt varied approaches when tasked with carrying out an online search for dog or puppy information. Whilst some dog owners stated they would input a single word into the internet search bar, others opted for complex sentences, questions or multiple word search strings. The results generated by the general search expressions established showed the existence of a great deal of online information on how to care for a new dog or puppy. Resources were predominantly in website format, relating to generic dogs of mixed age and did not provide additional information or links to other websites. The majority of websites covered at least half of 16 predefined aspects of dog or puppy care (see Table 38) and did so in a way deemed understandable to 12-15 year olds as indicated by Flesch Kincaid readability scores. However, many resources failed to meet basic criteria indicating quality. This raises a number of questions regarding the quality and clarity of information available to dog owners online.

Identifying search expressions and conducting searches

The questionnaire on which search terms or expressions dog owners would use to search the internet for information on how to care for a new dog or puppy received a good response rate of 41.5%. This success is likely to have been due to the fact that the dog owners had already participated in a previous questionnaire-based study. The questionnaire was also short and quick to complete which may have aided in securing a good response rate.

The search terms and expressions identified from the dog owners' data were highly variable, demonstrated by the fact that responses ranged between 1-20 words. As no research of this type had been carried out previously in the UK there is no data with which to compare these findings. However, using search expressions generated from dog owners' own search terms was considered to

be a novel method of generating the required search results and to be more representative of a search conducted by a standard dog owner.

The majority of dog owners questioned made reference to generic dog and puppy care within the search terms or strings they provided as opposed to breed specific care. This may have been due to the fact that they were asked what search they would carry out if they had acquired a new (generic) dog for the first time as opposed to a specific breed. It is possible that if the word pedigree had been used, more people may have made reference to breed specific searches. The disadvantages of collecting data in this way, along with the potential influence it may have had, is discussed further below under study limitations.

The top five words featured within the search terms and strings provided by dog owners were dog, care, puppy, training and breed. It was decided that generating search expressions involving the word breed would be too challenging, as within the time restraints of the study, searches could not be conducted individually for recognised breeds. It was also decided not to use training in any of the search expression as dog and puppy training is a relatively specific search to carry out and whilst important, it is not necessarily representative of general care. As a result of these considerations the next two most frequently used words (owner and looking) were used alongside dog, care and puppy as key words within the final, more general, search expressions.

Of the owners that mentioned specific aspects of dog health in the search terms or strings they provided, behaviour, training and socialisation, nutrition and general health were among the most frequent. This may have been for a number of reasons; owners may feel these topics to be of most importance or these may be aspects of dog and puppy care on which they feel they require more information. Once the search expressions had been decided, searches were conducted at a local library to avoid potential search bias and the first 50 hits were taken for each search. It was decided to take the first 50 hits as this number had been previously used by similar studies of both human patient and

pet owner information resources (Smart and Burling, 2001, Jehn *et al.*, 2003, Bernard *et al.*, 2007).

Conducting the searches in a library was considered a novel approach which has not been described in any other similar literature, although to assess its effectiveness all searches would have to be conducted on an additional computer and consistency of search hits assessed. Interestingly two of the resources created after recommendations by key reports for a public education campaign to promote better dog ownership and canine welfare (see 1.7) (APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010) did not appear in any of the searches. These were the RSPCA's Get Puppy Smart resource (RSPCA, 2011a) and the Advisory Council on the Welfare Issues on Dog Breeding's 'Buying a Puppy' guide (Advisory Council on the Welfare Issues of Dog Breeding, 2012a). As data have indicated that few pet owners carry out research before acquiring a new pet (RSPCA, 2011b, PDSA, 2013), it was decided not to focus on pre-purchase information in the searches conducted for this study. However, it was particularly interesting that these two resources were not generated as a result of searches such as 'Caring for a new puppy" and "Looking after a puppy" even if they would have been excluded from this particular study. These findings suggest that the metadata for these new resources may be inadequate and they are thus poorly signposted or that they are simply still too new and have not had enough page views to feature in the top 50 hits. For either of these circumstances, it is unlikely that those seeking such information will go beyond the first 50 hits of an internet search and this is therefore something which needs to be addressed by these organisations.

The majority of websites did not supply additional information, although of those that did, information was supplied in a number of formats including additional websites, PDF files and videos. Only the minority of websites linked to other independent websites. These findings suggest a lack of centralisation and collaboration between stakeholders represented online with regards to sharing and dissemination of good quality information on dog and puppy care. This is something which could be addressed by many influential parties and

organisations. Collaboration should be encouraged with multiple parties playing a role in public education and the internet is one of the quickest and cheapest methods of doing this.

Coverage of different aspects of dog care

Of the dog and puppy resources generated from the searches performed, the majority covered a good proportion of the 16 aspects of dog care outlined on the critical appraisal sheet (see Table 38). Websites only covering one aspect of dog care were those that focussed on a single task such as grooming a dog or checking its teeth, not necessarily reflecting them to be of poor quality but simply featuring a very specific focus. Of the aspects of dog care covered, nutrition, general health and lead and obedience training were among the most frequently covered. Interestingly pet insurance, micro-chipping and neutering were the aspects of dog care least covered by the online resources. This was a fascinating finding which, in the case of micro-chipping, may be due to the fact that until recently it has not been a legal requirement. However, with the change in law meaning that micro-chipping of dogs will be compulsory from 2016 onwards (British Veterinary Association, 2013) it is arguable that greater information needs to be available on this method of identification. With the costs of veterinary care being a frequent feature in the forum of public debate (a subject which was touched on more than once in the breeders' focus groups conducted in Chapter 3) it was surprising that this was not covered more in the information resources reviewed. This was also true of neutering, although as breeders and breed specific websites were the most common origin of the search hits generated (see Table 41), this may simply indicate that breeders focus less on this topic. For those with an interest in breeding from dogs, neutering may not be such a dominant consideration, especially for those breeders of numerically small breeds who wish to protect the gene pool or those who own larger breeds and are concerned about perceived detrimental growth and behaviour effects of early neutering.

The Flesch Kincaid reading ease and grade level scores generated for each of the online resources showed the vast majority of information within the search results to be easily understandable for 12-15 year olds. Only the minority of information was considered relatively complex or difficult to read. This was a promising finding suggesting there is currently not an issue with the availability of easily understandable information on dog and puppy care online. However, the fact that any given text is easily understandable is not a reflection of quality and thus this is perhaps the greater consideration with regards to appraisal of owner resources.

Critical appraisal

Critical appraisal of the online resources generated showed the vast majority to have no specific named author, raising a number of questions about the origin of existing resources. Of the minority that were named, over half of the authors were of unknown standing with regards to dog and puppy care and no qualifications or relevant experience was listed, making it nearly impossible for owners to assess the reliability of the provided information. This is of particular concern as findings from Chapter 4 showed participating owners to use the general internet as a top information resource during their dog(s) lifetime. Whilst the majority of information resources took into account both the needs of the owner and dog, only 10% of resources clearly identified author opinion via the use of phrases such as 'we recommend…' or 'from my experience…' The remaining resources featured a combination of both experience and fact. This was a realistic finding as even those with extensive knowledge of dog and puppy ownership are likely to rely on their own experience alongside commonly accepted fact. This however highlighted a clear challenge in the interpretation of this information by new dog owners, who may not have a great deal of knowledge in this area and thus may struggle to divide fact from opinion. In the case where a resource is from a reputable author and reliable information is provided this is not such an issue. However, in the case of less reputable sources, combined with the lack of clear authorship and qualifications described above, this may pose a real challenge and lead to

owners acquiring misinformed and inaccurate information. An example of such misinformation can be demonstrated by one website which stated “dogs left unattended in their own yards, even for a few minutes, have been stolen, poisoned, and beaten” (PETA, 2010). Such information infers that dogs are at risk spending time outside in the garden and may cause new owners unnecessary worry about the risks of their dog spending time outside, despite this being in many dogs’ best interests.

This issue was further highlighted by the lack of supporting evidence, reference to other resources and provisions of reference lists within the resources reviewed. Such reference to existing evidence was only made in the very minority of cases. This implies a lack of centralisation and circulation of factual, evidence-based information on dog and puppy care and whilst most information is anecdotally accepted and repeated from website to website, arguably a system is needed to ensure that this information is of adequate quality and vigour. As more people turn to the internet for health advice for their pets, this is an area which could potentially be harnessed by influential organisations who could post links to useful peer reviewed resources on their own websites. This would encourage better centralisation of good quality information and ensure the best, most useful information is well sign posted for dog owners.

Furthermore, only 12 of the 121 resources (9.9%) reviewed were dated and whilst the mean age of dated references was only 2 years, 10 months this by no means guarantees that some of the other undated references were not much more outdated. This lack of dates on information resources makes it difficult for owners to assess whether they are accessing the most up-to-date information or indeed if the information provided is still applicable. Many areas of dog care are subject to ongoing updates, for example microchip legislation, pet travel requirements, dog training methods and behaviour. Thus a system for evaluating the age and relevance of such information is required and dating a resource is a simple step for any website.

Study Limitations

This study was subject to several limitations. A two week period was allocated for the questionnaire-based data collection in stage 1 due to the time restraints of the study. It is difficult to know what effect, if any, this may have had on the data collected but it is likely that those willing to participate online would have done so soon after seeing the study link. Collecting a biased convenience sample in this way was another limitation of this study, however not enough is known about all dog owners in the UK to identify the extent to which this sample is subject to bias or the degree to which different data may represent the wider population.

One of the greatest difficulties faced was asking dog owners how they would conduct an online search for information of how to care for a new dog or puppy without suggesting key words which would consequently influence their responses. It was difficult to overcome this issue. Existing reviews looking at online patient resources in the medical world did so without first looking at patient search strategies and no similar methods could be found within the veterinary world to offer methods for overcoming this problem. This was therefore accepted to be a study limitation and the frequent use of the word 'care' within the dog owner responses is likely to have originated as a result of this. In reality the search terms used by dog owners are diverse but for the purposes of this study six broad search expressions were generated to condense the number of searches performed. Whilst it was hoped these encompassed the search terms suggested by dog owners, it is likely the search results generated differed from those that would have been generated if some of the other owner search terms were used. A further limitation of this study was that analysis of the search terms and expressions provided by owners relied on human interpretation for the generation of broader search expressions for use in the review. Whilst every effort was made to interpret the data in a consistent and logical manner this was not infallible and offered the potential for researcher bias.

All searches conducted in this study were done so on a library computer to reduce the potential for search bias. It is not known exactly how Google works in terms of prioritising the relevance of its search results to individual users, although the Google Guide states that the formulas it uses are 'tweaked to improve quality and performance' (Google, 2007). This possibly implies that results may vary from user to user based on previous search history and thus if these results were carried out on other computers the resources generated may be slightly different. Also, whilst Google is the most popular search engine used in the UK, accounting for 90% of UK-based desktop searches and 92% of mobile searches in June 2013 (BBC News, 2013), it is likely a proportion of dog owners opt to use other search engines which may also yield different search results or prioritise search results in a different order.

Finally, appraisal of search results required a degree of interpretation and whilst every care was taken to appraise each resource in a consistent and impartial manner it was impossible to do this in a way which did not involve some degree of opinion on which to base the interpretation.

Future research

This study has highlighted a number of interesting findings in relation to owners' use of the internet to obtain information on how to care for a new dog or puppy. Whilst this was an exploratory study, if the internet is to be harnessed as a cost effective means of implementing better public and dog owner education and awareness with regards to dog welfare as recommended by several key reports (see 1.7) (APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010), further research is required to better understand the potential of the internet in disseminating information. Further, methods of ensuring such information is clearly signposted for dog owners searching the internet also need to be explored. Such research could take place as a more extensive review using more than one search engine, a greater variety of search terms and encompassing a greater number of hits. To avoid researcher bias in interpretation of owner search terms, owners could be recruited to conduct

the searches from which the direct results could then be appraised. A more detailed questionnaire supplemented with focus groups could also be conducted with dog owners to better understand how and why they search the internet in the way that they do, how and if they assess website quality and what aspects of dog care they feel they know most and least about. Such information could then form the basis of future policy making on the implementation of educational initiatives for this target population. Current understanding of this topic is mostly based on anecdote and to better inform dog owners and influence their decision making behaviours more information is needed about this demographic.

5.5. Conclusion

There is no 'standard' dog owner. This group is very diverse and this is reflected in the variability of the terms and expressions they use when searching the internet for information on how to care for a new dog or puppy. Appraisal of the information resources generated by search expressions adapted from dog owners, revealed a great deal of available information online. However, despite many of these resources being fairly comprehensive with good readability based on Flesch Kincaid reading scores, serious questions were raised with regards to indicators of resource quality. Such issues need to be considered if the internet is to be harnessed as a means of improving knowledge and awareness of both the general public and dog owners. Peer review, provision of authorship, dates on web resources and centralisation of good quality information via dog and animal welfare organisations would assist in directing lay public to reputable information. However, to instigate significant change further research is required to better understand prospective dog owners' information seeking needs and behaviours and this is something that should be adopted by influential organisations with an educational role.

Chapter 6 – Final discussion and conclusions

Pedigree dog breeding in the UK: a consumer driven market or something more complex? In recent years, increased controversy surrounding dog breeding practices, increased health concerns associated with inherited disease and a lack of dog owner knowledge have necessitated the need for further research and the implementation of initiatives to safeguard canine welfare. The overarching aim of this thesis has been to generate a better understanding of the grassroots stakeholders involved in pedigree dog health and welfare, including pedigree dog breeders, veterinary surgeons and dog owners within the United Kingdom and the views they hold. The intention was to document and report areas in which the knowledge, awareness and collaboration of such parties may be addressed in the interests of improved canine health and wellbeing. This mixed-methods research has explored veterinary surgeons', pedigree dog breeders' and dog owners perceptions' regarding key elements of canine welfare including dog acquisition, breeding, inherited diseases, health schemes and the use of information resources. The possible methods through which dog owners search the internet for information on how to care for a new dog and the quality of the information generated as a result have also been investigated. Whilst exploratory, this PhD project has generated a number of important findings which suggest that vets, breeders and dog owners have a much more significant role to play in improving pedigree dog health than the lack of research in this area implies.

This research showed that the majority of vets and breeders share a common goal in their desire to improve pedigree dog health and that they both express optimism that canine welfare will improve in the future. This is vital to ensure the health of dogs is improved and needs to be encouraged and harnessed as much as possible. These parties were shown at times to utilise different sources of information on pedigree dog health and thus, to facilitate collaboration between these stakeholders greater centralisation and sharing of information

is required. Both vets and breeders recognised the internet as a source of advice and this may offer a method through which such interventions could be delivered at convenience and little cost. Preferences expressed regarding receiving information from organisations such as the KC and Advisory Council suggest there may be a benefit to both vets and breeders joining mailing lists overseen by these organisations to receive monthly text or email updates on the latest developments relating to canine welfare. Such interventions would help to ensure greater consistency in the knowledge shared between parties, thus enabling more effective communication and ensuring approved resources are readily available and accessible to stakeholders at all levels.

Differences identified between vets' and breeders' perceptions of the most common health conditions seen for selected breeds suggest a tendency for vets and breeders to relate to general health in slightly different ways. Vets, appear, by professional tendency, to consider both inherited and acquired disease synonymously with regards to health, whilst breeders focus more on the detail of inherited conditions. Both parties, in conjunction with data collection initiatives such as SAVSNET (SAVSNET, 2014), VetCompass (VetCompass, 2013) and the CICADA animal disease survey (CIRCADA, 2014) have an important role to play in disease surveillance and establishing and prioritising which diseases are of most concern. However, recent research has shown that a great detail of information, often relating to more than one individual health condition, is usually discussed during a veterinary consultation and that the richness of this information may be lost when just evaluating clinical data from practice management systems (Robinson, 2014). Therefore, in the case of pedigree dog health, vets and breeders have both the expertise and knowledge to serve as a feedback system to 'fill the gaps' within the collection of such data to better inform on current and emerging diseases. Measures therefore need to be taken to ensure such data collection is possible and that such knowledge is pooled, recorded and made available. One possible method of doing this would be via an online system such as that used by Dogslife to collect information from dog owners (Dogslife, 2014), which could be adapted for willing vets and

breeders to log on intermittently to report disease updates that could be used to generate incidence measures. However, for such interventions to be effective vets and breeders need to better understand and appreciate each other's' roles, perspectives and knowledge to instigate effective collaboration and improve pedigree dog health.

Other studies have highlighted the need for better education of puppy buyers (APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010). Vets and breeders are both respected and hold prime professional positions to conduct such interventions. However, it is important that both vets and breeders approach the education of puppy buyers and dog owners in a clear, consistent and evidence-based way as conflicting opinions currently foster a disjointed approach for some. In an ideal world, a potential method for achieving a local solution would be via a collaborative approach where vets could initiate education on basic care, health and veterinary costs and then direct clients to one or more breeders in association with the practice to provide information on breed-specific considerations. This study showed participating vets and breeders to hold varied relationships which could pose a challenge for such interventions, however if successfully implemented, collaboration may potentiate substantial progress. A further difficulty is however faced in the fact that currently it appears there is a deficit in the amount of research carried out prior to acquisition of dogs and puppies (The University of Bristol, 2011, PDSA, 2013, Veterinary Record, 2013a) and that vets are underutilised as a source of advice (PDSA, 2013). Therefore, vets and breeders have a role to play in both offering and advertising free pre-purchase advice to as many prospective owners as possible and this needs to be promoted as a commonplace interaction for dog owners of the future. In the long term hopefully such actions would be rewarded with increased business, but in the short term this should be considered an obligation necessary to ensure the continued improvement of canine welfare for which these parties have an extremely important role to play.

Vets and breeders face a further challenge when implementing such educational initiatives, in knowing how much information to supply and at what level. Again this poses a challenge in maintaining consistency. It may therefore be beneficial for a group of independent, keen and experienced vets and breeders to form a steering group to generate what they perceive to be the most important and up-to-date information required by prospective dog owners. This would mean the group would need to be trained in understanding the quality of information available and further would need to be carefully and impartially chaired to ensure each member was given a chance to contribute. In turn summary guides could be created which could be used by associated practices and breeders to form the basis on which their educational interventions were based. Initiatives such as this could be used in conjunction with good existing tools such as the puppy contract and Puppy Information Pack (PIP) designed by the BVA AWF and RSPCA (RSPCA and BVA AWF, 2012) and the Pet Industry Federation's Puppy Index (Pet Industry Federation, 2013).

The qualitative component of this project has shown the majority of participating vets and breeders share both amicable working relationships and a common goal in their desire to improve pedigree dog health. Despite this, both vets and breeders were able to give examples of difficulties they had faced when interacting with each other and at times such disagreements had propagated negative feelings that were still apparent years later. Whilst such experiences are quite subjective in nature, the negative consequences of such interactions were apparent and in some cases detrimental to the individuals perceptions of vets or breeders as a whole. This is a very complex topic encompassing social politics, professional beliefs, miscommunication and at times misinformation and is therefore an issue for which no single intervention exists. However, for those involved it understandably results not just in dissatisfaction, but also propagates disunity and bad feeling which may then be transmissible to future vet-breeder interactions, detrimentally effecting both collaboration and the establishment of good working relationships. Some possible measures to reduce the incidence of these negative exchanges may

include vet and breeder education days running quarterly in each region for these parties to discuss canine health concerns on neutral territory and continued outreach work by the Kennel Club to ensure vets and breeders are up-to-date with key health and welfare developments. Although organisations like the Kennel Club and Advisory Council are very unlikely to direct local governance at a practice level, transparent and consistent practice policy surrounding pedigree dog health care introduced by vets may help to manage breeder expectations and protect new graduates from negative interactions with breeder clients. For example, those associated with overseeing tasks where varied opinions exist, such as elective caesareans and dew claw removal. Additionally, greater appreciation and provision of social science research in this area would provide a better understanding of such interactions and highlight areas most requiring change in order to facilitate progress.

This project has also indicated that dog owners in the UK are a diverse and varied demographic for which no 'gold standard' exists. Owners' reasons for wanting a dog, their methods of acquiring dogs and the information and advice they source about their dogs were vast and came from a variety of sources. These considerations make designing interventions for this demographic particularly challenging. Owners, as consumers, arguably have more influence on pedigree dog health than breeders or vets do. However, it is apparent that factors surrounding dog ownership are very subjective and as a result, the considerations or needs of each owner may be very different and at times complex. Study data indicated owners to become aware that their dogs were available for purchasing through a variety of means some of which bypassed the potential for any sort of educational intervention. For example, for those buying from online adverts, many websites now feature information on responsibly sourcing a pet adjacent to the adverts displayed. However, this is not true in every case and for those buying directly for friends or colleagues decisions are more likely to be governed by emotion than informed by factual considerations. Data presented in this thesis indicate that the majority of owners had carried out pre-purchase research of some kind whether through

use of a resource or from verbal advice delivered by others. This finding was dissimilar to existing evidence which indicates pre-purchase research is lacking (The University of Bristol, 2011, PDSA, 2013, Veterinary Record, 2013a). This may indicate that those who participated in this research were particularly responsible, that the answers were subject to social acceptability bias or that the wording of questions administered by other studies did not count advice from friends and family as a form of pre-purchase research. Such considerations further demonstrate the complexity of this demographic and highlight the potential for owners to exhibit different schools of thought on what actually constitutes pre-purchase advice.

This research showed the considerations which influenced owners' decisions to get a dog to include informed decision making, emotional response and a desire for convenience. Such considerations demonstrate the complexities of dog acquisition and may explain findings such as that by from the PDSA's Wellbeing report in 2013, which found 22% of respondents would consider buying a pet from a puppy farm (PDSA, 2013). It is arguable that as the desire to rescue and nurture is ingrained within human nature, this consideration may therefore remain unchanged even by extensive implementation of a public education campaign. Therefore, relying on people not to buy dogs from puppy farms may be an ineffective approach. Instead as part of improved public education, owners could continue to be advised to take all new puppies for a vet check, with the additional aim of discussing any concerns about the breeder or establishment from which the puppy was sourced. Such an intervention would allow new owners to address any concerns, discuss them with a vet and be made aware of systems for reporting suspicious breeders. If a strong system for negative feedback, reporting and penalisation of irresponsible breeders could be established this may assist in removing the niche in which puppy farming currently exists. The issue of pedigree dog relinquishment to shelters is also a consideration which needs to be addressed (Stavisky *et al*., 2012). Whilst many breeders stipulate within their puppy contracts that unwanted

puppies and dogs should be returned to them, it would appear that this facility may be underutilised and needs to be better promoted.

The results of this study indicated that owners use a variety of information resources during their dogs' lifetime, a consideration which poses a number of challenges with regards to achieving consistency in the information this party are exposed to. Similarly to vets and pedigree dog breeders, owners were shown to prefer verbal communication when receiving information and although advice was sought from a number of parties regarding different aspects of dog care, vets were the main party consulted. These findings are of use in informing interventions aimed at this demographic and (whilst it is not possible to make verbal communication the method of choice for a national educational campaign) if vets are a key source of advice, practices should be better encouraged to engage with their clients and the public in offering education and advice. It should also be noted that whilst verbal communication was the preferred choice of receiving information by vets, pedigree dog breeders and owners, the provision of supplementary written information is likely to offer a more concise resource which can be referred to once verbal exchange has been forgotten, increasing the chance that information will be retained in the long term.

This is a complex area and more needs to be done to understand the dog owning population if successful public education campaigns are to be implemented as recommended by several key reports (APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010). To-date implementation of such campaigns have been disappointing and more needs to be done to engage in a way that is both broad reaching and informed with regards to the target audience. This is a task for which the KC, in collaboration with welfare charities, could lead the way. For future policy making to be successful interventions aimed at owners need to be multifaceted and engage at all levels, across all stakeholders who interact with this group, including vets and pedigree dog breeders. Further, quality, relevant information needs to be delivered to prospective and current dog owners in a way that is useable, understandable and accessible. At present

this is too greater task to be undertaken by a single organisation and thus such an intervention would require both collaboration and provision of funding by the larger welfare charities and the KC Charitable Trust.

The internet was shown to be a key source of information for dog owners during their dogs' lifetime. However, data collected on the search terms owners used when looking for information on how to care for a new dog were variable with regards to use of words, punctuation, length and specificity. Findings such as this indicate a potential challenge may exist for organisations wishing to target prospective and existing dog owners online in ensuring their website metadata are broad enough to allow for variability in the way that owners appear to search. This research suggests that without such measures good quality information may not reach its intended target population or appear too far down the list of search results for owners to find it easily. This observation may be reflected by the absence of the RSPCA's 'Get Puppy Smart' tool (RSPCA, 2011a) and the Advisory Council on the Welfare Issues of Dog Breeding's Guide to Buying a Puppy (Advisory Council on the Welfare Issues of Dog Breeding, 2012a) in the search results generated by this study. Realistically there is little point in trying to overcome this problem by teaching owners how to conduct an internet search using specific search strategies. Instead, one potential method of addressing this issue would be for key parties who work with both prospective and current dog owners, such as vets and breeders, to supply leaflets containing lists of approved websites. This would therefore aid in ensuring owners were aware of available resources and mindful of trusted sources of advice.

For owners conducting Google searches on how to care for a new dog or puppy, this research indicated there to be a great deal of easy to understand information available for which the indicators of quality were poor. This does not necessarily mean the information featured by such resources was untrue or not useful but that the majority of resources failed to meet recognised indicators of quality. This presents potential difficulties for owners in interpreting resource reliability and may increase the risk of misinformation;

an issue which is unacceptable and needs to be addressed. All providers of information, but particularly those large organisations which receive the most online traffic should be obliged to meet basic indicators of quality to verify the information they provide. Such actions need to be introduced if the internet is to be harnessed as a means of improving knowledge and awareness of the puppy buying public, the need for which was outlined by several key reports conducted in the aftermath of PDE (The BBC Press Office, 2008, APGAW, 2009, Rooney and Sargan, 2009, Bateson, 2010). Peer review, provision of authorship, dates on web resources and centralisation of good quality information via dog and animal welfare organisations would assist in directing lay public to reputable information. Further, dog owner mailing lists overseen by vets, breeders or larger organisations such as the KC may offer a means of regularly updating owners and directly linking them to the most recent quality resources. Interestingly, the KC's website was the only one to be generated as a result of all six searches conduced. This showed the KC website to be well signposted and to have a great deal of potential to assist with the centralisation of quality information by providing links to other reputable independent websites.

Study limitations

The studies conducted in this thesis were subject to several limitations, in part due to the exploratory nature of the research and also the difficultly in defining and contacting the relevant target populations. The exact population of dogs in the UK is unknown and estimates vary (Murray *et al.*, 2010, Asher *et al.*, 2011, PFMA, 2013a) and in the same way so are the exact numbers of those who can be considered pedigree dog breeders or dog owners. In reality these target populations are diverse and difficult to define in a way which is inclusive of the complexity of these demographics. Whilst vet practices, the KC, microchip databases and insurance companies all possess data on those who can be considered owners or breeders, no inclusive list for any of these populations exists, for example, not all breeders register with the KC and not all owned dogs are vet visiting. Such considerations make achieving a representative sample

challenging and thus at times the potential disadvantages of methods such as convenience sampling had to be weighed against enabling numerically strong data collection.

Whilst the questionnaire response rates achieved throughout this research were fairly good, *post hoc* analysis for Chapter 2 showed the data collected from veterinary surgeons and pedigree dog breeders to be of inadequate power to allow generalisation of statistical results to the wider target populations. Whilst this finding was true of both parties, the sample size for pedigree dog breeders was not far off the required target and as such these data are likely to have better validity than those of the vets, for which the margin of error was greater. In light of such findings, any statistical comparisons made within this chapter should be interpreted with caution and in the context of this particular study only. Conversely, *post hoc* analysis for Chapter 4 indicated the sample size of dog owners obtained to of adequate power to draw meaningful conclusions from the data collected; however it is still possible this calculation may not have be suitable for all questions and this should therefore be taken into account when interpreting the validity of the results.

Although questionnaire data was successfully collected from veterinary surgeons during this research, recruiting vets for focus groups proved very challenging. This was likely a reflection of the time pressures on the profession and, on reflection, better uptake may have been instigated by holding focus groups at veterinary practices, events or conferences to negate the need for vets to travel in order to attend. Finally, whilst deriving the internet search terms used for the scoping review from a selection actually used by owners was considered a novel approach, this presented its own challenges. It is exceedingly difficult to ask for owners to generate search terms on a given topic without using any words which will influence the responses attained. In the event of this research this consideration was difficult to overcome, and the prevalence of the words ‘dog’ and ‘care’ is indicative of this.

Finally, many of the references cited throughout this thesis, whilst relevant, are of a lower quality than anticipated. This was due to the genuine lack of existing evidence on this subject and further, the lack of open access papers available. Such issues are not just applicable to this research but also to the stakeholders on which this research is based, many of whom will also have limited access to the existing evidence needed to instigate change. This highlights the need for a greater drive in open access publication, so that new evidence can be disseminated to those with the potential to induce change. Both data by the PDSA and PFMA are frequently quoted throughout this thesis and whilst these resources were contextually relevant, the quality of the data they provide is difficult to assess. The PFMA claims to collect data 'nationally representative of households in the UK' (PFMA, 2013b), however the exact methods behind this are not publically available (Downes *et al.*, 2013). Similarly, the data from the PDSA reports, whilst appropriate in the context of this study, lack detailed information on the methodology and sample sizes used making it difficult to assess the degree to which such findings may be representative of the wider population. Such references served in providing some evidence where peer-reviewed publication was lacking, but should be interpreted with caution.

Conclusion

Improving pedigree dog health and wellbeing in the UK is a complex task for which no single solution exists. Despite this, vets, breeders and dog owners all exhibit substantial potential and willingness to instigate significant change; improving pedigree dog health from the grassroots up. Despite the common goals shared between all parties, data presented in this project clearly show that there is little in the way of joint strategies to achieve the desired end point. The umbrella organisations who oversee vets, breeders and owners have key roles to play in actively encouraging collaboration between these parties. Further encouraging the promotion of educational initiatives for dog owners and puppy buyers that take both vet and breeder expertise into account. To do this successfully organisations need to adopt an impartial and non-biased approach towards improving pedigree dog health in which the needs of vets', breeders' and owners' are of primary importance and not hindered by infrastructure politics or outdated opinion. Vet-breeder-owner collaboration is vital in instigating positive change and methods for better resource pooling between these parties, improved networking and communication events, along with coordinated strategies for dog owner and public education should be developed as a matter of priority.

Dog owners are a diverse demographic with varied needs for whom a multifaceted educational approach is required. An issue clearly exists regarding whether or not sufficient research is conducted prior to dog or puppy acquisition, but the tendency for puppy buyers to let their hearts rule their heads may be a difficult one to change. Although attempts to introduce educational interventions pre-purchase should continue, damage limitation may be a better method for those who insist on buying on impulse. In this instance greater benefit is likely to be achieved by ensuring good quality, evidence-based information and advice is available post-purchase in a way which is easily accessible and understandable. The value of additional research in this area needs to be recognised and a trend for utilising the most up-to-date evidence needs to be established. Educational support should also be given to

those who wish to relinquish a new puppy or dog to ensure the puppy or dog is suitably rehomed and such a situation does not occur again. Clarity is required regarding the quality of online dog and puppy care resources available as a matter of priority and this should start with simple steps such as large organisations dating the resources they provide. Ongoing centralisation and dissemination of evidence-based, peer-reviewed information on canine welfare and breeding practice is required to ensure welfare improvements continue and to encourage collaborative thinking at all levels.

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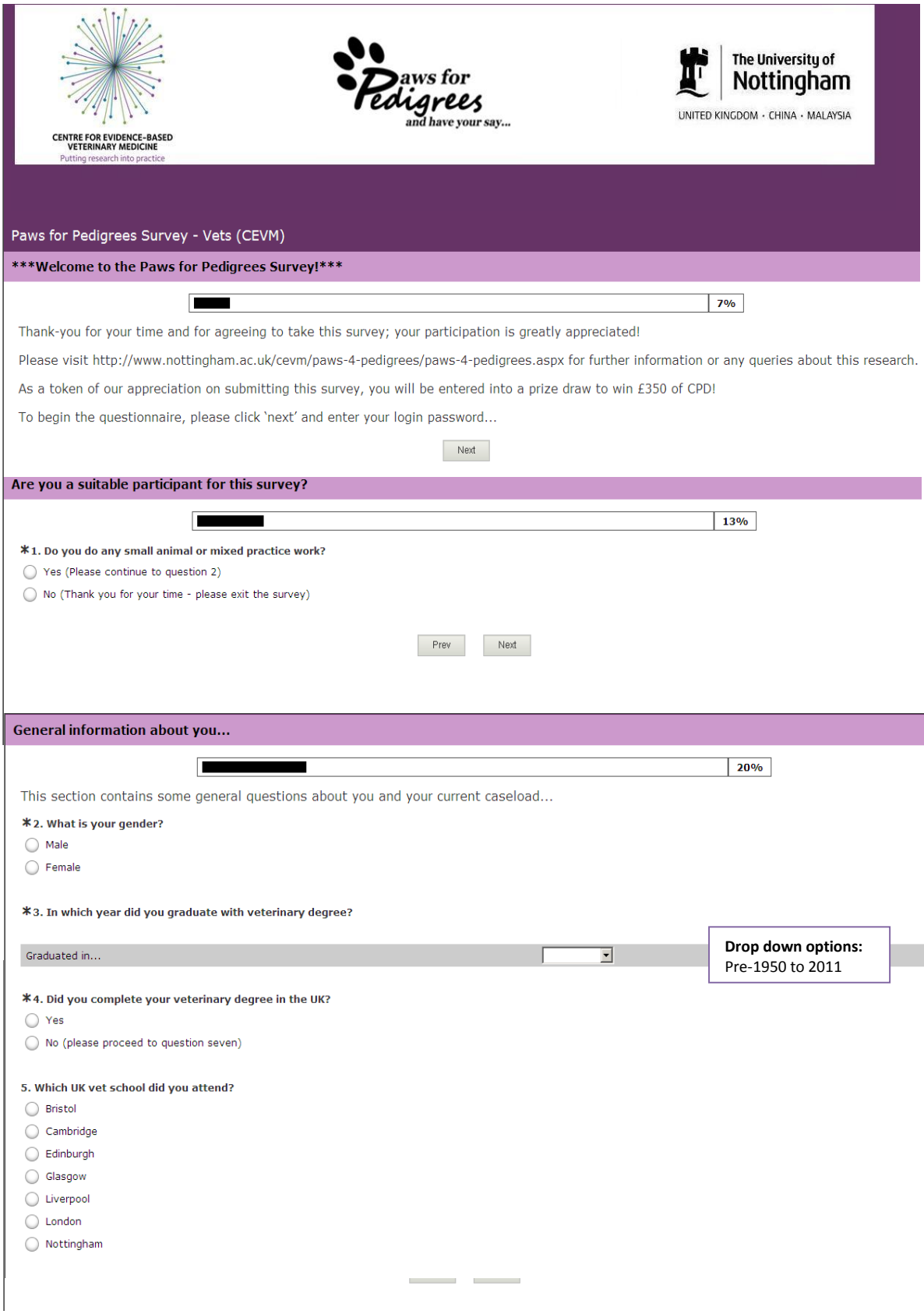
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Appendix 1 – Veterinary surgeons' questionnaire



CENTRE FOR EVIDENCE-BASED VETERINARY MEDICINE
Putting research into practice

Paws for Pedigrees and have your say...

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

Paws for Pedigrees Survey - Vets (CEVM)

Welcome to the Paws for Pedigrees Survey!

7%

Thank-you for your time and for agreeing to take this survey; your participation is greatly appreciated!

Please visit http://www.nottingham.ac.uk/cevm/paws-4-pedigrees/paws-4-pedigrees.aspx for further information or any queries about this research.

As a token of our appreciation on submitting this survey, you will be entered into a prize draw to win £350 of CPD!

To begin the questionnaire, please click 'next' and enter your login password...

Next

Are you a suitable participant for this survey?

13%

*1. Do you do any small animal or mixed practice work?

- Yes (Please continue to question 2)
- No (Thank you for your time - please exit the survey)

Prev Next

General information about you...

20%

This section contains some general questions about you and your current caseload...

*2. What is your gender?

- Male
- Female

*3. In which year did you graduate with veterinary degree?

Graduated in...

Drop down options:
Pre-1950 to 2011

*4. Did you complete your veterinary degree in the UK?

- Yes
- No (please proceed to question seven)

5. Which UK vet school did you attend?

- Bristol
- Cambridge
- Edinburgh
- Glasgow
- Liverpool
- London
- Nottingham

Sources of information...

33%

This section contains questions about the sources of information that you and your clients use for information on pedigree dog health...

***12. Using the list below please select ALL sources of information you use as a vet when requiring information on pedigree dog health.**

	Information sources you use
Television	☐
Radio	☐
Books	☐
Journals/scientific papers	☐
Veterinary organisation manuals e.g. BSAVA manuals	☐
Dog magazines	☐
Breed club newsletters	☐
Kennel Club literature/publications	☐
General Internet Search	☐
Veterinary websites	☐
The Kennel Club website	☐
Relevant breed club websites	☐
Online forums and blogs	☐
Social networking sites e.g. Facebook/Twitter etc	☐
Friends or relatives	☐
Other breeders	☐
Owners	☐
Ask a colleague or another first opinion vet	☐
Contact a referral vet or specialist	☐
Dog shows	☐
Contact breed club health committees	☐
Veterinary graduate notes	☐

Other (please specify)

***13. Using the scales provided please indicate how much information you feel is available to you on the following subjects: (1 = NONE AT ALL and 10 = ENOUGH)**

	1	2	3	4	5	6	7	8	9	10
How to select a pedigree dog for breeding	○	○	○	○	○	○	○	○	○	○
Recommended hereditary disease tests for pedigree dogs	○	○	○	○	○	○	○	○	○	○
Pedigree breed associated hereditary diseases	○	○	○	○	○	○	○	○	○	○

Prev Next

***14. If the Kennel Club, Independent Dog Advisory Council or associated organisations wanted to communicate information on clinical research developments and current pedigree dog news to you, how would you prefer to receive this information? Please select only ONE option.**

	Preferred type of information
Leaflets	○
A website	○
Emails	○
Letters or reports	○
Phone calls	○
Updates in dog magazines or other publications	○
Via social networking sites e.g. Facebook/Twitter etc	○

Other (please specify)

***15. In general terms how frequently do you feel you would USE this sort of information in practice?**

- Daily
- Weekly
- Monthly
- Yearly
- Less often than yearly
- Never

***16. Where do you think pedigree dog breeders source their information on pedigree dog health from?**

Please select all information sources you feel apply.

	Information sources BREEDERS use
Television	☐
Radio	☐
Books	☐
Journals/scientific papers	☐
Veterinary organisation manuals e.g. BSAVA manuals	☐
Dog magazines	☐
Breed club newsletters	☐
Kennel Club literature/publications	☐
General Internet Search	☐
Veterinary websites	☐
The Kennel Club website	☐
Relevant breed club websites	☐
Online forums and blogs	☐
Social networking sites e.g. Facebook/Twitter etc	☐
Friends or relatives	☐
Other breeders	☐
Owners	☐
Vets	☐
Contact a referral vet or specialist	☐
Dog shows	☐
Contact breed club health committees	☐
I don't know	☐

Other (please state and say whether relevant to owners/breeders or both)

Prev Next

53%

***17. What method do you use most frequently to convey information on canine health to both pedigree dog owners and breeders? Please select all methods which apply using the columns provided, answering for BOTH owners and breeders.**

	Information conveyed to OWNERS	Information conveyed to BREEDERS
Verbal communication	☐	☐
Sending them emails	☐	☐
Providing written/typed instructions at their request	☐	☐
Social networking sites e.g. Facebook/Twitter etc	☐	☐
Sharing commercial leaflets	☐	☐
Providing pre-prepared handouts	☐	☐
Directing them to a commercial website e.g. BVA/KC health scheme site	☐	☐
Directing them to breed club websites	☐	☐
Directing them to published literature	☐	☐

Other (please state and say whether relevant to owners/breeders or both)

Influences...

60%

This section contains questions on who you perceive to carry the most knowledge and influence with regards to pedigree dog breeding, canine hereditary diseases and screening programs...

What level of KNOWLEDGE do you perceive the below groups to have with regards to the following topics?

For the following questions please answer for EACH group using the scales provided: 1 = VERY POOR KNOWLEDGE and 10 = VERY GOOD KNOWLEDGE

***19. Knowledge on pedigree dog breeding...**

	1	2	3	4	5	6	7	8	9	10
General practitioners	○	○	○	○	○	○	○	○	○	○
Pedigree dog breeders	○	○	○	○	○	○	○	○	○	○
Pedigree dog owners	○	○	○	○	○	○	○	○	○	○

***20. Knowledge on canine hereditary diseases...**

	1	2	3	4	5	6	7	8	9	10
General practitioners	○	○	○	○	○	○	○	○	○	○
Pedigree dog breeders	○	○	○	○	○	○	○	○	○	○
Pedigree dog owners	○	○	○	○	○	○	○	○	○	○

***18. Now please select from the drop-down menu the number of the information source you most PREFER when conveying information to pedigree dog owners and breeders.**

Preferred method of conveying information to OWNERS	
Preferred method of conveying information to BREEDERS	

Prev Next

Drop down options:
Verbal communication, Sending them emails, Providing written/typed instructions at their request, Social networking sites e.g. Facebook/Twitter etc, Sharing commercial leaflets
Providing pre-prepared handouts, Directing them to a commercial website e.g. BVA/KC health scheme site, Directing them to breed club websites, Directing them to published literature

***21. Knowledge on canine hereditary disease screening programmes ...**

	1	2	3	4	5	6	7	8	9	10
General practitioners	○	○	○	○	○	○	○	○	○	○
Pedigree dog breeders	○	○	○	○	○	○	○	○	○	○
Pedigree dog owners	○	○	○	○	○	○	○	○	○	○

Prev Next

Responsibilities...

67%

This section contains questions on who you perceive to carry the most responsibility for various actions relating to the promotion of pedigree dog health...

***22. For each area or subject relating to the PROMOTION OF PEDIGREE DOG HEALTH listed in the below table, please select the ONE party you perceive to carry the MOST RESPONSIBILITY.**

Definitions:
Veterinary organisations - e.g. the BVA and the RCVS

	The Kennel Club	Pedigree dog breeders	Pedigree dog owners	General practitioners	Geneticists/research scientists	Veterinary organisations
Advising pedigree dog OWNERS	○	○	○	○	○	○
Addressing pedigree dog breed standards	○	○	○	○	○	○
Educating the public	○	○	○	○	○	○
Data collection on hereditary diseases	○	○	○	○	○	○
Advising pedigree dog BREEDERS	○	○	○	○	○	○
Addressing genetic diversity of individual breeds	○	○	○	○	○	○
Promoting responsible dog breeding	○	○	○	○	○	○
Advising puppy buyers	○	○	○	○	○	○
Advising the veterinary profession	○	○	○	○	○	○

Prev Next

Future actions...

73%

This section involves some questions on the importance of health-promotion actions for the control of canine hereditary diseases...

***23. Please use the options provided to indicate how important you perceive the following health-promotion actions to be for the control of hereditary diseases in pedigree dogs in the future.**

	Unimportant	Of little importance	Moderately important	Important	Very important
Limitations on the number of pedigree dog registrations	○	○	○	○	○
More specific vet school teaching	○	○	○	○	○
Increased exchange of information between the Kennel Club and vets	○	○	○	○	○
Increased exchange of information between the Kennel Club and breeders	○	○	○	○	○
Increased exchange of information between the vets and puppy buyers	○	○	○	○	○
Increased exchange of information between the Kennel Club and owners	○	○	○	○	○
Increased exchange of information between vets and breeders	○	○	○	○	○
Increased awareness of all parties to the information resources available	○	○	○	○	○
Obligatory screening for hereditary diseases	○	○	○	○	○
Increased selection of healthy breeding dogs by breeders	○	○	○	○	○
Increased health demands by the general public	○	○	○	○	○
Increased education of puppy buyers	○	○	○	○	○

24. If there are any health-promotion actions for the control of canine hereditary disease you feel are NOT on this list please state them in the box provided.

Prev Next

Pedigree dog health and welfare...

80%

This section is focused on health and aims to collect information on which conditions are most commonly seen in the top ten registered pedigree dog breeds in the UK...

25. Below is a list of the ten pedigree dog breeds featured in this study.

Answering for each breed please indicate the TOP THREE health issues you feel are most frequently seen, along with the single health issue you believe to have the biggest impact on the welfare of that breed.

Answers should be indicated using the drop-down menus provided. An 'I don't know' option is also provided.

	Issue 1	Issue 2	Issue 3	Issue with the biggest impact on welfare:
Labrador Retrievers				
Cocker Spaniels				
English Springer Spaniels				
German Shepherd Dogs				
Cavalier King Charles Spaniels				
Staffordshire Bull Terriers				
Border Terriers				
Golden Retrievers				
Boxers				
West Highland White Terriers				

Drop down options:
Don't know, Cardiovascular, Dermatological (including ears and paws), Endocrine, Gastrointestinal, Haematological, Musculoskeletal, Neurological, Ocular, Urinary, Reproductive, Respiratory, Another

Comments about other issues experienced:

*** 26. For the following statement please select your answer from the drop-down menu:**

In your opinion pedigree dog health in the LAST 10 years HAS...

Drop down options: Worsened, Remained unchanged, Improved, I don't know

*** 27. For the following statement please select your answer from the drop-down menu:**

In your opinion pedigree dog health in the NEXT 10 years WILL...

Drop down options:
Worsen, Remain unchanged, Improve, I don't know

Prev Next

About you...

87%

This final section is designed to obtain some further information about you...

***28. Do you hold any post graduate qualifications in addition to your veterinary degree?**

- Yes
- No (Go to question thirty)

29. If your specialism involves a high caseload of pedigree dogs or you are directly involved in canine hereditary disease screening programs, please give information on this in the space provided (e.g. I am a referral opthamologist/member of the BVA/KC/ISDS eye panel)

***30. Do you own a pedigree dog yourself?**

- Yes (please state which breed(s) in the space provided)
- No

Breed(s) owned:

***31. Have you ever bred pedigree dogs yourself?**

- Yes (please state which breed(s) in the space provided)
- No

Breed(s) bred:

***32. Are you a member of the Kennel Club?**

- Yes
- No

Further comments...

93%

33. Please use the space provided for any additional comments relating to this questionnaire, this study or any issues that you feel are important to this research.

***34. As a follow-up to this survey we will be holding focus groups at the vet school (see address below) for vets to discuss vet-breeder relations.**

This will take place at the end of the calender year and refreshments will be provided.Please indicate below if you would be willing to participate. You can withdraw from this part of the study at any time.

- Yes, I would be interested in participating (please provide your email address in the box below)
- No, I am unable to participate

Email address:

The School of Veterinary Medicine and Science,
The University of Nottingham,
Sutton Bonington Campus,
Sutton Bonington,
Leicestershire,
LE12 5RD

35. If you would like to be entered into a prize draw to win £350 worth of CPD of your choice, please select 'yes' and provide your email address in the space provided.

- Yes I would like to be entered into the prize draw (please supply your email address)
- No I am not interested

Email address:

Prev Next

Thank you for completing this survey!

100%

Thank you very much for taking the time to complete this questionnaire, your participation is greatly appreciated and vital to this research.

On submitting this questionnaire, you will be entered into a prize draw to win £350 of CPD!

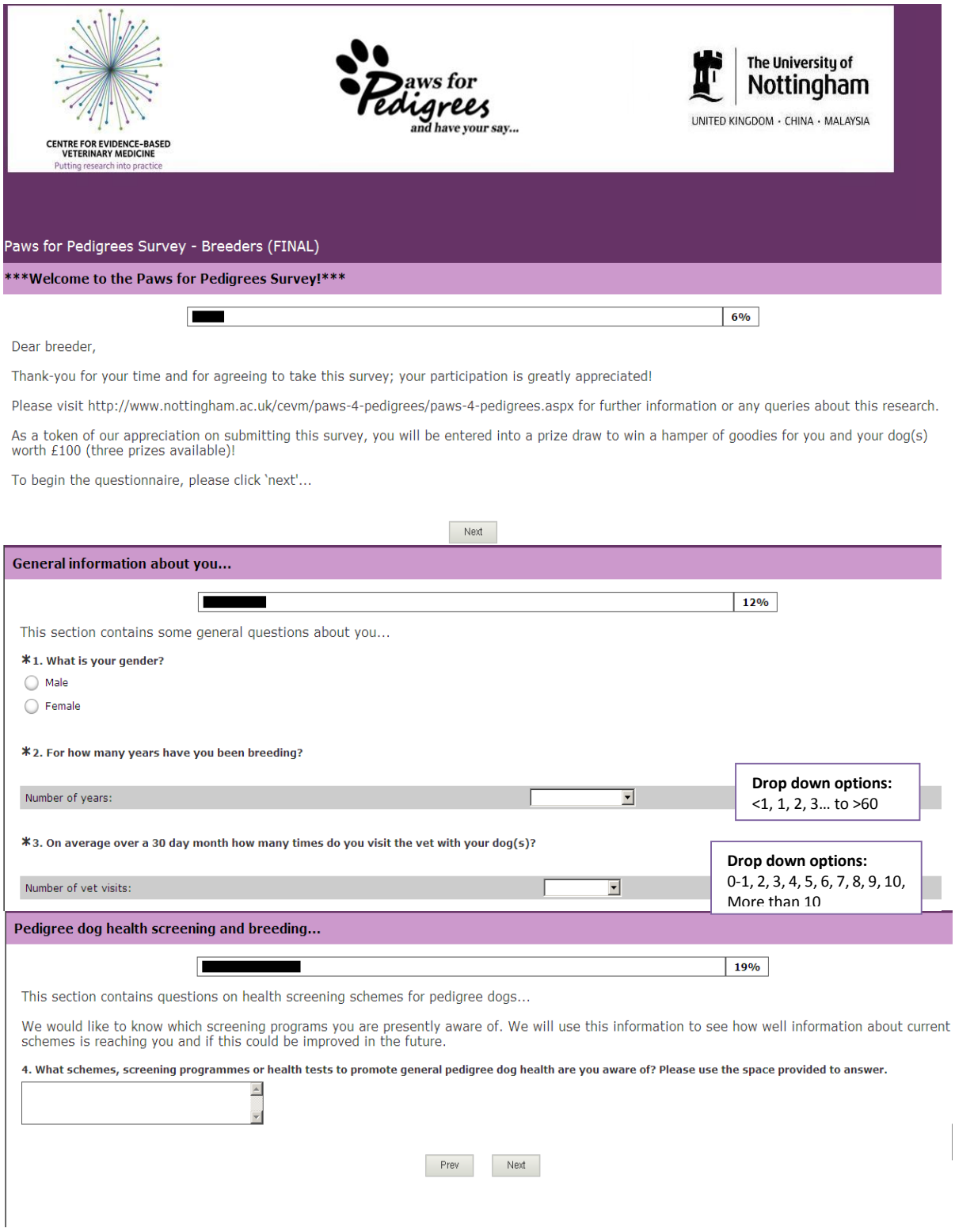
If you wish to discuss this project further or have any questions, please do not hesitate to contact me personally using the details shown below.

Kind regards,
Christina Hunt BVMedSci

Phone: 01159 516576 (please leave a message and I will call you back)
Email: paws4pedigrees@nottingham.ac.uk

Prev Done

Appendix 2 – Pedigree dog breeders' questionnaire



CENTRE FOR EVIDENCE-BASED VETERINARY MEDICINE
Putting research into practice

Paws for Pedigrees and have your say...

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

Paws for Pedigrees Survey - Breeders (FINAL)

Welcome to the Paws for Pedigrees Survey!

6%

Dear breeder,

Thank-you for your time and for agreeing to take this survey; your participation is greatly appreciated!

Please visit http://www.nottingham.ac.uk/cevm/paws-4-pedigrees/paws-4-pedigrees.aspx for further information or any queries about this research.

As a token of our appreciation on submitting this survey, you will be entered into a prize draw to win a hamper of goodies for you and your dog(s) worth £100 (three prizes available)!

To begin the questionnaire, please click 'next'...

Next

General information about you...

12%

This section contains some general questions about you...

*1. What is your gender?

Male

Female

*2. For how many years have you been breeding?

Number of years:

Drop down options:
<1, 1, 2, 3... to >60

*3. On average over a 30 day month how many times do you visit the vet with your dog(s)?

Number of vet visits:

Drop down options:
0-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, More than 10

Pedigree dog health screening and breeding...

19%

This section contains questions on health screening schemes for pedigree dogs...

We would like to know which screening programs you are presently aware of. We will use this information to see how well information about current schemes is reaching you and if this could be improved in the future.

4. What schemes, screening programmes or health tests to promote general pedigree dog health are you aware of? Please use the space provided to answer.

Prev Next

25%

5. What schemes, screening programmes or health tests do you use to evaluate your dogs prior to breeding? Please use the space provided to answer.

Prev Next

31%

The following statements aim to collect information on your opinions towards pedigree dog breeding and health screening...

We would like to know your current views on the following topics.

For each statement please select the answer you feel to be most true.

***6. In your opinion, do puppies from health screened parents sell more or less easily than puppies from non-screened parents?**

- More easily
- Just as easily
- Less easily
- I don't know

***7. In your opinion, will puppy buyers spend more or less on puppies from health screened parents?**

- More
- The same
- Less
- I don't know

***8. In your opinion, is breeding from dogs which have not been health screened acceptable or unacceptable?**

- Acceptable
- Neither acceptable or unacceptable
- Unacceptable
- I don't know

***9. In your opinion, is breeder expertise more or less important than health screening status when choosing breeding dogs?**

- Of greater importance
- Of equal importance
- Of lesser importance
- I don't know

***10. In your opinion, is a breeder's reputation improved or reduced by health screening the dogs they breed?**

- Improved
- Unchanged
- Reduced
- I don't know

***11. In your opinion, does the introduction of health screening programs give a breed's health a positive or negative portrayal?**

- Positive portrayal
- Unchanged portrayal
- Negative portrayal
- I don't know

Prev Next

Sources of information...

38%

This section contains questions about the sources of information you use to find out more about pedigree dog health...

We will use your answers to see whether information on pedigree dog health could be supplied to you more effectively in a form that breeders favour most. We will also look at how information is exchanged between vets and breeders to highlight areas which can be addressed for future improvement.

***12. Where do you currently source information on pedigree dog health from? (Please select all information sources that apply)**

	Information sources you use
Television	☐
Radio	☐
Books	☐
Journals/scientific papers	☐
Veterinary organisation manuals e.g. BSAVA manuals	☐
Dog magazines	☐
Breed club newsletters	☐
Kennel Club literature/publications	☐
General Internet Search	☐
Veterinary websites	☐
The Kennel Club website	☐
Relevant breed club websites	☐
Online forums and blogs	☐
Social networking sites e.g. Facebook/Twitter etc	☐
Friends or relatives	☐
Other breeders	☐
Owners	☐
Vets	☐
Contact a referral vet or specialist	☐
Dog shows	☐
Contact breed club health committees	☐

Other (please specify)

***13. Using the scales provided please indicate how much information you feel is available to you on the following subjects: (1 = NONE AT ALL and 10 = ENOUGH)**

	1	2	3	4	5	6	7	8	9	10
Selection of suitable pedigree dogs for breeding	○	○	○	○	○	○	○	○	○	○
Hereditary disease testing for pedigree dogs	○	○	○	○	○	○	○	○	○	○
Breed-associated hereditary diseases	○	○	○	○	○	○	○	○	○	○

Prev Next



***14. Please select from the drop down menu which method of delivery you most PREFER when obtaining information from your VET.**

Preferred method of obtaining information from your vet:

Other (please specify)

Drop down options:
Verbal communication, Being sent emails, Being provided written/typed instructions at their request, Via social networking sites e.g. Facebook/Twitter etc, Commercial leaflets, Pre-prepared handouts, Being directed to a commercial website e.g. BVA/KC health scheme site, Being directed to breed club websites, Being directed to published literature

***15. If the Kennel Club, Independent Dog Advisory Council or associated organisations wanted to communicate information on clinical research developments and current pedigree dog news to you, how would you prefer to receive this information? Please select only ONE option.**

	Preferred type of information
Leaflets	○
A website	○
Emails	○
Letters or reports	○
Phone calls	○
Updates in dog magazines or other publications	○
Via social networking sites e.g. Facebook/Twitter etc	○

Other (please specify)

***16. In general terms how frequently do you feel you would use this sort of information?**

- ○ Daily
- ○ Weekly
- ○ Monthly
- ○ Yearly
- ○ Less often than yearly
- ○ Never

Prev Next

***17. Where do you think vets source their information on pedigree dog health from?**

Please select all information sources you feel apply.

	Information sources used
Television	☐
Radio	☐
Books	☐
Journals/scientific papers	☐
Veterinary organisation manuals e.g. BSAVA manuals	☐
Dog magazines	☐
Breed club newsletters	☐
Kennel Club literature/publications	☐
General Internet Search	☐
Veterinary websites	☐
The Kennel Club website	☐
Relevant breed club websites	☐
Online forums and blogs	☐
Social networking sites e.g. Facebook/Twitter etc	☐
Friends or relatives	☐
Other breeders	☐
Owners	☐
Ask a colleague or another first opinion vet	☐
Contact a referral vet or specialist	☐
Dog shows	☐
Contact breed club health committees	☐
Veterinary graduate notes	☐
I don't know	☐

Other (please specify)

Prev Next

56%

***18. What method do you use most frequently to convey information on canine health to both pedigree dog owners and other breeders? Please select all methods which apply using the columns provided, answering for BOTH owners and breeders.**

	Information conveyed to OWNERS	Information conveyed to other BREEDERS
Verbal communication	☐	☐
Sending them emails	☐	☐
Providing written/typed instructions at their request	☐	☐
Social networking sites e.g. Facebook/Twitter etc	☐	☐
Sharing commercial leaflets	☐	☐
Providing pre-prepared handouts	☐	☐
Directing them to a commercial website e.g. BVA/KC health scheme site	☐	☐
Directing them to breed club websites	☐	☐
Directing them to published literature	☐	☐

Other (please state and say whether relevant to owners/other breeders or both)

✱19. Now please select from the drop-down menu the information source you most PREFER when conveying information to pedigree dog owners and other breeders.

Preferred method of conveying information to OWNERS	
Preferred method of conveying information to other BREEDERS	

Drop down options:
Verbal communication, Sending them emails, Providing written/typed instructions at their request, Social networking sites e.g. Facebook/Twitter etc, Sharing commercial leaflets, Providing pre-prepared handouts, Directing them to a commercial website e.g. BVA/KC health scheme site, Directing them to breed club websites, Directing them to published literature

Prev Next

Influences...

62%

This section contains questions on who you perceive to carry the most knowledge and influence with regards to pedigree dog breeding, canine hereditary diseases and screening programs...

We will use the data collected (along with that from the vets' questionnaire) to see how aware each group is of other parties' knowledge and how this may affect the transfer of information between vets, breeders and owners day to day.

What level of KNOWLEDGE do you perceive the below groups to have with regards to the following topics?

For the following questions please answer for EACH group using the scales provided: 1 = VERY POOR KNOWLEDGE and 10 = VERY GOOD KNOWLEDGE

✱20. Knowledge on pedigree dog breeding...

	1	2	3	4	5	6	7	8	9	10
Vets	○	○	○	○	○	○	○	○	○	○
Pedigree dog breeders	○	○	○	○	○	○	○	○	○	○
Pedigree dog owners	○	○	○	○	○	○	○	○	○	○

✱21. Knowledge on canine hereditary diseases...

	1	2	3	4	5	6	7	8	9	10
Vets	○	○	○	○	○	○	○	○	○	○
Pedigree dog breeders	○	○	○	○	○	○	○	○	○	○
Pedigree dog owners	○	○	○	○	○	○	○	○	○	○

✱22. Knowledge on canine hereditary disease screening programmes ...

	1	2	3	4	5	6	7	8	9	10
Vets	○	○	○	○	○	○	○	○	○	○
Pedigree dog breeders	○	○	○	○	○	○	○	○	○	○
Pedigree dog owners	○	○	○	○	○	○	○	○	○	○

Prev Next

Responsibilities...

69%

This section contains questions on who you perceive to carry the most responsibility for various actions relating to the promotion of pedigree dog health...

The answers you provide will be used to see whether current health promotion actions are being addressed in the most effective way possible and whether future improvements can be made.

***23. For each area or subject relating to the PROMOTION OF PEDIGREE DOG HEALTH listed in the below table, please select the party you perceive to carry the MOST RESPONSIBILITY.**

	The Kennel Club	Pedigree dog breeders	Pedigree dog owners	Individual vets	Geneticists/research scientists	The veterinary profession
Advising pedigree dog OWNERS	○	○	○	○	○	○
Addressing pedigree dog breed standards	○	○	○	○	○	○
Educating the public	○	○	○	○	○	○
Data collection on hereditary diseases	○	○	○	○	○	○
Advising pedigree dog BREEDERS	○	○	○	○	○	○
Addressing genetic diversity of individual breeds	○	○	○	○	○	○
Promoting responsible dog breeding	○	○	○	○	○	○
Advising puppy buyers	○	○	○	○	○	○
Advising the veterinary profession	○	○	○	○	○	○

Prev Next

Future actions...

75%

This section involves some questions on the importance of health-promotion actions for the control of canine hereditary diseases...

We would like to know which health-promotion actions you feel are most important for the control of canine hereditary diseases. We will use the information we obtain from both vets and breeders to highlight areas for future improvement in addressing pedigree dog health in the UK.

***24. Please use the options provided to indicate how important you perceive the following health-promotion actions to be for the control of hereditary diseases in pedigree dogs in the future.**

	Unimportant	Of little importance	Moderately important	Important	Very important
Limitations on the number of pedigree dog registrations	○	○	○	○	○
More specific teaching in vet schools	○	○	○	○	○
Increased exchange of information between the Kennel Club and vets	○	○	○	○	○
Increased exchange of information between the Kennel Club and breeders	○	○	○	○	○
Increased exchange of information between the vets and puppy buyers	○	○	○	○	○
Increased exchange of information between the Kennel Club and owners	○	○	○	○	○
Increased exchange of information between vets and breeders	○	○	○	○	○
Increased awareness of all parties to the information resources available	○	○	○	○	○
Obligatory screening for hereditary diseases	○	○	○	○	○
Increased selection of healthy breeding dogs by breeders	○	○	○	○	○
Increased health demands by the general public	○	○	○	○	○
Increased education of puppy buyers	○	○	○	○	○

25. If there are any health-promotion actions for the control of canine hereditary disease you feel are NOT on this list please state them in the box provided.

Prev Next

Pedigree dog health and welfare...

81%

This section is focused on health and aims to collect information on which conditions are most commonly seen in the top ten registered pedigree dog breeds in the UK...

We would like to know which conditions you are aware of in your breed(s) and which you perceive to have the biggest impact on welfare. We will use this information (with the answers collected from our vets questionnaire) to see whether vets are aware of the conditions which breeders feel to be most problematic.

26. Below is a list of the ten pedigree dog breeds featured in this study.

Answering ONLY for the dog(s) you breed (not those which are pets), please indicate the top three health issues you feel are most frequently seen in your breed(s) along with the single issue you believe to have the biggest impact on the welfare of that breed.

Answers should be indicated using the drop-down menus provided. Breeds which do not apply to you can simply be left blank. An 'I don't know' option is also provided.

	Issue 1	Issue 2	Issue 3	Issue with the biggest impact on welfare:
Labradors				
Cocker Spaniels				
Springer Spaniels				
German Shepherds				
Staffordshire Bull Terriers				
Cavalier King Charles Spaniels				
Golden Retrievers				
West Highland White Terriers				
Boxers				
Border Terriers				

Comments about other issues experienced:

Drop down options:
Don't know, Heart and circulatory, Skin problems (including ears and paws), Hormonal problems, Digestive problems, Blood and immune problems, Muscle and bone problems, Nerve and bone problems (including epilepsy), Eye problems, Bladder and kidney problems, Reproductive problems, Lung and breathing

*** 27. For the following statement please select your answer from the drop-down menu:**

In your opinion pedigree dog health in the LAST 10 years HAS...

Drop down options:
Worsened, Remained unchanged, Improved, I don't know

*** 28. For the following statement please select your answer from the drop-down menu:**

In your opinion pedigree dog health in the NEXT 10 years WILL...

Drop down options:
Worsen, Remain unchanged, Improve, I don't know

Prev Next

About you and your dogs...

88%

This final section is designed to obtain some further information about you and your dog(s)...

29. Please use the matrix of drop down menus below to provide us with information about which of the ten breeds featured in this study you breed.

For the breeds you do not breed, simply leave the row blank.

	Which category best describes your dogs?	No. of adult dogs owned?	No. of litters per year?
Labradors			
Cocker Spaniels			
Springer Spaniels			
German Shepherds			
Staffordshire Bull Terriers			
Cavalier Kind Charles Spaniels			
Golden Retrievers			
West Highland White Terriers			
Boxers			
Border Terriers			

Drop down options:
Show
Working
Pet
Show and working
Show and pet
Working and pet
Show, working and pet

Drop down options:
1 to >10

Drop down options:
1 to >10

30. Do you BREED any other pedigree dogs that were not mentioned above? If so, please provide information in the space provided.

31. Do you OWN any other pedigree dogs as PETS that were not mentioned above? If so, please provide information in the space provided.

***32. Do you register the puppies you breed with the Kennel Club?**

- Yes - all
- Yes - some
- No
- Prefer not to answer

***33. Are you a member of the Kennel Club?**

- Yes
- No
- Prefer not to answer

***34. Are you a veterinary nurse or veterinary surgeon?**

- Yes - I am a veterinary nurse
- Yes - I am currently a student veterinary nurse
- Yes - I am a veterinary surgeon
- Yes - I am currently a student veterinary surgeon
- No

Prev Next

Further comments...

94%

35. Please use the space provided for any additional comments relating to this questionnaire, this study or any issues that you feel are important to this research.

***36. As a follow-up to this survey we will be holding focus groups at the vet school (see address below) for breeders to discuss vet-breeder relations.**

This will take place at the end of the calender year and refreshments will be provided. Please indicate below if you would be willing to participate. You can withdraw from this part of the study at any time.

- Yes, I would be interested in participating (please provide your email address in the box below)
- No, I am unable to participate

Email address:

The School of Veterinary Medicine and Science,
The University of Nottingham,
Sutton Bonington Campus,
Sutton Bonington,
Leicestershire,
LE12 5RD

***37. If you would like to be entered into a prize draw to win a hamper of goodies for you and your dog(s) worth £100, please select 'yes' and provide your email address in the space provided.**

- Yes I would like to be entered into the prize draw (please supply your email address)
- No I am not interested

Email address:

Prev Next

Paws for Pedigrees Survey - Breeders (FINAL)

Thank you for completing this survey!

100%

Thank you very much for taking the time to complete this questionnaire, your participation is greatly appreciated and vital to this research.

On submitting this questionnaire, you will be entered into a prize draw to win a hamper of goodies for you and your dog(s) worth £100 (three prizes available)!

If you wish to discuss this project further or have any questions, please do not hesitate to contact me personally using the details shown below.

Kind regards,
Christina Hunt BVMedSci

Phone:01159 516576 (please leave a message and I will call you back)
Email: paws4pedigrees@nottingham.ac.uk

Prev Done

Appendix 3 – Vets' and breeders' data summary

Only vets results = blue Only breeders results = Red Both = black

Variable		Vets		Breeders	
		n	%	n	%
Source	CEVM List	89	59.3	-	-
	RCVS List	57	38.0	-	-
	Paper Copy	4	2.7	-	-
Source	Labradors	-	-	50	14.2
	English Cocker Spaniels	-	-	42	12.0
	English Springer Spaniels	-	-	27	7.7
	German Shepherds	-	-	52	14.8
	Staffordshire Bull Terriers	-	-	25	7.1
	Cavalier King Charles Spaniels	-	-	30	8.5
	Golden Retrievers	-	-	61	17.4
	West Highland White Terriers	-	-	10	2.8
	Boxers	-	-	36	10.3
	Border Terriers	-	-	18	5.1
Gender	Male	58	38.7	53	15.1
	Female	92	61.3	298	84.9
Year of graduation	1965	1	0.7	-	-
	1970	2	1.3		
	1971	2	1.3		
	1973	1	0.7		
	1974	2	1.3		
	1977	1	0.7		
	1978	3	2.0		
	1979	4	2.7		
	1980	6	4.0		
	1981	4	2.7		
	1983	1	0.7		
	1984	3	2.0		
	1985	3	2.0		
	1986	5	3.3		
	1987	6	4.0		
	1988	1	0.7		
	1989	2	1.3		
	1990	4	2.7		
	1991	3	2.0		
	1992	2	1.3		
	1993	4	2.7		
	1994	8	5.3		
	1995	2	1.3		
	1996	3	2.0		
	1997	3	2.0		
	1998	6	4.0		
	1999	4	2.7		
	2000	8	5.3		
	2001	9	6.0		
	2002	6	4.0		
	2003	7	4.7		
	2004	5	3.3		
	2005	2	1.3		

	2006	5	3.3		
	2007	3	2.0		
	2008	5	3.3		
	2009	6	4.0		
	2010	6	4.0		
	2011	2	1.3		
Vet degree completed in the UK?	Yes	119	79.3	-	-
	No	31	20.7	-	-
Vet school attended:	Bristol	24	20.2	-	-
	Cambridge	16	13.4	-	-
	Edinburgh	19	16.0	-	-
	Glasgow	14	11.8	-	-
	Liverpool	17	14.3	-	-
	London	28	23.5	-	-
	Nottingham	1	0.8	-	-
University where degree was completed:	Sydney	1	5.6	-	-
	Ghent	2	11.1		
	Free University Berlin	1	5.6		
	Hannover	1	5.6		
	Leipzig	1	5.6		
	Thessaloniki	1	5.6		
	Szent Istvan Egyetem	1	5.6		
	The Veterinary College of Ireland	1	5.6		
	Trinity College Dublin	3	16.7		
	University College Dublin	1	5.6		
	Massey University	1	5.6		
	Massey	1	5.6		
	Madrid	1	5.6		
	Bern University	1	5.6		
	Utrecht				
Country where degree was completed:	Australia	1	5.6	-	-
	Belgium	2	11.1		
	Germany	3	16.7		
	Greece	1	5.6		
	Hungary	1	5.6		
	Ireland	5	27.8		
	New Zealand	2	11.1		
	Spain	1	5.6		
	Switzerland	1	5.6		
	The Netherlands	1	5.6		
% of caseload estimated as SA work	5-10	1	0.7	-	-
	10	1	0.7		
	25	1	0.7		
	30	3	2.0		
	40	2	1.3		
	50	3	2.0		
	60	2	1.3		
	70	3	2.0		
	75	1	0.7		
	80	3	2.0		
	90	5	3.3		
	95	4	2.7		
	99	2	1.3		

	100	119	79.3		
% of caseload estimated as pedigree dogs	10	5	3.3	-	-
	15	4	2.7		
	20	12	8.0		
	24	1	0.7		
	25	11	7.3		
	30	28	18.7		
	35	15	10.0		
	35-45	1	0.7		
	36	2	1.3		
	40	22	14.7		
	40-80	1	0.7		
	44	1	0.7		
	45	3	2.0		
	50	10	6.7		
	>50	1	0.7		
	55	1	0.7		
	60	16	10.7		
	60-70	1	0.7		
	70	3	2.0		
	75	4	2.7		
	70-80	1	0.7		
	80	4	2.7		
	90	3	2.0		
Frequency of PDBS seen in practice	Daily	39	26.0	-	-
	Weekly	38	25.3	-	-
	Monthly	50	33.3	-	-
	Yearly	16	10.7	-	-
	Less Often than Yearly	2	1.3	-	-
	Never	1	0.7	-	-
	I don't know	4	2.7	-	-
No. of years breeding PDs	1	-	-	21	6.0
	2			18	5.1
	3			15	4.3
	4			22	6.3
	5			16	4.6
	6			15	4.3
	7			13	3.7
	8			6	1.7
	9			5	1.4
	10			25	7.1
	11			6	1.7
	12			13	3.7
	13			6	1.7
	14			7	2.0
	15			11	3.1
	16			9	2.6
	17			2	0.6
	18			5	1.4
	19			2	0.6
	20			21	6.0
	21			1	0.3
	22			3	0.9
	23			4	1.1
	24			5	1.4

	25			16	4.6
	26			6	1.7
	27			2	0.6
	28			5	1.4
	29			1	0.3
	30			16	4.6
	31			4	1.1
	32			4	1.1
	33			3	0.9
	34			3	0.9
	35			12	3.4
	36			3	0.9
	37			2	0.6
	39			4	1.1
	40			7	2.0
	41			1	0.3
	42			2	0.6
	43			1	0.3
	44			1	0.3
	45			3	0.9
	48			1	0.3
	50			1	0.3
	51			1	0.3
	52			1	0.3
Average vet visits over a 30 day month	0-1	-	-	311	88.6
	2			22	6.3
	3			8	2.3
	4			2	0.6
	5			0	0.0
	6			3	0.9
	7			0	0.0
	8			1	0.3
	9			0	0.0
	10			1	0.3
	More than 10			3	0.9
Using the scales provided please indicate how comfortable you feel with regards to the following: (1 = VERY UNCOMFORTABLE and 10 = VERY COMFORTABLE)		Mean	Range	Mean	Range
	Dealing with pedigree dog breeders in practice	6.52	1-10	-	-
	Discussing breeding options with pedigree dog breeder clients	5.95	1-10	-	-
	Advising puppy buyers on pedigree dog health	8.07	1-10	-	-
	Diagnosing hereditary diseases in pedigree dogs	6.70	1-10	-	-
	Managing hereditary diseases in pedigree dogs	6.63	1-10	-	-
	Advising on screening programs for canine hereditary disease	6.14	1-10	-	-
What schemes, screening programmes or health tests to promote pedigree					

dog health are you aware of?					
What schemes, screening programmes or health tests do you use to evaluate your dogs prior to breeding?		-	-		
In your opinion, do puppies from health screened parents sell more or less easily than puppies from non-screened parents?	More easily	-	-	186	54.5
	Just as easily	-	-	119	34.9
	Less easily	-	-	6	1.8
	I don't know	-	-	30	8.8
In your opinion, will puppy buyers spend more or less on puppies from health screened parents?	More	-	-	180	52.8
	The same	-	-	135	39.6
	Less	-	-	2	0.6
	I don't know	-	-	24	7.0
In your opinion, is breeding from dogs which have not been health screened acceptable or unacceptable?	Acceptable	-	-	10	2.9
	Neither acceptable or unacceptable	-	-	40	11.7
	Unacceptable	-	-	289	84.8
	I don't know	-	-	2	0.6
In your opinion, is breeder expertise more or less important than health screening status when choosing breeding dogs?	Of greater importance	-	-	22	6.5
	Of equal importance	-	-	262	76.8
	Of lesser importance	-	-	55	16.1
	I don't know	-	-	2	0.6
In your opinion, is a breeder's reputation improved or reduced by health screening the dogs they breed?	Improved	-	-	296	86.8
	Unchanged	-	-	39	11.4
	Reduced	-	-	1	0.3
	I don't know	-	-	5	1.5
In your opinion, does the introduction of health screening programs give a breed's health a positive or negative portrayal?	Positive portrayal	-	-	260	76.2
	Unchanged portrayal	-	-	47	13.8
	Negative portrayal	-	-	27	7.9
	I don't know	-	-	7	2.1
Where do you/vets currently source information on		**n**	**%**	**n**	**%**
	Television	14	1.1	15	0.9
	Radio	8	0.6	5	0.3

pedigree dog health from?	Books	120	9.7	62	3.9
	Journals/scientific papers	137	11.1	206	12.8
	Veterinary organisation manuals e.g. BSAVA manuals	138	11.2	257	16.0
	Dog magazines	18	1.5	18	1.1
	Breed club newsletters	13	1.1	18	1.1
	Kennel Club literature/publications	55	4.5	72	4.5
	General Internet Search	104	8.4	58	3.6
	Veterinary websites	124	10.1	201	12.5
	The Kennel Club website	79	6.4	51	3.2
	Relevant breed club websites	54	4.4	22	1.4
	Online forums and blogs	14	1.1	7	0.4
	Social networking sites e.g. Facebook/Twitter etc	1	0.1	2	0.1
	Friends or relatives	5	0.4	3	0.2
	Other breeders	29	2.4	54	3.4
	Owners	36	2.9	67	4.2
	Vets/colleagues	111	9.0	151	9.4
	Contact a referral vet or specialist	119	9.7	176	10.9
	Dog shows	4	0.3	4	0.2
	Contact breed club health committees	11	0.9	24	1.5
	Veterinary graduate notes	31	2.5	88	5.5
	I don't know	-	-	24	1.5
	Other	7	0.6	22	1.4
Additional comments about information sources:	Misc. comments The public Personal experience/opinion Conferences/meetings CPD Laboratories Working dog clubs Veterinary information network UFAW website	0 0 0 0 1 3 1 1 1		16 1 3 1 1 0 0 0 0	
Using the scales provided please indicate how much information you feel is available to you on the following subjects: (1 = NONE AT ALL and 10 = ENOUGH)		**Mean**	**Range**	**Mean**	**Range**
	Selection of suitable pedigree dogs for breeding	5.10	1-10	6.91	1-10
	Hereditary disease testing for pedigree dogs	5.42	1-10	6.88	1-10
	Breed-associated hereditary diseases	5.73	1-10	6.98	1-10
If the Kennel Club, Independent Dog		**n**	**%**	**n**	**%**
	Leaflets	17	11.3	21	6.2

Advisory Council or associated organisations wanted to communicate information on clinical research developments and current pedigree dog news to you, how would you prefer to receive this information?	A website	46	30.5	74	21.9
	Emails	64	42.4	164	48.5
	Letters or reports	14	9.3	40	11.8
	Phone calls	0	0.0	2	0.6
	Updates in dog magazines or other publications	6	4.0	27	8.0
	Via social networking sites e.g. Facebook/Twitter etc	1	0.7	3	0.9
	Other	3	2.0	7	2.1
Other comments:	Miscellaneous KC Accredited Breeder Scheme Via the Media Veterinary press Scientific magazines	0 0 0 2 1		5 1 1 0 0	
In general terms how frequently do you feel you would use this sort of information?	Daily	7	4.8	34	10.3
	Weekly	37	25.2	86	26.0
	Monthly	88	59.9	154	46.5
	Yearly	15	10.2	49	14.8
	Less often than yearly	0	0.0	8	2.4
	Never	0	0.0	0	0.0
Where do you/ breeders source their information on pedigree dog health from?	Television	51	3.5	16	0.6
	Radio	26	1.8	9	0.3
	Books	54	3.7	123	4.6
	Journals/scientific papers	4	0.3	110	4.1
	Veterinary organisation manuals e.g. BSAVA manuals	2	0.1	114	4.3
	Dog magazines/newspapers	116	8.0	150	5.6
	Breed club newsletters	115	8.0	198	7.4
	Kennel Club literature/publications	94	6.5	249	9.3
	General Internet Search	109	7.5	186	7.0
	Veterinary websites	8	0.6	94	3.5
	The Kennel Club website	86	6.0	216	8.1
	Relevant breed club websites	109	7.5	217	8.1
	Online forums and blogs	101	7.0	109	4.1
	Social networking sites e.g. Facebook/Twitter etc	57	3.9	35	1.3
	Friends or relatives	85	5.9	41	1.5
	Other breeders	136	9.4	254	9.5
	Owners	29	2.0	76	2.8
	Ask a colleague or another first opinion vet	57	3.9	166	6.2
	Contact a referral vet or specialist	11	0.8	66	2.5
	Dog shows	113	7.8	104	3.9
	Contact breed club health committees	72	5.0	126	4.7
	I don't know	6	0.4	-	-

	Other	4	0.3	11	.4
Other comments:	Miscellaneous Other websites Country of breed origin Breed databases	4 0 0 0		5 3 2 1	
What method do you use most frequently to convey information on canine health pedigree dog owners?	Verbal communication	145	28.4	278	20.3
	Sending them emails	7	1.4	185	13.5
	Providing written/typed instructions at their request	59	11.5	185	13.5
	Social networking sites e.g. Facebook/Twitter etc	4	0.8	49	3.6
	Sharing commercial leaflets	62	12.1	51	3.7
	Providing pre-prepared handouts	67	13.1	164	12.0
	Directing them to a commercial website e.g. BVA/KC health scheme site	89	17.4	164	12.0
	Directing them to breed club websites	44	8.6	173	12.6
	Directing them to published literature	34	6.7	122	8.9
What method do you use most frequently to convey information on canine health to pedigree dog breeders?	Verbal communication	140	30.1	246	27.8
	Sending them emails	4	0.9	185	20.9
	Providing written/typed instructions at their request	52	11.2	40	4.5
	Social networking sites e.g. Facebook/Twitter etc	0	0.0	59	6.7
	Sharing commercial leaflets	46	9.9	34	3.8
	Providing pre-prepared handouts	50	10.8	24	2.7
	Directing them to a commercial website e.g. BVA/KC health scheme site	93	20.0	121	13.7
	Directing them to breed club websites	38	8.2	102	11.5
	Directing them to published literature	42	9.0	75	8.5
Other comments:					
Now please select from the drop-down menu the information source you most PREFER when conveying information to pedigree dog owners	Verbal communication	88	60.3	128	40.5
	Sending them emails	1	0.7	65	20.6
	Providing written/typed instructions at their request	12	8.2	47	14.9
	Social networking sites e.g. Facebook/Twitter etc	0	0.0	2	0.6
	Sharing commercial leaflets	3	2.1	2	0.6
	Providing pre-prepared handouts	29	19.9	51	16.1
	Directing them to a commercial website e.g. BVA/KC health scheme site	12	8.2	16	5.1
	Directing them to breed club websites	1	0.7	3	0.9

	Directing them to published literature	0	0.0	2	0.6
Now please select from the drop-down menu the information source you most PREFER when conveying information to pedigree dog breeders.	Verbal communication	63	51.2	142	49.8
	Sending them emails	0	0.0	85	29.8
	Providing written/typed instructions at their request	15	12.2	6	2.1
	Social networking sites e.g. Facebook/Twitter etc	0	0.0	8	2.8
	Sharing commercial leaflets	1	0.8	1	0.4
	Providing pre-prepared handouts	0	0.0	5	1.8
	Directing them to a commercial website e.g. BVA/KC health scheme site	38	30.9	19	6.7
	Directing them to breed club websites	5	4.1	9	3.2
	Directing them to published literature	1	0.8	10	3.5
The information source you prefer when obtaining information from your vet.	Verbal communication	-	-	264	80.5
	Sending them emails	-	-	25	7.6
	Providing written/typed instructions at their request	-	-	10	3.0
	Social networking sites e.g. Facebook/Twitter etc	-	-	1	0.3
	Sharing commercial leaflets	-	-	1	0.3
	Providing pre-prepared handouts	-	-	10	3.0
	Directing them to a commercial website e.g. BVA/KC health scheme site	-	-	10	3.0
	Directing them to breed club websites	-	-	7	2.1
Other comments:	Miscellaneous I have more knowledge/information about my breed than my vet Recommended literature Seminars Personal research Over the phone Consult a specialist	-	-	6 9 1 1 1 1 1	
What level of KNOWLEDGE do you perceive the below groups to have with regards to the following topics?	**Knowledge on pedigree dog breeding...**	Mean	Range	Mean	Range
	Vets	6.32	2-10	4.79	1-10
	Pedigree dog breeders	6.01	1-10	7.43	1-10
	Pedigree dog owners	3.28	1-8	3.79	1-10
	Knowledge on canine hereditary diseases...				
	Vets	6.80	2-10	6.21	1-10

	Pedigree dog breeders	5.68	1-10	7.52	1-10
	Pedigree dog owners	3.04	1-8	3.91	1-10
	Knowledge on canine hereditary disease screening programmes ...				
	Vets	6.53	2-10	6.36	1-10
	Pedigree dog breeders	6.17	1-10	7.63	1-10
	Pedigree dog owners	2.86	1-8	3.64	1-10
		n	%	n	%
For each area or subject relating to the PROMOTION OF PEDIGREE DOG HEALTH listed in the below table, please select the party you perceive to carry the MOST RESPONSIBILITY	**Advising pedigree dog OWNERS**				
	The Kennel Club	26	18.6	62	19.9
	Pedigree dog breeders	25	17.9	171	54.8
	Pedigree dog owners	2	1.4	4	1.3
	Individual vets	83	59.3	25	8.0
	Geneticists/research scientists	0	0.0	12	3.8
	The veterinary profession	4	2.9	38	12.2
	Addressing pedigree dog breed standards				
	The Kennel Club	112	80	209	67.0
	Pedigree dog breeders	7	5	86	27.6
	Pedigree dog owners	0	0	4	1.3
	Individual vets	3	2.1	0	0.0
	Geneticists/research scientists	3	2.1	11	3.5
	The veterinary profession	15	10.7	2	0.6
	Educating the public				
	The Kennel Club	71	50.7	179	57.4
	Pedigree dog breeders	3	2.1	80	25.6
	Pedigree dog owners	1	0.7	4	1.3
	Individual vets	25	17.9	10	3.2
	Geneticists/research scientists	0	0.0	3	1.0
	The veterinary profession	40	28.6	36	11.5
	Data collection on hereditary diseases				
	The Kennel Club	36	25.7	102	32.7
	Pedigree dog breeders	1	0.7	14	4.5
	Pedigree dog owners	0	0.0	0	0.0
	Individual vets	6	4.3	8	2.6
	Geneticists/research scientists	65	46.4	137	43.9
	The veterinary profession	32	22.9	51	16.3
	Advising pedigree dog BREEDERS				
	The Kennel Club	77	55	158	50.6
	Pedigree dog breeders	1	0.7	20	6.4
	Pedigree dog owners	0	0	1	0.3
	Individual vets	46	32.9	17	5.4
	Geneticists/research scientists	3	2.1	59	18.9
	The veterinary profession	13	9.3	57	18.3

	Addressing genetic diversity of individual breeds				
	The Kennel Club	52	37.1	86	27.6
	Pedigree dog breeders	22	15.7	51	16.3
	Pedigree dog owners	0	0.0	0	0.0
	Individual vets	2	1.4	3	1.0
	Geneticists/research scientists	52	37.1	145	46.5
	The veterinary profession	12	8.6	27	8.7
	Promoting responsible dog breeding				
	The Kennel Club	89	63.6	183	58.7
	Pedigree dog breeders	10	7.1	118	37.8
	Pedigree dog owners	3	2.1	1	0.3
	Individual vets	25	17.9	5	1.6
	Geneticists/research scientists	0	0.0	1	0.3
	The veterinary profession	13	9.3	4	1.3
	Advising puppy buyers				
	The Kennel Club	20	14.3	71	22.8
	Pedigree dog breeders	10	7.1	227	72.8
	Pedigree dog owners	0	0.0	1	0.3
	Individual vets	102	72.9	3	1.0
	Geneticists/research scientists	0	0.0	0	0.0
	The veterinary profession	8	5.7	10	3.2
	Advising the veterinary profession				
	The Kennel Club	7	5	50	16.0
	Pedigree dog breeders	0	0	46	14.7
	Pedigree dog owners	0	0	2	0.6
	Individual vets	1	0.7	5	1.6
	Geneticists/research scientists	30	21.4	189	60.6
	The veterinary profession	102	72.9	20	6.4
Please use the options provided to indicate how important you perceive the following health-promotion actions to be for the control of hereditary diseases in pedigree dogs in the future.	**Limitations on the number of pedigree dog registrations**				
	Unimportant	21	15	60	19.6
	Of little importance	48	34.3	72	23.5
	Moderately important	40	28.6	74	24.2
	Important	25	17.9	57	18.6
	Very important	6	4.3	43	14.1
	More specific teaching in vet schools				
	Unimportant	3	2.1	2	0.7
	Of little importance	6	4.3	8	2.6
	Moderately important	45	32.1	33	10.8
	Important	64	45.7	137	44.8

	Very important	22	15.7	126	41.2
	Increased exchange of information between the Kennel Club and vets				
	Unimportant	3	2.1	4	1.3
	Of little importance	2	1.4	6	2.0
	Moderately important	13	9.3	28	9.2
	Important	59	42.1	90	29.4
	Very important	63	45.0	178	58.2
	Increased exchange of information between the Kennel Club and breeders				
	Unimportant	2	1.4	0	0
	Of little importance	2	1.4	9	2.9
	Moderately important	11	7.9	22	7.2
	Important	55	39.3	86	28.1
	Very important	70	50.0	189	61.8
	Increased exchange of information between the vets and puppy buyers				
	Unimportant	1	0.7	6	2.0
	Of little importance	3	2.1	17	5.6
	Moderately important	21	15.0	64	20.9
	Important	56	40.0	121	39.5
	Very important	59	42.1	98	32.0
	Increased exchange of information between the Kennel Club and owners				
	Unimportant	4	2.9	6	2.0
	Of little importance	9	6.4	30	9.8
	Moderately important	37	26.4	87	28.4
	Important	55	39.3	104	34.0
	Very important	35	25.0	79	25.8
	Increased exchange of information between vets and breeders				
	Unimportant	1	0.7	0	0
	Of little importance	6	4.3	1	0.3
	Moderately important	22	15.7	24	7.8
	Important	64	45.7	104	34.0
	Very important	47	33.6	177	57.8
	Increased awareness of all parties to the information resources available				
	Unimportant	1	0.7	1	0.3

	Of little importance	1	0.7	2	0.7
	Moderately important	11	7.9	18	5.9
	Important	39	27.9	80	26.1
	Very important	88	62.9	205	67.0
	Obligatory screening for hereditary diseases				
	Unimportant	1	.7	0	0
	Of little importance	1	.7	4	1.3
	Moderately important	23	16.4	18	5.9
	Important	42	30.0	77	25.2
	Very important	73	52.1	207	67.6
	Increased selection of healthy breeding dogs by breeders				
	Unimportant	1	.7	5	1.6
	Of little importance	2	1.4	14	4.6
	Moderately important	2	1.4	46	15.0
	Important	21	15.0	111	36.3
	Very important	114	81.4	130	42.5
	Increased health demands by the general public				
	Unimportant	2	1.4	0	0
	Of little importance	3	2.2	1	0.3
	Moderately important	22	15.8	9	2.9
	Important	36	25.9	75	24.5
	Very important	76	54.7	221	72.2
	Increased education of puppy buyers				
	Unimportant	2	1.4	0	0
	Of little importance	1	0.7	4	1.3
	Moderately important	9	6.4	20	6.5
	Important	37	26.4	76	24.8
	Very important	91	65.0	206	67.3
Additional actions for the control of canine hereditary disease suggested:					

Breed	Sample	Body systems identified																								Total (n)
		Don't know		CV		DERM		ENDO		GI		HEAM		MSK		NEURO		OC		URI		REPRO		RESP		Another		
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
LR	Vets	19	5	11	2.9	99	26.3	9	2.4	40	10.6	4	1.1	135	35.8	4	1.1	35	9.3	1	0.3	1	0.3	7	1.9	12	3.2	377
	PDBs	8	5.3	2	1.3	16	10.5	2	1.3	5	3.3	0	0	49	32.2	11	7.2	49	32.2	1	0.7	1	0.7	0	0	8	5.3	152
CS	Vets	42	11.5	26	7	110	29.5	13	3.5	17	4.6	38	10.2	12	3.2	11	2.9	78	20.9	8	2.1	0	0	2	0.5	15	4	373
	PDBs	3	2.8	7	6.5	18	16.7	0	0	0	0	6	5.6	8	7.4	2	1.9	36	33.3	22	20.4	0	0	1	0.9	5	4.6	108
ESS	Vets	73	21.4	8	2.3	83	24.3	11	3.2	19	5.6	31	9.1	58	17	7	2.1	39	11.4	4	1.2	1	0.3	1	0.3	6	1.8	341
	PDBs	8	12.3	0	0	10	15.4	0	0	2	3.1	7	10.8	7	10.8	5	7.7	20	30.8	0	0	0	0	0	0	6	9.2	65
GSD	Vets	8	2.1	5	1.3	62	16.4	8	2.1	81	21.5	27	7.2	123	32.6	44	11.7	6	1.6	4	1.1	0	0	0	0	9	2.4	377
	PDBs	8	5.6	3	2.1	11	7.7	0	0	28	19.6	17	11.9	39	27.3	23	16.1	2	1.4	1	0.7	0	0	0	0	11	7.7	143
CKCS	Vets	12	3.2	125	33.3	66	17.6	8	2.1	7	1.9	1	0.3	11	2.9	95	25.3	34	9.1	0	0	1	0.3	12	3.2	3	0.8	375
	PDBs	1	1.1	31	32.6	1	1.1	1	1.1	0	0	2	2.1	3	3.2	24	25.3	27	28.4	0	0	1	1.1	1	1.1	3	3.2	95
SBT	Vets	80	23.6	6	1.8	103	30.4	14	4.1	17	5	4	1.2	46	13.6	18	5.3	10	2.9	2	0.6	3	0.9	14	4.1	22	6.5	339
	PDBs	3	5	2	3.3	15	25	0	0	1	1.7	0	0	2	3.3	13	21.7	16	26.7	1	1.7	0	0	4	6.7	3	5	60
BT	Vets	140	43.9	10	3.1	64	20.1	20	6.3	17	5.3	3	0.9	14	4.4	19	6	16	5	8	2.5	1	0.3	1	0.3	6	1.9	319
	PDBs	5	20.8	4	16.7	2	8.3	0	0	1	4.2	1	4.2	1	4.2	6	25	3	12.5	0	0	1	4.2	0	0	0	0	24
GR	Vets	24	6.6	16	4.4	93	25.8	22	6.1	36	10	9	2.5	117	32.4	15	4.2	18	5	3	0.8	1	0.3	1	0.3	6	1.7	361
	PDBs	6	3.7	8	4.9	22	13.4	2	1.2	11	6.7	3	1.8	41	25	7	4.3	39	23.8	4	2.4	3	1.8	0	0	18	11	164
B	Vets	11	3	96	25.8	61	16.4	23	6.2	22	5.9	14	3.8	30	8.1	36	9.7	30	8.1	0	0	5	1.3	18	4.8	26	7	372
	PDBs	0	0	36	37.9	5	5.3	0	0	5	5.3	0	0	2	2.1	9	9.5	2	2.1	16	16.8	1	1.1	4	4.2	15	15.8	95
WHWT	Vets	30	8.3	11	3	139	38.5	33	9.1	23	6.4	6	1.7	25	6.9	3	0.8	27	7.5	4	1.1	1	0.3	56	15.5	3	0.8	361
	PDBs	1	5.3	1	5.3	8	42.1	2	10.5	1	5.3	1	5.3	1	5.3	0	0	1	5.3	0	0	1	5.3	1	5.3	1	5.3	19

Most frequent
Second most frequent
Third most frequent

Breed	Sample	Body systems identified																								Total (n)
		Don't know		CV		DERM		ENDO		GI		HEAM		MSK		NEURO		OC		URI		REPRO		RESP		Another		
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
LR	Vets	0	0	0	0	11	9.1	1	0.8	1	0.8	0	0	106	87.6	1	0.8	0	0	0	0	0	0	0	0	1	0.8	121
	PDBs	2	4.7	1	2.3	0	0	0	0	1	2.3	0	0	31	72.1	1	2.3	4	9.3	0	0	1	2.3	0	0	2	4.7	43
CS	Vets	10	8.5	2	1.7	68	58.1	1	0.9	3	2.6	10	8.5	3	2.6	5	4.3	14	12	0	0	0	0	0	0	1	0.9	117
	PDBs	3	11.1	3	11.1	0	0	0	0	0	0	3	11.1	1	3.7	0	0	10	37	6	22.2	0	0	0	0	1	3.7	27
ESS	Vets	22	20.6	1	0.9	46	43	0	0	2	1.9	10	9.3	15	14	1	0.9	6	5.6	2	1.9	0	0	1	0.9	1	0.9	107
	PDBs	2	15.4	0	0	0	0	0	0	0	0	1	7.7	1	7.7	2	15.4	3	23.1	1	7.7	0	0	0	0	3	23.1	13
GSD	Vets	2	1.7	0	0	5	4.3	1	0.9	10	8.5	3	2.6	86	73.5	9	7.7	0	0	0	0	0	0	0	0	1	0.9	117
	PDBs	2	5.1	1	2.6	2	5.1	0	0	2	5.1	2	5.1	13	33.3	8	20.5	2	5.1	0	0	0	0	0	0	7	17.9	39
CKCS	Vets	0	0	79	68.7	5	4.3	0	0	0	0	0	0	0	0	26	22.6	2	1.7	0	0	0	0	2	1.7	1	0.9	115
	PDBs	1	3.8	13	50	0	0	0	0	0	0	0	0	0	0	8	30.8	2	7.7	0	0	1	3.8	0	0	1	3.8	26
SBT	Vets	19	17.9	0	0	53	50	1	0.9	1	0.9	0	0	13	12.3	1	0.9	0	0	0	0	2	1.9	5	4.7	11	10.4	106
	PDBs	4	23.5	0	0	2	11.8	0	0	0	0	1	5.9	0	0	4	23.5	3	17.6	0	0	0	0	2	11.8	1	5.9	17
BT	Vets	42	42.9	3	3.1	32	32.7	4	4.1	3	3.1	0	0	2	2	8	8.2	2	2	1	1	0	0	0	0	1	1	98
	PDBs	0	0	2	50	1	25	0	0	0	0	0	0	0	0	0	0	1	25	0	0	0	0	0	0	0	0	4
GR	Vets	7	6.4	0	0	16	14.5	0	0	2	1.8	0	0	82	74.5	1	0.9	1	0.9	0	0	0	0	1	0.9	0	0	110
	PDBs	2	5.6	0	0	6	16.7	0	0	1	2.8	0	0	11	30.6	5	13.9	6	16.7	0	0	0	0	0	0	5	13.9	36
B	Vets	5	4.7	49	45.8	9	8.4	4	3.7	4	3.7	3	2.8	4	3.7	4	3.7	4	3.7	0	0	0	0	8	7.5	13	12.1	107
	PDBs	0	0	10	47.6	0	0	0	0	1	4.8	0	0	1	4.8	0	0	2	9.5	3	14.3	0	0	0	0	4	19	21
WHWT	Vets	2	1.8	0	0	105	92.1	0	0	0	0	1	0.9	0	0	1	0.9	1	0.9	0	0	0	0	3	2.6	1	0.9	114
	PDBs	0	0	0	0	2	66.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	33.3	0	0	3

Biggest impact on welfare

Other Issues Identified:	Another issue				
In your opinion pedigree dog health in the LAST 10 years has...	Worsened	51	37.2	40	13.4
	Remained unchanged	37	27.0	50	16.8
	Improved	33	24.1	201	67.4
	I don't know	16	11.7	7	2.3
In your opinion pedigree dog health in the NEXT 10 years will...	Worsen	20	14.6	16	5.4
	Remain unchanged	37	27.0	42	14.1
	Improve	65	47.4	216	72.5
	I don't know	15	10.9	24	8.1
Do you hold any post graduate qualifications in addition to your veterinary degree?	Yes	42	30.9	-	-
	No	94	69.1	-	-
Specialist Qualifications which may affect questionnaire answers:	Orthopaedist Ophthalmologist Dermatologist Anaesthetist Internal med. and repro referrals Other	2 2 4 1 1 5	13.3 13.3 26.7 6.7 6.7 33.3	-	-
Do you own a pedigree dog yourself?	Yes	55	40.4	-	-
	No	81	59.6	-	-
Breed(s) owned:					
Have you ever bred pedigree dogs yourself?	Yes	33	24.3	-	-
	No	103	75.7	-	-
Breed(s) bred:					
Are you a member of the KC?	Yes	9	6.8	151	51.2
	No	123	93.2	128	43.4
	Prefer not to answer	-	-	16	5.4
Please provide us with information about which of the ten breeds featured in this study you breed:		-	-		
Do you breed any other pedigree dogs that were not mentioned above?	Yes	-	-		
	Blank	-	-		
Breed(s):					
Do you own any other pedigree dogs as pets that were not mentioned above?	Yes	-	-		
	Blank				
Breed(s):					

Do you register the puppies you breed with the Kennel Club?	Yes – all	-	-	281	95.3
	Yes – some	-	-	13	4.4
	No	-	-	0	0.0
	Prefer not to answer	-	-	1	0.3
Are you a veterinary nurse or veterinary surgeon?	Yes - I am a veterinary nurse	-	-	2	0.7
	Yes - I am currently a student veterinary nurse	-	-	1	0.3
	Yes - I am a veterinary surgeon	-	-	1	0.3
	Yes - I am currently a student veterinary surgeon	-	-	0	0.0
	No	-	-	291	98.6

Appendix 4 – Focus group master sheet

Master sheet for breeders' focus group

5.45-6pm – Breeders will arrive.

- Take a register of names/breeds and give everyone a sticky name/breed badge.
- Everyone will congregate for teas, coffees, cakes etc in the dining room.
- We need to briefly work out how we're going to divide everyone for the FGs.

6 – 6.15pm

- Make sure everyone's sorted with refreshments
- Give a brief introduction/ introduce everyone:

Hi everyone,
Thank you very much for coming and offering your time to help us with this research. My name is Christina (introduce whoever else is there). Over the last few months; I have conducted a national survey of vets and pedigree dog breeders to find out about their attitudes to pedigree dog breeding, inherited disease and health schemes. The next stage of this research is to hold focus groups for both breeders and vets to explore these areas in more depth and find out more about breeder-vet relations and this is why we're here this evening.

There are ten breeds which this research has focused on:

- Labrador Retrievers
- English Cocker Spaniels
- English Springer Spaniels
- German Shepherd Dogs
- Cavalier King Charles Spaniels
- Staffordshire Bull Terriers
- Border Terriers
- Golden Retrievers
- Boxers
- West Highland White Terriers

Everyone in this room has been sourced via the Champdogs website and invited here as they breed one or more of these breeds and we're really hoping you will be able to help us to expand our current research through these focus group interviews.

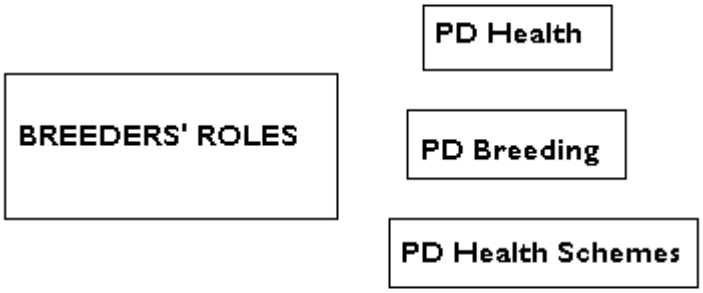
- Explain that we will divide into two groups for the FGs (about 1hr) and each group will have three topics to discuss. Also explain that we will all come together again in the dining room at the end.
- Move ½ the group out into the sitting room

6.15-7.15pm – Two 1 hour focus groups

- Start by going around the group and getting everyone to introduce themselves and what breed(s) they breed.
- Then let them know that they will remain anonymous and turn the recorder on. Say START RECORDING GROUP 1/2 and the CEVM members present.

TASK 1 – Need to have BREEDERS' ROLE flash Card and 3 blue subcategory flash cards out on the table.

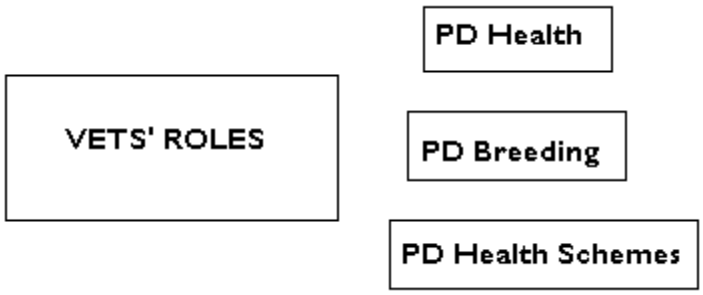
- Read through cards.
- **As pedigree dog breeders what do you feel your roles/responsibilities are in pedigree dog health?** Please talk around the blue cards provided.
- **15-20 MINUTES?**



'Health Schemes' are inclusive of all the genetic screening schemes, eyes, hips, elbows, breed club schemes etc/ whatever they believe it to be.

TASK 2 - Need to have VETS' ROLE flash Card and 3 blue subcategory flash cards out on the table.

- Read through cards.
- **What do you feel vets' roles/responsibilities are in pedigree dog health?** Please talk around the blue cards provided.
- **15-20 MINUTES?**



TASK 3 - Need to have VETS' ROLE flash Card, BREEDERS' ROLE flash card and ADVISING PEDIGREE DOG OWNERS AND PUPPER BUYERS flash cards out on the table.

- Read through cards.
- **Evidence has shown that breeders and vets differ in their opinion of who should advise pedigree dog owners and puppy buyers. What are your thoughts on this?**
- **30 MINUTES?**



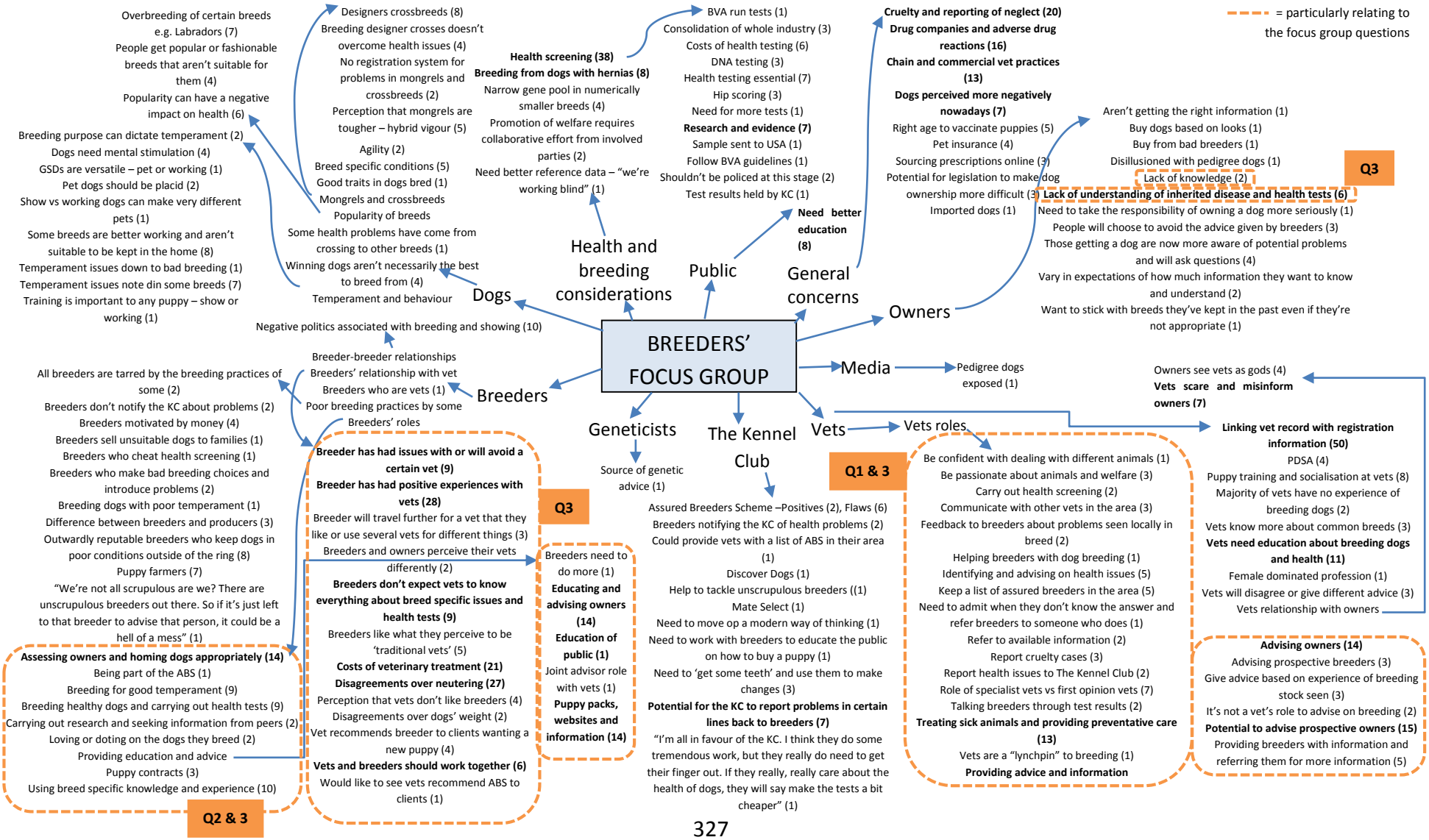
TASK 4 – TIME ALLOWING

- **What do you feel owners' roles/responsibilities are in pedigree dog health?**

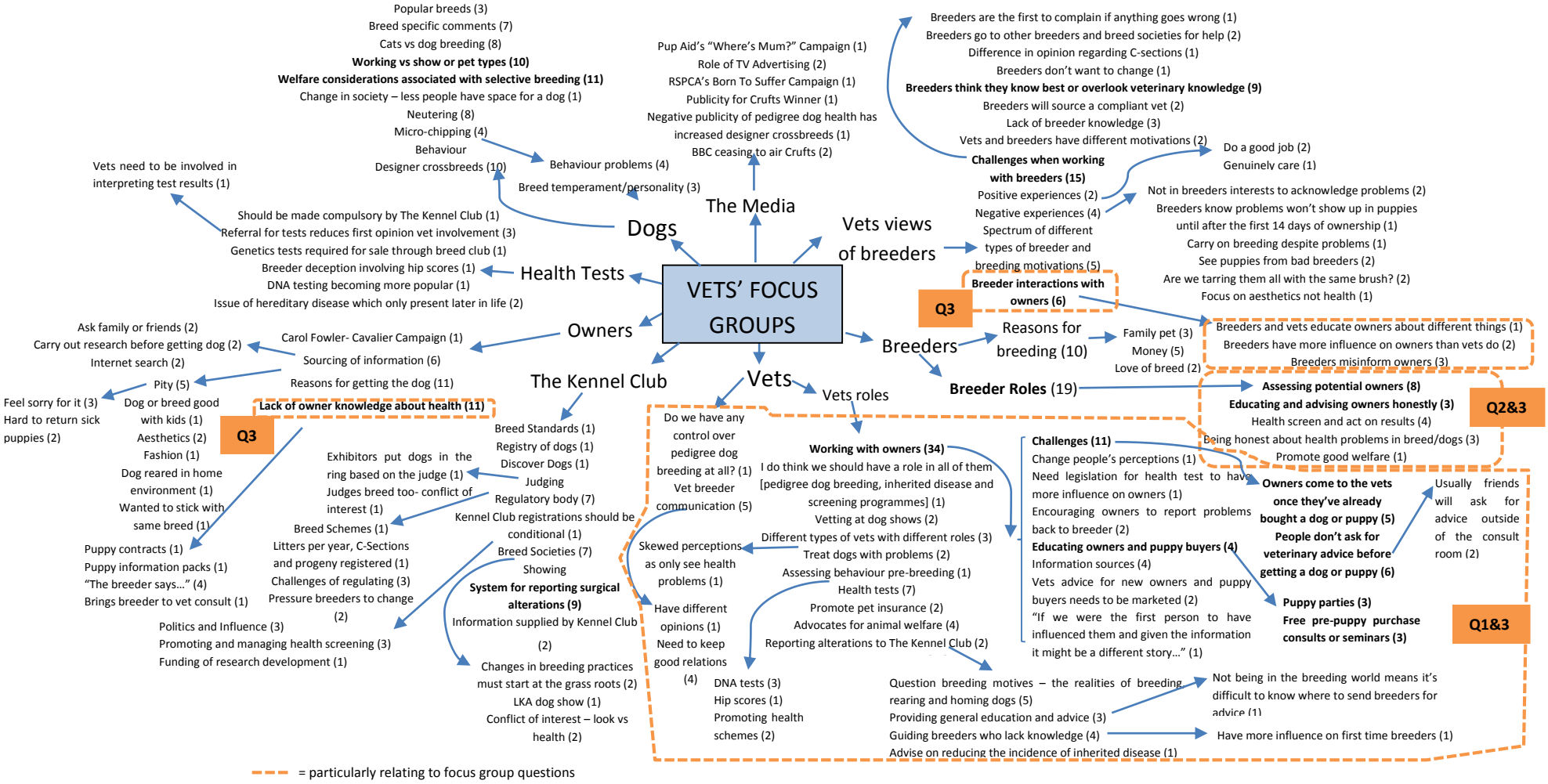
7.15 – 7.30pm

- Brief wrap up and the chance to ask further questions
- Thank everyone for their time, it's been really interesting/useful. It will now take us some time to analyse the results but I will share these with you via email when they are complete. Please feel free to ask any further questions you have about this research.
- Need to leave by **7.45pm**

Appendix 5 - Pedigree dog breeders' OSOP



Appendix 6 – Veterinary surgeons OSOP



Appendix 7 – Dog owners' questionnaire

Paws4Pedigrees Online Questionnaire

Welcome!

Thank you for your interest in our Paws4Pedigrees dog owners questionnaire!

If you have any further questions about this research please refer back to our webpage for further contact details.

www.nottingham.ac.uk/CEVM

We are very grateful for your time and co-operation; your help is very important to the success of this research.

Please remember that your participation in this questionnaire is taken as consent to use the data you provide in our research, although this data is strictly confidential. Any personal information you choose to supply will be detached upon receipt of your questionnaire and your answers will remain anonymous. If you would like to leave the questionnaire at any point you can simply close the window, although you will not be able to return back to your answers.

To begin the questionnaire please click 'next'...





Why did you get a dog?

This section aims to find out your reasons for wanting to get a dog and what factors were important to you when choosing them...

1. What were your reasons for getting a dog? Please tick all that apply. *

- ☐ Assistance dog (e.g. hearing dog)
- ☐ Breeding
- ☐ Companionship - for you or your family
- ☐ Companionship - for another animal
- ☐ Exercise
- ☐ Received it as a gift
- ☐ Guarding of my home/property
- ☐ Hobbies and sports (e.g agility, obedience trials, racing)
- ☐ Personal Protection
- ☐ Social benefits (e.g. meeting other dog walkers)
- ☐ Showing
- ☐ Working (e.g. gun dog, herding dog)

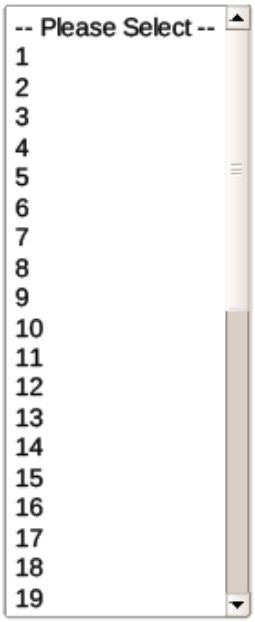
2. Please give us any other information about why you wanted a dog:

About the dogs you own...

In this section we would like to find out some basic information about the dogs you own...

3. How many dogs do you own in total?

Drop down options:
1 to 20+



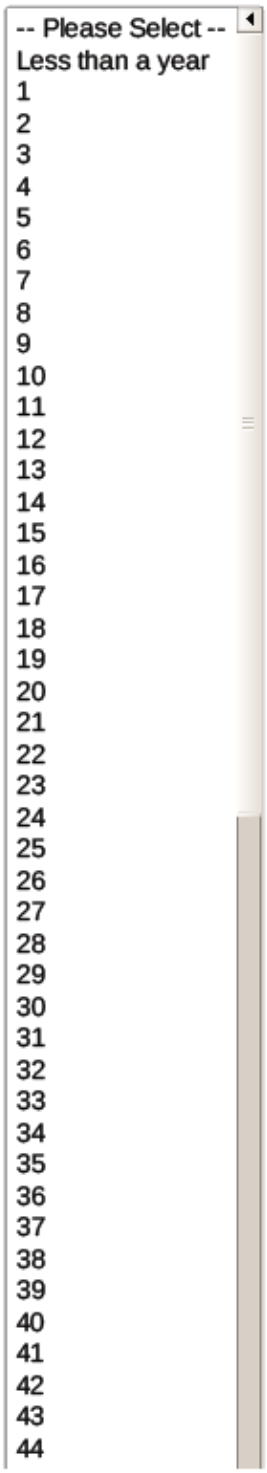
4. Please tell us about the breed(s) of dog(s) you own. If you have more than five dogs, please answer for the five dogs you acquired most recently.

An example is shown below:

	Breed	Age (years)	Number of years owned
Dog 1	Labrador	8	5
Dog 2			

	Breed	Age (years)	Number of years owned
Dog 1			
Dog 2			
Dog 3			
Dog 4			
Dog 5			

5. For approximately how many years have you kept pedigree dogs?



Drop down options:
1 to 50+



Deciding where to get a dog from...

The aim of this section is to find out how you first became aware that your dog or dogs were available for purchase/re-homing and what, if any, information you sourced...

6. How did you first find out that your pedigree dog(s) were available for purchase/re-homing? Please tick all that apply. *

- ☐ Animal shelter/charity/rescue
- ☐ Breeder
- ☐ Friends, family or colleagues
- ☐ Groomers
- ☐ Newspaper/magazine advert
- ☐ Online advert
- ☐ Pet shop
- ☐ Vet practice
- ☐ Other (please specify)

7. Did you source any information about your pedigree dog(s) before you got him/her/them?

- ○ Yes
- ○ No

8. Please tick all the sources of information you used before getting your dog(s).

- ☐ Animal shelter/charity/rescue
- ☐ Books

- [ ] Breed club
- [ ] Breeder
- [ ] Dog magazines/newspapers
- [ ] Friends/family who own a dog
- [ ] General internet search
- [ ] Pet shop
- [ ] The Kennel Club
- [ ] Vet practice
- [ ] Other (please specify)

Where did you get your dog(s) from and why?

This section aims to gather information about where you got your dog(s) from and what factors influenced your decisions...

9. Where did you get your pedigree dog(s) from? Please tick all that apply.

- [ ] A dog I already owned had puppies
- [ ] Animal shelter/charity/rescue
- [ ] Breeder
- [ ] Directly from previous owner (not a breeder)
- [ ] Found a stray
- [ ] Friend/family/colleague
- [ ] Pet shop
- [ ] Pound
- [ ] Veterinary surgery
- [ ] Other (please specify)

10. Why did you get your dog(s) from the person or place that you did? Please tick all that apply.

- [ ] Already had a dog from this person/place
- [ ] Puppy/dog was affordable
- [ ] Puppy/dog was a rescue
- [ ] Puppy /dog came from health screened parents
- [ ] Puppy/dog was available at a convenient time
- [ ] Reputation of the breeder/seller/establishment
- [ ] Suitable travelling distance to collect puppy/dog
- [ ] Please give any other reasons or comments about the above:

11. Were one or more of your pedigree dogs already insured when you bought or rehomed them?

- ○ Yes
- ○ No
- ○ I don't know

12. How much did the fact that your dog(s) came already insured influence your decision to buy/re-home them? Please tick one box, or if you are not sure simply select 'I don't know'

1 = no influence

10 = complete influence/reason for getting dog

	1	2	3	4	5	6	7	8	9	10	I don't know
Influence	○	○	○	○	○	○	○	○	○	○	○

13. Were one or more of your pedigree dogs already vaccinated when you bought or rehomed them?

- ○ Yes
- ○ No
- ○ I don't know

14. How much did the fact that your dog(s) came already vaccinated influence your decision to buy/re-home them? Please tick one box, or if you are not sure simply select 'I don't know'

1 = no influence

10 = complete influence/reason for getting dog

	1	2	3	4	5	6	7	8	9	10	I don't know
Influence	○	○	○	○	○	○	○	○	○	○	○

15. Were one or more of your pedigree dogs already neutered when you bought or rehomed them?

- ○ Yes
- ○ No
- ○ I don't know

16. How much did the fact that your dog(s) came already neutered influence your decision to buy/re-home them? Please tick one box, or if you are not sure simply select 'I don't know'

1 = no influence

10 = complete influence/reason for getting dog

	1	2	3	4	5	6	7	8	9	10	I don't know
Influence	○	○	○	○	○	○	○	○	○	○	○

Finding information about your dog(s)...

This section aims to find out where you look for information about your dog(s)...

17. Where do you source information about all aspects of your dogs(s) during their life? Please tick all sources that you use.

- ☐ Animal shelter/charity/rescue
- ☐ Books
- ☐ Behaviourists or puppy trainers

- [ ] Breed club health committees
- [ ] Breed club newsletters
- [ ] Breed club websites
- [ ] Dog breeders
- [ ] Dog magazines and newspapers
- [ ] Dog shows
- [ ] Friends or relatives
- [ ] General internet search
- [ ] Groomers
- [ ] Kennel club literature and publications
- [ ] Online forums and blogs
- [ ] Other owners
- [ ] Pet shops
- [ ] Radio
- [ ] Scientific papers and journals
- [ ] Social networking sites e.g. Facebook, Twitter etc
- [ ] Television
- [ ] The Kennel Club website
- [ ] Veterinary websites
- [ ] Your vet
- [ ] I don't know
- [ ] Other (please specify)

Seeking information from others about your dog(s)...

The aim of this section is to find out in what format you prefer to receive information about your dog(s) and who you turn to for advice about various aspects of your dog(s) care...

18. When needing information about your dog(s) health, how would you rather this information was delivered?

- ○ By email
- ○ By post
- ○ By text message
- ○ Posts on websites, blogs or forums
- ○ Verbally (e.g. face to face conversation or phone call)
- ○ Via social networking sites (e.g. Facebook or Twitter)
- ○ Other (please specify) _____

19. Who do you ask for advice about your dog(s) for each of the following...

Please tick all that apply. *

	Vet	Breeder	Friends/family/colleagues	Other	I don't know	I don't source advice	Not applicable
General health	☐	☐	☐	☐	☐	☐	☐
Health when ill	☐	☐	☐	☐	☐	☐	☐
Behaviour	☐	☐	☐	☐	☐	☐	☐
Diet	☐	☐	☐	☐	☐	☐	☐
Exercise	☐	☐	☐	☐	☐	☐	☐
Breeding	☐	☐	☐	☐	☐	☐	☐
Vaccinations	☐	☐	☐	☐	☐	☐	☐
Worming	☐	☐	☐	☐	☐	☐	☐
Micro-chipping	☐	☐	☐	☐	☐	☐	☐

20. Please give details about the other parties that you go to for advice about your dog:

Knowledge of pedigree dog health and breeding...

This section aims to find out your opinions on vets', breeders' and owners' general knowledge on the following topics:

1) Pedigree dog breeding

2) Canine inherited disease

3) Inherited disease screening programmes

We have previously carried out research on vets' and breeders' opinions. We hope to compare the data we collect in this question with our earlier findings. We want to see whether each groups' opinions differ and whether this affects how information about dogs is exchanged.

There are no right or wrong answers and if you are unsure, simply select 'I don't know'.

21. How would you rate the following groups' knowledge on **pedigree dog breeding**?

1 = very poor knowledge

10 = very good knowledge

	1	2	3	4	5	6	7	8	9	10	I don't know
Vets	○	○	○	○	○	○	○	○	○	○	○
Breeders	○	○	○	○	○	○	○	○	○	○	○
You	○	○	○	○	○	○	○	○	○	○	○

22. How would you rate the following groups' knowledge on **canine [inherited disease]**?

Hover over [inherited disease] for a definition

1 = very poor knowledge

10 = very good knowledge

	1	2	3	4	5	6	7	8	9	10	I don't know
Vets	○	○	○	○	○	○	○	○	○	○	○
Breeders	○	○	○	○	○	○	○	○	○	○	○
You	○	○	○	○	○	○	○	○	○	○	○

23. How would you rate the following groups' knowledge on **canine [health screening programmes]**?

Hover over [health screening programmes] for a definition

1 = very poor knowledge

10 = very good knowledge

	1	2	3	4	5	6	7	8	9	10	I don't know
Vets	○	○	○	○	○	○	○	○	○	○	○
Breeders	○	○	○	○	○	○	○	○	○	○	○
You	○	○	○	○	○	○	○	○	○	○	○

The Kennel Club...

The purpose of this section is to find out whether you have heard of the Kennel Club before and what you think their role is...

24. Have you heard of the Kennel Club?

- ○ Yes
- ○ No

25. Please use the space provided to tell us what you think the role of the Kennel Club is:

26. Are you a Kennel Club member?

- Yes
- No
- Prefer not to say

Some final questions about you...

In this section we would like to ask a few final questions about you...

27. Have you ever worked with dogs?

- Yes - currently (please specify) _____
- Yes - in the past (please specify) _____
- No

28. What breeding experience, if any, do you have? *

- I have not bred from any of my dogs
- I am a breeder
- Occasional planned litter
- Occasional unplanned litter
- My dog goes to stud
- Other (please specify) _____

Optional information...

In this final section we would like to collect some information about you to use in our statistical analysis...

Any information collected is optional and will be kept strictly confidential. It will NOT be used for commercial purposes. If you do not wish to provide this information please click 'next' to skip this section.

29. Are you...?

- Male
- Female

30. What is your age group?

Drop down options:
16, 17, 18... to 80+

31. Please provide the first half of your home postcode:

This is for use in the statistical analysis only and any information provided will be kept strictly confidential. We will not contact you unless you indicate at the end of the questionnaire that you are happy to be involved in any future research.

32. How did you hear about this questionnaire?

Further comments...

Please use the space provided for any additional comments relating to this questionnaire, this study or any issues you feel are important to this research.

33. Comments:

Prize draw and future research...

If you would like to be entered into a PRIZE DRAW to win a hamper of goodies for you and your dog(s) worth £100, please provide your name and contact details in the boxes below. This information will be detached upon receipt of your questionnaire to protect the anonymity of your responses.

34. Your details:

First Name

Last Name

Email Address

Phone Number

35. Would you be interested in taking part in future studies about your dog(s) conducted by the CEVM?

The information you can provide is very important to us and by working together we can build on our knowledge of dog ownership in the UK and identify ways through which canine health can be improved.

- ○ No
- ○ Yes (please provide an email address)

Thank you!

Thank you very much for taking the time to complete this questionnaire. Your participation is greatly appreciated!

If you wish to discuss this research further or have any questions, please do

not hesitate to contact me personally using the details shown below.

Christina Hunt BVMedSci

Centre for Evidence-based Veterinary Medicine,

School of Veterinary Medicine and Science,

The University of Nottingham,

Sutton Bonington Campus,

College Road,

LE12 5RD

Phone: 01159 516576 (please leave a message and your call will be returned)

Email: paws4pedigrees@nottingham.ac.uk

Visit us at: www.nottingham.ac.uk/CEVM and select the Paws for Pedigrees tab

Appendix 8 – Dog owners' data summary

Question	Possible answers	Response (pedigrees)		Response (both)	
		n	%	n	%
1) Reasons for getting dog	Assistance dog	4	0.3	3	0.2
	Breeding	27	1.8	5	0.4
	Companionship –family	583	39.5	540	40.6
	Companionship – another animal	142	9.6	163	12.2
	Exercise	276	18.7	250	18.8
	Gift	15	1.0	21	1.6
	Guarding	48	3.3	44	3.3
	Hobbies and sports	133	9.0	127	9.5
	Personal protection	18	1.2	15	1.1
	Social benefits	152	10.3	131	9.8
	Showing	44	3.0	11	0.8
	Working	34	2.3	21	1.6
2) Other reasons	Free text				
3) How many dogs owned in total?	1	242	43.8	211	40.3
	2	166	30.0	175	33.5
	3	71	12.8	67	12.8
	4	32	5.8	35	6.7
	5	11	2.0	19	3.6
	6	9	1.6	11	2.1
	7	6	1.1	3	0.6
	8	5	0.9	0	0.0
	9	0	0.0	0	0.0
	10	3	0.5	0	0.0
	11	0	0.0	1	0.2
	12	2	0.4	0	0.0
	13	0	0.0	0	0.0
	14	0	0.0	0	0.0
	15	1	0.2	0	0.0
	16	1	0.2	0	0.0
	17	0	0.0	0	0.0
	18	1	0.2	1	0.2
	19	0	0.0	0	0.0
	20+	3	0.5	0	0.0
4) Tell us about the breeds you own (first 5 dogs)	Free text	Free text		Free text	
5) For how many years have you kept dogs?	Less than 1 year	26	4.8	29	5.6
	1	32	5.9	11	2.1
	2	24	4.4	27	5.2
	3	29	5.3	35	6.8
	4	18	3.3	15	2.9
	5	35	6.4	15	2.9

	6	20	3.7	13	2.5
	7	24	4.4	19	3.7
	8	23	4.2	18	3.5
	9	18	3.3	9	1.7
	10	36	6.6	32	6.2
	11	12	2.2	11	2.1
	12	16	2.9	19	3.7
	13	11	2.0	16	3.1
	14	12	2.2	9	1.7
	15	19	3.5	18	3.5
	16	5	0.9	9	1.7
	17	8	1.5	4	0.8
	18	11	2.0	4	0.8
	19	5	0.9	7	1.4
	20	22	4.0	38	7.4
	21	3	0.6	3	0.6
	22	5	0.9	4	0.8
	23	8	1.5	10	1.9
	24	5	0.9	6	1.2
	25	16	2.9	17	3.3
	26	5	0.9	5	1.0
	27	3	0.6	3	0.6
	28	2	0.4	4	0.8
	29	1	0.2	3	0.6
	30	24	4.4	24	4.7
	31	5	0.9	2	0.4
	32	4	0.7	6	1.2
	33	3	0.6	3	0.6
	34	2	0.4	3	0.6
	35	5	0.9	7	1.4
	36	3	0.6	2	0.4
	37	3	0.6	7	1.4
	38	3	0.6	3	0.6
	39	2	0.4	3	0.6
	40	14	2.6	24	4.7
	41	3	0.6	3	0.6
	42	2	0.4	0	0.0
	43	1	0.2	0	0.0
	44	0	0.0	0	0.0
	45	4	0.7	1	0.2
	46	2	0.4	0	0.0
	47	0	0.0	0	0.0
	48	1	0.2	4	0.8
	49	1	0.2	1	0.2
	50+	9	1.7	10	1.9
6) How did you find out that your PD(s) were available for	Animal shelter/charity/rescue	137	16.0	256	34.1
	Breeder	264	30.8	75	10.0
	Friends, family or colleagues	149	17.4	159	21.2

	purchase/rehoming?	Groomers	1	0.1	1	0.1
		Newspaper/magazine advert	53	6.2	54	7.2
		Online advert	144	16.8	122	16.2
		Pet shop	7	0.8	8	1.1
		Vet practice	11	1.3	10	1.3
		Other	91	10.6	66	8.8
7)	Did you source any info about you PD before you got him/her	Yes	468	85.6	373	71.9
		No	79	14.4	146	28.1
8)	Info sources you used before getting your dog(s)	Animal shelter/rescue/charity	105	5.6	190	16.2
		Books	300	15.9	178	15.2
		Breed Club	207	11.0	70	6.0
		Breeder	273	14.5	97	8.3
		Dog magazine/newspaper	138	7.3	93	7.9
		Friends/family who own dog	199	10.5	145	12.4
		General internet search	336	17.8	234	20.0
		Pet shop	9	0.5	8	0.7
		The Kennel Club	204	10.8	61	5.2
		Vet practice	65	3.4	50	4.3
		Other	53	2.8	46	3.9
9)	Where did you get you dog(s) from?	A dog I already owned had puppies	41	5.6	15	2.2
		Animal shelter/charity/rescue	136	18.5	257	37.6
		Breeder	389	52.9	166	24.3
		Directly from previous owner (not breeder)	74	10.1	107	15.7
		Found a stray	8	1.1	9	1.3
		Friend/family/colleague	48	6.5	82	12.0
		Pet shop	2	0.3	2	0.3
		Pound	8	1.1	9	1.3
		Veterinary surgery	3	0.4	5	0.7
		Other	27	3.7	31	4.5
10)	Why did you get your dog(s) from the	Already had a dog from this person/place	61	5.2	34	3.6
		Puppy/dog was affordable	64	5.4	82	8.6
		Puppy/dog was a rescue	145	12.3	267	28.1

person/place that you did?	Puppy/dg came from health screened parents	219	18.5	65	6.8
	Puppy/dog was available at a convenient time	175	14.8	141	14.8
	Reputation of breeder/seller/establishment	237	20.1	89	9.4
	Suitable travelling distance to collect puppy/dog	136	11.5	107	11.3
	Other	145	12.3	165	17.4
11) Were one or more of you PD insured when you bought/rehomed them?	Yes	238	44.5	137	26.9
	No	263	49.2	348	68.4
	I don't know	34	6.4	24	4.7
12) How much did this influence your decision to buy/rehome them? Ped Median 1 Ped Min, Max 1,10 Pup Median 1 Pup Min, Max 1,10	1 (no influence)	188	79.7	117	85.4
	2	3	1.3	4	2.9
	3	10	4.2	1	0.7
	4	1	0.4	1	0.7
	5	7	3.0	3	2.2
	6	6	2.5	1	0.7
	7	5	2.1	0	0.0
	8	1	0.4	0	0.0
	9	1	0.4	0	0.0
	10 (complete influence)	5	2.1	4	2.9
	I don't know	9	3.8	6	4.4
13) Were one or more of you PD vaccinated when you bought/rehomed them?	Yes	304	57.1	314	62.3
	No	214	40.2	174	34.5
	I don't know	14	2.6	16	3.2
14) How much did this influence your decision to buy/rehome them? Ped Median 1 Ped Min, Max 1,10 Pup Median 1 Pup Min, Max 1,10	1 (no influence)	200	66.0	200	64.1
	2	13	4.3	17	5.4
	3	13	4.3	13	4.2
	4	9	3.0	7	2.2
	5	20	6.6	24	7.7
	6	14	4.6	7	2.2
	7	6	2.0	10	3.2
	8	14	4.6	12	3.8
	9	3	1.0	4	1.3
	10 (complete influence)	8	2.6	12	3.8
	I don't know	3	1.0	6	1.9
	Yes	95	17.9	169	33.7

15) Were one or more of you PD neutered when you bought/rehomed them?	No	435	81.9	331	65.9
	I don't know	1	0.2	2	0.4
16) How much did this influence your decision to buy/rehome them? Ped Median 1 Ped Min, Max 1,10 Pup Median 1 Pup Min, Max 1,10	1 (no influence)	59	62.8	98	58.7
	2	3	3.2	5	3.0
	3	1	1.1	6	3.6
	4	1	1.1	5	3.0
	5	8	8.5	14	8.4
	6	5	5.3	6	3.6
	7	5	5.3	3	1.8
	8	5	5.3	13	7.8
	9	2	2.1	3	1.8
	10 (complete influence)	3	3.2	11	6.6
	I don't know	2	2.1	3	1.8
17) Where do you source info on all aspects of your dog(s) during their life?	Animal shelter/charity/rescue	95	2.5	164	5.2
	Books	346	9.1	306	9.7
	Behaviourists or puppy trainers	183	4.8	202	6.4
	Breed health committees	102	2.7	14	0.4
	Breed club newsletters	67	1.8	10	0.3
	Breed club websites	205	5.4	62	2.0
	Dog breeders	166	4.4	42	1.3
	Dog magazines and newspapers	184	4.8	147	4.7
	Dog shows	102	2.7	66	2.1
	Friends or relatives	207	5.5	221	7.0
	General internet search	390	10.3	375	11.9
	Groomers	55	1.4	47	1.5
	Kennel club literature and publications	123	3.2	51	1.6
	Online forums and blogs	301	7.9	310	9.8
	Other owners	268	7.1	244	7.7
	Pet shops	42	1.1	45	1.4
	Radio	7	0.2	9	0.3
	Scientific papers and journals	103	2.7	88	2.8
	Social networking sites	113	3.0	117	3.7
	Television	53	1.4	66	2.1

	The KC website		147	3.9	63	2.0
	Veterinary websites		140	3.7	116	3.7
	Your vet		358	9.4	354	11.2
	I don't know		0	0.0	0	0.0
	Other		38	1.0	39	1.2
18) When needing info about your dogs' how would you rather receive it?	Email		84	16.1	77	15.4
	Post		18	3.4	27	5.4
	Text message		5	1.0	3	0.6
	Posts on websites, blogs, forums		83	15.9	73	14.6
	Verbally (face to face, phone)		285	54.5	278	55.7
	Social networking sites		29	5.5	20	4.0
	Other		19	3.6	21	4.2
19) Who do you ask about each of the following:	General health	Vet	383	49.6	378	55.2
		Breeder	101	13.1	23	3.4
		Friends/family/colleagues	162	21.0	174	25.4
		Other	99	12.8	83	12.1
		I don't know	0	0.0	1	0.1
		I don't source advice	24	3.1	21	3.1
		Not applicable	3	0.4	5	0.7
	Health when ill	Vet	505	77.3	482	81.1
		Breeder	41	6.3	10	1.7
		Friends/family/colleagues	58	8.9	62	10.4
		Other	47	7.2	38	6.4
		I don't know	1	0.2	0	0.0
		I don't source advice	1	0.2	1	0.2
		Not applicable	0	0.0	1	0.2
	Behaviour	Vet	151	21.4	165	23.9
		Breeder	94	13.3	24	3.5
		Friends/family/colleagues	182	25.7	197	28.5
		Other	210	29.7	243	35.2
		I don't know	2	0.3	2	0.3
		I don't source advice	45	6.4	38	5.5
		Not applicable	23	3.3	22	3.2
	Diet	Vet	248	36.2	236	37.8
		Breeder	91	13.3	22	3.5
		Friends/family/colleagues	112	16.3	121	19.4
		Other	162	23.6	174	27.8

		I don't know	3	0.4	0	0.0
		I don't source advice	57	8.3	58	9.3
		Not applicable	13	1.9	14	2.2
	Exercise	Vet	174	26.5	152	25.4
		Breeder	85	13.0	23	3.8
		Friends/family/colleagues	126	19.2	122	20.4
		Other	123	18.8	138	23.1
		I don't know	2	0.3	0	0.0
		I don't source advice	119	18.1	135	22.6
		Not applicable	27	4.1	28	4.7
	Breeding	Vet	105	17.2	69	13.1
		Breeder	117	19.1	32	6.1
		Friends/family/colleagues	39	6.4	16	3.0
		Other	33	5.4	20	3.8
		I don't know	3	0.5	4	0.8
		I don't source advice	69	11.3	78	14.9
		Not applicable	246	40.2	306	58.3
	Vaccinations	Vet	455	72.9	430	75.8
		Breeder	36	5.8	7	1.2
		Friends/family/colleagues	40	6.4	37	6.5
		Other	68	10.9	67	11.8
		I don't know	1	0.2	0	0.0
		I don't source advice	18	2.9	19	3.4
		Not applicable	6	1.0	7	1.2
	Worming	Vet	422	67.6	394	71.2
		Breeder	36	5.8	3	0.5
		Friends/family/colleagues	46	7.4	40	7.2
		Other	80	12.8	70	12.7
		I don't know	0	0.0	0	0.0
		I don't source advice	33	5.3	34	6.1
		Not applicable	7	1.1	12	2.2
	Micro-chipping	Vet	395	66.6	375	68.3
		Breeder	40	6.7	9	1.6
		Friends/family/colleagues	30	5.1	34	6.2
		Other	53	8.9	61	11.1
		I don't know	0	0.0	0	0.0
		I don't source advice	48	8.1	36	6.6
		Not applicable	27	4.6	34	6.2
20) Other parties you go to for advice about your dog:	Free text		Free text		Free text	

21) How would you rate the following groups knowledge on PD breeding?	Vets Median 7 Min 1 Max 10	1	15	3.2		
		2	10	2.1		
		3	26	5.6		
		4	15	3.2		
		5	52	11.1		
		6	37	7.9		
		7	52	11.1		
		8	62	13.3		
		9	24	5.1		
		10	79	16.9		
		Don't know	95	20.3		
	Breeders Median 8 Min 1 Max 10	1	3	.6		
		2	5	1.1		
		3	6	1.3		
		4	11	2.4		
		5	29	6.2		
		6	18	3.8		
		7	48	10.3		
		8	92	19.7		
		9	60	12.8		
		10	127	27.1		
		Don't know	69	14.7		
	You Median 6 Min 1 Max 10	1	26	5.6		
		2	20	4.3		
		3	33	7.1		
		4	37	8.0		
		5	76	16.4		
		6	45	9.7		
		7	71	15.3		
		8	58	12.5		
		9	22	4.7		
		10	33	7.1		
		Don't know	43	9.3		
22) How would you rate the following groups knowledge on inherited disease?	Vets Median 8 Min 1 Max 10	1	14	3.0		
		2	3	0.6		
		3	15	3.2		
		4	7	1.5		
		5	31	6.7		
		6	20	4.3		
		7	52	11.2		
		8	74	15.9		
		9	78	16.8		
		10	133	28.6		
		Don't know	38	8.2		
	Breeders Median 8 Min 1 Max 10	1	8	1.7		
		2	6	1.3		
		3	7	1.5		
		4	12	2.6		
		5	36	7.7		
		6	31	6.7		

		7	54	11.6		
		8	81	17.4		
		9	80	17.2		
		10	87	18.7		
		Don't know	63	13.5		
	You Median 6 Min 1 Max 10	1	26	5.6		
		2	15	3.2		
		3	24	5.2		
		4	36	7.8		
		5	65	14.1		
		6	57	12.3		
		7	64	13.9		
		8	70	15.2		
		9	41	8.9		
		10	31	6.7		
		Don't know	33	7.1		
23) How would you rate the following groups knowledge on health schemes?	Vets Median 9 Min 1 Max 10	1	8	1.7		
		2	10	2.1		
		3	14	3.0		
		4	7	1.5		
		5	29	6.2		
		6	21	4.5		
		7	43	9.2		
		8	65	13.9		
		9	74	15.8		
		10	141	30.2		
		Don't know	55	11.8		
	Breeders Median 8 Min 1 Max 10	1	10	2.1		
		2	8	1.7		
		3	10	2.1		
		4	5	1.1		
		5	33	7.1		
		6	39	8.4		
		7	40	8.6		
		8	76	16.3		
		9	72	15.5		
		10	90	19.3		
		Don't know	83	17.8		
	You Median 6 Min 1 Max 10	1	37	8.0		
		2	22	4.8		
		3	22	4.8		
		4	39	8.5		
		5	50	10.8		
		6	39	8.5		
		7	76	16.5		
		8	53	11.5		
		9	32	6.9		
		10	37	8.0		
		Don't know	54	11.7		

24) Have you heard of the KC?	Yes	495	99.4	466	97.3
	No	3	0.6	13	2.7
25) What do you think the role of the KC is?	Free Text	Free text		Free text	
26) Are you a KC member?	Yes	71	14.5	38	8.3
	No	392	80.2	418	91.1
	Prefer not to say	26	5.3	3	0.7
27) Have you ever worked with dogs?	Yes – currently (specify)	92	18.7	110	23.2
	Dog training work (obedience, working dog training etc)	22	17.5	19	14.5
	Vet/vet student	13	10.3	15	11.5
	Charity/rescue/pound volunteer/worker	13	10.3	14	10.7
	Other	12	9.5	12	9.2
	Dog walker	13	10.3	10	7.6
	Dog agility (instructor/competitor/judge)	7	5.6	12	9.2
	Veterinary -other	9	7.1	10	7.6
	Behaviourist or assisting with behavioural work	6	4.8	9	6.9
	Vet nurse/student nurse	5	4.0	10	7.6
	Kennel work (boarding, quarantine, show etc)	8	6.3	6	4.6
	Dog groomer/student groomer	3	2.4	7	5.3
	Dog foster carer	4	3.2	4	3.1
	Dog sitter/dog day care	3	2.4	2	1.5
	Breeder	4	3.2	0	0.0
	Work involving farm dogs	2	1.6	1	0.8
	Dog handler	2	1.6	0	0.0
	Yes – in past (specify)	79	16.1	60	12.6
	Kennel work (boarding, quarantine, show etc)	20	22.0	21	25.6
	Charity/rescue/pound volunteer/worker	18	19.8	9	11.0
	Dog training work (obedience, working dog training etc)	11	12.1	7	8.5
	Other	11	12.1	7	8.5
	Dog groomer/student groomer	5	5.5	6	7.3
	Vet nurse/student nurse	6	6.6	5	6.1
	Dog foster carer	3	3.3	6	7.3
	Veterinary -other	4	4.4	5	6.1
	Work involving farm dogs	3	3.3	5	6.1
	Behaviourist or assisting with behavioural work	1	1.1	3	3.7
	Dog agility (instructor/competitor/judge)	2	2.2	2	2.4
	Dog walker	2	2.2	2	2.4
	Dog sitter/dog day care	0	0.0	3	3.7

	Vet/vet student	2	2.2	1	1.2
	Dog handler	2	2.2	0	0.0
	Breeder	1	1.1	0	0.0
	No	321	65.2	305	64.2
28) What breeding ex. If any do you have?	I haven't bred from any of my dogs	366	74.4	399	84.2
	I am a breeder	15	3.0	1	0.2
	Occasional planned litter	49	10.0	16	3.4
	Occasional unplanned litter	4	0.8	8	1.7
	My dog goes to stud	10	2.0	1	0.2
	Other (specify)	48	9.8	49	10.3
29) Are you?	Male	40	8.3	34	7.3
	Female	444	91.7	431	92.7
30) Age group?	<18	15	3.1	6	1.3
	18-24	71	14.7	64	13.7
	25-29	46	9.5	56	12.0
	30-34	44	9.1	51	10.9
	35-39	44	9.1	46	9.9
	40-44	49	10.1	51	10.9
	45-49	64	13.3	58	12.4
	50-55	65	13.5	53	11.4
	56-60	32	6.6	32	6.9
	61-64	20	4.1	27	5.8
	65-69	26	5.4	16	3.4
	70 or older	7	1.4	6	1.3
31) First half of home postcode	Free text	Free text		Free text	
32) How did you hear about this questionnaire?	Free text	Free text		Free text	
33) Comments	Free text	Free text		Free text	

Appendix 9 – Grouping of dog owner internet search terms

Group	Relevant data	Search terms
Care	dog care dog care Dog care Dog care Dog care dog care dog care Dog care dog care Dog care Dog care Dog care Dog care Dog care Dog care dog care dog care Dog care Dog care Dog care dog care dog care dog care dog care Dog care dog care Dog care dog care dog care dog care Dog care dog care dog care dog care dog care puppy care puppy care Puppy care puppy care Puppy care Puppy care Puppy care puppy care	"Caring for a new dog" "Caring for a new puppy"

	Puppy care Puppy care puppy care puppy care puppy care puppy care puppy care Puppy care Puppy care Puppy care Puppy care puppy care "new dog care sheets" (Breed of dog) care (breed name) care All about dog care 'basic dog care guide' Beginners dog care breed care breed care breed, advice, care, tips, message board, forum, guide breed, care, training, information breed: Care, food, how to look after, how much exercise, grooming, advice, health problems Canine care Canine care Care look after new dog help please Care of breed care of dogs Care requirements for a dog. caring for a new puppy caring for a puppy caring for a puppy Caring for a puppy caring for new puppy information caring for puppies caring for your dog Caring for your dog. Caring for your dog. caring for your new dog Caring for your new dog	

	caring or needs of breed Dog care advice dog care advice UK Dog care behaviour training Dog care first dog Dog care- how?' dog care information for new owners dog care looking after dog Dog care needs Dog Care sheet DOG CARE TIPS dog care training Dog care? Dog puppy new help care training dog, care, how to: train, feed Everything you need to know about caring for your new dog Health Care for new dog owners Healthy dog care How do I care for my dog? how to best care for a breed how to best care for my dog How to care and look after new dog plus training tips 'How to care for a (breed) how to care for a (breed name) how to care for a dog how to care for a dog How to care for a new dog How to care for breed how to care for dogs how to care for my dog how to care for my new puppy How to care for my puppy How to care for pet dog how to care for your dog How to care for your first dog. information dog care introduction dog care needs New (breed) care new dog care New dog owner care advice New pet dog care new puppy care	

	new puppy care novice dog owner looking how to care for new dog Puppy care guide Puppy vet care RSPCA dog care	
Looking	breed: Care, food, how to look after, how much exercise, grooming, advice, health problems Care look after new dog help please dog care looking after dog How to care and look after new dog plus training tips how to look after a dog how to look after a dog how to look after a dog How to look after a dog how to look after a puppy how to look after a puppy How to look after a puppy How to look after my dog looking after a dog Looking after a dog. Looking after a dog. looking after a dog? looking after a new dog Looking after a new puppy Looking after a rescue dog. looking after dog looking after dog, Looking after dogs. looking after my new dog looking after puppy Looking after your dog novice dog owner looking how to care for new dog	“Looking after a dog” “Looking after a puppy”
New	"new dog care sheets" "welcoming a new dog into your home" Adopted New Dog Hints Behaviour Breed new dog Care look after new dog help please Caring for a new dog	“New dog owner information” “First time dog owner information”

	caring for a new dog caring for a new puppy Caring for my new dog caring for new dog Caring for new dog caring for new puppy information caring for your new dog Caring for your new dog dog care information for new owners Dog puppy new help care training Everything you need to know about caring for your new dog Health Care for new dog owners How to care and look after new dog plus training tips How to care for a new dog how to care for my new puppy Introducing a new dog introducing a new dog kennel club new dog advice looking after a new dog Looking after a new puppy looking after my new dog New (breed) care new breed new dog new dog new dog new dog new dog new dog advice new dog care new dog in the home NEW DOG OWNER new dog owner New dog owner New dog owner care advice new dog owner help New dog owner needs help new dog owner. new dog owners need advice on how to care for dog. new puppy	

	new dog new dog settling in new dog training New dog training and care New pet dog care new puppy New puppy new puppy new puppy new puppy New Puppy new puppy new puppy advice new puppy care new puppy care new puppy training, novice dog owner looking how to care for new dog puppy training dog new owner raising a new puppy Settling in new pet dog top ten most important things for new dog owners training a new dog training a new puppy "first time dog owners" "help for novice dog owners" Beginners dog care bringing rescue dog home for first time caring for first dog Dog care first dog first aid for dogs First dog training help First time border collie owner advice. first time dog owner first time dog owner first time owner First time owner of a dog (breed) First time owner of a puppy (breed) How to care for your first dog. Information for first time dog owners	

	novice dog owner looking how to care for new dog top tips for first time dog owners	