THE KENNEL CLUB

Making a difference for dogs

THE KENNEL CLUB DOG HEALTH GROUP

ANNUAL REPORT 2012

CONTENTS

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INTRODUCTION

The Dog Health Group (DHG) has now overseen the Kennel Club's ever increasing health and welfare initiatives for a third year. Prior to the existence of the DHG its work was directed by a number of Kennel Club internal groups. Bringing all these activities under the profile of the DHG, along with input from external members, makes the DHG more effective and credible in delivering a co-ordinated approach to improving dog health and welfare.

The scope and impact of these initiatives continue to expand and provide an excellent platform from which to highlight the Kennel Club's commitment to ensuring UK dogs are healthy and their welfare is well cared for.

This report intends to update the information given in previous reports and highlight some of the main developments. However, full information on all of our health work can be obtained from the Kennel Club website, www.thekennelclub.org.uk

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REMIT OF THE DOG HEALTH GROUP

- To develop strategy for the Kennel Club's health work.
- To provide overall co-ordination and monitoring of such work.
- To supervise the *Fit for Function: Fit for Life* campaign and other 'public' campaigns.
- To be responsible for recommending, on advice from the various sub-groups, the requirements for health schemes, the Assured Breeder Scheme requirements and other breeding strategies.
- To produce an annual report on the Dog Health Group's work.

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DOG HEALTH GROUP ACHIEVEMENTS IN 2012

ESTABLISHMENT OF A FOURTH SUB-GROUP OF THE DOG HEALTH GROUP

The Activities Health and Welfare Sub-Group was established in 2012. The principal aim of this Sub-Group is to ensure any identified risk of injury by competing in activities is considered and mitigating actions are taken. An initial report and details of its remit are included on page 6.

KENNEL CLUB CHARITABLE TRUST

In 2012 the Kennel Club donated £400,000 to the Charitable Trust to support work on canine health, training and welfare initiatives. During the course of the year the Trust has funded the following health projects:

Animal Health Trust Payments for Year 4 of the Kennel Club Genetics Centre at the Animal Health Trust	£250,000
Dachshund Breed Council 2nd instalment for a research project into Lafora in the breed	£5,000
University of Liverpool 3rd and final payment for the research into cruciate ligament failure in Newfoundlands	£28,200
Royal (Dick) School of Veterinary Studies 1st instalment of additional funds for 'Dogslife: An Epidemiological Study of Canine Health'	£20,000
Kennel Club/BVA For the employment of a person to undertake work required to set up a joint BVA/KC scheme for cardiac disease in dogs.	£5,000

VETERINARY HEALTH CHECKS

One of the most important developments this year has been the introduction of veterinary health checks for the Best of Breed winners from high profile breeds at General and Group Championship Shows. This initiative produced a mixed response but, within a year, some positive benefits of the scheme are apparent and are providing good evidence of improvement across the board.

Ultimately, the scheme was introduced to ensure only healthy dogs compete for the Group and Best in Show awards at Group and General Championship Shows and to help those breeds which have been the subject of adverse criticism, to prove that they have acknowledged and are addressing the issues. Whilst there are no plans to suspend the veterinary health checks, the scheme is under review to ensure that the checks are fair and consistent. A more detailed analysis of the scheme is contained within the Breed Standards and Conformation Sub-Group report below.

THE KENNEL CLUB CANCER CENTRE AT THE ANIMAL HEALTH TRUST

In November 2012 the new cancer treatment and research facility for animals at the Animal Health Trust (AHT) in Newmarket was opened by HRH the Princess Royal. The facility is purpose-built to treat dogs, cats and horses with cancer, and will also assist in furthering the understanding of the disease in animals and, indirectly, humans.

The Kennel Club Cancer Centre at the AHT will help more pets to receive treatment. It will also lead to a better understanding of the disease and will help educate veterinary surgeons treating cancer patients, which will, in turn, provide better help for hundreds of animals, and their owners, who may never visit the facility at the AHT. Knowledge learned within the new cancer centre will feed into research helping to develop tests which are better able to detect tumours at an early stage, or predict how a cancer in an individual animal will behave and respond to treatment. It is also hoped that the information we are able to gather through treatment of cancer patients in the Kennel Club Cancer Centre will lead to the identification of the underlying causes of cancer and especially any genetic factors in various breeds.

The Kennel Club provided an interest-free loan of £1.5 million, which allowed the AHT to complete the building project within a year. With one in four dogs and one in six cats developing cancer at some time in their life, the new centre will help many more animals fight cancer and help find ways to prevent cancer in the future.

BREED SPECIFIC ISSUES

There has been development in a number of breed specific issues as follows:

Chinese Crested - During 2012 the first breed to be removed from the high profile breed list was confirmed. The Chinese Crested had been placed on the list in 2010 due to concerns about the preparation of some dogs for exhibition. Concern had been expressed about the methods used to remove hair and the associated skin irritation arising as a result. In order to highlight this issue and to monitor progress, the breed was classified as high profile. However the acknowledgement of and response to the problem was rapid and effective, so we are pleased to confirm that the Chinese Crested was removed from high profile breed categorisation in 2012.

German Shepherd Dog Judges Education Working Party - Discussions between the Kennel Club and the German Shepherd Dog Breed Council reached a satisfactory conclusion on several points relating to the future training of new judges and of existing judges. An education pack for presenters of judges training has been agreed and includes a powerpoint presentation with animations and video clips taken from the WUSV (World Union for GSDs) DVD. This will provide consistency and accuracy in delivery from the Breed Council approved presenters. An agreement was reached on the correct topline and an image supplied that will appear throughout the education programmes.

It was agreed that the Kennel Club Regulation on double handling would be highlighted during the seminar and that the Kennel Club's advice note would be included in the seminar pack for attendees.

Key areas were also agreed on teaching the correct method of judging the GSD, i.e. how to go over the dog and how they are presented and moved in the ring.

Chiari-like Malformation/Syringomyelia syndrome - There is now a screening programme in place for this condition and the test results are routinely included in the Health Test Results Finder on the Kennel Club's website, along with explanatory notes explaining their relevance and offering advice on breeding. The Kennel Club and the British Veterinary Association (BVA) are involved in actively promoting the benefits of this testing scheme amongst the breeds known to be affected.

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SUB-GROUP ACTIVITY 2012

ACTIVITIES HEALTH AND WELFARE SUB-GROUP

REMIT

- Contribute towards guidance, advice and opinion to the Kennel Club's Activities Sub-Committee, based on clinical veterinary experience and the latest available scientific research.
- Proactively review the available scientific research and bring any relevant information or findings to the attention of the Sub-Committee for discussion and action where appropriate.
- Recommend areas for further research and investigation in order to address issues raised, and to define and scope the parameters for any research recommended.

ACHIEVEMENTS

The aim of the Activities Health and Welfare Sub-Group is to review current research and proactively pursue any need for research to be undertaken regarding specialised activity disciplines which include: Agility, Obedience, Heelwork To Music, Flyball and Working Trials. The need for research, within these disciplines, is based on numerous factors including potential implications on dog health and welfare, public views/knowledge, current and previous research available, cost and time needed to undertake research. This approach allows the Kennel Club to be at the forefront of research regarding activity disciplines whilst also investigating issues which may improve the health and welfare of dogs. Such research also allows the Kennel Club to deal with any questions from the public and provides relevant information and advice to the appropriate sections within the Kennel Club and external bodies.

The Sub-Group currently consists of a range of experts including veterinary surgeons, university lecturers, researchers and specialists who are actively involved in various canine activities. The Sub-Group is chaired by Mr Steve Croxford. External individuals are also involved from time to time to aid in the group's aims and objectives.

The Sub-Group has only recently been set up; it held its first meeting in late 2011 with a further meeting in September 2012. The Sub-Group is planning to hold its third meeting in early February 2013. At its next meeting, the Sub-Group will discuss proposed research which involves a health survey of dogs who take part in specific canine activities recognised by the Kennel Club. The aim of this survey is to gain an overall view of the health and welfare of dogs taking part in canine performance sports. This survey is likely to aid in prioritisation and guidance for future areas of research.

It is expected that, now that the Sub-Group is established, significant progress can be made in providing an evidence based contribution to health related issues raised by the various Kennel Club committees involved in canine activities.

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ASSURED BREEDER SCHEME [ABS] SUB-GROUP

REMIT

- To act as an impartial unit which provides for the participation of all parties significantly concerned with the Kennel Club ABS.
- To advise on the formulation of policy matters relating to the operation of the scheme.
- To oversee the running of the ABS, with particular regard to the performance of the processes of admitting, monitoring and excluding breeders from the scheme, as well as the receipt and evaluation of puppy buyer feedback.
- To make recommendations as to the husbandry aspects of the ABS and to put into operation those health screening requirements/recommendations agreed by the DHG and in liaison with breed clubs/councils.
- To oversee the use of scheme finances.

ACHIEVEMENTS

The Sub-Group has had another productive year and met on four occasions. The total ABS membership now stands at 8,850 breeders, an increase of 1,350 breeders on the previous year.

The composition of the Sub-Group represents all relevant parties involved in the breeding and selling of dogs and assures impartiality of the ABS on strategy and policy, certification and evaluation and as such includes representation from puppy buyers, dog trainers, breeders, the veterinary profession and the Kennel Club. This has remained constant throughout the year, but a further breeder, who breeds on a regular basis, was invited to join the Sub-Group towards the end of the year and it has been agreed that a further representative from the welfare sector will be invited to join in 2013, giving the Sub-Group its full quota of eight voting members.

The Kennel Club continued to work towards accreditation for the Assured Breeder Scheme by the United Kingdom Accreditation Service (UKAS) and significant progress was made during 2012. A series of formal audits have been undertaken and further development work is nearing completion. In particular, work has been undertaken on the rules of the scheme (the ABS Standard) and a guidance document, which is primarily designed as a tool to assist the Regional Breeder Assessors in assessing members' compliance with the rules of the scheme. Finalised documents are expected to be published and available to members early in 2013.

The frequency of the Assessment Visits (the inspections carried out by the Regional Breeder Assessors), increased during the year and will be increased further during 2013. The associated costs of these and the recovery of these costs through application and membership fees, formed part of further proposals which remain under discussion.

Two new breed-specific requirements have been approved - one DNA test and one clinical health test. In addition, 12 new breed-specific recommendations were approved - four DNA tests, four clinical health tests and four welfare-related aspects. All requirements and recommendations can be found on the Kennel Club website, where any breeds with recent adjustments are always marked with an asterix. The link is as follows: **www.thekennelclub.org.uk/download/1100/abshealthreqs.pdf**

Other developments finalised during 2012 include a questionnaire for breeders following a visit from a Regional Breeder Assessor, and a guide to the drawing up of a Stud Dog contract, similar to that which exists for the Puppy Sales Contract.

BREED STANDARDS AND CONFORMATION SUB-GROUP

REMIT

- To advise on conformation-related health issues as they relate to breed standards.
- To work with breed clubs/councils and other organisations on specific conformation-related health issues.
- To liaise with Kennel Club departments and committees on judges' involvement, training and monitoring related to health issues.

ACHIEVEMENTS

MONITORING OF JUDGING OF HIGH PROFILE BREEDS

The programme of obtaining reports from the high profile breed judges at Championship Shows has continued throughout 2012. A high profile breed is defined as 'a breed from time to time designated by the General Committee as requiring particular monitoring by reason of visible condition(s) which may cause health or welfare concerns'. The list of designated high profile breeds is kept under regular review and is published from time to time in the Kennel Gazette.

With the introduction of veterinary health checks at General and Group Championship Shows for dogs winning best of breed and those who are to be awarded Champion status, the health observation scheme was adapted to concentrate on observations at single breed club shows for 2012. The role of the observer is to monitor the judging of high profile breeds but also to act as an ambassador for the Kennel Club, entering into discussion about conformation-related health issues and the work that both the Kennel Club and the breed club are undertaking.

Every judge of a high profile breed scheduled at Championship Shows last year was requested to complete a report seeking their opinion on the health and well-being of exhibits shown under them. They were also invited to submit comments on any particular problems they saw when judging.

During the year the Dog Health Group altered the grading used to analyse judges' and observers' comments. The number of reports returned by judges for individual breeds ranged from 12 to 34, whereas Observer reports were far fewer in number. Therefore, in view of the new grading and the low number of observations carried out in 2012, there is little data and comparison with 2010 and 2011 data was not possible

RESULTS

The following figures summarise the information received from judges.

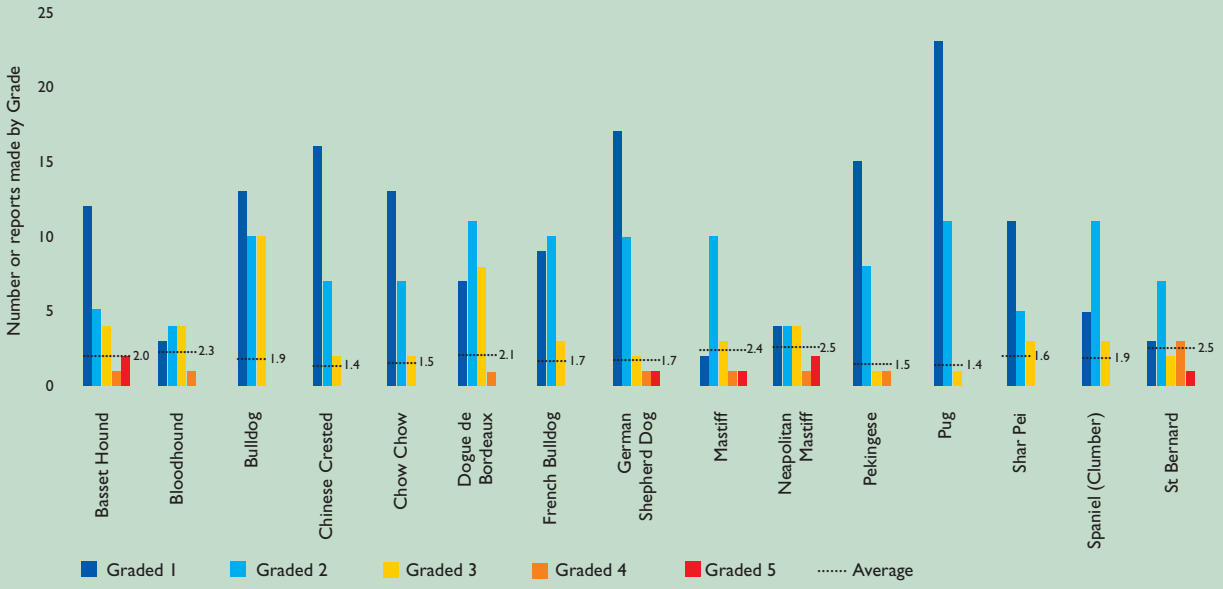
Fig. 1 shows the aggregated results for 2012. The term 'Average Grading' refers to the judges' opinions on the health and well-being of the dogs being exhibited.

In order to allow a comparison in future years, the ratings have been given a numerical value from 1-7 with the following scale provided:

1 - There were no features or exaggerations detrimental to the soundness, health or well-being of the dogs (Excellent)

7 - All dogs showed features and/or exaggerations that are a cause for concern (Poor)

Fig 1 Judging of High Profile Breeds at 2012 Chammpionship Shows
Grading of health and well-being of dogs extracted from Judges' reports (with average grade indicated for each breed)



The main concerns expressed by judges and observers have been summarised in Fig. 2 for each breed. Most of the comments were made by judges rather than observers and referred to a few dogs in a breed which were perceived to have either potentially deleterious exaggerations or were felt to be unsound.

Fig 2 Issues specifically commented on by observers and judges for each high profile breed in 2012

Breed	Issues
Basset Hound	Eyes*, Excessive Haw*,Incorrect Bite*, Inadequate Ground Clearance, Teeth, Eyelid Conformation, Unsound Movement, Short in Upper arm and Upright in Shoulder, Overweight, Excessive Wrinkle, Temperament
Bloodhound	Incorrect bite*, Eyes, Temperament, Unsound Movement
Bulldog	Unsound Movement*, Eyes*, Wry Jaw*, Overweight*, Pinched Nostrils*, Tight Tails*, Overnose Wrinkle, Breathing Difficulties, Eyelid Conformation, Hocks
Chow Chow	Temperament, Hocks, Unsound Movement, Incorrect Bite
Dogue de Bordeaux	Unsound Movement*, Eyes, Temperament, Weak Hind Movement, Incorrect Bite, Ear, Overweight, Excessive Wrinkle, Mouth, Eyelid Conformation, Breathing Difficulties
French Bulldog	Breathing Difficulties, Wry Jaw, Incorrect Bite, Weak Hind Movement, Construction, Tails, Visible Teeth & Tongue, Shortened Rib-Cage, Breathing Difficulties
German Shepherd Dog	Weak Hind Movement*, Temperament*, Unsound Movement, Hocks
Mastiff	Unsound Movement*, Weak Hind Movement, Temperament , Unsound, Weight, Eyelid Conformation, Eyes
Neapolitan Mastiff	Eyelid Conformation, Unsound Movement , Construction, Skin, Eyes, Excessive Wrinkle
Pekingese	Weak Hind Movement*, Pinched Nostrils, Overnose Wrinkle, Hocks, Unsound Movement, Mouth, Overcoated, Breathing Difficulties
Pug	Eyes*, Breathing Difficulties*, Overweight*, Nasal Folds, Unsound Movement, Overnose Wrinkle
Shar Pei	Excessive Wrinkle*, Temperament, Incorrect Bite, Mouth
Spaniel (Clumber)	Unsound Movement*, Mouth*, Ear*, Eyes, Overweight, Incorrect Bite
St Bernard	Eyelid Conformation*, Eyes*, Unsound Movement*, Teeth*, Excessive Haw*, Excessive Wrinkle*, Overweight, Weak Hind Movement, Temperament

*indicates issues remarked about on five or more occasions.

The Group is grateful to the health observers who have given their time to watch individual breeds and to the judges who have submitted constructive and informative reports.

HIGH PROFILE BREED HEALTHY EYE CONFORMATION SEMINARS

In July and October 2012, high profile breed representatives, judges and veterinary surgeons were invited to attend Healthy Eye Conformation seminars, in order to begin a consultation process to clarify what judges and veterinary surgeons should look for when assessing eyes. A total of 332 delegates attended the seminars.

The seminars were led by Professor Sheila Crispin, who gave a presentation which described the basic principles that should guide a judge's assessment of a dog's eye and provided examples of normal eyes and those with abnormalities. Professor Steve Dean followed with a presentation which contextualized this information in terms of the high profile breed veterinary checks.

Clubs were also invited to give presentations on the valuable health work they are undertaking within their breeds. Eight breeds gave presentations and several others provided static displays illustrating their work.

VETERINARY HEALTH CHECKS

During 2012 a total of 370 veterinary health checks have taken place at Group & General Championship Shows for Best of Breed and Champion title awards. 219 individual dogs have been checked with 66 dogs being checked more than once.

In addition, 52 Champion title checks took place in 2012 with only 2 dogs not passing their initial check. However, both dogs passed their second check to be awarded their Champion title. Of the 66 Best of Breeds that have been checked more than once, only 3 dogs have both passed and failed a veterinary health check.

We are aware of how difficult the introduction of veterinary health checks has been for breeds, with many seeing it as a spotlight being shone on a small number of breeds. The statistics show that the results are overwhelmingly positive, which is a credit to the judges, exhibitors and breeders involved.

The co-operation from the high profile breeds, alongside the increasing consistency of the checks and the continuing programme of educational events, have all contributed to a regime in which all parties can have increasing confidence. The veterinary health checks will continue in 2013 and the Working Party set up to review this new process will submit its report to the Kennel Club's 2013 AGM.

HIGH PROFILE BREED CONSULTATION

The Dog Health Group has undertaken to keep under active review the breeds that are categorised as high profile. The criteria for removal of breeds from the high profile list were issued in 2011 and included in the previous annual report. To accompany this, a practical and detailed framework through which breeds can work towards removal from the high profile list is being devised.

With the principal aim of working with high profile breed clubs towards removal from the list, a new role of High Profile Breed Co-ordinator was agreed by the Dog Health Group in 2012. This provides a dedicated liaison between the Kennel Club and high profile breed representatives. A number of meetings with Breed Clubs/Councils/Health Co-ordinators have already been held, through which close working relationships are being developed and will continue into 2013.

The DHG will continue to monitor breeds across all the groups to ensure that the high profile breed list remains a useful tool in working on long term breed health.

DOGS WITHDRAWN, WITHHELD AND EXCLUDED

Over the course of the 2280 shows licensed by the Kennel Club last year, only 42 dogs were reported as having been excluded from competition[1], 65 dogs reported withdrawn from competition[2] and 58 awards reported as being withheld by judges[3] spread across a total of 47 breeds. It is encouraging to note that these totals represent a very small percentage of the number of dogs entered for competition during 2012.

BREED WATCH

The Breed Watch section of the Kennel Club website is an important resource both for new judges and for the more experienced. The site alerts judges and breeders to particular health issues and tendencies towards conformational exaggeration in breeds, of which judges should be mindful when judging. Breed Clubs and Health Co-Ordinators continue to have input into the content for their particular breed. This site now receives an average of 6,900 hits per month, peaking at over 18,700 in March. The link to the Kennel Club webpage on Breed Watch is: **www.thekennelclub.org.uk/services/public/breed/watch/Default.aspx h**

[1]Data does not include high profile breed veterinary health check exclusions. [2]Data does not include those dogs which withdrew from the BOB challenge due to high profile breed veterinary health checks. [3]Reasons for withholding include lack of merit and/or concerns over health and welfare

FUTURE WORK

- A High Profile Breed Education Day will take place early in 2013. The event will highlight the health work undertaken by breeders and the progress which has been made. Representatives for each breed will be able to showcase the health initiatives that have been undertaken in a dedicated breed booth and an area will be provided so that breed representatives can provide commentary on the movement in their breeds. Each breed representative will bring along dogs that have good characteristics and that have moved away from exaggerations as well as dogs that show conformation or movement problems that are still faced within the breed.
- Other specific education events will be devised as a result of feedback from the above event.
- Monitoring of high profile breeds at Championship shows will continue, although a review of the practice is underway.
- Veterinary checks at Championship shows will continue.
- Feedback on high profile breed monitoring will be issued to relevant breed clubs.
- The High Profile Breed Co-ordinator will continue to liaise with breed clubs to assist and advise on related matters.

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GENETICS AND HEALTH SCREENING SUB-GROUP

REMIT

- To advise on strategy for development of health screening (clinical/DNA) tests.
- To advise on which of the above should be requirements or recommendations in the Kennel Club Assured Breeder Scheme (ABS).
- To advise on breeding and registration issues to protect or enhance genetic diversity.
- To set up review processes on effectiveness of health screening schemes.
- To provide scientific input, where appropriate, to breeding strategies on phenotypic issues.
- To monitor progress on external data collection and surveillance.

ACHIEVEMENTS

At each of its meetings in the last year, the group received and commented on updates from Dr Blott and Dr Mellersh of the Kennel Club Genetics Centre at the Animal Health Trust on progress, and current projects. Dr Mellersh updated members on the work in the molecular genetics section. During 2011 the Genetics and Health Screening Sub-Group advised that as it was clear that many DNA tests would become available in the next few years, it was important to give breeders context, i.e. frequency of mutation and significance of condition. As a result, in 2012, the research team led by Dr Mellersh has undertaken two studies to estimate the frequency of disease-associated mutations in Kennel Club registered dogs and deliver customised breeding advice based on the frequency of the mutations in the relevant UK populations.

The first study, undertaken in collaboration with Cavalier King Charles Spaniel (CKCS) breed clubs and the Kennel Club, tested 280 randomly selected CKCS for the two mutations that cause Episodic Falling and Curly Coat/Dry Eye syndrome in this breed. The owners of tested CKCS received the DNA test results for their dog free of charge and a summary report was prepared containing customised breeding recommendations based on the study findings.

In a second study the owners of 500 randomly selected, Kennel Club registered Beagles were contacted by the Kennel Club, on behalf of the Animal Health Trust. Individual owners were invited to submit DNA from their dog to be tested for the mutation that causes an inherited neurological disorder called Neonatal Cortical Cerebellum Degeneration (NCCD), which Dr Mellersh's team identified during 2012. To date over 150 Beagle owners have returned DNA from their dogs for this study, which will be finalised early in 2013 with the distribution of a report containing customised breeding advice based on the frequency of the mutation in the UK Beagle population.

Dr Blott reported on her area within the Kennel Club Genetics Centre which is involved with quantitative or statistical genetics, and more population-based analyses. During the year, estimated breeding values (EBVs) were made ready to launch for 15 breeds for hips and of that 15, 5 for both hip and elbow dysplasia. As the breeds included also represent large registration numbers, these EBVs will account for 25% (hip and elbow) of all Kennel Club registrations. In addition, 48 population analyses were completed, with the remaining population analyses to follow soon. These reports will enable detailed breed-specific strategies to be formed.

During the year, the Sub-Group also made the following recommendations to the Dog Health Group:

- The Sub-Group suggested that the prioritisation of health conditions, particularly in breeds where a number of tests are available, should be discussed amongst all relevant parties to ensure health and welfare concerns are in balance to the greatest benefit of all dogs.
- The Sub-Group discussed the benefit to improving data capture from non-official, but reliable canine health schemes to identify their significance within wider health initiatives.
- There was consideration given to dual sire matings with regards to health and welfare, and it was agreed that this could be advantageous in those breeds where an expansion of the gene pool is being sought, and the possible welfare advantage of a bitch producing more genetically variant puppies in a single gestation.
- The Sub-Group explored the development of an online research journal which could improve access to canine specific health and welfare research for the veterinary and research community, as well as the lay-person.

CONCLUSION

The 2012 Dog Health Group Annual Report aims to give a broad overview of the continuing work of the Kennel Club on the main health and welfare issues being faced. The initiatives introduced in previous years have continued to develop and gain momentum. The systems that have been established to measure progress are now embedded and within the next few years the comparative data will demonstrate clearly what is being achieved.

These achievements would not have been attainable without the co-operation and dedication of breed health co-ordinators and breed club committees, for which we are most grateful. Our sincere thanks are also expressed to the members of the Dog Health Group and its sub-groups, as well as all of the judges, observers and accredited trainers who provide the feedback on which we build our initiatives and pave the way for future improvement.

Finally, 2012 saw the retirement from the Dog Health Group of one of the Kennel Club's greatest champions for protecting and improving canine health and welfare. Dr Ruth Barbour had been Chairman of the Breed Standards and Conformation Sub-Group and a Dog Health Group member since its inception. Prior to that, Dr Barbour had led, since 2001, the initial group which was formed to consider the implications of the European Convention on the Protection of Pet Animals, which eventually evolved to become the Dog Health Group. Without Dr Barbour's drive and commitment over many years, the achievements in health and welfare attained by the Kennel Club would have been far fewer. We sincerely thank Dr Barbour for her work with the Dog Health Group and in making a very important difference to the canine world.

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ANNEX A

HEALTH TESTS

Annual summaries of health data generated by BVA/KC health schemes

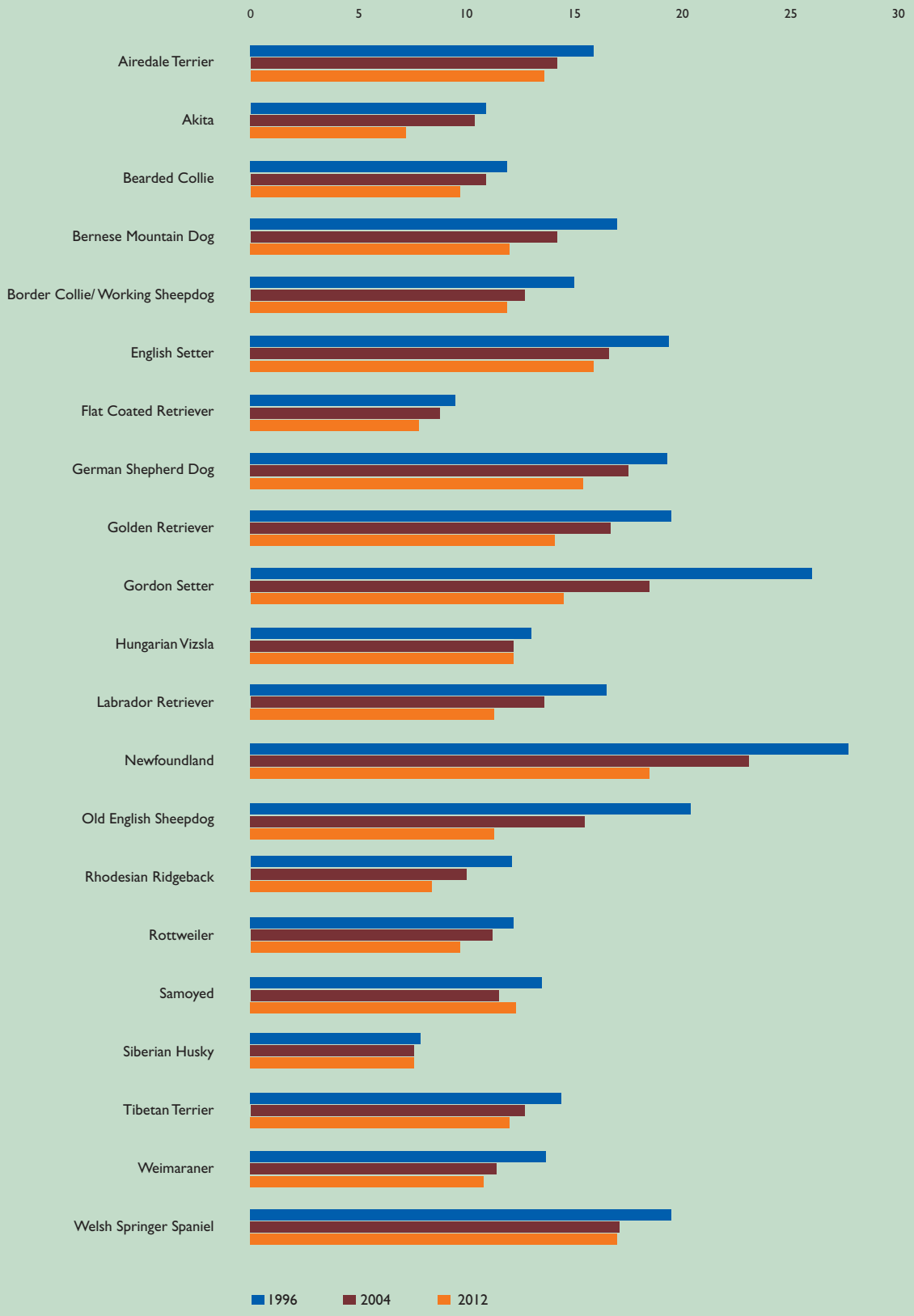
BVA/KC HIP DYSPLASIA SCHEME

'Five year Rolling Mean Scores' are maintained for the breeds that have a high throughput of annual scoring. The five year rolling mean is the average derived from dogs scored in the previous 5 years. So, the 1996 5-year mean represents the mean of the dogs scored between 1st January 1992 and 31st December 1996. For the 1997 5-year mean, the start date moves on by a year as does the end date, and so on.

5-YEAR ROLLING MEAN HIP SCORES FOR THE MAJOR BREEDS USING THE SCHEME

Breed	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Airedale Terrier	15.9	16.2	15.8	16.0	15.6	15.6	15.1	14.8	14.2	14.6	14.7	14.8	14.4	14.6	14.0	13.5	13.6
Akita	10.9	10.7	10.7	11.0	11.0	11.0	11.1	10.8	10.4	10.4	9.9	9.2	8.8	8.3	7.8	7.4	7.2
Bearded Collie	11.9	11.6	11.1	10.6	10.3	10.3	10.3	10.8	10.9	11.0	11.0	10.8	10.5	10.2	10.1	9.7	9.7
Bernese Mountain Dog	17.0	17.1	16.8	16.1	15.5	15.7	15.0	14.3	14.2	14.0	13.3	13.3	13.2	12.7	12.4	12.5	12.0
Border Collie/ Working Sheepdog	15.0	15.1	14.9	14.4	14.2	13.7	13.2	12.6	12.7	12.4	12.3	12.2	12.2	11.9	11.8	11.7	11.9
English Setter	19.4	18.9	18.4	17.3	17.1	16.7	16.4	16.2	16.6	16.9	16.8	16.3	16.5	15.7	15.3	15.4	15.9
Flat Coated Retriever	9.5	9.2	9.1	8.9	9.0	9.0	8.9	8.8	8.8	8.6	8.5	8.3	8.1	7.9	7.9	7.8	7.8
German Shepherd Dog	19.3	19.4	19.0	18.9	18.7	18.3	17.7	17.5	17.5	17.5	17.2	17.0	16.7	16.1	15.9	15.7	15.4
Golden Retriever	19.5	19.2	18.7	18.1	17.6	17.3	17.1	16.8	16.7	16.6	16.2	15.7	15.3	15.0	14.7	14.3	14.1
Gordon Setter	26.0	25.1	24.2	23.7	23.2	21.0	20.2	18.7	18.5	18.6	17.9	18.0	17.9	16.3	15.5	15.3	14.5
Hungarian Vizsla	13.0	13.0	13.0	12.8	12.7	12.4	12.5	12.1	12.2	12.1	12.1	12.0	12.4	12.2	12.1	12.1	12.2
Labrador Retriever	16.5	16.1	15.8	15.4	15.0	14.5	14.2	13.8	13.6	13.4	13.1	12.8	12.6	12.2	11.9	11.6	11.3
Newfoundland	27.7	26.5	25.4	25.0	25.0	24.6	23.8	23.5	23.1	22.8	21.9	22.8	21.6	20.9	20.6	19.9	18.5
Old English Sheepdog	20.4	19.8	19.9	18.7	17.5	16.8	15.6	15.3	15.5	15.2	15.5	15.0	13.9	13.4	12.9	11.9	11.3
Rhodesian Ridgeback	12.1	12.1	12.1	11.7	11.1	11.0	10.4	10.0	10.0	10.0	9.9	9.9	9.7	9.4	9.2	8.8	8.4
Rottweiler	12.2	12.0	11.7	11.6	11.5	11.3	11.2	11.2	11.2	11.2	11.1	11.0	10.9	10.6	10.3	10.0	9.7
Samoyed	13.5	13.5	13.0	12.6	12.1	11.7	11.4	11.4	11.5	12.0	12.3	12.5	12.6	12.8	12.1	12.2	12.3
Siberian Husky	7.9	7.8	7.7	7.8	7.8	7.7	7.6	7.6	7.6	7.7	8.0	8.1	8.0	8.0	8.0	7.8	7.6
Tibetan Terrier	14.4	13.5	12.7	13.0	13.3	13.1	12.8	13.0	12.7	12.4	12.3	12.3	12.2	12.1	12.0	12.1	12.0
Weimaraner	13.7	13.7	13.1	12.7	12.5	12.0	11.7	11.5	11.4	11.2	11.1	11.1	11.0	11.2	11.3	11.0	10.8
Welsh Springer Spaniel	19.5	19.2	19.0	19.5	19.6	19.6	19.1	18.3	17.1	16.4	16.1	16.7	16.7	16.6	17.7	17.1	17.0

Comparison of results indicating decline in Hip Dysplasia



HIP SCORES BY BREED

Data Calculated to 01/11/12

The following is the Annual Summary that is now prepared for the BVA, covering all breeds, using data from the current approximated breeding population (data from dogs scored in the last 15 years only). By representing dogs scored in the last 15 years, a more accurate reflection of each breed's current state of health and improvement is given. The 5-year mean here refers to dogs scored between 1st November 2007 and 31st October 2012.

A: BREEDS WITH 1000 OR MORE SCORED (37)

Breed	No.	15 Years			5 Years
		BMS	Range	Median	BMS
Airedale Terrier	1606	14.5	3 to 68	11	13.6
Akita	2395	9.5	0 to 91	8	7.2
Alaskan Malamute	1181	12.3	0 to 78	10	12.4
Bearded Collie	3321	10.3	0 to 79	9	9.7
Belgian Shepherd Dog (all types)	1837	9.1	0 to 56	8	8.4
Belgian Shepherd Dog (Groenendael)	483	8.9	0 to 40	8	8.4
Belgian Shepherd Dog (Laekenois)	16	10.4	5 to 16	10	10.3
Belgian Shepherd Dog (Malinois)	187	8.8	0 to 45	8	8.3
Belgian Shepherd Dog (Tervueren)	972	9.3	0 to 56	9	8.4
Belgian Shepherd Dog (pre 2000 unspecified)	179				
Bernese Mountain Dog	4940	13.6	0 to 122	10	12
Border Collie/ Working Sheepdog	7911	12.4	0 to 84	11	11.9
Bullmastiff	1075	22.7	4 to 93	16	20.3
Cocker Spaniel	1199	12	0 to 99	10	11
Dobermann	1481	10.8	0 to 64	10	10.5
Dogue de Bordeaux	1100	22.1	0 to 98	15	21.2
English Setter	3047	16.3	1 to 92	12	15.9
Flat Coated Retriever	6327	8.3	0 to 84	8	7.8
German Shepherd Dog	42614	16.8	0 to 106	12	15.4
German Shorthaired Pointer	1156	9.9	0 to 49	9	9.3
Golden Retriever	34567	15.8	0 to 102	12	14.1
Gordon Setter	2535	17.8	0 to 101	12	14.5
Hungarian Vizsla	2245	12.1	0 to 70	11	12.2
Irish Setter	1389	14	0 to 100	11	13.5
Italian Spinone	1287	12.1	0 to 88	9	10.9
Labrador Retriever	77194	12.8	0 to 106	10	11.3
Leonberger	1469	11.6	0 to 89	9	11.3
Newfoundland	4500	21.8	0 to 104	13	18.5
Old English Sheepdog	1846	14.2	0 to 99	10	11.3
Rhodesian Ridgeback	2427	9.5	0 to 84	8	8.4
Rottweiler	12642	10.9	0 to 91	8	9.7
Rough Collie	1158	9.8	0 to 85	8	9.2
Samoyed	1552	12	0 to 71	10	12.3
Siberian Husky	3877	7.8	0 to 47	8	7.6
Tibetan Terrier	2574	12.3	0 to 97	10	12
Weimaraner	2256	11.2	0 to 69	10	10.8
Welsh Springer Spaniel	1817	17.6	0 to 94	13	17

B: BREEDS WITH 500 TO 999 SCORED (15)

Breed	No.	BMS			5 Years
		BMS	Range	Median	BMS
Australian Shepherd	689	10.1	2 to 55	9	10.1
Briard	958	13.3	0 to 71	10	12.9
Chesapeake Bay Retriever	520	10.7	0 to 61	9	9.6
Chow Chow	827	15.5	0 to 106	9	18.5
Clumber Spaniel	850	25.2	0 to 106	14	24.1
Elkhound	571	11.9	0 to 57	11	11.3
English Springer Spaniel	965	13	0 to 89	10	12.2
Great Dane	565	11.8	0 to 81	10	11.1
Irish Water Spaniel	883	14.2	0 to 76	11	13.5
Large Munsterlander	647	10.5	0 to 81	8	9
Pyrenean Mountain Dog	547	11.6	0 to 77	9	10.4
Shetland Sheepdog	605	12.4	0 to 90	10	12.7
Soft-Coated Wheaten Terrier	562	11.8	0 to 48	11	11.6
Standard Poodle	936	12.6	0 to 66	11	12.3
St. Bernard	650	20.6	0 to 98	15	22.8

C: BREEDS WITH 100 TO 499 SCORED (29)

Breed	No.	15 Years			5 Years
		BMS	Range	Median	BMS
Anatolian Shepherd Dog	191	12.1	3 to 67	9	11.8
Bouvier Des Flandres	154	15.3	6 to 65	13	16.4
Boxer	418	14.8	0 to 75	13	13.5
Bracco Italiano	143	15.6	4 to 79	11.5	12.8
Brittany	470	15.9	5 to 66	13	15.8
Cavalier King Charles Spaniel	272	12.8	0 to 47	12	15.7
Curly Coated Retriever	479	11.1	0 to 43	10	10.2
Dalmatian	185	11.7	0 to 96	10	12.2
Eurasier	129	10.2	2 to 27	10	9.9
Field Spaniel	239	15	0 to 78	11	14
Finnish Lapphund	213	13.3	4 to 45	12	13.9
German Wirehaired Pointer	400	10.4	0 to 34	10	10.4
Giant Schnauzer	193	12.8	0 to 75	10	11.8
Hovawart	220	10	0 to 60	9	9.2
Hungarian Puli	495	11.8	4 to 83	10	11.6
Hungarian Wire Haired Vizsla	428	13	4 to 63	11	12.7
Irish Red & White Setter	434	9.7	0 to 96	8	8.5
Maremma Sheepdog	165	16.9	4 to 62	13	15.8
Mastiff	374	17.7	0 to 80	13	18.5
Norwegian Buhund	152	15.1	5 to 76	12	12.5

C: BREEDS WITH 100 TO 499 SCORED (29) (CONTINUED)

Breed	No.	15 Years			5 Years
		BMS	Range	Median	BMS
Nova Scotia Duck Tolling Retriever	462	10.7	0 to 70	9	11.2
Otterhound	228	46.7	9 to 106	46	50.6
Pointer	149	10	0 to 54	9	9.3
Polish Lowland Sheepdog	424	15.1	4 to 60	12	11.8
Pyrenean Sheepdog	109	13	3 t 53	11	13.3
Spanish Water Dog	246	15	0 to 64	12	15.2
Sussex Spaniel	170	38.5	8 to 90	30	40.9
Swedish Vallhund	195	10.1	2 to 26	10	10.1
Tibetan Mastiff	248	14.8	0 to 101	10	15.2

D: BREEDS WITH 40 TO 99 SCORED (24)

Breed	No.	BMS			5 Years
		BMS	Range	Median	BMS
Affenpinscher	64	16.9	6 ro 90	12	17.8
Afghan Hound	48	7.6	0 to 12	8	11
Australian Cattle Dog	93	12.5	6 to 56	11	13.8
Basenji	41	7.5	0 to 16	8	
Beagle	61	22.5	10 to 71	16	19.7
Bloodhound	44	18.4	10 to 44	14	
Canaan Dog	54	10.8	3 to 36	10	9.8
Estrela Mountain Dog	67	25.9	2 to 89	13	25.8
German Longhaired Pointer	66	9.5	0 to 35	9	9.1
Irish Wolfhound	75	8.1	2 to 18	8	
Japanese Akita Inu	71	13.3	4 to 85	8	12.7
Keeshond	55	11.8	7 to 16	12	
Kerry Blue Terrier	66	14.5	6 to 66	12	
Komondor	42	11.7	2 to 20	10.5	
Lagotto Romagnolo	43	11.6	0 to 43	10	10.8
Miniature Poodle	68	10.6	4 to 45	10	10.5
Neapolitan Mastiff	51	34.5	6 to 97	25	39.8
Portuguese Water Dog	92	14.9	4 to 60	12	15.4
Pug	41	22.7	8 to 72	19	24.9
Russian Black Terrier	56	33.9	5 to 90	28	28.1
Shar Pei	63	15	6 to 77	10	
Slovakian Rough Haired Pointer	46	10	4 to 29	9	9.8
Smooth Collie	79	5.4	0 to 15	6	3.2
Staffordshire Bull Terrier	59	12.9	0 to 53	11	12.9

E: BREEDS WITH 10 TO 39 SCORED (26)

Breed	No.	BMS			5 Years
		BMS	Range	Median	BMS
American Cocker Spaniel	14	21.5	6 to 90	11	
Basset Griffon Vendeen (Petit)	14	11.7	7 to 18	10	
Bavarian Mountain Hound	38	10.2	4 to 20	10	10.2
Beauceron	36	12.2	3 to 37	11	10.8
Bichon Frise	17	8.5	6 to 11	8.5	
Border Terrier	21	11.3	6 to 33	9	9.3
Bull Terrier	14	1.5	0 to 6	0	
Bulldog	28	41.7	9 to 96	35	39.4
Canadian Eskimo Dog	38	13	0 to 45	10	12.8
Catalan Sheepdog	35	17.5	7 to 71	13	17.5
French Bulldog	22	18.4	5 to 93	12	18.4
Greater Swiss Mountain Dog	16	7.4	2 to 12	8	7.6
Greenland Dog	33	10.9	7 to 34	9	
Havanese	11	7.6	0 to 12	8	
Hungarian Kuvasz	13	11.5	9 to 13	12	
Japanese Shiba Inu	35	11	11 to 11	11	
Korthals Griffon	28	9.8	4 to 34	9.5	9.8
Lowchen	17	15.2	8 to 84	12	
Miniature Schnauzer	17	10	10 to 10	10	
Saluki	39	4	0 to 8	4	
Schnauzer	27	14.7	9 to 24	13.5	
Swedish Lapphund	16	26.4	7 to 80	13	
Tibetan Spaniel	39	12.6	3 to 28	10	
Welsh Corgi (Cardigan)	27	16.2	8 to 67	13	14.3
Welsh Corgi (Pembroke)	30	23.8	9 to 58	20	
West Highland White Terrier	16	9.1	6 to 14	8	

BVA/KC ELBOW DYSPLASIA SCHEME

The following table contains the outcome of all dogs scored under the scheme.

Total number of dogs (all breeds) elbow graded by year

Number of dogs in each elbow grade (% of total dogs graded in the year)

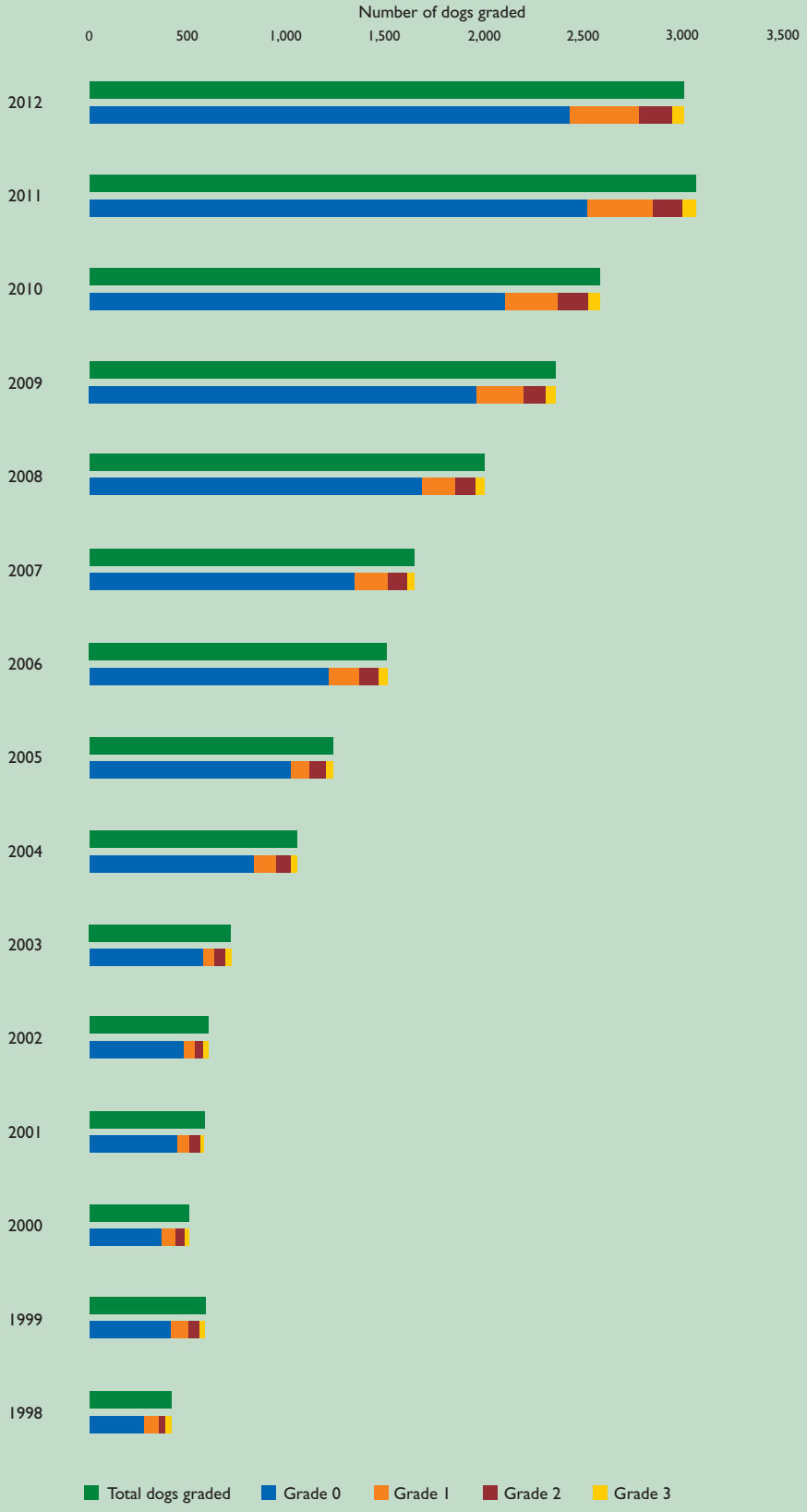
Year	Total dogs graded	0	1	2	3
2012	3000	2420 (80.7%)	351 (11.7%)	168 (5.6%)	61 (2.0%)
2011	3059	2509 (82.0%)	331 (10.8%)	152 (5.0%)	67 (2.2%)
2010	2575	2095 (81.4%)	267 (10.4%)	152 (5.9%)	61 (2.4%)
2009	2351	1953 (83.1%)	234 (10.0%)	116 (4.9%)	48 (2.0%)
2008	1993	1674 (84.0%)	172 (8.6%)	101 (5.1%)	46 (2.3%)
2007	1639	1335 (81.5%)	167 (10.2%)	99 (6.0%)	38 (2.3%)
2006	1501	1206 (80.3%)	152 (10.1%)	100 (6.7%)	43 (2.9%)
2005	1229	1014 (82.5%)	97 (7.9%)	81 (6.6%)	37 (3.0%)
2004	1046	828 (79.2%)	111 (10.6%)	75 (7.2%)	32 (3.1%)
2003	714	570 (79.8%)	57 (8.0%)	54 (7.6%)	33 (4.6%)
2002	598	471 (78.8%)	59 (9.9%)	43 (7.2%)	25 (4.2%)
2001	578	441 (76.3%)	62 (10.7%)	53 (9.2%)	22 (3.8%)
2000	503	359 (71.4%)	70 (13.9%)	49 (9.7%)	25 (5.0%)
1999	583	408 (70.0%)	89 (15.3%)	54 (9.3%)	32 (5.5%)
1998	411	274 (66.7%)	73 (17.8%)	33 (8.0%)	31 (7.5%)

BVA/ KC ELBOW DYSPLASIA SCHEME - RESULTS FOR COMMONLY SCORED BREEDS.

The following annual summary covers all breeds that have had over 100 dogs tested in the last 15 years.
This data is further broken down by grade.

Year	Total dogs graded	0	1	2	3
Australian Shepherd	221	211 (95.5%)	7 (3.2%)	2 (0.9%)	1 (0.5%)
Bernese Mountain Dog	2025	1239 (61.2%)	294 (14.5%)	315 (15.6%)	177 (8.7%)
Border Collie	160	157 (98.1%)	3 (1.9%)	0	0
Dogue de Bordeaux	229	145 (63.3%)	35 (15.3%)	34 (14.8%)	15 (6.6%)
Flat Coated Retriever	177	170 (96.0%)	2 (1.1%)	3 (1.7%)	2 (1.1%)
German Shepherd Dog	2658	2200 (82.8%)	253 (9.5%)	133 (5.0%)	72 (2.7%)
Golden Retriever	2942	2315 (78.7%)	358 (12.2%)	215 (7.3%)	54 (1.8%)
Great Dane	153	132 (86.3%)	9 (5.9%)	6 (3.9%)	6 (3.9%)
Irish Water Spaniel	101	75 (74.3%)	21 (20.8%)	5 (5%)	0
Labrador Retriever	11108	9491 (85.4%)	971 (8.7%)	430 (3.9%)	216 (1.9%)
Large Munsterlander	144	116 (80.6%)	18 (12.5%)	8 (5.6%)	2 (1.4%)
Leonberger	1092	995 (91.1%)	78 (7.1%)	7 (0.6%)	12 (1.1%)
Mastiff	119	89 (74.8%)	13 (10.9%)	10 (8.4%)	7 (5.9%)
Newfoundland	564	402 (71.3%)	81 (14.4%)	51 (9.0%)	30 (5.3%)
Otterhound	120	49 (40.8%)	34 (28.3%)	30 (25.0%)	7 (5.8%)
Rhodesian Ridgeback	267	224 (83.9%)	33 (12.4%)	9 (3.4%)	1 (0.4%)
Rottweiler	768	371 (48.3%)	222 (28.9%)	156 (20.3%)	19 (2.5%)
St. Bernard	193	151 (78.2%)	16 (8.3%)	10 (5.2%)	16 (8.3%)

Comparison of Elbow Dysplasia Gradings



BVA/KC/ISDS EYE SCHEME

Annual summary of the results of eye examination performed under schedule A of the scheme.

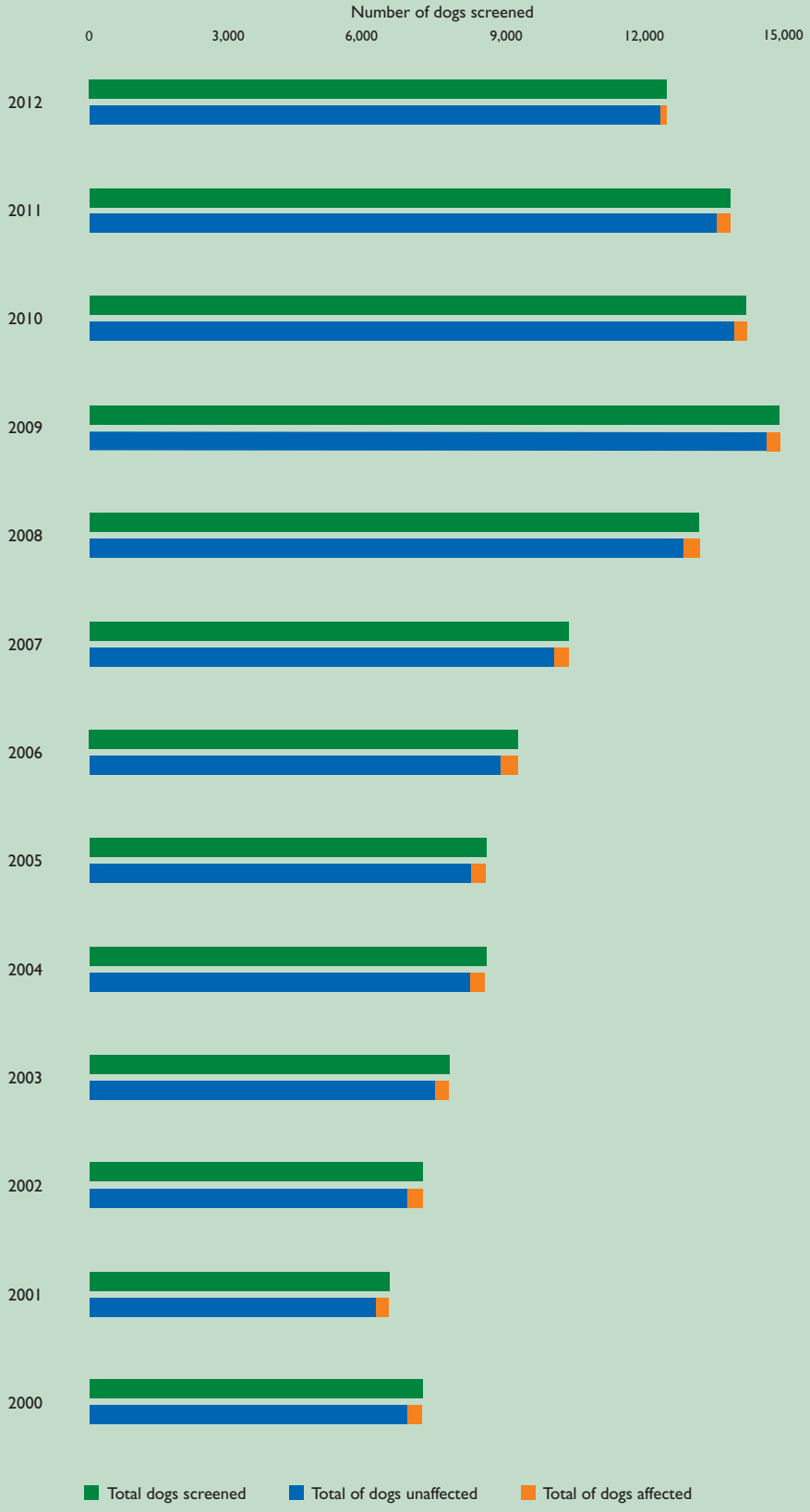
Year	Total Screened	Unaffected	Affected	CEA	TRD	CHC	PHPV	PPM	G	gPRA	cPRA	HC	PLL	RD
2012	12478	12329	149	13	0	0	1	0	32	5	2	96	1	0
2011	13844	13548	296	34	0	2	3	0	52	12	0	193	2	0
2010	14198	13926	272	28	0	0	6	0	47	11	1	178	2	0
2009	14915	14623	292	38	0	1	3	0	58	14	0	177	3	0
2008	13180	12825	355	36	1	0	0	0	69	17	0	237	0	0
2007	10363	10035	328	27	0	0	4	0	69	14	0	209	7	0
2006	9264	8874	390	37	0	1	6	1	59	17	1	268	8	0
2005	8571	8249	322	30	0	1	2	0	37	12	0	236	4	0
2004	8575	8241	334	25	0	1	2	1	53	18	1	229	6	0
2003	7780	7472	308	31	0	0	4	1	31	26	0	216	2	0
2002	7206	6881	325	43	0	0	4	1	45	18	2	214	2	0
2001	6480	6195	285	29	0	0	3	0	30	11	2	206	6	0
2000	7206	6881	325	43	0	0	4	1	45	18	2	214	2	0

Key: **CEA** - Collie Eye Anomaly, **TRD** - Total Retinal Dysplasia, **CHC** - Congenital Hereditary Cataract, **PHPV** - Persistent hyperplastic primary vitreous, **PPM** - Persistent Pupillary Membrane, **G** - Goniodysgenesis/glaucoma, **gPRA** - Generalised progressive retinal atrophy, **cPRA** - Centralised progressive retinal atrophy/ Retinal Pigment Epithelial Dystrophy, **HC** - Hereditary Cataract, **PLL** - Primary Lens Luxation, **RD** - Retinal Dysplasia

KENNEL CLUB DNA TESTING SCHEMES - RESULTS FOR DOGS TESTED IN 2012

	Clear	Carrier	Affected	Total
Australian Cattle Dog				
prcd-PRA (Progressive Retinal Atrophy)	3	0	0	3
Australian Shepherd				
CEA/CH (Collie Eye Anomaly/Choroidal Hypoplasia)	8	0	0	8
HC-HSF4 (Hereditary Cataract)	8	0	0	8
MDR1 (Multi-Drug Resistance)	8	12	5	25
prcd-PRA (Progressive Retinal Atrophy)	7	0	0	7
Beagle				
MLS (Musladin-Leuke Syndrome)	149	16	0	165
Bedlington Terrier				
COMMD1 (Copper Toxicosis)	47	7	1	55
Border Collie				
CEA/CH (Collie Eye Anomaly/Choroidal Hypoplasia)	50	8	0	58
CL (Ceroid Lipofuscinosis)	49	10	0	59
TNS (Trapped Neutrophil Syndrome)	52	6	0	58
Boston Terrier				
HC-HSF4 (Hereditary Cataract)	80	2	0	82

Breakdown of eye examination results into unaffected and affected figures



KENNEL CLUB DNA TESTING SCHEMES - RESULTS FOR DOGS TESTED IN 2012

	Clear	Carrier	Affected	Total
Briard				
CSNB (Congenital Stationary Night Blindness)	8	2	0	10
Bull Terrier (Miniature)				
PLL (Primary Lens Luxation)	25	21	0	46
Bulldog				
HUU (Hyperuricosuria)	107	37	3	147
Chinese Crested				
PLL (Primary Lens Luxation)	10	8	1	19
prcd-PRA (Progressive Retinal Atrophy)	5	0	0	5
Collie (Rough)				
CEA/CH (Collie Eye Anomaly/Choroidal Hypoplasia)	1	6	1	8
GPRA (Generalised Progressive Retinal Atrophy) rcd-2	2	0	0	2
MDR1 (Multi-Drug Resistance)	15	19	7	41
Collie (Smooth)				
CEA/CH (Collie Eye Anomaly/Choroidal Hypoplasia)	5	5	0	10
DM (Degenerative Myelopathy)	6	2	0	8
MDR1 (Multi-Drug Resistance)	6	14	10	30
GPRA (Generalised Progressive Retinal Atrophy) rcd-2	1	0	0	1
Dachshund (Miniature Long-Haired)				
GPRA (Generalised Progressive Retinal Atrophy) cord 1	50	47	4	101
Dachshund (Miniature Smooth-Haired)				
GPRA (Generalised Progressive Retinal Atrophy) cord 1	153	161	23	337
Dachshund (Miniature Wire-Haired)				
GPRA (Generalised Progressive Retinal Atrophy) cord 1	117	23	0	140
Dobermann				
vWD (von Willebrand's disease)	32	25	3	60
Finnish Lapphund				
prcd-PRA (Progressive Retinal Atrophy)	5	5	0	10
French Bulldog				
HC-HSF4 (Hereditary Cataract)	204	7	0	211
German Wirehaired Pointer				
vWD (von Willebrand's disease)	12	1	0	13
Glen Of Imaal Terrier				
crd3 (Progressive Retinal Atrophy)	8	4	0	12
Gordon Setter				
PRA (rcd-4) (Progressive Retinal Atrophy)	44	27	8	79
Greyhound				
GN (Greyhound Neuropathy)	1	1	0	2

KENNEL CLUB DNA TESTING SCHEMES - RESULTS FOR DOGS TESTED IN 2012

	Clear	Carrier	Affected	Total
Irish Red & White Setter				
CLAD (Canine Leucocyte Adhesion Deficiency)	1	0	0	1
vWD (von Willebrand's disease)	4	0	0	4
Irish Setter				
CLAD (Canine Leucocyte Adhesion Deficiency)	13	0	0	13
GPRA (Generalised Progressive Retinal Atrophy) rcd-1	43	0	0	43
PRA (rcd-4) (Progressive Retinal Atrophy)	150	124	19	293
Lancashire Heeler				
PLL (Primary Lens Luxation)	21	19	0	40
Large Munsterlander				
HUU (Hyperuricosuria)	11	4	0	15
Manchester Terrier				
vWD (von Willebrand's disease)	4	0	0	4
Newfoundland				
CU (Cystinuria)	28	9	0	37
Norwegian Elkhound				
prcd-PRA (Progressive Retinal Atrophy)	7	11	0	18
Parson Russell Terrier				
LOA (Late Onset Ataxia)	43	9	0	52
PLL (Primary Lens Luxation)	25	14	0	39
Poodle (Miniature)				
prcd-PRA (Progressive Retinal Atrophy)	39	8	0	47
Poodle (Standard)				
vWD (von Willebrand's disease)	2	0	0	2
Poodle (Toy)				
prcd-PRA (Progressive Retinal Atrophy)	38	11	0	49
Portuguese Water Dog				
prcd-PRA (Progressive Retinal Atrophy)	6	6	0	12
Retriever (Chesapeake Bay)				
DM (Degenerative Myelopathy)	4	0	0	4
prcd-PRA (Progressive Retinal Atrophy)	1	0	0	1
Retriever (Golden)				
GR_PRA1 (Progressive Retinal Atrophy)	184	14	2	200
Retriever (Labrador)				
CNM (Centronuclear Myopathy)	209	16	2	227
EIC (Exercise Induced Collapse)	84	12	3	99
prcd-PRA (Progressive Retinal Atrophy)	152	42	0	194

KENNEL CLUB DNA TESTING SCHEMES - RESULTS FOR DOGS TESTED IN 2012

	Clear	Carrier	Affected	Total
Retriever (Nova Scotia Duck Tolling)				
CEA/CH (Collie Eye Anomaly/Choroidal Hypoplasia)	8	2	0	10
prcd-PRA (Progressive Retinal Atrophy)	4	8	0	12
Russian Black Terrier				
HUU (Hyperuricosuria)	4	7	3	14
Sealyham Terrier				
PLL (Primary Lens Luxation)	23	24	2	49
Shetland Sheepdog				
CEA/CH (Collie Eye Anomaly/Choroidal Hypoplasia)	13	13	0	26
MDR1 (Multi-Drug Resistance)	3	1	3	7
vWD (von Willebrand's disease)	0	1	0	1
Spaniel (Clumber)				
PDP-1 (Pyruvate Dehydrogenase Phosphates)	6	0	0	6
Spaniel (Cocker)				
FN (Familial Nephropathy)	205	0	0	205
prcd-PRA (Progressive Retinal Atrophy)	149	73	3	225
Spaniel (English Springer)				
Fuco. (Fucosidosis)	133	0	0	133
GPRA (Generalised Progressive Retinal Atrophy) cord 1	124	30	0	154
PFK (Phosphofructokinase Deficiency)	28	0	0	28
Spanish Water Dog				
prcd-PRA (Progressive Retinal Atrophy)	4	1	0	5
Staffordshire Bull Terrier				
HC-HSF4 (Hereditary Cataract)	106	2	0	108
L-2HGA (L-2-Hyrdoxyglutaricacid uria)	102	7	0	109
Tibetan Terrier				
NCL (Neuronal Ceroid Lipofuscinosis)	189	42	0	231
PLL (Primary Lens Luxation)	72	39	2	113
Welsh Corgi (Cardigan)				
GPRA (Generalised Progressive Retinal Atrophy) rcd-3	7	0	0	7
Activity Register (Working Sheepdog)				
CEA/CH (Collie Eye Anomaly/Choroidal Hypoplasia)	17	7	0	24
CL (Ceroid Lipofuscinosis)	17	0	0	17
prcd-PRA (Progressive Retinal Atrophy)	1	0	0	1
TNS (Trapped Neutrophil Syndrome)	20	1	0	21
vWD (von Willebrand's disease)	1	0	0	1

ANNEX B

COMPOSITION OF DOG HEALTH GROUP AND SUB-GROUPS

COMPOSITION OF THE DOG HEALTH GROUP

Kennel Club Members	Prof. Steve Dean, *Kennel Club Chairman and Veterinary Surgeon*
	Mr Jeff Horswell, *General Committee member*
	Mr Frank Kane, *Chairman Breed Standards Sub-Committee*
	Mr Mike Townsend, *Chairman Kennel Club Charitable Trust*
External	Mr Nick Blayney, *Veterinary Surgeon*
	Prof. Sheila Crispin, *Veterinary Surgeon with specialist expertise in comparative ophthalmology and systemic disorders with ocular manifestations*
	Mr Robin Hargreaves, *President Elect, British Veterinary Association*
	Prof. Mike Herrtage, *Veterinary Surgeon, Dean of University of Cambridge Veterinary School*
	Dr Cathryn Mellersh, *Canine Genetics Research Group Leader, Animal Health Trust*
Kennel Club Staff	Mrs Rosemary Smart, *Chief Executive*
	Mrs Caroline Kisko, *Secretary/Director of Communications*
	Mr Bill Lambert, *Health and Breeder Services Manager*
	Mrs Caroline Hallett, *Registered Societies Manager*
	Ms Aimee Llewellyn, *Health Information Manager*

COMPOSITION OF THE ACTIVITIES HEALTH AND WELFARE SUB-GROUP

External	Mr Richard Curtis, *Heelwork to Music*
	Mrs Sue Garner, *Obedience*
	Mr Barry Gilbert, *Working Trials*
	Mrs Rachel Mowbray, *Veterinary Practitioner and International Agility Team Vet and Agility competitor*
	Dr Jacqueline Boyd, *Nottingham Trent University, School of Animal, Rural and Environmental Sciences, and Agility competitor and Judge*
	Ms Lowri Davies, *Veterinary Practitioner at the Smart Clinic, Canine Sports Medicine & Rehabilitation*
	Mr Gary Doyle, *Senior Lecturer at the University of East London, Sports Biomechanics and Health & Safety and Agility competitor*
	Miss Natasha Wise, *BSc in Sport Science and Agility competitor*
Kennel Club	Mr Steve Croxford, *General Committee member, Activities Sub-Committee member*
Kennel Club Staff	Ms Debbie Deuchar, *Working Dog Activities Team Manager*
	Mr James Oxley, *Licensing specialist*

COMPOSITION OF THE ASSURED BREEDER SCHEME SUB-GROUP

External	Mr Tony Buckwell, *Veterinary Surgeon*
	Mr Graham Thurlow, *Veterinary Surgeon*
	Dr Jessica Holm, *Assured Breeder and Broadcaster*

DHG COMPOSITION

COMPOSITION OF THE ASSURED BREEDER SCHEME SUB-GROUP (CONTINUED)

	Miss Annette Conn, *Behaviourist*
	Mr Gavin Robertson, *Assured Breeder*
	Mrs Jan Wood, *General Committee member and Assured Breeder*
Kennel Club Staff	Mr Bill Lambert, *Health and Breeder Services Manager*
	Mr Glen Dymock, *Assured Breeder Scheme Manager*
	Mrs Sue Sampson, *Assured Breeder Assessor*
	Ms Jacquie Easton, *Executive, Registration Services*
	Mr Nick Sutton, *Health Information Officer*

COMPOSITION OF THE BREED STANDARDS AND CONFORMATION SUB-GROUP

Kennel Club Members	Mr Frank Kane, *General Committee member and Breed Standards Sub-Committee Chairman*
	Dr Ron James, *General Committee member and Veterinary Surgeon*
	Mrs Meg Purnell-Carpenter, *Breed Standards Sub-Committee Vice-Chairman*
	Mr Ian Seath, *Kennel Club member*
External	Prof. Sheila Crispin, *Veterinary Surgeon with specialist expertise in comparative ophthalmology and systemic disorders with ocular manifestation.*
	Prof. Mike Herrtage, *Veterinary Surgeon, Dean of University of Cambridge Veterinary School*
Kennel Club Staff	Mrs Caroline Kisko, *Secretary/Director of Communications*
	Mr Bill Lambert, *Health and Breeder Services Manager*
	Mrs Kathryn Symns, *Executive, Canine Activities Department*
	Mrs Caroline Hallett, *Registered Societies Manager*

COMPOSITION OF THE GENETICS AND HEALTH SCREENING SUB-GROUP

External	Prof Neil Gorman, *Vice-Chancellor, Nottingham Trent University*
Canine Genetics	Dr Cathryn Mellersh, *Canine Genetics Research Group Leader, Animal Health Trust*
	Dr Sarah Blott, *Animal Health Trust Genetics Centre*
	Dr Susan Long, *University of Bristol, School of Veterinary Science*
Human Genetics	Prof. Bill Ollier, *Professor of Immunogenetics at Manchester University and Director of the Centre for Integrated Genomic Medical Research*
Canine Epidemiologist	Dr Dave Brodbelt, *Royal Veterinary College Lecturer in Companion Animal Epidemiology and a European Veterinary Specialist in Anaesthesia*
BVA nominated Veterinary Surgeon	Dr Ruth Dennis, *Head of Diagnostic Imaging Unit AHT and European Specialist in Veterinary Diagnostic Imaging, Chief Scrutineer BCA/KC Hip and Elbow Dysplasia schemes*
Kennel Club Members	Mr Mike Townsend, *Chairman Kennel Club Charitable Trust*
	Dr Ron James, *General Committee member and Veterinary Surgeon*
	Prof. Jeff Sampson, *Canine Geneticist*
Kennel Club Staff	Mrs Caroline Kisko, *Secretary/Director of Communications*
	Ms Aimee Llewellyn, *Health Information Manager*

ANNEX C

REPORT FROM KENNEL CLUB GENETICS CENTRE (KCGC) AT THE ANIMAL HEALTH TRUST (AHT)

CANINE GENETICS - 2012

During 2012 the Canine Genetics research team at the KCGC has continued to investigate inherited disorders that are highlighted by breeders and/or veterinarians as health and welfare burdens for breeds at risk. We seek to identify the causal mutation(s) for each disorder and develop DNA tests that breeders can use to reduce the prevalence of the disorder in their breed and that veterinarians can use to facilitate diagnosis, prevention and treatment, where appropriate.

Our research utilizes DNA collected by a simple mouth swab from pet dogs, always with their owner's consent. During 2012 we received DNA samples from approximately 1500 dogs, of 91 different breeds, of which around 400 were affected with an inherited disorder. Our DNA sample collection now comprises over 23,000 DNA samples, collected from over 180 different breeds, and represents an extremely valuable research resource.

We are currently investigating the genetics of a wide variety of inherited disorders in several different breeds, but our major findings from 2012 are summarised below. For a more complete summary of conditions under investigation please see our website: www.aht.org.uk/cms-display/genetics_cares.html

PROGRESSIVE RETINAL ATROPHY (PRA) IN THE GOLDEN RETRIEVER

In November 2010 we identified and launched a DNA test for the mutation that causes PRA in Golden Retrievers (GR_PRA1). The research we undertook to find the GR_PRA1 mutation indicated that at least one additional form of PRA was present in the Golden Retriever so our studies continued and in 2012 we were very pleased to announce we had identified a second mutation responsible for PRA in this breed. A DNA test for this second form, known as GR_PRA2, was launched in August 2012 and since that time we have tested 499 Golden Retrievers from 19 different countries worldwide.

NEONATAL CEREBELLAR CORTICAL DEGENERATION (NCCD) IN THE BEAGLE

Also in 2012 we used whole-transcriptome sequencing to identify the mutation that causes the serious, debilitating and non-curable condition known as neonatal cerebellar cortical degeneration (NCCD) in the Beagle. To our knowledge, this was the first time this technique had ever been used to find a disease mutation in any species, and so was widely accepted as a ground-breaking piece of research. A DNA test has been developed for the mutation and, in collaboration with the Kennel Club, we are currently undertaking a study to estimate the frequency of the NCCD mutation in Beagles in the UK. On the AHT's behalf, the Kennel Club has contacted the owners of 500 Beagles randomly selected from their transfer of ownership database, inviting them to submit DNA from their Beagle to be tested, free of charge, for the NCCD mutation. At the time of writing we have received DNA from 152 Beagles (30.4% response rate) and expect to have the results by the beginning of March 2013. The data will be used to customise advice to Beagle breeders with respect to testing for the NCCD mutation and breeding with carriers.

LATE ONSET ATAXIA (LOA) IN THE PARSON RUSSELL TERRIER

During 2012 we continued our genetic investigations of the neurological condition referred to as late onset ataxia (LOA) in the Parson Russell Terrier (PRT) and in November 2012 were able to announce we had identified the causal mutation and were in a position to make a DNA test available. We have had a terrific response from PRT breeders worldwide and in the short time the test has been available we have tested close to 1000 PRTs.

EPISODIC FALLING (EF) AND DRY EYE AND CURLY COAT SYNDROME (DE/CC) IN THE CAVALIER KING CHARLES SPANIEL

We have reported previously identification of the mutations for episodic falling (EF) and the condition known as dry eye and curly coat syndrome (DE/CC) in the Cavalier King Charles Spaniel (CKCS). DNA tests for these two mutations were launched in April 2011 and during 2012 we undertook a study, in collaboration with CKCS Breed Clubs and the Kennel Club, to determine the frequency of these mutations in UK CKCSs. The findings indicated that both mutations are frequent in the breed, and led us to recommend that all CKCSs should be tested for both mutations prior to breeding, regardless of their coat colour or ancestry. To download a copy of our findings please visit our website:http://www.aht.org.uk/skins/Default/pdfs/CKCSMutation_Report.pdf

SUMMARY OF DNA TESTING STATISTICS

Since 2009, when the Kennel Club commenced funding of the Canine Genetics Centre at the Animal Health Trust, DNA tests have been developed for eight different disease mutations that are relevant to 23 different breeds of dog, with some breeds benefitting from more than one test. In total the AHT has now tested over 27,500 dogs for these eight mutations, over 11,000 of which were tested during 2012. Importantly, the tests have identified 6,759 dogs that are carriers of at least one disease mutation. In the absence of DNA tests it would have been impossible to determine whether the vast majority of these dogs were carrying these mutations or not, meaning they might have been innocently bred to other carriers and given rise to affected offspring.

ESTIMATED BREEDING VALUES (EBVS)

Complex diseases, such as hip dysplasia and epilepsy, are believed to be caused by a combination of genetic and environmental effects. Pedigree information and population-wide data on disease, such as that collected for the BVA/KC health screening schemes, are analysed using advanced statistical techniques to calculate the extent to which a disease is genetic (its heritability) and this information is used to determine EBVs. EBVs are an objective numerical assessment of the genetic status of an individual dog, with environmental effects removed. By using EBVs breeders can distinguish between dogs of high and low genetic risk when selecting parents. EBVs projects are currently underway for the following conditions:

1. Hip and elbow dysplasia

Hip and elbow dysplasia are developmental diseases which affect several breeds of dog, often causing pain, dislocation of the joints and leading to lameness. Data from the BVA/KC hip and elbow dysplasia schemes has been analysed and used to develop EBVs. Hip dysplasia EBVs for 15 breeds and elbow dysplasia EBVs for 5 breeds will be released in early 2013. The EBVs will be available online via the Kennel Club's Health Test Finder and Mate Select. The introduction of EBVs to more accurately identify genetic risk of hip and elbow dysplasia will:

- allow breeders to plan low risk matings based on parental EBVs
- improve the ability of breeders to select against hip and elbow dysplasia
- result in much quicker progress towards the goal of eradicating these debilitating conditions.

2. Syringomyelia and mitral valve disease in Cavalier King Charles Spaniels (CKCS)

Two of the most prevalent diseases in CKCS are syringomyelia, a neurological condition which results in abnormalities of the spinal cord, and mitral valve disease, a heart condition. There is significant genetic variation in the risk of developing these two diseases, although other non-genetic factors may also play a role. These conditions are candidates for the development of EBVs but require appropriate data collection procedures to be in place. A BVA/KC scheme for syringomyelia was launched in 2012 and once enough data has accumulated through the scheme then EBVs for the condition will become a possibility.

POPULATION STRUCTURES AND INBREEDING

Inbreeding is one of the risk factors for inherited disease in purebred dogs. It is important to understand how the population structure of breeds may be contributing to an increased rate of inbreeding. Kennel Club pedigree records are being used to calculate the rate of inbreeding for each breed over the last 30 years. The rates show how fast inbreeding is accumulating in a breed and indicates the effective population size. This gives a measure of how many individuals are contributing genetically to the population and is a measure of the size of the gene pool in any UK breed.

The analysis also examines how much close inbreeding there is in the breed, and produces other descriptive statistics such as how many dogs are used for breeding and their average number of offspring. So far we have analysed over 100 breeds and will be publishing reports soon in conjunction with the Kennel Club.

Generally, our results show that most breeds have an effective population size below the recommended minimum to maintain a sustainably low rate of inbreeding. In many cases there is evidence that inbreeding rates could be much lower, if appropriate breeding strategies were adopted.

Recommendations to improve the effective population size for each breed analysed will be included in the published reports. Strategies might include reducing the degree of line breeding used, managing the use of popular sires to reduce their future impact on inbreeding, and using more individuals as sires and dams.

MATE SELECT

An online service for dog breeders which is available from the Kennel Club's website has been developed. The program, called Mate Select, is designed to help breeders manage inbreeding and ensure, as far as possible, the good health of the puppies they produce. The service is available for all breeds. Breeders simply need the KC registered name, registration number or stud book number of a particular dog, in order to access information on that animal. Mate Select has been designed so that additional tools will be added, as they are developed, and made available to dog breeders. For 2013, this will include Estimated Breeding Values (EBVs).

Phase one of Mate Select, launched in May 2011, enabled breeders to:

- access a dog's individual inbreeding coefficient
- access the average inbreeding coefficient for any breed recognised by the KC
- perform hypothetical matings and predict the inbreeding coefficients of the puppies.

We have now created technologies that will underpin the second phase of Mate Select. This included developing statistical models for EBVs, for conditions such as hip and elbow dysplasia. For the third phase, we plan to research the impact of 'optimum contributions' (OCs) when applied to dog breeds. By using OCs we will be able to understand the impact that using any particular dog will have on the future diversity of a breed.

Going forward, once all tools are operational, we will continue to carry out the routine calculation of EBVs and OCs ensuring the data breeders are accessing is as accurate and up-to-date as possible. This may include EBVs for other suitable conditions, and to include more breeds in current EBVs when possible. We also hope that through our continued research we will be able to develop new features for the program, ensuring that Mate Select remains an innovative and cutting-edge development in dog breeding.

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