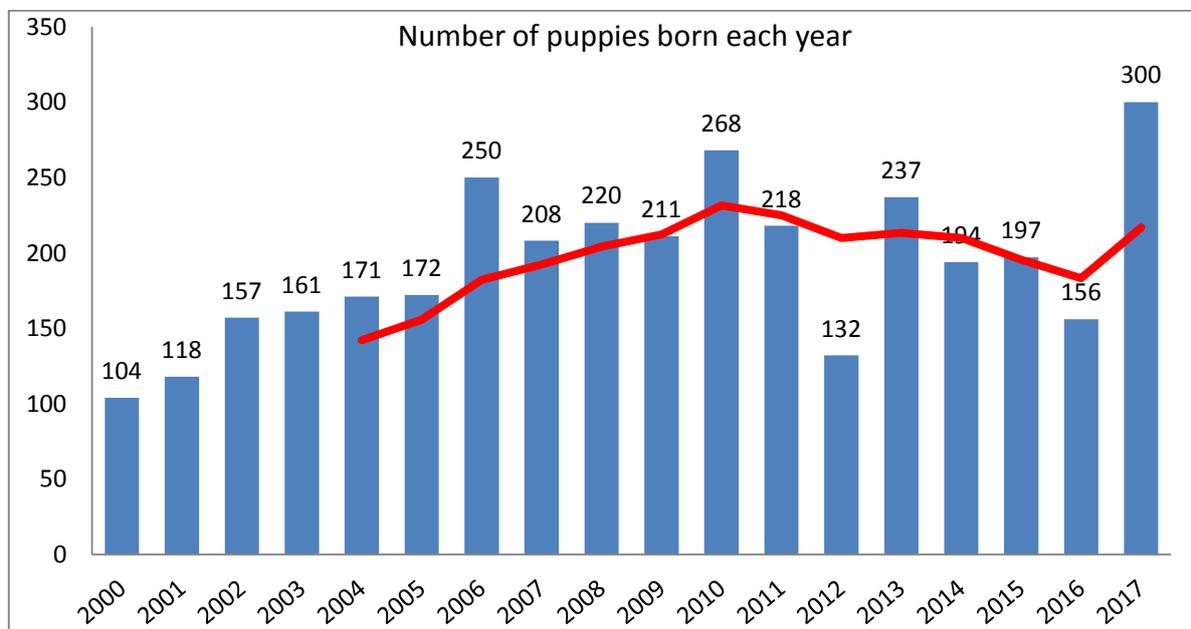


# 2018 CLUMBER SPANIEL BREED HEALTH PLAN

This Breed Health Plan has been developed to provide information on the current health status of the Clumber Spaniel and guidance / recommendations on breeding practice to assist with improvement on health issues. The issues have been placed in the order of priority as identified in the KC Breed Health & Conservation Plan which is “genetic diversity, IVDD, head conformation with relation to eye health, EIC, hip dysplasia and body condition score.”

## GENETIC DIVERSITY

In 2003 the Kennel Club undertook research after concerns were raised about “protecting those breeds of dog which are of British origin and are considered to be vulnerable i.e. those whose numbers are declining and whose status within the world of dogs has diminished over a number of years.” they defined a ‘Vulnerable British Breed’ as one with 300 or fewer registrations per year in the UK. Clumber Spaniels were named as one of these breeds. In 2016 there were just 156 puppies born, but the number increased by almost 100% to 300 puppies born in 2017. The diagram below illustrates the number of puppies per year since 2000. The red line is the 5-year rolling average which shows that a previous steady increase in numbers had more recently become a steady decrease until the increase in 2017.



In September 2015, the KC published the estimated Effective Population Size (EPS) for Clumber Spaniels as 24.5 and noted that an EPS of less than 50 “indicates the future of the breed may be considered to be at risk”, and that it is also “at risk of detrimental effects of inbreeding which could increase the chances of the breed being at risk for both known and unknown inherited disorders.” Breeds with a low EPS are also “at risk of inbreeding depression which is an overall decrease in general fitness, or general health, and may reduce litter size and fertility across the breed.”

However it must be noted that this report covers a 34 year period and records the EPS in 5 year blocks; it can be seen that the main loss of genetic diversity occurred during the 1980s and 1990s and this represents a “genetic bottleneck” with genetic variation lost from the population. Since 2000 the trend has been reversed; for 2000-2004 the EPS was 164.04, for 2005-2009 & 2010-2014 it is shown as n/a which indicates increasing genetic diversity.

Loss of genetic diversity in a numerically large breed would be easier to address but given the low numbers of Clumber Spaniels being born every effort must be made to continue with the improvement being made.

It is understood that the KC will calculate the EPS for all breeds again in 2020.

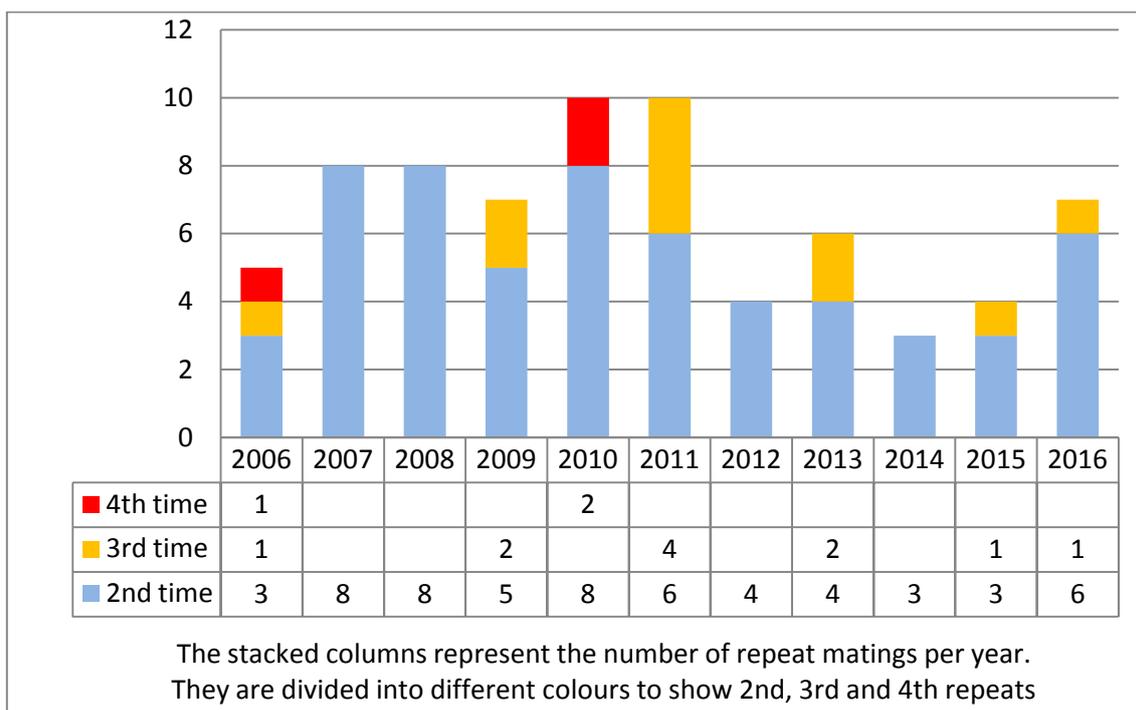
There are three key factors which contribute to the rate of inbreeding and would affect future calculation of the estimated EPS. These are overuse of popular sires, repeat matings and selection of pairs which would produce puppies with a resultant high Coefficient of Inbreeding. Overuse of popular bitches is already limited by the KC, because they “will not normally register more than 4 litters from any one bitch because of concerns that the current legal limit of six litters per bitch can be potentially detrimental to a dog’s welfare.”

**OVERUSE OF POPULAR SIRES** can be a particular issue in a numerically small breed and has been highlighted in previous reports on Clumber Spaniel litter registrations available on the Club website.

The Bateson report published in 2010 included a recommendation that over a 5-year period no sire “should have more offspring than 5% of the total number of puppies registered for that breed”. Each Clumber Spaniel Breed Health Plan has advised stud dog owners on the maximum number of puppies each sire should produce based on the Bateson recommendations. This has been amended each year according to the number of puppies registered. The 2016 plan stated that no sire “should produce more than 53 puppies in a 5-year period”.

The full history of the dogs that had sired a litter in 2015 and/or 2016 was analysed and the total number of puppies produced by each over their life up to the end of 2016 was calculated. The three most prolific dogs produced 100, 89, and 67 puppies respectively.

**REPEAT MATINGS** (i.e. same dam mated to the same sire) is another factor which can lead to a loss of genetic diversity in a breed. During the past ten years some matings have been repeated three or even four times. The next figure shows the number of second, third and fourth repeats by year of birth.



**THE COEFFICIENT OF INBREEDING (COI)** is a measure of the extent of inbreeding. It can be calculated for an individual dog or for a mating, and is expressed as a percentage and the higher the figure the higher the level of inbreeding. The COI is calculated over a stated number of generations, usually 5 or 10, although the KC produces figures which are based on all the available information it has and so the number of generations may vary from dog to dog. However this figure is the one that is published on the KC website, which is available to the puppy buying public and by which breeds are measured; for 2018 this stands at 17.9%.

Given that the KC includes all their data there will be more generations included in their calculations as time progresses. Therefore their figure is expected to increase gradually over time; this may not mean that the COI is getting worse but that more data is being included each year. Also those COI calculated using a large number of generations will certainly include the high inbreeding from the 1980s and 1990s.

Litter analysis has been undertaken since 2013 and average 5-generation COI and 10-generation COIs have been calculated as well as a 'KC COI' which has been calculated using the KC Mate Select tool. The next table shows a comparison of all the different calculations plus the KC's published average COI for the breed and shows that after a rise over the first two years the average appears to have fallen over the most recent three years.

	5-Gen COI	10-Gen COI	KC COI	Average COI published on KC website
2013	10.5%	20.2%		18.2%
2014	11.9%	21.8%	19.3%	18.5%
2015	12.5%	21.3%	19.5%	19.1%
2016	10.4%	20.2%	17.9%	17.9%
2017			16.8%	*16.2%

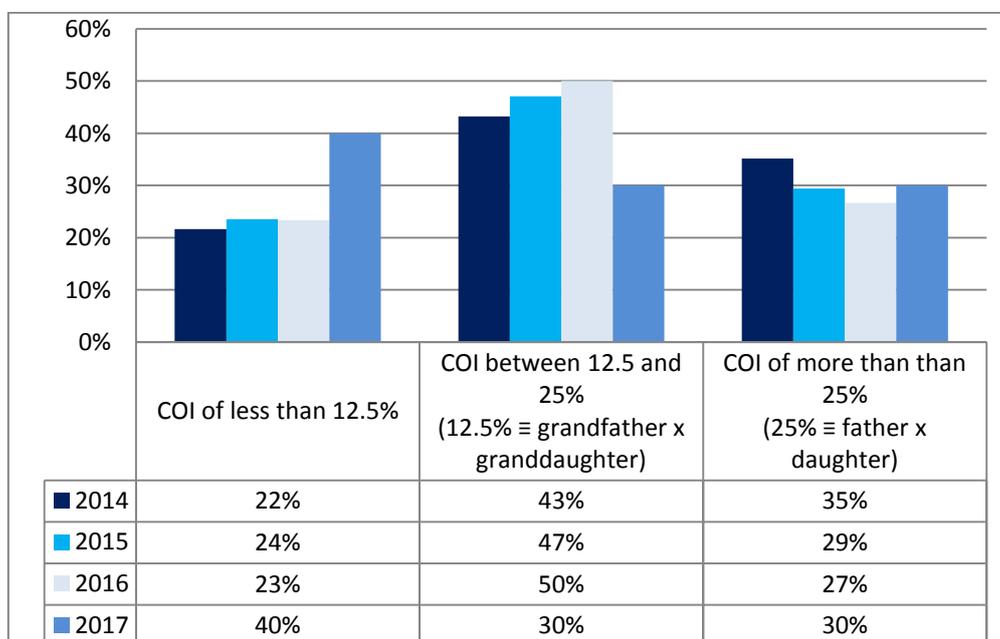
*\*figure supplied by Dr Tom Lewis, KC Geneticist*

The KC Mate Select website includes guidance which states that “where possible, breeders should produce puppies with an inbreeding coefficient which is at, or below, the annual breed average” “and ideally as low as possible”.

In the section on breed averages for COI, it highlights three key measurements for COI which are:

- 0% which indicates that the offspring have an unrelated sire and dam
- 12.5% which is the “genetic equivalent” of a mating between a grandfather and granddaughter
- 25% which is the “genetic equivalent” of a mating between a father and daughter

These three categories have been used to compare matings to assess how the COI is changing and whether the advice is being followed. The Figure below has been calculated using the KC COI and shows the percentage of matings that fell into the categories separated by these three key measurements: i.e. 0 to 12.4%; between 12.5 and 24.9%; and 25% or more.



This shows that about a third (30%) of matings in 2017 had a COI above 25% or the genetic equivalent of a father x daughter mating. The actual numbers of matings with a COI above or below the calculated average of 16.8% were counted and it was found that 53% of matings had a COI above that average.

**The overall OBJECTIVE** is to increase genetic diversity and to reduce the breed average COI. Ideally therefore, more stud dogs should be used and the influence of each individual dog should be reduced.

Breeders are advised:

- a) to consider limiting the use of a stud dog
- b) to select pairs so that the resultant litter will have a COI, calculated using Mate Select, which is as low as possible and below the current breed average published by the KC

## **INVERTEBRAL DISC DISEASE (IVDD)**

At the International Clumber Spaniel Breed Seminar in 2014, it was suggested that the conformation of the Clumber being 'long and low' coupled with its heavy build could lead to back problems. The KC Pedigree Breeds Health Survey (2014) suggested that the prevalence of back problems across all breeds was less than 1% while in Clumbers it was 7%. Earlier Clumber Spaniel Breed Health surveys in 2009 and 2014 both indicated that the incidence of back problems in the breed was around 12%.

During 2018 a survey will be conducted by the Royal Veterinary College to investigate the prevalence of Intervertebral Disc Disease (IVDD) in Clumber Spaniels and identify any lifestyle factors that contribute to the risk of this condition.

The information gathered will also be provided to Dr Tom Lewis, the Kennel Club geneticist, to allow research into the inheritability of the condition and, if sufficient data is available, to develop Estimated Breeding Values for IVDD.

**The OBJECTIVES are:**

- a) To provide information on lifestyle factors that may contribute to IVDD
- b) To develop Estimated Breeding Values for IVDD

## **HEAD CONFORMATION and EYE HEALTH**

2011 the Clumber Spaniel was listed by the KC as a High Profile Breed and the Breed Watch Scheme included a point of concern about eyes which is defined as

“Excessive amounts of loose facial skin with conformational defects of the upper and/or lower eyelids so that the eyelid margins are not in normal contact with the eye when the dog is in its natural pose (e.g. they turn in, or out, or both abnormalities are present)”.

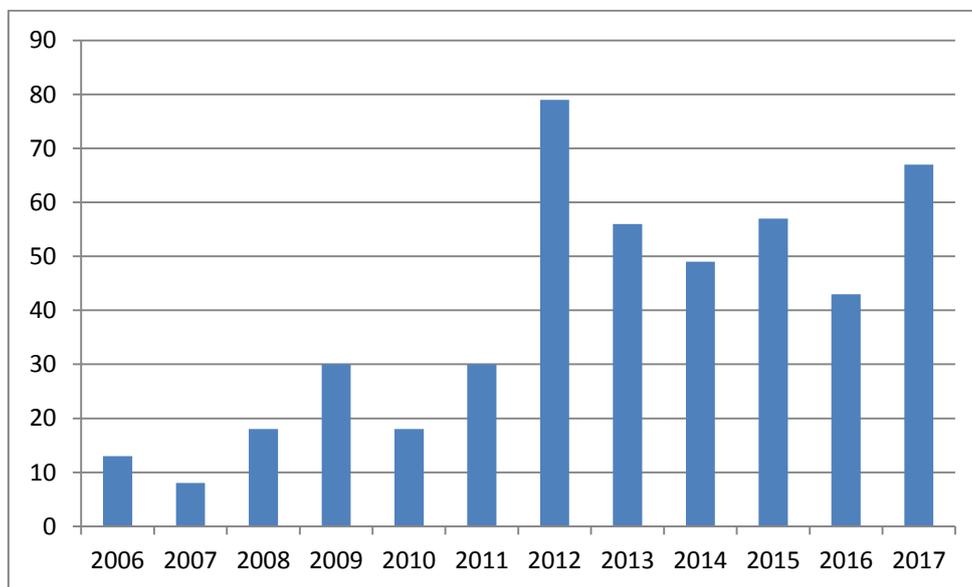
Dr Peter Bedford addressed members after undertaking eye tests at the Championship Show in 2012, and said he had seen some good eyes but also some with too much exposure of the eye. During the debate that followed there was an acceptance that problems regarding the conformation of the eye could be exaggerated when there was too much loose skin on the head, and it was acknowledged that the Breed Standard states “No exaggeration in head and skull” and therefore dogs with excessive loose skin on the head are undesirable. The standard also says that it is “Acceptable to have some haw showing but without excess.”

Breeding dogs which show the haw (or third eyelid) and have loose skin on the head, appears to have led to some exaggerations in the past and may result in some dogs having very loose lower lids. When the eyelid margins are not in normal contact with the eye it can lead to unhealthy eyes as the blink mechanism that lubricates the eye does not function correctly. Also when the lower lid droops excessively, the conjunctiva is exposed and this can lead to dogs suffering from conjunctivitis. Five surveys have been conducted which included questions about eye problems and the table below is a summary of results from the published survey reports.

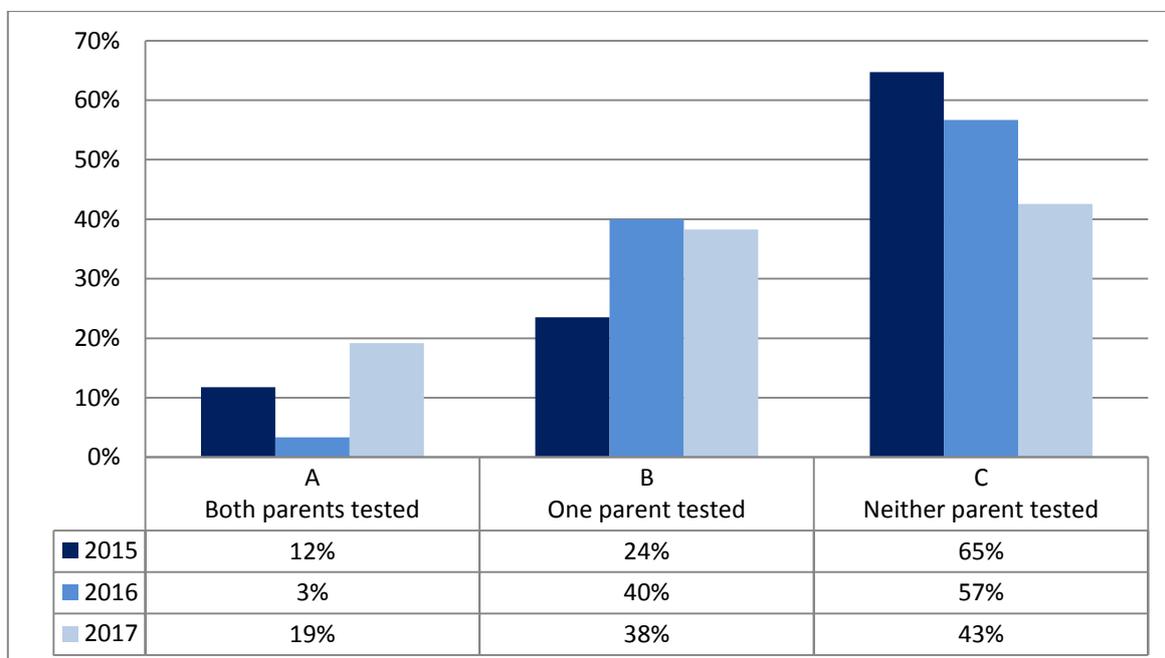
	Entropion	Ectropion	Cataracts	Dry Eye
1989	37.80%	7.50%	2.70%	7.60%
1991	4%	n/a	1%	7%
2001	16.30%	1.50%	3%	20.40%
2009	Eye problems: 22.60%			
2014	21%	11%	4%	20%

Judges' reports submitted under the KC Breed Watch scheme show that the number of reports highlighting eye problems started quite low and has reduced each year for the past three years. In 2014 there were 5 reports (0.93%), in 2015 there were just 2 (0.36%) and in 2016 there were none.

Use of the BVA/KC Eye Testing Scheme has been recommended for the last 10 years and all results are collated and published on the Club Website. To date the breed is not listed as having any of the BVA Schedule A or Schedule B eye conditions. The chart below shows the number of test certificates issued in each year.



The next table below is an analysis of the number of parents of all litters that produced puppies born in 2015, 2016, and 2017 to show whether they had a published eye test date.



**The percentage of breeding pairs which have a published eye test result.**

This shows that although eye testing has been recommended since the first Health Plan was published in 2014, the uptake for breeding dogs is still very low with 43% litters in 2017 where neither parent had a published eye test.

**The OBJECTIVES are:**

- a) To have “Excessive amounts of loose facial skin with conformational defects of the upper and/or lower eyelids ...” removed as a Breed Watch point of concern.
- b) To reduce the incidence of known eye problems (e.g. entropion and ectropion)
- c) To ensure that appropriate actions are taken and the plan is revised if any inherited or late-onset eye conditions are identified through on-going eye testing,

**ADVICE** to breeders is that they should use dogs that

- a) have a current eye test certificate and additionally that it does not report any serious hereditary defect with the eye
- b) are without exaggeration

**The H&W Sub-committee will** continue to offer subsidy for eye testing and publish the results; and will work to promote eye testing and to increase the number of dogs over 8 years who have an eye examination

## EXERCISE INDUCED COLLAPSE (EIC)

**Description and symptoms:**

This condition causes affected dogs to have profound exercise intolerance, but they usually recover relatively quickly if allowed to rest. It has a simple recessive gene trait, which means that an individual has to inherit one copy of the EIC gene from each of its parents to be ‘affected’. Some genetically affected dogs only show mild symptoms; some do not develop symptoms until later in life, and some may never show any symptoms.

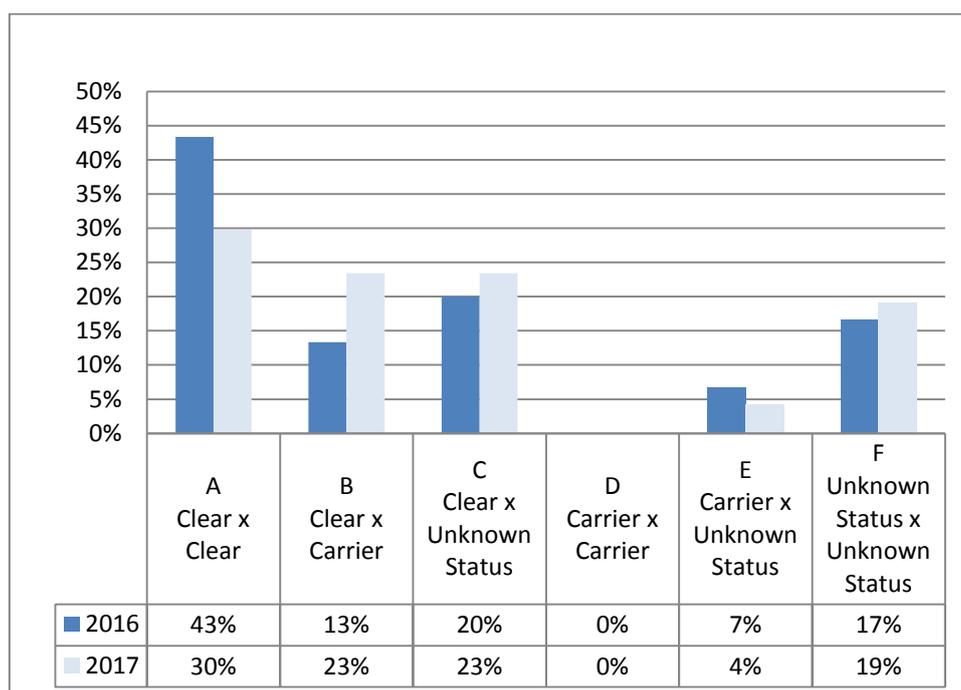
Dogs are defined as ‘affected’ if they have two copies of the recessive gene; a ‘carrier’ if they have one copy of the recessive gene and ‘clear’ if they have no copies. Results of different mating combinations are summarised in the table below. However, it should be noted that exact percentages shown for the offspring may not apply to a single litter, but are the result of adding together a number of matings of the same kind.

Parents	Offspring
<b>Both clears</b>	<b>= 100% Clear</b>
<b>One clear parent + one carrier parent</b>	<b>= 50% clear + 50% carrier</b>
<b>One clear parent + one affected parent</b>	<b>= 100% carriers</b>
<b>Both carriers</b>	<b>= 25% clears + 50% carriers + 25% affected</b>
<b>One carrier parent + one affected parent</b>	<b>= 50% carriers + 50% affected</b>
<b>Both affecteds</b>	<b>= 100% affected</b>

**Health Screening:** Since a DNA test was developed in 2015 and approved by the Kennel Club, results have been published on its Mate Select pages so that breeders can select breeding pairs according to their EIC status, and potential buyers can check the health status of the puppy’s parents. The CSC website also includes the results of the tests that were used to validate the test. The database of results established by the Clumber Spaniel Club includes results that are not recorded by the Kennel Club. At July 2018 the Club’s database holds results for 320 Clumbers that have been tested, of which there are 15 affected (4.7%); 133 carriers (40.8%) and 175 clears (54.5%). Given an estimated population size of 2400 these figures are representative of just 13% of the population.

During 2017 geneticists Dr Tom Lewis at the Kennel Club and Dr Cathryn Mellersh at the Animal Health Trust were consulted for their views on breeding practice with regard to EIC. Their expert opinion was that for the time being both carriers and affected dogs could be used in a breeding programme as removing them would be detrimental to the gene pool. It was also their opinion that the situation be reviewed in 5 years time i.e. 2022.

The 2016 Health Plan “recommended that all breeding stock is tested”. The EIC status of the parents of all litters that produced puppies which were born in 2016 and 2017 were analysed.



**EIC Status of parents of puppies born and registered  
in the years 2016 and 2017 ('clears' include 'hereditary clears')**

This figures show that no known 'affected' dogs were used for breeding; and there were no known 'carrier' to 'carrier' matings (*column D*). Of the matings with puppies born in 2017, there were 22 matings (46%) which involved at least one untested dog. In addition 11 matings 23% (*columns E and F*) could potentially have produced an 'affected' dog.

**The OVERALL OBJECTIVE** is to reduce the prevalence of the EIC gene in the gene pool by breeding slowly away from the mutant gene.

Breeders are **ADVISED** that

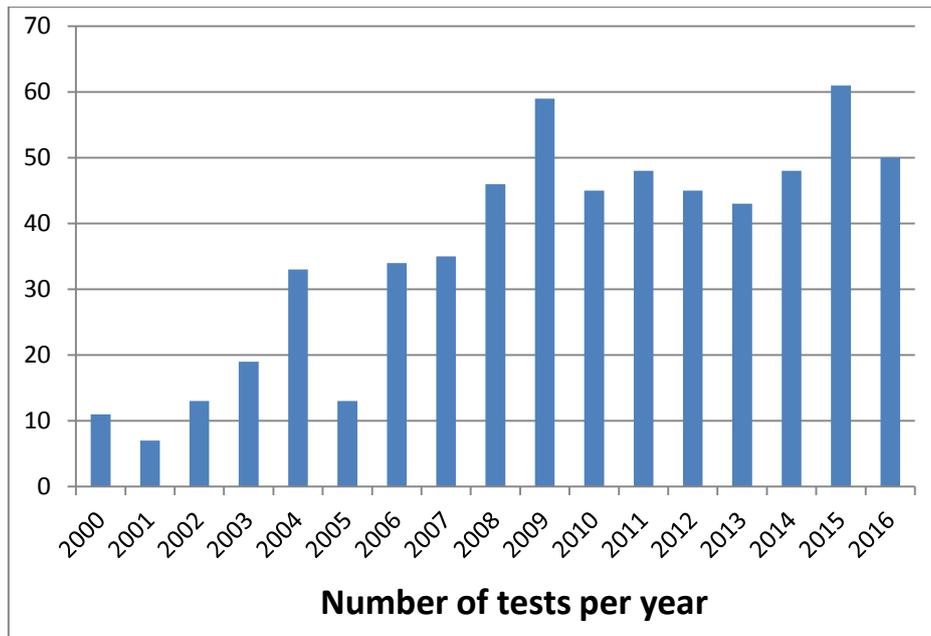
- a) all dogs should be DNA tested before mating
- b) carriers and affected dogs must only be mated to a clear dog

## HIP DYSPLASIA

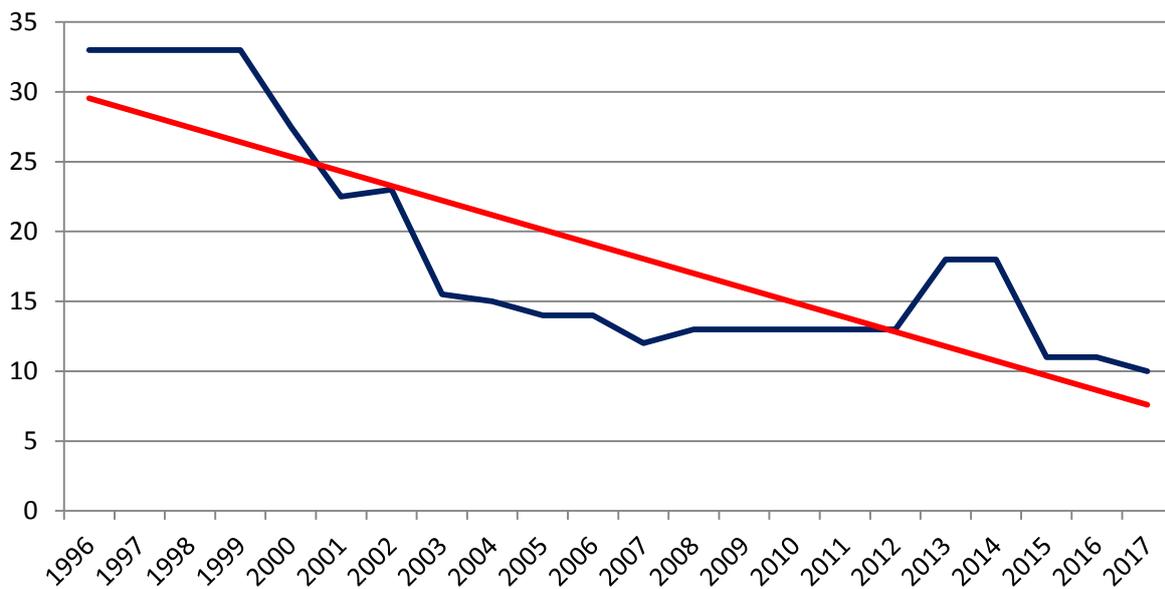
Hip Dysplasia (HD) is a common orthopaedic problem in dogs caused by abnormal development of the structures that make up the hip joint. This can lead to excessive wear and tear in the joint which can become mechanically defective causing lameness. It is considered an inherited condition but it is known that the hereditary factor is partial contributor with environmental factors such as diet, exercise and lifestyle also contributing to the development of the hip joints.

Although not life threatening hip dysplasia can affect the quality of life for a dog especially in later life when they may suffer with arthritis. The 2014 health survey included a question about hips and 6% of respondents said their dog had arthritis, with some others reporting 'stiffness in old age'.

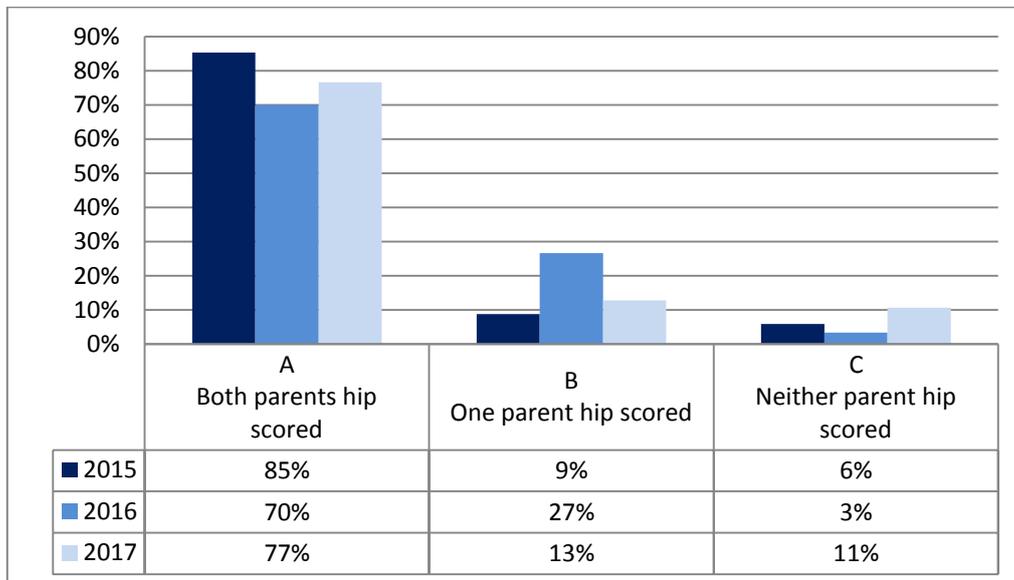
The Club has long supported use of the KC/BVA Hip Scoring Scheme and the number of tests per year since the year 2000 is shown in the following graph:



The test involves taking x-rays of the hips which are then assessed and given a score for each hip from 0 to 53, which are added together to give a single score. In 1996 the 5-year Rolling Median score was 33 but it has now fallen to just 10 in 2017 as shown in the figure below. All hip score results are collated and published on the Club website.



Previous Health Plans recommended hip scoring for all Clumber Spaniels and “that the current BVA recommendations should be followed”. The next table is an analysis of the number of parents of all litters that produced puppies born in 2015, 2016, and 2017 that have a published hip score.



**The percentage of breeding pairs which have a published hip score.**

The figures for 2017 show that the majority of dams and sires had been scored, and the percentage of those used for breeding that had a score at or below the current breed average of 11 was 55% for dams and 53% for sires. The highest hip scores for dams and sires were 45 and 46 respectively.

Estimated breeding values (EBVs) are now available for hip dysplasia on the KC website; there are currently no EBVs for elbows for Clumber Spaniels.

The KC suggests that effective use of “EBV’s can help reduce the risk of puppies inheriting hip and elbow dysplasia more effectively than by only using the sire and dams’ individual hip or elbow score (which are partly influenced by environmental factors)” and. “communicate the genetic risk of hip/elbow score for individual dogs in reference to the entire breed. They can be compared to determine which breeding animals have a higher or lower genetic risk, a risk which will be inherited by their offspring/progeny”.

The EBV takes account of a dog’s hip score plus those of all related dogs and will be revised as additional data becomes available and this also improves the confidence factor of the figure given.

It should be noted that the BVA guidance states that “the best chance of producing offspring with good hips is to use only parents with low scores, considering the *median* as the ideal cut-off”.

However in a numerically small breed this may lead to a reduction in the number of available dogs for breeding. Ideally dogs with a known hip score should be used for breeding however every dog will have an EBV which should be used to gauge its potential risk of passing on the condition if bred from. Using EBVs wisely could enable a wider variety of dogs to be used.

The average parental EBV gives the risk factor for progeny inheriting the condition in a proposed mating.

The overall **OBJECTIVE** is that the 5-year rolling median hip score should not increase to more than 10

**ADVICE** to breeders is

- a) To use dogs that have been hip scored.
- b) Ideally the average parental EBV should be less than zero.

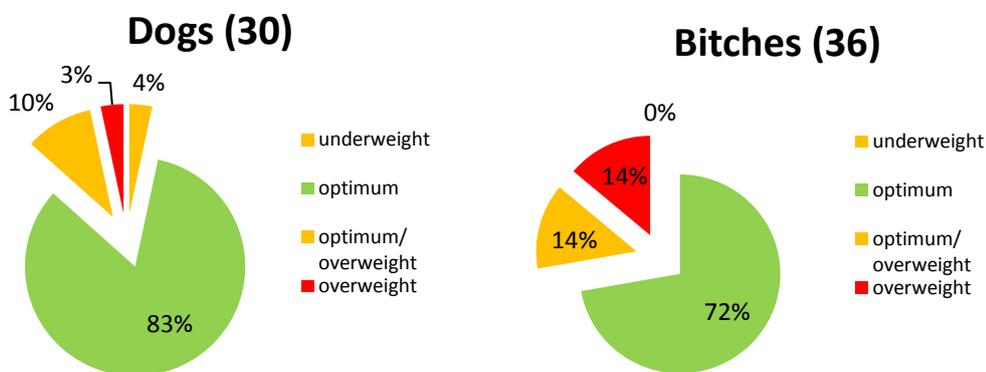
## **WEIGHT and BODY CONDITION SCORE**

Like other Spaniels the Clumber was originally developed to hunt and flush game and the Clumber’s stature enables it to work in the heaviest of cover. The Clumber should be a sturdy powerful dog without exaggeration and excess weight that is also fit and active to enable it to carry out its original function.

Obesity is known to be a problem in the wider dog population. It can lead to other medical problems such as heart problems and diabetes, as well as putting additional strain on the joints. In Clumbers 'overweight' remains one of the Kennel Club's Breed Watch points of concern. In 2013 owners were asked to submit the weight of their dog and also a veterinary assessment of the dog according to a Body Condition Score where the animal was classified as either emaciated, thin, optimum, overweight or obese (see appendix 1). The 2014 health survey also had a question about weight. The following table shows the KC Breed Standard ideal weights and the averages from the results of both surveys.

	Dogs	Bitches
KC Breed Standard ideal weights	29.5 – 34 kgs	25 – 29.5 Kgs
Average weight from 2013 Weight Survey (confirmed by Vet)	28.97 kgs	25.3 kgs
Average weight from 2014 Health Survey (confirmed by owner)	29.77 kgs	25.25 kgs

The Body Condition Score results are summarised in the next diagrams, which show that only 10% of the dogs included in the survey were described as being overweight.



Judges reports submitted under the KC Breed Watch scheme show that the number of reports highlighting 'overweight' in show dogs has reduced each year for the past three years. In 2014 there were 13 reports (2.40%), in 2015 there were 10 (1.82%) and in 2016 it had fallen to just 5 reports (1.2%).

However it should be noted that all of these figures are representative of a small number of the population.

The **OBJECTIVES** are to reduce the number of overweight dogs in the overall population and the removal of 'overweight' as a Breed Watch point of concern.

The H&W subcommittee will:

- prepare information and advice, including use of the Body Condition Score, which can be published on the website and in a leaflet providing information on general health for all owners.
- Include questions on weight in the next breed health survey in 2019

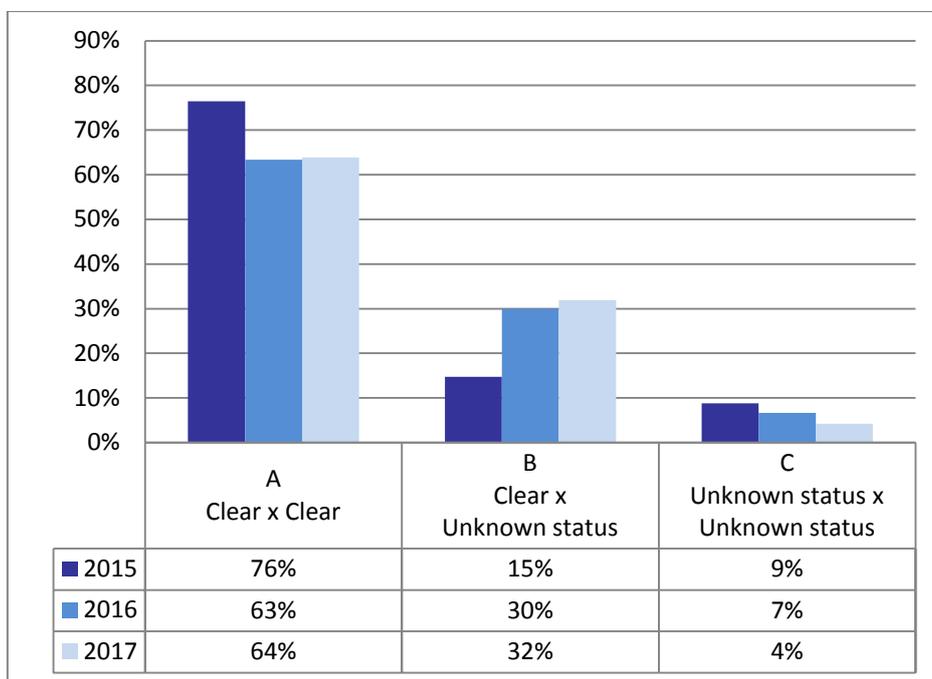
## PYRUVATE DEHYDROGENASE PHOSPHATASE 1 DEFICIENCY (PDP1)

The lack of this enzyme leads to a failure of the processes responsible for helping to rid the body of waste products from metabolism and the dog suffers from extreme exhaustion after very limited exercise. PDP1 deficiency can lead to an early death in affected dogs. As with EIC, it has a simple recessive gene trait, which means that an individual has to inherit one copy of the PDP1 gene from each of its parents to be 'affected'.

The DNA test for PDP1 is approved by the Kennel Club so that all results are published and included on its Mate Select pages. The most recent figures show that in total 195 dogs have been DNA tested as clear and 1274 have been

registered as hereditarily clear. Only four carriers have been identified to date and these were born 10 years ago and no carriers have been identified since then.

The first Health Plan published in 2014 recommended “testing for the condition” and results are published on the Club website. The table below is an analysis of the PDP1 test status of the parents of all litters that produced puppies born in 2015, 2016, and 2017.



**PDP1 Status of parents of puppies born and registered  
in the years 2015, 2016 and 2017 ('clears' include 'hereditary clears')**

From these figures it appears that the number of litters with neither parent having a known status is falling (column C) although there are almost a third (32%) of litters with at least one parent of unknown status in 2017.

The **OVERALL OBJECTIVE** is to prevent the PDP1 gene reappearing in the gene pool. Breeders are **ADVISED** that

- a) all dogs should be DNA tested before mating
- b) if a carrier is identified it should not be bred from

## CONCLUSION

It should be noted that whilst the Clumber Spaniel has recognised health issues to address it is generally a healthy breed and by no means do the majority of Clumbers suffer from the conditions that have been listed. Diligent work by breeders over a number of years has greatly improved many of the health conditions such as eye health and hip dysplasia. The Breed is fortunate that the newer conditions, i.e. EIC and PDP1, have a simple recessive inheritance trait and that a DNA test is available for both. This enables breeders to fully evaluate breeding stock and it is important that all dogs are tested before mating rather than rely on them being “Hereditarily Clear”.

## REVIEW PROCESS

This Breed Health Plan has been developed by the Club’s Health & Welfare Sub Committee and will be reviewed annually. Any contributions for the review process are welcomed.

It has been approved by the Committees of both Clumber Spaniel Club and the Working Clumber Spaniel Society in February 2019 and published in February 2019.

APPENDIX 1

**Body Condition Score**

The following Body Condition Score chart is based on a 1-5 point scale:

	<p><b>1. Emaciated</b> Easily visible ribs, lower back and pelvic bones. No visible covering of fat, obvious waist and abdominal tuck. Absence of any muscle mass.</p>
	<p><b>2. Thin</b> Easily felt ribs, minimum covering of fat, waist easily noted when viewed from above and visible abdominal tuck.</p>
	<p><b>3. Optimum</b> Ribs felt but without excess fat covering, waist noted behind ribs when viewed from above. Abdomen tucked up when viewed from the side.</p>
	<p><b>4. Overweight</b> Ribs felt but with an excess covering of fat. Waist still observed from above but not as prominent. Abdominal tuck may be absent.</p>
	<p><b>5. Obese</b> Ribs not easily felt under a large covering of fat. Waist and abdominal tuck not discernible. Fat deposits on lower back and base of tail. May observe signs of obvious abdominal distention.</p>