



THE KENNEL CLUB  
DOG HEALTH

# Breed Health and Conservation Plan

## Samoyed Evidence Base

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## INTRODUCTION

The Kennel Club launched a new resource for breed clubs and individual breeders – the Breed Health and Conservation Plans (BHCP) project – in September 2016. The purpose of the project is to ensure that all health concerns for a breed are identified through evidence-based criteria, and that breeders are provided with useful information and resources to raise awareness of current health and welfare concerns in their breed, and support them in making balanced breeding decisions.

The Breed Health and Conservation Plans take a complete view of breed health with consideration to the following issues: known inherited conditions, complex conditions (i.e. those involving many genes and environmental effects such as nutrition or exercise levels, for example hip dysplasia), conformational concerns and population genetics.

Sources of evidence and data have been collated into an evidence base which gives clear indications of the most significant health conditions in each breed, in terms of prevalence and impact. Once the evidence base document has been produced it is discussed with the relevant Breed Health Co-ordinator and breed health representatives where applicable. Priorities are agreed based on this data and incorporated into a list of actions between the Kennel Club and the breed to tackle these health concerns. These actions are then monitored and reviewed on a regular basis.

## DEMOGRAPHICS

The number of Samoyeds registered by year of birth between 1990 and 2020 are shown in Figure 1. The trend of registrations over year of birth (1990-2020) was -39.7 per year (with a 95% confidence interval of -46.5 to -33.0), reflecting the decrease in registrations over this period.

[Put simply, 95% confidence intervals (C.I.s) indicate that we are 95% confident that the true estimate of a parameter lies between the lower and upper number stated.]

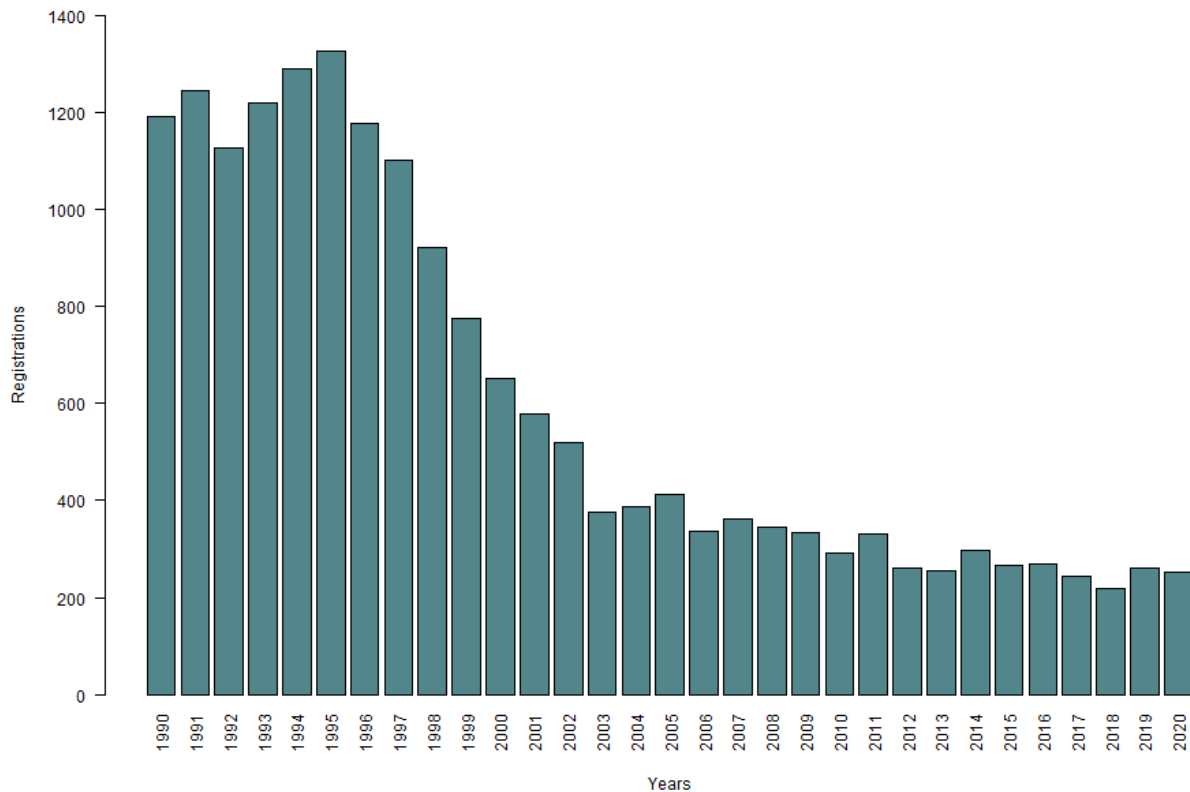


Figure 1: Number of registrations of Samoyeds per year of birth, 1990 – 2020.

Please note that the breed anecdotally reports a growing number of Samoyeds not being registered with the Kennel Club.

## BREED HEALTH CO-ORDINATOR ANNUAL HEALTH REPORT

Breed Health Co-ordinators (BHCs) are volunteers nominated by their breed to act as a vital conduit between the Kennel Club and the breed clubs with all matters relating to health.

The BHC's Annual Health Report 2017, yielded the following response to 'please list and rank the three health and welfare conditions that the breed considers to be currently the most important to deal with in your breed':

1. Diabetes mellitus
2. Juvenile nephropathy (nephritis)
3. Hip dysplasia

In terms of what the breed has done to help tackle these health and welfare concerns, the breed has continued to support diabetes research, collected data on juvenile nephropathy through health/death reports, and continued to recommend hip scoring of breeding animals.

No further annual health reports have been submitted for the breed and in 2020 it was decided that the AHRs would be superseded by the BHCP to avoid duplicating information. Nevertheless, in Sept 2021, the BHC reported that the top conditions were:

- Diabetes mellitus
- Glaucoma
- Hip dysplasia

## BREED CLUB HEALTH ACTIVITIES

The Samoyed has an active Breed Health Coordinator (BHC), who is currently in the process of producing a series of factsheets for common issues within the breed. The Breed Liaison Council are actively involved in supporting the BHC and have a webpage dedicated to health on their website, which can be found at:

- <http://samoyedbreedcouncil.co.uk/health/>

Most of the club websites include a link to the Breed Liaison Council website. There are also webpages dedicated to health on the following club websites:

- <http://british-samoyed-club.co.uk/bsc/health-matters/>
- <http://www.thenorthern-samoyed-society.co.uk/healthmatters.html>

## BREED SPECIFIC HEALTH SURVEYS

### Kennel Club Purebred and Pedigree Dog Health Surveys Results

The Kennel Club Purebred and Pedigree Dog Health Surveys were launched in 2004 and 2014 respectively for all of the recognised breeds at the time, to establish common breed-specific and breed-wide conditions.

**2004 Morbidity results:** Health information was collected for 356 live Samoyeds of which 195 (54%) were healthy and 163 (46%) had at least one reported health condition. The top categories of diagnosis were reproductive (19.0%, 59 of 310 reported conditions), musculoskeletal (14.8%, 46 of 310 reported conditions), ocular (14.8%, 46 of 310 reported conditions), dermatological (13.9%, 43 of 310 reported conditions), and urological (8.1%, 25 of 310 reported conditions). The most frequently reported specific conditions were failure to push/ uterine inertia (17 cases), ulcer/ corneal ulcer (14 cases), pyometra (13 cases), kennel cough/ infectious tracheobronchitis (11 cases), bladder infection/ cystitis (9 cases), and cruciate ligament rupture (9 cases).

**2004 Mortality results:** A total of 223 deaths were reported for the Samoyed. The median age at death was 12 years and 6 months (min = 4 months, max = 17 years and 3 months). The most frequently reported causes of death by organ system or

category were cancer (26.5%, 59 of 223), old age (20.6%, 46 of 223), combinations (9.0%, 20 of 223), musculoskeletal (6.3%, 14 of 223), and other (6.3%, 14 of 223).

**2014 Morbidity results:** Health information was collected for 100 live Samoyeds, of which 68 (68%) had no reported conditions and 32 (32%) were reported to be affected by at least one condition. The most frequently reported conditions were urinary tract infection (7% prevalence, 7 cases) and lipoma (3% prevalence, 3 cases). The following conditions were reported twice each: arthritis, conjunctivitis, cruciate disease, foreign body ingestion, hip dysplasia, pancreatitis, skin (cutaneous) cyst, skin lump, and unspecified tumour/ cancer. The following conditions were reported just once: acute moist dermatitis, anal gland impaction, and aortic valve stenosis.

**2014 Mortality results:** A total of 22 deaths were reported for the breed. The range of age at death for the Samoyed was 3 years to 16 years. The reported causes of death by organ system or category were mammary tumour (4 cases, proportion 18.2%), cancer - unspecified (3 cases, proportion 13.6%), gastric tumour (2 cases, proportion 9.1%), liver failure (2 cases, proportion 9.1%), old age (2 cases, proportion 9.1%) and splenic tumour (2 cases, proportion 9.1%).

## LITERATURE REVIEW

The literature review lays out the current scientific knowledge relating to the health of the breed. We have attempted to refer primarily to research which has been published in peer-reviewed scientific journals. We have also incorporated literature that was released relatively recently to try to reflect current publications and research relating to the breed.

### Endocrine conditions

*Diabetes mellitus:* Diabetes mellitus is a chronic autoimmune disorder caused by the destruction of pancreatic cells, which consequently leads to an imbalance in important regulatory hormones, chiefly a reduction in insulin resulting in hyperglycaemia (elevated glucose concentrations in the blood). Early clinical signs typically include polydipsia (increased thirst), polyuria (increased urination), lethargy, weight loss, and increased appetite, however, if uncontrolled, can also result in multiple organ damage. Familial diabetes mellitus has been suspected in the Samoyed since the early 2000s, following several case reports of siblings affected by the disease (Kimmel et al, 2002). Subsequent studies have also suggested a high relative risk of disease in the breed, with this estimated to be 17.3 (Short et al, 2007), as well as an odds ratio of 35.84 (95% C.I. 25.58-50.22) (Denyer et al, 2020). Similarly, a Swedish study looking at breed-specific risk found the Samoyed to have the second highest ranking, with a mean age of onset of 8.6 years (95% CI 8.0-9.1) and incidence rate of 104 per 10,000 dog years at risk (DYAR) – almost eight times higher than the all-breed incidence (95% CI 72-136).

Several studies have attempted to determine a genetic basis for disease, with these highlighting the complexity of the condition and identifying a number of genes that

either increase susceptibility to disease or protect against it (Short et al, 2007). In particular, single nucleotide polymorphisms (SNPs – specific variations at a single point in the DNA code) within immune regulatory genes (such as *CTLA4* and *INS*) have been found to be associated with disease in the breed; although to date no single region has been consistently associated across studies (Short et al, 2010; Hess et al, 2019; Denyer et al, 2020).

Autoantibodies involved in the autoimmune destruction of insulin producing cells in the pancreas ( $\beta$ -cells) can be detected in humans with type 1 diabetes. O’Kell et al (2020) investigated the presence of three autoantibodies (*GAD65*, *ZnT8* and *IA-2*) common to human type 1 diabetes in 73 Samoyeds (31 diabetic and 42 non-diabetic) from the United States. The findings did not support that diabetic dogs were more likely to be positive for any of these autoantibodies than non-diabetic dogs.

*Thyroid function:* Levels of hormones can vary breed-to-breed and this may result in misdiagnosis of thyroid disease in individuals which fall within their normal reference values for their breed. To determine whether Samoyeds have reference values in line with the all-breed average, an American study investigated thyroxine (T4), free T4 (FT4), and thyrotropin (TSH) concentrations in samples from 102 healthy dogs of the breed (Hegstad-Davies et al, 2015). The breed was found to have significantly higher TSH values than the other breeds (median 13.8 nmol/L compared to 10.2 nmol/L) highlighting the need for breed-specific reference intervals to improve assessment of thyroid function.

### Eye conditions

*Progressive retinal atrophy (PRA):* PRA is a progressive degenerative disease of the retina, which can eventually lead to vision impairment or blindness in affected individuals. The disease has been noted in the breed since 1980 (Dice, 1980) with this more recently being postulated as having an x-linked mode of inheritance, meaning this is carried by the X chromosome (therefore males are more likely to be affected as they need only one copy of the defected mutation to develop disease) (Zangerl, et al, 2007). A distinct mutation in the *RPGR* gene is thought to be responsible for PRA in the Samoyed and has been tested against 23 dogs of the breed for confirmation (including two affected males).

### Musculoskeletal conditions

*Oculo-skeletal dysplasia/ dwarfism with retinal dysplasia type 2:* A syndrome of short-leggedness, undershot jaw, and eye disorders (cataracts and retinal detachment) have been reported in the breed since the 1980s (Meyers et al, 1983; Aizenberg et al, 1996). The mutation has been proposed to be inherited in an autosomal recessive manner, and more recently a mutation in the *COL9A2* gene identified as a candidate (Goldstein et al, 2010).

### Dentition conditions

*Enamel hypoplasia/ amelogenesis imperfecta (AI):* This condition is characterised by bad breath, an abnormal accumulation of tarter, discoloured teeth, irregular tooth surfaces, gum disease and tooth loss. A paper determining the genetic source of this

condition in the breed established a mutation in *SCL24A4* as a likely candidate, which was suggested to be inherited in an autosomal recessive manner (Pedersen et al, 2017).

As well as this, the authors evaluated the breed's genetic diversity over three continents based on 182 individuals of the breed (North America n=144; Europe n=32; and Australia n=6). Overall, it was suggested that the breed originated from two distinct lines, with quite small overall genetic diversity, likely due to there being only a small number of founders in the breed. Similarly, the heterozygosity (used to determine genetic variability based on the likelihood of having inherited two different alleles for a particular gene) was lower than expected, indicating less variation in the breed's genetic pool. The authors speculated that the increased inbreeding within the breed has resulted in the reportedly increased occurrence of this condition, however the mutation appeared to be circulating at small frequencies, and so the authors noted the breed should be able to easily select away from the condition without harming genetic diversity. A genome wide association study (GWAS) on seven affected dogs and five healthy controls revealed a 21 bp duplication in exon 17 of the candidate gene (*SCL24A4*). A DNA test is available but not yet recognised by The Kennel Club.

### **Urinary conditions**

*X-linked hereditary nephritis/ juvenile nephritis/ nephropathy*: Familial renal disease has been described in the breed since the 1970s (Bernard and Valli, 1977; Rawdon, 2001) with affected puppies presenting with severe disease, often leading to renal failure at the age of nine months and death by 16 months (Jansen et al, 1984; Jansen et al, 1986; Jansen et al, 1987). Clinical signs present from approximately three months of age and include excessive protein lost in the urine, lethargy, weight loss, vomiting and depression. The mutation has been suggested as being x-linked dominant, due to only males presenting with severe clinical disease and females with disease not progressing to renal failure (Jansen et al, 1986; Jansen et al, 1987).

Genetic studies have determined a mutation in *COL4A5* as causative for disease (Zheng et al, 1994; Thorner et al, 1996), and a DNA test has been made available for the breed.

Grodecki et al (1997) investigated the effectiveness of angiotensin converting enzyme (ACE) inhibitors as a treatment for hereditary nephritis in male Samoyeds and found that treated dogs tended to show improved weight gain, had a delayed onset of clinical signs indicative of renal failure and survived significantly longer.

### **VETCOMPASS**

The Kennel Club work closely with VetCompass at the Royal Veterinary College. VetCompass is a broad welfare research programme that collects anonymised clinical information from more than 1800 UK veterinary practices and includes over 7.5 million dogs. VetCompass research can be used to identify common breed-specific conditions, or condition-specific concerns which affect a range of breeds.



Whilst no breed specific VetCompass paper has yet been published for the Samoyed, the breed is included in the condition-specific studies detailed below.

### **Endocrine conditions**

*Diabetes mellitus:* The Samoyed was found to be predisposed to diabetes mellitus, as described in previous studies (Short et al, 2007; Mattin et al, 2014; Denyer et al, 2020). A case-control study of 480,469 dogs presented at 430 VetCompass clinics in the UK was used to identify risk factors of diabetes mellitus (Heeley et al, 2020). It should however be noted that just one affected Samoyed was included in this study.

### **INSURANCE DATA**

There are some important limitations to consider for insurance data:

- Accuracy of diagnosis varies between disorders depending on the ease of clinical diagnosis, clinical acumen of the veterinarian and facilities available at the veterinary practice
- Younger animals tend to be overrepresented in the insured population
- Only clinical events that are not excluded and where the cost exceeds the deductible excess are included

However, insurance databases are too useful a resource to ignore as they fill certain gaps left by other types of research; in particular they can highlight common, expensive and severe conditions, especially in breeds of small population sizes, that may not be evident from teaching hospital caseloads.

### **Swedish Agria Data**

Swedish morbidity insurance data were available from Agria for the Samoyed. Reported rates are based on dog-years-at-risk (DYAR) which take into account the actual time each dog was insured during the period (2011-2016) e.g. one DYAR is equivalent to one whole year of insurance. The number of DYAR for Samoyed in Sweden during this period was between 5,000 and 10,000.

### **Swedish Agria insurance morbidity data**

#### Specific causes for veterinary care episodes

The most common specific causes of veterinary care episodes (VCEs) for Agria-insured Samoyed in Sweden between 2011 and 2016 are shown in Figure 2. The top five specific causes of VCEs were vomiting/ diarrhoea/ gastroenteritis, pain during locomotion, dermatitis/ pyoderma/ folliculitis, teeth, and skin trauma.

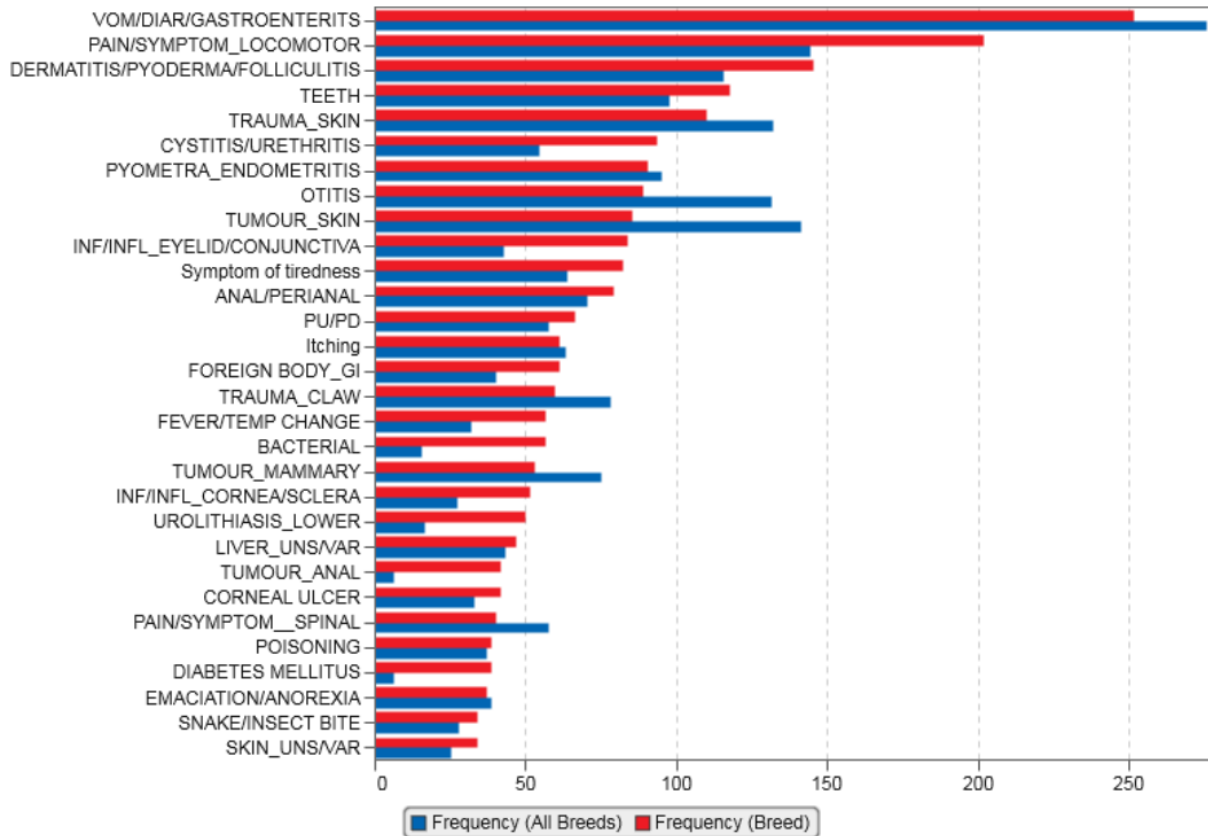


Figure 2: The most common specific causes of VCEs for the Samoyed compared to all breeds in Sweden between 2011 and 2016, from Swedish Agria insurance data.

Relative risk for veterinary care episodes

The specific causes of VCEs ordered by relative risk are shown in Figure 3 for the Samoyed. In this analysis, the top five specific causes of VCEs ordered by relative risk were carpal degeneration/ dystrophy/ dysplasia, anal tumour, diabetes mellitus, distichiasis/ trichiasis, and panosteitis.

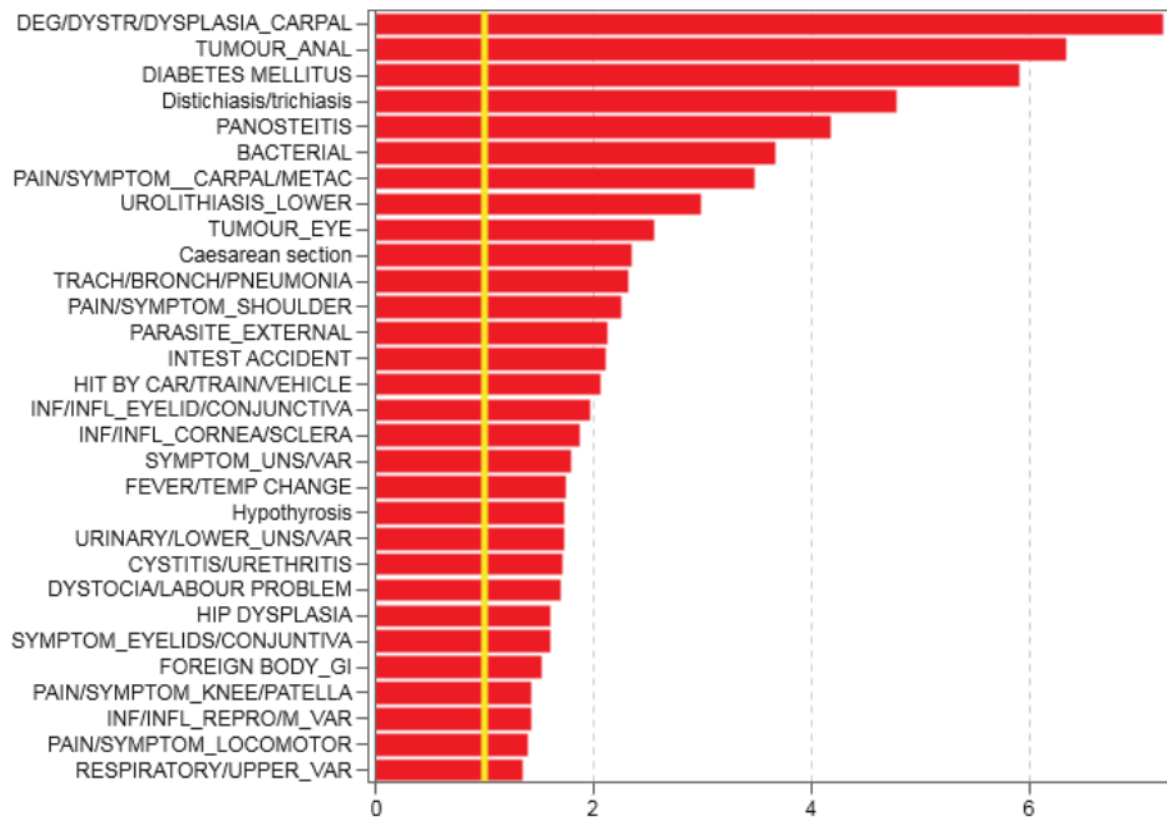


Figure 3: The specific causes of VCEs for the Samoyed ordered by relative risk compared to all breeds in Sweden between 2011 and 2016, from Swedish Agria insurance data. The yellow line indicates the baseline risk for all breeds.

## BREED WATCH

The Samoyed is a category one breed, meaning judges are not required to complete mandatory monitoring forms following an appointment at championship certificate level. To date no optional reports have been received for the breed however all championship show judges should continue to monitor the health of dogs in the ring and inform the Kennel Club of any visible points of concern.

## PERMISSION TO SHOW

As of the 1<sup>st</sup> January 2020 exhibits for which permission to show (PTS) following surgical intervention has been requested will no longer be published in the Breed Record Supplement and instead will be detailed in BHCPs, and a yearly report will be collated for the BHC. In the past five years, no reports have been received for the Samoyed (excluding neutering or caesarean sections).

## ASSURED BREEDERS SCHEME

Currently within the Kennel Club (KC)'s Assured Breeders Scheme there are the following requirements for the Samoyed:

- Hip scoring under the BVA/KC Hip Dysplasia Scheme

It is also recommended that all breeding stock are tested for the following prior to breeding:

- Eye testing under the BVA/KC/ISDS Eye Scheme
- Breeders should issue grooming advice

## BREED CLUB BREEDING RECOMMENDATIONS

The Kennel Club include the breed club breeding recommendations which are detailed under the Assured Breeders Scheme sub-heading above.

## DNA TEST RESULTS

Currently there are no Kennel Club recognised DNA tests for the Samoyed. Tests available include:

- Hereditary Nephritis/ Samoyed hereditary glomerulopathy
- Amelogenesis Imperfecta (AI) – familial enamel hypoplasia
- XL-PRA – Progressive retinal atrophy

Whilst DNA tests may be available for the breed, results from these will not be accepted by the Kennel Club until the test has been formally recognised, the process of which involves collaboration between the breed clubs and the Kennel Club in order to validate the test's accuracy.

## CANINE HEALTH SCHEMES

All of the British Veterinary Association (BVA)/Kennel Club (KC) Canine Health Schemes are open to dogs of any breed with a summary given of dogs tested to date below.

### HIPS

To date (Aug 2021), 859 Samoyeds have been hip scored under the BVA/KC Hip Dysplasia Scheme in the past 20 years, with a median hip score of 10 (range 0-71). The mean hip score for the breed per year of birth is shown in Figure 4 below, with a gradual improvement seen during this period of time.

It is worth noting that scores for later years will reflect younger dogs (e.g. dogs born in 2018 will be no more than 2 years of age) and therefore these will have had fewer years for disease to manifest and a generally lower mean score.

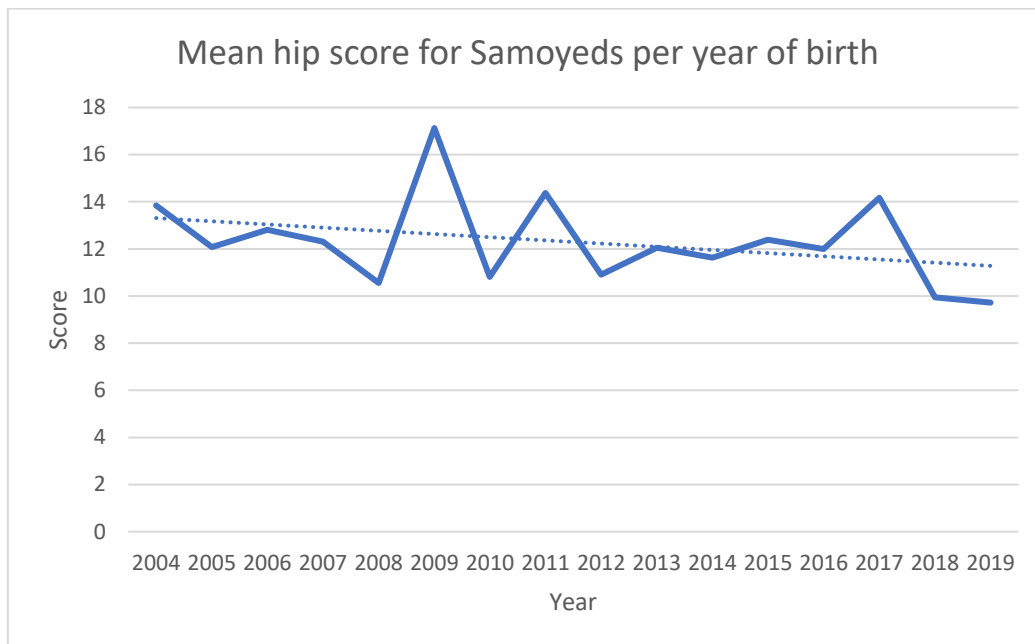


Figure 4: The mean hip score for the Samoyed per year of birth between 2004 and 2019.

Similarly, the proportion of registered dogs with a known hip score per year of birth was analysed, with this having fluctuated over time (Figure 5). The proportion appeared to peak in 2014, when 18.0% of dogs born went on to be screened. However, as with above, it is to be expected that the numbers for the later years will be lower, as these dogs may not yet have been used for breeding.

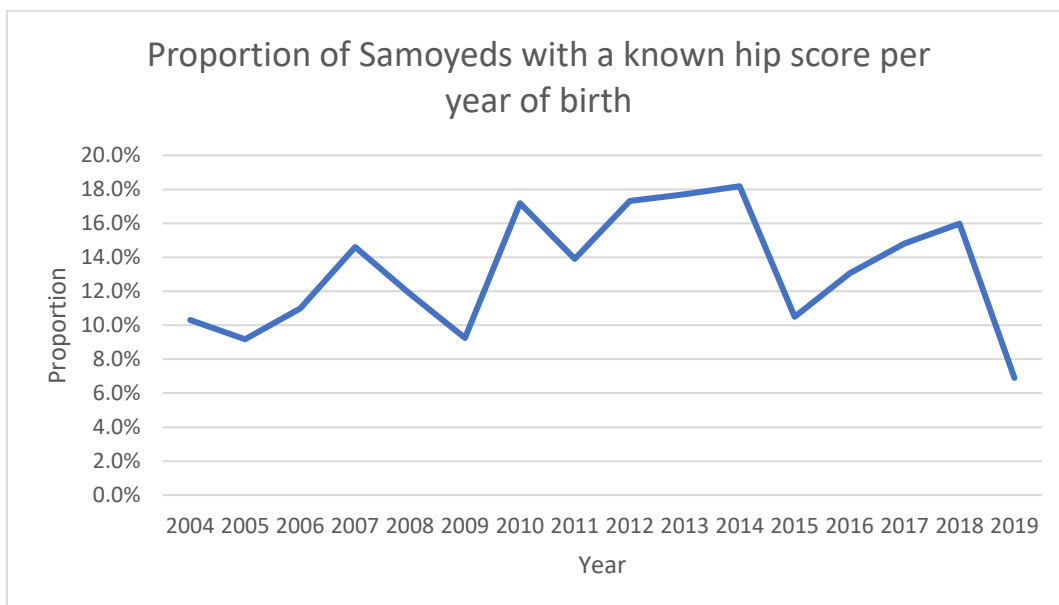


Figure 5: The proportion of registered Samoyeds with a known hip score per year of birth.

## ELBOWS

To date (Aug 2021), 25 Samoyeds have been elbow graded under the BVA/KC Elbow Dysplasia Scheme in the past 20 years, with one being grade 3, one being grade 1 and the remaining being grade 0.

## EYES

The breed is not currently on the BVA/KC/ISDS Known Inherited Ocular Disease (KIOD) list (formally Schedule A) for any condition under the BVA/KC/International Sheep Dog Society (ISDS) Eye Scheme.

KIOD lists the known inherited eye conditions in the breeds where there is enough scientific information to show that the condition is inherited in the breed, often including the actual mode of inheritance and in some cases even a DNA test.

As well as the KIOD list, the BVA record any other conditions affecting a dog at the time of examination, which is incorporated into an annual sightings report. Results of Samoyeds tested between 2012-2018 are shown in Table 1 below.

Table 1: Reports on Samoyeds that have participated in the BVA/KC/ISDS Eye Scheme between 2012-2018.

<b>Year</b>	<b>Number Tested</b>	<b>Comments</b>
2012	8 Adults 1 Litter	1 – hyaloid remnant
2013	13 Adults 0 Litters	1 – distichiasis 1 – ectropion 1 – corneal lipid deposition
2014	13 Adults 3 Litters	1 – distichiasis 1 – other cataract
2015	15 Adults 0 Litters	1 – distichiasis 1 – other cataract 1 – optic nerve hypoplasia
2016	30 Adults 0 Litters	1 – entropion 2 – corneal lipid deposition 2 – other cataract
2017	26 Adults 0 Litters	2 – distichiasis 2 – corneal lipid deposition
2018	27 Adults 0 Litters	No comments
2019	<i>Awaiting report</i>	
2020	<i>Awaiting report</i>	

## **AMERICAN COLLEGE OF VETERINARY OPHTHALMOLOGISTS (ACVO)**

Results of examinations through ACVO are shown in Table 2 below for conditions affecting over 1% of the examined population. Between 2015 and 2019, 5,482

Samoyeds were examined, of which 77.1% (4,229 of 5,482 dogs) were found to be unaffected by any eye condition.

Whilst it is important to note that these data represent dogs in America, the organisation tend to examine a higher number of dogs than that in the UK, and therefore are a valuable source of information.

Table 2: ACVO examination results for Samoyeds, 1991 – 2019

Disease Category/Name	Percentage of Dogs Affected	
	1991-2014 n= 22,134	2015-2019 n= 5,482
<b>Eyelids</b>		
Distichiasis	5.8%	4.6%
<b>Cornea</b>		
Corneal dystrophy	3.4%	4.6%
<b>Uvea</b>		
Persistent pupillary membranes, iris to iris	1.9%	2.5%
<b>Lens</b>		
Cataract, suspect not inherited/ significance unknown	3.3%	3.0%
Significant cataracts	4.2%	4.7%
<b>Retina</b>		
Retinal dysplasia, folds	2.1%	1.5%

Adapted from: <https://www.ofa.org/diseases/eye-certification/blue-book>

## REPORTED CAESAREAN SECTIONS

When breeders register a litter of puppies, they are asked to indicate whether the litter was delivered (in whole or in part) by caesarean section. In addition, veterinary surgeons are asked to report caesarean sections they perform on Kennel Club registered bitches. The consent of the Kennel Club registered dog owner releases the veterinary surgeon from the professional obligation to maintain confidentiality (vide the Kennel Club General Code of Ethics (2)).

There are some caveats to the associated data;

- It is doubtful that all caesarean sections are reported, so the number reported each year may not represent the true proportion of caesarean sections undertaken in each breed.
- These data do not indicate whether the caesarean sections were emergency or elective.
- In all breeds, there was an increase in the number of caesarean sections reported from 2012 onwards, as the Kennel Club publicised the procedure to vets.

The number of litters registered per year for the breed and the number and percentage of reported caesarean sections in the breed for the past 10 years are shown in Table 3.

Table 3: Number of Samoyed litters registered per year, and number and percentage of caesarean sections reported per year, 2009 to 2019.

Year	Number of Litters Registered	Number of C-sections	Percentage of C-sections	<i>Percentage of C-sections out of all KC registered litters (all breeds)</i>
2009	82	0	0.0%	0.15%
2010	77	0	0.0%	0.35%
2011	86	2	2.3%	1.64%
2012	60	9	15.0%	8.69%
2013	74	11	14.9%	9.96%
2014	79	9	11.4%	10.63%
2015	75	11	14.7%	11.68%
2016	74	15	20.3%	13.89%
2017	68	11	16.2%	15.00%
2018	63	10	15.9%	17.21%
2019	54	9	16.7%	15.70%

## GENETIC DIVERSITY MEASURES

The effective population size is the number of breeding animals in an idealised, hypothetical population that would be expected to show the same rate of loss of genetic diversity (rate of inbreeding) as the population in question; it can be thought of as the size of the 'gene pool' of the breed. In the population analysis undertaken by the Kennel Club in 2015, an estimated effective population size of **64.7** was reported (estimated using the rate of inbreeding over the period 1980-2014).

An effective population size of less than 100 (inbreeding rate of 0.50% per generation) leads to a dramatic increase in the rate of loss of genetic diversity in a breed/population (Food & Agriculture Organisation of the United Nations, "Monitoring animal genetic resources and criteria for prioritization of breeds", 1992).

An effective population size of below 50 (inbreeding rate of 1.0% per generation) indicates the future of the breed may be considered to be at risk (Food &



Agriculture Organisation of the United Nations, “Breeding strategies for sustainable management of animal genetic resources”, 2010).

Annual mean observed inbreeding coefficient (showing loss of genetic diversity) and mean expected inbreeding coefficient (from simulated ‘random mating’) over the period 1980-2014 are shown in Figure 6. The rate of observed inbreeding gradually increased until a peak in 2001. Since this time the rate has notably decreased, although with some fluctuation, implying breeders have been carefully selecting mates to restore the diversity in the breed. This decrease may also be due to the potential introduction of new genetic material from imported animals.

It should be noted that, while animals imported from overseas may appear completely unrelated, this is not always the case. Often the pedigree available to the Kennel Club is limited in the number of generations, hampering the ability to detect true, albeit distant, relationships.

For full interpretation see Lewis et al, 2015

<https://cgejournal.biomedcentral.com/articles/10.1186/s40575-015-0027-4>.

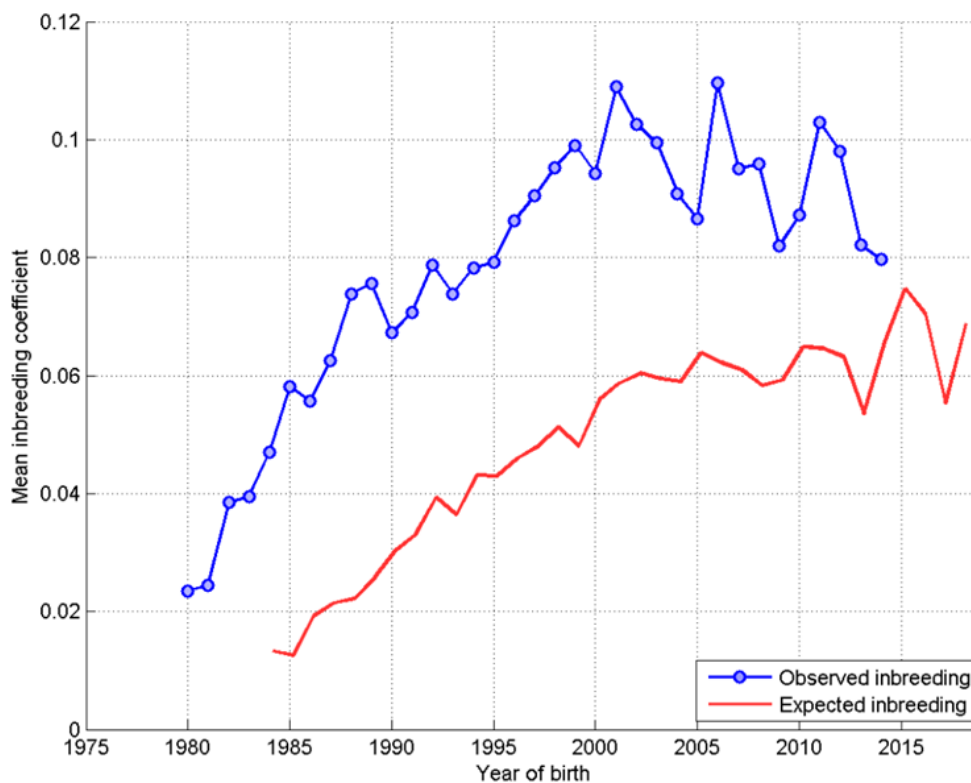


Figure 6: Annual mean observed and expected inbreeding coefficients.

The current annual breed average inbreeding coefficient is **8.0%**.

Below is a histogram (‘tally’ distribution) of number of progeny per sire and dam over each of seven 5-year blocks (Figure 7). A longer ‘tail’ on the distribution of progeny per sire is indicative of ‘popular sires’ (few sires with a very large number of offspring, known to be a major contributor to a high rate of inbreeding). Throughout

the period analysed, there is evidence of several popular sires being used between 1990-1999, however this appears to be more under control.

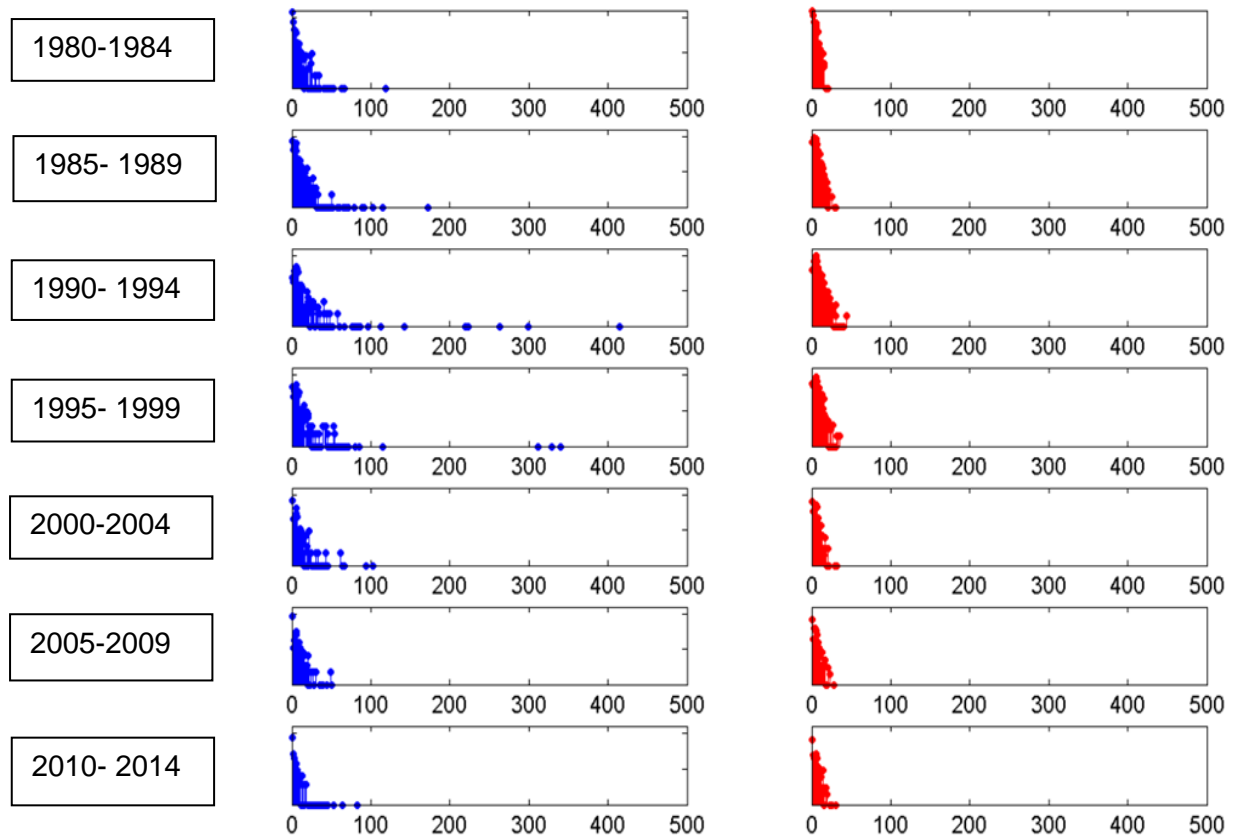


Figure 7: Distribution of the proportion of progeny per sire (blue) and per dam (red) over 5-year blocks (1980-4 top, 2010-4 bottom). Vertical axis is a logarithmic scale

## CURRENT RESEARCH

Researchers at the Royal Veterinary College are currently undertaking analysis to determine genetic basis of diabetes mellitus in several breeds, including the Samoyed. The breed also have an ongoing Cause of Death survey.

## PRIORITIES

Correspondence between the breed representatives and the Kennel Club was undertaken in September 2021 to discuss the evidence base of the BHCP and agree the priority issues for the health of the breed. The group agreed from the evidence base that the priorities for the Samoyed were:

- Diabetes mellitus
- Glaucoma
- Hip dysplasia

At watch:

- Engagement in health matters
- Skin issues (sebaceous adenitis)
- Juvenile nephropathy

## **ACTION PLAN**

Following the correspondence between the Kennel Club and the breed regarding the evidence base of the Breed Health & Conservation Plans, the following actions were agreed to improve the health of the Samoyed. Both partners are expected to begin to action these points prior to the next review.

### **Breed Club actions include:**

- The Breed Clubs to ensure that they have a webpage dedicated to health and a link to the Breed Liaison Council health webpage on their websites.
- The Breed Clubs to continue to promote health issues and available health tests via club magazines, websites, and social media.
- The Breed Clubs to continue to develop factsheets for common health issues within the breed.
- The Breed Clubs to undertake a breed health survey, with the Kennel Club to assist where needed.
- The Breed Clubs to continue to encourage hip scoring under the BVA/KC Hip Dysplasia Scheme prior to breeding.
- The Breed Clubs to continue to encourage eye testing (including gonioscopy testing) under the BVA/KC/ISDS Eye Scheme prior to breeding.
- The Breed Clubs to consider making a proposal to the Assured Breeders Scheme for the inclusion of eye testing as a requirement and gonioscopy testing as a recommendation prior to breeding.
- The Breed Clubs to put a proposal forward to the Kennel Club for the recognition of relevant DNA tests.
- The Breed Clubs to continue to monitor the use of popular sires and raise awareness of the importance of considering genetic diversity when breeding.

### **Kennel Club actions include:**

- The Kennel Club to update the population analysis for the breed.
- The Kennel Club to produce a piece on the importance of considering genetic diversity and popular sires when breeding, specifically for numerically small breeds.
- The Kennel Club to monitor nephritis and diabetes research and inform the breed of any opportunities to engage in future projects.

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