



THE KENNEL CLUB  
DOG HEALTH

# Breed Health and Conservation Plan

## Saluki Evidence Base

## CONTENTS

CONTENTS.....	2
INTRODUCTION.....	3
DEMOGRAPHICS.....	3
BREED HEALTH CO-ORDINATOR ANNUAL HEALTH REPORT.....	4
BREED CLUB HEALTH ACTIVITIES.....	5
BREED SPECIFIC HEALTH SURVEYS.....	5
LITERATURE REVIEW.....	7
INSURANCE DATA.....	9
BREED WATCH.....	12
ASSURED BREEDERS SCHEME.....	12
DNA TEST RESULTS.....	12
CANINE HEALTH SCHEME RESULTS.....	13
REPORTED CAESEAREAN SECTIONS.....	14
GENETIC DIVERSITY MEASURES.....	15
CURRENT RESEARCH PROJECTS.....	17
PRIORITIES.....	18
ACTION PLAN.....	19
REFERENCES.....	20



## 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 support them in making balanced breeding decisions that make health a priority.

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 committee or representatives if 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 Salukis 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 -0.02 per year (with a 95% confidence interval of -1.45 to +1.41) reflecting that the trend is not significant and the breed's numbers have widely fluctuated during this time. The number of dogs registered per year has been consistently low, with no more than 230 registered in any one year.

[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.]

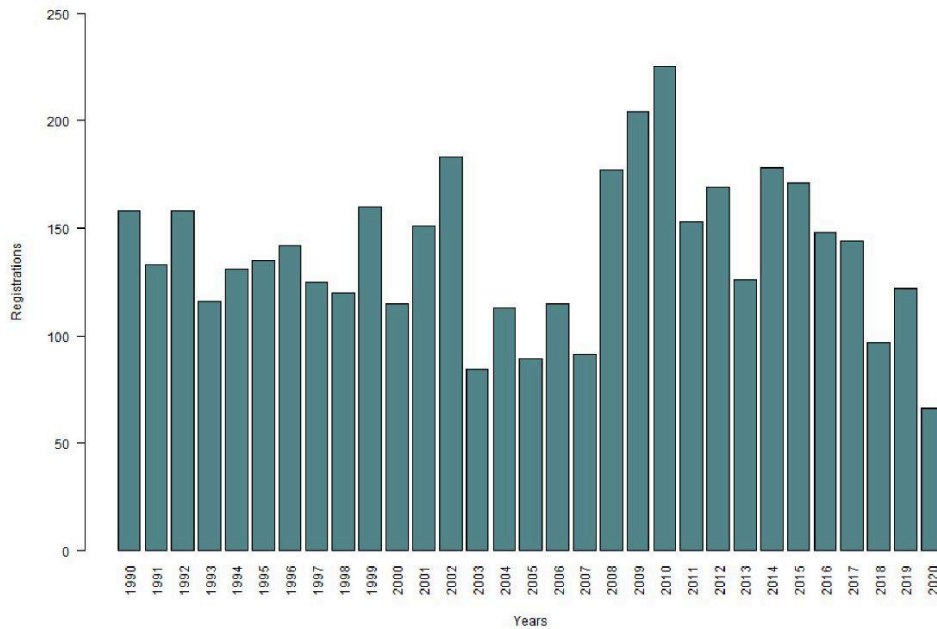


Figure 1: Number of registrations of Salukis per year of birth, 1990 - 2020

### 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 Breed Health Coordinators' Annual Health Report 2022 yielded the following top health concerns:

- Neuronal ceroid lipofuscinosis (NCL)
- Autoimmune hypothyroidism
- Epilepsy

In terms of what the breed has done to help tackle these listed health concerns, the breed have ensuring that NCL DNA testing is complete prior to breeding, however unfortunately the vast majority are bred by non-breed club members over which the breed have little control. With respect to autoimmune thyroiditis, instances are looking to be in decline with breed club members taking account of health history prior to breeding. An epilepsy case is also presently being studied by the KCGC. The breed also cover the importance of correct conformation at breed appreciation days.

## BREED CLUB HEALTH ACTIVITIES

The breed has a comprehensive health information on its website and ways in which owners can participate in health initiatives:

- <https://salukiclub.co.uk/the-breed/health/>
- [http://www.northernsalukiclub.co.uk/?page\\_id=2546](http://www.northernsalukiclub.co.uk/?page_id=2546)

The breed also have an international breed archive hosted on The Breed Archive, which includes health information, allows test matings and individual dog/ breeder information world-wide. The Saluki Breed Archive can be found here:

<https://saluki.breedarchive.com/home/index>

## 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 reported for 193 live Salukis of which 130 (67%) were healthy and 63 (33%) had at least one reported health condition. The top disease conditions by organ system/category for the breed were: cardiac (17.2%, 16 of 93 reported conditions), dermatologic (10.8%, 10 reports), reproductive (9.7%, 9 reports), cancer (7.5%, 7 reports), musculoskeletal (7.5%, 7 reports), and urologic (7.5%, 7 reports). The most frequently reported specific conditions were bladder infection/ cystitis (7 reports), sarcoptic mange (7 reports), heart murmur – unspecified (6 reports), and lipoma (3 reports).

**2004 Mortality results:** A total of 132 Saluki deaths were reported. The median age of death was 12 years (min = 1 year and 11 months, max = 16 years and 4 months). The top causes of death by organ system/category for the breed were: cancer (35.6%, 47 deaths), cardiac (14.4%, 19 deaths), old age (12.9%, 17 deaths), and trauma (5.3%, 7 deaths). The top specific causes of death were: old age/ unspecified (10 deaths), heart failure (8 deaths), liver cancer (6 deaths), cancer – unspecified (6 deaths), and mammary cancer (6 deaths).

**2014 Morbidity results:** Health information was reported for 49 live Salukis of which 40 (81.6%) reported no conditions and 9 (18.4%) had at least one reported health condition. The most frequently reported specific conditions were skin (cutaneous) cyst (3 cases, 16.7% proportion), hypersensitivity (allergic) skin disorder (2 cases, 11.1%), immune mediated haemolytic anaemia (IMHA) (2 cases, 11.1%), and mammary lump (2 cases, 11.1%).

**2014 Mortality results:** A total of 17 deaths were reported, with a range in longevity from three to 16 years. The most commonly specific reported causes of death for the breed were old age (3 deaths), old age combinations (3 deaths), gastric haemorrhage

(2 deaths), road traffic accident (2 deaths), and one for each of the following: aural tumour, bone tumour, liver tumour, kidney failure, poisoned, traumatic injury, and unknown.

### Breed Health Survey – 2013

A summary of the findings are given below, with the full report available at:

<http://www.northernsalukiclub.co.uk/wordpress/wp-content/uploads/2018/10/FinalReportSalukiHealthLogo.pdf>

This survey accounted for 90 live Salukis and 61 deceased dogs.

With respect to morbidity, the median age of the live dogs was 5 years 8 months (min 4 months, max 13 years 1 month). Health information were collected for 90 dogs, of which 59 (66%) were healthy, and 31 (34%) were reported to be affected by at least one condition. A total of 49 conditions were reported, with these given in Table 1 below.

Table 1: Conditions reported in the 2013 health survey.

Organ system	Main conditions	Number
Reproductive	false pregnancy (7), pyometra (3), long season (1)	10
Dermatologic	ear mites (3), sarcoptic (1), demodectic mange (1), seb.dermatitis, otitis(2), dustmite allergy(1).	9
Cancers/ Tumours	Mammary (6 of which 2 confirmed), testicular (1), seminoma, Leydig cell tumour (1)	8
Respiratory	Kennel cough (4), one side collapsed windpipe (1)	5
Cardiac	heart murmur	5
Endocrine	diabetes1, anal gland problems 1, Cushings syndrome 1	3
Gastrointestinal	chronic diarrhoea, 1, infection 1	2
Musculo skeletal	arthritis hind leg, rheumatism	2
Ocular	sensitive eyes1, excess lachrimation 1	2
Urological	Kidney infection 1, Cystitis 1	2
Hematologic	Haemolytic Anaemia	1
Other	Very nervous	1

Breeding data were also collated, with some 28 dams having been bred from, accounting for 31 litters. Of these 27 were whelped naturally, with four via caesarean section. A total of 190 puppies were born, of which 183 were born alive, and just two going on to die within the first week of life.

In terms of the mortality data, the median age at death was 11 years 3 months (range 1 year 6 months to 16 years 11 months). The reported causes of death are shown in the table below.

Table 2: Causes of death reported in the 2013 health survey.

Cause of death	N	%	Most common specific cause in descending order	Mean age at death
Cancer	22	36.6	Type unspecified, lymphoma, liver, lung, heart/spleen	12 years (min = 3y4m, max = 14y3m)
Cardiac	8	13.25	DCM, heart attack, mitral valve disease, heart failure	11 years 1 months (min = 4y3m, Max = 16y7m)
Old age	6	10	Old age and age combinations	15 years 6 months (min = 14y6m, max = 16y11m)
Neurologic	5	8.25	Stroke, viral meningitis, epilepsy, dementia	9 years (min = 3y6m max = 15y)
Trauma	4	6.6	Road traffic accident, ran away,	6y 3m (min = 1y6m, max = 14y9m)
Combinations	4	6.6		12y 7m (min = 11y2m, max = 12y6m)
Liver	3	5	Liver virus, unspecified	3y 11m (min = 4 y, max=15y11m)
Unknown	3	5		9y 7m (min = 6y6m, max = 13y7m)
Endocrine	2	3.25	Cushings syndrome	14y, 12y 1m
Urologic	2	3.25	Kidney disease, kidney failure	12y 8m, 13y
Musculo skeletal	1	1.6	Arthritis, lame back end	12y 5m
Other	1	1.6	Suspected reaction to vaccination	6y
<b>Total</b>	<b>61</b>	<b>100</b>		

## 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 includes dogs residing within the UK primarily, and literature that was released relatively recently to try to reflect current publications and research relating to the breed.

### Cardiovascular conditions

*Cardiac abnormalities:* An older paper discussed a family of Salukis with a number of congenital (from birth) abnormalities, including tricuspid valve insufficiency, pulmonic stenosis, patent ductus arteriosus and mitral valve insufficiency (Ogburn et al, 1981). However, unfortunately the full paper could not be sourced and no more recent papers detailing these conditions in the breed could be found.

*Cardiac reference intervals:* Several papers have commented on the breed-specific reference intervals of sighthounds, including Salukis. Dogs of the breed have higher diastolic and systolic volumes compared to non-sighthound breeds, which could

cause misdiagnosis of heart disease when not taken into account (Seckerdieck et al, 2015; Kurosawa et al, 2018; Giraut et al, 2019). The latter two papers have developed reference intervals for the breed to allow for more accurate diagnosis during echocardiogram.

*Ventricular arrhythmias:* An American study of 25 Salukis was undertaken to determine the presence and frequency of arrhythmia in dogs of the breed, over a seven-day period (Sanders et al, 2018). In total, eight of dogs were found to have second-degree atrioventricular block noted at least once during a 24-hour period, and ventricular escape beats in 19 out of the 25 dogs. Of note, all of the dogs had at least one period of time where a ventricular premature complex (arrhythmia) was detected, with 92% of dogs having a pause for more than two seconds. In total, 88% of dogs had less than 20 episodes in a 24-hour period. Further to support the infrequency of these arrhythmia, no complexes were reported during 37% of the recorded days.

#### **Dermatological conditions**

*Black hair follicular dysplasia:* This condition has been mentioned in the breed in small numbers, having first been raised in the 1990s (Hargis et al, 1991; Lewis, 1995). Dogs affected with disease usually have black, brown or blue coats, and present with skin lesions, dry, fractured and short hairs, and scaly skin. Whilst this can predispose dogs to secondary skin infections, it does not affect the lifespan of an affected individual. The condition is thought to have a hereditary basis, but may have a complex mode of inheritance.

#### **Endocrine conditions**

*Thyroid reference values:* As with the cardiac values, the reference intervals for sighthounds can differ significantly to other breeds, which has also been noted in the Saluki (Shiel et al, 2010). In this American paper the authors investigated a number of dogs from sighthound breeds (n=398), and found 76.1% of these were diagnosed with hypothyroidism based on low serum thyroid hormone concentrations alone, and 7.5% despite all thyroid levels being within reference limits. Just 16.3% had actual high TSH concentration or positive thyroglobulin autoantibodies to support diagnosis. The authors noted that healthy Saluki hormone values differ markedly from most standard limits, and should be carefully considered prior to formalising a diagnosis.

The underlying mechanism behind hypothyroidism/ lymphocytic thyroiditis is a complex area, with it likely that there are a number of genes and environmental factors interplaying in order for an individual to present with disease.

#### **Haematological conditions**

*Sighthound reference values:* Similarly with respect to cardiac and thyroid levels, sighthounds have also been seen to have differing haematological and biochemical parameters, which should be considered by a veterinarian when coming to a diagnosis for an individual (Hilppo, 1986; Uhrikova et al, 2013). Similarly, the latter paper noted that caution should be taken when applying a sighthound breed profile



onto another, as there are also within-breed nuances which do not necessarily translate across similar breeds.

### **Neurological conditions**

*Neuronal ceroid lipofuscinosis (NCL)*: This condition is characterised by the abnormal accumulation of ceroid-lipofuscin within nerve cells, and presents with progressive neurological clinical signs such as unusual body movements and disorientation, poor perception of touch and pain, blindness and seizures, with the disease first noted in two littermates in 1982 (Appleby et al, 1982). There is a poor prognosis for affected dogs, with euthanasia chosen due to poor quality of life. A more recent case report of an affected Norwegian dog underwent genome sequencing in order to identify the causative gene for disease in the breed (Lingaas et al, 2017). A mutation within *CLN8* was found to be causative, which was suggested to be inherited in an autosomal recessive mode of inheritance. A DNA test is available and recognised for the breed, with further information provided on page 12.

*Succinic semialdehyde dehydrogenase deficiency (SSADHD)/ status spongiosus in Saluki dogs (SSSD)*: Another neurological condition was recently reported in several litters of the breed, presenting with clinical signs such as seizures, unusual movement and sensitivity, and unusual behaviour such as periods of vocalisation and difficulties in being roused from sleep (Vernau et al, 2020). The puppies had marked abnormalities within their brains, and genome sequencing identified a mutation within the *ALDH5A1* gene as causative. This mutation resulted in a reduced amount of serum succinic semialdehyde dehydrogenase (SSADH) which causes levels of other chemicals to build up inappropriately, and is thought to be inherited in an autosomal recessive manner. A DNA test is available but not yet recognised by the Kennel Club.

### **INSURANCE DATA**

#### **UK Agria 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 UK 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.

Insurance data were available for Salukis insured with Agria UK. Full policies are available to dogs of any age. Free policies are available to breeders of Kennel Club registered puppies and cover starts from the time the puppy is collected by the new owner; cover under free policies lasts for five weeks from this time. 'Exposures' are equivalent to one full policy year; in 2017 (June 2016 – July 2017) there were 56 free exposures, 39 full exposures and 28 claims, in 2018 (July 2017 – June 2018) these figures were 58, 42 and 47 respectively.

It is possible that one dog could have more than one settlement for a condition within the 12-month period shown.

Conditions by number of settlements, for authorised claims where treatments started between July 2017 and June 2018, are shown in Table 3 below.

Table 3: Top 10 conditions and number of settlements for each condition between 1<sup>st</sup> July 2017 and 31<sup>st</sup> June 2018 for Salukis insured on full policies with Agria UK

Condition	Number of settlements
Onychodystrophy unspecified	12
Inflammatory bowel disease (IBD)	7
Gastrointestinal disorder finding	5
Wound - laceration	3
Epilepsy - idiopathic generalised	2
Lethargy finding	2
Keratoconjunctivitis sicca (KCS, Dry Eye)	2
Urinary tract infection (UTI)	2

### Swedish Agria Data

Swedish morbidity and mortality insurance data were available from Agria for the Saluki. 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 Salukis in Sweden during this period was between 1,000 and 2,500.

A summary of the findings is given below, with the full report available at: <https://dogwellnet.com>

### Swedish Agria insurance morbidity data

#### Specific causes for veterinary care episodes

The most common specific causes of veterinary care episodes (VCEs) for Agria-insured Salukis in Sweden between 2011 and 2016 are shown in Figure 2. The top five specific causes of VCEs were: skin trauma, vomiting/ diarrhoea/ gastroenteritis, pain during locomotion, skin tumour, spinal pain/ symptom and mammary tumour.

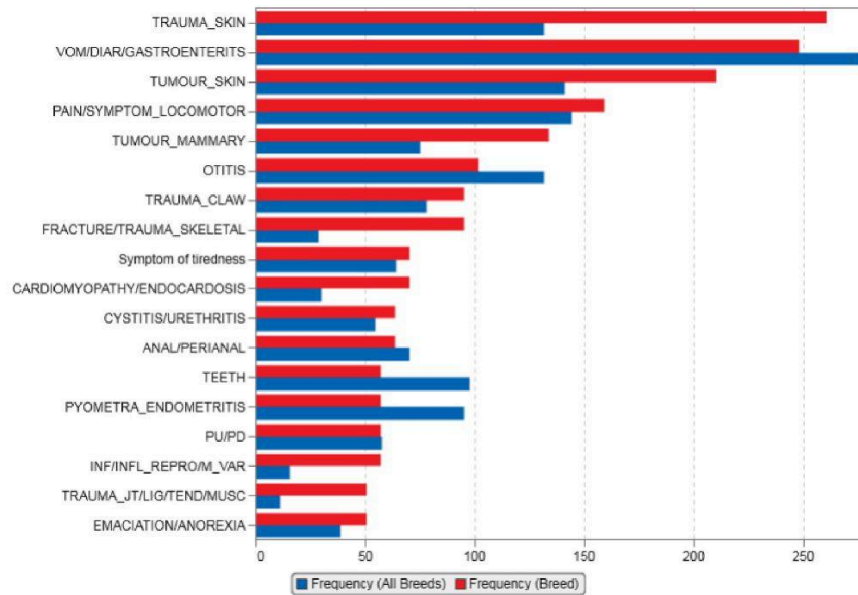


Figure 2: The most common specific causes of VCEs for the Saluki compared to all breeds in Sweden between 2011 and 2016, from Swedish Agria insurance data.

Relative risk for veterinary care episodes

The specific causes of VCEs ordered by relative risk are shown in Figure 3 for the Saluki. In this analysis, the top five specific causes of VCEs ordered by relative risk were: joint/ ligament/ tendon/ muscle trauma, male reproductive infection/ inflammation, skeletal fracture/ trauma, cardiomyopathy/ endocardosis, and skin trauma.

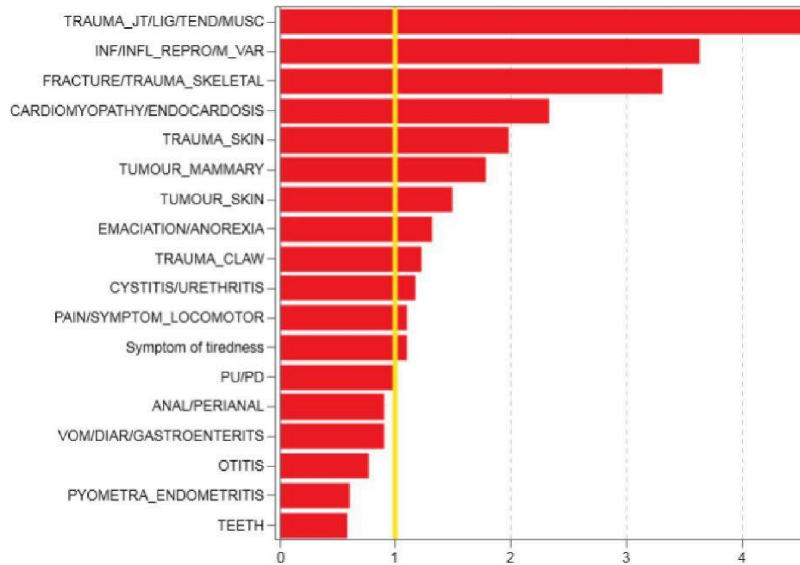


Figure 3: The specific causes of VCEs for the Saluki ordered by relative risk compared to all breeds in Sweden between 2011 and 2016, from Swedish Agria insurance data. The yellow line indicates the baseline risk for all breeds.

### BREED WATCH

The Saluki is a category 1 breed, therefore it is not currently mandatory for judges to submit a health monitoring form when judging this breed at championship certificate level. No optional health reports have been received for the breed.

### ASSURED BREEDERS SCHEME

It is currently recommended that Assured Breeders undertake DNA testing for NCL.

### DNA TEST RESULTS

The DNA test for NCL was recognised for the breed in Sept 2019 with some 46 results having been received to date. Of these, 27 dogs were tested clear (55.3%), and the remaining 21 hereditarily clear (44.7%).

As of 2020 the mutation frequency for the mutation in the tested population was 0.0%, as only clear and hereditarily clear status have been assigned. Once a sufficient number of years have passed a trend of the mutation frequency over time will be provided.

Whilst other 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 involves collaboration between the breed clubs and the Kennel Club in order to validate the test's accuracy.

As a note, as of January 2023 hereditarily clear status will no longer apply after two generations and dogs will need to be retested to confirm the status of that individual. This is to prevent the possibility of misclassification of status and therefore unintentional breeding of affected puppies. Where parentage is confirmed by DNA profile, the major contributor to erroneous status will be removed. Therefore, a less stringent restriction for HC status is applied where parentage is confirmed by DNA test.

### **CANINE HEALTH SCHEME RESULTS**

Participation in the British Veterinary Association/Kennel Club Canine Health Schemes are open to dogs of any breeds regardless of whether the scheme comes under an ABS requirement or recommendation.

#### HIPS

To date, 22 Salukis have been hip scored under the BVA/KC Hip Dysplasia Scheme, however just two were in the past 20 years, with these being a score of 8 and 9.

#### EYES

The Salukis not currently on the BVA/KC/International Sheepdog Society (ISDS) Known Inherited Ocular Disease List (KIOD - formally known as Schedule A).

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. However, some 153 dogs of the breed have been eye tested in the last 15 years.

However, the scheme is open to dogs of any breed and the findings are recorded in the annual Sightings Report. However no Salukis have been eye tested under the scheme between 2012-18.

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

Throughout 2015 to 2019, 61 Salukis were examined for ocular disorders under AVCO. The resultant prevalence data is shown in Table 4 below, alongside that for previous time periods. Overall, 77.0% (47 of 61 dogs) of Salukis examined between 2015 and 2019 had normal eyes unaffected by any condition.

However, it is important to note that this data is from dogs in the United States.

Table 4: ACVO examination results for the Saluki, 1991 - 2019

Disease Category/Name	Percentage of Dogs Affected	
	1991-2014 (n=262)	2015-2019 (n=61)
<b>Eyelids</b>		
Distichiasis	0.0%	6.6%
<b>Uvea</b>		
Persistent pupillary membranes (iris to iris)	2.3%	4.9%
<b>Lens</b>		
Cataract (significant)	5.0%	4.9%
<b>Optic nerve</b>		
Optic disc coloboma	0.4%	1.6%

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

#### REPORTED CAESEAREAN 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 Saluki breed for the past 10 years are shown in Table 5.

Table 5: Number of Saluki litters registered per year, and number and percentage of caesarean sections reported per year, 2010 to 2020.

Year	Number of Litters Registered	Number of C-sections	Percentage of C-sections	Percentage of C-sections out of all KC registered litters (all breeds)
2010	30	0	0.0%	0.35%
2011	20	0	10.0%	1.64%
2012	20	2	10.0%	8.69%
2013	14	3	21.4%	9.96%
2014	23	0	0.0%	10.63%
2015	21	0	0.0%	11.68%
2016	21	2	9.5%	13.89%
2017	22	2	9.0%	15.00%
2018	11	0	0.0%	17.21%
2019	18	3	16.7%	15.70%
2020	13	0	0.0%	14.41%

## 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 2020, an estimated effective population size of **327.3** was reported (estimated using the rate of inbreeding over the period 1980-2019).

When the effective population size drops below 100 (inbreeding rate of 0.50% per generation) the rate of loss of genetic diversity in a breed/population increases dramatically (Food & Agriculture Organisation of the United Nations, "Monitoring animal genetic resources and criteria for prioritization of breeds", 1992).

Annual mean observed inbreeding coefficients (showing loss of genetic diversity) and mean expected inbreeding coefficients (from simulated 'random mating') over the period 1980-2019 are shown in Figure 4. The rate of inbreeding for the breed appears to have peaked in the last 1990s, implying increased awareness of genetic diversity when breeders are considering mates for their dog, however there is some fluctuation due to the consistently small numbers of the breed, so this should be interpreted cautiously.

For full interpretation see Lewis et al, 2015

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

The current breed average inbreeding coefficient is **9.3%**.

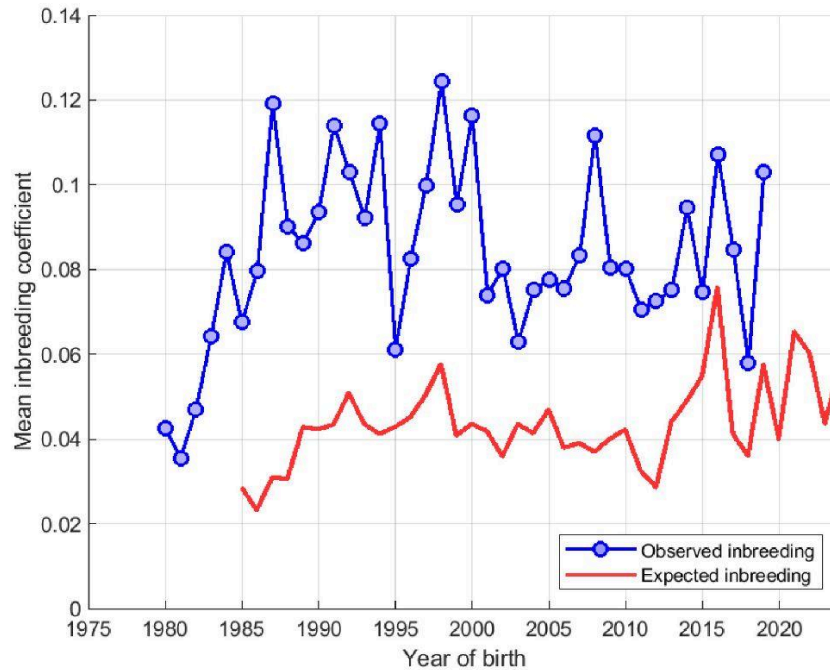


Figure 4: Annual mean observed and expected inbreeding coefficients

Below is a histogram ('tally' distribution) of number of progeny per sire and dam over each of six 5-year blocks (Figure 5). 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). There is evidence of popular sires having been used recently in the breed, with some seven sires responsible for almost a third of progeny registered in the past five years.



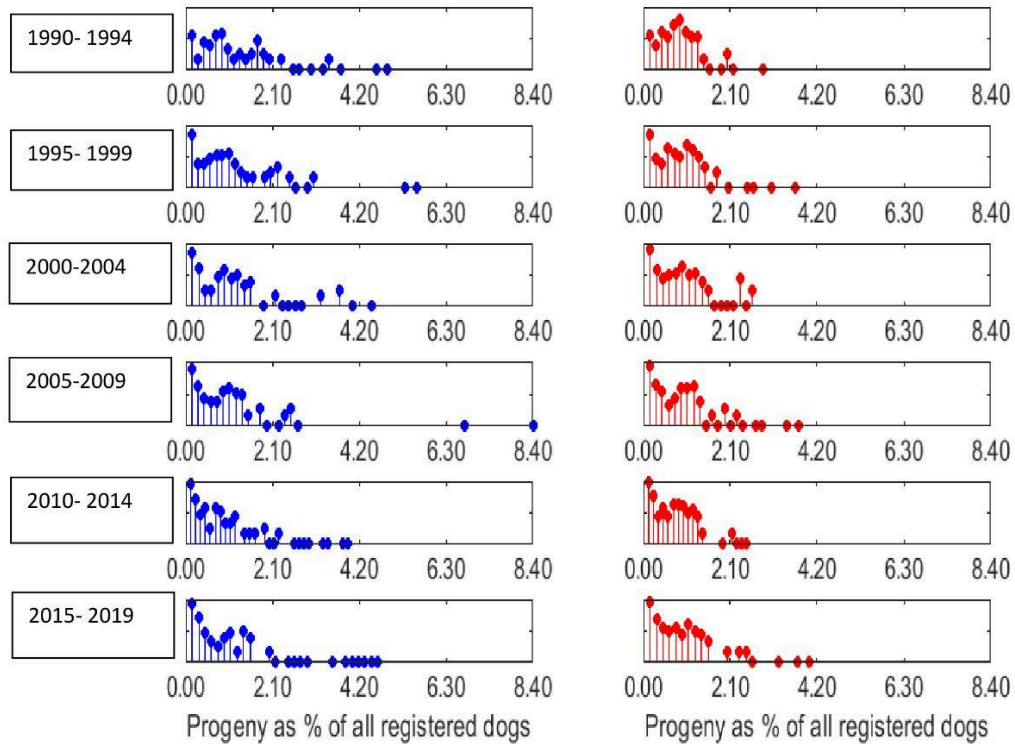


Figure 5: Distribution of the proportion of progeny per sire (blue) and per dam (red) over 5-year blocks (1990-4 top, 2015-19 bottom). Vertical axis is a logarithmic scale.

### CURRENT RESEARCH PROJECTS

The breed are currently involved in the following projects:

- 1) Participating in the KC NCL validation scheme: 3 clear and 3 carrier salukis.
- 2) Participation in the KCGC idiopathic epilepsy inherited disorders research with genomic sequencing: 1 confirmed affected saluki is participating.
- 3) Establishment of give a dog a genome for salukis with the KCGC - the BHC is presently in discussions with the KCGC.

## PRIORITIES

Correspondence between the breed representatives and the Kennel Club was undertaken in Jan 2022 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 Saluki were:

- Neuronal ceroid lipofuscinosis (NCL)
- Autoimmune hypothyroidism
- Epilepsy

DRAFT

## **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 Saluki. Both partners are expected to begin to action these points prior to the next review.

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

- The Breed Clubs to continue to encourage engagement in health testing for the breed
- The Breed Club to liaise with the KCGC with respect to prominent concerns in the Saluki
- The Breed Clubs to develop a health survey, with the Kennel Club to assist where needed
- The Breed Clubs to engage in the Royal Veterinary College's ImmunoRegistry project, with the Kennel Club to assist in recruitment
- The Breed Clubs to consider adding a proposal for thyroid testing on the ABS, with this to be upgraded to a requirement should thyroid results be formally recognised by the Kennel Club

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

- The Kennel Club to explore the feasibility of recording thyroid results for the breed
- The Kennel Club to assist in the development of a health survey
- The Kennel Club to explore the feasibility of hosting Veterinary Cardiology Society rare breed testing days, to collate further heart information in the breed
- The Kennel Club to explore whether a monitoring database can be developed and included on the Breed A-Z page for the Saluki

## REFERENCES

- Appleby, E.C., Longstaffe, J.A., Bell, F.R. (1982) Ceroid-lipofuscinosis in two Saluki dogs. *Journal of Comparative Pathology* **92**: 375-380
- Giraut, S., Haggstrom, J., Koskinen, L.L.E., Lohi, H., Wiberg, M. (2019) Breed-specific reference ranges for standard echocardiographic measurements in Salukis. *Journal of Small Animal Practice* **60**: 374-378 DOI: 10.1111/jsap.12975
- Hargis, A.M., Brignac, M.M., Al-Bagdadi, F.A.K., Muggli, F., Mundell, A. (1991) Black hair follicular dysplasia in black and white Saluki dogs: differentiation from colour mutant alopecia in the Doberman Pinscher by microscopic examination of hairs. *Veterinary Dermatology* **2(2)**: 69-83
- Hilppo, M. (1986) Some haematological and clinical-chemical parameters of sighthounds (Afghan hound, Saluki and Whippet). *Nord Vet Med* **38(3)**: 148-55
- Kurosawa, T.A., Sist, M.D., Sanders, R.A. (2018) Echocardiographic variables in healthy North American Salukis. *Journal of Veterinary Cardiology* **20**: 301-306 <https://doi.org/10.1016/j.jvc.2018.07.003>
- Lewis, C.J. (1995) Black hair follicular dysplasia in UK bred Salukis. *Veterinary Record* **137(12)**: 294-5 doi: 10.1136/vr.137.12.294.
- Lingass, F., Guttersrud, O-A., Arnet, E., Espenes, A. (2017) Neuronal ceroid lipofuscinosis in Salukis is caused by a single base pair insertion in *CLN8*. *Animal Genetics* **49**: 52-58 oi: 10.1111/age.1262952
- Ogburn, P.N., Peterson, M., Jeraj, K. (1981) Multiple cardiac anomalies in a family of Saluki dogs. *Journal of American Veterinary Medical Association* **179(1)**: 57-63
- Sanders, R.A., Kurosawa, T.A., Sist, M.D. (2018) Ambulatory electrocardiographic evaluation of the occurrence of arrhythmias in healthy Salukis. *Journal of American Veterinary Medical Association* **252(8)**: 966-969
- Seckerdieck, M., Holler, P., Smets, P., Wess, G. (2015) Simpson's method of disc in Salukis and Whippets: echocardiographic reference intervals for end-diastolic and end-systolic left ventricular volumes. *Journal of Veterinary Cardiology* **17(4)**: 271-81 doi: 10.1016/j.jvc.2015.08.002.
- Shiel, R.E., Sist, M., Nachreiner, R.F., Ehrlich, C.P., Mooney, C.T. (2010) Assessment of criteria used by veterinary practitioners to diagnosis hypothyroidism in sighthounds and investigation of serum thyroid hormone concentrations in healthy Salukis. *Journal of the American Veterinary Medical Association* **236(3)**: 302-308 doi: 10.2460/javma.236.3.302.
- Uhrikova, I., Lacnakova, A., Tandlerova, K., Kucharova, V., Rehakova, K., Janova, E., Doubek, J. (2013) Haematological and biochemical variations among eight sighthound breeds. *Australian Veterinary Journal* **91(11)**: 452-9 doi: 10.1111/avj.12117.

Vernau, K.M., Struys, E., Letko, A., Woolard, K.D., Aguilar, M., Brown, E.A., Cissell, D.D., Dickinson, P.J., Shelton, G.D., Broome, M.R., Gibson, K.M., Pearl, P.L., Konig, F., Van Winkle, T.J., O'Brien, D., Roos, B., Matiasek, K., Jagannathan, V., Drogemuller, C., Mansour, T.A., Brown, C.T., Bannasch, D.L. (2020) A missense variant in *ALDH5A1* associated with canine succinic semialdehyde dehydrogenase deficiency (SSADHD) in the Saluki dog. *Genes* **11**: 1033  
<http://dx.doi.org/10.3390/genes11091033>

DRAFT

