



Breed-specific Breeding Strategies RAS for



Cavalier King Charles Spaniel



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What is RAS?

A breed-specific breeding strategy (RAS) is an action plan for breeding within a specific breed. RAS for Cavalier King Charles Spaniel was established for the first time in 2005. This version of RAS is revised in 2016.

RAS is to be regarded as a dynamic document to be assessed annually. The conditions and health may be changed and thus RAS must be reviewed and updated continuously.

The document is to be regarded as a tool in the breeding work as well as providing the history and origin of the breed. It is also a tool in the work towards future goals.

Health Work within the Breed Club

The breed club's work with health issues has included, among other things, the following:

- Health survey in 2014 to get an idea of the health status of the breed
- In 2014 two major health seminars were held with Sweden's foremost specialists in Cardiology and Neurology
- In 2015 there was 1 health seminar held with an eye specialist
- Annual reports of heart, eyes and patella status
- SCKCS health fund receives 10 SEK per registered dog and specialty show
- Changed framework to keep the dog on the +7-year list to encourage owners to continue to take heart certificates on older dogs in order to know *when* heart murmurs occur.
- Heart certificates for older dogs (+7 years) are subsidized by the club with 150 SEK with the same purpose as the above paragraph
- Continuous information through targeted emailing to breeders
- Mentoring for new breeders has been introduced
- Health register (SM) has been initiated and will be published on the Cavalier Society's website during the first quarter of 2017. The death registry will be presented on the website in the form of a summary
- In 2015 5 breeders' meetings were held around the country, which were arranged by the breeding committee to firmly establish the work with RAS.

Description of the Establishment Process

The revised RAS has been developed within the framework of a project in collaboration between the Specialty Club for Cavalier King Charles Spaniel (SCKCS), the Swedish Kennel Club breed committee and SKK's breed and health department. Work on the project has been going on since the end of 2014 through 2016. Club members have continuously been informed of the progress of the project through health seminars and breeders' meetings as well as on the club's website and Facebook page. The revised health program for heart testing was presented at a meeting in September 2016. After completion the revised RAS document has been made available via the club's website.

General Breeding Strategy

It is important for a breeding animal to reach mental and physical maturity prior to its breeding debut. A Cavalier King Charles Spaniel must not be used for breeding before 3 years of age, and at that point as a functionally healthy dog with a breed typical build and mentality. It is desirable to use breeding animals with as much documented information regarding hearts, SM, eyes and knees in the family ranks as possible. Older males should be used to a greater extent than today. This is to address the health problems existing in the breed, the most widespread is MVD (Mitral Valve Disease), meaning heart murmurs, but also SM (Syringomyelia), which is a neurological disease that exists in the breed and usually occurs before the age of 3. Here it is important to know the family history and to not use dogs with clinical symptoms.

The strategy is:

Top priority is to significantly improve cardiovascular status of the Cavalier but also to significantly reduce the risk of SM.

- Continue cardiovascular examination of breeding animals until at least 8 years of age, preferably longer or until the animal has been confirmed with a murmur.
- Observe research and development of screening for Syringomyelia and for screened dogs to follow the breeding recommendations developed by BVA/The Kennel Club.
- Increase the use of older healthy dogs.
- Raise the age for the breeding debut for both males and bitches.
- Limit the use of young males.
- Increase the number of potential breeding animals by getting more dogs in the breed heart tested and qualified at shows. That alone will result in an increased available breeding base and hopefully lead to a wider used breeding stock.
- Continue to examine eyes and patella (knees).



Breed Story, Background and Development

The breed has an interesting story spanning several centuries back in time. According to some sources the forerunner to the Cavalier of today came from the Far East via Spain to Great Britain during Henry VIII's reign (1509-1547). The Cavalier King Charles Spaniel of our time is a direct descendant of the little miniature spaniel, which can be seen in so many paintings from the 15-, 16-, and 1700s.

In Great Britain miniature spaniels were common as companion dogs for the ladies of the court during the reign of Queen Elizabeth I. However, it was the kings of the House of Stuart, who were so fond of the little dogs, that they gave them the royal title King Charles Spaniel. History tells us that Charles II was rarely seen without two, three or more of them hanging around his heels.

But time passed and miniature spaniels became unfashionable and it was not until the 17- and 1800s you can find that particular type of red and white miniature spaniels, bred by the Dukes of Marlborough at Blenheim Palace, which were well known both as a hunting and pet dogs.

During Queen Victoria's reign dog shows became common in Great Britain and hence the systematic breeding work to change the type in accordance with the fashion at the time began. The result was the flat-nosed type which is the modern King Charles Spaniel. Not until 1926, Mr. Eldridge, an American miniature spaniel lover, came to England and discovered to his grief that there no longer were any left of the little long-nosed spaniels. To remedy this, he set up monetary prizes of £ 25 to be awarded at Crufts, the largest show of year, during a five-year period, to the best dog or bitch of the type that existed in Charles II's time. In the show catalogue it was stated that the dogs should look like in "Charles II's time, with long nose, flat on the skull with no hint of curvature and with "the spot" in the middle of the skull, and the prize would be awarded to the one which resembled the description the most.

In 1928 a specialty club for the breed was formed and the name The Cavalier King Charles Club was chosen to emphasize the affinity with King Charles.

The breeding material was long-nosed pups which were excluded from the short-nosed litters. The breed quickly gained popularity in Great Britain, but not until 1945 the Cavalier King Charles Spaniel was accepted as a specific breed by the Kennel Club. Some years have had over 10 000 registered Cavalier puppies in Great Britain. These days the breed is spread all over most of the world and is a highly appreciated companion and show dog.

In 1961 the first Cavaliers came to Sweden and quickly became a popular breed. Already in the mid-70s registrations reached over 1000 annually and are still often recorded at over 1000 cavalier puppies per year.

The Swedish specialty club for Cavalier King Charles Spaniel - SCKCS aka The Cavalier Society was formed in 1972.

The Cavalier is a small throughout moderate dog of spaniel type where type and temperament are very important characteristics. It is a lively, graceful, and well-balanced dog with a gentle expression. Its character must be absolutely fearless and dashing, it is cheerful, friendly, never aggressive and without any hint of nervousness. Its affection and softness makes it an ideal companion that fits into most environments. Despite being of spaniel type it should be kept natural, thus all trimming is prohibited before shows. SCKCS is in charge of breeding activities of the Cavalier King Charles Spaniel in Sweden. Breeding is also regulated in the Swedish animal welfare legislation and the Swedish Kennel Club's basic rules and its breed specific health programs.



*The Duchess of Portsmouth, Louise de Kérouaille, with a little spaniel.
Born in 1649 in Bretagne and mistress to Charles II of England.
(Source: <http://godsochgardar.se/bloggar/kristina/god-fortsattning-2/>)*

Population/Breeding Structure of the Breed

Current Situation

Registration Numbers in Sweden

Year	2011	2012	2013	2014	2015
Sw. born	1033	997	1000	864	870
Imports	14	19	34	24	20
Total	1047	1016	1034	888	890

The registration stats indicate a decrease in numbers in the last years. Imports represent around 2% of all registered Cavaliers, but especially males (and their offspring) are often used quite a lot for breeding and may consequently have a major impact on the breed.

Registration Statistics for Other Nordic Countries and Great Britain

Year	2011	2012	2013	2014	2015
Finland	790	641	667	616	528
Norway	705	868	802	692	648
Denmark	398	434	499	440	431
Great Britain	7446	5970	5145	4931	4383

The statistics in the above chart have been obtained from the websites of each kennel club respectively (Finland, Denmark and Great Britain) or via direct contact with relevant kennel club (Norway). The numerical development in several countries indicates a decline in the registration numbers during the 5-year period.

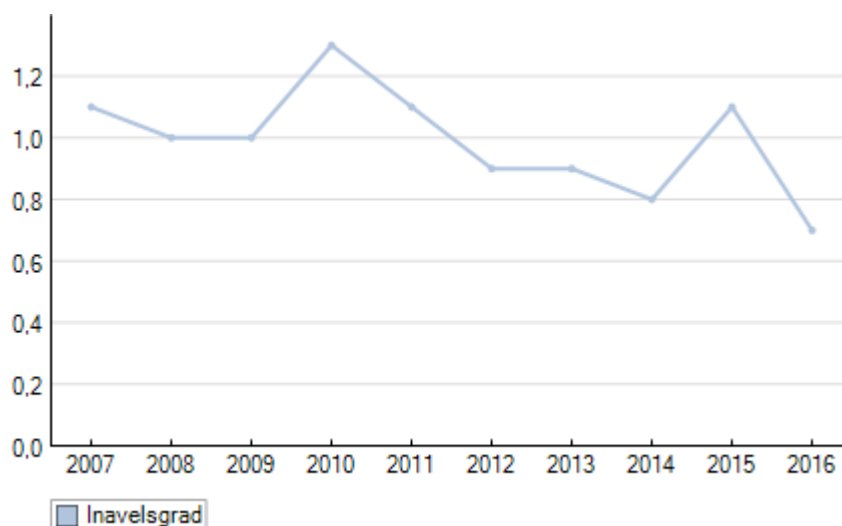
Average Litter Size

The average litter size has ranged between 3,7 - 3,9 in the last 10 years.

Inbreeding Trend and Use of Breeding Animals

During the 2010-2015 period, the increase of the inbreeding degree has slightly declined (except in 2015), and is so far in 2016 at 0,7% (see graph below, taken from the SKK Breed Data). The inbreeding degree reported in the SKK Breed Data is calculated over 5 generations. The rate for each birth year thus corresponds to the average inbreeding degree (over 5 generations) for dogs born this year.

Average inbreeding in the breed



Breeding on closely related individuals has also clearly decreased. During the latest 4 years only 2-7 litters per year have a higher coefficient of inbreeding than 6,25%, i.e. higher than the recommended max level (corresponding to cousin mating).

Distribution of matings in %	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Up to 6,25%	301	281	289	251	275	250	240	226	221	232
6,26% - 12,49%	8	11	7	12	9	5	2	2	6	0
12,5% - 24,99%	2	1	0	0	1	1	0	0	1	0
25% -	0	0	0	0	1	0	0	0	0	0

During the 5-year period 2011-2015, 734 different females and 287 different males have been used for breeding and produced a total of 1240 litters during the period. As a rough comparison, during a 5 year period 3 years earlier (2008-2012), 2735 females and 2820 males have been registered (potential breeding animals). Based on these figures a rough estimate is that around 27 % of the females and 10 % of the males have been used for breeding.

During the latest 10-year period (until 2015) 11 males have produced more than 100 puppies, of which the one with the most produced 162. We have (Oct. 2016) 12 dogs (all males) with more than 300 grandchildren each. 7 of those 12 are imports. Show winners and imports are typically used from an early age and are allowed to produce many litters before the offspring has been assessed.

We have studied the breeding males of recent years and are noting that young males are widely used for breeding, and may affect the breed extensively.



Goal Breeding Structure

In light of the health problems found in the breed, MVD and SM, more males, preferably healthy elderly individuals should be used for breeding. To assess the breeding value of a male/bitch their offspring should also be assessed regarding heart and SM, at 3 years of age, at the earliest.

We wish to increase the number of potential breeding animals by having more dogs merited at shows and heart examined. That alone gives an increased available breeding stock and hopefully also a more widely utilized breeding stock (see also under the heading Health).

We wish to maintain the low inbreeding degree.

Strategies Breeding Structure

Priorities and Strategies to Reach the Goals

A reduction of young males for breeding, will likely lead to more elderly healthy males being used. To get an overview of the males which are available for breeding, two lists of males will be set up, one for males over 5 years and one for males over 8 years of age. These lists will be published on the club's website and hopefully be helpful in the search for suitable males and thus also broadening the breeding base. We will also, on our (SCKCS) shows, organize 5+ parades for males and veteran parades of both genders. These will help to highlight somewhat older males, which usually do not appear much at shows and therefore are easily "forgotten" in breeding work.

The revised health program for heart (see under the heading Health) means a raised age for the breeding debut, a raised age for heart healthy parents of breeding animals and a limitation of the number of litters for dogs below 6 years of age (see further under Health). The revision of the health program will surely affect the breeding structure of the breed in the desired direction.

Health

To compare with other breeds, Agria Dog Breed Profiles for insurance can be used. The breeds are divided into groups 1 to 9, of which 9 is the one with the highest insurance. Cavaliers are in group 6 and most breeds are in group 5 or 6. It has long been known that the Cavalier as a breed has a larger number of dogs with early onset of heart murmurs caused by congestive heart valve degeneration (MVD) than other breeds. Compared to other breed-specific health problems heart defects are clearly overrepresented. There is a great awareness of this in the breed and if you look around the world you will see that this is the health issue that many Cavalier Clubs have some kind of health program for.

In recent years there has been much media attention to the previously called scratching-disease, now referred to as Syringomyelia (SM).

Health Survey

In 2014 a health survey for the breed was carried out. The survey was available on the website of The Cavalier Society. 740 responses were received. Below are the five most common reasons for Cavaliers being euthanized, according to data in the health survey:

- Heart Disease- Murmur 22,4%
- Old Age 17,2 %
- Unknown Reason 12, 1 %
- Cancer 10,3 %
- Syringomyelia 7,8 %

The survey also shows a few cases of herniated disc, liver disease, uterine inflammation, kidney disease and episodic falling.

Insurance Statistics

The Agria Dog Breed Profiles statistics (see diagram noting life injuries and veterinary injuries below) confirm that heart disease is the single biggest reason for Cavaliers to seek care or to be euthanized. In the insurance data the difference to other diseases is even greater. A weakness in these figures is that they do not note the age at which dogs have been euthanized. There is a great difference if a dog is euthanized because of heart failure at the age of 3, compared to at 13 years of age.

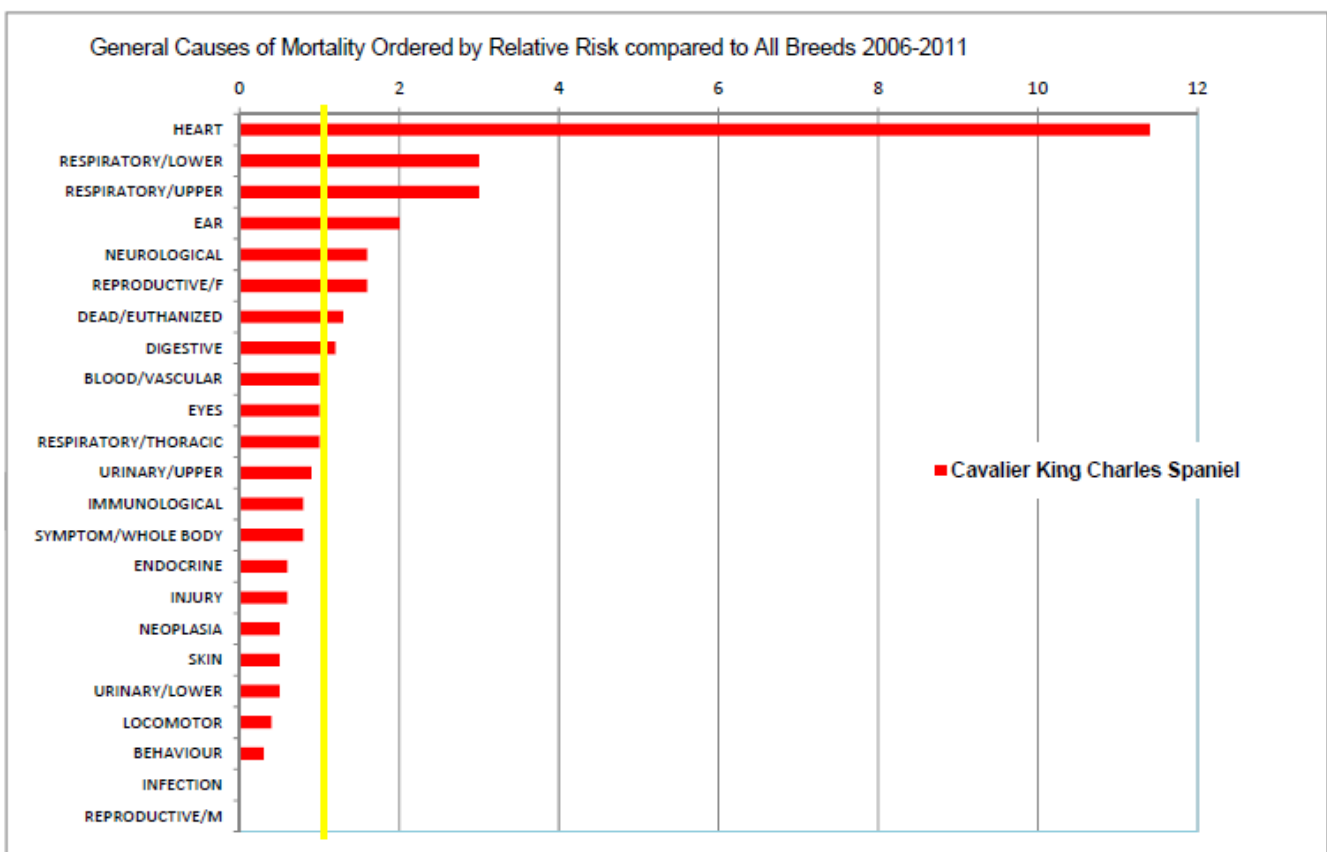
The Cavalier is also overrepresented regarding injuries (life and veterinary care) for neurological causes. There are several reasons for this, and a certain portion could emanate from symptoms of Syringomyelia.

Something that also pops up as a relatively high risk in insurance data for Cavaliers (compared to other breeds) is respiratory problems linked to both upper and lower respiratory tract. It is possible that this may be due to the fact that the same dogs that come in with heart failure also have respiratory problems because of this. Breathing

problems with "snorting" are also noted as an issue in the breed specific instructions for show judges (BSI). Although the breed is over-represented relative to all breeds in the insurance data, the actual risk of a life injury related to respiratory problems is low according to the Agria Data.

Also ear problems and reproductive problems in females are noted in the life injury statistics as a higher risk compared to all breeds. In the statistics of veterinary injury, eyes, blood/vascular and skin are prominent, relative to the risk of other breeds. For eye and skin, the actual frequency of veterinary injury is also relatively high. This is not the case for blood/vascular.

General Causes of Mortality Ordered by Relative Risk compared to All Breeds 2006-2011

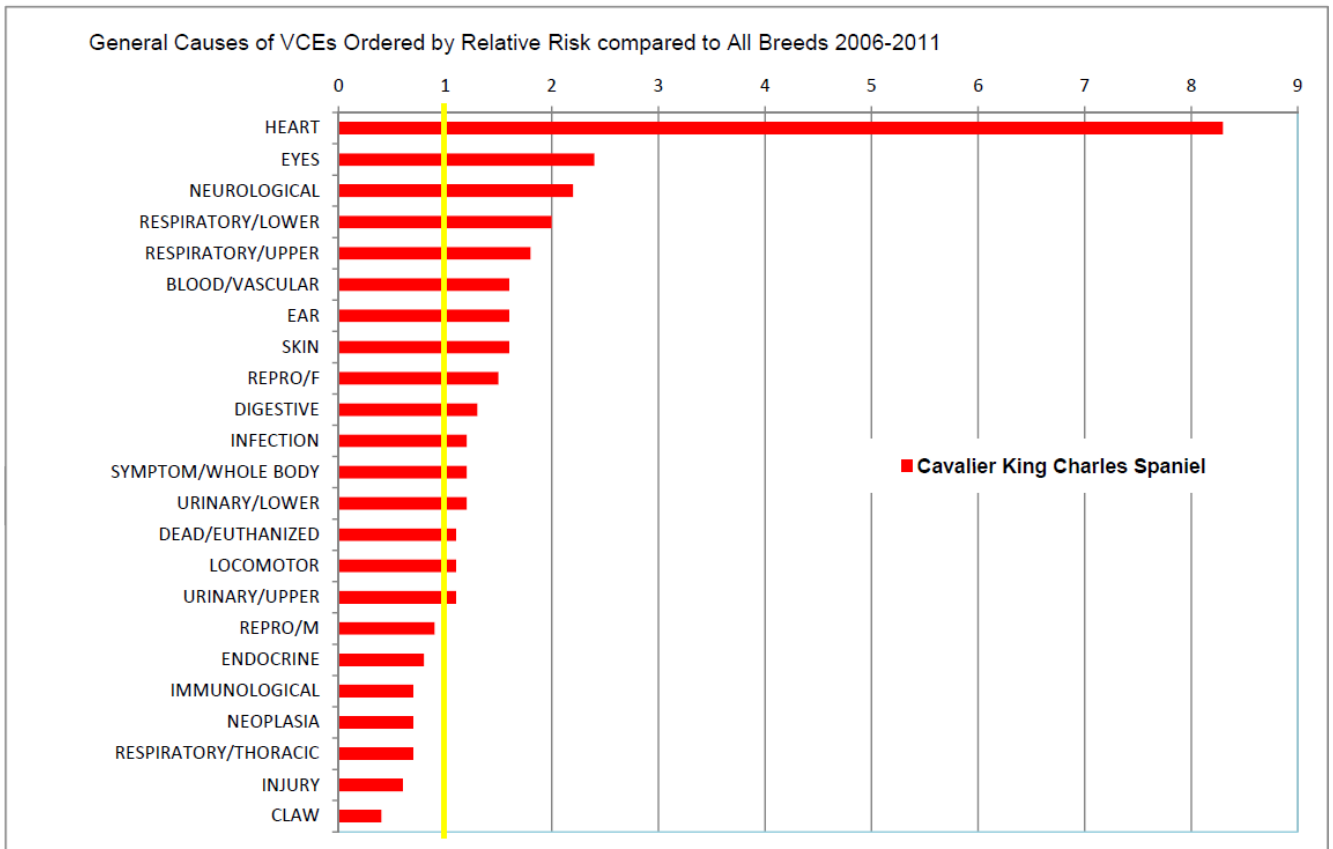


Interpretation:

The yellow line is the baseline risk for All Breeds; so, for those conditions where the red bar goes to the right of the yellow line, the breed is at increased risk compared to All Breeds. If the red bar goes to '2' it means that the risk in the Breed is approximately 2 times that for All Breeds.

The above chart shows the relative risk of life injury of the Cavalier, compared to all other breeds together, divided into overall causes of death. The data covers injuries during the period 2006-2011. Note that a *relatively* increased risk for the Cavalier compared to other breeds, does not necessarily mean a high frequency in itself, as this depends on the degree of risk in other breeds.

General Causes of VCEs Ordered by Relative Risk compared to All Breeds 2006-2011



Interpretation:

The yellow line is the baseline risk for All Breeds; so, for those conditions where the red bar goes to the right of the yellow line, the breed is at increased risk compared to All Breeds. If the red bar goes to '2' it means that the risk in the Breed is approximately 2 times that for All Breeds.

The above chart shows the relative risk of a veterinary injury for the Cavalier, compared to all other breeds together, spread into more overall injury causes/organ systems. The data covers injuries during the period 2006-2011. Note that a *relatively* increased risk for the Cavalier compared to other breeds, does not necessarily mean a high rate of injuries per se, as this depends on the degree of risk in other breeds.

Registration of Death Causes in Finland

The Finnish Kennel Club registers, since a few years back, information on the cause of death, as reported by the dog's owner. Currently (November 2016) there is information on the cause of death for 1610 Cavaliers in Koiranet. The chart shows that the most common choice is "cause of death has not been specified" (394 dogs). Next is "heart disease" (364 dogs), which is in line with the information from the health survey and insurance data. The average age of this group is indicated to 9 years and 4 months. Also "old age" is a common choice (285 dogs). 71 dogs are reported as having been euthanized/died as the result of a neurological disease. "Tumor/Cancer" is noted as the reason for 101 dogs.



Dödsorsak	Genomsnittlig livslängd	Sammanlagt
Död utan diagnos av sjukdom	8 år 0 månader	43
Endokrin sjukdom	8 år 8 månader	17
Eutanasi på grund av en beteendestörning	6 år 2 månader	5
Eutanasi utan diagnos av sjukdom	9 år 0 månader	55
Förlossningssvårighet	4 år 11 månader	2
Försvunnen	5 år 2 månader	5
Hjärtsjukdom	9 år 4 månader	364
Hud- eller öronsjukdom	6 år 1 månader	5
Immunologisk sjukdom	3 år 0 månader	8
Leverns eller mag-tarmkanalens sjukdom	8 år 1 månader	34
Luftvägsjukdom	8 år 8 månader	9
Neurologisk sjukdom	6 år 4 månader	71
Olycksfall eller trafikskada	4 år 4 månader	64
Rovdjursskada	7 år 4 månader	2
Ryggsjukdom	9 år 2 månader	14
Skelett- eller ledsjukdom	7 år 7 månader	18
Tumör, cancer	9 år 6 månader	101
Urinvägens eller förökningsorganens sjukdom	8 år 2 månader	42
Valpens medfött fel eller anomali	0 år 3 månader	3
Ålderdom (naturlig eller eutanasi)	11 år 9 månader	285
Övrig sjukdom som inte finns med i listan	7 år 0 månader	69
Dödsorsaken har inte specificerats	9 år 4 månader	394
Alla sammanlagt	9 år 1 månader	1610

Summary of the cause of death for Cavaliers registered in the Finnish Kennel Club.
Reason given by the owner
(<http://jalostus.kennelliitto.fi/frmTerveystilastot.aspx?R=136&Lang=sv>).

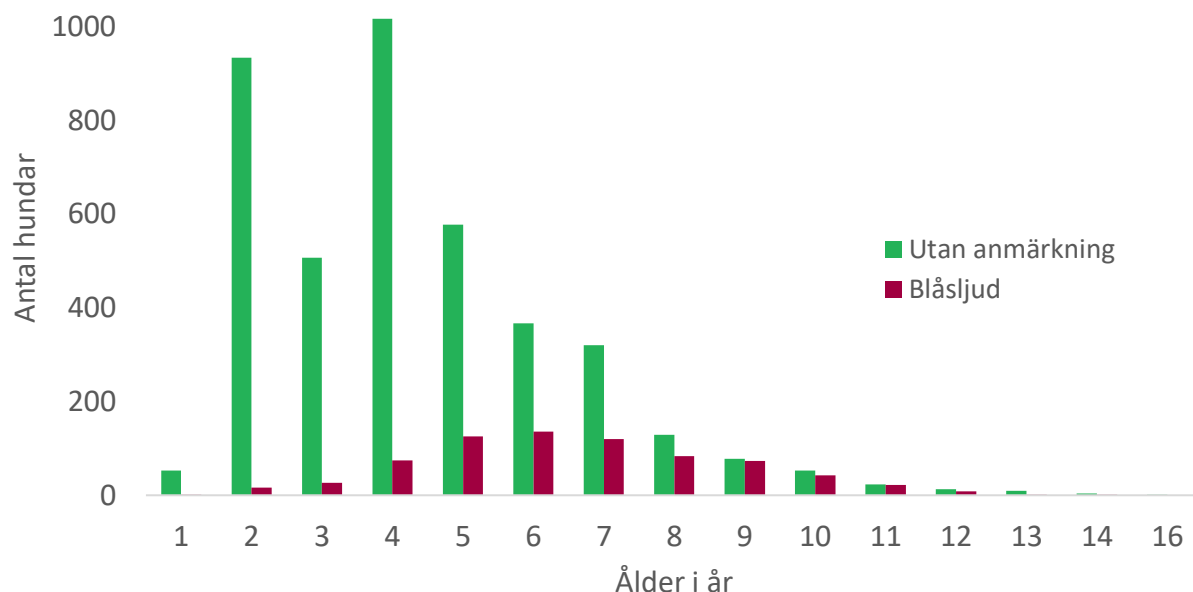
Heart Murmur

In 2001, the SKK introduced registration rules for Cavaliers requiring heart testing of breeding animals to improve the cardiac status of the breed. When reviewing the cardiovascular statistics of the SKK database, we cannot see any significant improvement.

RESULT OF HEART EXAMINATIONS 2012-2016						
	2012	2013	2014	2015	2016	2012-2016
Number of examined dogs	885	814	840	837	970	4346
Without remark (UA)	832	767	781	780	887	4047
Proportion (%) UA	94,00%	94,20%	93,00%	93,20%	91,44%	93,12%
Murmur	53	47	59	57	83	299

The basis for cardiac data is however difficult to interpret. The majority of the dogs get their latest examination results at a relatively young age (around 5 years on average) and only a few dogs (usually breeding animals) return for tests later in life. This is also apparent in the chart below. The graph shows the number of dogs with and without a murmur, spread by age in years. Only the latest test result of each dog is noted. The material includes dogs examined from 2001 (since the Health Program was introduced) until March 2015.

Antal hundar med respektive utan blåsljud, fördelat på ålder i år

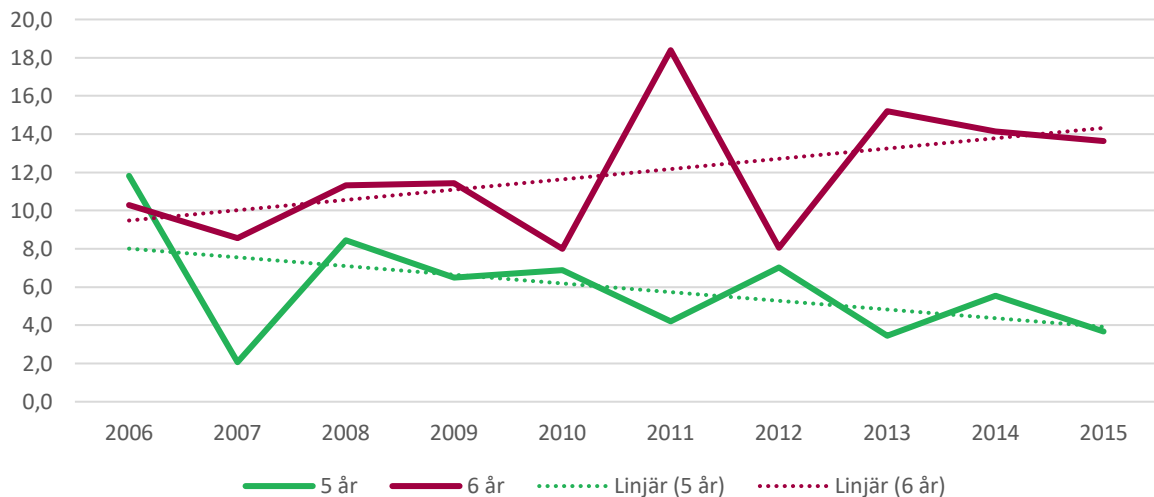


The graph illustrates that the majority of dogs are examined at an age lower than the age when murmurs normally start. By increasing the number of dogs tested at a higher

age, we can get a better picture of the incidence of heart problems in the breed and a more reliable basis for breeding evaluation.

In the attempts to evaluate the health program, introduced in 2001, there are indications that the age of onset of heart murmurs is slightly higher, which may be interpreted as the health program having some, though not satisfactory, effect.

Andel av undersökta 5- och 6-åringar med hjärtfel



The graph above indicates an increase in the proportion of 6-year-old dogs diagnosed with heart murmur, and a corresponding reduction for 5-year-old dogs. The total proportion of dogs with heart murmur, however, has not been diminished since the health program was introduced.

Breeding Goal Heart Murmurs

Reduce the incidence of, above all, early heart disease and postpone the age of onset heart murmur to significantly later in age.

Breeding Strategy Heart Murmurs

Although SCKCS, for many years, has recommended the use of healthy elderly males, statistics show that young males are used for breeding to a very large extent. There are examples of males who have been used a lot for breeding and then have been found to have heart failure before 5 years of age. These dogs affect the breed in a negative way today. We know that there is a link between old heart healthy parents, and heart healthy offspring.

An official health program relating to heart was introduced already in 2001. As of 2017 a revised health program will be introduced with an aim to streamline the breeding selection of heart healthy dogs. The revision implies a higher age at the breeding debut and limited use of breeding dogs before the age of 6. This is to reduce the use of young

males for breeding. The new health program should provide a better basis for breeding assessment and in the future possibly a prerequisite for establishing a breeding index related to heart.

The health program in full may be found in Appendix 2, as well as in the SKK Registration Rules - [SKKs Registreringsregler](#).

In addition to the revised health program, the following measures will be taken in order to get more information about cardiac status in older dogs and highlight older potential breeding animals:

- Heart test at least once/year for members in each local area
- Develop the main official show in Eskilstuna:
 - 5+ parade for males
 - Veteran parade for males and females
 - Heart test (+7 years) subsidized by the club with 150 SEK.

Syringomyelia

Syringomyelia, SM is, second to heart, the health problem that should be given the highest priority in the breeding work related to health. Syringomyelia is a neurological disease that can cause severe pain. It is not easy to diagnose when all symptoms may be due to other factors such as a herniated disc, Lyme Disease, otitis media, etc. Some common symptoms are itching around the head and neck (often scratching in the air), neck pain, scoliosis, wobbliness or hysterically biting on paws. Symptoms of SM occur most frequently at a relatively young age, mostly before 3 years of age, but may also appear later in life. SM has a complex picture and is said to be a multifactorial disease. One way to diagnose SM is via MRI scanning, but to MRI scan a dog, it would have to be anesthetized, which is always associated with a risk. An MRI scan can determine if the dog has a syrinx and the size of it. Unfortunately, from a breeding point of view, the result of an MRI scan is not completely consistent with the presence of clinical symptoms. A dog that has clinical symptoms of SM in the early years is at risk for more severe symptoms than one that contracts the disease somewhat later in life. From a breeding point of view, it is an advantage if those experiencing symptoms are doing so mostly at a young age, as it means that the dogs can be removed from the breeding program before being used for breeding. A dog showing clinical symptoms must not be used for breeding.

The presence of SM in Sweden is not clear, but the English Kennel Club has recently published an article by the Royal Veterinary College where they studied veterinary care data on Cavaliers having sought treatment at veterinary clinics in England (within the project VetCompass) (Summers J. et al. 2015, Canine Genetics and Epidemiology, DOI: 10.1186/s40575-015-0016-7). The data showed that 3624 dogs were registered as Cavaliers in VetCompass (only 3.9% of these were registered in the English Kennel Club). 1875 dogs were randomly selected for a detailed review of the data. Of these, 1749 individuals had clinical data related to veterinary care. The report showed that 1.9% of

the individuals in the study (33 dogs) were diagnosed with SM, CM, or both. Only dogs with a diagnosis confirmed by MRI were included as cases (dogs with information only on clinical symptoms were excluded), which may have caused an underestimation of the true prevalence in the population, because not all individuals with suspicions based on clinical symptoms had undergone MRI scanning (due to vague clinical symptoms, reluctance or financial limitations of the owner).

SCKCS has also checked out a report on 28 MRI screened Cavaliers at the Animal Doctor in Linköping between 2012 and 2015, as noted in the schedule produced by KC/BVA (personal communication with Måns Röken). Of these 28 dogs all had CM (Chiari-like malformation) grade 2. 19% had SM grade 0, 31% grade 1 and 50% grade 2. As many as 73% of the dogs, were reported to have clinical symptoms of SM. A relationship between syrinx diameter and the presence of clinical symptoms was observed. The examined dogs cannot be presumed to constitute a representative selection of individuals for determining the presence of SM in the breed, since a few dogs probably were screened on account of clinical symptoms, but may still provide some information on the relationship between MRI findings and clinical symptoms. In the material there was one dog with SM grade 2b, without clinical symptoms, and several dogs with grade 0 or 1, having clinical symptoms. SCKCS is following the research on grading and classification of SM from MRI and its relation to clinical symptoms.

Recently, it has been discussed whether the shape of the skull is related to CM/SM. In a study by Mitchell T J et al 2014 (<http://www.cgejournal.org/content/1/1/9>), the relationship between shape of the skull and the presence of SM, was studied. The researchers found two significant risk factors in relation to the skull shape for CM/SM of Cavaliers. These were the degree of Brachycephaly (the width of the skull in relation to the length), and the allocation of "doming" (curvature) of the skull. A reduced cephalic index (less Brachycephaly) was protective against developing SM. Further, it was found, that more skull at the back of the head (caudal) relative to the amount of in front (rostral) also was protective against SM. If, in accordance with this study, it is possible to identify a skull shape that is associated with SM, breeding selection of exterior as regards skull shape, would contribute to a reduced incidence of SM in the breed. SCKCS is observing further research also in this area.

Breeding Goals Syringomyelia

Reduced occurrence of clinical symptoms caused by Syringomyelia.

Breeding Strategy Syringomyelia

As a first measure the presence of Syringomyelia needs to be mapped further. SCKCS has introduced reporting of SM which is noted on the club's website. This health register will be marketed more for an enhanced reporting. Starting in 2017, the club will also post a health survey on the club website every two years. After a 5-year period, the development may be compiled and studied.



More information is also needed regarding the relationship between SM at MRI and clinical symptoms caused by SM. The club is observing the research and development of this issue.

Before more information is available on the above, no official health program concerning SM, will be introduced. The following recommendations can serve as a guide in the breeding work until further notice:

- Dog showing clinical symptoms of SM must obviously not be used for breeding.
- Breeding combination having caused offspring with symptoms of SM must not be repeated.
- Male/female, which from several various combinations has produced offspring with clinical symptoms of SM, should not be further used for breeding.
- Male/female, which previously has produced offspring with clinical symptoms of SM, should be used with caution and if used, with an individual not having siblings, offspring or other close relatives with symptoms of SM.
- Male/female having siblings with symptoms of SM, should be used with caution and if used, with an individual not having siblings, offspring or other close relatives with symptoms of SM.

The raising of the age for breeding debut, which the revised health program for heart, implies, can be expected to have a positive impact also on SM, in the sense that more dogs that develop clinical symptoms of SM should be possible to be caught before they have been used for breeding.

If breeders/dog owners choose to screen their dogs, with respect to SM prior to breeding, SCKCS recommendation is to follow the breeding recommendations developed by the Kennel Club/BVA. These recommendations are available on the Kennel Club's website

[https://www.bva.co.uk/uploadedFiles/Content/Canine Health Schemes/CM-SM_breeding_recommendations\(1\).pdf](https://www.bva.co.uk/uploadedFiles/Content/Canine_Health_Schemes/CM-SM_breeding_recommendations(1).pdf). Currently, SCKCS has no breeding recommendations of their own, regarding screening results beyond these.

The possible correlation between SM and skull shape having emerged in research studies, should be considered in breeding work, in that individuals with an extreme exterior with a wide and short skull (especially at the back) should be avoided for breeding. SKCKS is observing the development in this area of research.

Eyes

SCKCS recommends that breeding animals should be eye screened before the breeding debut, at the earliest at 1 year of age. The results from screening presented in the table below are taken from SKK Breeding Records (Avelsdata). If the dog is eye screened

several times, only the latest result is noted. A dog can have several different diagnoses. We can conclude that we have no single eye disease that is a major problem in the breed. The diagnoses with the highest numerical data from eye screening are retinal dysplasia (RD) and Distichiasis (see table below).

Resultat undersökningar ögon 2012-2016						
	2012	2013	2014	2015	2016	2012-2016
Antal undersökta	243	253	252	235	243	1226
UA	213	213	227	181	197	1031
% UA	88%	84%	90%	77%	81%	84%
Corneadystrofi		2	2	6	6	16
Colobom						
Linscolobom	1					1
Katarakt, icke ärftlig					2	2
Katarakt bakre polär						
Katarakt total			1	1		2
Katarakt övr. partiell						
Kongenital katarakt partiell nukeleus						0
Katarakt partiell nukleus			1	1		2
Katarakt partiell cortex ekvatoriell	1	2	1	1		5
Katarakt partiell cortex främre	1		1	4	2	8
Katarakt partiell cortex bakre	3			1		4
Katarakt partiell cortex punktförmig	1			1	2	4
RD multifokal	1	2	3	3	5	14
RD geografisk	7	10	4	13	11	45
Näthinneveck	3	7	2	5	2	19
Glaukom						0
Distichiasis	11	8	10	15	13	57
Entropion medial	3	9	3	1	2	18
Entropion undre		1			1	1
Vitreusprolaps	2	1				3
Ektopiskt Cilium	1	1				2
Artesia punta lacrimalis		1				1
PPM irir-iris lindrig		1				1
PHTVL/PHPV grad 2-6		1				1
Retinopati sannol. ej ärftlig				1		1
Retinopati ärftlig				1		1

RD, retinal dysplasia, is an incorrect development of the retina and occurs in four different varieties (mild retinal dysplasia/retinal folds, multifocal retinal dysplasia, geographic retinal dysplasia and total retinal dysplasia). The SKK general breeding recommendations regarding RD are: Mild retinal dysplasia/retinal folds and multifocal



retinal dysplasia does usually not disqualify for breeding; mating with free individual is recommended.

Distichiasis (incorrectly growing eyelashes) improperly emerge from the sebaceous glands in the eyelid margin. Eyelashes that can be short and hard, and sometimes point sideways, instead of straight out, and can irritate the cornea. Our personal experience is that the eyelashes of the Cavalier are mostly soft and usually not a problem for the dog. For more information about Distichiasis see skk.se under Breeding/Health/Area around the eye and Breeding/Health.

Further, we feel that watery eyes of the breed can also be caused by clogged tear ducts. It is often related to the eye socket being too large for the eye, whereby the tears flow at the side of the tear duct. This often is the case with young dogs, where the eye has not finished growing, and often disappears when the dog becomes an adult.

In the reports from the BSI, Breed Specific Instructions for judges, a few notes on prominent (protruding) eyes have been submitted. The breed standard notes that the Cavalier shall have large dark eyes but not prominent (protruding), this is something we should consider in our breeding work so that the eyes do not become too large, as this may cause eye injuries, and watery eyes, etc.

Breeding Goal Eyes

Maintain the low instance of eye diseases in the breed.

To avoid eye problems associated with the exterior, such as large (prominent) eyes.

Breeding Strategy Eyes

We continue to recommend breeders and dog owners to do eye screening prior to breeding. This makes it possible to follow the development of various eye problems in the breed.

SCKCS refers to the SKK breeding recommendations regarding eye diseases, when available. (see <http://www.skk.se/sv/uppfodning/halsa/halsoprogram/ogon/>).

To, in breeding work, also consider the area around the eye (adnexa) in the selection of breeding animals, e.g. problems caused by large (prominent) eyes (increased risk of damage to eyes and watery eyes). Also Distichiasis and Entropion, which are present in the breed, according to SKK Breeding Records (Avelsdata), have a connection to breed exterior and the eye area (for more information see <http://www.skk.se/sv/uppfodning/halsa/halsoprogram/Omradet-runt-ogat/>).

Patellar Luxation

The recommendation of SCKCS is that breeding animals should be examined for Patellar Luxation at the earliest 1 year of age and that the results should preferably be without

remark prior to breeding. If using dogs with grade 1 the club advocates using it with an individual, which is free. Individuals with grade 2 and 3 should not be used for breeding. If the dog has several patellar certificates it is always the last, which is valid.

RESULTAT UNDERSÖKNINGAR KNÄ 2012-2016						
	2012	2013	2014	2015	2016	2012-2016
Antal undersökta	244	246	255	194	254	1193
UA	236	227	242	182	238	1125
%UA	97%	92%	95%	94%	94%	94%
Patella, mediant grad 1	7	9	10	11	13	50
patella, lateralt grad 1		1		1	3	5
Patella, mediant grad 2	1	9	2			12
Patella, mediant grad 3			1			1

The above chart shows that medial patellar grade 1, and also grade 2, is present in a small scale (data retrieved from SKK Breeding Records/Avelsdata). (Note: In those cases where a dog is examined several times in the same year, it is only the latest result which is included in the table).

Breeding Goals Patellar Luxation

Maintain the low frequency of Patellar Luxation.

Breeding Strategy Patellar Luxation

We continue to recommend breeders and dog owners to have the patella examined before the dog is used for breeding, to maintain the low frequency. Ideally, free breeding animals should be used, but it is also ok to mate a dog with patellar luxation grade 1 with a free individual.

Episodic Falling, Curly Coat and Dry Eye

The diseases exist within the breed and DNA tests for each condition have been developed, but they are not properly validated and therefore they should not be considered completely reliable. We are following the development of these diseases, but they have not led to any targeted action at this time.

Breeding Goals Episodic Falling and Curly Coat/Dry Eye

Maintain a low incidence of both diseases within the breed.

Breeding Strategy Episodic Falling and Curly Coat/Dry Eye

There are diseases that are of greater clinical importance within the breed and should be given priority over the EFS and CCS. No targeted measure is currently considered to be necessary for these diseases and SCKCS has no general recommendation of DNA testing breeding stock before breeding. However, it may in some cases, be justified to do DNA tests, if the breeder has information about any of these diseases occurring in close relatives of the prospective breeding animal.

Breeders and dog owners who choose to test their breeding animals, are according to the SKK rules required to take into account the results of the test in their breeding work. This means that a carrier of any of the diseases can only be mated with a dog that is free from the corresponding predispositions. A dog, which at the DNA test, is given the result it may be genetically affected, must not be used for breeding, even if the dog has not yet shown any clinical symptoms.

What is being done in our Neighboring Countries regarding Health?

We have mapped out what the countries Finland, Denmark, Norway, the Netherlands and Great Britain are focusing on in their health work. The regulations and recommendations vary greatly and you may wonder why, when the breed problems are so similar. There is one common health problem that all focus on and that is the heart issue, for which there are either registration rules or recommendations.

Summary Goals Health

In summary, the top priority in the breeding work for health is to reduce the incidence of early heart murmurs of the breed. Next to murmurs, Syringomyelia is a disease that should be given high priority in breeding. So, the main goals of the breed's health are:

- Fewer dogs developing heart murmurs
- Fewer dogs developing SM
- Maintain the low frequency of eye diseases and patellar disorders
- Maintain the low frequency of other diseases

Summary of Strategies Health

Priorities and strategies to reach the goals

The breed has a relatively high incidence of early heart murmur. Dogs which contract SM usually do so before the age of 3. The SKK health program for heart has not achieved the desired results. Instead of working with breeding barriers, we want to reverse the mindset, partly by raising the age for the breeding debut to a minimum of 3 years of age, but most of all by limiting young males to a maximum of 5 litters before the age of 6, and in doing so encouraging breeders to use heart-healthy old males and also, owing to their confirmed "health", improve cardiovascular status. Before males are used for breeding after 6 years of age, they are to be heart tested again without remark.

We continue to recommend breeders do eye-screening and to examine the patella before they use the dogs for breeding to maintain the low incidence of these health problems. However, it is okay to mate a dog with patella grade 1 with a free individual.

We can follow cardiovascular statistics via the SKK databases. Regarding clinical symptoms of SM, we need more knowledge about the presence in Sweden. We are



therefore planning as of 2017 to post a web survey to collect more information. The plan is to conduct this every two years so that we can follow the development trend and evaluate in 5 years. We will also market our health records more clearly to get more information in that way.

Mentality

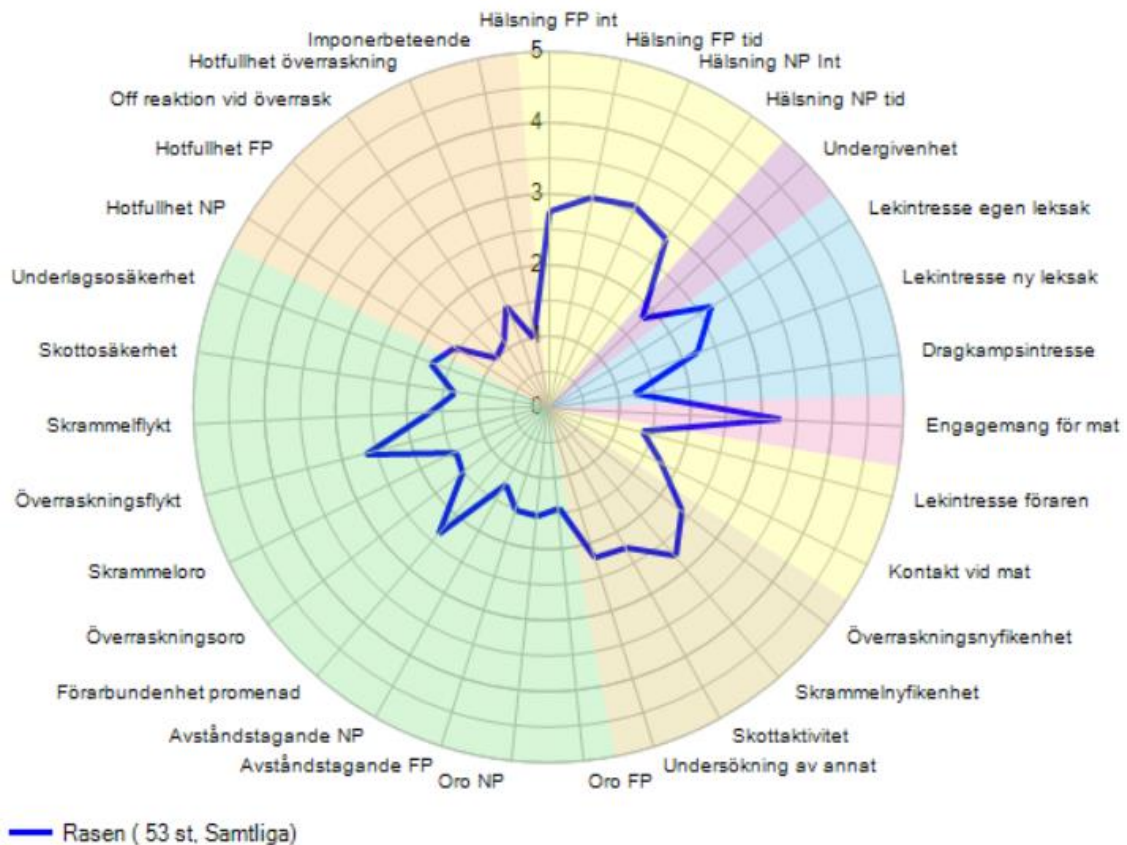
Cavalier King Charles Spaniel is generally a happy outward dog without aggressive or nervous tendencies. The Cavalier is a common breed, so there are of course individuals, which guard both their toys and chewing bones, but when it comes to contact with people and other dogs, there is never a problem. Normally it is not a one-man-dog, but it loves everybody and is often fond of children.

Current Situation

Mentality Description

Currently, (in September 2016) 53 Cavaliers have completed SKK new behavioral and personality description, BPH, which was launched in 2012. Updated summaries of BPH results on described dogs may be found in the SKK Breed data.

The spider diagram below shows the average of the dogs so far described in the breed.



The diagram notes in brief that the average for the breed (or at least for the dogs described) depicts a dog that greets a stranger cheerfully, but still relatively balanced, which is relatively curious and also engaged in food. When playing they prefer their own toy rather than a borrowed one and would rather not be involved in a tug of war. The described dogs' average is low as regards threat (i.e. the behavior is rare in the breed) but at a rapidly emerging surprise a certain tendency of distance control/escape, can be seen, which is common in most breeds described in BPH.

In the breed summary of BPH it can be noted that a total of 53 Swedish bred dogs participated in BPH, 52 with shooting tests and 1 without. A slightly greater number of females than males have participated and all the dogs have achieved "Completed BPH", i.e. none has been canceled.



Sammanställning per år	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Totalt för 2005-2016
Antal födda	1 220	1 289	1 212	1 106	1 095	1 019	1 070	990	947	868	873	568	12 257
Antal starter BPH	1				1	11	2	15	10	10	3		53
varav genomförda BPH	1				1	11	2	15	10	10	3		53
Med skott	0				1	11	2	15	10	10	3		52
varav - hanar	0				1	6	1	3	5	4	2		22
varav - tikar	0				0	5	1	12	5	6	1		30
Utan skott	1				0	0	0	0	0	0	0		1
varav - hanar	0				0	0	0	0	0	0	0		0
varav - tikar	1				0	0	0	0	0	0	0		1
Ägaren avstår skott	0				0	0	0	1	0	0	0		1
Beskrivaren avbryter	0				0	0	0	0	0	0	0		0
Ägaren avbryter	0				0	0	0	0	0	0	0		0
Oacceptabelt beteende	0				0	0	0	0	0	0	0		0
Fördjupad genomgång	0				0	0	0	0	0	0	0		0

Goals Mentality

Temperament is an important characteristic of the breed. The Cavalier is, according to the standard, lively, graceful and well balanced with a mild expression. Its character is absolutely fearless and dashing, happy, friendly, never aggressive and without any hint of nervousness. Its affection and softness makes it an ideal companion that fits into most environments.

The mentality breeding goal is that we should maintain the good mentality described in the standard and shown in the breed today.

Breeding Strategy Mentality

SCKCS is planning to implement a number of BPH in the upcoming year. The club will also market BPH so that more dog owners and breeders are aware of the possibility to describe their dogs themselves.

By studying BPH results for the breed, its mentality may be mapped and assessed to be a guide for breeding.

Exterior

Current Situation

Cavalier King Charles Spaniels have traditionally been a "head breed" where beautiful heads with dark round eyes have been rewarded. It is important not to forget that the Cavalier also needs a good build.

BSI (Breed Specific Instructions) note 4 points, where show judges should pay attention to excesses and errors, which endanger the soundness and health. Of these, 3 are related to the tendency of Brachycephaly.

1. Breathing: Respiratory problems with "snorting".
2. Head: Too short muzzle and very short rounded skull.
3. Eyes: Protruding/prominent eyes in shallow eye sockets and loose eye rims. Abundant tear flow and folds of skin with signs of irritation. *"Eyes shall be big, dark and round, without being protruding."*
4. Movements: An abnormal movement pattern with frantic scratching and/or signs of pain for no reason, when the dog is on a leash may give notice of a severe neurological disorder, Syringomyelia.

A review of the BSI reports shows that in the 2015 official shows, 42 judges judged a total of 1616 Cavaliers. Of these judges, 9 thought that the breed could be removed from the list, 23 judges thought the breed should remain. Although 23 judges believe that it should stay on the BSI list, only 9 who found something to criticize related to BSI. Only a few of the judged dogs exhibited any of these exterior exaggerations, almost exclusively running or protruding eyes. The fact that the judges, who had found something to criticize, want to keep the breed on the BSI list is not strange. As a specialty club, however, we are questioning why judges want the breed to remain in the BSI list, when they have not found any of the faults SKK has instructed them to look for.

Head/Shape of Skull

A trend, that has become apparent in recent years, is a type transition to round skulls, low set ears and, along with hard marked stop. This is seen worldwide today and is regarded by some as "modern", but does NOT support the current breed standard and is not desirable. A broad, short skull, especially at the back, can be a risk factor for Syringomyelia and should be given particular attention.

Eyes

The breed standard notes that the eyes shall be large, dark and round, but not prominent. "Prominent" is to be read in this context as "protruding". The eyes shall instead be pronounced in a way that they draw attention to them. Much of the Cavalier soul lies in the gentle, friendly gaze from the large, dark, round eyes.

Goals Exterior

The Cavalier exterior shall be evolved in a direction where no Cavaliers are getting criticism in the BSI reports. Special focus in the breeding work on the exterior should be on the head/skull shape and eyes, because the exaggerations in these areas will result in obvious risks for health problems.

Breed Strategy Exterior

Promote a well thought out breeding work, and inform and educate breeders about what they should consider and prioritize in their breeding work, regarding health and exterior that is linked to health.

Dogs with exterior exaggerations regarding the shape of the skull (too short muzzle and/or very short rounded skull), or eyes (protruding/prominent eyes in shallow eye sockets and loose eye rims) must not be used for breeding.

It is desirable that the breeding animals are shown with at least Very Good result, but not required, as we want to use regular family dogs for breeding, and these have most often not been shown.



Image: <https://www.pet-art.net/oil-pet-portraits-gallery.htm>.



Summary RAS

Major focus in the Cavalier breeding work should be on health and especially the breed's heart problems as well as Syringomyelia (SM). The frequency of early heart murmurs has not decreased to the extent desired. We are many, who are reporting that veterinarians around the country, say they do not hear as many early onset heart murmurs now as earlier, but we cannot see it in the general heart statistics. In an attempt to get ahead on the issue, a revised health program for the heart has been introduced from 2017, comprising a raised lowest debut age for breeding animals to 3 years of age, and a restriction in the use of young males. The program is expected to result in an increased use of heart healthy elderly males for breeding.

There is not enough knowledge about the prevalence of SM in Sweden and especially about breeding strategies that may be successful. With a raised age for the breeding debut, the vast majority of dogs developing clinical symptoms of SM, may be discovered and excluded, before they are used for breeding.

Plan for Continued Work in the Club

SCKCS plans to, in the coming years, arrange recurring breeder meetings, where breeding strategies in RAS are reviewed. We will also develop a web-based health survey every two years. In each local area at least one breeder meeting per year will be organized with specific themes related to RAS and at least one opportunity to heart test family dogs. In connection with SCKCS shows there will be a 5+ and a veteran parade to highlight old healthy males for breeding.

As of 2017, the club will extend its reward function to include show, as well as competition and feat dog.



Appendix 1: Breed Standard

ORIGIN: Great Britain.

DATE OF PUBLICATION OF THE OFFICIAL VALID

STANDARD: 04.11.2008.

UTILIZATION: Companion and Toy.

FCI-CLASSIFICATION: Group 9 Companion and Toy
Dogs.

Section 7 English Toy Spaniels.

Without working trial.

GENERAL APPEARANCE: Active, graceful and well balanced,
with gentle expression.

BEHAVIOUR / TEMPERAMENT: Sporting, affectionate,
absolutely fearless. Gay, friendly, non-aggressive; no tendency
towards nervousness.

HEAD

CRANIAL REGION:

Skull: Almost flat between ears.

Stop: Shallow.

FACIAL REGION:

Nose: Nostrils black and well developed without flesh marks.

Muzzle: Length from base of stop to tip of nose about 1 1/2 ins. (3,8
cm). Well tapered. Face well filled below eyes. Any tendency to
snipiness undesirable.

Lips: Well developed and not pendulous.

Jaws/Teeth: Jaws strong, with a perfect, regular and complete scissor
bite, i.e. the upper teeth closely overlapping the lower teeth and set
square to the jaws.

Eyes: Large, dark, round but not prominent; spaced well apart.

Ears: Long, set high, with plenty of feather.

NECK: Moderate length, slightly arched.

BODY :

Back : Level.

Loin : Short-coupled.

Chest : Moderate; good spring of ribs.

TAIL: Length of tail in balance with body, well set on, carried
happily but never much above the level of the back. Docking
previously optional when no more than one-third was to be
removed.

LIMBS

FOREQUARTERS:

General appearance: Legs moderately boned, straight.

Shoulders: Well laid back.



HINDQUARTERS:

General appearance: Legs with moderate bone.

Stifle: Well turned.

Hocks: No tendency to cow- or sickle-hocks.

FEET: Compact, cushioned and well feathered.

GAIT / MOVEMENT: Free-moving and elegant in action, plenty of drive from behind. Fore-and hindlegs move parallel when viewed from in front and behind.

COAT

HAIR: Long, silky, free from curl. Slight wave permissible. Plenty of feathering. Totally free from trimming.

COLOUR: Recognized colours are :

- **Black and Tan:** Raven black with tan markings above the eyes, on cheeks, inside ears, on chest and legs and underside of tail. Tan should be bright. White marks undesirable.
- **Ruby:** Whole coloured rich red. White markings undesirable.
- **Blenheim:** Rich chestnut markings well broken up, on pearly white ground. Markings evenly divided on head, leaving room between ears for much valued lozenge mark or spot (a unique characteristic of the breed).
- **Tricolour:** Black and white well spaced, broken up, with tan markings over eyes, cheeks, inside ears, inside legs, and on underside of tail.

Any other colour or combination of colours highly undesirable.

WEIGHT: 5,4 - 8 kg (12 - 18 lbs). A small, well-balanced dog well within these weights desirable.

FAULTS: Any departure from the foregoing points should be considered a fault and the seriousness with which the fault should be regarded should be in exact proportion to its degree and its effect upon the health and welfare of the dog.

DISQUALIFYING FAULTS:

- Aggressive or overly shy dogs.
- Any dog clearly showing physical or behavioural abnormalities shall be disqualified.

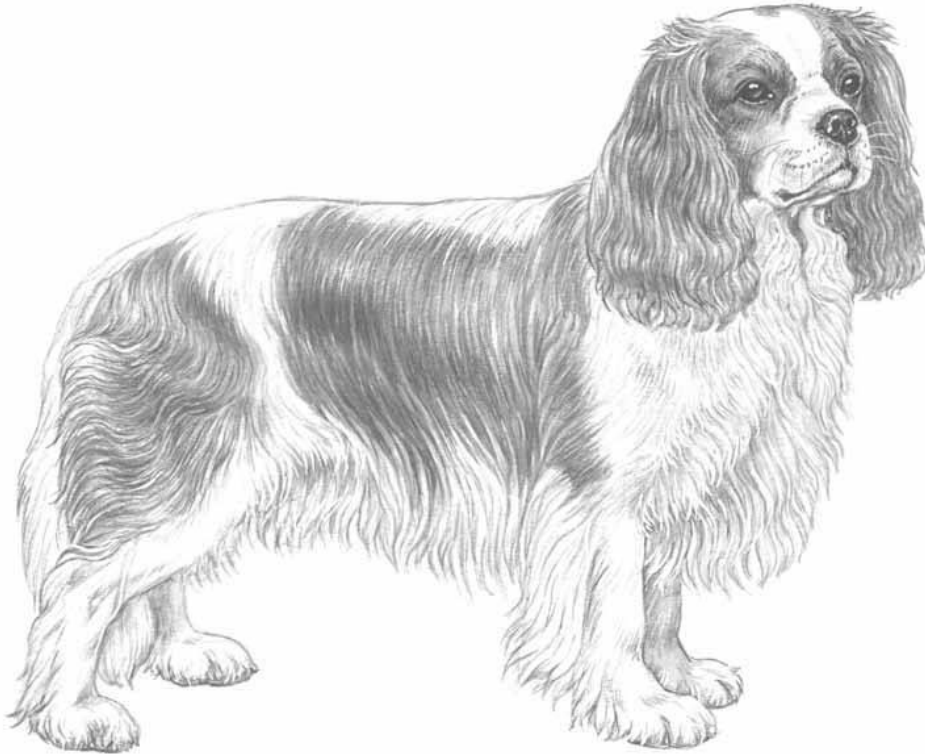
N.B.:

- Male animals should have two apparently normal testicles fully descended into the scrotum.
- Only functionally and clinically healthy dogs, with breed typical conformation should be used for breeding



Citation

www.skk.se



Drawing: M. Davidson (<http://www.skk.se/hundraser/cavalier-king-charles-spaniel/>).



Appendix 2: Health Program concerning Heart

Registration prohibiting the offspring from parents/animals lacking official certificate for heart without remark. The certificate may not be older than 12 months at the time of mating. The lowest age for official examination is 3 years of age. Breeding animals, who have parents that lack certification without remark at the lowest 5 years of age, must reach an age of at least 5 years themselves, prior to mating and at this age have a heart certificate without remark. Males, which are ID tagged and at the earliest 8 years of age have a heart without remark, but later develop murmurs, may be used for breeding.

Registration prohibiting offspring from parent animals contracting murmur before 5 years of age (the parent animal will receive a breeding ban). Already produced offspring from parent animal contracting murmur before 5 years of age may not be used for breeding (breeding banned).

Registration ban for offspring of male, younger than 6 years of age, already used for 5 litters. Male, which at the age of at least 6 years old, on renewed investigation has an official certificate of heart without remark, is permitted to more litters, provided it has a valid heart certificate.

Valid as of 01/01/2017.

Citation

The SKK website on health program heart

<http://www.skk.se/sv/uppfodning/halsa/halsoprogram/hjartstatus-hos-cavalier-king-charles-spaniel/>

SKK Registration Rules

<http://www.skk.se/uppfodning/regler-policys-och-lagar/skks-registreringsregler/>