Summary of the Breed-Specific Breeding Program (JTO)

Finnish Spitz

2016-2020

Finnish Spitz Club
http://www.spj.fi/en/frontpage/
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Goal-oriented breeding of the Finnish Spitz started officially in 1892, when the first breed standard of a "Finnish barking bird dog" was written. Breeding goal was to develop a skillful dog, who barks at birds perched in trees, and who at the same time is also a beautiful yard dog.

A Finnish Spitz dog uses its voice to indicate the location of game. It is mostly used to hunt forest game birds, but also to some extent as an elk-hunting dog as well as to hunt small game and retrieve birds shot into the water.

Today behaviour of the Finnish Spitz dogs corresponds quite well to the breed standard. Behaviour has developed surprisingly quickly to a more open and more social direction. Thus Finnish Spitz can nowadays be an excellent pet for the whole family. Finnish Spitz is also considered as a healthy dog breed.

It is of particular importance that we remember our special status as the native country of this breed and our responsibility to maintain and develop our living cultural heritage.

1. Population structure and gene pool

Based on registration numbers from abroad, the breed association estimates that the worldwide living population of the Finnish Spitz is somewhat 13 000 – 15 000 dogs. The largest population is in Finland, and the populations in the neighboring countries are also quite numerous.

To widen the gene pool, the cross-border Russian population that is, according to local estimates, growing strongly, was added to the Finnish Spitz population in 2006.

The most important factors shrinking the gene pool are the decreasing registration numbers (Tables 1 and 2) as well as popular sires. In 2004-2014, 8285 puppies were born in Finland, of which 1018 (12.3 %) were sired by the 15 most popular sires. Altogether 739 different sires were used for breeding during the period. Numbers of second generation offspring are unevenly distributed between sires. Many popular sires are also closely related to each other.

Finnish Spitz belongs to the Finnish Kennel Club's health program PEVISA. From the beginning of 2009, at most 70 offspring could be registered for an individual dog in this breed. The number of registrable offspring was lowered to **50** as of the beginning of 2016.

Table 1. Annual statistics of the Finnish Spitz – registrations (Finnish Kennel Club breeding database http://jalostus.kennelliitto.fi/frmJalostustilastot.aspx?R=49&Lang=en)

	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
Offspring (domestic)	574	610	648	687	694	618	904	929	848	767
Imports	7	12	12	7	4	2	2	5		1
Registrations altogether	581	622	660	694	698	620	906	934	848	768
Litters	147	152	144	161	152	150	220	227	207	180
Size of litter	3,9	4,0	4,5	4,3	4,6	4,1	4,1	4,1	4,1	4,3
Breeders	137	135	134	140	137	139	188	204	184	169
different sires used for breeding										
- all	120	118	101	115	113	112	132	148	123	117
- domestic	110	111	98	108	112	108	130	145	121	115
- imports	3	1	1		1	2				
- foreign	7	6	2	7	0	2	2	3	2	2
- average breeding age	5 y 10 mo	5 y 11 mo	5 y 10 mo	5 y 8 mo	5 y 5 mo	5 y 9 mo	5 y 9 mo	5 y 5 mo	5 y 6 mo	5 y 1 mo
different dams used for breeding										
- all	144	150	144	161	152	148	218	226	207	180
- domestic	141	149	143	159	150	147	216	224	206	179
- imports	3	1	1	2	2	1	2	2	1	1
- average breeding age	4 y 9 mo	4 y 8 mo	4 y 7 mo	4 y 6 mo	4 y 5 mo	4 y 5 mo	4 y 5 mo	4 y 8 mo	4 y 7 mo	4 y 11 mo
Grand sires	159	163	142	152	149	138	159	171	158	142
Grand dams	213	216	197	210	215	203	259	279	240	223
Inbreeding %	1,86	1,96	1,93	1,98	2,29	2,27	2,42	2,42	2,67	2,62

Table 2. Gene pool of the Finnish Spitz per generation (4 years; Finnish Kennel Club breeding database http://jalostus.kennelliitto.fi/frmJalostustilastot.aspx?R=49&Lang=en)

	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
litters	604	609	607	683	749	804	834	809	804	812
different sires used for breeding	331	314	305	323	338	342	339	347	346	338
different dams used for breeding	458	465	481	540	579	594	608	608	609	591
ratio of sires/dams	0,72	0,68	0,63	0,60	0,58	0,58	0,56	0,57	0,57	0,57
effective population	541 (45%)	534 (44%)	538 (44%)	588 (43%)	624 (42%)	636 (40%)	641 (38%)	648 (40%)	648 (40%)	631 (39%)
% of males used for breeding	3%	5%	8%	9%	10%	11%	11%	12%	13%	14%
% of bitches used for breeding	5%	8%	13%	17%	21%	23%	24%	25%	26%	25%

Most important breeding objectives regarding the gene pool

- Size of the gene pool should be maintained large enough.
- At the moment a little over 10 % of the males and 25 % of the females are used for reproduction. The aim is to raise these figures.

Requirements for breeding dogs or litters

- Only 50 offspring are registered for an individual dog. The litter, in which this limit is reached, is, however, registered as a whole.
- Maximum inbreeding coefficient of a litter: 6.25 % (calculated from 7 generations).

Additional recommendations for breeding dogs

- Maximum inbreeding coefficient of a litter: 3.0 % (calculated from 7 generations), with influence from a single ancestor at most 1.0 %.
- In a 7-generation pedigree, the number of different individuals should be at least 180.
- Litters of a dog should be as evenly divided between different years as possible. This enables taking into account also trial and health results of the offspring when making decisions which dogs to use in breeding.

2. Key problem points in the breed's behaviour and temperament

According to a health survey conducted in 2014, anxiety or fear of sudden loud noises occurred in 25% of the dogs included in the survey's responses. The sounds, which most commonly triggered a fearful response, were thunder and fireworks. Usually, the same dog would not be afraid of gunshots (the dogs were accustomed to gunfire and associated the sound with a positive thing, i.e. the catch). Genetics and lack of familiarity are behind the fear of sounds.

Breeders must pay attention to a dog's sound sensitivity: a dog that suffers from a clear sound phobia must not be used for breeding. Two dogs that are somewhat anxious of loud sounds should not be mated. Breeders and owners are advised to pay attention to the appropriate conditioning of puppies and young dogs.

Most important breeding objectives regarding behavior and temperament

- Retain the breed's current bird-barking characteristics without forgetting its diverse potential as a versatile hunting dog. The Finnish Spitz is a designated hunting dog, so its mental make-up and other properties must be up to this task.
- Increase the proportion of dogs participating in working trials.

Recommendations for breeding dogs

- Dogs that have demonstrated their abilities in breed-typical working trials as well as been found capable in practical hunting use should be used for breeding.
- Dogs that suffer from a clear sound phobia or are vicious must not be used for breeding.
- A dog should have achieved at least an open class 2 result in a working trial at the age of 15 months.

3. Average lifespan

Average lifespan of the Finnish Spitz seems to have increased by one year during 2010-2014, and was 9 years and 5 months in 2014. The reason for the increment can, however, be the increase in the number of dogs included in the statistics rather than a real change in the average lifespan. The statistics is very typical for an active hunting breed (Table 3). Death by accident is common and the general infirmity and mobility difficulties that develop with age can prompt a decision to euthanize the dog once it is no longer able to fulfil its use purpose.

4. Key health and reproduction problems

Epilepsy

Epilepsy has been the focus of significant attention in this breed and the effort has yielded results. Some high-risk pairings are also carried out in the breed, but they are rare. As a rule, breeders comply with the breed association's recommendations.

Epilepsy is the most common neurological disease of dogs. It has been identified in Finnish Spitz dogs since the 1980s. According to doctoral research performed by veterinarian Ranno Viitmaa, the incidence of epilepsy in Finnish Spitz dogs is 5.4%, with males being more prone to contracting the disease (the study was based on data from 2,069 dogs; https://helda.helsinki.fi/handle/10138/41571?locale-attribute=en).

On average, Finnish Spitz dogs suffer their first seizures at the age of three, get on average three seizures per year and the typical length of a seizure is 12 minutes. Partial seizures, which are commonly associated with behavioural changes and autonomous symptoms like vomiting and drooling, were typical for the breed. More frequent occurrence of seizures can indicate progression of epilepsy, although the course of epilepsy is usually benign in Finnish Spitz dogs.

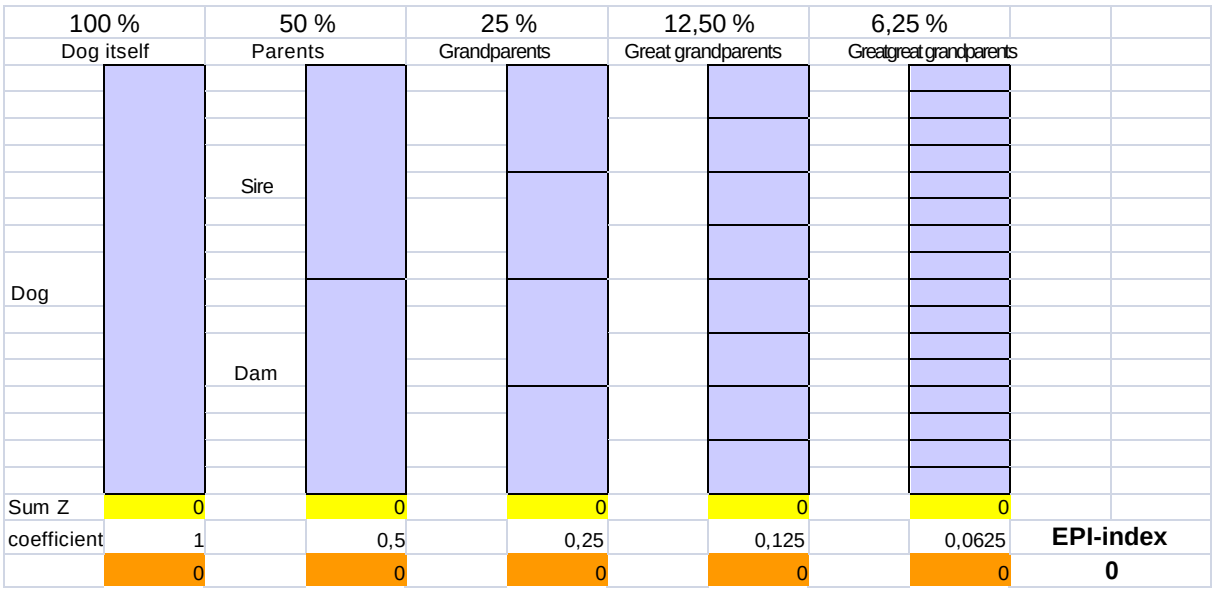
As a cause of death epilepsy has been recorded to 13 dogs (1 %) in the Finnish Kennel Club breeding database. In a health survey in 2014, epilepsy was reported in five dogs (2.75 %).

Heritability estimate for the epilepsy in the Finnish Spitz is 0.22 (Master's Thesis by Hanna Bragge in 2008, University of Helsinki). The disease is most probably polygenic.

Breed association estimates so called epi-indices for the dogs, based on their epileptic relatives. Epileptic dogs are recorded in an open database where epi-indices are included in the pedigrees, together with notations explaining which relatives are included in the index: http://metsastyspystykorvat.com/spj/.

Epi-index is calculated from a five-generation pedigree, taking into account the genetic relationships between the dog and its epileptic ancestors. Letters represent epileptic dogs in the pedigree and the probability of genes in common between the epileptic ancestor and the dog.

- I = the dog itself, 1.0 ie 100 %
- J, S and V = offspring, full-sib or parent, 0.5 ie 50 %
- P = half-sib or grandparent, 0.25 ie 25 %



EPI-index has been an effective tool in breeding: the average epi-index of the breed as well as the number of epileptic dogs has decreased since 1997 when the calculation of epi-indices started. A clear improvement (Figure 1) can be seen starting from the year 2001, when the breeding advisors of the association started to use the indices.

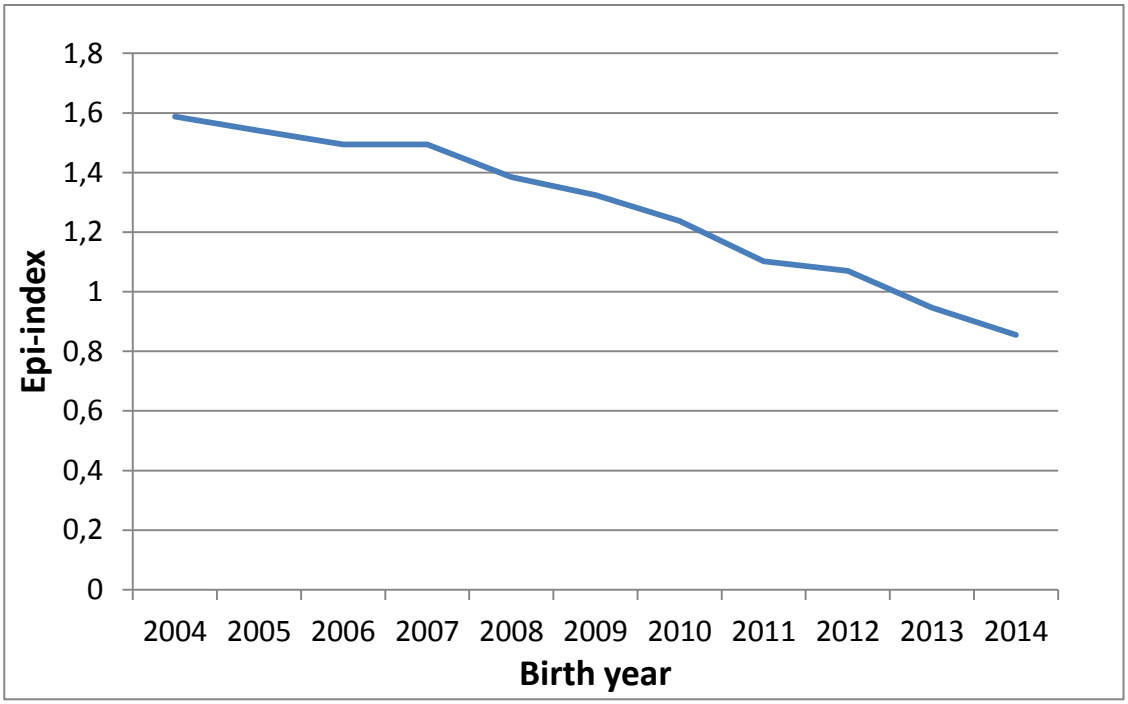


Figure 1. Change in the average EPI-index of the Finnish Spitz during 2004-2014.

Patellar luxation

Knee examination statistics indicate that the situation is good regarding patellar luxation (Table 4), but the association has been informed of cases in which a young dog has been euthanized or has had to undergo surgery before the age of examination (12 months) because of strong symptoms. A build, in which the long bones of the hind leg are convoluted respective to each other, the trochlear groove is shallow and the entire knee angle is too open makes the dog susceptible to patellar luxation. The structure of the hind leg is a hereditary trait, which can be influenced through breeding.

Eye diseases

Different cataracts as well as PHTVL/PHPV are the most common eye diseases in the breed (Numbers of eye examinations in Table 5 - statistics including all the diagnoses available in the Finnish Kennel Club breeding database). Incidence of cataracts is approximately 4 % and PHTVL/PHPV (grades 2-6) approximately 1 % of the dogs examined.

Missing teeth

Missing teeth is a widespread problem in the breed. Tooth problems are strongly hereditary. A missing individual tooth or even a few teeth has no impact on the dog's quality of life, but there are already so many dogs with missing teeth that it is not possible to remove all of them from breeding use. In this situation, the recommendation is to use dogs with only mild teeth problems for breeding and to mate them with a partner, which has a full set of teeth.

Most important breeding objectives regarding health and reproduction

- Maintaining the good health of the breed is the most important breeding goal.
- Individuals transmitting hereditary problems should be culled from breeding without reducing the gene pool too much. Aim is to develop health indices for eye and patella problems.

Requirements for breeding dogs

The PEVISA health program of the Finnish Spitz started in 1994. In 2016-2020 the program includes:

- Veterinary **patella examination** before the second litter. Offspring will not be registered from parents with patellar luxation (grade 2 or worse). If one parent has a grade 1 patellar luxation, the other one has to have grade 0 (normal patellas).
- Veterinary **eye examination** before the second litter. Offspring will not be registered from parents with hereditary cataract, PRA, or PHTVL/PHPV (grades 2-6). If one parent has a grade 1 PHTVL/PHPV, the other one has to be free of PHTVL/PHPV.

Additional recommendations for breeding dogs

- Despite of the PEVISA requirements starting only from the second litter, eye and patella examinations are recommended already before the first litter.
- It is not recommended to use in breeding epileptic dogs, their progeny, their full-sibs, or a dog that has produced an epileptic offspring. If the epi-index of a dog is 1.8 or larger, it is recommended that the dog is not used for breeding. If the epi-index is 1.5 or larger, the dog should be mated only to a dog whose epi-index is below 1.0.
- Dams, which resist mounting, or sires that are repeatedly reluctant to mount even though the timing is confirmed to be correct must not be used for mating if even a switch in partners fails to produce the desired end result. Nor should artificial insemination be used in such cases. Dams, which have suffered from birthing problems with two litters or that have undergone a Caesarean section twice must not be used for breeding again.
- Dogs used for breeding should be mostly over four years old, PEVISA health-checked dogs. Dogs under four years of age are recommended to have at most two litters, and dogs under two years of age are not recommended for breeding at all. Also bitches are recommended to reach two years of age before the first litter.

Table 3. Causes of death in the Finnish Spitz. Statistics collected 21th Jan 2016 (Finnish Kennel Club Breeding database http://jalostus.kennelliitto.fi/frmTerveystilastot.aspx?R=49&Lang=en).

Cause of death	Average life span	Total
Accident	4 years 11 months	154
Age (natural or euthanasia)	12 years 0 months	512
Congenital defect or malformation of a puppy	2 years 5 months	1
Damage done by large carnivores	5 years 6 months	12
Dead without diagnosis of illness	9 years 8 months	67
Endocrine disease	10 years 4 months	16
Euthanasia due to behavioral problems	5 years 8 months	37
Euthanasia, non-diagnosed	9 years 11 months	146
Eye disease	8 years 0 months	6
Heart disease	11 years 8 months	32
Immunological disease	12 years 3 months	2
Jecur or digestive disease	7 years 6 months	19
Labor difficulties	5 years 2 months	12
Lost	6 years 4 months	13
Neurological disorder	7 years 9 months	21
Other unspecified disease	7 years 6 months	64
Respiratory disease	12 years 0 months	16
Skeletal or articular disease	6 years 7 months	18
Skin or ear disease	5 years 0 months	4
Spinal disease	14 years 3 months	1
Tumor, cancer	10 years 9 months	69
Urinary disorder	8 years 5 months	10
Cause of death not specified	9 years 0 months	270
Altogether	9 years 7 months	1502

Table 4. Patella examination results in the Finnish Spitz dogs born in 2006-2015. 0 = normal, 1 = near normal, 2-4 = different grades of luxation, 4 being the most severe (Finnish Kennel Club breeding database http://jalostus.kennelliitto.fi/frmTerveystilastot.aspx?R=49&Lang=en)

Year	Born	0	1	2	3	4	operated	Total
2006	768	157	6	2	0	0	0	165
2007	848	178	11	3	1	0	0	193
2008	934	190	9	5	0	0	0	204
2009	906	176	13	5	3	2	0	199
2010	620	128	8	4	1	0	0	141
2011	698	115	6	2	1	1	0	126
2012	694	133	9	1	0	1	0	144
2013	660	98	8	1	0	0	0	107
2014	622	37	2	1	0	0	0	40
2015	577	0	0	0	0	0	0	0
Total	7327	1212	72	24	6	4	0	1319

Table 5. Eye examination results in the Finnish Spitz dogs born in 2006-2015 (Finnish Kennel Club breeding database http://jalostus.kennelliitto.fi/frmTerveystilastot.aspx?R=49&Lang=en)

Year	Born	Examined	Examined %	Healthy	Healthy %
2006	768	166	22%	146	88%
2007	848	191	23%	177	93%
2008	934	202	22%	184	91%
2009	906	189	21%	175	93%
2010	620	138	22%	124	90%
2011	698	125	18%	115	92%
2012	694	141	20%	130	92%
2013	660	101	15%	98	97%
2014	622	32	5%	27	84%
2015	577	1	0%	0	0%