



Breeding Guidelines

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Introduction

- The Finnish Lapphund Club of NSW is a breed club affiliated with Dogs New South Wales (NSW). These guidelines have been produced for the use of registered Finnish Lapphund Breeders in NSW. The use of these guidelines is voluntary.
- Breeders from other states or countries are welcome to refer to these guidelines, but should be aware of the breeding guidance of their local canine governing body.
- These guidelines have been produced with the rationale that the Finnish Lapphund breed is a precious domestic landrace in its country of origin, and that our breeding stewardship is a privilege and a responsibility.
- The aim of these guidelines is to provide a resource for breeders in the Australian breeding context that remains in overall alignment with the Finnish Kennel Club Breeding Strategy for the Finnish Lapphund 2016-2019. The English-speaking Finnish Lapphund breeder community also may know the Finnish document by the name “Lapphund club of Finland/ Lappalaiskoirat Ry Breeding Strategy”. The Finnish Language abbreviation (JTO) has been used throughout these guidelines to refer to this document.
- These breeding guidelines are in alignment with breeding direction published in these additional documents and communications:
 - The Finnish Kennel Club General Breeding Strategy (FKC-GBS).
 - The International Canine Federation (FCI) International Breed Standards and Rules documents (FCI-IBS and FCI-IBR)
 - Lapphund Club of Finland (Lappalaiskoirat) Breeding Committee updates (LBC)
 - The codes of ethics of the FCI, the Australian National Kennel Club (ANKC) and the code of ethics and rules and regulations of Dogs NSW.
- Where our recommendation for breeding practice differs from breeding practice or guidance in Finland, or from the minimum breeder requirements set by the ANKC or DOGS NSW, this has been mentioned explicitly.

Club Vision for the Finnish Lapphund Breed

The Finnish Lapphund is a primitive spitz breed with moderate unexaggerated conformation. The Finnish Lapphund should be intelligent, courageous, calm and willing to learn, friendly and loyal.

The Finnish Lapphund of the future should be a mentally and physically healthy breed with the broadest possible genetic base and healthy longevity. The necessary temperament and conformational features that allow for a sound working dog should be maintained.

The Finnish lapphund breed standard has always been kept fairly loose. Small conformational differences have not been deciding factors in the show ring or in selection of breeding stock. Thus the breed has remained delightfully diverse, albeit with enough shared type to remain recognisable as a defined breed.

There are many delightful, almost perfect Finnish Lapphund dogs with distinctly unique personalities both in their nature, and in appearance. The great wealth of the breed is that two identical Finnish Lapphund dogs do not exist. This is something to cherish.

Breeders bear a heavy responsibility in the fight against hereditary defects within the breed. Because it is they who will make the final selection of breeding dogs, it is vital that they are familiar with heritable problems both within their breeding lines and within the breed.

The general principle of free and open disclosure for both positive and negative health-relevant information is warmly encouraged. Transparency in the flow of health information for all Finnish Lapphund owners is to be commended.

Finnish Lapphund puppies should experience a physically and mentally beneficial environment for as long as they remain in breeding homes, to lay the foundations that will ensure that the naturally positive temperament of the breed will shine into adulthood.

(Supported by: JTO and FCI Code of Ethics)

Recommendations: Overview

Recommendations for the preservation of breed diversity (A to F)

Recommendations A-E are measures to help the breed remain genetically diverse, regardless of any individual diseases that may be present in the breed. These measures can all be implemented by individual breeders and require no special help or input from veterinarians, scientists or the wider breeding community. Recommendation F is best approached with a community of breeders sharing data together, although individual private databases are quite possible.

- A Natural Mating
- B Use of artificial insemination (AI)
- C Considerations for bitches.
- D Considerations for sires.
- E Other strategies to maximise breed diversity
- F Measures of genetic diversity and relatedness.

Recommendations for specific disorders & diseases (G to J)

Recommendations G-J need a coordinated whole-of-breed response and scientific input from breeders and the wider dog community and commercial world if they are to succeed in improving overall breed health. It should be noted the main key to preserving **long-term** breed health lies in adhering to the first six recommendations.

- G Eye diseases
- H Hip health
- I Single gene diseases
- J Complex inheritance diseases.

Recommendation A

Only dogs that can mate naturally should be used for breeding. Artificial insemination (AI) should not be used to overcome an unwillingness or inability to mate normally on the part of the bitch or the male. A bitch should be excluded from further breeding if she cannot care for her puppies due to her mental state.

(Supported by:FKC-JBS, JTO, FCI-IBS)

Rationale:

It is important for breeders in Australia to self-regulate and not use AI in animals that are repeatedly proven to be temperamentally unwilling or physically unable to mate.

Genetic factors may influence the success of reproduction. The Finnish Lapphund generally whelps easily. The FLCNSW reaffirms the importance of maintaining this ability to mate and whelp without assistance. The overarching intent of these recommendations to preserve and enhance the soundness and genetic diversity of the breed. Sometimes the genetic health and diversity of the breed may be enhanced by the use of older dogs that have not been previously used at stud. This recommendation is not intended to limit the use of inexperienced but otherwise desirable stud dogs. If a planned mating with a health-tested, previously unused older sire is unsuccessful, and the alternative would be the loss of a diverse bloodline, warm AI remains a sensible option. For bitches, expert veterinary advice should be sought to determine whether the underlying cause of whelping or mothering difficulties is likely to be repeated.

Recommendation B

In the Australian breeding context, a naturally conceived litter does not need to occur before the use of artificial insemination. The FLCNSW supports the option of artificial insemination for maiden bitches and previously unused sires.

(FLCNSW recommendation)

Rationale:

This Recommendation has no equivalent in other breeding guidance. The aim here is to clarify our breeding position in respect of FCI guidance. The FCI-IBR 13 specifies that AI should not be used on animals which have not reproduced naturally before. "Exceptions can be made.... to preserve or increase the genetic pool within the breed."

Artificial insemination is rare in Finland, but has been used frequently in the Australian lapphund community. Of the litters whelped in Australia in 2016, 28% (11/29) used imported semen. This high proportion of AI litters does merit special mention as our breeding custom differs markedly from the breeding norms in the breed's country of origin.

Australia has notably stringent quarantine requirements for imported dogs. The FLCNSW considers that the use of AI enhances the pool of available sires, overcomes the health consequences of population bottlenecks due to a small establishment import population, and alleviates the cost and logistical challenges of importing stud dogs. Chilled AI may reasonably be used to overcome distances between breeding dogs within Australia.

Castration/neutering without a medical reason is rare and discouraged in Finland, but is usual practice for 'pet dogs' in Australia. The Australian practice of early neutering artificially restricts the pool of available sires. Unfortunately early neutering is encouraged by local and state governments. This practice is unlikely to change. The collection and storage of frozen semen prior to neutering may allow for the future breeding of dogs that may show great health and breeding potential as they age, but who would not otherwise be bred.

Delayed use of frozen semen allows time to fully assess the potential of a prospective sire as he ages. It also artificially increases the generation time which is good for minimising genetic drift within the breed. Additionally, current Australian breeders are choosing to include an impressively wide range of stud dogs, including rare lines and older, little used sires in their semen import choices. The majority of Australian older dogs in pet homes are neutered, but Australian breeders may locate worthy intact older unused dogs overseas. The import of semen from these dogs (subject to appropriate health testing) is a very reasonable breeding strategy.

These factors are all likely to be good for breed diversity and health. As the breed has an excellent natural mating and whelping ability, the likelihood that any given maiden bitch or unused stud would have been unable to mate naturally is very small. The genetic diversity benefits granted by a wider choice of sires is likely to be considerable. For these reasons, the FLCNSW supports the option of AI for appropriately health-tested maiden bitches and unused/unproven sires.

Recommendation C

Bitches should not be mated before the age of 18 months. The total number of litters for each individual Finnish Lapphund bitch should not exceed 5. Sequential cycle 'back to back' litters should not occur more than once in a bitches breeding career.

(Supported by JTO and Dogs NSW)

Rationale:

There are good reasons to delay breeding until physical maturity for bitches. All Australian State Pedigree Dog organisations recommend a minimum breeding age in the interests of bitch welfare, either in their code of ethics, their rules or their regulations. Unfortunately, the suggested advice differs between canine governing bodies. For most State Pedigree dog organisations, including Dogs NSW, the lowest age limit for bitch mating is currently 12 months. It is the intention of the FLCNSW committee to submit a proposal to dogs NSW to include the Finnish Lapphund on the list of breeds whose bitches should not be mated before 18 months of age. Dogs Victoria have already taken this step and bitches registered in Victoria are not be mated before 18 months. Breeders should be aware that the Finnish JTO recommendation is that neither dogs nor bitches should be bred before the age of 20 months, and that it is preferable to wait till the age of three years.

It should be a rare event for a bitch to have 5 litters. In Australia, the ANKC and Dogs NSW recommend a maximum of 6 litters per bitch before veterinary certification is required. It is the opinion of the FLCNSW that this 6 litters maximum is not in the best interests of bitch welfare or breed diversity. The litter limit in QLD is 4 litters before veterinary certification is required and this is the lowest recommended number of any of the Australian canine governing bodies. The Finnish equivalent recommendation is 5 litters. Breeding for diversity should aim to use a greater number of bitches with each having fewer litters.

Breeding guidance for 'back to back' or sequential estrus cycle litters is variable. This may reflect the underlying conflict between the health harms of 'overusing' a bitch for breeding, and the health harms of multiple estrus cycles generally. The overarching intent is bitch welfare. The Dogs NSW code of ethics states that a bitch should not be bred more than twice in 18 months. The JTO document recommends that a one-time litter spacing of 10 months is acceptable but that the next litter spacing should be a year. We have stopped short of making any specific time-based recommendation but generally sequential cycle 'back to back' litters should be an infrequent choice and should probably not occur more than once in a bitches breeding career.

Recommendation D

Dogs should not be used at stud before the age of 18 months. Breeding combinations where both dog and bitch are younger than two years old are not recommended. The use of older sires is encouraged. To preserve or preferably extend the genetic diversity of the breed, overly popular sires should be avoided. As a general recommendation, the maximum number of puppies per stud dog should be equivalent to no more than 5% of the puppies registered in the breed population during a 5-year period. Breeders should be aware that this would currently represent a maximum of approximately 30 puppies across the breeding career of an Australian stud dog.

(Supported by FCI-IBS 3, JTO, FKC-GBS 7)

Rationale:

One of the simplest and most effective ways of preserving and enhancing genetic diversity within a closed pedigree dog gene pool is to consider the use of older and lesser used sires.

The use of young sires in Finland is seen as a matter of concern for overall breeding direction. If very young sires are used, there is little opportunity to assess the health of siblings and close relatives before litters are planned and born. Young sires can rapidly accumulate many puppies in their breeding lifetime and unexpected health problems may be uncovered too late. Where older sires are used, the health information pertaining to the sires' close relatives will be more certain.

*“Genetic Drift” occurs when genes are randomly lost in a closed population. It occurs more quickly in pedigree dog breeding where matings are controlled and not random. It also occurs faster if the generation time is short. One of the most important reasons to use older sires (and older stud-bitch combinations) is to slow genetic drift. This is the rationale behind avoiding young stud bitch **combinations** where both stud and bitch are under the age of 2.*

The use of a sire under the age of 18 months should be an exceptionally rare event. Breeders are encouraged to seek out sires from rarer lines, older sires and lesser used individuals, who are “better than breed average” in health, temperament and breed quality.

*The recommendation to avoid popular sires is consistent across the FCI, and the FKC. The JTO recognises that Finland cannot meaningfully import dogs to bolster the breed's genetic health, and thus the preservation of genetic diversity is taken very seriously. For breeders in Finland, the JTO recommends an even lower maximum puppy limit than the 5% we have suggested. The commonly quoted 80 puppy maximum for Finnish Lapphund sires in Finland represents a figure of 2% of the population of puppies registered in Finland over 4 years. If this stricter calculation were applied to Australian puppy registrations, it would be equivalent to a recommended maximum of only 11 puppies per sire (from data 2012-2016). In the Australian breeding context, with heavy use of imported semen and moderate inflow of import stock, this very strict 11 puppy total is not thought to be necessary to optimise diversity. Not all popular sires will go on to have a large number of descendants. A more significant benchmark to aim for would be a maximum of 4-6% of the registered puppies in the **second** generation. Access to this type of data calculation is achievable, but is not currently available for our breed in Australia.*

Recommendation E

Other points for breeders to consider in the interests of overall breed health are:

- To choose breeding stock from lines with maximal **healthy** longevity.
- To avoid repeat matings with the same stud-bitch pair, and to also avoid a mating with one of the siblings of a previously used stud-bitch pair.
- To cherish and maintain the properties of the original working dog, including suitable temperament (friendly, obedient, persistent, calm, loyal, responsive to training), suitable size to be fit for function, weather resistant coat, resistant footpads, and lack of skin sensitivities.
- To safeguard the generally excellent temperament of the breed by avoiding nervous, timid or aggressive dogs.
- To safeguard genetic diversity by ensuring that at least 50% of the breed's gene pool remains in breeding use. This means that least two puppies from every litter should be used for breeding. If at all possible an even greater number should be earmarked as available for breeding subject to health, temperament and breed quality considerations.

(Supported by JTO.)

Rationale:

The desirability of maintaining 50% of the gene pool within the breeding base of the breed is reaffirmed by the JTO, the FKC-GBS and the FCI. The concept of 'pick of the litter' is best expanded to include the best two or three 'picks' who are at, or above breed average in all desirable breed characteristics. In Australia, selection of the best breeding dogs is hindered by a tendency to encourage early neutering. Many Australian Local Councils have regulations that favour or insist on early neutering. Arguments in favour of early neutering rarely discuss the negative impact of the practice on the genetic diversity of closed-registry breeds. The selection of breeding stock at the young puppy stage before the full adult qualities are evident is undesirable. Where breeders have the option to negotiate a delay in neutering till adult assessment for health and breed quality can occur, this is likely to be of benefit for the whole breed.

Recommendation F

Breeders are encouraged to be familiar with common measures of genetic diversity within pedigrees, and to use pedigree software that can calculate them for test matings. No specific software is recommended, but breeders should be aware that there is free online software available. When choosing breeding combinations of stud and bitch, the following criteria are recommended:

- An 8 generation Coefficient of Inbreeding (COI) at or below 6.25%
- A 3-generation pedigree with 14/14 unique ancestors such that the ancestor loss coefficient = 1.0. This means that in a 3 generation pedigree of the type that has been

traditionally available to breeders via the ANKC, all 14 ancestors should be different, and there should be no double ups.

- A 4-generation pedigree should contain **at least** 27/30 unique ancestors such that the ancestor loss coefficient is **at least** 0.9

(Supported by JTO, FKC GBS 3.7.4, FCI-IBS.)

Rationale:

*Breeding for a low COI is a strategy to maintain genetic diversity, and to keep overt genetic disease low in the population. **A low COI cannot eliminate diseases that are already present in the breed.** Unfortunately most diseases cannot be eliminated without substantial loss of genetic diversity. Breeding strategies that prioritise the elimination of a single disease may have the unintended consequence of making the health of the population worse via genetic drift and loss of diversity.*

The Finnish Lapphund breed does have an open stud book, but new breed intake dogs are infrequent and they are not necessarily widely used at stud. Consequently, the risk of genetic diversity loss for the Finnish Lapphund is similar to any other closed-stud-book breed. Studies have found the side effects of inbreeding start to manifest where the COI exceeds 10%. The phenomenon of “inbreeding depression” includes reproductive problems, pup mortality, litter malformations, greater susceptibility to infection, atopy and autoimmune diseases. The higher the COI is in the breed, the faster will be the loss of genetic diversity for the whole breed over time.

Breeders should be aware that the COI that we are able to calculate with pedigree data assumes that the original breed foundation dogs were unrelated. This is often not the case. Studies have found that the ‘true’ COI in almost all pedigree breeds is higher than an 8 generation pedigree would suggest. The suggested maximum of 6.25% allows for a margin of safety to accommodate this uncertainty.

Breeders may not have access to their own databases or software but all breeders of Finnish Lapphunds should be aware of the powerful Koiranet software available via the Finnish Kennel Club website. Unfortunately, there is no similar public access Kennel Club data for purebred registered dogs in Australia. A good substitute is the well populated online database known as The Breed Archive. www.breedarchive.com. The pedigree data entry for this database has been crowdsourced with the support of enthusiasts within the international breed community. This means that there is a chance of missing data and data error. Breeders should check the pedigrees of their own lines for accuracy, to ensure data matches ANKC pedigrees, and/or relevant validated public overseas breed club databases such as Koiranet, and the Swedish and Norwegian Kennel Club databases.

Recommendation G

The FLCNSW strongly supports the Finnish strategy for decreasing the incidence of heritable eye diseases. Departing from the Finnish breed criteria is not advisable on the very important subject of eye health. All Finnish Lapphunds intended for breeding should have an ophthalmological examination, preferably an ACES accredited eye exam in the 2 years PRIOR to being used for breeding. This should be repeated at least every two years, and a repeat exam in old age (over the age of 8) should be considered in any dog that has been used for breeding in the past. Where abnormal eye exam results are obtained, breeders should:

- Seek advice on the heritability of the condition from ophthalmological experts.
- Seek the advice of experienced breed mentors and breed club health officers.
- Consult the English language version of the Finnish Lapphund Club breeding criteria available at www.lappalaiskoirat.fi

(Supported by, JTO.)

Rationale:

The prioritisation of eye health cannot be overstated. The preservation and improvement of eye health is a key priority of the Finnish Lapphund JTO. Individual eye disorders in Finnish Lapphunds are very rare. Cumulatively they remain rare but can cause significant disease burden. Finnish Lapphunds are included on the “schedule 1” list of breeds for the ACES clinical screening examination. The history of this inclusion is worth a mention. Prior to the availability of gene testing, a clinical eye exam was the best way to identify evolving clinical disease. The breed was known to be at risk of PRA, albeit with less than 3% of dogs affected. The earliest importers of Finnish Lapphund took proactive steps to ensure that this risk was given due attention and the breed was included in the ACES scheme. The prcdPRA gene test became available within a few years, and the screening for prcdPRA moved from ‘eye examination’ to ‘genetic’ screening. Provided that prcdPRA carrier status is known and managed appropriately, the prcdPRA threat to breed health is now minimal. But there are other significant eye diseases that demand ongoing vigilance. These include hereditary cataracts, glaucoma, and PRA of unknown genetic aetiology. These guidelines are not intended to be a primer of individual diseases. The list of rare eye conditions that affect breeding decisions is extensive and may be subject to change. The significance of any abnormal ACES or ophthalmology results should be carefully verified by intended breeders. Research into the inheritance of other rarer types of PRA is an active interest of the breed clubs in Australia.

Recommendation H: Hip and Elbow Dysplasia

Breeders are encouraged to screen for hip and elbow dysplasia, and retain their records. Dogs with moderate or severe hip dysplasia, or a combined hip score of 20 or above should generally not be used for breeding. Dogs who have hip scores in the mildly dysplastic (09-19) range should not be excluded from breeding, but ideally should be mated with dogs with excellent-fair (00-08) hips.

(FLCNSW recommendation, supported by JTO)

Rationale:

The strength of this recommendation is limited by the lack of an adequate Australian hip-score database and of necessity our guidance must differ from that issued in the breed's home country. Clinical hip dysplasia is rare in the breed.

Hip scoring of individual dogs in isolation does not provide breeders with enough information or strategy to make major improvements to breed hip health. Nevertheless, it is an important issue for breeders as the condition can impact markedly on a dog's quality of life if it is clinically severe.

Hip dysplasia is only moderately heritable. For screening to be truly effective in improving the health of the breed it requires high levels of screening participation, computerised data, and the calculation of estimated breeding values (EBV) to allow consistent long-term choices of "better than breed average" stud and bitch combinations. If an EBV is to be calculated it is critical that all scores, including poor ones are disclosed. (FCI-IBS 4.1).

The Finnish Lapphund average hip score in Finland is B, with D and E hips being uncommon. The average hip score of the Lapphund in Finland has improved from B/C to B with 20 years of screening.

In the USA, The Finnish Lapphund average OFA hip score is 'Fair' with both excellent and dysplastic hips being uncommon. (Data retrieved Feb 17 for all historical OFA scoring till December 2016)

The Australian Veterinary Association (AVA) no longer administers the Australian hip-scoring scheme (CHEDS). Of the 103 Australian Finnish Lapphunds that were screened under the CHEDS scheme until 2014, the average score was 10.3, with ranges from 0 to 40.

The Australian national canine hip screening scheme is significantly unlike its Finnish equivalent. The scheme in Australia is now administered by the ANKC. "Score Shopping" is an acknowledged practice and referred to on the ANKC website for ORCHID, the national canine health database. (www.pedigreeblue.com. Accessed February 2017.) There are plans to make selected data in ORCHID publicly available but only with owner consent. It is the opinion of the

FLCNSW that this will be of limited value without full disclosure of all hip scores and EBV calculations. There are unfortunately no known plans for a national EBV scheme for hips. Further discussion is beyond the scope of this current guideline. For the time being, it is acknowledged that screening any potential breeding stock and excluding the rare dysplastic dogs may be the only available hip-improvement option for Australian breeders. Screening of breeding dogs is recommended both to exclude severely affected dogs, and to collect data for a point in time where the breed community may have tools available for a better strategy.

Recommendation I

Single gene disorders generally only become relevant if a dog carries two copies of a disease-related allele. The following testing recommendations apply to Finnish Lapphunds:

- prcdPRA (progressive rod-cone degeneration) Progressive Retinal Atrophy

We recommend that the prcdPRA status should be known for all breeding dogs.

- GSD II (Pompe's disease)

Knowledge of GSD II status is highly desirable. A validated, affordable and accessible test for GSD II must be commercially available to Australian breeders before the FLCNSW will formally recommend testing for all breeding dogs.

- SOD1-associated Degenerative Myelopathy (DM)
- CMR1 Multifocal Retinopathy

These tests are commercially available but the importance of testing all breeding stock for these conditions is not established.

It should be stressed that overly restrictive breeding recommendations have historically been very harmful for pedigree dog populations. It is important to screen only for conditions where a true threat to health exists.

(Supported by FCI-IBS 5, JTO, LBC.)

Rationale.

*Single gene inheritance disorders are relatively simple to screen for once the mutant allele has been identified. The number of commercial genetic tests is increasing. The mere availability of a commercial test does **not** mean that testing in all dogs is mandatory for breeders. Only*

conditions that have significant disease burden within the breed should be critical to test for. Unfortunately commercial entities may encourage breeders and the general public to consider that testing is mandatory for many more conditions than is useful or necessary for breed health.

- **prcd PRA**

*prcdPRA is the **only** gene status that the FLCNSW would formally recommend for breeding dogs. prcdPRA is an autosomal recessive single gene disorder. It has been known for many decades that there is clinical PRA disease within the breed. **The disease onset of prcdPRA is late and mild** in most cases. The testing of every breeding dog is not necessary if documentation of clear-by-parentage status is available. As testing becomes cheaper, breeders may prefer to retest “clear by parentage” dogs every few generations. There is no harm in this practice and does make documentation of carrier status across generations easier.*

- **GSD II**

GSD II (Pompe’s Disease) is an early onset disease and is fatal. It is a rare condition that is present in only a few lines of the breed. A commercial test became available internationally in 2013. As the commercial test for GSD II becomes validated and reliable within Australia, breeders should ensure that the GSD II status of their breeding stock is known. A significant proportion of Australian dogs are expected to be clear by parentage.

- **CMR1**

A test for CMR1 Multifocal retinopathy has recently become commercially available. This condition affects Lapponian Herders and does very rarely affect Finnish Lapphunds. The Finnish Lapphund carrier frequency is unknown but is likely to be very low. Until better data on the test performance becomes available, clinical eye examination by an approved vet (see recommendation G) is currently still the recommended screening strategy. Testing for CMR1 is optional for this breed at this time.

- **SOD1 DM**

There has been recent interest in the commercially available genetic test for Degenerative Myelopathy (DM) conferred by a mutation in the SOD1 gene. Dogs with two copies of the mutation are best described as ‘at risk’. This mutation is present in the Finnish Lapphund gene pool. Exact carrier frequency is not yet established, but is likely to be between 25% and 40% of the Finnish Lapphund population. DM is a condition with both reduced penetrance and variable expressivity. Multiple other genes are at work to affect expression of the disease. Some breeds with extremely high rates of DM allele frequency have long lives but are not known to be affected by the disease. Other breeds with low DM allele frequency are well known to be affected. It is possible that DM has not been recognised in Finnish Lapphunds because it is a

late onset disease where the manifestations of disease in dogs at risk have been attributed to very old age. It is also possible that the disease does not manifest very frequently in Finnish Lapphunds. Nevertheless, at time of writing (Jun 2017) there have been two older dogs in Finland who were 'at risk' of DM and who have manifested clinical symptoms consistent with DM disease. One of these dogs has died and has displayed findings at autopsy consistent with DM.

For the Finnish Lapphund breed, The SOD1 mutation is the first 'susceptibility gene' that has been found where the health consequences for 'at risk' dogs are not certain. It is inevitable that the dilemma of whether to screen for different susceptibility genes will recur many times in the future as the genetic basis for more health conditions are revealed.

*Healthy dogs suitable for breeding programs should **never** be excluded merely because of their SOD1 carrier status. Where voluntary testing has occurred and the SOD1 status of breeding dogs is known, breeders should:*

- *avoid carrier-to-carrier matings.*
- *choose a known clear mate if the dog is homozygous/ 'at risk'*

Recommendation J

Most health problems in dogs have a complex mechanism of inheritance. Genetic screening strategies do not exist for these conditions. Breeders are encouraged to share health data within the breed community, and to participate in any breed health surveys initiated by the breed clubs, state Canine bodies, or the ANKC.

Open disclosure of health data is warmly supported for the following conditions of interest to the Finnish Lapphund community:

- Autoimmune diseases (Hypothyroidism, Addison's Disease, Cushing's, Diabetes)
- Allergies and Atopy.
- Disorders of temperament, aggression or undue timidity.
- **Early onset PRA of unknown type** (high priority)
- Epilepsy
- Unexplained early death
- Congenital heart disease
- Malocclusion/overshot/undershot bites.
- Cryptorchidism/monorchidism
- Osteogenesis imperfecta or other structural malformations in puppies.

New breeders should be well versed in the disease incidence within their own breeding stock, even for very rare and poorly predictable conditions. Consulting veterinary experts in heritability of disease, breed mentors, State Breed Club Health officers and referring to the breeding criteria of the Finnish Lapphund club is strongly recommended. For most of the conditions listed above, affected dogs should not be bred from. First degree relatives should also not be bred from in some cases.

(Supported by JTO, FLCNSW, FCI)

Rationale:

*Fortunately, the Finnish Lapphund is a healthy breed but there are several rare health conditions with a complex underlying genetic/environmental mixed aetiology. The goal of the JTO is NOT to decrease the incidence of all diseases. That would not be possible. The goal is to ensure that rare diseases remain rare and do not increase. In contrast, breeders should be aware that **eye diseases and epilepsy** are target diseases where the goal is to decrease the incidence of disease.*

In Finland, epilepsy is currently the subject of a breed-wide effort to decrease disease incidence. An 'estimated breeding value' or EBV scheme similar to the system used for hips is being planned.. This will ensure that over many generations, combinations of breeding pairs will have 'better than breed average' likelihood of remaining epilepsy-free. The slow and gradual decrease in the incidence of epilepsy is the goal. This type of breed improvement is only possible in circumstances where there is high disclosure of the disease and good centralised data collection.

In Australia, a multi-pronged approach to known diseases is recommended, including a commitment to low levels of inbreeding, transparent data collection to allow good breeding decisions across the entire breed community, and ongoing research into the aetiology of disease clusters. A better approach to reporting of puppies who fail to thrive or are stillborn would be of great value to the breed.

The FLCNSW actively supports research into PRA of unknown cause. This rare but serious condition has an early onset. Identification of the underlying aetiology is one of the highest priorities for the breed in Australia, and if a gene is identified, the discovery is likely to be of benefit for the international Finnish Lapphund community.

*The FLCNSW is working towards the establishment of a permanently accessible breed health survey for owners and breeders to voluntarily share health information, including **good** health news such as active, healthy old age.*