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The only international Dalmatian Club

WORLD ASSOCIATION FOR DALMATIANS

BREEDING RECOMMENDATIONS AND BREEDING PROJECTS FOR THE DALMATIAN

The Dalmatian is an old and healthy breed that reaches a high average lifespan. Exaggerations were mostly avoided, so the breed should generally be preserved unchanged and does not require any fundamental breeding corrections. Nevertheless, it should be noted that there are breed-specific genetic disadvantages, and that general health risks can also occur in healthy breeds. In addition, care must be taken in breeding to keep the gene pool diverse through appropriate measures.

Selection of breeding animals: breeding should only be done with animals that are as healthy and stable in character as possible. This applies in particular to deafness and lineage-specific risks (see below). The Dalmatian impresses the layman with its unique and striking spotting. Nevertheless, the anatomy is the most important breeding goal and takes precedence over optical characteristics. The Dalmatian is an efficient endurance runner that moves mainly at the trot, but can also canter and sprint if necessary (roughly comparable to horses). Every breeder should be familiar with the biomechanical basics, so when selecting breeding animals, the most important thing is to ensure that the anatomy and gait are as correct as possible. Secondly, the typical character of the Dalmatian (friendly and curious, non-aggressive towards people and animals, active outside but calm in the house, willing to work but independent) should be preserved. Thirdly, of course, the optics, which are defined in the applicable standards, should also be taken into account.

Line breeding instead of outcrossing (definition in a glossary): The genetic diversity of a population is best maintained when as many breeders as possible (or groups of breeders) establish their own lines. As it may take decades for a single breeder to establish a new line, it makes sense to build breeders groups, networks, kennel collaborations etc. Although the diversity within these lines is not particularly great, the lines differ from each other. In the event of a breeding problem, a breeder can then access lines from other breeders and thus cross in "fresh blood". Linebreeding reveals recessive traits, both positive and negative. This shows which properties are to be expected in a line. The so-called outcross is generally not advisable, this should only be carried out if "fresh blood" is necessary. Outcross generally leads to recessive traits accumulating (without them becoming apparent: trait carriers) and after a few generations all offspring are related to one another and genetic diversity is lost as a result. Breeding over several generations is therefore only possible as line breeding, outcross prevents the sensible planning of further generations. This should also be considered when calculating inbreeding coefficients. It is true that matings that are too close should be rejected, but the desired line breeding will lead to an increase in the inbreeding coefficient. So the COI alone is not a good measure of a good mating. It is also part of the line breeding technique to avoid certain "popular" dogs that occur on the pedigrees of other lines very often.

Diversity instead of popular sires: to increase genetic diversity, it is important to use as many different animals as possible in breeding. It is common practice in some breeds to limit the number of mating acts for male dogs. Whether and to what extent such rules make sense is up to the individual clubs. However, breeders should be encouraged to use "new" stud dogs and avoid popular sires. Likewise, breed clubs



should keep the requirements for approval for breeding as low as possible and limit them to the bare minimum. At least proof of the hearing examination should be mandatory, and X-rays of certain joints (hips, maybe elbows, shoulders and parts of the backbone) are recommended.

Combating the risk of diseases: In principle, all risks cannot be completely ruled out in any mating. This applies to dogs as well as to all other living beings. Breeding is therefore about avoiding increased risks and calculating risks that are already known in advance. When it comes to disease risks, a distinction must be made between breed-wide risks, which affect all dogs of a breed, and risks of individual lines/individuals, which only affect a few lines or a few individual dogs. In addition, only diseases or risks that have a hereditary component are relevant to breeding, since only these are more likely to affect the offspring. There are two known breed-wide risks in the Dalmatian that have at least a genetic basis and affect the entire breed. On the one hand, this concerns congenital deafness, on the other hand, hyperuricosuria.

Congenital deafness: A low percentage of puppies might lose their hearing ability when they are just a few weeks old. This can be detected by means of a hearing test (BAER test) from around 7 weeks of age. The basis is a missing pigmentation of the middle ear. It has been scientifically proven that the deafness rate is correlated with the presence of blue eyes (blue eyes lead to higher percentage of deaf or unilateral hearing puppies), as well as negatively correlated with the presence of head patches (head patches are correlated to lower percentage of deafness).

For this reason, blue-eyed Dalmatians should never be used for breeding.

In addition, it is recommended, at least in individual cases, to also use dogs with head patches in breeding. While patches are disqualifying faults by most standards, it is possible to have appropriate breeding projects in accordance with governing body regulations (see below).

When selecting the breeding animals, their immediate relatives must also be included. If a dog comes from a litter in which there were deaf or blue-eyed siblings, or whose parents are blue-eyed/unilateral hearing/deaf, these animals carry an increased genetic risk for deafness/blue-eyedness, even if they are bilateral-hearing/brown-eyed themselves. So if there are no other outstanding characteristics that speak for the use of these animals, it is better to avoid using them for breeding.

Deafness can generally occur sporadically in every litter, but can also be observed more frequently in individual lines/matings. Such lines should be avoided in the medium term or at least improved by crossing in dogs with “good deafness statistics”.

Hyperuricosuria: the Dalmatian has a genetic specialty in the uric acid metabolism: while all other dogs process the uric acid into allantoin and excrete it through the urine, the Dalmatian lacks the last metabolic step, so that mainly uric acid is excreted. This is less soluble in the urine, under certain circumstances it can form crystals, which can form into stones. These stones can occur in the bladder, occasionally also in the kidneys. Good management (water-rich feed, enough fluids, regular urinating) can greatly reduce the risk of forming stones. Nevertheless, stones form sporadically (accumulated in individual lines), which in extreme cases can lead to bladder occlusion, emergency operations or even death. For anatomical reasons, male dogs are particularly affected. Most Dalmatians will have urate sediment in the bladder, some will have larger crystals, and an estimated 1– 2% (mainly males) will have medical complications from stones. The reason for this modified nitrogen metabolism is a mutation in a gene; all Dalmatians carry this mutation homozygous. The responsible gene (SLC2A9) was identified and a genetic test developed.



LUA Dalmatians: since the mutation is homozygous in all Dalmatians, it was not possible to correct the hyperuricosuria by breeding within the breed. A closely related breed (Pointer) was therefore crossed once and then bred further with purebred Dalmatians. These "LUA Dalmatians" have normal uric acid metabolism, but (usually) show a slightly poorer pigment. The breeding project started in the USA in the early 70ies, then came to England around 2010 and from there to Germany, Finland and many other countries. As LUA Dalmatians have fully recognized pedigrees, they should be recognized in clubs and run as a breeding project (see below).

In addition to the two general (breed-wide) genetic risks mentioned, there are many individual risks that only affect one or a few lines or only some individuals. Mentioned here are heart diseases (e.g. mitral valve insufficiency, DCM), kidney diseases, copper storage disease, epilepsy, hypothyroidism, anatomical damage, skeletal damage, character problems and much more. All of these risks can occur sporadically and often in connection with certain negative environmental influences. In the event of an accumulation within certain lines, genetic components must be evaluated and this must be taken into account in breeding.

As a general rule, most genetic risk factors are recessive. Risk factors from both parents must come together for puppies to become ill. For this reason, the duplication of known "risk dogs" should be avoided and the pedigrees of the parent animals researched accordingly.

Carrying out breeding projects: Breeding projects should only be carried out to improve health. There should be scientific evidence for this. Breeding projects for visual reasons (e.g. changing coat colour, hair length, body size, etc.) must be strictly rejected. The Dalmatian is an old and healthy breed that should be preserved as such. Breeding extremes should be avoided at all costs, and the breed should be preserved and not changed ("improved"). Nevertheless, there are individual or general health risks (see above) that must be considered in breeding. Due to scientific progress, there are more and more test options, so that many medical or genetic risks have lost their terror. For example, the hearing ability of every puppy, especially every dog used for breeding, can be checked using the BAER test. In countries where only (bilateral) hearing dogs are bred and blue-eyed dogs are banned from breeding, the deafness rate has been reduced to around 1% (vs. around 10%). There are now genetic tests for several genetic diseases available, so that carriers for certain diseases don't have to be excluded from breeding any more: they now can be used under certain circumstances (mated to non-carriers), and the genetic diversity can be preserved. In earlier days, it was not possible to identify carriers of certain diseases, so whole litters or even whole lines were banned from breeding if they were putative carriers. The following applies here: if a dog is a carrier (the risk of this can be found in the pedigree and checked by genetic testing), the carrier can be used in breeding and mated with a non-carrier. All puppies are then subjected to a genetic test.

In the case of breeding projects, a distinction must be made as to whether these are compatible with the applicable breed standard or whether they would violate the standard in individual points. Projects that are in line with the respective standards can be carried out without restrictions. Nevertheless, it should be noted that the project is to be carried out by the association, is to be scientifically monitored and only a minority of breeders/breeding animals are to take part. All offspring of a breeding project should be registered and recorded (e.g. by marking the registration number). The breeding project should be documented and statistically recorded. Breeding projects should be worked out, approved and carried out on a scientific basis by the breeding clubs in consultation with their members. It should be remembered that there are usually supporters and opponents of breeding projects. After the



exchange of arguments and extensive discussion, a democratic decision should be taken on whether to carry out the project.

If the breeding project deviates from the breed standard in individual points, this can and should be carried out, provided that clear health advantages can be expected. The governing bodies (e.g. FCI, KC, AKC, CKC) encourage the implementation of projects that improve the health of the breed. Please note: Crossbreeding to improve health should be carried out within the breed if possible. If this is not possible (e.g. if 100% of the breed is affected by a defect), then a variety that is as similar as possible or a closely related breed should be crossed. All offspring must be marked and checked with a suitable test (e.g. genetic test). The project should be scientifically recorded, only carried out in cooperation with the clubs/associations, all descendants and the success of the project should be recorded. It is important for all projects that they should be visible to all breeders, so that every breeder can have an insight into the breeding projects. After four generations, animals from backcross projects are considered purebred and receive unrestricted pedigrees from their umbrella organization.

Breeding projects are carried out on Dalmatians in some countries, either "patch-breeding projects" (breeding from dogs with a head patch) or LUA breeding. The implementing clubs should make sure that all descendants of the projects are marked accordingly. In the case of "patch-breeding", we recommend adding the letter P to the registration number, in LUA breeding the letter L. In patch breeding, the next 3-5 generations should be statistically recorded with regard to deafness. All descendants of the LUA project should be consistently marked. An inventory should be made after 10 generations.

Breeding is a very complex task. It is absolutely essential to avoid selecting only for a single trait (e.g. presence/absence of one gene or other single feature); each dog must always be assessed in its entirety in terms of health, anatomy, character and appearance. Breeding for single traits would lead to genetic impoverishment and neglect of all other traits, leading to exaggeration and new problems in future generations. Every breeder must be aware that even the most well thought-out mating involves risks. Health can never be guaranteed in advance. In addition, every breeder is obliged to preserve the entire breed, so population-wide considerations must also be taken into account. Preserving the breed, preserving genetic diversity, maintaining/improving health are international tasks that require several generations to think ahead. The „perfect“ Dalmatian does not exist and never will.

Breeders (and stud dog owners) decide about the mating partners. Both are responsible for the next generation(s). Breeding does not just mean producing nice puppies, cuddling and feeding them for eight weeks and selling them to happy families. Breeders are responsible for their offspring and all the good and bad things that might appear during the whole life of a dog, and future offspring of this dog. Ignoring known risks might bring lots of suffer, pain and misfortune for the affected dog, but also for this family. Many diseases appear when the dog reached a certain age (e.g. heart or bone problems), so the affected dogs might already have been used for breeding. In that case, the next generation might be affected as well. This means that at the end of the day, a breeder is responsible not only for his litters, but also for all the families involved, the future offspring and thus the whole breed.

It is of great advantage to network breeding internationally and to benefit from the differences in views, mentalities, methods of different countries and breeders. International standardization should take place, especially with regard to breeding requirements, examinations and databases.



GLOSSARY:

LINE BREEDING, OUTCROSS, COI:

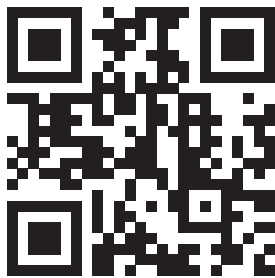
The COI is a tool to calculate the relatedness of two dogs. The last 5-6 generations are usually considered for this. The COI depends on how many ancestors the two dogs have in common and in which generation the common ancestors occur.

Line breeding is the mating of dogs that are (more or less) related so that this combination has a higher COI than the breed average. This serves to stabilize certain traits and build lines. Line breeding/inbreeding should not be confused with incest breeding. In this case, closely related animals would be mated, e.g. Father daughter. In outcrossing, two animals that are as unrelated as possible are mated, but both of them were linebred/inbred. This technique serves for adding "fresh blood" to a line and should not be done too often. Otherwise, the lines would get lost, and all dogs would have more or less the same mixed pedigree after few generations.

DOMINANT/RECESSIVE:

Dogs have a double set of chromosomes. This means that each gene exists in two copies (the maternal and the paternal version). Both copies can be identical (homozygotic), or slightly different (heterozygotic). Sometimes, mutated versions can cause diseases or other negative traits. Mutations can affect one or both copies of the gene.

If one copy of a version is sufficient to express a trait, it is called dominant. If two copies are necessary for expressing the trait, this is called recessive. For example, black is dominant whereas liver is recessive: a dog that carry the versions black/black or black/liver will have black spots whereas only dogs with versions liver/liver will have liver spots. Black is dominant, liver is recessive.



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IF YOU HAVE ANY QUESTIONS, PLEASE DON'T HESITATE TO CONTACT US ON: president@wafdal.org