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## Dwarfism in Dalmatians

from the magazine 'Dalmatisch Nieuws' of the Dutch Dalmatian Club (NCDH), written by Lizzy Plat-Coelers

The Health Commission of the Dutch Dalmatian Club (NCDH) would like to inform all breeders and enthusiasts of Dalmatians about the fact that in 2015, two puppies with dwarfism were born to a Dutch breeder. Dwarfism is not an unknown phenomenon in the world of Dalmatians. The first puppies with dwarfism were born in the 1970s in Scandinavian countries. Because the number of puppies with dwarfism has always remained so low, there was no direct reason to pay much attention to this phenomenon or to address it in breeding practices. However, in the 20th and 21st centuries, several puppies with dwarfism have been born, and it is no longer limited to Scandinavia. It seems like a good time to pay attention to dwarfism in Dalmatians.

First, some background information on dwarfism. Dwarfism occurs in many living beings, such as cows, horses, humans, and also dogs. There are several breeds where dogs with dwarfism are occasionally born. There are several forms of dwarfism known in dogs, such as pituitary and chondrodysplastic dwarfism. Some dog breeds are deliberately bred with a specific characteristic of dwarfism, such as in the legs, think of Dachshunds and Basset Hounds. In these breeds, we speak of achondroplasia, one of the forms of orthochondrodysplastic dwarfism.

In the case of the two dogs born in the Netherlands in 2015, numerous examinations were conducted, so it could be determined with certainty that it was not pituitary dwarfism. In Dalmatians, we are dealing with chondrodysplastic dwarfism. The exact form of dwarfism in Dalmatians (within chondrodysplastic dwarfism) is still unknown and needs to be determined through further research.

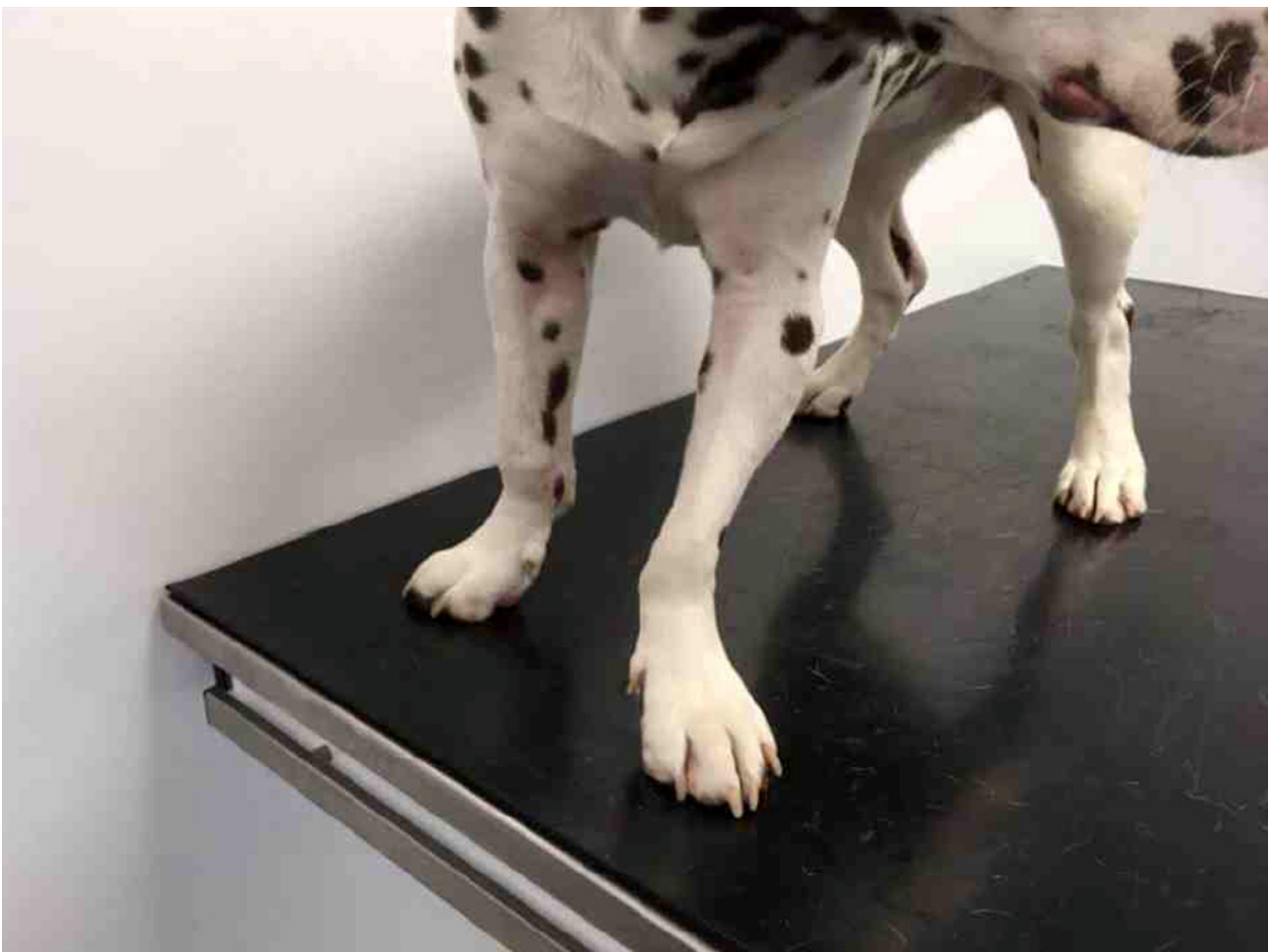


Figure Front legs of a Dalmatian with dwarfism

External characteristics of Dalmatians with dwarfism: The puppies have a nearly normal appearance in the first 8 weeks. Some of the puppies that had or have dwarfism had or have a slightly shorter neck, a shorter, thicker tail, and a bit longer and softer coat. Given that this, in turn, did not apply to all dogs born with dwarfism, unfortunately, these are not sufficient clues to identify these puppies in a litter. As the puppies continue to grow, it becomes clear that something is going wrong with the growth of the front legs. A curvature grows in the front legs, which looks the same, with the radius curvus syndrome. But caution is advised because recently a puppy was born in Scandinavia where none of this was visible. Also, in the past (in the 70s/80s), puppies were born who were so seriously affected that they were euthanized, and dogs were born who had no outward signs but had dwarfism.

On X-rays taken between the 4th and 12th weeks of life, however, the difference between a carrier and non-carrier of chondrodysplastic dwarfism is very noticeable. Puppies without dwarfism have a V-shaped (pointed, like an arrow), uniform, and opaque end of the elbow bone. In puppies with chondrodysplastic dwarfism, the elbow is noticeably flattened and has an irregular shape there. After the 12th week of life, the difference at the end of the elbow bone is no longer visible.



Illustration of a Dalmatian with Dwarfism

The current status of the two dogs born in the Netherlands is that both dogs have undergone surgery on their front legs, where the elbow was sawed through. Both dogs have successfully undergone the operation and rehabilitation and now live a perfect dog life without any other health problems. Unlike the crooked front legs, all organs and the skeleton function correctly.

Furthermore, blood samples were taken from the Dutch and Scandinavian puppies with Dwarfism and their family members and sent to the University of Finland. There, a team led by Professor Hannes Lohi is engaged in research on Dwarfism, among other things. This team has already developed a DNA test for the Norwegian Elkhound, a breed where Dwarfism also occurs. The intention is for this university to research which gene is responsible for Dwarfism in Dalmatians, in order to What it exactly involves, and ultimately, of course, we hope that they will develop a DNA test for Dalmatians.

Dwarfism also occurs in Alaskan Malamutes, bearing many similarities to the dwarfism we have encountered in Dalmatians thus far.

The same Finnish team has been researching this breed for a longer period. However, they have not been able to develop a DNA test to date, so we do not expect a DNA test for Dalmatians to be available soon.

The research at the Finnish university costs a lot of money. The Norwegian Dalmatian Club has donated a total of €4000 to support this research. However, this amount will not be nearly enough to cover the research costs. Therefore, the Health Commission of the Dutch Dalmatian Club (NCDH) intends to discuss at the next membership meeting the possibility of whether this club can and wants to support the research as well. As we currently strongly suspect a recessive mode of inheritance, the probability of puppies with dwarfism in a litter, measured from carriers, should be 50% after one generation, 25% after two generations, 12.5% after three generations, 6.25% after four generations, 3.12% after five generations, 1.56% after six generations, and 0.78% after seven generations. Of course, this is theoretical and "statistically speaking".

If we carefully examine the pedigrees of the dogs and search for the dogs that likely started everything, we find that these dogs have passed on their carrier status for many generations to the dogs of today. Due to the numerous uncertainties regarding the form of dwarfism and the mode of inheritance, it is still too early to say with certainty. But based on the current situation, it appears that the dwarfism gene originated from Scandinavian and English lines around 1965.

Almost all breeders in Europe have dogs with these dogs in their pedigrees, so it is impossible to exclude all dogs from breeding based on their ancestors. If we were to

exclude all dogs that have these dogs (presumed carriers) in their pedigrees, we would have no dogs left to continue breeding our breed. Therefore, it is crucial that we do not solely select for dwarfism when selecting pairs for breeding and exclude all possible carriers from breeding. We must be extremely cautious about excluding dogs because the differences in genes are our greatest weapon in breed preservation, ensuring the preservation of healthy dogs!!!

It is still too early to make recommendations regarding dog breeding. Based on the latest insights, where the preservation of as large a gene pool as possible is essential for the survival of a healthy breed dog, we believe that it is crucial not to exclude possible carriers from breeding, thus ensuring that as many dogs as possible are available for breeding. Dogs or their genes that we no longer use will disappear forever and will not return. We should also question whether proven carriers should be excluded. Because excluding proven carriers also has significant consequences for the gene pool. The Norwegian Dalmatian Club has decided not to do this. They have decided that if a proven carrier is used, the partner must not have a carrier in its ancestors for at least 4 generations. At the moment, this seems like a reasonable solution to us, even though we know that this strategy carries a low risk because it cannot be said with certainty whether the chosen partner is truly free from the dwarfism gene.

This is also evident in the litter bred in the Netherlands. After thorough research of the pedigrees, it has been determined that proven carriers have been found in the sire's pedigree, while no proven carriers have been found in the dam's pedigree to date, and there are only assumptions about which dogs could be carriers of the dwarfism gene maternally. Balancing the preservation of the gene pool while not wanting to breed dogs with dwarfism poses a dilemma. But



considering that many litters have been bred in the recent past with several proven carriers in the pedigrees and no puppies with dwarfism have resulted from them, we also suspect that other factors besides recessive inheritance play a role in the occurrence of this problem. But this too is nothing more than speculation. Research must provide clarification.

As long as we do not have a DNA test, we must work with what we have, and excluding carriers or presumed carriers is certainly the worst thing we can do to our breed (reducing the gene pool). Of course, no one wants to deliberately breed dogs with dwarfism. For us breeders, there is a great responsibility to carefully weigh things with intelligence. If a breeder wants to double proven carriers in a pairing, then as the Health Commission of the NCDH, we cannot do otherwise and mandate that the puppies must be X-rayed before the 12th week of life.

Finally, we present here a list of 'confirmed' carriers of the dwarfism gene. These are dogs that, in this specific pairing, have produced puppies with dwarfism.

Vader	Moeder	Jaar	Aangedane pups
Of Course Slow Motion	Pepita II	1980	onbekend
Chipsmakers Immer	Chipsmakers Goodness of Courbettes	1980	onbekend
Dallas Celtic Coal	Falabellas Merry Goo Round	1983	3
Of Course Star Dust	Falabellas Merry Goo Round	1984	onbekend
Dallas Jack in the Box	Chess Candy Rose	1985	2
Dallas Jack in the Box	Falabellas Merry Goo Round	1985	onbekend
Courbettes Illuster	Solbos Pepsi	1985	onbekend
Boings Leopold	Boings Katja	1989	4
Dallas Jack in the Box	Dallas My Selected Rose	1987	1
Chipsmakers Immer	Courbettes Nursery Rhyme	1992	4
Perdita's Just in Time	Perdita's Flower Power	2003	1
Pongolands Tursamme Ture	Perdita's Dotty Design	2009	1
Ridotto Formosus	Pongolands Berömnda Barbara	2001	1
Ridotto Formosus	Ridotto Drusilla	2001	3
Caldecacre Secrets and Lies	Namara's Draaif Mie Kreesie	2015	2
Dalspots Coach Master	Vinatta's Alma	2015	1

If you have any questions after reading the article, please do not hesitate to contact us. Lizzy Plat-Coelers on behalf of the Health Commission of the NCDH.

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