

## **DCM AND THE DOBERMAN; A CRISIS**

With all the good and grace that is the Doberman there is a dark shadow; Dilated Cardiomyopathy, aka DCM. DCM is a form of heart disease common amongst all dogs but particularly plagues the Doberman. Statistics vary but it is safe to say at the current diagnosis rate reported to the AVMA nearly 60% of all Doberman will be diagnosed with DCM by the age of 8 years old. American bred Doberman tend to have slightly less rates of DCM, about 45% being diagnosed by age 8. European Doberman tend to be upwards to 58% diagnosed by age 8. It is a devastating disease, often fatal, and hard to detect early without annual cardiac screenings.

DCM is a very complex disease with many factors from environmental, hereditary, genetic, nutritional, eugenics, and more. It is a devastating disease and so widespread in the breed there may not be a way to reverse it without drastic measures. Before the 1970s DCM was barely heard of. Since the rise in Doberman's popularity, both in the AKC show ring and in the hearts of people globally, DCM has been on the rise. One theory, the "Popular Sire Syndrome", believes one or a few select dogs corrupted the once diverse gene pool and sacrificed the breed's health. The thought is that a few very popular and in-demand dogs dominated pedigrees eliminating much of the diversity that was once there. Another theory is inbreeding has reduced the genetic diversity. It is thought by selecting only for titled breedings, for certain traits, or from certain popular kennel lines the breed foundation became scarce resulting in the decline of health and diversity. While many other theories exist one thing is certain, the lack of genetic diversity is one reason the Doberman suffers ailments like DCM.

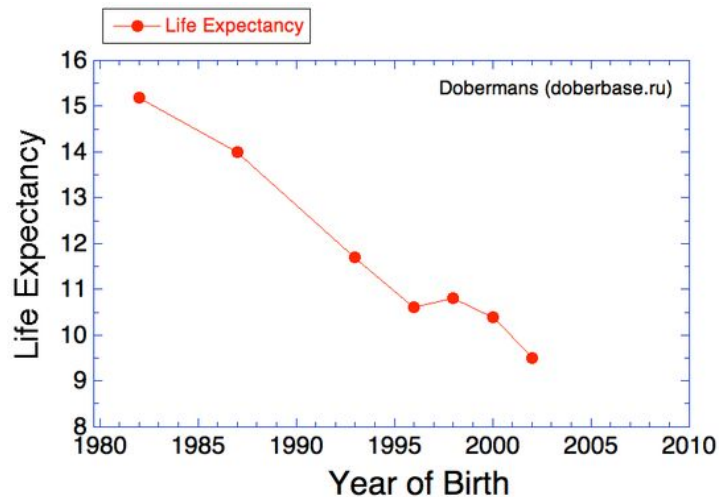
### **DCM AND GENETICS**

DCM has a strong genetic basis. The two genes associated with DCM are DCM1 (aka PDK4) and DCM2. The Doberman Diversity Project states 73% of unaffected Doberman tested in their research had one or both DCM genes and 99% of dogs diagnosed with DCM had one or both genes. Putting it in other words; 7 of 10 Doberman without clinical DCM carry a DCM gene. 99 of 100 Doberman who were clinically diagnosed with DCM had at least one DCM gene. While genes alone don't predict DCM, they're a strong indicator of the potential to develop the disease. There have been many Doberman to develop DCM and not have the genes, as well as many to have a gene or both and not develop DCM. That said, rates of DCM in dogs without any DCM genes is lesser than those who carry one or more genes. Remember, a DCM gene clear dog can still develop DCM. DCM is complex, with strong hereditary components. There is even a study stating that the PDK4 mutations may not be indicative of disease in most of the European population. (<https://www.ncbi.nlm.nih.gov/pubmed/22834541>) You may be wondering how genetic mutations happen; as a population becomes more inbred it loses genetic diversity which results in more and more mutations being passed down each generation. As new generations are born there are more and more carriers and less pool to breed to, resulting in more mutations being passed down. Maintaining genetic diversity is crucial to a population thriving.



### DOBERMAN DIVERSITY CRISIS, DIET, AND DCM AS AN AUTOIMMUNE DISEASE

Doberman are one of the most inbred breeds of all the dog world. All Doberman share the same 10 haplotypes. That means they are all so closely related to one another it is as if breeding family members together! The average inbreeding ratio (COI, aka coefficient of inbreeding) is 43%! There is not much diversity left to support healthy dogs. The higher the COI the less ancestral diversity there is.



There is a way to produce genetic diversity/lower COI percentages with skillful breeding. Avoiding high-risk pedigrees (pedigrees with a lot of inbreeding, with high COI, with several young deaths, with several DCM deaths, and with popular dogs peppered across the pedigree-popular sire syndrome) is one way to get genetic diversity. Pairing pedigrees with higher COI to pedigrees with lower COI or to unrelated pedigrees (both genetically and the dogs listed on the pedigree) can help create diversity.

Doberman Genetic Crisis -

<https://www.instituteofcaninebiology.org/blog/are-preservation-breeders-preserving-the-doberman-no>

<https://www.instituteofcaninebiology.org/blog/an-update-on-the-genetic-status-of-the-doberman-pinscher>

<https://www.instituteofcaninebiology.org/blog/are-we-watching-the-extinction-of-a-breed-or-why-are-we-focused-on-consequence-instead-of-cause>

Doberman Longevity Study -

<https://www.veterinarypracticenews.com/uf-announces-lifetime-study-on-fatal-heart-disease-in-doberman-pinschers/>

Doberman Diversity Project (open to select populations) -

<https://www.dobermandiversityproject.org/>

Grain Free Diet/Nutritional DCM - <https://news.vin.com/vinnews.aspx?articleId=52712>

<https://www.vin.com/apputil/content/defaultadv1.aspx?meta=&pld=11149&id=3846592>

Rates of DCM - <https://www.ufaw.org.uk/dogs/doberman-pinscher-dilated-cardiomyopathy>

Predictors of DCM - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4913570/>

DCM Related Autoantibodies -

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0214263>

## DCM MYTHS

- *DCM can be bred out.* - Sadly, no. Breeding practices removing DCM affected dogs and their relatives fails to lessen the rate of DCM in the breed..
- *There are DCM free lines.* - No, absolutely not! All Doberman are subject to develop DCM. Some lines seem more affected than others and some less, but no line is free from DCM.
- *European Dobermann don't get DCM.* - False! FALSE! The original DCM study used European Dobermann. Certain Euro lines are actually *more likely* to develop DCM (aka high-risk pedigrees).
- *Holter testing/Echos prevent DCM.* - I wish they did. Unfortunately, dogs who test clear/normal can still develop DCM. These tests are diagnostic only.
- *Grain free foods cause DCM.* - Nutritional DCM is real. There is a lot of evidence linking grain free diets and nutritional DCM. Where that line falls in dobes, between nutritional and hereditary, is extremely blurred. It is best to err on the side of caution and feed a well rounded, inclusive diet.
- *Raw feeding like BARF prevents DCM.* - No; many raw fed dogs go on to develop DCM. Raw feeding is often imbalanced, failing to meet the nutritional needs of the dog. (see: <https://vetnutrition.tufts.edu/2018/11/dcm-update/>)
- *Supplements will prevent or cure DCM.* - How I wish it was a simple as that. Human models show some promise in supplementation with L-arginine as a management aid as well as a way to prevent and reverse DCM but no such studies exist in Doberman or other dog breeds.

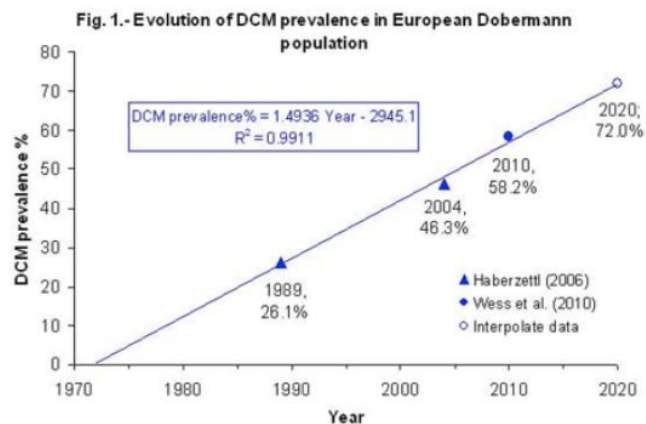
- *DCM is always fatal.* - Not always, just usually. Predictably usually. DCM can be managed and sometimes reversed with early intervention and extensive treatment. Nutritional DCM can be reversed in most early and mild cases. The type/method of DCM in Doberman tends to be a silent and sudden killer making treating it difficult.
- *Stem Cell Therapy can cure DCM.* No, it can't cure DCM but may be a good treatment. Stem Cell Therapy is still a new therapy needing more study and time to show if it is an effective treatment. The expense of SCT makes it not a practical option for managing DCM positive dogs.

## METHODS TO REDUCE DCM OCCURRENCE

- *Elimination Method* - Stop breeding dogs with DCM genes or who have positive echos/holter tests.
- *Avoidance Method* - Avoid lines and familial groups who develop or are related to a dog that develops DCM.
- *Selective Breeding* - Breed only certain dogs who meet a strict genetic and physical standard, or breeding only among titled dogs
- *Outcross Genepools* - Staying within the breed, bring in unrelated lines and breed together - yes, this can produce and maintain genetic diversity!
- *Outcross Other Breeds* - Select one or multiple breeds to crossbreed into the Doberman and selectively breed the desirable dogs back to purebred Doberman, continuing to breed back to more purebred Doberman until the dogs test genetically as purebreds.
- *Low COI Method* - Selectively breed dogs with testes low COI (Coefficient of Inbreeding) to produce low COI litters (this method preserves and creates diversity when done carefully and open mindedly)

## WHY WHAT WAS RECOMMENDED ISN'T WORKING

"Clearly, the efforts made by breeders over the last three decades to decrease the incidence DCM have had no effect at all on the prevalence of the disorder. Not even a little." - Carol Beuchat PhD



The above chart shows a striking and steady increase in DCM in the Doberman breed. Efforts to reduce DCM seem ineffective. Efforts such as the Holter Project failed to reduce DCM rates. The old methods to reduce DCM have failed to improve the breed. We need to be looking at all

options and be honest with ourselves as breeders and buyers. We need to recognize that holter testing, echos, and breeding for DCM genetics, eliminating DCM families, and so on is not effective enough. DCM is a crisis. The old methods aren't working.

So what will work? Open up the breeding lines. Many breeders refuse to branch out their programs to unrelated lines or to import lines. Many are repulsed and disgusted at the thought of outcrossing within the breed to pet lines and to other import lines. They want to keep their lines within their circles. That mindset is why the breed suffers like it does. There is strong support that opening up lines to include pet lines, untitled dogs, working and show crosses, show and pet line crosses, working and pet line crosses, maintaining active pet line breedings will lower the COI, increase genetic diversity, and will improve the breed. One single breeding can reduce the COI by ten points or more. Imagine if all breeders did that; think of how fast we could reduce the breed average COI of 43% to the low 20s! There is more being a breeder than titles and a name for yourself; it's the breed and it's future in your hands. Good breeders breed for the betterment of the breed, which goes beyond titling and working dogs.

### **WHAT TO TAKE FROM THIS**

When looking for a Doberman keep in mind no line is free from the DCM risk. Whether pure American, pure European, imported, domestic born, mixed pedigree; any DOberman is at risk to develop DCM. It is the shadow that haunts the breed. The current theory is that producing low COI litters is the key to reducing and potentially reducing DCM deaths. Genetic diversity is crucial in all animals to maintain healthy populations. As genetic diversity is lost disease and autoimmune disorders rise. Buyers should look for breeders with low COI dogs and for pedigrees with the least DCM deaths possible. Buyers should be careful who they buy from; don't shop just for price. Look at how the breeder breeds, what they test for, and their knowledge of the breed. The best practice for breeders is to screen their dogs for genetic mutations, be open to breeding outside your established line, research pedigrees to avoid high-risk lines, pair breedings that help preserve and increase genetic diversity (lowering the COI), and continue to screen their own breeding dogs for DCM and heart health.