

# Canine Heart Disease Has Spiked – Here's Why

This is a frightening, confusing time for millions of pet parents worried their dog has already or might soon develop dilated cardiomyopathy (DCM) as a result of their food. Owners want to know why dogs are suddenly developing this form of heart disease. Is it truly food-related?

Reviewed by Dr. Becker

## STORY AT-A-GLANCE

- Among the FDA's findings in its ongoing investigation into the rising incidence of nutritionally related dilated cardiomyopathy (DCM) in dogs is that the majority of reports involved grain-free kibble produced by major U.S. pet food companies, and the predominant protein sources were chicken, lamb and fish
- These findings should put to rest misleading speculation that most of the dogs diagnosed with DCM were eating a "boutique" brand dog food or one containing exotic proteins
- While there are likely several nutritional factors in play in the cases of DCM currently under investigation, protein deficiency is likely the biggest contributor
- Protein deficiency in pet food can be caused by excessive levels of carbohydrates and/or fats, processing methods, poor-quality raw ingredients and/or synthetic add-ins
- Steps you can take to help protect your dog from nutritionally related DCM include feeding a fresh food diet with low carbs and moderate fat, rotating the food you feed and adding taurine-rich toppers and treats

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If you're a dog parent, you may be aware that the veterinary community is seeing a sudden rash of cases of nutritionally related dilated cardiomyopathy (DCM, a type of heart disease) in dogs, and there appears to be a link between grain-free kibble, taurine deficiency and the mini epidemic we're seeing.

If you've been following the news on this topic, you're also aware of just how confusing it is, and that dog parents aren't sure who to listen to or trust.

## What We Learned from the FDA Update on Diet-Related Canine DCM

In 2019, the FDA, in collaboration with veterinary cardiologists and nutritionists, started digging into the issue and published an update on its investigation, which included the following datapoints:<sup>1</sup>

- Between January 1, 2014 and April 30, 2019, there were reports of 560 affected dogs and 119 deaths
- The number of reported cases (which also included a small number of cats) jumped from three in 2017 to 320 in 2018, and was at 197 through April 30, 2019
- **Golden retrievers**, mixed breeds and Labrador retrievers were the breeds most frequently reported

- The vast majority of affected dogs were fed a dry food (kibble) diet
- 91% of the diets were grain-free and 93% contained peas and/or lentils
- The most common proteins in the diets were chicken, lamb and fish

You can find the full **[June 27, 2019 FDA update here](#)**. It's also very important to note that there has been a campaign by some in both the veterinary community and pet food industry to lay the blame on "BEG" (boutique, exotic, grain-free) diets. Some of these folks imply or actually recommend that pet parents switch to a big name-brand, grain-based dog food containing a non-exotic protein source. However, the FDA report exonerates both dog food found in pet food boutiques (the "B" in BEG), and exotic protein sources (the "E").

Many of the diets fed to the dogs who developed nutritionally related DCM were about as far from "boutique" brands as it gets, including formulas produced by the biggest pet food companies in the U.S.: Mars Petcare/Royal Canin (which owns Nutro, California Natural and Evo), Nestle Purina Petcare (Merrick), Hill's Pet Nutrition, Smucker (Rachael Ray and Natural Balance) and General Mills/Blue Buffalo.

In addition, as noted in the datapoints above, the most common proteins in the diets were chicken, lamb and fish, none of which are considered exotic. Sadly, despite the FDA's clear evidence to the contrary, the "experts" continue to insist part of the problem is exotic protein sources.<sup>2</sup>

What we have left after debunking the myth that boutique brands and exotic proteins are the problem is the "G" in BEG — grain-free — and indeed, the vast majority of the diets the dogs were fed were grain-free kibble.

Some pet food companies attempt to convince pet parents the DCM issue really isn't a big deal. The truth is, veterinarians under-report most of the issues we should be routinely reporting, including adverse reactions to vaccines and pesticides (pest preventives) and cases of DCM. Doing more paperwork at the end of a long, stressful day is overwhelming for many of us.

That's why the FDA's numbers are just a small representation of the actual number of cases occurring nationwide. A quick visit to online DCM support groups highlights dozens of new, heartbreaking personal testimonies on a daily basis, many of which have likely not been reported to the FDA.

## **Protein Deficiency and Dilated Cardiomyopathy**

DCM is multifactorial, meaning it has multiple causes. Genetics and nutrition both play a role, and the nutrition component is also multifactorial. For example, the lectins and other anti-nutrients in grain-free kibble may be contributors. In addition, toxic levels of metals (iron, copper and cobalt) have been linked to DCM in humans.<sup>3,4</sup>

However, the elephant in the room is protein deficiency, which when coupled with high levels of certain minerals causes DCM in humans that is reversible with added protein in the diet.<sup>5,6,7</sup> From the 2016 study cited:

*"... [H]ypothesis is consistent with observations in animal models, which showed no cardiomyopathy with cobalt exposure alone but a severe cardiomyopathy when cobalt exposure was preceded by protein deficiency ..."*<sup>8</sup>

For pets, AAFCO sets minimum mineral requirements, but not maximums, and some companies may supply excessive synthetic nutrients via the premixes used across multiple formulations. This is one reason to rotate proteins and brands often.

## How Pet Foods Become Protein-Deficient

All pet food contains three sources of calories and nutrients: fat, protein and carbohydrates, which occur in varying amounts depending on the formula. It's the amount of each of these components that means the difference between health and disease, and also defines how species-appropriate the food is.

1. **Excessive carbohydrates** — In the vast majority of dry pet foods on the market, excessive amounts of carbs offset animal protein, which creates amino acid deficiencies. Canned food usually has fewer carbs than kibble, which is why over 90% of the DCM reports have involved dogs on dry versus canned diets.

Additionally, if a pet parent feeds a lower volume of food than their pet requires (for example, to a dog who needs to lose weight), this reduces critical amino acid intake from meat-based protein even further. Vegan diets, high-carbohydrate diets (e.g., most grain-free kibble), high-fiber diets (weight loss formulas) and low protein diets ("senior" formulas) can also predispose dogs to nutritionally mediated DCM over time.

These diets lack sufficient meat-based protein, coupled with excess minerals and the digestion and absorption issues created by significant alteration of nutrients during processing.

2. **Excessive fat** — In the case of raw diets, if they're poorly formulated, excessive fat can offset animal protein. Raw lamb diets (lamb is high in fat) have been implicated in a few cases of DCM.

Lean meat is expensive, so some fresh pet food producers use fatty meats and add additional animal fat to their formulas as well, creating fresh meat-based diets that are grossly deficient in amino acids because all that fat offsets the protein in the meat. This is also why high-ratio ketogenic diets can't be fed to dogs indefinitely — They're deficient in amino acids and can create protein deficiency-related disease, if fed long-term.

Unbalanced prey model diets have also caused DCM in cats.<sup>9</sup> Remember, domesticated animals (in this case, prey animals) do not contain the same macronutrients as their wild counterparts.

# WHY IT IS SO HARD TO COPY THE ANCESTRAL DIET



Wild duck	Nutrient	Unit /1000 kcal	Domesticated duck
0.1	Mg	g Magnesium	0.04
20.27	Fe	mg Iron	6.00
1.52	Cu	mg Copper	0.59
0.09	Mn	mg Manganese	0.04
3.75	Zn	mg Zinc	3.4
0.09	Se	mg Selenium	0.03

	Protein	Fat	Kcal / lb
Wild duck	17.4%	15.2%	931
Domesticated duck	11.5%	39.3%	1814

Meat from a domestically raised duck has twice the fat as meat from a wild duck. It's easy to see how these differences, if pet food manufacturers aren't doing their due diligence, can cause medical issues long term.

Poorly formulated homemade diets can also cause DCM. Master pet food formulator Steve Brown has told the fresh-feeding community for years that homemade recipes that don't state the leanness of the meat should not be fed, unless fed in rotation with super-lean meats. This is because, for example, 60% lean ground beef is not the same as 90% lean ground beef in terms of the amount of amino acids provided to the animal.

Lamb meat is often higher in fat and contains less methionine than other types of meats; it's easy to see how amino acid deficiencies can occur over time if protein sources aren't rotated and if raw diets aren't formulated with an abundance of lean protein.

A raw or fresh food diet can be the best or worst food you offer your dog or cat, depending on how nutritionally complete it is. A low-fat, well-formulated fresh food diet is the best way to avoid DCM in pets because it provides bioavailable nutrients in their unprocessed state, which is the way nature intended animals to eat. The key is to not guess at meeting macro and micronutrient requirements; research shows "balance over time" rarely occurs.

3. **Processing methods** — The extreme processing methods used to produce commercial pet food also deplete critical amino acids and choline. The ingredients in your average kibble have been heat processed four times. Each time the food is heated, more amino acids are depleted.

Freezing also degrades amino acids over time,<sup>10</sup> and how meat is prepared at home also influences the amount of taurine left in the food.<sup>11</sup>

Extrusion of pet food prevents its optimal digestion and assimilation, as well as the microbiome's ability to process certain nutrients.<sup>12</sup> On paper, the level of choline, cysteine, lysine and methionine present before processing isn't really an objective measure of the amount of nutrition or viable amino acids that remain after processing.

This is one of many reasons to feed minimally processed foods; digestion, absorption and the body's ability to extract nutrients is better with whole food sources than with synthetics.

- 4. **Poor-quality raw ingredients and synthetic add-ins** — FDA compliance policies allow pet food companies to break federal law by using decomposing and diseased animals (animals that have died by means other than slaughter) as ingredients in pet foods that don't claim human-grade status (if you want to let the FDA know you disagree with this practice please comment [here](#)).

The quality of protein used in much of the processed pet food on the market (including a few raw food companies, unfortunately) is terrible, and no digestibility or absorption studies are required. These studies should be a mandatory part of AAFCO feeding trials but are not. These feeding trials are a joke, and misguided veterinarians are telling people to use them as the barometer of what to feed pets to avoid DCM.<sup>13</sup>

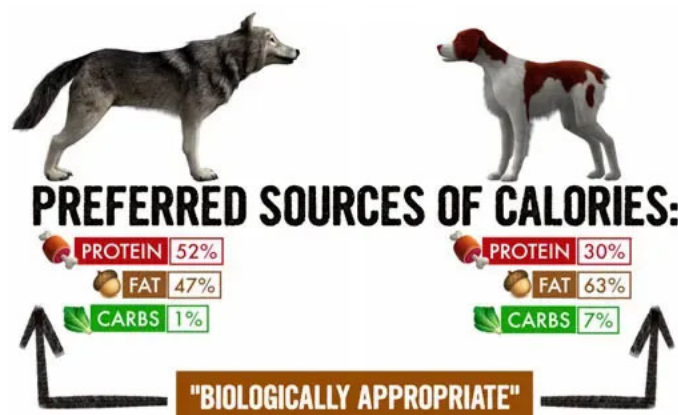
Some companies add synthetic amino acids to their formulas after processing, and these companies are associated with the fewest reported cases of DCM. Synthetic nutrients (primarily imported from China) are better than nothing but can have their own problems.

Big Pet Food's approach with synthetic nutrient add-ins is sort of like taking a multivitamin after eating at McDonald's. Common sense tells us that getting nutrients from real food (rather than laboratory made powders) is safer in the long run, which is why fresh, lean, real meat-based diets for dogs and cats is recommended.

Since it appears formulas free of synthetics have been implicated in more cases of DCM, it's possible the manufacturers of those formulas, in trying to do the right thing by not using synthetic add-ins (but still using large amounts of carbohydrates), have inadvertently created profound amino acid deficiencies.

Bottom line: The answer to the DCM issue isn't to add grains back into grain-free formulas, nor is it to add synthetic amino acids into basically vegan pet foods. The answer is to feed an abundance of biologically appropriate, real meat as the foundation of any nutritionally optimized formula or recipe.

## Species-Appropriate Diets — What They Are and Why They're so Important





In the image above, the percentages for wolves were published in a 2013 study titled "Dietary nutrient profiles of wild wolves: Insights for optimal dog nutrition?"<sup>14</sup> The percentages for dogs were published in a study titled "Geometric analysis of macronutrient selection in breeds of the domestic dog, *Canis lupus familiaris*" also in 2013.<sup>15</sup>

A 2018 study titled "Macronutrient intake of dogs, self-selecting diets varying in composition offered ad libitum"<sup>16</sup> challenged the 2013 percentages for domestic dogs, finding they chose 44% of their calories from protein sources (versus 30%), 52% of their calories from fat (versus 63%) and 4% of their calories from carbs (versus 7%). Please note, these aren't proportions of food to feed, it's the percent of calories coming from these macronutrients.

This helps illustrate what "species-appropriate" aka biologically appropriate diets for dogs means. The take-home message here for pet parents is that both wild and domesticated dogs naturally consume low-carbohydrate diets given the choice. My message for pet food companies: Bad things happen when you formulate food for dogs that in no way resembles the species-appropriate diets their bodies require.

Dogs don't require grains or legumes for nutritional well-being, so loading up processed dog food formulas with inexpensive starches (or fat, in the case of poorly formulated fresh food diets) depletes the amount of critically important fresh, lean meat in those diets. This sets the stage for amino acid deficiencies and the myriad of chronic diseases plaguing pets today, including obesity, diabetes and a whole host of degenerative metabolic issues that develop with long-term feeding of biologically inappropriate diets.

Most processed pet food companies use corn, wheat, rice, tapioca, potatoes, legumes and other plant-based proteins in their formulas to provide "filler" amino acids, which dramatically reduces their production costs. But carbs can't replace meat when it comes to supplying the sulfur amino acids dogs' (and cats') bodies require to produce adequate amounts of carnitine and taurine.

And again — supplementing with synthetic amino acids doesn't improve poor-quality ingredients, which is why switching to Purina Pro Plan (or any other feed-grade, synthetically fortified formula) is not recommended if your dog has DCM or is genetically predisposed.

## Recommendations for Dog Parents Concerned About Diet-Related DCM

The following to-do list is designed to help you be self-sufficient when choosing how to best nourish your pet.

- **Step 1 — Calculate the macronutrients in your pet's food** — To use the carb calculator below, find the guaranteed analysis on your pet food label. Enter the percent protein, fat, moisture, fiber and ash in the appropriate cells in the spreadsheet.

This simple carb calculator (thank you, Steve Brown!) doesn't account for micronutrient deficiencies that are common in poorly formulated raw foods, nor can it account for unethical companies that lie about their guaranteed analyses results. It also won't tell you if the protein in canned and dry foods is sourced from meat or plants, which plays into how well-equipped your dog's body is to manufacture carnitine (from the amino acids methionine and lysine) and taurine (from cysteine and methionine).

Carbohydrates should not exceed 20% for any dog or cat food without concern for meat-based amino acid deficiencies occurring over time. A dog's ancestral diet supplies approximately 50% of calories from fat and 50% of calories from protein (lean, human-grade, fresh meat).

The organization Check Your Pet Food, LLC will be offering third party testing services to help companies and pet parents discover what's really in the food they're feeding. Hopefully this is the beginning of ethical, transparent companies proactively engaging in third party testing.

- **Step 2 — Rotate through a variety of foods, brands and proteins** — Rotating flavors within just one brand of foods means that if there's excessive cobalt or iron, your pet is probably still at risk. All meats have a different amino acid profile, so providing a variety of proteins offers your dog nutritional diversity.

If you feed a homemade diet, follow a recipe you know meets minimum nutrient requirements and use only 85% lean meats. Guessing gets people into trouble and rotation over time statistically doesn't work. Feed frozen diets within three months of preparation or manufacturing.

If your dog needs to eat an exotic protein due to adverse reactions to other proteins, it's important you make sure the diet contains enough lean meat protein to supply all of the essential amino acids, in abundance.

Part of the reason exotic proteins were erroneously implicated in DCM cases early on was probably because the volume of real meat protein added to exotic protein diets is minimal, due to cost. If formulators rely on an abundance of legumes or other plant proteins to provide the amino acids missing from meat-protein deficient diets, then "exotic" diets may look nutritionally adequate on paper but fail in real life.

That doesn't mean the meat source is poor, it means formulators have skimmed on the amount of meat needed to sustain health. And because AAFCO's current feeding trials are worthless (not measuring a single aspect of the test diet's digestion, absorption or serum nutrient levels) there is currently no reliable industry requirement to demonstrate a food's nutritional adequacy over time.

Ideally, feeding trial requirements would demand the levels of remaining nutrients in the test diet be measured at the conclusion of the trial (including choline, lysine, cysteine and methionine, which are necessary for adequate taurine and carnitine production) to assure the diet meets minimum nutrient requirements for the duration of the test period. Currently, no one knows what level of nutrients remain at the bottom of an opened pet food bag, or how rancid the fats may be.

- **Step 3 — Add amino-rich toppers and treats to a well-balanced, diversified diet** — The key to avoiding this deficiency-induced disease is to offer a variety of well-formulated commercially available fresh food diets or prepare nutritionally optimized meals yourself.

Seafood is especially high in taurine and other amino acids, as are animal hearts. An easy way to supply additional amino acids to your pet's meals is to simply divvy up a can of sardines (packed in water) per 30 pounds of dog over a week. (So, if you have a 60-pound dog, spread out two cans over a week, and so on.)

You can also find the taurine content of many other foods on page 2 of [this study](#) and also in this [Raw Feeding Community article](#). Swap out carb-based treats and "cookies" for freeze dried or dehydrated hearts and other organ meats.

- **Step 4 — Have your veterinarian check your dog's taurine levels if you have a predisposed breed** — Ask your vet to submit both plasma and serum taurine levels directly to the [UC Davis Veterinary Medicine Amino Acid Laboratory](#). If you don't know your pet's breed, do a DNA test, so you can determine if your dog may have a genetic predisposition you didn't know about.

- **Step 5 — Provide supplementation, if your dog tests low for taurine** — If your dog has low blood taurine levels the first step is to change the diet. Rotate through a variety of better quality, meat-based foods and supplementing simultaneously with taurine-rich foods, as well as:
  - **Taurine** — Talk with your veterinarian about starting supplementation at 500 mg for every 25 pounds of body weight twice daily.
  - **Ubiquinol** — This reduced form of CoQ10 is very beneficial in supporting at-risk animals, with no side effects.<sup>17</sup> Talk with your veterinarian about starting with 1 mg per pound of body weight one to two times daily.
  - **L-carnitine** — Talk with your vet about starting supplementation with L-carnitine at 500 mg for every 25 pounds of body weight twice daily.
- **Step 6 — Schedule an annual wellness exam, including a CardioPet proBNP heart health test for predisposed breeds** — After 6 years of age, a complete physical twice a year is recommended.

## Final Thoughts (For Now)

This is a confusing topic and will remain so until (and providing) we get more information on the connection between types of dog food and the true incidence of dilated cardiomyopathy.

Unfortunately, pet food manufacturers and their advocates are using the current crisis to push their products, bash their competitors and point fingers, which makes the situation all the more confusing for pet parents. Returning to the "good old days" of synthetically infused, feed grade, grain-based (yes, think unregulated **mycotoxin levels**, which can also cause heart disease) formulas produced by Big Pet Food and sold in 40-pound bags is a ridiculous recommendation bordering on negligence.

Adding rice or grains back into your dog's diet (which is what some veterinarians are recommending) is the worst thing you can do. DCM is not caused by a rice or grain deficiency — it's caused by an insufficient amount of high-quality, meat-derived protein in the diet.

Now is the time to demand pet food companies clean up their act and become transparent about the source, quality and amount of meat-based protein in their formulas, post production. Now is also the time to implore AAFCO to update and revamp their current poorly designed feeding trial requirements and define pet food ingredients in plain English that everyone understands.

## Sources and References

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<sup>16</sup> [J Anim Physiol Anim Nutr \(Berl\). 2018 Apr;102\(2\):568-575](#)

<sup>17</sup> [Int J Tissue React. 1990;12\(3\):173-8](#)

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