

# Grain-Free Diet Risks and Working Dogs

Laura McLain, DVM, Working Dog Practitioner  
Erin Perry, MS, PhD, Professor of Animal Science

January, 2025

In 2018 the FDA announced preliminary findings that correlated certain brands of grain-free dog food with dilated cardiomyopathy (DCM) in dogs, including heart failure and death<sup>1</sup>. An update was released in 2019<sup>2</sup>. As of September, 2020, over 1,100 dogs with DCM had been reported to FDA<sup>3</sup>. In 2022, FDA announced that they would not be providing any further updates, but fortunately a number of veterinary specialists (internists, cardiologists, and nutritionists) have carried on the research.

We are a veterinarian and a professor of animal nutrition, both affiliated with FEMA Urban Search and Rescue: Dr. McLain as team veterinarian with UT-TF1 and Dr. Perry as Canine Search Specialist with TN-TF1. Our concern is specifically with the risks of feeding grain-free diets to working dogs. While a mild decrease of heart function may be inconsequential for a pet dog, it could make an enormous difference for a working dog who is functioning at an elite level and on whom human lives depend.

Dilated cardiomyopathy is the most common acquired cardiac disease of large and giant breed dogs. DCM can lead to congestive heart failure or sudden death from arrhythmia. Classically, DCM was found in certain breeds as a heritable condition (Dobermans, Portuguese water dogs, Boxers, Irish wolfhounds, Great Danes), and in other breeds predisposed to deficiency of taurine, an amino acid necessary for heart function (Golden retrievers, Newfoundlands, Cocker spaniels). But over the last decade there have been many more cases of DCM being diagnosed in other breeds. Over 2/3 of those dogs were eating grain-free or “nontraditional” diets<sup>1</sup>.

Commercially-produced dog food kibble of any brand or variety will include a mix of protein, fat, and carbohydrates. Historically, the carbohydrate was often corn or wheat. Some pet food companies started offering grain-free formulas because of pet owner concerns with corn and wheat. However, there has to be a carbohydrate to stick everything together in the manufacturing process. So the corn or wheat had to be replaced with another carb, such as rice, potato, quinoa, barley, peas, lentils, or chickpeas. These last three ingredients, peas, chickpeas, and lentils, are all in a category called “pulses.” The diets of highest concern have high pulse scores—usually multiple pulses in the top five ingredients.

Research has identified a number of compounds that are higher in high-pulse diet formulations compared to regular grain-inclusive diets<sup>3</sup>. Unfortunately, the specific compounds causing heart effects have not yet been identified. Theories about how these diets may affect the heart are

1. Deficiency of certain required nutrients,
2. Excess of other nutrients which could interfere with digestion/absorption of required nutrients,
3. Excess of compounds that block uptake of required nutrients by the heart muscle, or
4. Excess of compounds that are directly toxic to heart muscle cells<sup>3,4,5,6,7</sup>.

One study looked at 46 happy, healthy, asymptomatic pet dogs<sup>8</sup>. Half had been eating a regular diet (with grains) over the previous year while the other half had been eating high-pulse diets. They excluded dogs from the classic DCM breeds. The study dogs included working-type breeds such as Labrador retrievers, Border collies, German shepherds, and Australian shepherds. Echocardiographic (ultrasound) examination of their hearts showed that multiple cardiac measurements were altered in the grain-free dogs, including a decreased ejection fraction, which is a measurement of the efficiency of the heart in pumping blood through the body.

Besides the risk of DCM, we are especially concerned with the possibility of subclinical heart disease in working K9s eating a grain-free diet. One study of DCM dogs also looked at dogs with subclinical cardiac abnormalities<sup>9</sup>. These included housemate dogs of the diagnosed DCM dogs: dogs who were happy and active with no obvious symptoms, but eating a grain-free diet and with significant heart abnormalities seen on testing (echocardiogram and blood tests for heart muscle enzymes). In these apparently normal dogs, the average fractional shortening (FS, a measurement of the ability of the heart muscle to contract) was 24% initially, and increased to 30% nine months after changing to a diet containing grains. (The normal FS for dogs is 30-46%.) We are concerned that for a working dog, a decrease of FS from 30% to 24%, although it may not cause any outward symptoms, might negatively affect the K9's performance. For FEMA USAR K9's on the rubble pile, any decrease of heart function could lead to K9 injury or could impact the whole team's search capability. For a tracking or apprehension K9, it could lead to K9 exhaustion or escape of a suspect.

The good news is that the heart muscle abnormalities can improve after switching to a regular diet including grains. Multiple studies have looked at DCM dogs who had been eating grain-free/high-pulse diets at the time of diagnosis and were switched to a regular grain-inclusive diet<sup>4,7,10</sup>. These studies looked at blood tests for cardiac markers indicating heart muscle damage and echocardiograms for left ventricle size and fractional shortening. Dogs showed significant improvements in the months to years after switching diets: lower blood markers (meaning less heart muscle damage) and normalizing left ventricle measurements (meaning improved heart function). Survival time was also longer in nutritional DCM dogs who were switched to diets with grains, as compared to either nutritional DCM dogs who stayed on the grain-free diets or to hereditary DCM dogs.

So where does this leave the K9 handler looking to feed the best diet to their partner? If you are currently feeding a grain-free diet, especially one that is high in pulses, we recommend transitioning to a standard diet. Check the ingredients on the bag; if there are peas, lentils, or chickpeas anywhere in the top five ingredients, change the diet. Specific diet formulations that we recommend for working dogs include:

- Eukanuba Performance 30/20 Sport (30% protein, 20% fat, 447 calories per cup, chicken-based)
- Eukanuba Performance 26/16 Exercise (26% protein, 16% fat, 355 calories per cup, chicken-based)
- Purina Pro Plan Sport Performance 30/20 (30% protein, 20% fat, 484 calories per cup, chicken-based)

- Purina Pro Plan Sport Performance 30/20 Salmon & Rice (30% protein, 20% fat, 527 calories per cup, salmon-based)
- Purina Pro Plan Sport Performance 30/20 Salmon & Cod (30% protein, 20% fat, 473 calories per cup, salmon-based)
- Purina Pro Plan Sport Performance 30/20 Beef & Bison (30% protein, 20% fat, 489 calories per cup, beef-based)
- Purina Pro Plan Sport Performance Turkey, Duck and Quail (30% protein, 20% fat, 518 calories per cup, turkey-based)
- Purina Pro Plan Sport Active 27/17 (27% protein, 17% fat, 475 calories per cup, chicken-based)
- Purina Pro Plan Sport Active 26/16 (26% protein, 16% fat, 426 calories per cup, chicken-based)
- Royal Canin Sporting Life Trail 4300 (28% protein, 21% fat, 413 calories per cup, chicken-based)

If your K9 has a sensitivity to grains (such as rice or barley), consultation with a board-certified veterinary nutritionist is recommended. Diplomates of the American College of Veterinary Internal Medicine (Nutrition) can be found at <https://www.vetspecialists.com/home>.

*K9 Cyrus of FEMA USAR UT-TF1 and Search Dog Foundation. SDF dogs are fed a 30/20 commercial kibble with grains.*



Table from the FDA showing the characteristics of diets associated with dietary DCM<sup>2</sup>:

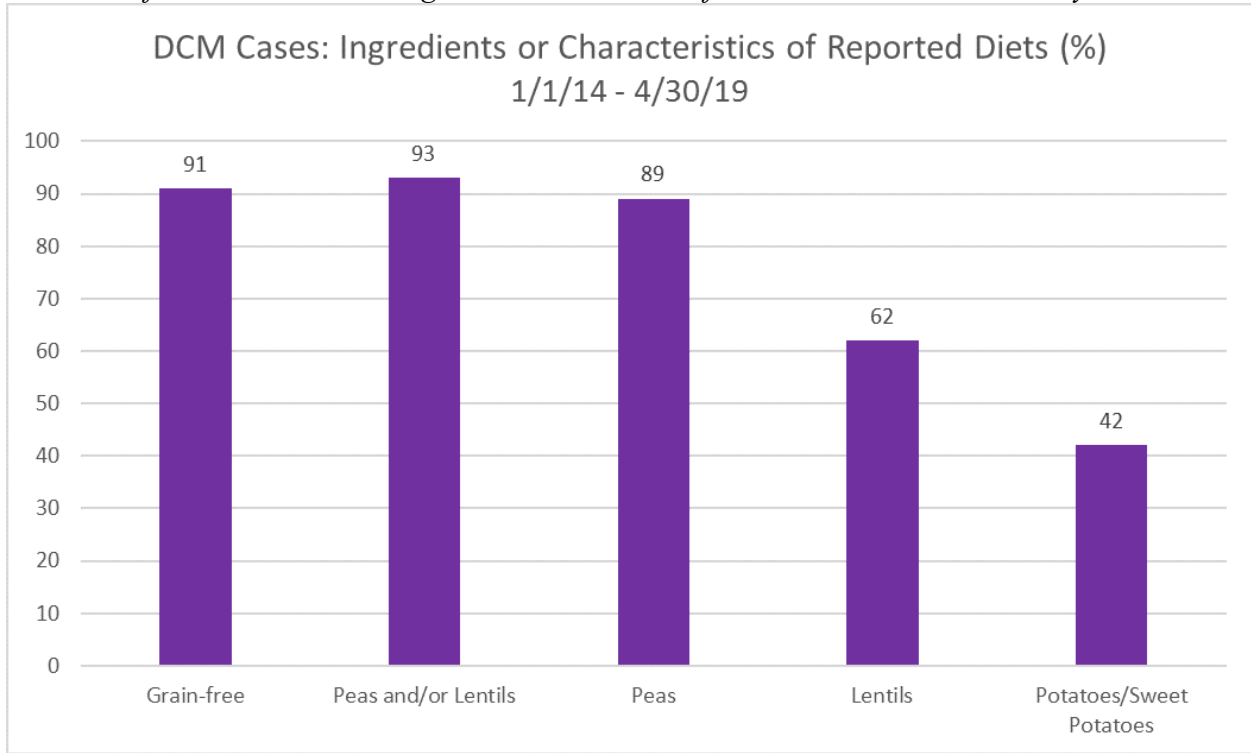
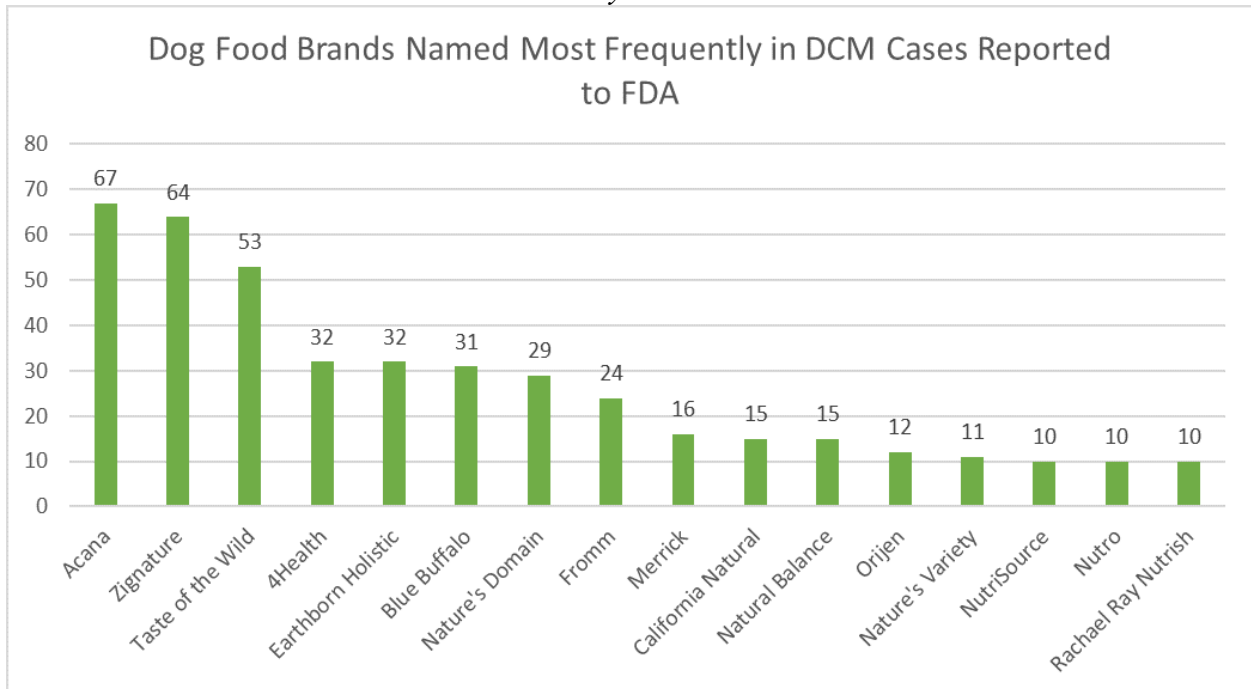


Table from the FDA showing the brand names of grain-free diets most commonly associated with dietary DCM<sup>2</sup>:



## References

---

<sup>1</sup> “FDA Investigating Potential Connection Between Diet and Cases of Canine Heart Disease.” FDA CVM press release July 12, 2018, accessed at <https://wayback.archive-it.org/7993/20201222194256/https://www.fda.gov/animal-veterinary/cvm-updates/fda-investigating-potential-connection-between-diet-and-cases-canine-heart-disease>

<sup>2</sup> “FDA Investigation into Potential Link between Certain Diets and Canine Dilated Cardiomyopathy.” FDA CVM update June 27, 2019, and again December 23, 2022, accessed at <https://www.fda.gov/animal-veterinary/outbreaks-and-advisories/fda-investigation-potential-link-between-certain-diets-and-canine-dilated-cardiomyopathy>

<sup>3</sup> Smith CE, Parnell LD, Lai C-Q, et al. Investigation of diets associated with dilated cardiomyopathy in dogs using foodomics analysis. *Sci Rep* 2021; 11:15881 <https://doi.org/10.1038/s41598-021-94464-2>

<sup>4</sup> Freid KJ, Freeman LM, Rush JE, et al. Retrospective study of dilated cardiomyopathy in dogs. *J Vet Intern Med* 2021; 35:58–67.

<sup>5</sup> Adin D, Freeman L, Stepien R, et al. Effect of type of diet on blood and plasma taurine concentrations, cardiac biomarkers, and echocardiograms in 4 dog breeds. *J Vet Intern Med* 2021; 35:771–779.

<sup>6</sup> McCauley SR, Clark SD, Quest BW, et al. Review of canine dilated cardiomyopathy in the wake of diet-associated concerns. *J Anim Sci* 2020; 98(6):1-20.

<sup>7</sup> Freeman LM, Stern JA, Fries R, et al. Diet-associated dilated cardiomyopathy in dogs: what do we know? *J Am Vet Med Assoc* 2018; 253(11):1390-1394.

<sup>8</sup> Owens EJ, LeBlanc NL, Freeman LM, et al. Comparison of echocardiographic measurements and cardiac biomarkers in healthy dogs eating nontraditional or traditional diets. *J Vet Intern Med* 2023; 37:37-46.

<sup>9</sup> Freeman L, Rush J, Adin D, et al. Prospective study of dilated cardiomyopathy in dogs eating nontraditional or traditional diets and in dogs with subclinical cardiac abnormalities. *J Vet Intern Med* 2022; 36:451–463.

<sup>10</sup> Haimovitz D, Vereb M, Freeman L, et al. Effect of diet change in healthy dogs with subclinical cardiac biomarker or echocardiographic abnormalities. *J Vet Intern Med* 2022; 36:1057-1065.