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Kibble Me This: The Scientific and Cultural Debate Over Boutique, Exotic, and Grain-Free Canine Nutrition

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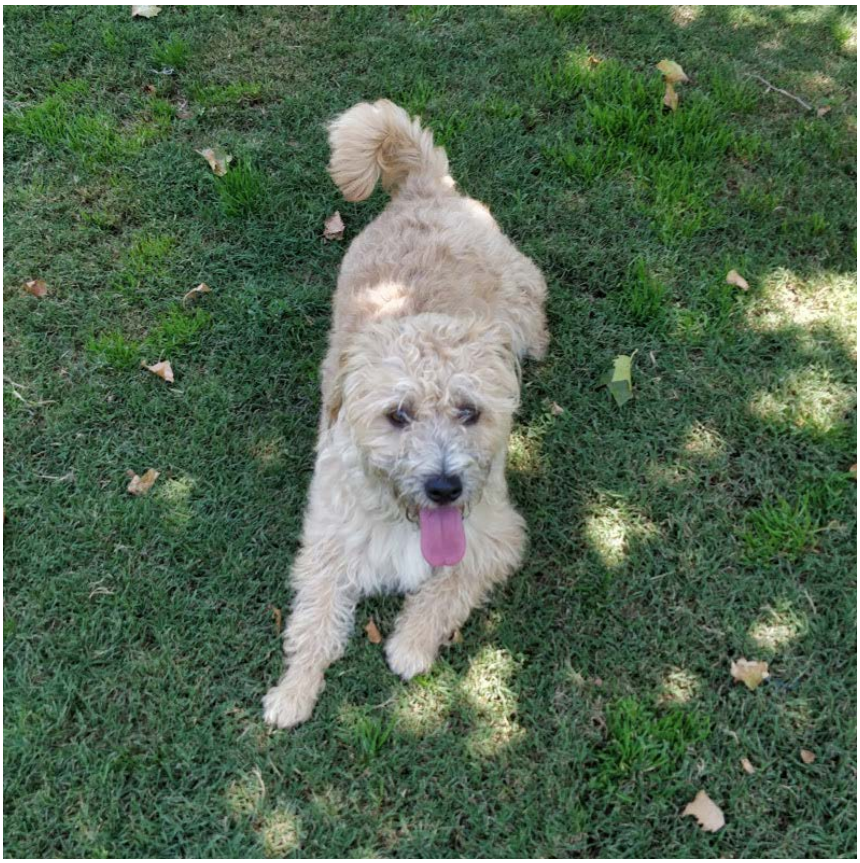
For Blue, whose fragile digestive system was the inspiration behind this thesis.



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Introduction – Julie's Story

Julie Carter lived in her New Jersey home with her husband Bruce and their two beautiful golden retrievers, Oliver and Riley, that they had raised from puppies. After Julie and Bruce's children grew up, Oliver and Riley diminished their empty nest syndrome, taking on some of the same roles their children had previously in their lives. The couple would frequently take their beloved pups to the beach and dress them up in silly costumes. Julie would then proudly post the pictures online, sharing them with her friends and family. Then, one day, just several days after his fourth birthday, Oliver collapsed in the kitchen while Julie was cooking. "Despite being less than 5 feet away when he dropped to the floor, there was nothing my husband or I could do to save him. He was gone in a matter of seconds, leaving us no time to say goodbye or accept what was happening" (Carter, "OLIVER, Hero #2803"). Julie was heartbroken, posting that "a part of me died with him that day" on her Facebook page (Carter, "OLIVER, Hero #2803").

At the age of 6 months, Julie had enrolled Oliver into the Morris Animal Foundation's Golden Retriever Lifetime Study meant to help scientists better understand when and under what circumstances dogs, particularly golden retrievers, get cancer. Because of this, Oliver was regularly receiving thorough medical examinations, ones more extensive than what annual veterinary checkups provide for the typical dog owner. On February 12, 2018, Oliver had been diagnosed with diet-induced Dilated Cardiomyopathy, colloquially referred to as DCM. DCM is characterized by an enlargement and weakening of the heart's ventricles which hinders the ability to pump blood throughout the body properly. This results in a decrease in the delivery of oxygenated blood to the body. The heart valves can begin to leak which can result in a buildup of fluid in the chest and abdomen ("Canine Dilated Cardiomyopathy (DCM)"). DCM often

[Figure 1. Julie Carter and Oliver posing together at the Morris Animal Foundation where Oliver was enrolled in a Golden Retriever Lifetime Study related to canine cancer. Image from Julie Carter. Reproduced with permission.]

results in congestive heart failure, especially when left untreated ("FDA Investigating Potential Connection Between Diet and Cases of Canine Heart Disease").

While startling and stressful, Oliver's DCM diagnosis was by no means a death sentence. He seemed perfectly happy and healthy, giving Julie and Bruce no impression that something was immediately wrong. In fact, if it was not for enrollment in the lifetime study, it is highly unlikely that a vet would have conducted an echocardiogram on an asymptomatic Oliver and noticed his enlarged heart ventricles. Because of the early diagnosis, Oliver was directed to a veterinary cardiologist who prescribed him multiple cardiac medications and supplements and suggested an immediate dietary change. While this was all stressful for Julie, of course, these were seen as conservative precautionary measures. Just half a year after his diagnosis, Oliver lay crumpled on the kitchen floor, dead by the time Julie was able to rush to his side from just a few feet away. Just the day prior, Oliver had an echocardiogram which indicated that the strength of his heart was improving, despite their still being an enlargement. Julie describes Oliver's cardiology team as having been "cautiously optimistic" (Carter, "OLIVER, Hero #2803"). Herein lies the horror of DCM. It is a largely silent and often unpredictable disease which can insidiously fester in seemingly perfectly healthy dogs and take their lives suddenly. The biggest tragedy of all of this is that it is thought to be largely preventable.

While fairly common in humans, DCM in dogs has recently gone from being a rare phenomenon to a seemingly much more common occurrence ("FDA Investigation into Potential Link between Certain Diets and Canine Dilated Cardiomyopathy"). In fact, DCM used to only occur in certain breeds of dogs that are genetically predisposed to the disease. Today, while predisposed breeds are still primarily the ones suffering from DCM, and at significantly higher rates than before, dog breeds that lack a predisposition are also getting DCM diagnoses. A rise in

DCM has been attributed to a rise in owners buying and feeding the "BEG diet" which is an acronym for Boutique, Exotic and/or Grain-free dog foods. *Boutique* is rarely if ever explicitly defined but seems to allude to small new companies that are perceived as merely riding recent trends and lacking a track record for science-backed healthy and safe products. *Exotic* refers to dog foods that include ingredients seen as unnecessary or not scientifically studied. These include kangaroo, alligator, duck, buffalo, and venison but some will also include lentils, peas, fava beans, tapioca, barley or chickpeas in this delimitation. Finally, *Grain-free* dog foods do not contain wheat or anything else classified as a grain (such as oats or barley). These foods will typically use legumes/lentils and potatoes to act as starch in place of grains. According to the FDA, while scientists are still trying to figure out the exact mechanism behind DCM, lentils, potatoes, and legumes seem to block taurine absorption in the body and thus can lead to DCM in dogs ("FDA Investigation into Potential Link between Certain Diets and Canine Dilated Cardiomyopathy").

Julie and others like her learned that the reason for her priceless pet's health decline was due to the very expensive "premium" food she had been feeding for years. First recommended by pet store employees (but actually discouraged by her vet), Julie thought she was making the best choice for her family member (Carter, "Oliver's Story"). Now she feels that it was simply a money-making ploy that lacked scientific backing. "I trusted the wrong people with my dog's nutrition, and he paid the price for my ignorance" (Carter, "Oliver's Story"). The recent FDA report that brings to light the spike of reported DCM cases and the connection to grain-free dog foods has caused a backlash against these foods. Since Oliver's diagnosis and continuing after his death, Julie has taken on an advocacy role, using her social media presence to inform others of the risk of BEG dog foods and advocating that dog owners buy dog foods that have been

deemed safe and healthy through scientific research on animal nutrition and feeding trials conducted according to the standards of the Association of American Feed Control Officials (AAFCO).

Julie is not alone in her suffering or her advocacy. There has been a sudden spike among young, liberal (sub)urban wealthy dog lovers who have had their pets fall ill with DCM and who have then become advocates for grain-inclusive dog food ("Is My Dog at Risk for Nutritionally-Mediated DCM?"). Most dogs do not get selected for longitudinal studies and end up with a cardiological team. In fact, many owners do not know that their dog has DCM until they collapse, some surviving it and others only being diagnosed post-mortem (Schmidt). A quick internet search returns dozens of similar heartbreaking tales: middle aged (but not yet senior) dogs beginning to show signs of illness such as decreased appetite, coughing, shortness of breath, vomiting, and sometimes full-on collapse ("FDA Investigation into Potential Link between Certain Diets and Canine Dilated Cardiomyopathy"). Vets sometimes assume the health issue is something else, perhaps a common condition such as kennel cough (Colleen). Eventually, there is a diagnosis, but often when it is too late.

To whom is Julie out there spreading the word? It is estimated that anywhere from 24 to 44 percent of dogs in the United States are currently on a grain-free diet (Pets International; Hoffman). The matter is complicated further as some grain-inclusive dog foods can still be considered boutique or exotic and thus fall into the BEG category. These people tend to have a higher income level and is more likely to shop at independent pet stores or online (Sprinkle). They report a willingness to spend more money in exchange for a healthier product for their pets (APPA, Packaged Facts, Global Pet Expo). According to one study by the American Pet Product Association, the average household only spends about $20 a month on pet food per dog (Phillips-

Donaldson, "US Pet Food Spending…"). While the cost of dog food is largely dependent on a dog's size, age, and activity level, premium dry dog foods tend to cost $30 to $50 a month, with some frozen and fresh foods running as high as $250 a month.[1] They are either unaware of the current DCM scandal or, as is true of a small but passionate subgroup, do not subscribe to its claims and conclusions. This substantial category of dog owners is the ones Julie is trying to reach with her message.

Finally, we have those who have already heard Julie's plea, likely either online or from their vet (Schleicher, Molly, et al.). They used to feed their dogs a BEG diet but have since switched back to the tried and trusted companies who are not connected to DCM diagnoses. The people in this group tend to identify as devout dog lovers and either seek to educate or look down upon those who still feed their pets a BEG diet (saf1999). This group generally believes that only foods that meet the World Small Animal Veterinary Association (WSAVA) guidelines are safe and are active proponents of feeding Purina Pro Plan (saf1999). They are backed by the recommendation of a majority of veterinarians and the FDA (Parker-Pope).

In this thesis, I am going to explore where and how these different groups of dog owners get their information and reach their conclusions. Additionally, I am intending to explore the role of the dog in American families and how dog food manufactures have appropriated narratives around human-canine relationships and health. I want to take a closer look at Julie's concerns and analyze whether the FDA's DCM report is worthy of the fear and doubt it has generated around BEG dog food diets. Finally, I aim to connect my exploration to a broader understanding

[1] These figures were calculated based on 10 different brands of premium dog food for a healthy medium/large 50-pound adult dog. Wet, freeze-dried, frozen, and fresh dog foods were significantly more expensive than dry kibble foods. Commercial raw dog foods and organic fresh food delivery services, both relatively new and growing markets, were outliers at $150-$250 a month.

of the power elite, lobbyist groups, and neoliberalism using dog food as a lens to view larger societal structures.

Chapter 1 – Past and Present in Dog Food

To fully understand the existing dog food landscape, we must first look back in time to understand the circumstances that preceded the modern-day market. The idea of dog food as something distinct from human food is in itself a relatively recent phenomenon staged by pet food manufacturers in the 1960s following the advent of kibble. For thousands of years, humans have shared their own food with dogs by feeding scraps and leftovers. Some research even suggests that the symbiotic relationship between humans and wolves (that later evolved into domesticated dogs) stemmed from wolves scavenging for food and humans being willing to exchange food for companionship. This creates a stark contrast to the modern-day notion that dogs have specific nutritional requirements distinct from those of humans which are best understood by industry professionals such as researchers and nutritionists. However, the idea that food is a way to show affection in a manner which traverses species lines is an ancient understanding that is possibly even more prevalent today. This chapter takes a deep dive into the history of the human/canine relationship, the beginnings and evolution of dog food as a mainstay for dog owners and global industry, and the multitude of different dog food options available to consumers today. This context uncovers the transition from self-sufficiency in the realm of dog nutrition to market and expert reliance as a vehicle for demonstrating affection and offering the promise of health to canine companions.

Ancient History

Although the exact origins of canine domestication are debated, the early-human/early-canine relationship goes back at least 20,000 years with some theories suggesting it to originate

as far back as 40,000 years (Briggs). A theory popularized in the 20th century suggests that paleolithic humans bonded with wolf cubs because of their charming appearance (Hare and Woods). Contemporary theories suggest the connection was far more complex, and actually happened twice in parallel, once in Europe and once in Asia (Briggs). Some theories indicate that it was actually wolves that took the initiative to bond with humans, not the other way around (Hare and Woods). The unnamed but currently leading theory goes that wolves lacking a pack would spend time near human encampments and eat their leftovers. Over time, these wolves became tamer as friendly wolves were tolerated but aggressive wolves were seen as a threat and would be killed (Fessenden). While these wolves still looked identical to other wolves at the time, they became genetically distinct as friendliness towards humans became evolutionarily advantageous. Humans began to interact more and more with these animals as they lacked aggression and expressed an interest in humans. These wolf-dogs could be used to help with hunting and alarm of approaching predators. With even more generation, they began looking different as well, bearing "splotchy coats, floppy ears, wagging tails," begging to resemble the modern family dog (Hare and Woods). To this day, dogs are the only large carnivore to have been widely domesticated (Fessenden).

Some scholars even believe that dogs themselves were actually used as a food source. Early humans would bulk up their dogs during times when food was abundant and kill and eat them during times of famine (Hare and Wood). While a gruesome thought by modern standards, this is another potential advantage dogs provided early humans. Additionally, this provides a comical inversion to the leading theory that wolves were the one to choose domestication for themselves because of its benefits for survival.

Dogs were seen as working animals, capable of hunting, herding, and protecting (Mark). Selective breeding was done with the intention of promoting traits that would help with these jobs. However, dog breeds were not standardized until the rise of dog shows in the Victorian Era (Howe). Many cultures ascribed various religious meaning to dogs including the people of Ancient Egypt, China, India, Mesoamerica, and Mesopotamia (Mark). Dogs simultaneously played many roles, from spiritual omen to family companion to livestock herder to food source. More recently, dogs have been used by the police and military and as service dogs to help those with disabilities. While dogs are still used as working animals in certain instances, at least in the United States their history as workers, spiritual figures, and food source has largely been replaced with companionship as dogs today predominantly take on the role of family pets (Mark).

From the days of the Roman Empire all the way up to the nineteenth century, the average household took little consideration of what their dog ate. However, our first record of a recipe specifically for dogs dates from Roman times in which philosopher Marcus Terentius Varro instructed readers of his farming manual to feed dogs "meat and bones" along with "barley soaked in milk" ("History of Pet Food"). Another early example is Gaston III, the eleventh Count of Foix in Southwestern France. He wrote a guidebook on hunting titled *Livre de Chasse* some time between 1387 and 1389 in which he discusses the role of the greyhound in assisting with hunting and suggests a diet of "bran bread, some of the meat from the hunt, and if the dog was sick, goat's milk, bean broth, chopped meat or buttered eggs" ("History of Pet Food"; "Pet Care Advice from the Middle Ages"). While there are recorded examples of wealthier individuals taking particular care to their dog's diet, for the common person, this was seen as far too frivolous ("Pet Care Advice from the Middle Ages"). Throughout different cultures

throughout time we saw much the same pattern; some wealthy owners prepared special food for their dogs but most fed table scraps. The diet consisted largely of meat scraps, grains, and occasional dairy.

Modern History

Commercial dog food as it exists today is a product of the social, political, and economic changes that have occurred in the past 150 years, existing within the context of large-scale manufacturing, global trade, and widespread commercialization. By repurposing and selling their excess and waste products as dog food, companies could profit from what would otherwise be discarded. Herein table scraps at home were replaced by industrial byproducts, the table scraps of factory manufacturing. With the addition of added vitamins, colors, and flavors, an anonymous mixture of these formerly largely worthless ingredients could be marketed as modern, convenient, and healthy. This section follows the creation and establishment of dog food from a niche product geared toward enthusiasts to the creation of an ideological distinction between "human food" and "dog food."

In the late 1800s and early 1900s dogs were primarily fed food scraps as they have been for most of history. Dogs diets varied by region, family, and wealth but primarily consisted of otherwise unusable food. Protein came in the form of meat parts that the family could not or refused to eat such as "hearts and calf heads or feet" (Grier 127). Some housewives would scrape the leftovers of their family members plates, other would sometimes even cook a dog stew. It was not uncommon to have a dog fend for itself, foraging and hunting either in the city or countryside for food. Dogs with owners would have to compete with stray dogs for resources (Howe).

The first commercial dog food is said to be created by James Spratt. The tale goes that the Ohio electrician was in London in 1860 selling lightning rods (Slater). Spratt observed street dogs munching on hardtack, a hard biscuit made from flour, water, and salt that sailors would eat on voyages. Thus, an idea was born. Pratt designed a hard biscuit consisting of wheat, beef gelatin, and beetroot (Slater). Spratt's Patent Meat Fibrine Dog Cakes were pricy and targeted to wealthy Englishmen, especially those who kept hunting dogs or partook in conformation dog shows ("Club History"). It was marketed that these fibrous biscuits could "obviate constipation, which is almost natural in the domestic dog, and the cause of more disease than anything else" (Grier 128). Spratt was ahead of his time, developing multiple different products to market to owners of dogs of different ages and breed groups (Grier 128).

While Pratt enjoyed a monopoly for decades, by the late nineteenth century, other competitors were entering the market, namely grain producers looking for additional profits. However, it was the advent of canned dog food in the early twentieth century that started the widespread shift from table scraps to commercial dog food in the average middle-class home. Earlier, canned food was not practical because of the high cost of metal cans and a lack of technology for cheap and efficient preservation. While there were predecessors as early as 1916, the first large-scale canned dog food operation appears to be Chappel Brothers, Inc.. After four years of development and roughly $60,000 (in the currency of the era), P. M. Chappel, with the assistance of Dr. Hoskins, launched their completed project in 1923 (Grier 130). At first Chappel struggled to find a market for their canned dog food, citing hesitation from grocers. However, after gaining the support of a wealthy patron, the company began finding sellers and growing their brand.

Dog food was a way to turn what was otherwise a waste product, the carcass of a horse, into something profitable. At first this was in abundance as the horse population was shrinking in conjunction with the decrease in demand for working horses. As the industry grew and the horse supply shrunk, they transitioned to slaughtering wild horses (Grier 131). At the time, there were many horses in the U.S. because they were working animals used for transportation among other tasks but Americans did not want to eat them because they were seen as being too close to pets. Because the demand for canned dog food, despite still being quite small at the time, outpaced the supply of horse meat, packinghouses were "creative about what they canned," switching to meat by-products as the main source of protein in their canned dog food (Grier 134). Meat packers quickly realized the economic potential of canning scraps inedible for human consumption as a means to increase profits, they used "various meat from domestic ruminants and from such wild species as whales, salmon, and reindeer from Alaska." (Grier 134).

Until WWII, the sale of canned dog food overshadowed that of dry dog biscuits with canned food accounting for roughly 9 out of 10 dog food sales (Grier 137). At the time, dry dog food needed to primary consist of grains as too much meat content would mean biscuits that spoiled quickly (Slater). Therefore, dogs much preferred the taste of canned dog food which consisted of more meat than the grain heavy dry food.

Dog food found itself in a peculiar place of not being classified as human food but also not quite fitting into the category of farm animal feed either, making it largely exempt from both regulation and statistic collection (Grier 136). It was not until the mid-1930s, a decade after the beginning of widespread manufacturing and sales of canned dog food and nearly 70 years since the advent of Spratt's Patent Meat Fibrine Dog Cakes, that the nutritional value and quality of dog food began to be questioned (Grier 134-137). The National Recovery Administration (NRA)

was a New Deal agency designed to improve industrial and labor practices in part through public hearings and the creation of “fair practice” codes (“National Recovery Administration”). In 1934, the NRA’s Code of Fair Practices and Competition division held a series of hearing with the intent of creating a Code of Fair Competition for the dog food industry. During these hearing, in addition to discussions of labor laws and the establishment of the first dog food labeling regulations, the health and safety of dog food was seriously challenged for the first time on a national stage (United States, National Recovery Administration, and T Schellenberg). J. R. Manning of the U.S. Bureau of Fisheries reported at the hearing that the dog food industry exploited consumers as…

> many kinds of decomposed materials, unfit for either human or animal nutrition have in times past entered such products. In some cases where the wholesome quality of the raw materials is acceptable, quite often these raw materials have little or no nutritional value. According to our information, chemists have found almost every conceivable variety or combination of materials in these products. Garbage and inert materials have sometimes found their way into the finished products. (United States, National Recovery Administration, Code of Fair Practices and Competition)

This alarming language illustrates the questionable nutritional and safety conditions of commercial dog food in this era. These hearings resulted in the first federal regulations of commercial dog food. While these regulations primarily targeting improving working conditions and preventing unfair methods of market competition, Section 1 of Article VII states that “The Code Authority shall establish reasonable standards of identity and biological value for canned dog food, necessary to prevent deception, fraud, and unfair competition in the sale of canned dog food” (United States, National Recovery Administration, Code of Fair Practices and

Competition). While this stated intent never came fully to fruition as the National Recovery Administration was ruled unconstitutional by the Supreme Court in 1935, these hearings were the first to spark a national conversation around the nutrition and safety of dog food and demonstrate a need for federal regulation ("National Recovery Administration").

Early scientific investigation into dog food quality returned alarming results. Consumers' Research Bulletin's consulting chemists evaluated nine brands of canned food and gave none a grade higher than "B." The report concluded that canned food "should be kept on the emergency shelf for an occasional feeding when there just is not another thing in the house." (Grier 138). While meat organs are very nutrient rich, they should only be feed in moderation and too much of them can be dangerous and lead to vitamin poisoning ("Recalls and Outbreaks"). Additionally, at the time there were no nutritional supplements being added to dog food to assure all nutritional requirements were being met (Grier 139). Despite these issues, by the advent of World War II, Consumers' Research Bulletin reported that around 20 percent of American dogs lived on commercial dog food." (Grier 140).

World War II caused a seismic shift in the dog food market. In 1942, the War Production Board prohibited dog food manufacturers from using metal cans (Grier 140). In 1943, federal government limited the amount of animal protein in pet food to 8 percent. (Nagle). Even the use of flours in dog biscuits was restricted ("Our History"). These wartime restrictions were meant to increase food supply for soldiers engaged in the war effort. At the same time, pushback was beginning to grow around the killing of horses for canned dog food which created an additional justification for the product's decline ("The History of Commercial Pet Food: A Great American Marketing Story"). While manufacturers experimented with frozen and dry foods, many families went back to feeding their dogs homemade food (Grier 140).

This wartime scrimping did not last long. With the war over and America prosperous, canned dog food grew in popularity once more. The rise of packaged meats decreased a family's meat scrap supply and increased reliance on dog food. By 1953, a whopping 75 percent of American dog owners were feeding packaged dog food at least some of the time (Nagle). One year later, a New York Times article about the growth of the pet food market observed that "gastronomically, Fido and Kitty never heretofore have had it so good. They are eating foods that for tastiness and nutritive value match and, in some cases, even surpass the victuals consumed by their owners" (Nagle). Despite dog food still largely consisting of manufacturing by-products, this headline reflects the social perceptions of the time period.

WWII, while initially a hit to the dog food market, prompted cultural and economic shifts in its aftermath which turned out to be the perfect opportunity for disruptive innovation in the industry. During the decade plagued by wartime rations, dog food companies consolidated, perhaps as a means to survive a difficult time for their businesses ("The History of Commercial Pet Food: A Great American Marketing Story"). For example, General Mills, a multinational manufacturing giant, acquired James Spratt's pioneering dog biscuit business ("The History of Commercial Pet Food: A Great American Marketing Story"). Already a manufacturer and seller of dog biscuits as well as the operators of multiple pet care centers, the Ralston Purina Company was experimenting with research and development of new products in their own effort to expand their business. In 1956, they were the first to create the modern dry "kibble" dog food through a process called extrusion ("The History of Commercial Pet Food: A Great American Marketing Story"). Extrusion is the same method used for producing large quantities of shelf-stable foods for humans such as dry breakfast cereals. First the ingredients are ground down into small pieces, measured out, and mixed together in batches of up to 2,000 pounds at a time. Then, this mixture

is cooked with pressurized steam at high temperature and pushed (or extruded, hence the name), through a die cut that forms the distinctive identical shapes of kibble. Finally, after the kibble is dried and cooled, a liquid or powder is added to the outer surface of the kibble to increase shelf life and palatability (Barrington). “The Purina™ Dog Chow® that became America’s most popular dry dog food was added to the line only in 1957, after six years of formulating and marketing experiments made with the intention of cracking an already established market in grocery stores.” (Grier 129). This newly developed process of extrusion allowed for the creation of a much cheaper, more palatable, and easily mass-produced dog biscuit that largely replaced canned dog food (Barrington).

In the 1964, the Pet Food Institute, a trade group representing 97 percent of the U.S. pet food manufacturers, launched a campaign aimed to convince customers that table scraps are dangerous and that dogs should only eat commercial dog food for the sake of their safety and health (Patrick). This campaign took shape via press releases to hundreds of newspapers, articles in 16 magazines, and advertisements on 91 radio stations and included warning from veterinarians, scientific researchers, and other industry experts (Korol). This campaign was incredibly successful, creating the distinction of “people food” and “dog food” that is still widely prevalent today. This fabricated distinction ensured the indispensability of the dog food industry as owners now believed that they were incapable of responsibly feeding their pets without purchasing commercial dog food.

[Figure 2. Scrappy Feeds Are No Good To A Dog. Advertisement from 1964.]

Present Day

Dog food as it exists today is a byproduct of globalized mass production and neoliberal values of individual consumer choice. Out of growing frustrations, movements have sprung up seeking a return to feeding homemade foods, either in the form of cooked or raw diets. Both brand new and well-established companies have leveraged consumer desire for healthy, fresh, and minimally processed dog food by selling commercial versions of these homemade traditions. Consumers find themselves traversing a landscape with nearly countless options of different brands and products, each claiming its superiority. This overwhelming complexity creates an increased desire for experts to help individuals make purchasing decisions and promotes fragmentation between demographic and ideological divides.

As of 2018, according to a study conducted annually by the American Pet Products Association (APPA), 68 percent of US households have at least one dog, totaling over 85 million households ("Pet Food Category Insights"). Feeding all of these hungry mouths translates to $14 billion in retail sales annually in the U.S of dry dog food alone and is expected to continue climbing to $16 billion by 2022 ("Pet Industry Expenditure…")[2]. As a result, consumers have an overwhelming number of options when it comes to what they feed their dogs. According to GfK Marketing Research Institute, there are 630 pet food and treat companies and over 22,000 individual products ("Pet Food Category Insights"). Premium foods continue to rise in popularity and largely contribute to the industry growing its total revenue each year. Dry dog food in 2016

[2] Despite considerable effort, I was not able to find recent and reputable statistics on the total annual revenue of dog food in the U.S. However, I was able to find that the global dog food market brought in $51 billion in revenue in 2018 and that about 60% of that sum was comprised of dry dog food sales ("$50 Billion Dog Food Market"). If we assume that approximately 60% of dog food sales in the U.S. are also from dry food, we can extrapolate that the entire U.S. dog food industry bring in roughly $23 billion of revenue annually.

cost 34 percent more per pound on average than it did in 2011 with only a 7 percent increase being explained by inflation (Phillips-Donaldson, “Premium Pet Food…”).

The most popular option for pet parents is the same standard kibble that has existed since the advent of extrusion in 1956 (Pets International). It is convenient, readily available, and perhaps most importantly, incredibly cheap (Barrington). Products will advertise the inclusion of different proteins and flavors (“porterhouse & prime rib”), specific health claims (“healthy skin”), and life stages (“large breed puppy”). These foods tend to be comprised of meat by-products and corn, wheat, and soy along with synthetic vitamins so they can meet the nutritional requirements to be considered “complete and balanced” (“Homestyle Grilled Beef & Vegetable Flavors”). These foods use food coloring to increase appeal for human consumers and preservatives to increase shelf life (“Homestyle Grilled Beef & Vegetable Flavors”).

The next most popular option is grain-free kibble that has spiked in popularity since the mid-2000s. Proponents of grain-free dog food will argue that grains are cheap filler ingredients with little to no nutritional value and that dog’s digestive systems are not designed to digest them (Rhae). These foods are seen as being healthier while still having the convenience of kibble as they typically, although not always, have more meat and a higher protein content then their grain-inclusive counterparts. Grain-free kibble will commonly include potatoes, peas, and legumes as starchy alternatives to grain to keep costs down and allow the kibble to stick together properly (“ORIJEN Original”). Because the term “grain-free” describes merely a range of ingredients the food does not contain, the quality of grain-free dog foods can vary significantly. To set themselves apart from the crowd, Orijen advertises their grain-free kibble as “biologically appropriate”, using whole prey ratios of meat in their formulas meant to “mirror the quantity, freshness, and variety of meat that dogs and cats have evolved to eat” (“ORIJEN Original”). The

rise in popularity of grain-free dog food has created incentivized for the rise of new companies and new brands being developed by already existing companies but the recent FDA DCM report has the potential to stun or even revert this market's growth.

Despite losing its market dominance since the advent of kibble, canned dog food continues to be widely produced by manufacturers. Canned dog food tends to be anywhere from 2 to 8 times more expensive per calorie because the high water content and metal packaging means more weight and volume which results in higher shipping and storage costs for companies (Coates). However, canned dog food tends to be less highly processed than kibble as it does not go through the extrusion process. It can consist almost entirely of meat as it is not subject to the manufacturing constraints of kibble which needs to have enough starch so that it will not fall apart when dried and compressed (Coates). Canned foods contain 70 to 80 percent moisture compared to kibble that has roughly a 10 percent moisture content. While some people, especially those with small dogs with dental or kidney problems, still feed their dogs canned food exclusively, many dog owners will add a little bit of wet food to their dogs dry food if their dog has low appetite, to provide variety, or as a treat.

Prescription dog food is promoted and sold by veterinarians with the promise of tackling specific health complications including weight management, joint issues, urinary care, and kidney disease ("History of Hill's Pet Nutrition…"). While technically not requiring any sort of official prescription, only licensed veterinarians are legally allowed to sell these foods and receive a hefty commission for doing so (Parker-Pope). Despite several small competitors, today prescription dog food is largely synonymous with Hill's Pet Nutrition, owned by toothpaste giant Colgate-Palmolive Co.. While Hill's® Prescription Diet® is "formulated to address specific medical conditions that can develop in pets" and can only be purchased through a licensed

veterinarian, Hill's® Science Diet® "offers clinically proven benefits that promote vitality and well-being at any age or lifestyle with a full range of precisely balanced products" ("Frequently Asked Questions - Answers for Your Pet")[3]. The brand strongly aligns itself as being scientifically legitimized and claims that while none of their formulas can singlehandedly cure any condition, that their assertions of improved healthy regarding specific conditions are backed by rigorous research ("History of Hill's Pet Nutrition…"). Some owners will feed these foods temporarily in conjunction with the suggestion of their veterinarian during illness or after surgery (Parker-Pope). Others, especially those with elderly dogs with ongoing health conditions may be encouraged to feed these foods indefinitely (Parker-Pope). A further exploration of this lucrative collaboration can be found in Chapter 3.

Then there is the world of breeders and show dogs where Purina Pro Plan dominates. Following in Spratt's footsteps back in the 1800s, Purina has worked tirelessly to make their premium Pro Plan line associated with the world of professional dog showing and handling. In 2017, Purina and the Westminster Kennel Club, host of the oldest continuously held dog show in the country, signed a 10-year agreement "making Purina Pro Plan the exclusive pet food sponsor of the world-famous dog show" ("Purina & Westminster Begin 10-Year Partnership"). This comes after years of previous sponsorship. Following the announcement, Purina launched a campaign in which they advertised that the 10 previous winners of the prestigious confirmation show had all been "fueled by Purina Pro Plan ("Purina & Westminster Begin 10-Year Partnership"). This advertisement mentions in small text "please note that the handlers or owners of featured dogs may have received *Purina Pro Plan* dog food as a Purina ambassador" ("Purina

[3] Every single reference to the Hill's brand or a specific Hill's Pet Nutrition product on their website includes a copyright symbol.

& Westminster Begin 10-Year Partnership"). Breeders can also become Purina brand ambassadors, who "will be encouraged to contact Purina when a new litter is born. For every puppy and kitten registered, the company will send out weaning food and a comprehensive starter pack to pass on to the pets' new owners" along with Purina-branded pedigree certificates to indicate the pet's purebred linage (Bold). In the past Purina Pro Plan has also sponsored the American Kennel Club's Registered Handlers Program which can be granted to handlers with "a minimum of seven years' experience showing dogs for a fee" among a slue of other requirements including three letters of recommendation ("Purina Pro Plan Renews Sponsorship…"). Through these sponsorships and ambassadorships, Purina Pro Plan reigns supreme amongst professional dog handlers, dog show enthusiasts, and conformation breeders. While Purina Pro Plan has never been exclusively for show dogs, it has grown massively in popularity outside of this limited realm since the DCM scare as dedicated dog owners transition away from BEG foods (octaffle).

Cooking homemade dog food suddenly gained popularity in 2007 following widespread dog food recalls. A more intentional version of the table scrap diets dogs have been eating for thousands of years and still do in parts of the world, homemade dog food lessens the distinction between "dog food" and "human food" and rejects the need for an outside expert.[4] Arden Moore, author of an Amazon bestseller homemade dog food recipe book, explains the appeal. "Spending an hour making liver treats for your Labradoodle is a natural extension of the anti-corporate-grind mentality that spawned the Slow Food movement and gave rise to the quit-your-job-and-open-a-bakery trend. I think there is a push for more of a sincere, simplistic life, and I think pets give you that" ("How and Why to Make Homemade Dog Food"). Throughout history and

[4] While homemade dog food, with its lack of FDA approval or corporate oversight, in many ways represents a rejection of the need for industry experts, many homemade dog food diets tout being "veterinarian approved." Moore himself worked with a veterinarian from the American College of Veterinary Nutrition in writing his cookbook ("How and Why to Make Homemade Dog Food").

different cultures, cooking for someone is a way to show love and care. While some owners will feed homemade dog food every day, many owners will opt to make a special meal for their pups just for birthdays and other special occasions.

New companies have popped up seeking to recreate the freshness and authenticity of homemade dog food with the added convenience of not having to cook. Fresh dog foods, which are similar in texture to canned dog food but lack preservatives, are sold refrigerated ("How to Feed Freshpet"). To decrease the need for frequent trips to the store and following with the trend of subscription delivery services, a number of companies are offering to deliver fresh dog food customized specifically for your pet directly to your doorstep, although for astronomical prices ("Get Started"). Some companies tout using "human grade" ingredients that have been deemed safe for human consumption by the USDA ("How Is Feed and Pet Food Regulated in the United States?"). Others sell dehydrated dog food to which water needs to be added before serving and which looks like a porridge with visible bits of different ingredients ("The Honest Difference"). Despite using different strategies, the goal of these different marketing tactics is quite similar; to create a dog food that resembles human food and is perceived as fresher, higher quality, and more authentic than unidentifiable uniform brown kibble bits.

Raw dog food, consisting primarily of raw meat, bones, and organs, has also grown in popularity. Proponents see this food as more nutritionally dense, easier to digest, and resembling what dogs are biologically designed to eat. As one raw food activist, dog trainer, and canine nutritionist describes, "I really do not know how any vet can tell me with a straight face their highly processed, high-carb, high-salt, high-chemical crackers made last year in China are as nutritious as [fresh raw meat]" (Brady). Feeding a raw diet can be expensive, time consuming, and require extensive research and knowledge to do properly. However, those who are willing to

overcome the ick factor and other barriers claim it has completely transformed their dog's health (Brady).

It is estimated that 3 percent of the commercial dog food sold in the United States is raw ("Share of Dog Food Purchases…"). A relatively new addition to the market, commercial raw food promises to provide the benefits of homemade raw food with less of the hassle, but for a greater price. Raw dog foods typically consist of ground up and mixed raw meat with some vegetables and supplements and is sold frozen. Commercial raw dog foods need to be kept frozen until they are ready to be thawed and served. Large patties require overnight thawing while small kibble-shaped pieces defrosting in 15 minutes "Raw Frozen Canine Beef Formula"). Because of the high amounts of higher quality meat, the need to be frozen when transported and stored, and the lower total quantities produced, these products tend to be incredibly expensive.

Companies have been developing alternatives that take out the ick factor of handling raw meat and the need for freezing and thawing. Freeze drying involves dehydration at low temperatures and can be done to raw formulas to create patties that are shelf stable and can be fed after rehydration ("How to Feed"). This process is very expensive so as an alternative, some companies have been coating their kibble with powder produced from grinding up these freeze-dried patties to provide a "raw boost" to their food ("How to Feed"). Others still will sell raw freeze-dried bits as toppers, also meant to enhance the nutritional quality of kibble ("How to Feed"). One company, Instinct by Nature's Variety, which calls itself "the RAW brand", advertises that its wide array of products from raw-coated kibble to raw patties consisting of 95 percent meat allows owners to feed raw at any budget ("100% Raw Nutrition").

[Figure 3. Twenty homemade prey model raw inspired meals. Image from Rawsome Vizslas. Reproduced with permission.]

Alternatively, raw meat can be bought from a supermarket, butcher, or online store and pet owners can formulate their own raw diets. There are two main competing philosophies on how to properly craft a nutritionally balanced raw dog food diet. Biologically Appropriate Raw Food (BARF) diets operate under the assumption that dogs are omnivores and that their diet should consist of 60 to 80 percent ground up meat and 20 to 40 percent fruit and vegetables (“Raw Feeding Guide…”). Prey Model Raw (PMR) diets operate under the assumption that dogs

are primarily carnivores and that they should be eating meat, bones, and organs in the ratios already designed by nature. People will sometimes mix the two philosophies in what is sometimes called "Frankenprey" (Marshall). People who invest the time and money into feeding homemade raw dog food tend to believe in it very strongly, a reasonable reaction considering the social and cultural obstacles of such a practice. Much like vegans before the diet began gaining social acceptance, homemade raw feeders can be found spreading their message and sharing information and knowledge on corners of the internet that they have created for themselves. There now exist websites and co-ops designed to promote the sale and exchange of difficult to find cuts of meat such as tripe and whole prey for raw feeders.[5]

Toppers, a term referring to adding a supplemental food on top of a dog's primary food, typically kibble, is an exploding market. Before, canned dog food was commonly used as a topper but now products are being sold exclusively as toppers. "With their high dollar rings and impulse nature, toppers are a darling of retailers" (Turcsik). Toppers tend to consist primarily of meat and/or fruit and vegetables. Bone broth and goat milk are also popular. "According to manufacturers, pet food toppers are a valuable tool for digestion and weight loss, and offer a host of other benefits, such as aiding with hydration and regulating diarrhea and constipation" (Turcsik). Toppers are not medicines, but rather high nutrient foods that do not need to meet the nutritional requirements of a food meant to be fed exclusively. Toppers are a way for owners to buy cheap highly-processed kibble but still boost the nutritional content of their pets diet.

Dog treats and chews, while not nutritionally complete and designed to comprise no more than 10 percent of a dog's caloric intake, are still a noteworthy component of dog's diets. Ninety-

[5] Examples include https://hare-today.com/, https://www.mypetcarnivore.com/, and https://www.socalrawfeddogs.com/.

two percent of dog owners have purchased dog treats or chews in the last year totaling $6 billion in annual U.S. sales ("Pet Treats and Chews in the U.S., 3rd Edition"). Intended as a reward or training tool, dog treats are small pieces of food meant to have higher palatability and produce greater satisfaction than food fed at mealtimes (Williams and Downing). Dog chews are treats that take a long time to consume, creating mental stimulation and acting as an edible toy (Williams and Downing). While dog treats vary widely in their ingredients and meat content, dog chews are commonly made of animal parts that humans do not readily eat such as cowhide or pig ears (Beaton). Table scraps can easily act as treats or chews as there is no need for them to be nutritionally complete and balanced. While this most certainly still occurs, the steady rise in sales of commercial treats and chews suggests that consumers are favoring packaged products over table scraps ("Pet Treats and Chews in the U.S., 3rd Edition"). Commercial treats and chews are often marketed, and therefore perceived, as being healthier, safer, and more enticing to dogs than leftover pieces of meat or vegetables (Philipson, "US Pet Food Spending…"). While there are genuine dangers to feeding certain foods that are toxic to dogs (such as chocolate, raisins, and onions), veterinarians sometimes decide to discourage feeding table scraps all together instead of educating pet owners on what is and is not safe to feed (Philipson, "US Pet Food Spending…"). The evolving market of dog treats and chews demonstrates the pet food industry's ability to create increasingly niche new products and then generate demand for them through marketing.

With so many options, it is important to note that the dog food industry, despite enjoying a period of growth and expansion, is smaller than it may first appear. In the same manner at Trader Joe's and Costco, dog food companies can pay third-party manufacturers to create their products while still using their own branding. "It is common in pet food to use 'co-packers.' As an example, ABC Pet Food is a pet food company but they do not have their own manufacturing

facility. Instead, ABC Pet Food provides their own exclusive recipes to XYZ Pets, a pet food co-packer. XYZ Pets manufactures ABC's pet food along with several other brands" (Andersen). Diamond Pet Food owns multiple plants where they manufacture food for their own brands, Diamond, Diamond Naturals, and Taste of the Wild. However, in these same plants they also manufacture foods for a number of other brands including 4Health, Canidae, Apex, Chicken Soup, Solid Gold, Wellness, Natural Balance, and Kirkland (Andersen). Some companies will have all of their products produced by a single third-party manufacturer while others will contract with a number of different third-party manufacturers and some will own their own plants and manufacture their own food (Andersen). This phenomenon creating an illusion of choice on store shelves that is ultimately putting money into the pockets of a select few. This model disperses responsibility and decreases transparency with respect to ingredient sourcing and in the event of a recall.

Another tactic that creates the illusion of choice is parent company who own many smaller companies which in turn can have multiple brands with multiple lines in each brand. While not a monopoly or even a true oligarchy, there are a few companies making most of the profits. These companies are giant corporations that own many pet food brands and also tend to have holdings that expand well beyond dog food into human food, hygiene, and other products. Mars Petcare Inc. and Nestle Purina Petcare dominate the market, collectively holding 68 percent of market share on dry dog food in the United States ("Market Share of the Leading…"). In 2018, Mars Petcare Inc. earned $18 billion in revenue from pet food in North American and Nestle Purina Petcare earned $13 billion dollars with the next leading competitor bringing in only 2 billion dollars ("Leading Pet Food Companies…"). Nestle has admitted that packaged

human food has become a stagnant market so they have been intentionally investing in dog food to continue their momentous growth (Chaudhuri).

Amidst the confusion of different product types, varying health claims, and clustering demographics, it is easy to lose sight of the small number of incredibly powerful corporations that hold most of the pet food market share through their numerous subsidiaries. These conglomerates accrue power not only from their dominance in the pet food market but through their vast empires spanning countless industries and nations (Chaudhuri). Mars and Nestle are the largest stakeholders in pet food but Del Monte (Kibbles ’n Bits, Milk Bone) and Colgate-Palmolive (Hill’s Science Diet, Hill’s Prescription Diet) operate under the same model (Lee). From here on, I will refer to the collective of these conglomerates as they exist in the pet food industry as Big Kibble. What initially appears to be a competition between dry and canned, raw and cooked, and budget and premium is in reality a contest between homemade and commercial and Big Kibble and smaller companies.

Chapter 2 – A Thwarted Search for Change

Challenging the Status Quo

You may be wondering… Why do so many different dog food options exist? What concerns caused consumers to seek alternatives to Big Kibble? Why did a shift happen, when, and for whom? What has Big Kibble done in attempts to maintain its industry dominance? I seek to answer these questions by exploring possible reasons for consumer dissatisfaction with mainstream commercial dog food in the 21st century, how this prompted a search for alternatives, and how this search was partially staunched by the FDA's DCM report.

Obesity in dogs is a major and growing concern in the United States with 56 percent of dogs falling into the classifications of overweight or obese, up from an already high 44 percent in 2008 ("Pet Obesity Epidemic Fact Sheet"; "2018 Pet Obesity Survey Results"). Excessive fat in dogs increases the risk of often preventable health issues such as arthritis, liver disease, thyroid issues, and diabetes ("Pet Obesity Epidemic Fact Sheet"). In fact, being obese shortens a dog's lifespan by more time proportionally than smoking cigarette regularly shortens a human's lifespan (Schulof 6). The rapid increase in dog and cat obesity in the U.S. has been labeled an epidemic by veterinarian associations and the media ("2018 Pet Obesity Survey Results"). Taking advantage of the trend, many companies are now selling dog foods specifically marketed as lower calorie or designed for weight loss (Schulof 7). Concerns around dog obesity and obesity-related health issues could be one reason an individual is swayed to feed their dog a BEG diet.

Just like humans, dogs can suffer from environmental or dietary allergies. Common symptoms include itching, rashes, loss of fur, and digestive distress ("Does My Dog Have a Food

Allergy?”). Unfortunately, there is no single medical test that can accurately determine food allergies in dogs. In fact, “research results presented at a veterinary dermatology conference even showed that some tests “diagnosed” plain water and stuffed animal “fur” as having food allergies” (“What Every Pet Owner…”). Instead, the best available method for diagnosing food allergies in dogs is an elimination diet in which dogs are fed a limited ingredient diet and other foods are slowly added in one by one paying careful attention to when allergy symptoms return (“Does My Dog Have a Food Allergy?”). Some owners choose to keep their dogs on a limited ingredient diet instead of merely using it as a tool for diagnosis. Many owners complain of allergy-like symptoms and these complaints have been on the rise, often to grains (Brady). Some scientific studies claim that only 0.2 percent of dogs suffer from food allergies (Burns). In contrast, as many as 11 percent of dog food owners indicated that they feed their dog a limited ingredient food (“Share of Dog and Cat Owners…”).While vets claim that dogs are really only allergic to specific proteins, owners feel otherwise, often blaming grains (Brady). Many owners report a decrease in symptoms following switching their dog to a BEG food. Perhaps this is not due to a true allergic reaction but rather health issues arising from low quality food. One can argue however whether this distinction is one of importance. Allergy, and allergy-like symptoms, are a major reason for owners switching their dogs onto BEG foods and a perceived decrease in symptoms is a major motivator for continuing to sacrifice money and sometimes also time and convenience to continue feeding these diets.

A food recall is a voluntary action by a manufacturer or distributer to protect consumers from health hazards when a product is found to have potentially dangerous contaminants (“FSIS Food Recalls”). Common reasons for food recalls include the discovery of a harmful bacteria such as salmonella, a foreign object such as glass or metal, or a major allergen that does not

appear on the product label (“Recalls and Outbreaks”). With dog food in particular, the most common reasons for recalls in the past few years have been improper vitamin content, particularly elevated vitamin D levels, and potential salmonella contamination (“Animal Food Recalls and Alerts”). Most recalls are preemptive and do not include any reports of pet death (Wall, “Avoid Pet Food Media Crises”). While potentially damaging to the reputation of a brand, dog food companies much prefer to conduct a recall proactively, even if it turns out to have been unnecessary, than to have their food cause pet deaths and fighting costly lawsuits (Wall, “Avoid Pet Food Media Crises”).

2007 saw the largest recall in pet food history, involving roughly 180 brands and over 13,000 filed claims of dog and cat deaths with more that went unreported (Lau). The bulk of the recalls were announced from March to June with information gradually surfacing about the cause of the contamination (Lau). It is now known and has been officially acknowledged by the FDA that the contamination was intentional, although not necessarily anticipated to cause medical harm to pets (“FDA Investigation Leads to Several Indictments...”). Melamine, a chemical compound used in the creation of plastics, cleaning products, glues, inks, and fertilizers, was deliberately added to over 800 tons of wheat gluten that then made its way into dog food. A manufacturing byproduct of wheat and wheat flour, wheat gluten is a cheap filler in dog food that can also be used to boost protein content in pet foods. The melamine is thought to have been added to the wheat gluten to even further raise the protein content to a whopping 75 percent of the product by weight (“Melamine Pet Food Recall Frequently Asked Questions”).

The melamine, along with the related compound cyanuric acid, caused renal failure and in some cases death for thousands of dogs and cats (“Melamine Pet Food Recall Frequently Asked Questions”). More mild symptoms included lack of energy, loss of appetite, and vomiting

(“PET FOOD RECALL STORY ON CNN”). Two Chinese nationals and the businesses they operate were indicted by a federal grand jury for their roles in the scheme along with U.S. company ChemNutra, Inc. (“FDA Investigation Leads to Several Indictments...”). In additional to knowingly contaminating and selling the wheat gluten, “according to the indictments, SSC falsely declared to the Chinese government that those shipments were not subject to mandatory inspection by the Chinese government prior to export.” (“FDA Investigation Leads to Several Indictments...”). In additional to a federal investigation, more than 100 class-action lawsuits arose out of the incident (Lau). A total of $27 million in claims was judged eligible for compensation but only roughly 45 percent of that total was issued in payouts to those that had filed claims.

The 2007 recalls gained widespread news coverage that lasted for several months as the details of the melamine contamination unfolded (“PET FOOD RECALL STORY ON CNN”). Recalls, especially ones that are widespread and deadly, call public attention to the danger of large underregulated international supply chains. This tragic story of intentional contamination has settled into the public conscious and contributed to a growing distrust of large pet food companies. In fact, the Big 5 were all indicted in the recalls. The sale of cookbooks featuring recipes for homemade pet food shot up at the time of the recalls as dedicated owners decided to take the matter of safety and nutrition into their own hands (“Food Scare Prompts Pet Owners…”). After this incident, some small dog food companies, Sojos being an example, proudly advertise that they do not source any ingredients, including vitamins and minerals, sourced from China (“Frequently Asked Questions”).

One common justification for feeding dogs grain-free or raw food is a mindset akin to that of the paleo diet for humans. The idea goes that evolution is a very slow process and that

dogs are much more biologically similar to their wolf ancestors than we may otherwise believe. Thus, the thinking goes, we should feed them what they have always eaten. Dogs have canine teeth, short digestive tracts, “an unsacculated colon, and a small caecum” which is characteristic of carnivores (Case, Linda P., et al.). Proponents argue that cooking food destroys vital enzymes and decreases nutritional value while the desire for a convenient cheap dry kibble promotes the use of grains which are a cheap and harmful filler. Some even go as far as to argue that carbohydrates feed cancer cells (Holland). Grain-free, high protein, and especially raw dog food is thought to be more easily digestible, have higher nutritional value, and improve overall health (“The Benefits of Raw Pet Food”). Raw feeders often claim that switching their dogs to a raw food diet has contributed to improved digestion, better dental hygiene, a stronger immune system, and healthy skin and coat (“The Benefits of Raw Pet Food”). Some studies even indicate that raw food positively contributed to a dog’s gut microflora (Becker, “New Dog Feeding Study…”). In an era of mass manufacturing and processing, the desire for a more natural solution that promises health benefits and a return to what is more natural and biologically appropriate is particularly appealing to devoted dog owners.

In the 21st century, we have seen a fundamental shift in how people, again, at least those with more financial means, buy and consume food. The once underground organic and local food movements have gained mainstream popularity and consumers are willing to spend more money in exchange for food that is perceived, as healthier, more sustainable, and “more authentic” (“2018 Food and Health Survey Report”). Vegan/vegetarian and paleo/low-carb diets are significantly more commonplace now than they were 20 years ago (“2018 Food and Health Survey Report”). Consumers today are more likely to read ingredient labels, search for specific claims on packaging (organic, pasture-raised, etc.) and seek out food options perceived to be

healthier ("2018 Food and Health Survey Report"). A shift towards more intentional food purchasing and consumption habits among middle- and upper-class Americans may have translated to the decisions we make for our animal companions.

Throughout history, the role of the dog has shifted from one primarily of "animals as equipment whose use facilitates performance of other functions" such as hunting, herding, and guarding to "animals as people, where the animal has the role of companion, friend, family member, sibling, or child" (Dotson, Michael J., and Eva M. Hyatt). Dogs have gone from primarily sleeping outside and scavenging for food on the streets in ancient times to roughly half of owners today allowing their dog onto their bed (J. Miller). In fact, today 95 percent of dog owners report that they think of their dog as a family member, up 7 percent from 2007 ("Report: 95% say pets are part of the family"). Millennials are having fewer children later in life but are more likely to have pet dogs (Bhattarai). Jean Twenge, a psychology professor at San Diego State University, explains that "pets are becoming a replacement for children. They're less expensive. You can get one even if you're not ready to live with someone or get married, and they can still provide companionship" (Bhattarai). 44 percent of millennials see dogs as practice for having a child later in life (Ewens). Others are choosing to not have children at all, citing that their dog(s) give them many of the same benefits without many of the drawbacks of parenthood. As one couple explained why they decided to have a dog in leu of a child, "She costs [almost] nothing, sleeps through the night, and our single friends still want to hang out with us" (Ewens). While raising a human child may appear entirely different from having a dog, some argue that there are important similarities which can meet some of the same social and emotional human desires. "When you see a bunch of mothers sitting around having coffees with babies in prams, that's the same as with dog-owners. You end up going to the same places, to the park, you meet

others walking dogs. It's a community that a lot of young people are realizing they want to be a part of" (Ewens). Common explanations for a rise in this type of behavior include financial stress, uncertainty about the future, and a desire for more freedom (Lowry).

This reimagining of the role of the dog, from working animal to family member to in some cases “fur baby,” also means a change in buying habits. In fact, the U.S. pet industry has more than tripled its annual revenue since 1996 (“Pet Industry Market Size & Ownership Statistics”). Owners, at least the more affluent ones, are spending more money on their dogs and are open to trying new products, with a particular interest in ones that are humanizing (Ewens). 76 percent of millennials reported that they were more likely to splurge on their pets than themselves (Bhattarai). Examples of emerging dog products and services range from yoga classes to Halloween costumes to subscription boxes to birthday parties to specially formulated ice cream to professional photoshoots. Purchasing these experiences allows dog owners to feel closer to their pets and have their relationship with their pet more closely resemble one shared with a friend or child.

We live in an era of doubt and distrust. Only 17 percent of Americans today say they can trust the federal government to do what is right at least most of the time (“Public Trust in Government: 1958-2019”). Many also reported distrust in companies, NGOs, and media. 73 percent worry about false information or fake news being used as a weapon (“2019 Edelman Trust Barometer”). This distrust of corporations and government organizations, as well as information in general, could contribute to individuals seeking alternatives to mainstream products backed by mainstream ideas.

With all of these forces at play, it is perhaps to be expected that consumers began to move away from Big Kibble and towards alternative approaches and products. People are thinking more both about what they are eating and more about their dog, hence they are thinking more about what their dog is eating. They see good food as vital to good health and are willing to spend more time and money to improve the health of their beloved pets. Owners were noticing health issues, commonly dental, digestive, and skin issues. They saw grains and carbs as generally being unhealthy for themselves. They heard the stories of a diet that was more natural and biologically appropriate and that could help with these health issues and saw others with similar values to them claim that their pets health improved significantly on a new food. A deep sense of distrust towards large companies made them more willing to question the status quo and embrace alternatives. Sure, the new food cost more but they were willing to do it for their priceless pup, were spending a lot on their dog anyway, are already were more affluent, and told themselves that they would save on vet bills later in life. Thus, the perfect formula was created for an alternative canine diet revolution. In fact, in 2016 one survey found that 41 percent of dog owners purchased some kind of premium food for their dogs ("Share of Dog Food Purchases…").]

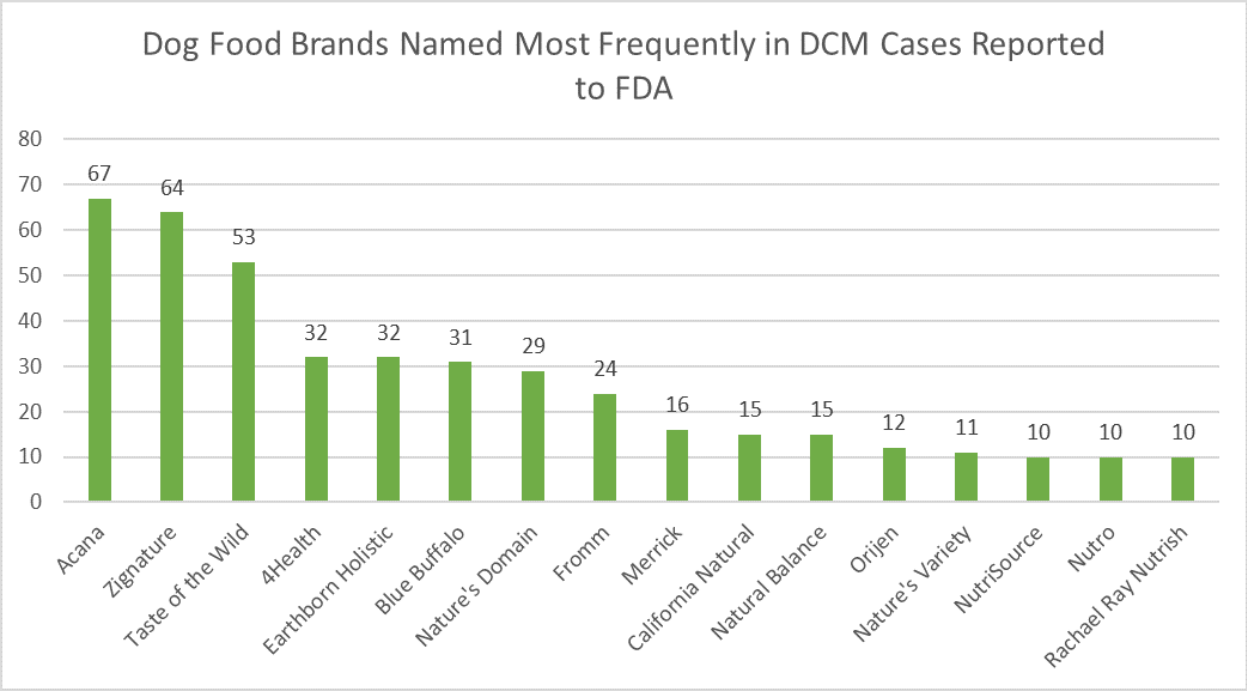
Using Google search results with limited timestamps (as data was otherwise hard to come-by) the first widespread mentions of grain-free dog food appear to have been from 2009 with the trend really beginning around 2012/2013 and really taking off in 2015/2016. A study of over 25,000 participants conducted by the American Pet Products Association in 2018 indicates that 36 percent of U.S. pet owners strongly agree and 39 percent somewhat agree that they would be willing to pay more for healthier dog food with only 2 percent strongly disagreeing (APPA, Packaged Facts, Global Pet Expo).

New companies, products, and websites emerged to meet a new demand for premium and alternative dog foods, ranging from kibble made from higher quality ingredients to new types of dog food all together such as freeze-dried and dehydrated formulas ("How to Feed"; "Frequently Asked Questions"). Homemade dog food cookbooks made their way onto Amazon bestseller lists ("How and Why to Make Homemade Dog Food"). Dog foods made by small family-owned businesses made their way onto more store shelves in more states ("Fromm Family Pet Food: Our History"). This growing trend came partnered with an emerging narrative prevalent in advertising, community forums, and social media (Schulof 13-19). First is the implication that food is a crucial component of overall health and well-being for dogs just as it is for humans. Then there are warnings of the manipulative tactics used by Big Kibble juxtaposed to the perceived superior quality of products from smaller companies or homemade meals. Finally, there is a call to action, inspiring individuals to switch to an alternative dog food as a way to show love and be able to share more healthy years with a beloved pet ("Raw Feeding Guide…"). Early adopters promoted these messages on social media and by word of mouth, as did companies involved in the premium and alternative dog food markets.

So far, we have explored mindsets prevalent in the 21st century leading up to the summer of 2018. Until then, alternative dog foods were seeing steady and massive growth. Large well-established dog food companies found themselves losing market share and being negatively affected by disruptions in the industry. However, much changed when the FDA published a study questioning the safety and health outcomes of feeding these alternative foods.

DCM report Changes the Playing Field

On July 12, 2018, the U.S. Food and Drug Administration (FDA) published a statement that they were conducting an ongoing investigation around there being a "potential connection between diet and cases of canine heart disease", specifically DCM ("FDA Investigating Potential Connection Between Diet and Cases of Canine Heart Disease"). The FDA urged dog owners to stop feeding their dog's BEG foods until more was understood regarding the matter. About a year later, on June 27, 2019, the FDA came out with an updated report linking 16 specific dog food brands to the recent spike in DCM reports. This specificity, atypical for the FDA in a matter that is still being investigated, named several of the most popular grain-free dog food companies (Schulof, "Bad Science and Financial Conflicts…"). While there is currently much uncertainty regarding the connection between BEG diets and canine DCM, taurine is thought to be to blame. Taurine is a necessary amino acid which dogs can naturally synthesize from the amino acids cysteine and methionine ("FDA Investigating Potential Connection Between Diet and Cases of Canine Heart Disease"). Most, but strangely not all, dogs with DCM were found to have dangerously low taurine levels in their blood (Case). Researchers indicate that foods with high amounts of legumes and lentils may somehow be preventing the absorption and use of taurine (Case). Unfortunately, more than two years after the initial FDA report was published, there is still much uncertainty around the science behind diet-induced DCM.



[Figure 4. Graph showing dog food brands named most frequently in DCM cases reported to the FDA.]

The FDA's report on canine DCM gathered mass media attention. It was reported on by major publications including the New York Times, Washington Post, and the Atlantic. These publications looked for their own Julie's, telling stories of specific families battling tragic cases of DCM thought to be caused by the expensive premium food they were intentionally feeding (Hoffman). These articles, at least those from more reliable sources not seeking to be blatantly inflammatory, acknowledge the uncertainty around the science behind the report by acknowledging that there merely "may" be a link between BEG dog foods and DCM (Hoffman). The coverage came in two waves a year apart coinciding with the first and second FDA reports.

Panic ensued on social media, at least in the realms occupied by dog lovers. Frantic posts from anxious dog owners littered Facebook pages, Reddit groups, and the comments sections of news articles. Many individuals reported feeling blind sighted by marketing that had convinced

them of the superior health benefits of grain-free dog foods and seemed eager to switch back to a grain-inclusive food made by one of the leading manufacturers. There is a reoccurring theme of needing to spread the message and inform others of the dangers (Schmidt). Occasionally, amongst the speculative posts, one finds personal stories of pet owners whose dogs were affected by DCM or other similar heart issues, diet-induced or not. One commenter wrote "just lost my little yorkie. Put him on grain-free food a few years back. We were shocked to learn he had an enlarged heart… Please take your dog off this food now" (Hoffman). As is common with emotionally charged rhetoric on the internet, there were many incidents of emotions running high, people making unbacked claims, and ad hoc attacks.

The publication of the FDA's DCM reports drastically changed the rhetoric around BEG (a term they themselves created), premium, and raw dog food diet trends. Before the summer of 2018, it was not uncommon to see hesitation around the positive claims that were being made about alternative diets. Unconvinced consumers and veterinarians alike touted them as an unnecessary waste of time and money that had few benefit and was difficult to do properly and safely (Mull). Now, with the scare caused by the FDA publication, these diets are being attacked for being downright dangerous and pet owners feeding them are at times labeled neglectful, uniformed, and even delusional (Mull). Accusational articles with titles including "How Americans Decided Dogs Can't Eat Grains" by the Atlantic and "Please Stop Buying Your Pets Grain-Free Food" by Slate depict the 21st century interest in alternative canine nutrition as "widespread misinformation" and "a fad," comparing these foods to crash diets and eating disorders in humans (M. Miller, Mull). Angry pet owners can be found posting and commenting on social media comparing grain-free enthusiasts, especially those who have kept feeding grain-free foods after the publication of the DCM report, as akin to anti-vaxxers or conspiracy theorists

(octaffle). While this sort of rhetoric is by no means the only voice in the crowd, it is significant enough to paint people feeding BEGs diet as uninformed and sometimes even villainous and psychologically unwell. This is a shift from the earlier mainstream notion that these people were committed dog parents willing to go out of their way for their beloved pets, even if the act was deemed unnecessary or excessive.

Raw dog food has found itself in a precarious situation amidst the DCM scare and changing social perceptions of alternative dog diets. While none of the 16 brands named by the FDA's report sell commercial frozen raw food, raw dog foods find themselves lumped in with BEG diets colloquially. Raw dog food diets have been under attack well before the DCM report was published but the scare has aided in bringing the viability and safety of alternatives to Big Kibble to question (Bauhaus). Proponents claim that raw foods is actually a potential solution to DCM, along with a number of other health concerns (Brady). Others claim that they are even more extreme and dangerous than grain-free foods (Mull). Concerns around the spread of food born illnesses such as salmonella, although in reality not significantly different from handling raw meat intended for human consumption, is commonly used to discourage raw feeding (Bauhaus).

Despite some defiant outliers, the DCM report was largely successful in creating doubt and fear that prompted a return to Big Kibble. It has also recreated a desire for dog food products that are well-established, reputable, and have scientific backing. It is important to remember that information and trends can be slow to spread and come with a lag time and that the majority of dog owners never switched away from Big Kibble to begin with. However, a quick look through r/Dogs, a community on Reddit of over 1.2 million highly dedicated dog owners, mostly based in the U.S., shows how a large and highly invested group of pet owners has switched from dabbling

in raw, grain-free, and other premium and alternative dog food diets to vehemently opposing them and strongly supporting and promoting Big Kibble, particularly Purina Pro Plan in this specific community (octaffle). Continuing into Chapter 3, I seek to challenge the claims of the FDA's DCM report and the return to a Big Kibble revering hegemony in the dedicated dog owner community.

Chapter 3 – Checks and Balances, Unchecked and Out of Balance

According to one study conducted by the Friedman School of Nutrition Science and Policy at Tufts University, 44 percent of respondents reported their primary source for dog nutritional information was their veterinarian followed by the internet at 25 percent (Schleicher, Molly, et al.). Other primary resources selected were pet store employees, dog breeders, and friends and family (Schleicher, Molly, et al.). With all of this competing information and the health of beloved pets on the line, who can one trust? Who is verifying the claims of profit-seeking dog food companies and providing reputable information about canine nutrition? The FDA? Other regulatory entities? Veterinarians? This chapter explores the hidden side of the pet food industry, revealing hidden yet omnipresent power structures and manipulation tactics in the formation, presentation, and spread of information used in dog owner decision making.

The FDA

When the DCM report was first published, the initial reaction was largely one of confusion and outrage. However, small groups of individuals were hesitant to blindly accept the FDA's bold claims. A small pet shop owner from Coronado California, Melania Parks, shares her account

> While there have been plenty of challenges along the way, including competing with the "big box" retailers, dealing with product recalls, and staying up-to-date on pet nutrition and health, nothing prepared me for what happened one day in early spring this year when a longtime customer walked up to the counter and said, 'My veterinarian just told me the food I've been buying here for my dog can cause heart disease and death…

> something called DCM.' She was shocked, frightened and confused. I was devastated. Had I been selling what I believed was a great product that actually was a threat to lives of the pets and a terrible disservice to their owners whom I had come to know and love?...
>
> I immediately started researching DCM, which stands for dilated cardiomyopathy, a rare but deadly canine heart disease. As I did, more and more customers came in with the same concerns. Their veterinarians had warned them off the grain-free pet foods we carried, or they had read about DCM online or heard it from friends. No matter what the source, they were terrified. Some were, understandably, even angry and outraged…
>
> The New York Times reported it. Social media went crazy. More panic ensued. But the more I delved into it, the more doubtful I became" (Parks).

It appears that many of these people were ones already feeding a raw or otherwise alternative diet and had a desire to reject claims that challenged their already established beliefs. Author and pet food activist Daniel Schulof summarizes it eloquently,

> "after a half-dozen biochemical tests, a handful of state and federal public records disputes, more than a dozen interviews, and a reexamination of the statistical methods employed in a key DCM report, it is abundantly clear to me that the FDA's DCM investigation bears all the hallmarks of a corporate influence-peddling campaign" (Schulof, "Bad Science and Financial Conflicts…").

Regardless of one's opinions on dog nutrition, it is difficult to dispute the dubious nature of the FDA's DCM report upon close investigation. This "link" referenced in title of the FDA study and many news media outlet articles is merely a correlation, not a causational study. "The FDA hasn't done its due diligence, failing to examine whether there is some other factor underlying

reported DCM cases *and* grain-free diets" (Marchand). There are no published studies having to do with causation. One potential explanation is that only owners with the money and emotional investment to go out of their way to feed grain-free foods are also going to go to the vet when mild symptoms first appear and get an expensive echocardiogram to diagnose DCM (Marchand). There have already been connections made through research between diets containing lamb meal and rice diets, soybean-based diets, diets high in rice bran or beet pulp, and high-fiber diets heavy in soybeans and increased rates of DCM but these did not get any kind of significant publicity, much less cause panic (Kerns). What was suggested merely to be a potential link has blown out of proportion in the public eye in a manner that could arguably be intentional.

The only three veterinarians identified by name in connection to the study have direct financial ties to Hill's Pet Nutrition, Mars Petcare (who own Royal Canin and Eukanuba), and Nestlé Purina PetCare, the only three major international pet food companies not named in the FDA's investigation (Schulof, "Bad Science and Financial Conflicts…"). Additionally, the FDA released its update to the report to industry experts via the Pet Food Institute trade association in February before releasing the information to the public in June (Thixton, "FDA Will Soon Release DCM Investigation Update"). This is an atypical but not illegal behavior for the FDA that raises suspicions about alliances formed behind closed doors (Thixton, "FDA Will Soon Release DCM Investigation Update").

The FDA's DCM report has not been peer reviewed. The data displayed and from which conclusions were drawn was gathered from reports voluntarily submitted to the FDA ("FDA Investigating Potential Connection Between Diet and Cases of Canine Heart Disease"). No scientific experiment was conducted ("Dilated Cardiomyopathy in Dogs & Cats…"). This data is not double-blind, randomized, or placebo-controlled as is generally required of any well-

regarded scientific data. Despite this, an article titled "Diet-associated dilated cardiomyopathy in dogs: what do we know?" was published in the Journal of the American Veterinary Medical Association. In the introduction of the piece, the authors state their intent,

> The recent announcement from the US FDA alerting pet owners and veterinarians about reports of DCM in dogs eating pet foods containing peas, lentils, other legume seeds, or potatoes as main ingredients has raised concerns among the pet-owning public. Therefore, we wanted to increase awareness of this issue among veterinarians, review what is currently known about the possible association between certain diets and DCM in dogs, and discuss what veterinarians can do to help identify underlying causes. (Freeman, Lisa M., et al.)

This piece appears to be by far the most downloaded article to be published by the esteemed journal in the past year and is also the "only academic article referenced anywhere on the FDA's investigation website" (Schulof, "Bad Science and Financial Conflicts…"). "Despite its avowedly factual focus ("… What Do We Know?"), its authors misleadingly characterized the piece as an op-ed, thus allowing it to avoid peer-review under JAVMA's editorial guidelines." (Schulof, "Bad Science and Financial Conflicts…"). While the piece acknowledges the uncertainty in the FDA's preliminary findings and the necessity for further scientific inquiry to establish a cause-and-effect relationship, the piece still ultimately recommends "for dogs in which possible diet-associated DCM is diagnosed, we recommend the owner change the diet to one made by a well-established manufacturer that contains standard ingredients (eg, chicken, beef, rice, corn, and wheat)." (Freeman, Lisa M., et al.). The concluding summary reads,

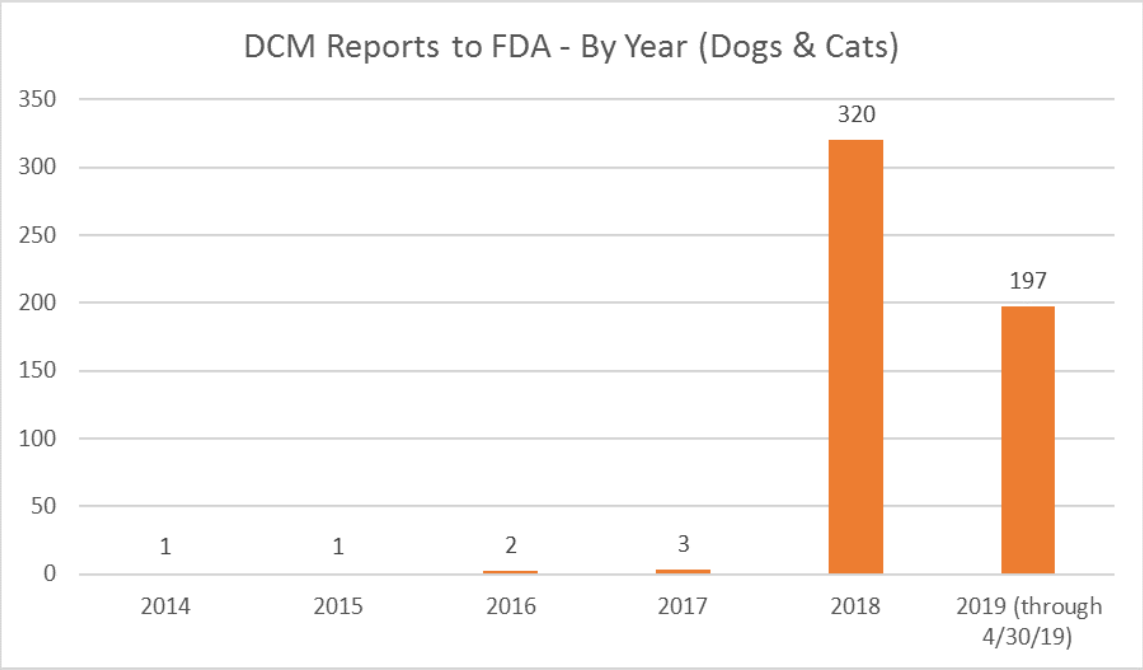
> Pet food marketing has outpaced the science, and owners are not always making healthy, science-based decisions even though they want to do the best for their pets. The recent

> cases of possible diet-associated DCM are obviously concerning and warrant vigilance within the veterinary and research communities. Importantly, although there appears to be an association between DCM and feeding BEG, vegetarian, vegan, or home-prepared diets in dogs, a cause-and-effect relationship has not been proven, and other factors may be equally or more important. Assessing diet history in all patients can help to identify diet-related cardiac diseases as early as possible and can help identify the cause and, potentially, best treatment for diet-associated DCM in dogs. (Freeman, Lisa M., et al.)

Whereas in the introduction where DCM is mentioned to be linked with pet foods containing peas, lentils, other legume seeds, or potatoes as main ingredients, which is what the correlational study actually has the data to back up, all “boutique,” “exotic,” grain-free, vegetarian, and homemade diets are now being linked to DCM. This academic article, ethically responsible to provide accurate information to the best of their ability, is making the same conflation as sensationalist media outlets by repeating the FDA’s claims instead of basing recommendations off of the study’s data or critiquing the bias in the data itself.

The article concludes with a statement that acknowledges that Dr. Freeman has received research support from Nestlé Purina PetCare and Royal Canin; has consulted Nestlé Purina PetCare; has given sponsored talks Hill's Pet Nutrition and Nestlé Purina PetCare, Dr. Rush has received research support from Nestlé Purina PetCare and Royal Canin and has consulted with Nestlé Purina PetCare, and Dr. Adin has received research support from Nestlé Purina PetCare” (Freeman, Lisa M., et al.). Disclosing these potentially relevant connections between the authors of the piece and corporate connections is required by the journal to maintain scientific integrity. While this information is by no means incriminating by itself, one may wonder about the intentionality of scientists with strong professional and economic ties to Big Kibble.

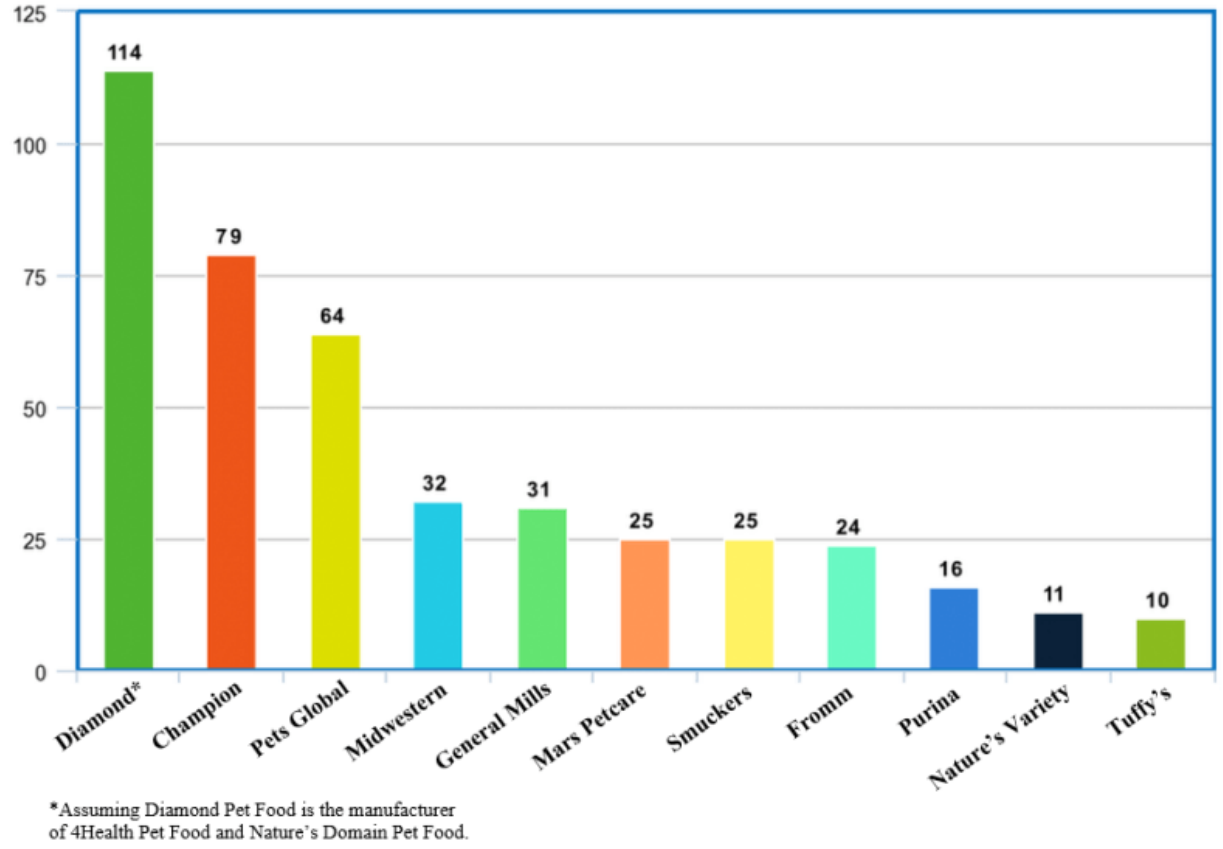
According to the data published by the FDA, there were 320 reports of DCM in dogs and cat in the United States in 2018 but only 3 reports in the previous year ("FDA Investigating Potential Connection Between Diet and Cases of Canine Heart Disease"). This is an astonishing 10,567 percent increase! The rise in owners feeding grain-free foods has been much more gradual, increasing by 10 to 20 percent annually since 2011 ("Grain-Free Pet Food Sales…"). While a spike this significant may be explainable in the even of a dog food recall incident, it seems highly unlikely in the case of DCM, a rare disease which takes years to develop and appears to be triggered by a mix of genetic and environmental factors. (Schulof, "Bad Science and Financial Conflicts…"). It appears that such a sudden and sizable increase in reports of DCM to the FDA may have more to do with changes in reporting or diagnoses than actual incidents of DCM ("Dilated Cardiomyopathy in Dogs & Cats…"). The challenge of accurately diagnosing DCM and the voluntary nature of reports to the FDA call into question the reliability of the presented data.



[Figure 5. Graph showing sudden spike in reports of DCM in dogs and cat.]

A central concern with the study is how the data is being presented. Looking at the data provided by the FDA, feeding dry food actually has a greater correlation with DCM than grain-free foods yet the FDA does not acknowledge this in their report and in fact discourages feeding fresh or raw foods (Thixton, "FDA Will Soon Release DCM Investigation Update"). Additionally, by rearranging the data provided so that it is compiled by manufacturer instead of individual brand, the results are very different. "Pet owners have – previous to this June 2019 FDA update – been told far too many times that the cases of DCM were directly linked to boutique brands of pet food" (Thixton, "FDA Update to DCM Investigation…"). At first glance, the FDA update still perpetuates this notion but this recategorization shows that Mars, Purina, General Mills, Smuckers, and Diamond, the U.S. leaders in pet food sales, are "all listed with high numbers of FDA DCM reports" (Thixton, "FDA Update to DCM Investigation…").

Additionally, these claims around exotic proteins being dangerous and finding their way into the BEG acronym seem to be largely unfounded as while it is true that less popular proteins such as kangaroo make their way onto the list, the leading protein fed to dogs that develop DCM is chicken ("FDA Investigating Potential Connection Between Diet and Cases of Canine Heart Disease"). The terms boutique and exotic in the BEG acronym seem to be constructed entirely outside of what the data suggests and the attack on grain-free foods is based on a poorly understood correlation that lacks any scientific causationality.



[Figure 6. Graph showing DCM cases reorganized by pet food manufacturer. Image by Susan Thixton. Reproduced with permission.]

Some individuals have expressed frustration at the FDA for allocating resources to an investigation centered around a rare disease experiences by pets when there are countless serious health risks impacting humans. Furthermore, these individuals suggest that the FDA cannot be trusted to promote accurate and up-to-date information (Marchand). "For decades, the agency pushed a definition of 'healthy' that fed into the prevailing dogma that high-carb, sugary foods were good for consumers if they were low in fat… Even as nutrition science has begun to recognize that high-fat diets can be an important part of weight loss and a healthy lifestyle, the FDA is taking years to play catch-up" (Marchand). Furthermore, Marchand argues that while the FDA is well-situated to warn consumers about pet food recalls and contamination, determining which dog foods contribute to long-term health should not be a goal of the FDA (Marchand).

Over 50 percent of dogs are overweight or obese and 1 in 2 will get cancer in their lifetime but only only 0.0007 percent have been diagnosed with DCM ("Pet Obesity Epidemic Fact Sheet"; Parks).

> "While DCM is a real and serious disease, it is also an exceedingly rare one. The FDA has received just over 500 owner reports since its widely publicized investigation was announced last July. This works out to less than one out of every 150,000 dogs and cats in the United States. The evidence suggests readers of this article are far more likely to be struck by lightning than to have a pet diagnosed with DCM, regardless of which brand of pet food the animal eats" (Schulof, "Bad Science and Financial Conflicts…").

Critics of the DCM report, including a number of companies that sell alternative dog food diets, urge pet owners to continue feeding a BEG diet as they insist that the health benefits from feeding these foods, such as decreased rates of obesity and cancer, greatly outweigh any

statistically miniscule and not yet scientifically understood links between BEG diets and DCM ("DCM FAQ'S").

Considering the biased data, potential conflict of interest, and scientific uncertainty around the DCM report, a select few are actively campaigning for the FDA to retract their report and subsequent updates. Pet food company CEO and author Daniel Schulof has taken it upon himself to stop this injustice.

> "I sent [a pair of retraction demand letters] to the editorial board of *JAVMA* earlier today as well as in a federal lawsuit I filed against the FDA alleging violations of the Freedom of Information Act due to its refusal to disclose government records pertaining to the DCM investigation. The retraction demand letters have been co-signed by more than 200 veterinarians, pet food professionals, animal scientists, and other stakeholders since I presented them as drafts at the 2019 American Academy of Veterinary Nutrition conference last month" (Schulof, "Bad Science and Financial Conflicts…").

Daniel's 42-page document addressed to the Editor-In-Chief of the Journal of the American Veterinary Medical Association, complete with citations and legal jargon, includes Exhibit A: Letter Demanding Retraction Due To Failure To Comply With Editorial Standards, Exhibit B: Letter Demanding Retraction Due To Unlawful Defamation, Exhibit C: Comment Concerning Methodological Irregularities, and Exhibit D: Comment Concerning Data Irregularities ("DCM Is a Real Disease. It Deserves Real Science"). While it appears Schulof has largely been ignored by his opponents, his thorough research and compiling of information serve as a resource for pet owners, veterinarians, and researchers skeptical of the FDA's claims.

Regulatory Agencies

There is no single agency in charge of dog food regulation in the United States. Instead, there exists a patchwork of agencies with overlapping responsibilities set by federal and state developed over many decades ("How Is Feed and Pet Food Regulated in the United States?"). The FDA conducts occasional inspections of pet food manifesting facilities, pursues pet food investigations based on consumer or veterinary complaint, works in collaboration with AAFCO to develop state laws around pet food labeling practices and nutritional requirements, and approves or denies pet food additives not already defined by the AAFCO (Thixton, "Who Regulates Pet Food in the US?"). The State Department of Agriculture varies its practices by state but can be involved in inspecting pet food labels, requiring pet food manufacturers to register each food they sell annually, investigating consumer complaints in cooperation with the FDA, and working with the AAFCO to establish state standard (Thixton, "Who Regulates Pet Food in the US?"). The Association of American Feed Control Officials has no regulatory authority over pet food, but they do have the power to set labeling and nutritional standards which are frequently adopted as state law ("How Is Feed and Pet Food Regulated in the United States?"). The USDA occasionally plays a role as well in their certification of organic foods, inspection of meats deemed "human-grade," and through their voluntary pet food certification program that is not recognized by the FDA. In essence, there exists a messy and convoluted string of regulations that focus largely on packaging, claims being made, and product registration in a way that makes it difficult for newcomers to enter the field but does little to promote safety or nutritional standards.

Nearly all dog foods will tout that they meet Association of American Feed Control Officials (AAFCO) standards which were first established in 1968 (Kelly 9). "AAFCO

establishes the nutritional standards for complete and balanced pet foods, and ***it is the pet food company's responsibility*** to formulate their products according to the appropriate AAFCO standard. ***It is the state feed control official's responsibility*** in regulating pet food to ensure that the laws and rules established for the protection of companion animals and their custodians are complied with so that only unadulterated, correctly and uniformly labeled pet food products are distributed in the marketplace and a structure for orderly commerce" ("The Business of Pet Food"). Essentially, more than anything, the AAFCO is a labeling standard. It is also a nutritional standard, although not a very strict one. It is incredibly common for dog food to advertise that they are in compliance with AAFCO standards, often because they are legally required to.

The AAFCO has a list of required minimums and in some cases maximums for micronutrient and vitamin content ("AAFCO METHODS"). To be able to claim that a dog food is "complete and balanced" it only needs to meet one of the following 3 standards. 1.) Formulation: The food must be formulated to contain the prescribed amount of every nutrient specified in the AAFCO Dog Food Nutrient Profile, which are based on the nutritional recommendations of the National Research Council (NRC) for dogs and cats ("AAFCO METHODS"). 2.) Feeding Trial: The food must undergo a feeding trial that meet all of the established criteria such as minimum number of animals and the duration of the test. The body weight and blood levels of the canine participants are tracked and must fit within certain guidelines. 3.) Product Family Establishment: If the new dog food being developed is deemed to be nutritionally similar to another food made by the same company that has undergone feeding trials, the product may be approved by proving this similarity exists (Dog Food Label Lessons).

The AAFCO, a private organization with no true regulatory authority, is the only one amidst a complex web of public and private entities establishing concrete nutritional requirements for pet foods. The FDA and other government agencies primarily deal with issues of safety, contamination, and permits (Thixton, "Who Regulates Pet Food in the US?"). As the actor who decides canine nutritional requirements and whether a dog food is nutritionally complete and balanced, the AAFCO has significantly more power and authority than could be expected of what is essentially an advisory board to government agencies. One might then not be surprised to learn that AAFCO's advisors and committee members include representatives from major dog food manufacturers and ingredient suppliers (Postins).

All of the foods linked by the FDA to cases of DCM meet AAFCO standards and can thus be legally be labeled as "complete and balanced" foods ("FDA Investigating Potential Connection Between Diet and Cases of Canine Heart Disease"). Instances such as this one suggest that AAFCO standards may not be accurate in verifying that a specific dog food is safe for long-term feeding. Products that meet AAFCO standards through formulation are based on assumptions around minimum and maximum acceptable nutritional values that may be incorrect or incomplete. The formulation approach also does not take into account interactions that may occur between different ingredients and nutrients (Thixton, "Who Regulates Pet Food in the US?"). While feeding trials, the more expensive avenue to meeting AAFCO standards, are often portrayed as more scientific and accurate by dog food companies who conduct them, upon closer inspection they also appear to be incomplete ("ORIJEN Original"). According to AAFCO standards, feeding trials only need to include a minimum of 8 dogs, only 6 of which need to complete the full trail. Over a period of 6 months, the participating dogs are fed only a single food while their blood and weight is tested regularly. In order for a feeding trial to be deemed

successful, the subjects must not lose more than 15 percent of their initial body weight and four specific blood values (hemoglobin, packed cell volume, serum alkaline phosphatase, and serum albumin) may not fall below a specific threshold ("AAFCO METHODS"). Testing as few as 6 dogs over the course of 6 months may not be large enough of a sample studied over long enough of a time to catch rare diet-related diseases or toxins that build up over years as we are now seeing is the case with DCM.

WSAVA, the World Small Animal Veterinary Association, touts their mission as being to "advance the quality and availability of small animal medicine and surgery, creating a unified standard of care for the benefit of animals and humankind" ("WSAVA Global Nutrition Committee"). Founded in 1969, they now represent more than 200,000 veterinarians worldwide. While they have less power and authority than the AAFACO, their set of Global Nutrition Guidelines has grown significantly in popularity among the general public since the rise of the DCM scare ("Cardiology Service Updates…"). The guidelines largely have to do with calorie needs and weight assessment but one section in particular has been getting traction ("WSAVA Global Nutrition Committee"). In addition to reviewing adherence to AAFACO standards, WSAVA recommends owners contact their pet food manufacturers and ask them a set of questions if the answers to these questions are not already readily available online. Additionally, WSAVA cautions that if a manufacturer cannot or will not provide the information to these questions, they do not meet WSAVA guidelines and "the owner should be cautious about feeding that brand" ("WSAVA Global Nutrition Committee"). The questions are as follows:

> 1.) Do you employ a full-time qualified nutritionist? What is their name and qualifications?
>
> 2.) Who formulates your foods and what are his/her credentials?

> 3.) Are your diets tested using AAFCO feeding trials or by formulation to meet AAFCO nutrient profiles? If formulated, do you meet AAFCO nutrient profiles by analysis of the finished product?
>
> 4.) Where are your foods produced and manufactured?
>
> 5.) What specific quality control measures do you use to ensure the consistency and quality of your ingredients and the end product?
>
> 6.) Will you provide a complete nutrient analysis for the dog or cat food in question?
>
> 7.) What is the caloric value per gram, cup or can of the food?
>
> 8.) What kind of product research has been conducted? Are the results published in peer-reviewed journals?
>
> ("WSAVA Global Nutrition Committee")

Virtually any dog food company has the information to answer questions 2 through 8 given there is a willingness to do so. Conflict stems from the first question, which has been widely interpreted to mean that in order to meet WSAVA guidelines, a dog food company needs to employ a full-time "qualified" nutritionist (octaffle)[6]. Dog food companies commonly contract nutritionists when developing a new product line but do not find the need to hire one full-time ("DCM FAQ's"). At the time of the publication of the FDA's DCM report, only four companies, Purina, Hills, Royal Canin, and Eukanuba, all constituents of Big Kibble, claimed to meet this standard. Thus, as the DCM scare spread and the WSAVA guidelines gained traction, these brands were promoted as the only safe foods on the market ("Taurine DCM FAQ and Answers"). Some smaller dog food companies have fought back against this requirement, calling it unnecessary and touting the expertise of their scientists ("DCM FAQ's"). Others have submitted, hiring a full-time nutritionist and advertising their compliance with the WSAVA guidelines ("FAQ: DCM"). WSAVA guidelines, while highly regarded by some for their apparent quest for transparency, in actuality seem to advantage Big Kibble at the expense of smaller companies.

[6] In this context, qualified implies a Board Certified Veterinary Nutritionist as approved by the American College of Veterinary Nutrition ("WSAVA Global Nutrition Committee").

Veterinarians

More owners list their veterinarian as their primary source of information regarding pet nutrition than any other source (Schleicher, Molly, et al.). Understanding this dynamic and inspired by the enormous success they saw marketing toothpastes through dentists, Colgate-Palmolive has designed their Hills brand to take full opportunity of this dynamic ("Hill's Pet Nutrition, Inc. History"; Scott). An article in the Wallstreet Journal from 2017 exposes the extent of this collaboration:

> "Borrowing a page from pharmaceuticals companies, which routinely woo doctors to prescribe their drugs, Hill's has spent a generation cultivating its professional following. It spends hundreds of thousands of dollars a year funding university research and nutrition courses at every one of the 27 U.S. veterinary colleges. Once in practice, vets who sell Science Diet and other premium foods directly from their offices pocket profits of as much as 40%." (Parker-Pope)

Hill's offers veterinarians their food at a severely discounted rate, offers large commissions on sales, and even funds university studies (Scott). Jana Norris, a graduate of the School of Veterinary Medicine at the University of California, Davis explained how "Hill's was just always around", offering her severely discounted food for her cat while she struggled to pay her way through school and funding her research projects (Parker-Pope).

Veterinarians report having limited training on pet nutrition. Veterinarian Debbie Phillips-Donaldson describes that "most U.S. veterinarians would admit their formal education on companion animal nutrition consisted of one basic course that, in some cases, had to be taught by a professor from another program because no veterinary faculty had the knowledge or expertise to teach it" (Scott). To make matters worse, she explains, "any information on nutrition received after veterinary school usually comes via a handful of petfood manufacturers that sell

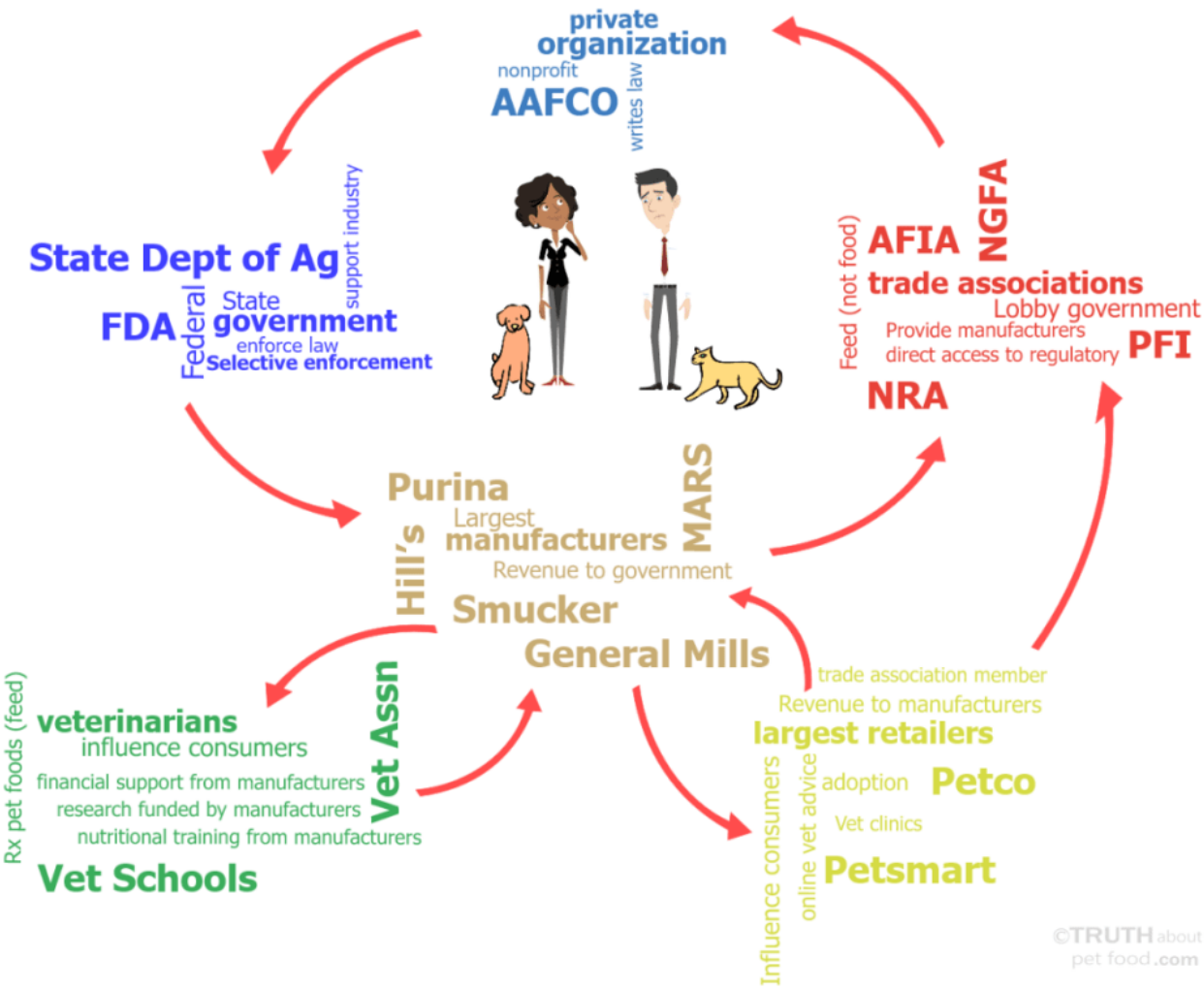
through the veterinary channel. That information is by its very nature prone to be limited and biased” (Scott).

While Hill’s does not reveal its marketing and promotions budget, John Steel, former senior vice president of global marketing and sales for Colgate-Palmolive admitted that "the bulk of our expenditure goes to the veterinary community" (Parker-Pope). He even acknowledged their strategy, stating that "it's just like taking drugs: You go to the doctor and he prescribes something for you and you don't much question what the doctor says. It's the same with animals" (Parker-Pope).Of course, Hill’s Science Diet outwardly claims that it is recommended by veterinarians because of its accolades as a scientifically-grounded line of products that effectively targets specific health conditions despite its products containing similar ingredients to much cheaper dogs foods such as large amounts of corn, soy, and chicken by-product meals (Scott).

Veterinarians’ inadequacy of knowledge regarding pet nutrition go beyond close ties to Hill’s Pet Nutrition. They are perceived as nutritional experts by pet owners despite often receiving only very limited education on the subject in veterinary school (Schleicher, Molly, et al.; Scott). After completing their formal education, veterinarians continue to learn about pet nutrition primarily through scientific journal, veterinary associations, and the FDA, all of which are heavily lobbied by Big Kibble (Scott). Mars owns the animal hospital and laboratory networks Banfield, Blue Pearl, Pet Partners, VCA, and AniCura. This translates to them employing over 9 percent of all U.S. veterinarians who serve pets (Kelloway). These veterinarians are well-situated to promote Mars Petcare products ranging from dog foods to DNA tests (Kelloway). Considering this information, it should serve as no surprise that many veterinarians tout the dangers of BEG diets, raw dog food, and table scraps (Scott).

A Systems Overview

The dog food market in the United States is largely controlled and influenced by Big Kibble. The FDA, State Department of Agriculture, and in some cases the USDA hold official regulatory power but the laws they enact are written by the AAFCO, a private corporation that openly allows industry to directly participate in the law-making process through trade associations. The largest manufacturers of pet food donate heavily to veterinary schools and provide nutritional training to students at these schools who in turn relay this biased nutritional information to consumers. Big Kibble heavily funds scientific research on canine nutrition, resulting in biased scientific publications. The largest chain of veterinary clinics in the United States is owned by the largest pet food manufacturer. In summary, Big Kibble's financial and political capital leverage them to create self-affirming narratives and then disseminated along the broader system.



[Figure 7. Manufacturers, trade associations, veterinarians, pet store chains and even the regulatory system itself are all interwoven into a system where industry prevails and consumers (and their pets) struggle. Image from Susan Thixton. Reproduced with permission.]

Conclusion – Takeaways and Broader Implications

The relationship between humans and our canine companions goes back tens of thousands of years but commercial pet food is a relatively new phenomenon that has existed for less than 200. In a world of mass-production, automation, and global trade, factory scraps have replaced table scraps as the staple diet for dogs. Health issues, recall scares, changing human-dog relationships, and other social and political factors prompted dedicated pet owners to question the mysterious ingredients on their dog's food packaging and seek alternatives. These consumers sought out already available alternative commercial options and some even began to make their own homemade dog food. The market responded with new products and companies marketing themselves as natural and healthy while promoting the growing narrative against Big Kibble. Purina and Mars played along at first, acquiring smaller companies and creating new lines of products that appealed to new consumer demand. Eventually they realized that this strategy was not working as they continued to lose market share.

Then, in the summer of 2018, the FDA released a report detailing their investigation into a potential link between BEG dog food diets and canine dilated cardiomyopathy. From the evidence presented in this thesis, it appears that Big Kibble was involved in the development of this report. Dog owners reacted to the FDA's report with fear and sometimes anger, sharing the report with others and switching their dogs back to Big Kibble. A select few, typically those feeding raw or homemade dog food diets, challenged the FDA's claims and continued feeding alternative diets. This created a polarizing divide laced with intense emotions and provocative rhetoric from both sides.

It is too early to know what will become of the BEG dog food market as a result of the FDA's DCM report. Perhaps the return to Big Kibble will prevail and small alternative dog food companies will go out of business. Maybe more damaging information will be released about the FDA's report, discrediting its preliminary findings and suggestions entirely. Realistically, the future reality is likely to fall somewhere in between these two extremes. While more time is needed to properly observe changes in the BEG dog food market following the DCM report, early data suggests that at least the grain-free dog food market growth has been stunted. A 10 percent annual growth rate from September 2018 has been replaced with a -0.3 percent growth rate the following year (Phillips-Donaldson, "Pet Food Brands…"). The 16 brands listed prominently by the FDA in their update to the DCM report saw a 10 percent decrease in sales within a three-month period following its publication (Phillips-Donaldson, "Grain-Free Pet Food's Future…"). While initial figures suggest a significant but not colossal hit to BEG dog foods, more time is needed to assess if the market will recover.

By using the rhetoric of scientific and industry expertise, Big Kibble has been profiting from the sale of manufacturing byproducts for decades. Through ingenious marketing, they have convinced consumers of the superior nutritional value and safety of their low-cost and low-quality factory leftovers. In doing so, they have discouraged individuals from educating themselves on pet nutrition, stripping pet owners from knowledge which would allow them to make more educated choices about their pet food purchases or even give them the tools to make their own food for their pets. By framing themselves as authority figures with an understanding of canine dietary requirements inaccessible to the public, Big Kibble gains the power to manufacture information widely regarded as reputable.

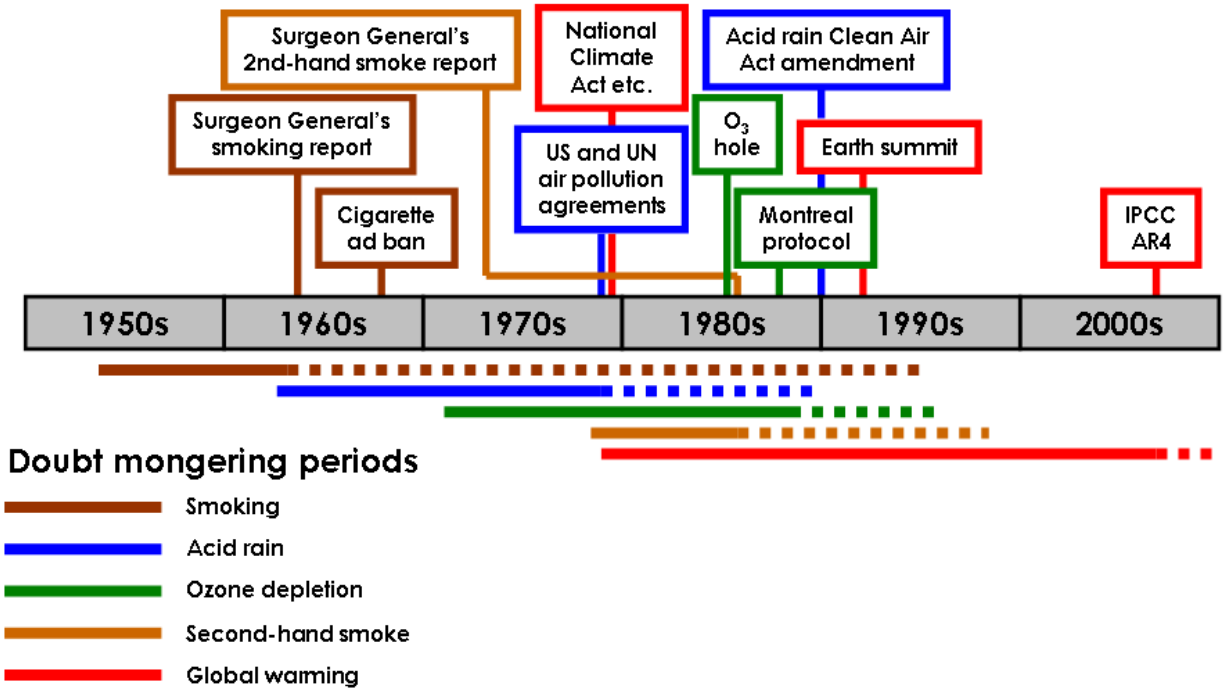
Poor Julie found herself in the crossfire of this messy debacle. Her beloved pet's rare illness and heartbreaking death was transformed from a personal tragedy to a cause for activism. The FDA's DCM report gave her a compelling explanation for her loss and a villain to rally against. Oliver's death was not in vain if she can prevent the death of other dogs from DCM. Julie has become a pawn for Big Kibble, her grief transformed into fuel to further a fabricated narrative meant to benefit the few at the expense of the many.

As evident by the aftermath of the publication of the FDA's DCM report, fear and uncertainty push individuals to question their own decision-making capacity and instead resort to the recommendations of industry experts. Whereas before consumers had mustered the confidence to try purchasing alternative foods for their dogs or even making their own, a health scare has caused them to doubt their own decision-making capacity. In instances of fear and uncertainty, individuals look to industry experts and government policy, preferring established options to innovative approaches.

Lobbyist groups across industries have spent decades using the same strategies to manipulate public consensus and policy changes (Oreskes and Conway 10-23). Large companies, by lining the pockets of researchers, have the power to create their own science capable of challenging already existing data. They lean on doubt as a means to disregard scientific consensus while touting their own authority and expertise. This technique has proven to be remarkably effective, leading industry lobbyists to use it repeatedly with little large-scale public backlash.

Naomi Oreskes and Erik Conway explore the power of industry to shape public opinion and policy change in their book *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*. In it, the authors explore the

conditions which have led to a world in which “a third of all Americans think that Saddam Hussein was behind the attacks on September 11[,] nearly a quarter still think that there’s no solid evidence that smoking kills[,] and as recently as 2007, 40 percent of Americans believed that scientific experts were still arguing about the reality of global warming” (Oreskes and Conway 223). A carefully constructed scheme of industry-funded scientific reports, lobbyist doubt mongering, and media distribution can effectively keep cigarettes on shelves and toxic waste in rivers, or at least greatly prolong their stay. Despite the immense power of industry to deceive and manipulate, their tactics appear to slow down social and political change instead of thwarting them indefinitely. By understanding these tactics, activist groups and individuals can actively work against them to decrease the impact of this manipulation.



[Figure 8. Doubt mongering periods as portrayed in the book *Merchants of Doubt*. Image from Andy Russell. Reproduced with permission.]

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