The Controversy Between a Raw Food Diet and a Kibble Diet: Is a Raw Food Diet Healthier for our Pets?

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Abstract

Dogs became domesticated thousands of years ago. A dogs ancestral history traces back to wolves with a less than 2% difference in their DNA. Dogs are carnivores with the same digestive physiology as their ancestors. Approximately 60 years ago, dogs diets consisted of scraps, carcasses, and what they killed on their own. When commercial dog food appeared on the market people found it easy to scoop out a portion of kibble and pour it into a bowl. They were told by veterinarians that it was balanced and nutritious for their dogs or pets. As the pet food industry exploded, so did health issues in dogs. The ingredients used by the pet food industry is basically waste from the human food industry (Martin, 2008). As people are becoming more aware of the dangers of commercially processed dry kibble, they are turning to other alternatives. Raw food, which is a species specific diet, has many benefits and has shown to promote health in dogs including healthy teeth (Lonsdale, 2001). Consuming whole live fresh food for all animals, including humans, is what nature intended it to be. Arguments have been made that feeding raw, fresh foods for dogs is dangerous and not nutritionally balanced and poses potential health risks.

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The Dog is a Wolf

Genetically, the dog, Canis Lupus Familiaris, is closely related to wolves, Canis Lupus. Over the years, through breeding, humans have developed different breeds and have shaped dogs to live in our lifestyle. The dog has become dependent on us for survival (Mech, 1991). Although dogs look different than wolves, they have the same number and shape of teeth (42) indicative of tearing and shredding meat (Coppinger and Coppinger, 2001). Characteristics of a carnivores teeth are sharp and jagged, unlike a herbivore whose molars are flat to break up vegetable matter. Carnivores jaws are hinged to be able to consume large pieces of meat where a herbivores jaws grind sideways to break up their food (Olsen, 2010). Dogs, as well as cats, still retain their carnivorous features. They still have teeth and claws designed to catch, rip, and tear meat. Their eye position is still forward on their skull to focus on prey animals, whereas, their prey have eyes set to the sides of their skulls to watch for attacks (Schultz, 1998). The internal workings and physiology did not change in the domestication process of dogs. Although we changed their appearance and mind, we did not change their requirement for food and exercise (Baker, 2002).

For thousands of years the domesticated dog survived on whatever food was available. There was no one to make sure their diet was balanced, complete and free from bacteria. They

lived in a biologically appropriate environment. In the wild, a wolf's diet consists of bones and meat, organs, decaying material, and partially digested vegetable matter in a raw food state. They even eat feces (Billinghurst, n.d.). According to Billinghurst (n.d.), "Wolves actually obtain healthy bowel bacteria along with proteins, fatty acids, vitamins, and fiber through feces." A species natural food is biologically adapted to their heritage from thousands of years ago. Dogs are scavengers and have lived in a world of bacteria and germs for thousands of years. They have eaten dead animals and carrion and have thrived through generations of dogs. Our dogs like to bury bones and objects in the ground to be dug up later and chewed on. That bone is contaminated with bacteria in a number that's incomprehensible.

When we compare digestive physiology between a carnivore, omnivore, and herbivore we find very distinct differences. For example, the length of time food spends in the stomach of a carnivore is about 4-8 hours , while the amount of time food spends in an omnivores stomach is 30 plus minutes. Food in the stomach of a carnivore gets a repeated bath of hydrochloric acid. The low pH provides a barrier to pathogens. Small amounts of food is then released by the pyloric sphincter into the duodenum where the pancreas secretes peptides, called defensins, that inhibit and kill any pathogens (Brown and Taylor, n.d). Carnivores digestive systems are 3-6 times their body length, their guts are short, smooth, and fast acting to digest proteins quickly. Omnivores digestive systems are 6 times their body length, while herbivores are about 30 times their body length because fiber requires longer digestion to break down cellulose. Livers in carnivores are larger to process proteins and nitrogenous wastes. Carnivores have highly acidic gastric juices and secrete large amounts of the enzyme pepsinogen, whereas, humans secrete weaker acid and very little pepsinogen. Amylase is an enzyme that omnivores and herbivores

secrete in their saliva to initiate the breakdown of carbohydrates which carnivores lack making it harder to catalyze carbohydrates into glucose (Baker, 2002).

The Pet Food Industry

The manufacturing of commercially processed dry pet foods is a multi-billion dollar industry. The pet food manufacturers control their interests by funding research at veterinarian schools, teaching veterinarians about nutrition, and marketing their product to the consumer in very well thought out advertising. Pet foods are supposed to be well balanced and nutritious, but are they? With the rise of chronic illnesses in pets and pet food recalls the safety of pet foods is in question. The ingredients used in pet foods have been under increasing scrutiny by the consumer forcing them to turn to other alternatives such as raw food or homemade diets. The industry is largely self regulating, however American Association of Feed Control Officers (AAFCO), the Food & Drug Administration/Center for Veterinary Medicine (FDA/CVM), the United States Department of Agriculture (USDA) and the National Research Council (NRC) all have a part in regulations and standards (Martin, 2008). AAFCO, according to Ann Martin (2008), "is a commercial enterprise that attempts to regulate quality and safety of pet food but has no regulatory power (p.51)."

AAFCO sets the standards for nutritional profiles, labeling procedures, ingredient definition, and uniformity within the industry. The FDA/CVM will approve new ingredients, ensure pet food safety, and deals with contamination/recall issues, while the NRC evaluates research and makes nutrient recommendations. The USDA regulates pet food labels and research (Case, Daristotle, Hayek, and Raasch, 2011). The FDA/CVM will not investigate claims of harmful pet foods unless scientific evidence is provided (Martin, 2008). There is no

requirement by the FDA for a pet food to have pre-market approval. "The FDA does require pet foods to be pure, wholesome, contain no harmful or deleterious substances, and be truthfully labeled," according to Benz, (2000).

Labeling of pet foods can be very confusing. Manufacturers use a practice in labeling called "splitting". Even though the first ingredient listed is a meat, corn in various forms such as ground yellow corn, corn meal, and corn gluten meal makes it the prime ingredient instead of the meat listed first (Martin, 2008). Also, the use of an ingredient that is a generally recognized as safe (GRAS) substance can only be used for an intended purpose. For example, sodium aluminosilicateis is GRAS as an anti-caking agent, but it has been purported to bind mycotoxins and prevent absorption from the intestinal tract and would not be GRAS for that use (Benz, 2000).

The pet food manufacturers base their formulations or nutrient profiles on NRC guidelines. Feed trials last only 26 weeks and growth food trials 10 weeks. Nutrient profiles do not test nutrient bioavailability. Feed trials or nutrient trials can be conducted with a family member rule, which means if a product is similar to another, nutritionally, it does not need to be tested (Patrick, 2006).

Problems with Ingredients in Pet Foods

When choosing a pet food, nutrient content is important. Ingredients vary in form, quality, and nutrition (Case et al., 2011). Raw materials used in dog foods are purchased in commercial lots on the open market making the quality variable. Products differ in place of origin and can come from farms, different states, storage facilities, or countries (Sagman, 2012).

The pet food industry promotes the image of beautiful cuts of meat, fresh grains, and vegetables through clever advertising. This couldn't be farther from the truth. The pet food industry is an extension of the human food and agricultural industries. It is the waste from slaughterhouse carcasses, leftover grains from human food manufacturing considered "unfit", and any other waste product. It can contain diseased and cancerous animal parts (Animal Protection Institute, 2004). Most everyone is familiar with AAFCO's main ingredient definitions, but also included are definitions of other ingredients.

These are just a few that are allowed in our pets food:

1. Spray-dried animal blood - is produced from clean, fresh animal blood exclusive of all extraneous material such as hair, stomach belching, and urine, except in such traces as might occur unavoidably in good factory practices. This ingredient can be used in pet food or mixed in during the rendering process, or found in meat chunks in some canned food.

2. Dehydrated garbage - comes from butcher shops, or plants that manufacture fruits and vegetables and is artificially dried and collected before decomposition has started. It should be separated from crockery, glass, metal, string, and similar materials.

3. Dried swine waste - composed of excreta that has been artificially dehydrated to a moisture content not in excess of 15%. It shall contain not less than 20% crude protein, not more than 35% crude fiber, including other material such as straw, wood shavings, or acceptable bedding materials, and not more than 20% ash. (Martin, 2008).

AAFCO labeling is very specific on chicken vs. poultry products, but some in the pet food industry interchange the words freely. If a product is labeled chicken it has to contain that

species. Poultry, on the other hand, can be chicken, turkey, geese, buzzards, seagulls, unidentifiable birds, or euthanized pet birds (Becker, 2012). About 50% of an animal is used in the human food industry with the remaining parts, heads, bones, intestines, organs, even unborn fetuses entering the pet food industry. This gives additional profitable markets for American farm products (Martin, 2008). Rendering, by law, can contain grocery store expired meat with the styrofoam and plastic intact, 4-D animals; diseased, disabled, dying, and dead, road kill, and euthanized animals (Becker, 2012). An EPA document states, "...independent rendering plants obtain animal by products...and entire animal carcasses, from the following sources; butcher shops, supermarkets, restaurants, fast food chains, animal shelters, etc." (as cited in Thixton, 2010). The pet food industry explicitly denies using euthanized cats and dogs in pet foods, but regulatory laws don't clearly state they are forbidden (Thixton, 2010).

The Problem with High Cooking Temperatures of Pet Food

All pet food is heated and cooked to eliminate micro-organisms. Foods that are susceptible to high heat and cooking are destroyed, while most ingredients are damaged (Better Health Channel, 2011). Grains and cereals, instead of losing nutritional value when cooked, increase in digestibility. Because most vitamins and minerals are destroyed they need to be added back in (Animal Protection Institute, 2004). A study done by the Animal Nutrition Group on the effects of high temperatures on nutrients showed that 4mm kibble dryed at 200 degrees lowered proline, total lysine, reactive lysine concentrations, linolenic and linoleic acid concentrations, and increased oleic acid (Animal Nutrition Group, 2011). The cooking process changes the molecular structure of ingredients making it more indigestible and the dogs immune system sees these as foreign, thus their immune system attacks them (Billinghurst, 1993).

Cooked processed dry dog food contains very little moisture, about 10%, and is dehydrating to dogs (Becker, 2012).

Health Issues Caused by Processed Pet Food

Illnesses and disease have risen dramatically that are directly or indirectly caused by diet such as periodontal disease, obesity, chronic digestive problems, kidney disease, allergies, cancer and many more (Bowen, 2010).

Allergies - the rate of incidences of food sensitivity in dogs is on the rise due to poor quality and biologically inappropriate ingredients. Most of the blame falls on proteins (Becker, 2011). However, the use of animal feed grade grains, high in carbohydrates and a poor source of protein, causes allergies, also. These grains are a by-product of flour mills. For example, humans get the wheat and dogs get the chaff. They are always handled last and sit around longer allowing storage mites, insects, and molds to grow. Atopic Dermatitis (AD) affects 15% of the canine population. A peer reviewed study by Dr. White found that consuming storage mites may be responsible for increased AD (as cited in Brown and Taylor, n.d.). Another study in 2003 by Dr. Arlian showed that 94% of the dogs studied with AD had serum 1gE against storage mite antigens, while another study in France in 2002 showed 120-150 dogs that had AD tested positive for either storage mite or dust mite antigens (as cited in Brown and Taylor, n.d.).

Toxins - grains can also contain mycotoxins that are the waste produced from molds. A few of the major classes of mycotoxins are aflatoxin, trichothecenes; also known as vomitoxin, and fumonisins. These toxins survive the cooking and extruding processes. They are found in wheat, corn, rice, barley, oats, peanuts, soybeans, and nuts. The effects of consuming

mycotoxins are cumulative and can cause suppressed immune system damage to body organs, reproduction issues, and death (Brown and Taylor, n.d.). Contamination by Salmonella and E. Coli is also a factor. Cooking may destroy these bacteria, but it doesn't destroy the endotoxins that are released when they die (Animal Protection Institute, 2004). Preservatives have to be used in dry food to keep fats from going rancid. BHA, BHT, and ethoxyquin have been used for years. These potential cancer causing agents are permitted at low levels. Extensive studies haven't been conducted, but it is believed that long term build up leads to diseases, skin problems, and infertility. The additional additives, emulsifiers, flavor enhancers, humectants, lubricants, stabilizers, texturizers, and many more are a concern. Some scientists believe that dangerous interactions happen due to their synergistic effects on one another (Animal Protection Institute, 2004).

Periodontal Disease - is an epidemic with increasing amounts of dogs suffering from rotting mouths. Periodontal disease patients often suffer low grade dermatitis and arthritis. It suppresses the immune system because it is a chronic infection of the mouth. Feeding commercial pet food is the prime cause of this disease and is associated with gastric dilatation and torsion, a substantial cause of diarrhea, and dermal pruitus (Lonsdale, 2001).

Dog Food Recalls

The year 2007 had probably the biggest recall in dog food history. Tainted wheat gluten from China sickened or killed thousands of dogs. Also, in 2007, a rice protein concentrate from China was found to contain melamine, as well. Royal Canin, Blue Buffalo, and Nature's Balance were a few that were affected. In 2012, Diamond pet foods recalled food due to salmonella

contamination in humans. This included labels from Diamond, Kirkland (Costco), Solid Gold, Wellpet, and Canidae. Purina recalled canned cat food due to low levels of thiamine. In 2011, Advanced Animal Nutrition, Petrus Feed & Seed, Arrow brand, Carghill, and more recalled their food due to Aflatoxin, and the industry also saw recalls from numerous manufacturers for pigs ears tainted with Salmonella. In Dec. 2008, the FDA issued a preliminary notification on possible contamination of chicken jerky treats (Food & Drug Administration, 2012). Nothing has ever been done; however, the complaints to the FDA this year alone has been over 600 and over 1,300 since 2006. Purina refuses to do a voluntary recall and encouraged vets to advise their clients that their treats are safe (Morrissette, 2012). These are just to name a few.

The Controversy with Raw Food

It has been implied that there is no scientific research or data that supports the benefits of a raw diet, therefore, according to the American Veterinary Medicine Association (AVMA), a raw food diet shouldn't be fed. However, there is no scientific research or evidence that commercial processed kibble is good for your pets. According to Keuhn (2007), "the only research that has been done is to see if dogs could be fed a grain diet, if dogs could survive acceptably on these processed foods, if X brand of food can do such and such for the dog with health issues, and if X brand is better; more palatable, better liked, less stool volume, etc., than Y brand of food." No research has been done to determine if dry food is actually healthy for your dog, only an assumption based on a 6 month feeding trial." The scientific community dismisses the evidence that raw food is healthy and beneficial, calling it anecdotal, yet their justification against raw food is just as anecdotal. Why is there no scientific studies on raw food diets? Could the research be damning against the pet food industry? If feeding a raw food diet is

as bad as scientists, veterinarians, and the pet food industry says it is, than why isn't there any research to back that up? If it was proven that a raw food diet is healthier and processed foods have created all the increased health issues, a multi-billion dollar industry would collapse, millions of people would be out of work, and there would be no outlet for disposing of waste from the human food industry (Kuehn, 2007). The peer review system is supposed to ensure that any new scientific thought has validity and integrity. However, when it comes to diet and diet related issues, the interests of the pet food industry comes first, therefore most scientific papers on raw food are rejected (Lonsdale, 2001).

Why Feed a Raw Food Diet?

A human diet is made up of a variety of foods. We consume different ingredients during the day and week. Our pets should also. We feed dogs the same food everyday throughout their lives (Brown and Taylor, n.d.). Dr. Ackerman, a canine dermatologist, wrote that dogs given the same food repeatedly can develop allergies (as cited in Brown and Taylor, n.d.). A variety of food is an essential part of a raw food diet and will provide a wide range of nutrients (Olsen, 2010). A balanced diet need only to be achieved through a series of meals as their counterparts in the wild (Billinghurst, 1993). Even humans obtain a balanced diet over a period of time and not at one sitting. All animals store nutrients, such as fat and proteins, as well as, vitamins to be needed if there is a shortage (Kuehn, 2007). Proteins contain essential amino acids, fats contain essential fatty acids. Both are necessary in the diet to meet energy needs (Case et al., 2011). Carbohydrates are different and don't contain any essential ingredient. There is no such thing as an essential carbohydrate. Even though carbs contain glucose and dogs need glucose, it can be

provided by amino acids through gluconeogenesis. Balance, in a diet, is a vague concept thought up by humans and pet food companies to encourage people to buy their food (Kuehn, 2007).

A raw food diet consists of all the vitamins and minerals in their natural form, thousands of different enzymes, and a full range of antioxidants. Studies have shown that nutrients from whole fresh food protects against many illnesses while the same nutrients in pill form show no more effectiveness than the placebos. Enzymes regulate most biological processes that are chemical reactions in the body. They catalyze all cell metabolism including digestion. The cooking of food forces the stomach, pancreas, and small intestine to produce these digestive enzymes that naturally come from raw food (Brown and Taylor, n.d.).

Benefits of Feeding a Raw Diet

The key to the benefits of a raw food diet is "life energy". Food that is whole, fresh, and uncooked helps the body fend off aging, improve cell oxygenation, metabolism, and renewal, helps fight off diseases, and are easily digested (Pitcairn and Pitcairn, 1982). Fecal volume is 1/5 that from dogs on dry kibble. The feces doesn't stink and will turn white and powdery and disappear. Dogs have clean, healthy white teeth and have no need for cleanings by a veterinarian. Obesity is non-existent with weight being easily controlled (Lonsdale, 2001). Energy levels are higher. Coats are silky, healthy, and shiny (Lee, 2012). Raw food contains 75-80% water, which is vital for proper digestion and could possibly decrease the risk of bloat and calcium oxalate bladder stones (Brown and Taylor, n.d.). There are different types of raw food diets. Raw meaty bones, known as the prey model diet and is closest to a wolves diet, the

BARF diet is similar with the addition of vegetables and fruits, homemade cooked diets, and dehydrated raw diets (Wildwater, n.d.).

Make-up of a Raw Food Diet

To achieve all the nutrient requirements for a dog, a raw food diet should consist of:

Raw meat - muscle meat from chicken, beef, turkey, fish, lamb, and rabbit. Organ meat is all the internal organs.

Raw bone - All bone, included with the muscle meat. Rib bones for chewing, but weight bearing bones of older animals are too dense and can damage teeth.

Raw vegetables - asparagus, broccoli, celery, lettuce, kale, squash, carrots, green beans. All in small quantities. Vegetables high in oxalic acid should be fed sparingly as it may interfere with calcium absorption. Too many cruciferous vegetables can alter thyroid function (Schultze, 1998).

Example of a partial analysis of a raw food recipe:

Chicken, Turkey, beef, organs, eggs, sardines, and vegetables with ground bone and krill

Macronutrients	as fed	% of calories	DM
Protein	14%	51%	60%
Fat	5%	43%	22%
Carbs	3.3%	6%	7%

Micronutrients	Nutrition per lb.	AAFCO req. per lb.	
Calcium	1.87	1.44	
Phosphorus	1.39	1.15	Cal/Phos. ratio 1.34:1
Potassium	1.17	0.85	

Taylor and Becker, 2011).

Scientific Studies on Raw vs. Dry

Some scientific studies show a benefit to feeding raw vs. dry. In the Netherlands, a study conducted proved that a raw meat diet reduced urinary oxalate and calcium excretion in dogs (Djicker, hagen-Plantinga, Everts, Bosch, Kema, and Hendriks, (2012). Another study conducted on total tract energy and macronutrient digestibility and fecal fermentation end product concentrations of domestic cats fed extruded (EX), raw beef based (RB), and a cooked beef diet (CB) resulted in SCFA increases in fecal propionate and decreased fecal butyrate in RB and CB diets compared to cats fed EX. Fecal concentrations of ammonia, isobutyrate, valerate, isovalerate, and total BCFA were greater in EX diets than RB and CB. The researchers concluded that further research is justified (Kerr, Vester, Morris, Liu, Swanson, 2011). A study on feeding African wildcats raw or extruded to determine nutrient digestibility and nitrogen metabolism resulted in protein digestibility was greater in the raw fed cats, while nitrogen intake was greater on cats fed the extruded diet and more was present in the feces. Nitrogen that was retained and balanced didn't differ between the two diets. The difference in blood tests was a higher alanine amino transferase activity and higher bicarbonate deficiencies on the raw (Vester,

Burke, Liu, Dikeman, Simmons, and Swanson, 2010). According to Vetinfo (2012), nutritional deficiencies in minerals, vitamins and amino acids can cause seizures. They recommend a raw food diet. The problem lies in commercial food using plant proteins as the bulk of a diet, while cooking kills many of the vitamins which have to be added back in (Vetinfo, 2012). Probably the oldest and best known study is Pottengers conducted between 1932 and 1942. Cats were divided into two groups. All the cats were fed the same diet of 2/3 meat, 1/3 milk and cod liver oil. The meat included beef, lamb, and poultry muscle meat, bones and organs, tripe, sweetbreads, brains and heart. One group was fed raw and the other group fed cooked. The raw fed group were healthy, calm, coordinated and resistant to fleas, infections, and parasites. They had healthy kittens and reproduced with ease. The group that was fed a cooked diet had dental and vision problems, were uncoordinated, had arthritis, thyroid problems, allergies, fleas, intestinal problems, and often had miscarriages and the kittens died. Each successive generation of raw fed cats was healthy, but no cats lived past the third generation that were fed the cooked diet (as cited in Puotinen, 2000).

Conclusion

Eighty million species on earth thrive on raw food. Only humans and domesticated pets largely consume a cooked processed diet filled with unhealthy ingredients, chemicals, and preservatives. Consequently, we and our pets suffer from many chronic ailments like arthritis, cancer, diabetes, and other degenerative diseases. The harmful effects of consuming toxins produced by processing accumulate over the years (Living Foods, 1998). Eating whole foods results in a lower risk of these chronic diseases. There is a synergy in whole foods that have a myriad of beneficial compounds (George Mateljan Foundation, n.d.). With the tremendous

increase of illnesses in dogs, pet food recalls for tainted ingredients, and the horrors of ingredients used in pet foods, it is extremely important to consider the benefits of a raw food diet. The pet food industry is all about profit and their increasing neglect of the health of our pets is shameful. Veterinarians are guilty, as well. Dr. Fox expounds, at the 2008 American Holistic Veterinary Medical Association convention, "The role of the veterinarian profession in preventing sickness and suffering in our beloved dogs and cats should be central, but because of conflicts of interest, as between selling products for profit and putting the best interests of the animal patient before those of running a business, is similar to the human medical profession." (Fox, 2011).

The benefits of feeding a species specific diet to dogs and cats far outweighs the small risk of salmonella contamination, possible broken teeth, and the very small risk of bone damaging the digestive tract if fed a balanced, nutritious diet of raw food. For thousands of years dogs and cats have eaten raw, fresh, whole food and have thrived. Compare that to the 60 years commercially processed food has been around. A small drop in the bucket in the history of the dog.

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