Pet Food Trends. What's All the Buzz About?

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It is not surprising that human food trends have a strong influence on pet food trends, especially since many people consider their pets to be part of their family. Unfortunately, consumer demand for pet food formulations and ingredients are often not based on research. According to a consumer survey conducted by ADM "global consumers are getting more adventurous with their food, as 74% express a desire to try new flavors from around the world and 63% report they like to be experimental when cooking."[1] This human exploration into trying new foods is translating to the world of pet food.

Human Grade Ingredients

Pet owners sometimes express the desire to feed a commercial pet food that is made with 'human grade' ingredients. The term 'human grade' has no definition in any animal feed regulations. The U.S. Department of Agriculture (USDA) defines products fit for human consumption to be officially "edible". Human-grade on a label implies a product or ingredients meet the legally recognized edible standard. For a product to be deemed edible for humans, *all* ingredients must be human edible and the product must be manufactured, packed, and held in accordance with US Food & Drug Administration (FDA) regulations. (21 CFR 110, Current Good Manufacturing Practice in Manufacturing, Packing, or Holding Human Food).[2] These food products have been processed, inspected, and passed manufacturing regulations that are designed to assure safety for consumption by humans. If a pet food meets these standards, a 'human grade' claim could be made on the label and in advertising. However, if the product does not meet *all* regulations, a 'human grade' claim would be considered as an unqualified claim and the product misbranded. Like human food, misbranding a pet food or animal feed is prohibited and subject to legal enforcement.

Alternative Protein Ingredient Options

According to the United Nations, the world population is estimated to reach 9.7 billion by 2050. It is estimated that the annual farm production of primary proteins will need to grow from 525 million tons to 790 million tons to meet the protein demand of the population at that time.[3] A growing concern is having enough food to support this projected global population growth. This has led to a high interest among governmental agencies, scientists, and food producers on seeking alternative sources of protein, including plants and insects.

According to the Food and Agriculture Organization (FAO) of the United Nations, there are more than 20,000 insect farmers worldwide, and more than 1,900 insect species have reportedly been used as food for human consumption.[4] It should come as no surprise, then, that the pet food industry is also looking at alternative protein sources.

Black Soldier Fly Larvae (BSFL)

In 2021, the Association of American Feed Control Officials (AAFCO) tentatively approved Black Soldier Fly Larvae (BSFL) for use in adult maintenance dog products only. (T60.117 (C))[5] BSFL can convert waste into food, an advantage over other insects. "Dried Black Soldier Fly Larvae is the dried larvae of the Black Soldier Fly, *Hermetia illucens*, with or without mechanical extraction of part of the oil that has been raised on feedstock made exclusively of feed grade materials. The ingredient must be labeled with guarantees for minimum crude protein and minimum crude fat on an as-fed basis. If oil is mechanically extracted, maximum crude fat must also be guaranteed on the ingredient label. The ingredient is dried by artificial means to no more than 10% moisture. It

is for use in salmonid, poultry, and swine feed and in adult dog food as a source of protein and fat consistent with good feeding practices."

A digestibility trial was completed involving 56 adult dogs (16 male, 40 female) fed one of 7 extruded diets for 28 days. Diet formulations were 0% BSFL meal or oil (control), or with BSFL meal partially replacing poultry by-product meal and corn meal at dietary levels of 5%, 10%, or 20% inclusion, or diets with BSFL oil partially replacing poultry fat at a 1:1 ratio at levels of 1%, 2.5%, or 5% inclusion. The dogs were monitored via physical examinations, clinical observations, blood chemistry and hematology. There was no significant difference in body weight, food consumption, or stool quality during the study. Hematology and blood chemistry parameters remained within normal limits for all dogs. No significant differences were observed in digestibility of dry matter, protein, fat, and calories; total digestibility was reported to be high for all nutrients examined. "Overall, it was concluded that BSFL meal and BSFL oil are well tolerated by dogs and their consumption results in no impact to physiology that would be concerning. Based on these data, BSFL meal and oil did not affect general health and could be included safely in dog diets." [6]

Crickets

A study published in the *Journal of Animal Science* in 2020 included 32 Beagles that were randomly selected, divided into 4 groups, and fed one of 4 diets for 29 days.[7] The diets were formulated to meet AAFCO adult maintenance guidelines and contained 0% (control), 8%, 16%, or 24% cricket meal. Fecal samples were collected daily. No significant differences in protein digestibility were found and all four formulations were deemed to be highly digestible at greater than 80% digestibility. Blood samples were obtained prior to the study and on day 29 for hematology and chemistry profiles. All blood values were within normal limits at the start and end of the study. Slight fluctuations in blood urea nitrogen and hemoglobin levels were reported but were not considered of biological significance. There were no significant differences in body weight, body condition score, fecal output, fecal score, or fecal moisture between the four groups.

Mealworms

Mealworms have been used in commercially available bird, reptile, and amphibian foods for many years. Use in dog or cat foods is relatively new but being explored by pet food industry researchers. Published research using dog and cat subjects is non-existent, however a study conducted at the University of Illinois using roosters was published recently. The researchers concluded "Our results demonstrate that mealworm-based ingredients are high-quality protein sources. Further research in dogs and cats is necessary to confirm sufficient palatability and digestibility, but these data suggest that they are valuable sources of protein for pet foods."[8]

Pet Owner Acceptance

Using an online testing service, 259 participants participated in a study entitled "Novel Foods Survey". The survey was designed to investigate consumer attitudes towards Black Soldier Fly Larvae (BSFL) and other insects in two forms: dried whole insects and insect flour incorporated into a familiar food.[9]

Participants were significantly more willing to try food made with insect flour than to eat the whole insects, with the same pattern emerging for acceptability of insects in dog food. BSFL were roughly as acceptable as other insects (crickets, mealworms, and ants). On average, participants had negative attitudes towards eating whole BSFL, but the majority were willing to try foods containing BSFL in the form of insect flour or rendered fat.

Could insects be a promising alternative to traditional protein sources commonly used in pet food? Perhaps however, extensive additional research needs to be conducted.

Invasive Species

Other potential novel pet food ingredients being discussed in pet food manufacturing articles include “invasive species”. Various marketing claims could potentially be used to promote products made with invasive species, such as Made in America, wild caught, non-GMA, cruelty-free, and in some cases limited ingredient.

One company, Artvark Pet Products, has cat and dog treats made with Asian carp that is currently available. In China, Asian carp is used in the human food industry, but is largely unused in the United States. Asian carp living in the US waterways, a result of escaping or being released in the 1960s and 1970s, now threaten the ecosystems in the Midwest and South, overtaking Mackerel and other species native to the area.

The company also has plans to offer treats containing feral hog, Axia deer, and possibly Burmese python. Feral hogs damage the ecosystems eating native plants, animals, ground nesting birds, rooting up the soil, destroying soil structure, and damaging roots which allows erosion. Axis deer were intentionally released on the Hawaiian Islands in the 1860s. Unfortunately, the deer eat endangered native plants and upset the soil structure contributing to erosion, smothering the coral reefs with silt. An Artvark representative is quoted in a Petfood Industry.com article as saying, “What we’re trying to do is create a whole new category in the pet industry of ‘stressless’.[10] The deer are living a totally stressless, Hawaiian lifestyle from beginning to end.” Burmese pythons are native to Southeast Asia and not in the United States, however these reptiles are threatening native snake species and alligators in the Florida everglades.

Could invasive species be an alternative to traditional protein sources commonly used in pet food? More investigation into using invasive species as an alternative source of protein needs to be conducted.

Soy, Soybean, Corn, and Wheat

Soy, soybean, corn, and wheat have been incorrectly labeled by some owners and breeders as a cheap filler that cause allergies and are not well digested by dogs and cats. There have been no studies indicating that corn-free or grain-free diets are superior or healthier for dogs and cats. However, three recent independent surveys conducted by OutsideVoices, a consumer research tool used by the ADM (Archer-Daniels-Midland, Co.) Pet Solutions Team, seems to indicate that pet owner opinion may be changing. Of 80% of pet owners surveyed responded indicating that they intentional seek or are open to soy, soybean, corn, or wheat in their pet’s food and treats.[11]

Vegetarian and Vegan Diets

Dietary trends and nutrition fads in people, whether based on scientific fact or not, lead some dog and cat owners to believe those options may be healthier for their pets. The owners' religious beliefs, ethical concerns, or health considerations may also play a factor in the type of diet they wish to feed their pets.

Dogs are omnivores despite the carnivore vs. omnivore controversy. Dogs produce more of the enzymes needed for starch digestion, have much lower protein and amino acid requirements, and utilize vitamin A and D from plant sources more easily than true carnivores. Complete and balanced vegetarian and vegan options are commercially available for dogs. However, there are no studies or scientific basis to show that vegetarian and vegan diets are healthier for dogs.

Cats, however, are obligate carnivores and have several nutrient requirements that are found only in animal-sourced ingredients. The major nutrients of concern in a vegetarian diet formulated for cats are taurine, preformed vitamin A, and arachidonic acid. These nutrients are found principally in animal tissues and are deficient in plant-sourced ingredients. Studies that have analyzed commercially available vegetarian cat foods and compared their nutrient content with AAFCO nutrient profiles for cats have reported numerous nutrient deficiencies. Commercially available supplements marketed to address nutritional deficiencies have also been shown to be lacking and not to meet AAFCO minimum recommendations.

Vegetarian and vegan diets are not recommended for cats due to the serious health risks associated with these nutritional deficiencies. Owners who insist on feeding vegetarian and vegan diets to feline patients should be referred to a veterinary nutritionist.

Cultivated or Cultured Meat

Could cultured pet food ingredients be an option for vegetarian or vegan pet owners? According to the Good Food Institute, "cultivated meat, also known as cultured meat, is genuine animal meat (including seafood and organ meats) that is produced by cultivating animal cells directly. This production method eliminates the need to raise and farm animals for food. Cultivated meat is made of the same cell types arranged in the same or similar structure as animal tissues, thus replicating the sensory and nutritional profiles of conventional meat."[12]

In a survey of 729 pet owners conducted in the UK, only 16% of vegans and vegetarians responding would themselves eat cultivated meat. However, 56% of those respondents indicated that they would feed it to their pets.[13]

Could cultivated meat be an alternative to traditional protein sources commonly used in pet food? Possibly however additional research is needed, including long-term studies to evaluate any potential health problems that might arise.

Raw, Freeze-Dried, and Frozen Diets

Another trend which has become more common is raw meat pet food diets. Commercial raw diets are available in many forms with frozen and freeze-dried being the most common. Advocates of raw feeding often compare domesticated dogs to wolves claiming it to be a more natural and healthier diet.[14] These claims are unsubstantiated by evidenced-based studies or research. Many veterinary professionals' express health concerns, for pets and people, with feeding raw meat diets. Such concerns include zoonotic bacterial as well as parasitic disease (i.e., salmonella, listeria, and toxoplasmosis).

High Pressure Processing (HPP)

High-pressure processing (HPP) uses water and high pressure at cold temperature to inactivate foodborne pathogens and destroys bacteria.[15] HPP has been used to pasteurize milk since 1899, it is also used in a variety of other food products such as juices, smoothies, hummus, and packaged meats. The process is being used by some commercial raw pet food companies. The pet food is packaged in airtight sealed packages, placed in baskets which move into the high-pressure chamber. Water is pumped into the chamber and the pressure increased, typically to 80,000-87,000 psi for 3 to 7 minutes. Time and pressure varies based on the specific food or formula. The HPP raw pet food is then sold fresh, freeze-dried, dehydrated, or frozen. There currently are no uniformed standards or regulation of high-pressure processing in pet food manufacturing. Therefore, effectiveness in killing harmful pathogens may vary from one manufacturers product to another.

Freeze-dried or Dehydrated Pet Food

Kibus, a European company, has created an automated dog food feeder that moistens, warms, and dispenses dehydrated dog food.[16] The owner fills the machine with a one-week supply of commercially available dehydrated dog food and water, programs the feeding schedule and quality. The selected quantity of the dehydrated product is dispensed into a bowl, moisture is added, and the mixture is warmed. Music is played when the bowl is moved outside of the device. It remains out until the next feeding time when it is retracted into the machine and any food remaining in the bowl is weighed. If more than 20% remains uneaten, no additional food is added, the food is not heated, the bowl goes back out, and a message appears on a screen to inform the owners.

There also are currently no uniformed standards or regulation of freeze-drying in pet food manufacturing. Supporters of cultured meat ingredients believe the technology could largely replace the need for farms to produce meat for human consumption and use in pet food. They point to sustainability and animal rights implications such as reduced pollution and the environmental impact associated with raising and transporting livestock, reduced chance of zoonotic disease spread, fewer animals kept in factory farm conditions, etc. Advocates also claim cell-cultured meat could provide taurine from biological sources for those who demand pet food that contains no artificial ingredients nor animal products. However, the author has not found any studies, research, or other evidence to support that belief.

Could HPP be a possible solution to safety concerns with raw meat diets for dogs and cats? Additional research needs to be conducted to answer this question.

Conclusion

Very little published research is available on these potential alternatives to traditional pet foods. Extensive long-term studies should be conducted before use in commercially available dog and cat food. The long-term effects, positive or negative, must be explored and evidence published before the veterinary professional can answer the question if any of these might be promising alternatives to traditional diet types or ingredients. Referring to the WSAVA Guidelines: Recommendations on Selecting Pet Foods (n.d.) is an excellent resource to begin your search.[17]

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