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Awareness and evaluation of natural pet food products in the United States

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Health- and nutrition-minded consumers have a considerable interest in and demand for natural food products, including natural foods for their pets. Natural pet food is the fastest growing segment of the pet food industry in the United States, compared with the science, grocery, and overall pet specialty segments. Sales of natural pet foods increased from $2.0 billion in 2008 to $3.9 billion in 2012.[1] Interest in natural pet foods and ingredient sourcing was fueled by the 2007 recall of pet food products adulterated with melamine and related derivatives as a result of the inclusion of Chinese-sourced wheat gluten, rice gluten, and corn gluten. Consequently, consumer awareness of pet food safety and the inclusion of specific ingredients in pet foods were heightened, which resulted in increased demand by consumers and pet food manufacturers for traceability of pet food ingredients, specifically with regard to country of origin.

The rapid growth in the demand for natural pet foods is also propelled by the unsubstantiated belief of many consumers that diets consisting of meat, whole grains, and fewer by-products offer better nutritional options for their dogs and cats.[1] A preference for recognizable ingredients (eg, fruits and vegetables) listed on the label parallels consumers' beliefs that these foods are good for the health and well-being of their pets.

Understanding what constitutes a natural pet food and how to assess its quality is necessary to enable veterinarians to confidently provide nutritional advice to pet owners. The purpose of the information provided here is to clarify the definition of natural pet foods in the United States and provide guidance for assessing natural pet food products. In addition, quality- and safety-related aspects involved in delivering optimal companion animal nutrition is discussed.

Defining Natural

Natural is a widely used term in pet food labeling and marketing. The term is often interpreted by consumers to refer to foods containing whole, minimally processed ingredients as well as foods that do not contain artificial ingredients or additives, including vitamins and minerals.[1] Each pet owner is likely to have his or her own definition because of personal biases, experiences, or perceptions. Importantly, regulatory standards in the United States allow processed ingredients to be considered natural; consequently, the term natural as it refers to pet food can have different meanings, depending on the perspective.

Abbreviation

AAFCO	Association of American Feed Control Officials

Regulatory and AAFCO perspective—Manufacturers of natural pet food must meet the regulatory definition of natural pet food, which primarily encompasses factors associated with the processing of ingredients and pet foods. In the United States, the AAFCO is a voluntary membership association of local, state, and federal agencies charged to develop model laws for states to regulate the sale and distribution of animal feeds. Although the AAFCO has no regulatory authority, it provides a forum for its members and industry representatives to develop model laws, regulations, standards, definitions, and enforcement policies for regulating the manufacturing, distribution, and sale of animal feed and pet food.

The AAFCO definition of natural states the following[2]:

> "a feed or ingredient derived solely from plant, animal or mined sources, either in its unprocessed state or having been subject to physical processing, heat processing, rendering, purification, extraction, hydrolysis, enzymolysis or fermentation, but not having been produced by or subject to a chemically synthetic process and not containing any additives or processing aids that are chemically synthetic except in amounts as might occur unavoidably in good manufacturing practices."

Although synthetic nutrients, such as vitamins and minerals, do not comply with the definition of natural, they are allowed in natural pet foods. The AAFCO guidelines recommend that exceptions be made in cases whereby chemically synthesized vitamins, minerals, or other trace nutrients are present as ingredients in a product, provided that it is not a supplement-type product

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and that a disclaimer on the label is used to inform consumers that the vitamins, minerals, or other trace nutrients are not natural. Such disclaimers are included on packaging as follows: natural with added vitamins, minerals, and other trace nutrients. The AAFCO guidelines recommend that the disclaimer be half the same font size and positioned juxtaposed with the term natural. In this manner, synthetic ingredients are permitted as long as they are essential and have nutritive value. This allows natural pet foods to be complete and balanced and provide requisite amounts of essential nutrients.

Pet owner perspective—For some pet owners, the term natural may be associated with such descriptors as organic, containing no by-products, having high protein, or even veterinary recommended,[3] although such descriptors are not addressed in the regulatory definition of natural pet food products. Pet owners consider that additives, synthetic ingredients, and preservatives are the opposite of natural.[3] Despite these owner perspectives, the 3 most important factors considered by veterinarians when recommending a pet food are ingredient quality, safety, and trust in a company or brand, rather than the individual ingredients used to make the pet food.[4]

Perceptions of consumers and pet owners can lead to exclusion of ingredients (eg, corn, soy, or animal by-products) that would otherwise be considered natural from a regulatory definition. These ingredients may be perceived by consumers as lower quality or of poor nutritional value for pets. However, these ingredients often meet the AAFCO definition of natural and may have quality and nutritional value comparable to that of other natural ingredients. Furthermore, many natural pet food consumers seek to purchase products or ingredients with claims of human-grade, organic, or holistic and avoid ingredients perceived as fillers.[5] Transference of human health issues to pets by their owners may occur, which may not be a sound philosophy. For example, certain pet owners may avoid wheat products because of gluten (gliadin) intolerance. However, gliadin sensitivity is rare in dogs and usually observed only in Irish Setters.[6] The aforementioned examples of consumer perceptions of natural pet foods illustrate that consumers do not make distinctions between descriptors of natural, quality, and nutritional value. Given the vast range of quality and nutritional value that can be provided for ingredients and pet foods classified as natural, each of these criteria need to be evaluated separately. There are distinctions among terms commonly used by consumers to assess natural pet food products[2,7,8] (**Table 1**).

As mentioned previously, some ingredients such as corn, soy, or animal by-products fit the AAFCO definition of natural but are nonetheless rejected by pet owners as not belonging in a natural pet food product. However, it is interesting that whereas animal by-products generally have a negative connotation, some

Table 1—Definition or description of terms commonly used in claims on natural pet food products.

Term	Defined by a regulatory body?	Definition or description
Ancestral or instinctual	No	Terms are often used interchangeably but rely on different philosophies to support high-protein, low-carbohydrate diets. Instinctual nutrition is based on self-selection of foods by animals to meet nutritional needs. Ancestral nutrition is based on eating foods similar to the diets of evolutionary ancestors or relatives.
By-products	Yes	Secondary products produced in addition to the principal product.[2]
Fillers	No	Many carbohydrate sources (eg, digestible carbohydrate and fiber sources such as beet pulp) are often called fillers by consumers because of a perceived lack of nutritional benefit and lower cost. However, digestible carbohydrates are often included in formulations as highly digestible and readily available energy sources, and fiber is included to maintain digestive health and fecal quality.
Holistic	No	A philosophy for eating based on nourishing an animal's mind, body, and spirit.
Human-grade	Yes	Human food safety and sanitation standards are described in regulations adopted by the FDA.[7] Description of a product as human-grade indicates compliance with these standards. For a manufactured pet food, both the ingredients and final product processing must comply with the standards. Thus, unless a pet food manufacturing facility complies with human food safety standards, once ingredients enter the facility they are no longer human-grade and it would not be appropriate to describe the finished pet food or ingredients as human-grade.
Organic	Yes	Agricultural products labeled as organic are produced in accordance with the provisions of the Organic Foods Production Act and the regulations of the National Organic Program as outlined by the USDA.[8] The term indicates that an agricultural product has been produced through approved methods that integrate cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity. Synthetic fertilizers, sewage sludge, irradiation, and genetic engineering may not be used.
Grain-free	No	A pet food product that does not contain grains. Does not mean carbohydrate-free, and may contain carbohydrates in amounts similar to or even higher than those in diets containing grains. In many grain-free diets, ingredients such as potatoes, sweet potatoes, chickpeas, and split peas are used instead of grains.

by-products provide nutrients (eg, cartilage provides glucosamine) that have positive associations among pet owners. Beyond the perception of poor nutritional quality, pet owners may also associate certain grains and by-products with food sensitivities. However, it should be mentioned that these ingredients are often not those reported in the scientific literature as contributing to most cases of food sensitivity. The most commonly reported food ingredients associated with food allergies are beef, dairy, wheat, and egg for dogs and beef, dairy, fish, and lamb for cats.[9]

Consumers may correlate quality and natural products with high-protein or ancestral diets. It is generally accepted that modern dogs evolved from ancient wolf populations.[10] Given this association, some natural pet foods are marketed on the basis that they contain high amounts of meat and protein, which are believed to be suitable for these ancient wolf ancestors. Although this is an intriguing approach, there are several important differences between feral wolves and domesticated dogs, including less aggression, altered social cognitive properties, and morphological differences.[11] Indeed, investigators in 1 study[12] found candidate mutations in key genes in domestic dogs, compared with those of wolves, which provides functional support for increased starch digestion in dogs, compared with starch digestion in the more carnivorous wolves. The nutritional importance of these findings[12] is that as domestication progressed, dogs evolved the capacity to thrive on starch-enriched diets. This helps explain, in part, the more omnivorous metabolism of dogs, compared with that of wolves, and supports that carbohydrates can be substituted as part of a natural diet for healthy dogs.

In contrast to the evolution of dogs, cats appear to have retained much of the metabolic and physiologic attributes of true carnivores. Although cats have the capability to digest carbohydrates,[13] high amounts of certain carbohydrates in the diet may exceed digestive capacity and cause digestive disorders, such as diarrhea, flatulence, and bloating.[14] Additionally, the metabolism of cats is adapted for gluconeogenesis rather than glucose clearance, which includes a lack of detectable hepatic glucokinase activity and higher activities of pyruvate carboxylase, fructose-1,6-biphosphatase, and glucose-6-phosphatase in the liver of cats, compared with metabolism in the liver of dogs.[15,16] However, there is currently limited evidence to suggest that moderate amounts of carbohydrate in the diet (20% to 30% of metabolizable energy from carbohydrates) are detrimental to the metabolism or health of cats.[17]

Natural Ingredients: A Fundamental Continuum

The pet food system is intertwined with the human food system by providing an outlet for nutrient-rich secondary products of the human food chain. With respect to pet food ingredients, by-products are defined as secondary products produced in addition to the principal product.[2] Animal protein sources, specifically ingredients with the term by-product in the name, create confusion regarding the definition of by-products and have contributed to generalized negative perceptions of secondary products. However, many ingredients used by the pet food industry are secondary products of the human food system. Without this relationship in the overall food system, both the human and pet food systems would become unsustainable from economic and environmental standpoints.[18]

The increasing humanization of pets has led to the adoption of human food trends for the natural pet food category, including the perception that the ingredients used in natural pet foods are the same as those used in human foods.[1] Knowledge about ingredients and ingredient quality is the first step in finding the balance between high-quality ingredients and competition with the human food chain. A description of ingredient terms and processing of ingredients commonly used in natural pet food products would prove helpful and provide transparency to veterinarians to increase understanding of ingredient declarations on natural pet food products.

Animal-based products—Meat (eg, beef, pork, lamb, or venison) contains the clean flesh from striated muscle, which may include muscle from the tongue, diaphragm, heart, or esophagus.[2] Poultry (eg, chicken, turkey, or duck) is the clean flesh and skin with or without accompanying bone, excluding the head, feet, and entrails. Fish may comprise the entire fish or the flesh remaining after filleting. Meat, poultry, or fish designated as deboned or boneless has had the bone removed by mechanical or knife separation, respectively. These raw animal products, with or without bone, are referred to in natural pet foods as real meat and are added in their raw state to pet food. The term fresh indicates an ingredient has not been subject to any method of preservation other than refrigeration, including not having been frozen.[2]

Raw meat, poultry, and fish are most often the secondary products of meat processing for human food after portions of striated muscle are removed and processed. However, pet foods often compete with the human food chain because ingredients such as deboned meat or poultry are used in human food products,[19] including sausages, hot dogs, or processed chicken products. Real meat, when it appears on a pet food label, is considered by consumers to be more natural or of higher quality than animal by-products or animal meals. However, processing and preservation are critical factors that affect ingredient quality.[20] Proper handling of animal by-products or animal meals can result in ingredients that have quality comparable to or better than that of raw animal products. Conversely, improper handling or preservation of raw animal products can result in nutritional degradation or concerns about quality and safety.[20]

Meat or poultry by-products consist of organs and other parts of the carcass remaining after raw meat processing. These include the lungs, spleen, kidneys, brain, liver, bones, stomach, and intestines without their contents for meat by-products and the head, feet, and viscera without fecal contents for poultry by-products.[2] These materials do not contain hair or feathers, hooves, horns, hide trimmings, or gastrointestinal tract contents. Although animal by-products do not typically become part of the human food chain in the United

States, there are global markets for various animal by-products that are used to make culinary delicacies, such as chicken feet, tripe, and haggis. Additionally, there is an increasing trend for high-quality animal by-products, such as tripe, to be incorporated into natural pet foods with instinctual or ancestral product positioning in the marketplace.

Animal meals and by-product meals are created during a process known as rendering, which is a process used in both the human food and animal food industries. During rendering, raw products are cooked at high temperatures (115° to 145°C) for 40 to 90 minutes, depending on the processing system and type of product.[21] Most of the water is removed from the meat and bone during the cooking process, and bacteria, viruses, protozoa, and parasites are killed or deactivated. The cooked meat and bone then are dehydrated and ground into a fine powder. Much of the fat is also removed and further processed for use as an ingredient. The shift toward incorporation of more whole ingredients into natural pet foods has resulted in the fact that animal meals are increasingly being replaced with raw animal products that are not processed by rendering.

Plant-based products—Many natural pet foods include grains as carbohydrate sources. Whole grains, including brown rice, oats, and barley, are the predominant grain types included in natural pet foods.[1] Whole grains contain the bran, endosperm, and germ portions of the grain kernel, as opposed to only the endosperm portion that is provided in refined grains. Bran and germ contribute nutrients, including fiber, vitamins, minerals, and phytonutrients, not found in high concentrations in the endosperm.[22,23] Phytonutrients (phytochemicals) are bioactive compounds in plant-based foods that may have beneficial health effects. Whole grains are often considered more natural by consumers than are refined grains because they are less processed, even though all products eventually undergo processing through canning and retort or extrusion procedures. It should also be mentioned that whole grains may not be beneficial for pets with some medical conditions. For example, dietary phosphorus should be restricted in pets with renal and other urinary tract problems. However, because the phosphorus content is much higher in brown rice than in white rice, the former is actually contraindicated when not part of a complete and balanced commercial pet food. In this situation, a pet owner with a preconceived notion that brown rice is more naturally healthful for their pet would be mistaken.

There are multiple points in the milling process where secondary products are produced from grains. After harvesting, rice kernels still contain an outer inedible hull that must be removed, after which the kernels go through a series of processes to produce a variety of rice products (**Figure 1**). Milling of grains such as rice, oats, and wheat uses physical processing to separate layers of the kernel or reduce particle size; this is an allowable processing technique for natural ingredients according to the AAFCO definition of natural.

Carbohydrate sources other than grains, including potatoes, sweet potatoes, peas, chickpeas, or lentils, are

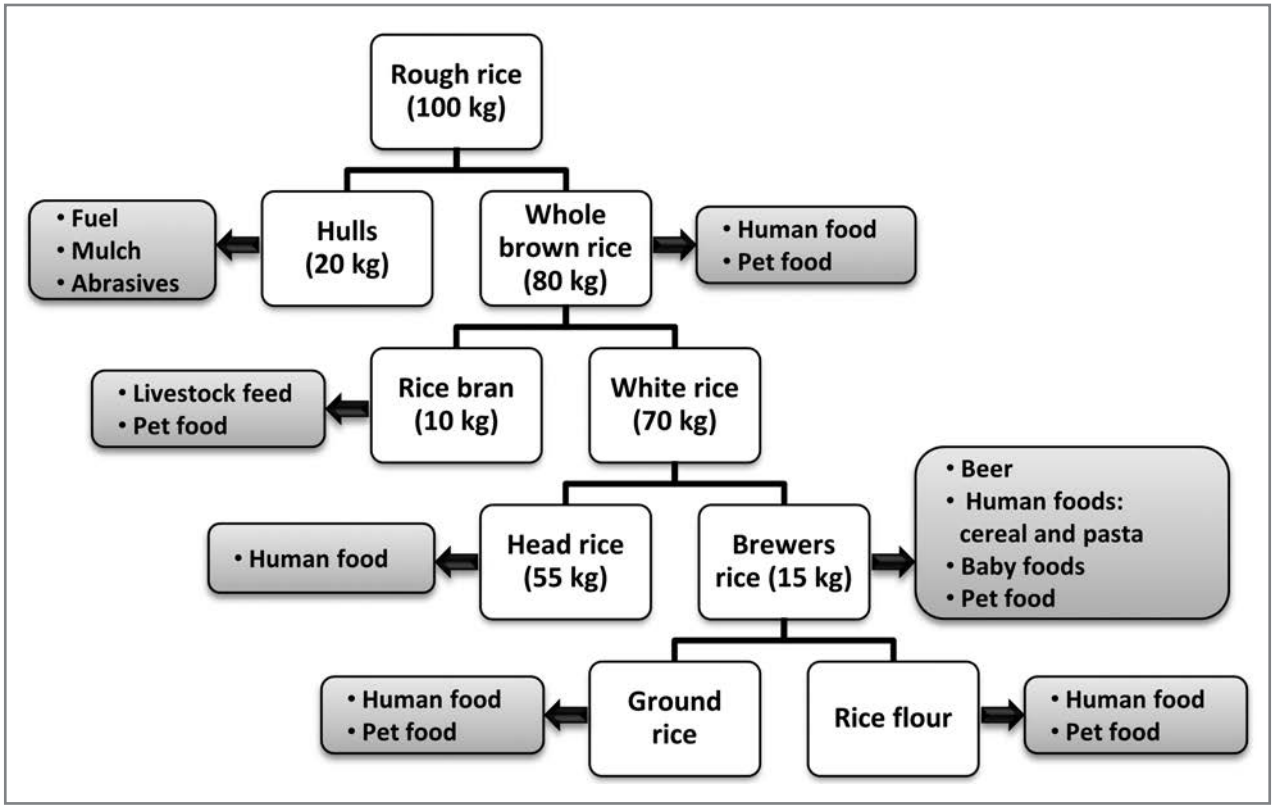

Figure 1—Products and approximate weight distribution resulting from the milling of rough rice.

often used in natural pet foods. These ingredients also provide plant-based protein. Legumes, such as peas and lentils, are typically between 20% to 30% protein on a dry-matter basis and have been successfully integrated into foods for dogs and cats.[24,25] These ingredients can also be fractionated into concentrated protein sources (eg, pea protein or potato protein).

Fruits and vegetables such as blueberries, cranberries, carrots, tomatoes, or spinach are often used in natural pet foods. These can be added as fresh whole products or dried via sun-curing or dehydration. Additionally, pomace or pulp is generated after the extraction of juice from fruits or vegetables; pomace and pulp are secondary products of the juicing industry. Therefore, fruit and vegetable ingredients can be listed on the ingredient list as dried, dehydrated, sun-cured, pomace, or pulp depending on the initial ingredient and processing method. In addition to providing fiber and digestible carbohydrates, fruits and vegetables can be used as natural sources of vitamins, antioxidants, and phytonutrients, even when dried or as pomace.[26,27] However, the amount of fruits or vegetables in a formula and nutrient loss (or gain) through extrusion and processing will influence their contribution of vitamins, antioxidants, or phytonutrients to the finished product. Fruits and vegetables are often not a pet food's primary source of vitamins or minerals because the overall amounts and assortment required would likely diminish the nutrient density and dramatically increase costs. Hence, vitamin and mineral content primarily are from synthetically derived sources.

Pet Food Quality and Safety

Similar to the range in quality of ingredients for other pet food categories, there is a wide range in quality of ingredients used in natural pet foods. Quality includes food safety. Both quality and food safety are multidimensional; they encompass nutrient content and variability, stability, digestibility, bioavailability, and impact on palatability and fecal quality. Standards of individual pet food manufacturers for transparent and responsible selection of ingredients, manufacturing processes to maintain natural ingredient integrity, and quality control consequently govern the important elements of quality and food safety. When food quality and safety are combined with meeting a pet's dietary needs and ingredients that can enhance specific attributes of a lifestyle or breed, the result is a product on the leading edge of optimum nutrition for companion animals. Additionally, a manufacturer's efforts to advance knowledge about the nutritional value of natural products through scientific research and publication should be considered when evaluating the trustworthiness and integrity of a company or brand. Responsible pet owners should have an appreciation for factors that influence quality and food safety, and they may rely on veterinarians as a trustworthy source for this information. Otherwise, they are left to make choices regarding the foods provided to their dogs and cats that are based on marketing information, anecdotal claims, and testimonials, rather than scientific evidence.

A pet food company's commitment to quality and food safety will be reflected in their quality control procedures. Pet food manufacturers control their own quality management system, which should include procedures for sanitation, incident management, ingredient and product traceability, and risk management of microbiological, physical, chemical, and nutritional contaminants. A manufacturer's internal quality management system may be based on external quality standards, such as ISO9001: 2000, Quality Management Systems—Requirements; ISO22000: Food Safety Management Systems; Good Manufacturing Practices; Dutch Hazardous Analysis Critical Control Point; International Food Standard; British Retail Consortium Technical Standard and Protocol; Safe Quality Food 2000; American Feed Industry Association Pet Food Manufacturing Facility Certification Program; or Food Safety System Certification 22000. Validation of the implementation of a quality management system by second-party or third-party assessments increases confidence about a pet food manufacturer's commitment to quality control. Third-party certifications are comprehensive assessments in which external certifying bodies perform validation of compliance with designated standards, such as those mentioned previously. It should be mentioned that testing of a finished product for salmonellae before release of the product is not required by regulatory agencies but should be implemented as part of a manufacturer's quality management system.

In addition to understanding quality control procedures, it is useful to consider a manufacturer's attention to the quality of raw ingredients, product formulation, processing variables, and preservation and contribution of these factors to producing top-quality natural pet food products. It may be hard to access some of the variables from information provided on the product label, but many companies will provide information if contacted.

Quality of raw ingredients—Responsible pet food manufacturers should perform numerous assessments to ensure the quality and safety of raw ingredients. These assessments include selection of responsible suppliers, physical inspection of raw ingredients, evaluation of cooking or processing methods, analysis of nutrients and contaminants (eg, aflatoxin and vomitoxin), and inspection of traceability documents. Responsible manufacturers have systems in place that include multiple steps to ensure specifications are strictly met with regard to selection and use of appropriate ingredients for formulations. Poor or inadequate quality controls at the supplier stage can result in compromised pet food products, and suspect raw ingredients should be rejected.

Many factors can influence the quality of raw ingredients, including the parts of the plant or animal used, processing variables, and preservation techniques. For example, meat and bone meal processed at 143°C had lower digestibility of lysine (77.0%), compared with digestibility of lysine for meat and bone meal processed at 129°C (85.7%).[28] Additionally, lysine bioavailability ranged from 43% to 89% in 15 samples of meat and bone meal from various suppliers in the United States and Canada.[29] Although these studies provided data specific to meat and bone

meal, variability among ingredient suppliers is expected for other ingredients, including raw animal products (eg, real meat) and plant-based products. Thus, a pet food manufacturer with policies and procedures in place to ensure quality of raw ingredients will evaluate suppliers through a supplier quality assurance program and work with suppliers to improve the quality and safety of ingredients by optimizing processes and procedures.

Product formulation—Most pet food companies use formulation software that contains nutrient information for each ingredient to predict nutrient content of final products. The accuracy of these nutrient values is critical to the nutritional value of the final products. Nutrient values of ingredients can be obtained from several sources, including published values, values generated by the supplier, or values obtained from testing of ingredients by the pet food manufacturer. It should be mentioned that even with continuous monitoring of raw ingredients, there will be variability in nutrient values because of interbatch variation. Knowing the variability of raw ingredients is important to pet food formulators as they attempt to meet nutrient requirements for complete and balanced products.

At a minimum, complete and balanced products in the United States must meet AAFCO nutrient profiles for dogs or cats.[2] Pet food manufacturers may choose to use additional specifications, outlined by the National Research Council,[30] clinical nutrition publications,[31] or company specifications based on multiple sources, that are more stringent and can adjust for caloric intake of an animal. Feeding trials conducted in accordance with AAFCO protocols or analytic evaluation are approved methods to ensure nutritional adequacy.[2] Additionally, product performance is often tested through palatability, digestibility, and fecal quality tests. It is important that the staff of a pet food manufacturer include companion animal nutritionists and at least 1 board-certified veterinary nutritionist with a thorough knowledge of nutrition, physiology, and pet food ingredients to ensure the production of nutritionally adequate products that enhance the health of pets.

Processing—Variations in product processing can greatly influence nutrition performance, such as nutrient digestibility and bioavailability. Most notably, time and temperature of cooking affect digestibility and nutrient availability, so careful monitoring of the cooking process is important. Thermal processing can benefit nutrient digestibility and availability up to a point; however, too much thermal processing can have the opposite effect. For example, the degree of gelatinization of wheat starch is positively associated with in vitro digestibility and plasma glucose and insulin responses in rats,[32] which indicates processing results in increased bioavailability of digestible carbohydrate. Additionally, starch gelatinization and reactive lysine in a canine diet increased with increasing extrusion temperatures up to 150°C, compared with results for an untreated control diet.[33] Conversely, increasing the time of heat treatment during canning of cat food was associated with a decrease in amino acid digestibility in the ileum of rats.[34] In addition, higher drying temperatures (200°C) for an extruded canine diet of 4-mm kibbles resulted in lower concentrations of lysine, reactive lysine, linolenic acid, and linoleic acid and the reactive-to-total lysine ratio, compared with results for lower drying temperatures (≤ 160°C).[35] Consequently, a pet food manufacturer's ability to control and adjust processing variables on the basis of nutritional performance can result in the manufacture of a high-quality finished product. Development trials to fine-tune processing variables specific for each formulation and ownership of manufacturing facilities allows more control of a pet food manufacturer to manage product processing to ensure quality and consistency.

Preservation—Preservation of a pet food product affects quality by avoiding changes in nutritional value, palatability, and pet health that occur when a product becomes rancid. The effectiveness of preservation is assessed through studies on shelf life, which measure changes over time for indicators of nutrient degradation, such as peroxide values and concentrations of hexanal, biogenic amines, and nutrients, especially vitamins. Product deterioration over time can result in negative palatability[36] as a result of off flavors or altered textures and aromas and can affect nutritional adequacy. Investigators in 1 study[37] reported that increased fat oxidation reduced puppy growth, caused platelet alterations, and lowered immune function. Although synthetic antioxidants such as butylated hydroxytoluene and tertiary butylhydroquinone are quite effective in pet foods, natural pet foods mandate that only natural antioxidants (eg, mixed tocopherols) be used. Natural antioxidants currently used are often not as efficacious as the same amount of a synthetic alternative; thus, increased amounts of natural antioxidants are required.[36,38] In some cases, ascorbic or citric acids could be added to augment the effects of mixed tocopherols. Therefore, these differences typically increase formulation costs for natural pet foods, compared with those of pet foods produced with synthetic antioxidants.

It also is important to accurately define the shelf life of a product, as indicated by best-by dates on product labels, and for natural pet food manufacturers, distributors, and retailers to manage logistics that will result in suitable product turnover. New methods for extending shelf life of rendered protein meals and the use of enzymatically derived natural peptides as possible antioxidants for the animal feed industry[39] are under investigation. Additionally, pet food manufacturers along with antioxidant suppliers are continually developing and evaluating new natural antioxidants and their impact on stability of natural pet foods and ingredients.

Quality assessment—Because of the demands of a busy veterinary practice, veterinarians or veterinary staff can use guidance regarding assessment of pet food

quality and recommendations to clients. The American Animal Hospital Association recently published comprehensive guidelines for nutritional assessment of dogs and cats.[40] The guidelines were developed in concert with board-certified veterinary nutritionists, practitioners, and licensed veterinary technicians and include a guide for patient nutritional assessment as well as advice on pet food evaluation. The World Small Animal Veterinary Association also issued similar guidelines for veterinary practices[41]; those guidelines have been translated into several languages.

In addition, veterinarians can assess the quality of pet foods by posing questions to pet food company representatives. The following brief list of questions (yes or no answers), which are based on the aforementioned guidelines, can be used to obtain information that will assist in the assessment of the quality of pet foods:

- Do you have a veterinary nutritionist or equivalent on the staff of your company?
- Is a nutritionist from your company available for consultations or questions?
- Can your company provide a complete product nutrient profile for your products?
- Has your company conducted published, peer-reviewed nutritional studies on your products to advance the scientific knowledge about natural nutrition for pets?
- Does your company perform nutrient analysis on raw ingredients to ensure correct nutrient values and adjust for variability?
- Are shelf life studies performed on your products to ensure effective preservation and nutrient stability?
- Does your company own the manufacturing facilities that produce the pet food?
- If your company does not own the manufacturing facilities, are external quality management procedures in place to ensure quality and safety of ingredients and products?
- Does your company have a supplier quality-assurance program that evaluates and works with suppliers to optimize the quality of raw ingredients?
- Does your company have a quality management system that incorporates good manufacturing practices, hazard analysis critical control point standard, incident management program, traceability standards, and risk management for microbiological, physical, chemical, and nutritional contaminants?
- Have your manufacturing facilities received second-party conformity statements or third-party certifications for quality control and food safety procedures?
- Are finished products tested for salmonellae and negative results received before products are released for distribution?

Essential sources for answers to quality-related questions include a pet food company's website and technical support team. The technical support team usually can be contacted via a toll-free number listed on the product label or company website.

Clinical Summary

The natural pet food category is the fastest growing segment of the pet food industry. Consumers believe that natural pet foods are healthier alternatives for their pets; however, the perception of natural is often based on personal biases, experiences, or perceptions, rather than the regulatory definition of natural. Although more thorough scientific evidence is needed to support claims of health benefits for natural pet foods and ingredients, there are documented health and nutrition benefits to providing high-quality and safe pet food products. Practices of pet food manufacturers, such as maintaining comprehensive quality management systems, having nutritionists on staff, and testing finished products, contribute to the manufacture of high-quality, safe pet foods. An understanding of the regulatory definition of natural, pet owner perspectives of natural pet foods, ingredients used in natural pet foods, and conditions that impact the quality and safety of natural pet food products will help veterinarians best advise their clients. Technical knowledge about the natural pet food concept will help veterinarians provide pet owners with answers to their questions about safety, quality, and product performance for their pets.

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