Addressing Myths and Misperceptions about Pet Food
Clients need help from their veterinarian to understand the nutritional information and misinformation derived from the Internet and other sources.

Diamond Anniversary
The Purina Pet Care Center celebrates 75 years of pet nutrition research.

Featured Nutraceutical: Chromium
Sometimes referred to as the “glucose tolerance factor,” chromium is a ubiquitous nutrient. Are dietary chromium supplements helpful?

What Determines Protein Digestibility?
Protein and amino acid bioavailability from soy and egg are similar, but rendering can alter the digestibility of protein from animal sources.
Addressing Clients’ Questions about Pet Nutrition
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Clients have long depended on their veterinarian to provide sound nutritional advice. In addition, pet owners are reading and hearing much about pet nutrition from sources such as Internet chat rooms and a wide variety of Web sites. The sheer volume of often conflicting information can be overwhelming. So these pet owners may turn to their trusted source of information, their veterinarian, for help in sorting out myths from reality. This article addresses some of these myths and facts to help you answer your clients’ questions.

**MYTH:** Meat and bone meal, poultry by-product meal and other rendered meals consist of indigestible or undesirable animal parts such as feathers, hooves and fecal matter and provide poor quality nutrition.

**FACT:** According to regulatory guidelines, by-products consist of various parts of the bird or animal, but specifically exclude feathers, hair, hide, hooves, manure and stomach contents. It may include such things as heart, lungs or other organs, meat trimmings and other tissues. While many organs or by-products are used in pet foods in the United States, these same tissues may be considereddelicious for human consumption in other cultures. The nutritional quality of meat meals and poultry meals can be highly variable, yet these meals can provide excellent sources of protein and essential amino acids. Rendering conditions, as well as the raw materials used, can greatly influence the quality of the protein meals produced. Therefore specific suppliers generally are secured so that the consistent quality of the ingredients can be assured. For example, Ralston Purina uses only beef and bone meal rendered from USDA inspected cattle, and numerous quality control measures are in place. By law, tissues from animals other than cattle cannot be included in beef and bone meal. Likewise, only poultry tissues are used to make poultry by-product meal. To determine if a particular product uses good quality by-product meals, veterinarians can contact the manufacturer to ask about the digestibility of protein in that product.

**MYTH:** Commercial pet foods lack enzymes necessary for normal digestive function.

**FACT:** The cooking process that pet foods undergo, whether extrusion, retorting or baking, renders most enzymes present in food ingredients inactive. However, these enzymes are not necessary for normal digestive function. Animals make and secrete their own digestive enzymes, such as those produced by the stomach, pancreas and intestinal cells. In addition, some enzymes in natural foods can destroy nutrients or make them unavailable. For example, raw soybeans contain an antitypsin enzyme that interferes with protein digestion. Some raw fish contain thiaminase, an enzyme that destroys the B-vitamin, thiamin. These enzymes are destroyed by extrusion or heat treatment, protecting the nutritional quality of foods.

**MYTH:** “Grains used in cat and dog foods are of very poor quality, have no nutritional value and are used as ‘fillers.’”

**FACT:** “Fillers” may be defined as feed ingredients with little or no nutritional value. Based on this definition, grains would certainly not be considered “fillers.” When properly processed, the corn, rice, wheat and other grains commonly used in pet foods provide highly digestible sources of carbohydrates for energy, plus essential fatty acids, protein and essential amino acids, and other nutrients. Fatty acids provided by grains are predominantly polyunsaturated for the Veterinarian.

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**Rendering conditions, as well as the raw materials used, can greatly influence the quality of protein.**

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**Purina Pet Care Center Celebrates 75 Years**

The Purina Pet Care Center in Gray Summit, Mo., celebrates an important milestone this year — turning 75 years old.

The 337-acre facility has much the same mission today as when it opened in 1926 as Purina Kennels. Inspired by the vision of Ralston Purina founder William Danforth, the Purina Pet Care Center was designed to provide an important role in understanding the nutritional needs of pets and testing the nutritional efficacy of feline and canine diets.

Long before many nutrients had even been identified, Purina scientists and their canine associates helped define many of the nutrients needed by dogs in various life stages. Nutritional studies with cats began later, in the 1950s.

Significant advances in technology have contributed to new learning about canine and feline nutrition. Today, at the Pet Care Center’s Nutrition Technology Center and other Purina Research laboratories, advanced technologies such as dual energy X-ray absorptiometry (DEXA), echocardiography and ultrasonography, cell culture, flow cytometry and molecular nutrition are used to provide detailed information. These scientific technologies provide insights about how nutrients affect canine and feline health and well-being, allowing the development of ever-improving pet foods.

Besides serving as the backdrop for Purina’s nutritional research, the Purina Pet Care Center focuses on providing a nurturing environment for the dogs and cats that live there. Daily interactions with humans and other pets help to socialize animals and prepare them for adoption into homes. Many kittens and puppies, even older animals, are adopted out to local families or to Purina associates through programs such as Purina Purrsonalties for cats and Homeward Hound for dogs. Potential families are carefully screened by an adoption committee, and all animals are either spayed or neutered and microchipped for easy identification.

Congratulations to the Purina Pet Care Center for an historical first 75 years.
FACT: Allergies and other diseases.

MYTH: Allergies are caused by food.

FACT: It is true that cats require some nutrients naturally found predominantly in animal tissues. Some examples of these are arachidonic acid, taurine and preformed vitamin A. Because of this, cats cannot thrive on completely vegetarian diets unless those diets include synthetic sources of these animal-derived nutrients. However, cats are easily capable of using proteins, carbohydrates and other nutrients from grains and other plant sources. Cats can digest carbohydrates from grains with over 90% efficiency when they are properly processed and included in a complete and balanced food.

MYTH: “Since cats are true carnivores, they cannot tolerate a grain-based diet.”

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MYTH: “Commercial pet foods cause food allergies.”

FACT: While there is adequate support to recognize that breeds of dogs can differ in their energy needs and minimum nutrient requirements, the above myth is an overinterpretation of these differences. Dogs’ digestive systems allow them to adapt to a wide range of diets and ingredients with no problems, especially those products formulated to provide optimal nutrient levels rather than minimum nutrient levels.

Minimum nutrient requirements as a percent of diet can be influenced by the energy density of the diet, the energy intake of the animal, nutrient interactions within the food, bioavailability of the nutrient and individual dog differences in energy metabolism, age, activity, body condition, general health, environment and physiology. In order to compensate for such influences, most pet food companies develop formulas that provide suitable safety margins for each nutrient, both in terms of avoiding deficiencies and excesses.

An understanding of individual dog and breed differences is critical to providing the optimal level of diet that will meet the needs of each individual dog. Overfeeding or underfeeding diets may result in unbalanced nutrition and other health issues for pets. For example, some cell culture studies have shown that avoidance of food restriction appears to increase the risk of bloat in dogs. This study has shown that avoidance of food restriction decreases the risk of bloat in dogs. This study has shown that avoidance of food restriction decreases the risk of bloat in dogs. This study has shown that avoidance of food restriction decreases the risk of bloat in dogs. This study has shown that avoidance of food restriction decreases the risk of bloat in dogs.
temperament, with “high-strung,” easily excited dogs at greater risk.14 Dogs that eat or drink rapidly may have an increased risk for developing bloat. Dividing the daily food allotment into 2 or more meals appears to reduce risk, as does avoidance of stress.15

**MYTH:** “BARF (Bones and Raw Food) diets more closely match dogs’ natural diet and provide better nutrition compared to commercial pet foods.”

**FACT:** BARF is not a specific diet. Instead it is a concept based on feeding a variety of raw, meaty bones plus raw vegetables and nutritional supplements. A scan of BARF sites on the World Wide Web suggests that this concept is put into practice in various ways. Certainly, it is possible for bones and raw food to be the core of a complete and balanced diet. However, there is no evidence that it can provide better nutrition than the complete and balanced nutrition provided by quality commercial pet foods. On the contrary, the likelihood for nutritional deficiencies or imbalances is increased since pet owners are left to balance their pets’ diets with little nutritional guidance. In addition, since the bones and raw food diet is based on feeding raw bones to cats, the risk for injury from bones is increased. Raw bones are said to be less likely to splinter, compared to cooked bones.14 However, intestinal obstructions and perforations can occur in animals fed raw bones. Other important risks include transmission of bacteria such as E. coli, Listeria and Salmonella, and parasites such as Echinococcus.

**References**


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**What are “High-Quality” Ingredients?**

The nutritional quality of pet foods depends heavily on the selection of ingredients used. Are there differences in protein quality? Are animal proteins really better than vegetable proteins? Research completed at the University of Illinois evaluated digestibility of many different protein sources incorporated into complete dog foods. The chart (right) shows that the ideal digestibility of the essential amino acids from animal sources, soy or egg are similar but that rendering can reduce the pet protein quality of animal source proteins. Other research by this group showed that amino acids in rendered meats can vary from high to poor digestibility.

**References**


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**Featured Neutraceutical: Chromium (Cr)**

While there is no legal definition for the term “neutraceutical,” it generally is accepted to represent a dietary supplement, food or food ingredient used to treat or prevent disease, promote health, or to enhance a structural or functional aspect of the body. Neutraceuticals and nutritional and herbal supplements have grown in popularity in recent years. Consumers are increasingly aware of these compounds and may use them for their pets as well as themselves. Therefore, it is important that the practicing veterinarian become familiar with these compounds. Toward that end, a new feature of this publication will be a section designed to provide information on various neutraceutical compounds.

**Name of compound: Chromium (Cr)**

**Sources:** Natural sources include brewers yeast, grains, meats and mushrooms. Supplements include chromium chloride, chromium picolinate and chromium nicotinate.

**Reported Functions:** Promotes normal glucose tolerance; promotes lean body mass; enhances weight loss.

**Support:** Glucose metabolism. The role of Cr in glucose metabolism was first described in 1959. While the specific mechanism by which Cr functions by increasing insulin sensitivity, 1,2 Glucose tolerance in human hyperglycemic subjects worsened when consuming low-calorie diets and improved when Cr was supplemented at 200 ug/day.3 Results of Cr-supplementation studies in human diabetics have yielded mixed results.4 Studies in healthy dogs and cats have reported mixed results on glucose tolerance, with 2 out of 3 showing no benefit.5,6 Supplementation with up to 800 ug/day of Cr picolinate had no effect on glycemic control in diabetic dogs.7 No studies in diabetic cats have been published. However, Cr supplementation had no effect on glucose tolerance in normal cats nor on the compromised glucose tolerance response of obese cats.8

**Lean body mass:** Of 11 human studies summarized by Lukasik,9 5 showed no effect while others reported changes in fat free mass or percent body fat. Both increases and decreases in body weight were reported, depending on study design and confounding factors. The U.S. Federal Trade Commission ruled in July 1997 that there is no support for claims that Cr promotes weight loss and lean body fat in humans.10

**Weight loss:** Supplementation with 600 ug/day of niacin-bound Cr increased the loss of body fat in women during a moderate weight-reduction program involving calorie restriction plus exercise, while 400 ug/day had no effect in a different study.11 In dogs, 200 ppb Cr from Ca-picolinate did not enhance fat loss. Instead Cr-supplementation resulted in less weight loss and body fat compared to the control group.12

**General:** For most or all studies, supplemental Cr showed no beneficial effect when dietary Cr and other nutrients were adequate.13 Dietary Cr does interact with other nutrients. High sugar intake as well as high blood glucose (as in diabetes) both promote Cr loss, leading to increased Cr requirements in diabetic patients.14 In addition, inadequate intake of the essential amino acid lysine may increase the need for Cr supplementation. Lean body mass was increased with Cr supplementation when lysine was limited, but such benefits were not observed when dietary lysine was adequate.15 Lysine is the amino acid most likely to be deficient in poor quality pet foods.

**Known Risks:** Inorganic Cr, such as found naturally and in commercially available supplements, is generally safe with a wide safety margin.16,17 Hexavalent Cr is toxic. One report indicated that Cr picolinate at extremely high doses induced chromosomal damage in Chinese hamster ovary cells in an in vitro assay.18 In addition, individual cases of human toxicity to Cr picolinate at doses of 200, 400, 600 and 2,400 ug/day have been reported.19 Other potential adverse effects may occur due to the interaction between Cr and iron, which share a common transport protein. Both Cr and picolinate can disrupt iron metabolism and may lead to increased liver iron accumulation.20 The recommended intake of Cr for humans is 3 ug/kg body weight/day,21 but requirements for cats and dogs have not been established.

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