COMPANION ANIMALS: **COMPANION ANIMALS AND SUSTAINABILITY: TODAY'S IMPACT ON THE FUTURE**

0188 Nutritional sustainability of pet foods.

R. A. Carter*[1], P. R. Buff[1], K. S. Swanson[2], T. P. Yount[1], and J. H. Kersey[1], [1]*The Nutro Company, Franklin, TN,* [2]*Department of Animal Sciences, University of Illinois, Urbana.*

The ability to provide adequate, safe nutrition is a critical component of a food system's sustainability. Nutritional sustainability is the ability of a food system to provide sufficient energy and the amounts of essential nutrients required to maintain good health of the population without compromising the ability of future generations to meet their nutritional needs. The intention of nutritional sustainability is to advance health and nutrition in parallel to advances in food system sustainability. Nutritional sustainability can be influenced by several factors, including ingredient selection, nutrient composition, digestibility, and consumption rates of diets. The pet food system is unique in regard to sustainability because it is based largely on secondary products and tightly interlinked with livestock production and the human food system. Secondary products of the human food system vary widely in their quality and food safety. The concept of nutritional sustainability calls for the evaluation of these ingredients from a nutritional perspective, and to use ingredients with the appropriate quality and food safety to support pet health. The use of secondary products also introduces challenges to the assessment of the environmental impact of a diet. Consequently, the principles used for human food system sustainability in regard to ingredient selection or dietary nutrient composition may not directly apply to the pet food system. An additional uniqueness of the pet food system is the influence of anthropomorphism on pet owner preferences for specific pet food products. Promoting more sustainable practices from an environmental perspective may not have the greatest overall impact on sustainability because of varying penetration into the marketplace. Therefore, it is critical to balance consumer expectations and pet health considerations in advancing sustainability initiatives. The complexities of pet owner preferences introduce challenges with ingredient selection and dietary nutrient composition, given the increasing preference for ingredients that compete with the human food chain and diets that contain high concentrations of protein and animal-based products. Additionally, as the prevalence of human obesity increases, so does the prevalence of pet obesity, along with the impacts on pet health and food wastage associated with food overconsumption. Companion animals play an important role in our lives, providing a positive impact on the emotional and physical health of people with whom they have contact. Advancing the sustainability of the pet food system through nutritional sustainability is a key enabler to maintaining responsible pet ownership in the future.

Key Words: companion animal, nutrition, pet food, sustainability

0189 How sustainability influences ingredient sourcing, quality, and safety.

D. L. Meeker*, *National Renderers Association, Alexandria, VA*.

The rendering industry collects and safely processes approximately 50 billion pounds of animal byproducts each year in the U.S. Rendering plants process a variety of raw materials from animal agriculture, principally offal from slaughterhouses, but including whole animals that die on farms or in transit and other materials such as bone, feathers, and blood. By recycling these byproducts into various protein, fat and mineral products, including meat and bone meal, hydrolyzed feather meal, blood meal, and various types of animal fats and greases, the sustainability of animal agriculture is greatly enhanced. The rendering industry is conscious of its role in the prevention of disease and microbiological control while providing safe feed ingredients for livestock, poultry, aquaculture, and pets. A HACCP-based Code of Practice is followed to ensure that cooking destroys microbes, and that recontamination does not occur after the rendering process. Recently published FDA animal feed safety regulations follow the same hazard analysis and prevention concepts renderers have used for many years. The processing of otherwise low value organic matter from the livestock production and meat processing industries through rendering drastically reduces the amount of waste. If not rendered, biological materials would be deposited in landfills, burned, buried, or inappropriately dumped with large amounts of carbon dioxide, ammonia, and other compounds polluting air and water. When rendered, these products are dried, stabilized, and recycled for animal feed, energy, fertilizer, and other uses. Even though cooking these high moisture materials is an energy intensive process, for each metric ton of CO_2 produced (scope 1 emissions) by operating rendering plants, 5.68 metric tons of CO_2 are removed from the environment. The majority of rendered protein products are used as animal feed. Rendered products are especially valuable to the livestock and pet food industries because of their high protein content, digestible amino acid levels (especially lysine), mineral availability (especially calcium and phosphorous), and relatively low cost in relation to their nutrient value. Rendering facilities produce many species specific meals as well as mixed species meals, and often meet special specifications required by pet food manufacturers by devoting individual plants or processing lines to certain products. The use of these reclaimed and recycled materials in pet food is a much more sustainable model than using human grade food for pets.

Key Words: rendering, sustainability, ingredients, byproducts

0190 Sustainability of non-traditional companion animals. G. Ballam*, *Purina Animal Nutrition, St Louis, MO.*

In the next 10 yr, the changing demographics within the United States will play an important role in the diversity of food selection and agricultural practices. In addition consumer attitudes will continue to demand products that are locally grown, fresh, safe and sustainable. Changes in attitudes and purchasing behaviors over the last 10 yr are reflected in the emergence of retailers and Farmer's Markets providing a greater variety of natural and sustainable foods. The change in purchasing behavior provides an opportunity for small producers to provide sustainable and non-conventional sources of food such as specialty eggs, meats and fish, free-range or pasture-raised chickens, and artisanal cheese from goats and sheep. The entrepreneurial spirit of sustainability is not limited to food production. There is rising interest in using nutrition to increase pond and lake productivity and sustainability to meet the needs of the recreational sport fisherman. Agricultural professionals have the opportunity to provide information on nutrition, health, and management to help these enterprises develop innovative products, meet the challenges of their industry and affect their sustainability.

Key Words: non-traditional, sustainable, companion

0191 Sustainable ecosystems: Free-ranging cats and their effect on wildlife populations. S. E. Kitts-Morgan*, E. I. Parsons, and K. A. Hilburn, *Berry College, Mount Berry, GA*

Feral and domestic cats are estimated to kill billions of small mammals and birds each year. In certain areas of the world, it is not uncommon for either feral or domestic cats to have high population densities, creating concern regarding their level of hunting. Interest centers on free-ranging cats, as they roam freely and receive care and food from humans. Arguments abound regarding the presence of cats in the habitats of native small mammals and birds, and whether or not local ecosystems can sustain this predator-prey relationship. Studies have attempted to determine the effects of cats on local wildlife populations using various methods. Some research has focused on determining the home range of free-ranging cats using either radio telemetry techniques or the Global Positioning System (GPS). Because home-range size differs for each cat, we can estimate the size of an area where potential damage on local wildlife might occur. Another technique used to determine the effects of cats on wildlife includes evaluating feline scat for prey items. This is a valuable tool, as prey teeth can usually be used to identify the genus and sometimes species of the prey. Unfortunately, it is impossible to accomplish complete collections of all scat from each cat, as they usually eliminate in multiple latrine areas within their home range. Incomplete scat collections increase the difficulty of estimating the true kill rate of prey by free-ranging cats. However, scat analysis has allowed us to determine that cats receiving cat food from humans continue to hunt and at least partially consume prey. Furthermore, the prey species identified in the scat often represent native species killed and consumed by the cats. Lastly, live animal trapping is another technique that may be used to estimate the population of small mammals in an area where cats are known to reside and hunt. Along with determination of home-range size and feline scat analyses, trapping provides another tool to help estimate the effect of free-ranging cats on native wildlife populations. Free-ranging cats certainly have the potential to roam and hunt in very large areas inhabited by native small mammals and birds. It remains questionable as to whether or not local ecosystems can sustain hunting by free-ranging cats.

Key Words: cats, wildlife, hunting

0192 Future aspects and perceptions of companion animal nutrition and sustainability. K. S. Swanson*, *Department of Animal Sciences, University of Illinois, Urbana.*

With an increasing world human population and resources becoming scarce, sustainable practices are of utmost importance. The world pet population also continues to grow. Because pet foods are based largely on secondary products from the human food system and often compete with the human food and livestock feed industries for ingredients, sustainability is also an important issue for the pet food industry. Land, water, air, and waste management, species biodiversity, and energy use are key issues to consider. Although the environmental impact of an ingredient or food usually receives the most attention, one cannot ignore the social and economic factors involved, especially when it comes to pet foods. The anthropomorphism of pet dogs and cats greatly impacts the expectations and purchases of consumers and marketing strategies and products sold by pet food companies. Pet owner preferences introduce challenges in regard to ingredient selection and dietary nutrient composition, with increasing preference for ingredients that compete with the human food chain, including many high-protein, animal-based products. Research focused on pet food sustainability is seriously needed in the future. The carbon- or water-footprint comparisons of animal- vs. plant-based ingredients for human foods have received a lot of attention. However, not only are the published footprint values hotly contested, but they are only applicable to human-grade ingredients. To date, nobody has provided insight as to the footprint of secondary products, an issue that needs to be addressed to provide accurate calculations for pet foods. Further research is also needed to compare farm-raised vs. wild-caught fish, livestock raised under conventional vs. free-range systems, and ingredient processing, packaging, storage, and handling

practices, and to search for acceptable alternative protein sources. Finally, even if an ingredient source is available for use, its nutritional quality, safety, price, and marketability must also be considered. Although many challenges exist, a coordinated effort across the industry, including ingredient buyers, formulators, and nutritionists may result in a more sustainable pet food system.

Key Words: pet food, canine, feline