THE TRUE SCIENCE BEHIND RAW FEEDING

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INTRODUCTION

In this era of evidence-based medicine, a criticism that is often levelled at feeding a raw, species-appropriate, prey-based diet to pets, is that there is a lack of scientific research to support the practice. The purpose of this document is to highlight the research that supports feeding pets their evolutionary diet. The research covers three important aspects of feeding a raw prey based diet:

- The nutrient content of raw food.
- The non-nutritive aspects of raw food (including dental health and behavioural enrichment).
- Food safety issues or raw-feeding (for human and pet health).

It is imperative that we define the nutrient profiles of cats and dogs based on current evidence, but we should look further than just nutrient profiles and include the non-nutritive aspects of food. Finally, the evidence available must support the safety of a raw food diet for pets and their owners.

DEFINING NUTRIENT PROFILES

Outlined below is a brief history of the challenges in defining nutrient profiles for cats and dogs. The National Research Council (NRC) of the United States National Academy of Science, and the Association of American Feed Control Officials (AAFCO) are the two most influential bodies when it comes to feeding domestic cats and dogs.**1**

Since the 1940's, the NRC have released reports on the nutrient requirements of cats and dogs, based on available literature and research. The reports have been updated as new research has come to light. The NRC receives no direct funding for the reports, and is dependent on sponsorship to fund the reports.**1**

AAFCO was formed in 1909 to establish a framework for uniform regulation of the feed industry. Although not a government agency, it operates within the guidelines of federal and state legislation, including laws administered by the Food and Drug Administration (FDA) and the United States Department of Agriculture (USDA).**1**

While companion animals are the ultimate beneficiary of the NRC guidelines, the pet food industry is the key user of the reports. There is currently a very legitimate and real concern about how to maintain the high standard and objectivity of the NRC guidelines in the face of the potential tensions of the pet food industry.

The NRC guidelines assume that availability and digestibility of nutrients is uncompromised.**1** Unfortunately, due to the nature of the raw materials used in the commercial production of pet food, this assumption does not hold true. As a result, pet food manufacturers concluded that the NRC recommendations could not be used in a manufacturing environment.**1**

To resolve this, in the early 1990's, AAFCO formed the Canine and Feline Nutrition Expert Subcommittees. These subcommittees comprised representatives from the pet food industry and academia, and were chaired by a representative of the FDA.**1** They provided industry, and industry regulators, with a vehicle for translating the NRC recommendations into a set of practical guidelines which better suited the pet food industry. These guidelines made life easier for the manufacturer. AAFCO has accepted some of the NRC's recommendations, but certainly not all. These guidelines have not been reviewed since the 1990's.**1**

In 2006 the NRC published an update of recommendations for cats and dogs.**1** The 2006 document represents a substantial improvement from previous guidelines but has become an expensive document to produce; severely limiting its outreach. It would certainly appear that AAFCO have not taken note of the most recent nutritional research.

To summarise, AAFCO provides some basic nutritional guidelines; a rough framework to build upon. The guidelines are very much concerned with the practicalities of making pet food from a vast array of low quality ingredients. They are minimum requirements, not optimal requirements. AAFCO acknowledge the NRC guidelines, but do not uphold them. In the words of Quinton Rogers (DVM, PhD), one of the AAFCO panel experts:

"although the AAFCO profiles are better than nothing, they provide false securities. I don't know of any studies showing their adequacies or inadequacies." **1**

Based on available nutritional science, it is best to take the AAFCO profiles as a starting point. These profiles are well-established minimal nutritional requirements of cats and dogs. Meeting a minimum requirement is important for the pet food industry. However, optimising our pets' nutrition is essential for improving their health and wellbeing.

THE NUTRITIVE AND NON-NUTRITIVE ASPECTS OF FOOD

We feel it is important to recognise food as not only having a nutrient profile, but also as having a form and function appropriate to the species being fed. The literature contains numerous references to the food habits of feral carnivores and therefore the appropriate nutrient profile is readily available.**2** It is important to meet a minimum nutrient profile using species-appropriate food - minimally processed and fed in a physical form that meets a pet's behavioural, needs and enriches their lives.

We are concerned with the nutritive and non-nutritive aspects of an evolutionary diet of whole prey for cats and dogs. Our recommended raw feeding regimes are based on the following research.

Ellen Dierenfield's report**4** on the nutrient composition of whole vertebrate prey shows that a whole prey diet is more than adequate to meet the needs of our carnivorous pets. The report discusses the nutrient composition of prey species, focussing on the differences in composition of particular prey species, with age, and sex and nutrient intake of the prey species itself. The report confirms that whole prey, as long as the soft tissues and some bones are consumed, meet all the nutrient requirements of carnivores, and at the same time enhance and positively influence behaviour.**4**

The report covers water, protein, fat, ash, fat soluble vitamins, macro-minerals and trace minerals, and suggests that the diet consumed by the prey species should be carefully assessed with respect to

nutrient content, interactions and persistence in tissues. The value of the prey species is dependent on what the prey species consumes. Wild sourced prey are likely to be more nutrient dense than farmed prey.**4** Based upon current research the study concludes that supplementation of whole prey-based diets appears unwarranted.**4**

It is also important that we recognise the impact of diet on the psychology and dental health of all of our pets. In the words of veterinarian Dr Jon Lumley:

"you do not need a degree in nutrition to evaluate the effects of raw bones on a dog's dentition – in fact, it appears that the qualification would be a serious disadvantage!" **3**

Improved appetites, longer periods spent feeding and greater possessiveness of food were noted in captive cheetahs fed a carcass based diet.**5** The study notes that processed foods lack the 'hassle factor' and as a result of eating them animals suffer tooth decay, dental pathologies, muscle atrophy and poor health.**5** The study references Fagan's 1980 presentation to the American Association of Zoo Vets **6** where the 'hassle factor' is defined. Dr Fagan, Zoo Veterinary Dental Consultant, states:

"it is possible to do something immediately and significantly to minimise oral problems in (captive exotic) carnivores. That 'something' is to re-evaluate their diet. Animals need more 'hassle factor' per mouthful of nutrients. The best kept secret of the last fifty years is that we must eliminate the pre-processed, the overcooked, the smashed, the blended and the pureed foods and feed our animals a more appropriate diet, duplicating the feeding habits of feral conditions." **6**

For the last eighty years we have ignored the literature with respect to oral disease in our pet carnivores.

The study concludes that a more natural diet (for example carcasses) better meets the psychological as well as nutritional needs, by taking into account diet consistency, texture, temperature, palatability and variability.**5** Non-nutritive factors should be considered when feeding carnivores. Consumption of whole prey provides for a relatively high intake of raw animal derived fermentative substances which may enhance gut health, stimulate growth of microbial commensals and optimise immune function in a very different way from heat treated, largely plant derived processed foods.**7**

Recent studies have shown that changes in the macronutrient content of the diet alters faecal microbial populations in the domestic cat.**8** Cats have evolved as strict carnivores with little or no carbohydrate in their diet. Dry processed diets, with low protein to carbohydrate ratio have been linked to obesity in cats. Emerging evidence suggest that microbiota are critical to the development of obesity**8,9** and shifts in the faecal microbiota may be as a result of an increased carbohydrate load entering the large intestine due to the low protein:carbohydrate ratio in the dry diets.**9** Emerging science continues to support the importance of the evolutionary diet of the domestic cat.

FOOD SAFETY ISSUES

An increasingly global and complex pet food supply chain further complicates the already substantial challenge of assuring pet food safety. This is a shared concern applying to commercially prepared pet foods, raw food diets and home prepared diets.**10** As increasing numbers of consumers rely on commercially produced pet foods, the potential impacts of hazards associated with the manufacture,

distribution and use of pet foods is amplified. Common sourcing of ingredients (from a global supply chain) and increased size of production lots lead to escalating problems. Documented problems include: chemical contaminants in food (melamine and cyanuric acid), high levels of aflatoxins due to improper sourcing of ingredients, botulism in improperly canned dog food, and several recent bouts of salmonellosis directly linked to contamination of dry pet foods and pet treats. Microbiological issues are often traced back to the use of contaminated raw materials, typically grains such as peanut flour. Managing Salmonella in the production of dry pet food can be very challenging, as many of the raw materials are naturally contaminated.

The most prevalent argument against raw feeding is to do with food safety as it pertains to both humans and pets. Earlier this year the American Veterinary Medical Association (AVMA) released a statement regarding raw-feeding.**11** They referenced several studies which suggested that raw protein sources may be contaminated with pathogenic organisms, and that pets may develop clinical illness from these organisms. They also stated that cats and dogs with either clinical illness, or subclinical infection are a health risk to other animals and humans. They concluded with a recommendation to (in the interests of public health) avoid feeding raw food (inadequately treated animal-source protein) to cats and dogs.

Certainly food safety must be considered as a potential hazard when dealing with raw animal protein, and given the numbers of pet owners feeding their cats and dogs raw food the Veterinary profession would be wise to establish guidelines to educate owners about harm reduction. Instead, the AVMA released a blanket statement advising against any kind of raw feeding. This is unhelpful to a large number of pet owners, and only serves to marginalise them.

Upon examining the references on which the statement is based, one could be forgiven for feeling somewhat confused as to what the AVMA believes constitutes evidence-based policy. Many of the conclusions drawn were only very loosely based on study results, if at all.

The AVMA have been questioned about their motivations for this policy when there is currently a relatively much greater problem regarding contamination of processed foods, and the known incidences of human illness caused by these foods (*"raw pet foods comprise approximately less than 1% of the pet food market"* **12**). Dr David M. Chico, chair of the AVMA Council on Public Health and Regulatory Veterinary Medicine, acknowledged that there are concerns regarding commercial processed foods. The reason he gave for addressing raw food rather than processed were that "*the council had simply dealt first with issues connected with raw meats.*" **12**

CONCLUSION

A thorough search of the literature reveals the depth of nutritional information available to us as veterinarians. The literature shows the importance of a minimal nutrient profile being a starting point for the selection of an optimal diet for domestic pets, and confirms the importance of the diet being presented in a physical and functional form that meets the physiological and psychological needs of our companion animals. Food safety is confirmed as an issue affecting the global supply chain of pet food and an issue which must be addressed by all pet food manufacturers. In this era of evidence-based medicine, the current and emerging science supports the feeding of a raw prey-based, species-appropriate diet, to domesticated carnivores for optimal health and wellbeing.

References

(1) Butterwick, R.F., Erdman Jr., J. W., Hill, R. C., Lewis, A. J., & Whittemore, C. T. (2011). Challenges in developing nutrient guidelines for companion animals. British Journal of Nutrition. 106, S24-S31. doi:doi:10.1017/S000711451100184X

(2) Landry, S. M. (1979) Food habits of feral carnivores: A review of stomach content analysis. Journal of American Animal Hospital Association. 15:6, P. 775-782

(3) Lumley, J. (1993, August). Raw meaty bones: Cats and dogs. Control and Therapy Series, Series 25, 3406, 556. Retrieved from http://www.cve.edu.au/elibrary/article/3579

(4) Dierenfeld, E. S., Alcorn, H. L., & Jacobsen, K. L. (2002). Nutrient composition of whole vertebrate prey (excluding fish) fed in zoos. Published by: U.S. Dept. of Agriculture, Agricultural Research Service, National Agricultural Library, Animal Welfare Retrieved from purl.access.gpo.gov/GPO/LPS80845

(5) Bond, C.J., & Lindburg, D.G. (1990) Carcass feeding of captive cheetahs(Acinonyx jubatus): the effects of a naturalistic feeding program on oral health and psychological well-being. Applied Animal Behaviour Science, 26, 373-382.

(6) Fagan, D.A. (1980) Diet consistency and periodontal disease in exotic carnivores. Proceedings of the Conference of the American Association of Zoo Veterinarians, Washington, DC, 34-37. Retrieved from http://www.colyerinstitute.org/pdf/diet.pdf

(7) Plantinga, E. A., Bosch, G., & Hendriks, W. H. (2011). Estimation of the dietary nutrient profile of free-roaming feral cats: possible implications for nutrition of domestic cats. British Journal of Nutrition, 106, S35-S48. doi:10.1017/S0007114511002285

(8) Bermingham, E. N., Kittelmann, S., Henderson, G., Young, W., Roy, N.C., & Thomas, D.G. (2011). Five-week dietary exposure to dry diets alters the faecal bacterial populations in the domestic cat (Felis catus). British Journal of Nutrition, 106, S49-S52. doi:10.1017/S0007114511000572

(9) The Economist (2012, August 18). The human microbiome - Me, myself, us - Looking at human beings as ecosystems that contain many collaborating and competing species could change the practice of medicine. The Economist, , 62-64. Retrieved from http://www.economist.com/node/21560523

(10) Buchanan, R.L., Baker, R.C., Charlton, A.J., Riviere, J.E., & Standaert, R. (2011). Pet food safety: a shared concern. British Journal of Nutrition, 106, S78-S84. doi:10.1017/S0007114511005034

(11) American Veterinary Medical Association (2012, July). Raw or Undercooked Animal-Source Protein in Cat and Dog Diets. Retrieved from https://www.avma.org/KB/Policies/Pages/Raw-or-Undercooked-Animal-Source-Protein-in-Cat-and-Dog-Diets.aspx

(12) American Veterinary Medical Association (2012, 28 August). Raw Pet Foods and the AVMA's Policy. Frequently Asked Questions About. Retrieved from https://www.avma.org/KB/Resources/FAQs/Pages/Raw-Pet-Foods-and-the-AVMA-Policy-FAQ.aspx

(13) American Veterinary Medical Association (2012, 15 September). Raw food policy draws debate. Journal of the American Veterinary Medical Association News. Retrieved from https://www.avma.org/News/JAVMANews/Pages/120915q.aspx