Dr. Adam Stern

Moisture analysis of canned dog food: how accurate is the label on the can?

Rationale: Food safety is of concern for all pet owners and trustworthy manufacturing of pet food is essential. The pet food market is projected to be a $30 billion industry in 2022. Since 2018, there have been at least 50 instances of food recalls of dog food, often concerning potential microbial contamination. In addition to microbial contamination, pet owners are concerned about product mislabeling, adulteration, and ingredient substitution.

Guaranteed analysis of crude protein (minimum), crude fat (minimum), crude fiber (maximum) and moisture (maximum) are required on pet food labels. A study reviewing the guaranteed analysis of pet foods submitted to food laboratories in 5 states observed that the guaranteed and measured concentrations of nutrients were significantly different. Since moisture content varies between products, iIn order to compare different pet foods using the guaranteed analysis (for example dry food vs. canned food), consumers must take these moisture differences into account and convert the nutrient guarantee to dry matter basis (DMB) using the following formula where "% Ingredient Value" is the nutrient that will be compared.

Since % moisture is central in determination of DMB, if the guaranteed value of moisture on the label is inaccurate then all calculations will be inaccurate. According to the Association of American Feed Control Officials Moisture Best Practices Working Group, there is "no official" moisture determination method for pet food, published studies have only included "two pet food samples" and "more data is needed on pet foods". Due to these facts, research pertaining to moisture in pet foods is essential.

Hypothesis/Objectives: The overall goal of this project is to analyze the moisture content of canned dog food and compare the results to the product labeling. *We hypothesize that the actual moisture content will be significantly different from the guaranteed moisture content. Additionally, as there are multiple methods available to measure moisture in food we will compare the methods used in this study to each other.* In AIM 1, we will evaluate the moisture content of canned dog food products and compare it to the product labeling. In AIM 2, we will compare the moisture analysis methodologies used to determine moisture to each other.

Study Design and Methods:

Products: To achieve our goal of determining the moisture content of canned dog food, we will process 20 different canned dog food products. For each product we will obtain a representative sample from 10 individual cans. In total 200 samples will be analyzed with 10 samples from each product. These products will be purchased from pet stores and online retailers. Moisture will be determined using three different loss-on-drying methods (drying oven, halogen moisture analyzer, and microwave moisture analyzer). Results will be compared to the product labeling and between the different methodologies.

Expected Results: We expect to determine whether or not significant differences in moisture content of canned dog food exist when all samples are analyzed using the same methodology. We expect that at least 50% of the products will have a moisture that is significantly different than the value listed on the product label. We expect the three different methodologies to provide similar results for moisture content for each product.

Potential Impact for Animal Health: Food safety and quality are extremely important for pet owners. Prospective evaluation of moisture content in canned dog food will provide insight to the accuracy of the product labeling and provide owners and veterinarians scientific information pertaining whether or not to support the modification of the moisture content listed on the label when calculating DBM. If modification of moisture content is required then this will allow for improved product comparison.