

## **The Digestibility of Nutrients from Pet Feed**

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**Abstract.** Many states follow the pet feed regulations of the Association of American Feed Control Officials (AAFCO). AAFCO includes officials from all states and federal government who are responsible for enforcing the laws regulating the production, labeling, distributions, and/or sale of animal feeds. Pet food manufacturers are required to include the method of substantiation that was used for the complete and balanced claim on the pet food label. If the statement that AAFCO feeding trial were conducted is included, this means that the food was adequately tested using AAFCO feeding trials with dogs and cats. If the statement claims that the food meets the AAFCO Nutrient profiles, this signifies that the food was formulated to meet the nutrient profile for the intended stage of life (adult maintenance or growth/reproduction). The aim of this paper is to highlight the true degree of digestibility of pet feed.

**Keywords:** nutrients, extruding process, vitamin loss, high temperature, high pressure, AAFCO.

### **Introduction.**

Many states follow the pet feed regulations of the Association of American Feed Control Officials (AAFCO). AAFCO includes officials from all states and federal government who are responsible for enforcing the laws regulating the production, labeling, distributions, and/or sale of animal feeds. Pet food manufacturers are required to include the method of substantiation that was used for the complete and balanced claim on the pet food label. If the statement that AAFCO feeding trial were conducted is included, this means that the food was adequately tested using AAFCO feeding trials with dogs and cats. If the statement claims that the food meets the AAFCO Nutrient profiles, this signifies that the food was formulated to meet the nutrient profile for the intended stage of life (adult maintenance or growth/reproduction).

### **Aims and objectives.**

The aim of this paper is to highlight the true degree of digestibility of pet feed.

The objectives include the knowledge of the principal factors that can negatively affect the digestibility and to observe principal modification during extrusion.

### **Materials and methods.**

For the present study the following materials were used: “ Canine and feline nutrition” - Linda P. Case, “Alimentary additives and interaction with food” - Maria Tofana, Association of American Feed Control Officials (AAFCO): Pet feed regulation. In AAFCO Official Publication, Atlanta, 2008, AAFCO, National Research council: *Nutrient requirements of dogs and cats*, Washington, DC, 2006, National Academy Press.

### **Results and discussion.**

The principal producers of pet feed are: Mars (30 %), Private label (22 %), Nestle (8%).

The industry of pet feed produce two types of feed: moist feed (cans) and dry feed (basic pet feed). The process used for obtaining pet feed is called extruding. The extruding process takes place at high temperatures (424 to 975 °C ) and pressure (30 to 700 Mpa). Because the extruder needs a consistent amount of starch and low moisture to work properly,

dry ingredients — such as rendered meat-and-bone-meal, poultry by-product meal, grains, and flours — predominate. In case of dry feed the feed is allowed to dry, and then is usually sprayed with fat, digests, or other compounds to make it more palatable. When it is cooled, it can be bagged.

True and apparent digestibility can only be measured through controlled feeding trials. The results of these trials provide digestibility coefficients for a food's dry matter (DM), crude protein, crude fat, and nitrogen extract free (NFE), which is a measure of the carbohydrate fraction in food. A series of early studies of commercial brands of dog foods reported average digestibility coefficients for crude protein, crude fat, and NFE of 81%, 85% and 79%.

Vitamins (fat and water soluble) are vital food ingredients for healthy living, required by the organism. These are present in most natural food in small quantities, but when we process food through thermal processing methods (especially extrusion) a reasonable amount of the present vitamins are lost. During extrusion, factors like barrel temperature, screw rpm, moisture of ingredients, die diameter, and throughput affect the retention of vitamins in food and feed. The vitamins most sensitive to the extrusion process are vitamin A and vitamin E from fat-soluble vitamins and vitamin C, B<sub>1</sub>, and folic acid from water-soluble vitamins. The other vitamins of the B group, such as B<sub>2</sub>, B<sub>6</sub>, B<sub>12</sub>, niacin, Ca-pantothenate, and biotin, are stable. Vitamin E itself or in its complex form is quite unstable during processing and even in storage of extruded food. Ascorbic acid directly added or coated with fat and then added to feed during extrusion is also very unstable. Vitamin A, C, D, and E are also sensitive to oxidation, so these vitamins have minimum retention during storage of extruded food.

#### **Conclusion:**

Although the cooking process kills bacteria in the ingredients, the final product can pick up more bacteria during the subsequent drying, coating, and packaging process. The vitamin losses are enormous because of high temperature and pressure.

#### **REFERENCES**

1. \*\*\* Association of American Feed Control Officials (AAFCO) ( 2008). Pet feed regulation. In AAFCO Official Publication, Atlanta, AAFCO.
2. \*\*\* Linda P. Case et al. (2011). “Canine and feline nutrition: a resource for companion animal professionals “, 3<sup>rd</sup> ed..
3. \*\*\* National Research council ( 2006). Nutrient requirements of dogs and cats, Washington, DC, National Academy Press.