



Increasing food intake of products

By: Dr George Collings

How do you ensure a pet will consume enough food to provide the nutrition it needs? It sounds simple – build a formula based upon a nutritional or product design, produce it well and the pet should consume it well. Is that true? I learned a long time ago that the best nutrition is meaningless if the dog or cat will not eat it.

As examples:

- You want to build a food for active dogs that need high levels of energy to maintain good body condition. However, there are limitations on how much energy (fat) can be absorbed into dry kibble due to process limitations.
- You want to build a food for overweight dogs or cats that require much lower levels of energy, but still need to ensure proper levels of other nutrients.
- You want to build a product for a specific health issue where the ingredients chosen are very specific, but are not very palatable. Compounding this issue, the pet is also given various drugs for their condition, which ultimately inhibits metabolic intake controls.

As an industry, we use the term palatability, which describes the comparison of one food to another but it does not describe food intake in a single bowl. With 150 to 200 registered breeds and hundreds of variations, building an acceptable and specific food for the variation in pet size, mouth structure, activity, life stage, atmospheric temperature, health status,

et cetera, creates challenges to ensure proper intake of nutrients. The rest of this article will focus on multiple product design considerations.

Product size

Ensuring that a Chihuahua consumes enough food is a different challenge than ensuring that a Great Dane consumes enough. It is clear that the size of the kibble is important so the pet actually chews up the food well to ensure good teeth cleaning. If the product is too large, the pet cannot eat it well, but if the product is too small, the pet could basically just swallow the food without any chewing.

How many kibble sizes are necessary? Many pet foods are made into two or three sizes to cover the weight range of 3 kg to well over 50 kg. Logically, it would seem that many more product sizes should be designed, but a pet food company would then have the challenge of turnover in the marketplace.

Product size can limit intake more in cats than dogs. If the food is too small, the cat will waste a lot of food, but if it is too large, the cat will not eat the product well.

Product shape

The shape of pet foods seems to be a very minor product challenge, but nothing changes intake of cat foods more. Building a cat food in the typical star shape will be much less palatable than a cat food made in a round disc.

Many cat foods use multiple shapes to attract the consumer, but some of the typical shapes have hard points. In general, cats do not like products with hard points as much as rounded products.

Product texture/structure

Nothing changes the texture more than the ingredients chosen in the formula. The texture of a pet food with corn or wheat is dramatically different than a pet food with tapioca or peas. With the humanization of pet foods, new ingredients are coming to the market – quickly creating new textures that do not always ensure food intake.

Extrusion of the different starch types does not yield the same structure and can limit absorption of the sprayed on fat or palatant. More porous structures are desirable to hold

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the fat, which improves intake and provides necessary calories. Some kibbles are more wood-like because of high cellulosic fibre added and break differently than porous products upon chewing. This can increase chewing time and reduce intake. Some kibbles are more brittle because the starch was not cooked properly and can result in a high level of fine material, which reduces intake.

One major limitation of intake in cats is surface texture. The grind size of the ingredients must be very small as cats are able to 'feel' the differences on their tongues, which then limit the intake of the food. I have sampled cat foods that are like sand paper to the tongue.

Texture can also increase chewing time of treats and chews, which might help teeth cleaning. If a dental chew is consumed too fast, the goal of dental cleaning is reduced. Some dental chews use a lot of glycerine and wheat gluten to form a unique structure, but if eaten too fast, could provide indigestible pieces in the dog.

Product coatings

It has long been known that the major drivers of intake are different for dogs and cats. Dogs like fat, sugar and meat flavours. Increasing fat on a dog food linearly will increase palatability and help ensure intake. Following the coating of fat with liquid and then dry liver or meat hydrolysates increases the acceptance and potential intake by the dog.

In contrast, cats are less attracted to fat addition although they will eat higher fat products. They will much prefer a dryer texture that high fat foods do not provide. Beyond the shape and size, the biggest driver of food intake with cats is the delivery of an acid note which can come from a limited number of liquid acids or the inclusion of specific, dry, mineral acids.

Product content

Some soft-moist foods are like candy to dogs because of the high level of sugars added to improve stability. In contrast, cats do not like sweet; so, as expected, soft-moist cat foods and treats are rejected by 30% to 40% of cats.

Injected meat into pet foods brings a lot of meat water and improved palatability, but not high quantities of meat protein. In contrast, meat meals that are dried bring more meat protein, but also bring a lot of bone ash. In general, as the ash in a food increases, a corresponding decline in digestibility occurs leading to larger stools, and more importantly there is the expected decrease in palatability.

Building products to maximize palatability is one goal, but building a product to ensure long-term intake is important. Clearly, there are multiple factors that must be considered in building the best products to help insure intake of nutrients. ■