Wet versus dry and other factors when choosing an optimum diet

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VETERINARIANS and owners are often unsure how to choose a pet food or to determine if the added cost of a more expensive food is worthwhile.

Veterinary surgeons are often asked by an owner “What is the best food to feed my pet?” There is no one best pet food or pet food company for all pets. A nutritional assessment is necessary to provide the best choice of food by considering age, breed, weight, body and muscle condition, and presence of disease. The World Small Animal Veterinary Association website (www.wsava.org) contains a guideline of how to do a nutritional assessment in the global nutrition committee’s nutrition toolkit.

The minimum standard for a pet food is that it is a complete and balanced diet that has adequate digestibility, is sufficiently palatable to be eaten in appropriate quantities, and is free from toxins. A complete food provides adequate amounts of all required nutrients. The term “balanced” is usually used in conjunction with “complete”, and means the food has all the nutrients present in the proper proportions.

Several requirement guidelines for the nutrients in pet food are available, including the Association of American Feed Control Officials (AAFCO), the National Research Council (NRC) and the

European Pet Food Federation (FEDIAF).

The more commonly used in Europe is, of course, the FEDIAF guidelines. In the UK, if a company chooses to belong to the Pet Food Manufacturers Association (PFMA; see www.PFMA.org.uk), they agreed to meet the FEDIAF nutrient guidelines.

If a label states a food is “complementary” or for “intermittent or supplemental use only”, it is not a complete food and should usually not be fed as the sole diet. This type of food may be acceptable if it is a veterinary therapeutic diet and is being used for a specific purpose (for example, dissolution of a specific type of urolithiasis), if it is being provided as a treat or in temporary use to stimulate an anorexic patient to eat (Figure 1) or possibly as part of an elimination diet to test for adverse reactions to food.

Pet food quality does not depend on the form or consistency of the food. There are high and low-quality canned foods and dry foods. The moisture content of canned foods varies from about 60 per cent to more than 87 per cent, with the rest of the food – the dry matter – containing all the non-water nutrients. The amount of water in dry foods is about three per cent to 11 per cent. Canned foods may contain gelling agents to solidify the food, and they often, but not necessarily, contain higher amounts of protein, phosphorus, sodium and fat than dry foods. In some foods the bits that appear to be meat chunks are actually extruded soy or wheat flour (textured vegetable protein) or combinations of meat, starch and gelling agents (Crane et al, 2010).

Dry foods may contain more carbohydrates than canned foods and are sometimes thought to increase the risk of a pet developing obesity because of this. It is more likely the pet will develop obesity due to free choice (eating all it wants) feeding, excessive treats and snacks, and insufficient exercise.

Canned foods are usually fed in meals, which can allow for more control of the food intake compared to free choice feeding. The water in canned foods also may (or may not, depending on the individual) decrease calorie intake.

Dry foods are often perceived as providing a benefit for dental health and, while in some cases they can decrease calculus (tartar), other than the dental diets designed to decrease plaque, they do not usually decrease periodontitis (Logan et al, 2010).

The choice of dry or canned forms of food is usually made due to owner preference and possibly cost, unless the animal has a requirement for higher fluid intake (such as a cat with chronic kidney disease or a pet with urolithiasis).

A cat on dry food plus free choice water will consume less total moisture than a cat on canned food plus free choice water – especially an older cat. Dogs will usually drink enough to make up the difference in the moisture content of the food. Owners may enjoy the convenience of feeding a dry

food free choice, especially for cats, which prefer to consume frequent small meals. If the pet is not prone to obesity this is a satisfactory way to feed (Figure 2). Many animals find canned foods more palatable, although some cats (and very rarely dogs) can become “dry food addicts” and refuse to eat canned foods. Because of this, many nutritionists recommend feeding kittens a combination of dry and canned foods when possible in case the cat requires a specific diet later in life.

There is a common perception that feeding dry food to cats increases the risk of diabetes mellitus due to the higher carbohydrate content. Cats are obligate carnivores and are less efficient than some other mammals at metabolising large amounts of dietary carbohydrates (Buffington, 2008). In one study on macronutrient selection the cats chose a low-carbohydrate diet, although cats are capable of digesting and absorbing carbohydrates (Hewson-Hughes et al, 2013). Overweight cats do show insulin resistance, especially when fed a very high-carbohydrate, low-protein diet (Hoenig et al, 2007), but the profile of the diet used in this trial is not consistent with most commercial cat foods. Carbohydrates, such as found in most dry cat foods, do not induce hyperglycaemia in healthy cats.

Different grains and the processing of the grains can also affect the blood glucose and insulin responses (Appleton et al, 2004; de Oliveira et al, 2008). Risk factors for type-two diabetes in cats have been reported to include indoor confinement, low physical activity, (Singerland et al, 2007) and neutering (Backus et al, 2007), but not the proportion of dry diet or high dietary carbohydrates.

Increased body fat (overweight or obese body condition) is more likely than the type of diet to induce a pre-diabetic condition (Backus et al, 2010). However, once a cat develops diabetes mellitus, feeding a high-protein, low-carbohydrate diet will increase the chance of remissions (no longer being dependent upon exogenous insulin).

Comparing the nutrients of dry versus canned foods using the pet food label can be challenging. Under the labelling laws of the European Union, the typical analysis on the label lists the percentages of protein, crude fibre, and fat (or oil) and the percentages of moisture if more than 14 per cent (Figure 3). The crude fibre analyses mostly include the less soluble fibres and do not necessarily reflect the total dietary fibre. The amount of water is not stated on dry foods, but can be estimated to be between seven per cent and 10 per cent. The procedures contain some inaccuracies, but are useful estimates and can be used for comparison of products (Burger and Thompson, 1994). Many pet food companies will provide more nutrient information about their diets either on their website, product book, or if directly queried.

The nutrient levels on the label are on an “as fed” basis, meaning they include the moisture. As pet foods may vary from about seven per cent to 80 per cent moisture this makes comparing them difficult. To calculate the amount of a food nutrient on a dry matter basis, the per cent moisture is subtracted from 100 to determine the amount of dry matter in the food. The “as fed” percentage of a nutrient is then divided by the dry matter to determine the percentage of the nutrient on a dry matter basis. This allows a more equitable method of comparing foods.

Another method of comparing the nutrient profile of different foods is on an energy basis. Since animals (should) eat to an appropriate amount of calories, if this isn't taken into account incorrect assumptions may be made about the intake of a nutrient. For example, with a high-calorie, low-protein food, it may be possible for the animal to have an insufficient intake of protein as the amount eaten may fulfil calorie needs, but not protein requirements.

To calculate nutrient concentrations on an energy basis, the kcal per kg of food should be known. This may be obtained by the manufacturer or estimated by calculation. The amount of grams of a nutrient per kg of food are determined and divided by the kcal per kg of food. This gives the amount of nutrient per kcal, and is often multiplied by 100 or 1,000 to give the amount per 100 kcal or 1,000 kcal. Energy containing macronutrients are also sometimes expressed as the percentage of calories that contribute to the food, for example, 35 per cent protein calories, 20 per cent fat calories and 45 per cent carbohydrate calories.

Owners may often also query the price of pet foods and ask if there is a difference in the quality of high and low-priced foods. The unit price or cost pet weight is one way of comparing foods, but may not take into consideration the actual value of nutrients. Another method of comparing foods is the cost per calorie or, probably easier for owners, the cost per day of feeding a food. Some of the differences in low-cost foods may be the quality of the ingredients and whether the diet is fixed formula (the same with every batch) or if the food is produced on a "least cost" basis. Least cost or a flexible formula means the ingredients may differ between batches, depending on the varying costs of ingredients, which is easily done with the labelling laws of the EU allowing for "meat and meat by-products" and similar as ingredient descriptions.

Many pets will do fine on varying ingredients; however, if there is a concern about a food-sensitive disorder, such as in many pets with diarrhoea, it is better to stay with a fixed formula diet.

It should be noted by-products can be high-quality ingredients, and the meat sources included may reflect cultural biases, for example, in some cultures, tripe or intestine is eaten by people and in others it would be a by-product. The cost may also reflect the quality of testing of the nutrient profile of the food, which can vary from only a computer analysis, chemical analysis, to lifelong feeding trials, depending on the company and the food.

Some owners feel they should avoid pet foods made by large pet food companies and prefer to support smaller or "boutique" companies. Foods made by either type of company may be high or low quality, but the larger companies often put more resources into research and development as well as quality control.

Considerations for choosing a food include the reputation of the company, if good feeding trials are performed, and if the company has strict quality control measures. The highest quality companies usually perform their own research and development and should be able to supply a nutrient complete analysis for their pet foods. Many of the companies have research showing benefits of

added ingredients, and this may have a role in the choice of diet (Kimberly et al, 2010).

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Figure 1. Providing a hospitalised dog with chicken and canned cat food is an unbalanced diet, but may be sufficient in the very short term for the purpose of initiating eating.

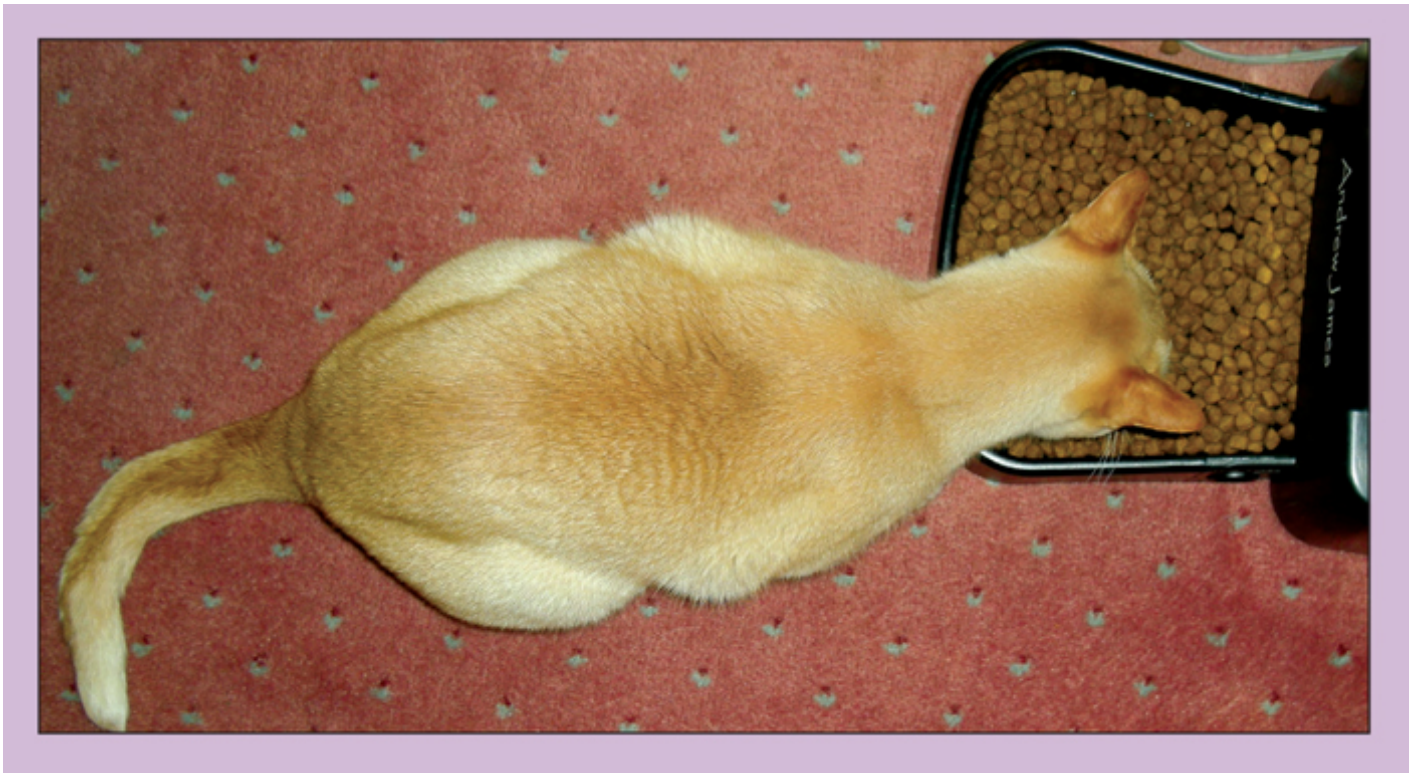

Figure 2. Feeding dry food free choice is convenient for owners and is acceptable for a cat that is not prone to weight gain.

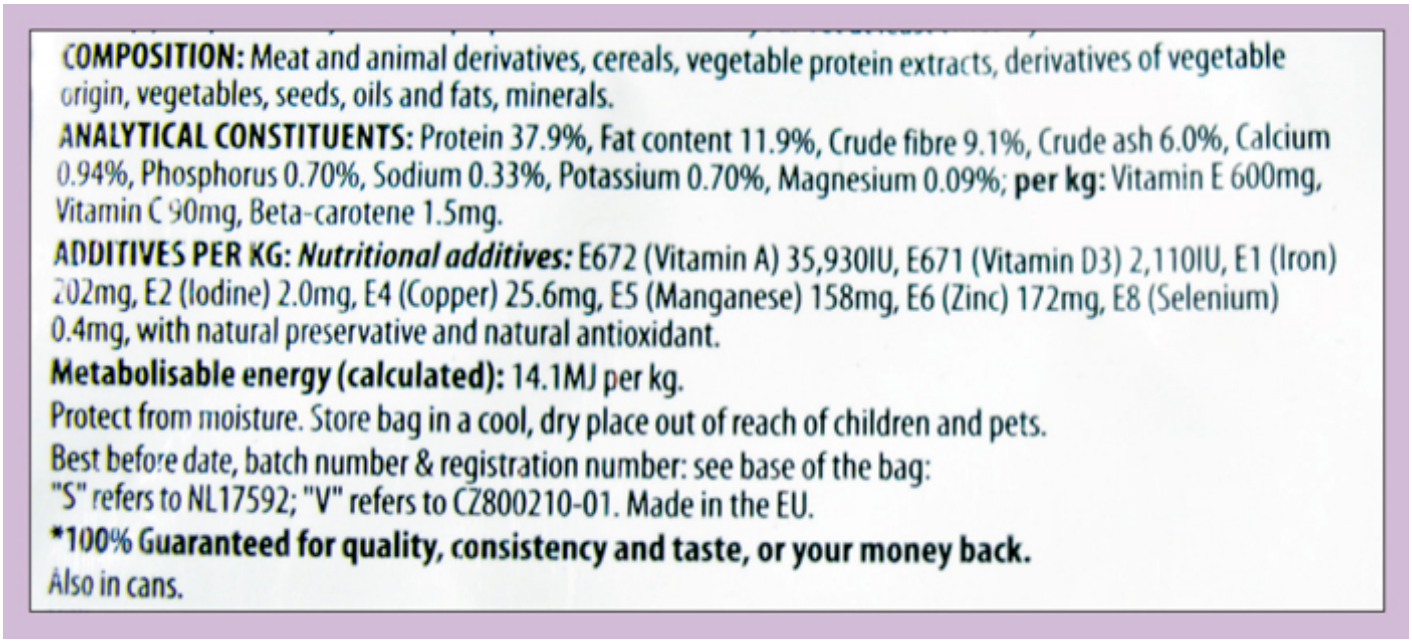

Figure 3. Dry food label showing the ingredients, analytic constituents (nutrient profile), and additives. Note this label does include the metabolisable energy, which may not appear on many labels in Europe.