“What additives are in pet foods?” is a question of interest to pet owners. The purpose of additives (more accurately called “minor ingredients”) includes: providing nutritional benefits, safety and maintaining the desirable features of colour, flavour, texture, stability and resistance to spoilage. In short, these “additives” are included to enhance the quality of the food and to ensure the food remains in good condition after processing.

The term “additive” can be applied to a range of ingredients that manufacturers add to the basic raw materials (meats, fish, cereals and vegetables) that are at the heart of pet foods. These “minor ingredients” include essential nutrients such as vitamins and minerals, flavours, colours and agents that are included to prevent harmful spoilage of the foods due to fats going rancid or through bacterial or fungal contamination. Let’s take a look at some of the important “minor ingredients” that are included and why they are there.

Vitamins and Minerals

Many prepared pet foods are carefully formulated to provide all the nutrients needed by the dog or cat in the amounts required. During recipe formulation and cooking, for nutritional completeness, it is important that key nutrients such as vitamins and minerals are added as required into the recipe to make sure they are all present in the finished food for the dog or cat. These foods are “complete and balanced” a statement advising the food is “nutritionally complete” or similar will be included on the label.

Vitamins

Vitamins are nutrients needed in very small amounts to enable many functions in the body. In the correct quantities they are absolutely vital to the health of all animals.

Dogs and cats cannot make all the vitamins they need so these must be supplied in the diet.

There are two broad vitamin groups:

- **Fat-soluble vitamins:** A, D, E, K, which are digested and absorbed in a similar way to dietary fat.
- **Water-soluble vitamins:** the B-complex vitamins and vitamin C, which are absorbed in the small intestine and are excreted in the urine.

Fat-soluble vitamins can be stored (e.g. in the liver), while most water-soluble vitamins cannot.

Minerals

Minerals are essential for the body’s metabolic processes. They are broadly categorised into two categories: macrominerals, needed in relatively large amounts (e.g. calcium, phosphorus, iron) and microminerals, which are important but only needed in very small amounts (e.g. cobalt, copper). Sodium is another essential mineral and the major source of dietary sodium for dogs and cats is salt (sodium chloride). Salt occurs naturally in some ingredients and is included in pet foods for its nutrient value, but also as it is a preservative and flavour enhancer.
Preservatives
Pet food safety is of critical importance. Preservatives (including antioxidants) may be added, largely dependent upon the type of pet food product and processing, to ensure that food products remain nutritious and safe for consumption throughout their shelf life. The food must be protected from bacterial or mould contamination and spoilage and be protected from degradation and the loss of nutrients during storage. The method of preservation used depends on the type of food as the type of processing also contributes to the food integrity and shelf life:

| Dry foods: | the low moisture content helps to inhibit the growth of most organisms. |
| Moist foods: | the heat applied in cooking of canned or foil sachet foods kills microbes and the packaging excludes air, protecting the food. |
| Chilled foods: | processed chilled foods have undergone a controlled thermal process and this, together with refrigeration during storage helps suppress spoilage. |
| Semi-moist foods: | these generally have a low pH and contain humectants that bind water to the product, making it less available for use by invading organisms. |

Antioxidant Preservatives
Antioxidants are preservatives used to protect foods from deterioration due to oxidation. Most pet foods contain fats and oils, which need to be stabilised by including antioxidants to prevent fats from reacting with oxygen in the air (oxidising) and becoming rancid which leads to losses in nutritional quality and the accumulation of possibly harmful degradation substances and unpleasant odours. The inclusion of antioxidants helps to maintain wholesomeness and quality of the food. Antioxidants are incorporated into dry foods to protect them from exposure to oxygen after processing. These are not generally added to canned foods because these are cooked at high temperatures in the can, thereby “sterilising” the contents in the sealed, airtight containers. Spoilage can occur if the can is damaged or if left too long after it is opened. Antioxidant preservatives that might be included in dry pet foods include: a variety of herbal or plant extracts including: rosemary extract, citric acid, vitamin E (tocopherols), vitamin C (ascorbates) or man-made anti-oxidants, which have been used in various human foods for many years.

Antimicrobials
Antimicrobial agents help protect food from potentially harmful spoilage organisms including mould formation or bacterial putrefaction. Some fresh meat products sold for pet consumption include added sulphite preservatives that release sulphur dioxide to suppress microbial growth and spoilage. Sulphites have been included in a range of food and beverage products for humans over many years for a similar purpose. It is known that sulphites degrade thiamine (vitamin B1) and for this reason, the Australian Standard (AS 5812 - Manufacturing and marketing of pet food) includes the following requirement: “Where sulphur dioxide or potassium sulphites are used, the common, prescribed, proprietary name or the FSANZ Food Standards Code number shall be included on the label. In this instance, to avoid acute thiamine deficiency in pets, sufficient thiamine shall be present throughout the shelf life of a pet food product. If necessary, this may be achieved by thiamine supplementation”. The Australian Standard (AS5812) requires antioxidants and preservatives to be listed on the statement of ingredients on pet food labels.

Colouring agents
Colouring agents may be added to pet foods to enhance the appearance of the food. These include a range of naturally occurring food colours, food dyes or mineral based colours such as iron oxide or titanium dioxide. The Australian Standard (AS5812) requires food colours to be listed on the statement of ingredients on pet food labels.
Emulsifiers and Stabilisers
Emulsifiers help keep the fat in the food and the water from separating. Gums, lecithin, glycerine and modified starch are used to prevent separation of ingredients and to create the gravy or gel in canned, sachet and other moist pet foods. Food gums include seaweed extracts such as alginate and carrageenan and seed gums such as guar gum (from the guar plant).

Flavours
Flavours are used to enhance the palatability in some foods and to provide product variation. Much of the appeal of prepared pet foods to the dog or cat stems from the choice of raw materials, such as fish, meat, vegetables or cereals. As with many foods for humans, the cooking process often increases the palatability of many foods. Some flavours may be added to some pet foods and these can be natural flavours such as extracts from fish or poultry, or agents designed to emulate natural flavours. The Australian Standard (AS5812) requires flavouring agents to be listed on the statement of ingredients on pet food labels.

Additives: A summary:
“Additives” or “minor ingredients” covers a wide range of recipe ingredients that are included in pet foods. They are important ingredients that are included for very specific and varied purposes. These “additives” include expensive food ingredients such as vitamins and are therefore incorporated into pet foods when considered necessary, at the appropriate level to enhance the quality, appeal and safety of prepared pet foods.

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