



# THE IMPORTANCE OF VEGETABLE INGREDIENTS IN PET FOOD

## IT ALL STARTS WITH BALANCED PET FOOD

A long and healthy life is what everyone tries to achieve for their pets. Well-balanced and high-quality nutrition with health benefits is where it all begins. A balanced, nutritious diet contains vegetable ingredients. Vegetable ingredients are a good source of fibre, minerals and vitamins. Vitamins keep the pet's skin and coat healthy, strengthen bones and teeth, and give them the overall energy that they need to function. In addition, vitamins also contribute to the body's ability to resist disease.

### Vegetable ingredients

Pet food manufacturers are increasingly aware of the importance of vegetable ingredients in pet food. Therefore, Duynie Ingredients has expanded its product portfolio with vegetable ingredients, all sustainable sourced, processed and produced. Let's take a closer look what impact vegetable ingredients have in dog and cat food.



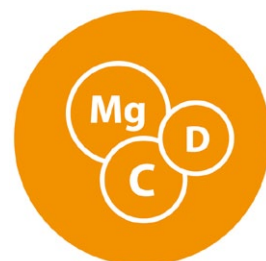
Sustainable



Natural



High fiber



Vitamins and minerals

# GETTING TO KNOW VITAMINS

VEGETABLE INGREDIENTS CONTAIN VITAMINS WHICH PLAY A CERTAIN ROLE IN DOG AND CAT FOOD AND HAVE MANY BENEFITS.

## Vitamin A

Vitamin A is a fat-soluble vitamin that mainly occurs in the liver. Dogs are able to produce vitamin A from carotenoids.

Cats are unable to convert  $\beta$ -carotene or other carotenoids into vitamin A. That is why carotenoids are sometimes referred to as provitamin A. The body stores Vitamin A in the liver, and any excess vitamin A is partly stored in fat.

### Benefits Vitamin A

- ☑ Vitamin A is important for sight, cell division and the immune system
- ☑ Vitamin A is required to generate skin cells and cells in the trachea, hair, gums and lung tissue
- ☑ Vitamin A contributes to a properly functioning immune system
- ☑ Vitamin A has an important function in the growth of young animals

Carotenoids is found in carrots, spinach and pumpkin.

## Vitamin E

Vitamin E is a fat-soluble vitamin and an umbrella term for a number of compounds that naturally occur in food: the tocopherols such as alpha, beta, gamma and delta tocopherols. Alpha tocopherol is most easily absorbed by cells and is therefore by far the most important form of Vitamin E. Vitamin E mainly occurs in vegetal products. Animal products are low on Vitamin E.

### Benefits Vitamin E

- ☑ Vitamin E is an important antioxidant and acts to protect cells against the effects of free radicals
- ☑ Vitamin E also plays a role in the regulation of cellular metabolism
- ☑ Vitamin E also has a function in the generation of red blood cells and in the maintenance of muscle and other tissues

Vitamin E is found in broccoli, pumpkin, spinach and carrots.

## Vitamin K

Vitamin K is a fat-soluble vitamin consisting of Vitamin K1, found in vegetables. Bacteria that occur in the animal's large intestine are able to generate Vitamin K2, also known as menaquinone. This substance has the same effect as Vitamin K1.

### Benefits Vitamin K

- ☑ Vitamin K is essential for good blood clotting
- ☑ Vitamin K is required for maintaining the strength of bones

Vitamin K1 is found in green leafy vegetables like broccoli and spinach.

## Vitamin B

Vitamin B is a water-soluble vitamin and there are different types of vitamin B with specific benefits.

- ☑ Vitamin B1 (Thiamine) is necessary for dogs and cats to convert carbohydrates into energy. Vitamin B1 is also necessary for the proper functioning of the heart muscle, the nervous system and the brains. If too much Vitamin B1 is ingested, then the excess amount is excreted via urine. Cats require more thiamine as dogs. The body can only store thiamine in limited quantities, so any deficiencies will become apparent fairly quickly.
- ☑ Vitamin B2 (Riboflavin) is vital to the energy system of cats and dogs. It plays an important role in releasing energy from carbohydrates, protein and fat. Vitamin B2 is also required for the generation of red blood cells and of antibodies. If too much Vitamin B2 is ingested, then the excess amount is excreted via urine. Vitamin B2 is sensitive to light but resistant to heat.
- ☑ Vitamin B3 (Niacin) consist of 2 types of niacin: nicotinamide and nicotinic acid. Dogs are able to generate niacin from the amino acid tryptophan, to a limited extent. Cats are unable to, or barely able to. Meat and fish contain a lot of Vitamin B3. Vitamin B3 is necessary to supply the body with energy. Vitamin B3 also plays a role in the production of fatty acids in the body.
- ☑ All forms of Vitamin B6 are absorbed by the intestinal cells and converted into pyridoxal. This is transported to the liver via the blood, where it is converted into the biologically active form of pyridoxal phosphate. It is in this form that Vitamin B6 performs its work for the body. It is involved in more than 100 enzymatic reactions in the body, mainly related to energy production and the metabolism of fats and proteins (building amino acids). It also regulates the functioning of certain hormones and is vital to growth, blood production and the proper functioning of the immune system and nervous system.
- ☑ Vitamin B11 (Folic acid) contains folate and is necessary for the growth and functioning of the body and the generation of white and red blood cells. Folic acid is also important for the early development of the unborn puppy/kitten.

Different types of Vitamin B are found in green vegetables like broccoli, spinach and pumpkin.

## Vitamin C

Vitamin C (ascorbic acid) is a water-soluble vitamin. Most vertebrates (including cats and dogs) are able to generate Vitamin C from glucose and thereby satisfy their need. Guinea pigs are an exception (as are humans).

### Benefits Vitamin C

- ☑ Vitamin C is an antioxidant and necessary for the immune system
- ☑ Vitamin C is necessary for the construction of connective tissue (collagen)
- ☑ Vitamin C is important for the absorption of iron

Vitamin C is found for instance in broccoli and pumpkin.





# NATURAL INGREDIENTS

In addition to healthy ingredients, pet food manufacturers are also looking to add ingredients which are natural. Given the present trends in humanization and clean label, consumers are looking for natural ingredients in their pet's food, preferably sustainable sourced and produced. Vegetables can be the answer.

## Vegetable ingredients from co-products

Our ingredients are made from plant-based co-products, directly sourced from the food industry. In our own factory these co-products are processed and produced to high quality ingredients for pet food manufacturing. Dried products are easy to handle and manage, and can be ground or cut to the right consistency for use in pet food or muesli.

## Sustainability is key

When choosing vegetable ingredients to use in pet food formulas, it's important to consider sustainability. Plant-based co-products released during the production of food for human consumption are used by Duynie Ingredients to produce sustainable plant-based ingredients. By using co-products for pet food, Duynie Ingredients enables maximal resource use

and helps prevent food loss. Based on Life Cycle Assessments (LCA) we know that the environmental impact is lower because our ingredients have a lower impact on land use and have a lower carbon footprint than alternatives in the market. By using these ingredients, pet food manufacturers can improve their corporate sustainability goals.

## New factory for production vegetable ingredients

In our new factory in the Netherlands vegetable ingredients are processed and produced using renewable energy, which means residual heat and green electricity, instead of fossil energy. The residual heat is generated by a bio-energy power station, burning wood chips sourced naturally by environmental pruning. Our factory is the largest in Europe, producing sustainable plant-based ingredients.

Our products have the following benefits:



Sustainable



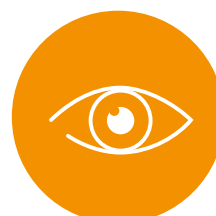
High quality



Year-round supply



Stable properties



Transparency



Value efficiency

## Vegetable ingredients range

Duynie Ingredients has a wide range of dried vegetable ingredients to use in pet food and muesli for dogs, cats and small animals. Carrot (granulate, flakes, cubes), bean granulate, spinach powder, pumpkin flakes and sweet potato flakes are some of the products available.



Carrot Flakes



Bean Granulate



Spinach Powder



Pumpkin Flakes

## Tailor-made vegetable blends

In response to the request by pet food manufacturers for a vegetable blend, Duynie Ingredients has created a blend with a unique combination of vegetable ingredients suitable for use in different recipes. A vegetable blend offers many advantages to pet food manufacturers. Saving on storage space, reduced handling of various products and the possibility of tailor-made production are some of them.



VeggieBlend

## Want to know more?

Visit our website [www.duynie-ingredients.com](http://www.duynie-ingredients.com)

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