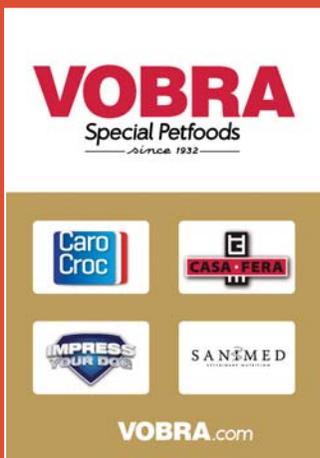




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# Dry Foods for Cats

*Dry cat foods contain less than 14 percent moisture and usually are rich in plant starch as their main carbohydrate constituent. In westernised countries, about 25 percent of the pet cats receive industrially produced dry food as their sole source of nourishment. Some owners see their cat as flesh eater and consider dry foods as unnatural and unhealthy. In their view, cats should consume a moist, almost carbohydrate-free, meat-based diet that mirrors the preys that they would naturally hunt in the wild. In addition, dry food is believed to cause obesity and diabetes through its high carbohydrate content. The low water content allegedly gives rise to stone formation in the urinary tract.*

*From a nutritionist's point of view, cats should be fed on diets with adequate amounts of nutrients that are readily available and present in a palatable mixture of safe ingredients. The diets should sustain a healthy and long life as supported by current scientific data. Dry foods for cats can satisfy the nutritionist's point of view. Cats effectively digest cooked starch and utilise the glucose released. Both descriptive and experimental research indicates that dry foods provide healthy nutrition for cats.*

## Dry and Wet

In regular dry cat foods the calories are distributed over proteins, fats and carbohydrates approximately in a 30:40:30 ratio. For low-carbohydrate, high-protein dry foods the ratio may be around 45:40:15. Canned foods may contain 80 percent water and have roughly an energy ratio of 40:50:10. When compared with moist foods, dry foods do not bring about obesity, diabetes and urinary stones, while they may promote dental health.

## Carbohydrate Utilisation

Carbohydrate is not an essential dietary nutrient, but carbohydrate in the form of glucose is an essential energy source for many cells in the cat's body. Cats appear to be metabolically programmed to convert protein-derived amino acids into glucose, thereby assuring energy supply on a cellular level.

Furthermore, cats have low enzymatic capacities to digest starch and to handle glucose in the liver. It can be assumed that the metabolism of cats is adapted to a meat-based diet with little carbohydrate.

While cats seem to have limited ability to process dietary carbohydrates, many experiments show that they can efficiently digest cooked starch and metabolise the glucose component. In one of the digestibility trials, cats were fed dry, extruded foods containing about 35 percent energy from six starch sources. Less than 6 percent of each starch type was recovered in faeces.

In the small intestine of cats about 72 percent of dietary cooked corn starch (21% of energy intake) was found to be apparently digested. High starch intakes by cats do not cause glucose excretion with urine. Absorbed glucose is oxidised as illustrated by extra oxygen consumption and carbon dioxide production.

## Obesity

It is argued that dry foods promote obesity in cats because the dietary carbohydrates are converted into fat, which is deposited in adipose tissue. This view is incomplete. In



adult animals, there only is net deposition of body fat when the calories consumed exceed energy expenditure. Moreover, carbohydrates are incorporated into body fat less efficiently than dietary fats.

Taken together the various descriptive studies, it can be concluded that consumption of dry foods is not associated with obesity in cats. Two experiments with cats indicate that high fat intake, but not high carbohydrate intake, induces gains in body weight and fat. In free-fed cats, replacement of dietary fat by an isocaloric amount of carbohydrate diminishes the degree of obesity.

## Diabetes

It is proposed that the cat's limited hepatic ability to process glucose causes hyperglycemia and hyperinsulinemia when fed a carbohydrate-rich diet. This would lead to low insulin sensitivity of tissues, pancreatic  $\beta$ -cell failure and development of type II diabetes. The proposition is refuted by research data.

Experiments with cats show that ingestion of a starch-rich meal after fasting does not produce excessively high blood glucose concentrations. In practice, the postprandial glucose response will be less. Most cats consume small, multiple meals daily so that carbohydrate intake per meal is low, even when fed a high-carbohydrate food. Three studies in cats document that high carbohydrate intake at the expense

of either protein or fat does not depress insulin sensitivity.

There are no controlled, prospective studies on diet composition and type II diabetes development in cats. Retrospective dietary information has been collected for 96 cats with diabetes mellitus and 192 matched controls. The energy percent of dry food in the whole diet was not different for cases and controls. This implies that the proportion of dry food in a cat's diet is not an independent risk factor for the development of type II diabetes.

## Dental Disease

Periodontal disease is common in adult cats. Dental plaque is the primary cause of periodontal disease, which refers to inflammation of gums (gingivitis) and tissues that surround and support the teeth (periodontitis). To control plaque and prevent gingivitis, the feeding of a diet with mechanical cleansing property is helpful.

While chewing, kibbles with an appropriate texture maintain contact with the tooth surface and provide mechanical cleansing. As would be expected, epidemiological studies found that dry foods are associated with less periodontal disease than moist foods.

## Lower Urinary Tract Disease

Impaired urine excretion due to obstruction of the urethra is often the result of formation of mineral crystals or stones (urolithiasis), which is a common and life-threatening condition in cats. Various descriptive studies have implicated dry food as a risk factor for urethral obstruction. This increased risk may lie in a combination of suboptimal food composition and smaller volumes of concentrated urine produced by cats when fed dry food. Properly formulated dry foods will not increase the risk of urinary stones. Veterinary dry diets are demonstrably effective in the control of feline urolithiasis.

*Dr Anton C Beynen writes this exclusive column on dog and cat nutrition every month. He is affiliated with Vobra Special Petfoods.*