

HOT TOPIC

Carbohydrates in pet food



In focus

Dietary carbohydrates in pet food help meet the pet's physiological need for glucose. However, due to the ancestral origins of dogs and cats, some owners may question whether carbohydrates should be a part of their pets' diet.

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the conversation.

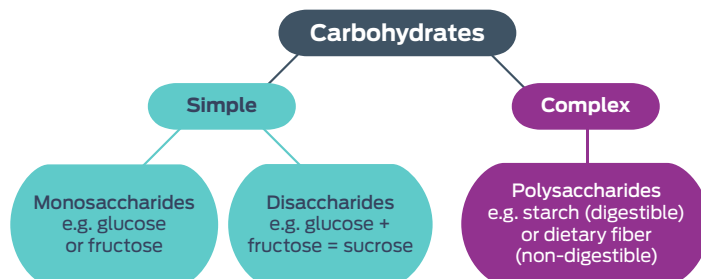
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What are carbohydrates?

Carbohydrates, together with protein and fat, are macronutrients – used by the body in relatively large amounts. Carbohydrates can be divided into two main types: simple and complex. **Simple carbohydrates** are composed of one or two sugar units, while **complex carbohydrates** consist of multiple sugar units. Through digestion, complex carbohydrates, e.g. starch, are broken down into simple sugars, e.g. glucose, which are used by the body for energy. Almost all cells of the body require glucose as their predominant energy source.

Dietary fiber is the indigestible fraction of carbohydrate, and although it provides many benefits to the pet and its GI microbiota, it is not a source of glucose.



The carbohydrate content of a pet food is not typically declared on the pet food label, but it can be estimated by calculating the “nitrogen-free extract” (NFE). By using information supplied on the pet food label, the estimated % of carbohydrates can be calculated using the following equation:

$$\text{NFE}\% = 100 - (\text{crude protein}\% + \text{crude fat}\% + \text{crude fiber}\% + \text{moisture}\% + \text{ash}\%)^1$$

Note: the term “ash” refers to the total mineral content of pet food, and includes essential minerals such as calcium, phosphorus and magnesium.

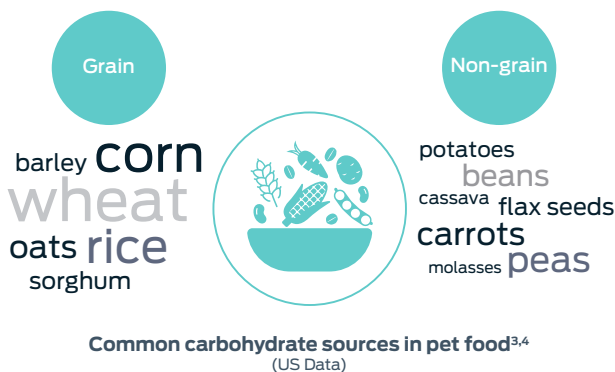
What is the role of carbohydrates in pet food?

Dogs and cats have a physiological requirement for glucose.² This need for glucose can either be met by dietary carbohydrates or by a process known as gluconeogenesis (the generation of glucose from non-carbohydrate substances like protein).³ If carbohydrates are not provided in the diet, glucose will be obtained from protein as the body satisfies its energy requirements first.⁴

Carbohydrates have a protein-sparing effect: when sufficient dietary carbohydrates are provided, the use of protein as an energy source is spared.

Carbohydrates provide an easily digestible energy source in pet food, and contribute shape and texture to extruded dry pet food. Although wet pet foods may contain some carbohydrates, extruded dry diets typically contain higher levels.^{5,6,7}

The largest proportion of carbohydrates in pet food is provided by starch.⁴ Proper processing of starch, such as grinding and cooking, makes the starch more available and digestible.⁴



How well can pets digest carbohydrates?

Since dogs and cats in the wild typically do not consume large amounts of carbohydrates, and cats are defined as “obligate

carnivores” (they require nutrients naturally found only in animal tissues), there is a perception that pets cannot digest carbohydrates. Although dogs and cats both lack salivary amylase (an enzyme in the mouth which initiates carbohydrate digestion), both species have sufficient pancreatic amylase and other enzymes which allow them to efficiently digest properly processed carbohydrates.³



Dogs and cats can digest properly cooked carbohydrates with greater than 90% efficiency^{8,9}

Are carbohydrates linked to obesity and diabetes in pets?

Although it has been suggested that high carbohydrate diets can contribute to the development of diabetes and obesity in cats, there is no evidence for this in the scientific literature.¹⁰ Low-carbohydrate diets can be high in calories³, as the carbohydrates are frequently replaced with fat which provides more than twice the metabolic energy of an equivalent amount of carbohydrate or protein. Excess calorie consumption, not the carbohydrates themselves, can be a risk factor for obesity.

Diabetes is a disease characterized by high blood glucose levels. Glucose from dietary carbohydrates is absorbed into the bloodstream and transported to cells where it is used for energy. The term glycemic index refers to a relative ranking system that categorizes foods based on their effects on blood glucose levels. The majority of carbohydrates found in pet food are complex carbohydrates.⁴ Generally, complex carbohydrates have a lower glycemic index than simple sugars because they are digested and absorbed more slowly, leading to lower blood glucose levels.⁴

Complex carbohydrates are digested and absorbed slowly, resulting in a more optimal, gradual rise in blood sugar levels.

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