

CLINICAL ASPECTS OF DIETARY FIBRES

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Introduction

Sedentary lifestyle and neutering of dogs and cats have increased the frequency of metabolic diseases such as obesity, *diabetes mellitus* and secondary hyperlipidemia. Therefore specific-purpose diets have been formulated to treat or to prevent the recurrence of more than 20 diseases. Although dietary fibres (DF) are not essential nutrients, they are used to increase the fibre content of many specific-purpose foods. Some commonly used DF sources are well characterised : their insoluble-to-soluble ratio is known and their effects have been described in healthy like in sick dogs. Among these sources : the insoluble purified cellulose and the cellulose-rich ingredients as peanut hulls, the sources of mixed DF like beet pulp that contain both soluble and insoluble fibre and the typical examples of soluble DF : guar gum or psyllium (1,2,3). Beside these conventional sources, prebiotics are nondigestible food ingredients that positively affect the host by selectively stimulating the activity of a limited number of beneficial colonic bacteria, resulting in improvement in host health (4). The most common forms of prebiotics are inulin, oligofructose and manno- or galacto-oligosaccharides. These new ingredients are considered as functional food in human nutrition (5) and there is currently much interest in the use of prebiotics for companion animals as modulators of colonic bacterial populations and fermentation end-products (6).

Clinical implications

The table 1 summarises the clinical indications of DF. Dietary fibres are known to exert several effects on faeces characteristics (decrease in dry matter –DM- content and increases in daily wet weight and total DM excretion), blood parameters (decreases in glucose, insulin, cholesterol, triglycerides, urea) and nutrient digestibility coefficients (that generally decrease) .

The major indications are prevention of constipation, obesity, *diabetes mellitus*, hyperlipidemia, uremia and large bowel motility disorders (7), even if there is still a debate about the opportunity to use either insoluble or soluble DF sources, especially in diabetic pets. Due to difficulties in the methodology, there is a lack consensus on the role of DF as a mean to increase satiety (8,9). In cats, prevention of hairball is also an indication of DF. Actually, the specific-purpose foods present important nutritional characteristics that are not related to the DF content. DF sources must be considered as an aid in the treatment, not as the cornerstone. Moreover, the controversy about the role of the insoluble-to-soluble ratio is not a real debate : it is possible to use high incorporation rates of insoluble fibre (until 25 % DM) or a combination of insoluble and soluble fibre (10) but the use of large amounts of only soluble fibre is not conceivable because it would cause diarrhoea. Generally, soluble fibre exerts more systemic effects than insoluble fibre. Soluble DF are used in dogs to decrease blood urea by stimulating colonic flora which development results in nitrogen incorporation as it has been demonstrated in experimental animals (11). In hyperlipidemic dogs, diets containing oligofructose have been shown to effectively decrease blood lipid concentrations (12).

Besides the properties reviewed here, concerning their role as DF, prebiotics have been shown to induce interesting physiological/nutritional effects in humans. These effects relate to immune-enhancing effects, reduction of risk of developing precancerous lesions in the colon and improvement in calcium bioavailability. In pets, important effects include the general benefits of colonic fermentation, which prebiotics share with non-starch polysaccharides and resistant

starch. A blend of fermentable fibres and prebiotics given to dogs modulated various properties of the immune system, including those of the gut-associated lymphoid tissue (13).

In conclusion, DF sources are interesting ingredients in companion animal nutrition and association of conventional DF and prebiotics have already been formulated in order to enhance health status and performance.

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