



GOS pet food ingredient contributes to a healthy gut

By Geert van der Velden, Innovation Manager at IQI Petfood

As people pay ever more attention to the health and well-being of their pets, there is growing interest in high quality pet food with beneficial ingredients and additives. The use of prebiotics to increase and stimulate 'good' microflora in the gastrointestinal tract is a significant trend in the food and pet food industry. Galacto-oligosaccharides (GOS) are second generation prebiotics with an established function in human infant and adult nutrition products. It is now being shown that this proven food ingredient also contributes to good gut health of monogastric companion animals, such as cats and dogs.

Promoting gut health

Pets are seen as full family members by the majority of people. Therefore, besides providing for their basic needs, people go to great lengths to ensure the health and well-being of their pets. One of the most important factors is pet food, where functional ingredients and additives such as nutrients, multivitamins, antioxidants and omega-3 fatty acids are becoming more popular. In recent years, there has been an increasing amount of product launches related to gut and digestive health of pets. Prebiotics from vegetable origin such as inulin and fructo-oligosaccharides (FOS) are well-known and widely used in pet food. Galacto-oligosaccharides (GOS) on the other hand is a class of prebiotics which has only recently become available for the manufacture of pet food and offers substantial

health benefits both for humans and monogastric companion animals, such as cats and dogs.

GOS are derived from lactose (milk sugar) in cow's milk. In an enzymatic reaction, lactose is converted to a complex mixture of oligosaccharides. The GOS composition share structural similarities with the lactose-based oligosaccharides found in human milk, which is why GOS is widely used as an ingredient in infant formula products. Both cats' and dogs' milk contain lactose-based oligosaccharides and GOS could play an important role in addressing some of the key gastrointestinal challenges faced by cats and dogs today. GOS is the foundation of good gut health and has been shown to support the natural defences of cats and dogs by stimulating the growth of health-promoting bacteria.

What are GOS?

Galacto-oligosaccharides (GOS) are non-digestible, soluble fibres which are manufactured from lactose (milk sugar) in cow's milk. In an enzymatic reaction, lactose is converted to a complex mixture of oligomers (short chains) composed by the monosaccharide galactose. The chains vary in length from 2-10 saccharide-residues and are most often terminated by a glucose residue. The individual components arising from the reaction share many compositional similarities with the oligosaccharides' found in mammalian milk. The prebiotic function of GOS exerts health benefits to the host by directly impacting the micro-organisms in the gut, usually through consumption by host-beneficial microorganisms. However, many other health benefits have been identified for GOS and it is widely used in infant nutrition to resemble human milk oligosaccharides.

issues and various diseases.

A dog or cat's defence system is constantly at work to combat pathogens entering the body, mostly through ingestion. To infect the body of a cat or dog, pathogens must break through a mucous membrane barrier, and the cells lining the gut. The best way for a pet to maintain a healthy gut is an appropriate nutrient-rich diet, plenty of exercise and the use of prebiotics to keep the immune system balanced. Of the available prebiotics, GOS offer the broadest range of beneficial effects, and aids the pet's natural defence in preventing unwanted organisms from moving into the body.

GOS for good gut health

GOS were first produced as non-digestible food ingredients in Japan some 30 years ago, benefiting people by stimulating the growth and activity of host-beneficial bacteria in the colon. Since then, their application has expanded rapidly all over the world (see also figure 1). One common application is as an ingredient in high-end infant nutrition products. In recent years, the health benefits of GOS have also been discovered for monogastric companion animals, such as cats and dogs.

The importance of a healthy digestive system

Up to 70 percent of a dog or cat's immune system is associated with their digestive tract. This contains trillions of bacteria, some of which are beneficial to the pet while others are potentially harmful. If there is an imbalance with too many potentially harmful bacteria, this will result in an unhealthy digestive system which can result in many different kinds of problems. This includes a malfunctioning immune system which can lead to infections and allergies, as well as conditions such as diarrhoea, constipation, urinary tract

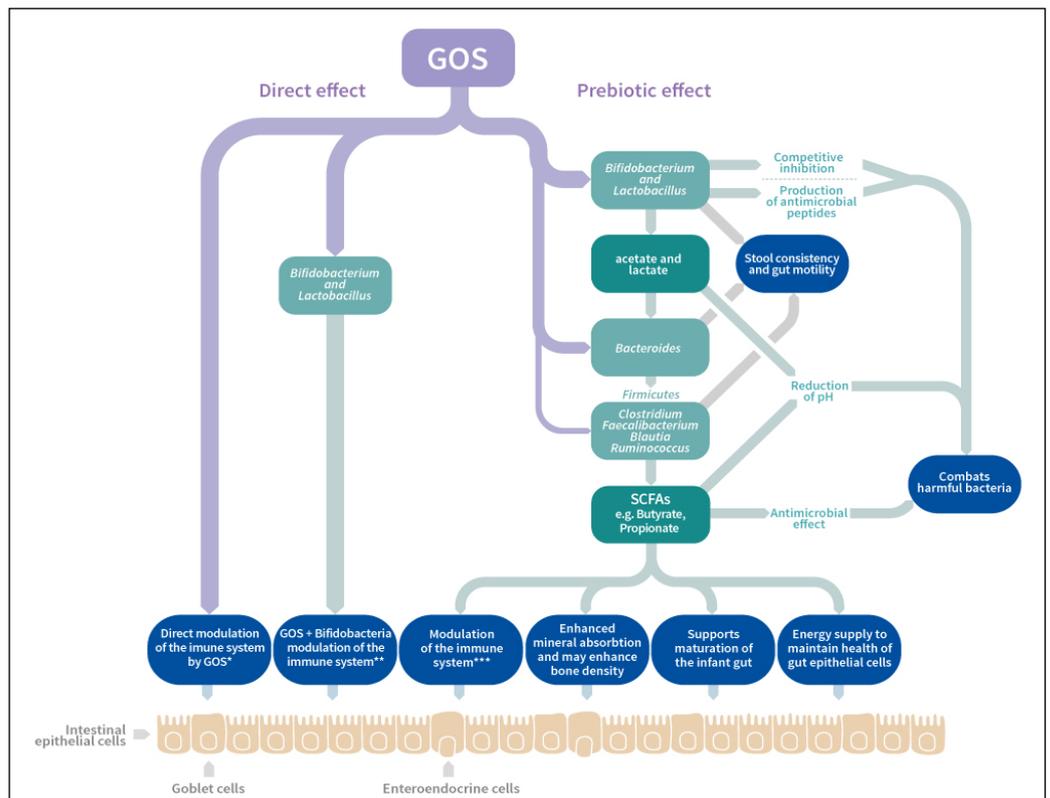


Figure 1: Modes of action and potential beneficial effects of GOS inclusion in the diet.

Prebiotics in general contribute to a diverse and balanced gut microbiota and thereby reinforce the natural defensive response to pathogenic and toxigenic bacteria. Thus prebiotics offer an effective reinforcement against digestive disorders, such as diarrhoea and inflammatory bowel disease. A somewhat overlooked result of an optimally functioning intestinal tract is that it also reduces faecal odours and promotes more solid stools, making them easier to collect and dispose of. Research suggests that GOS is the most effective prebiotic available and therefore is very well suited

as a choice ingredient to replace prebiotics from vegetable origin such as inulin and FOS (see table 1). It stimulates intestinal mucin production for increased intestinal barrier function against invasive pathogens. In doing so, this makes it more difficult for harmful bacteria to thrive and take hold and selectively stimulates healthy bacteria in the colon to grow and perform even better. GOS also have a positive impact on gut histology thereby increasing the absorption area for nutrients and minerals, including calcium, supporting stronger bone and dental health.

Table 1: Comparison between different prebiotics

| | FOS | Inulin | GOS |
|--------------------------------------|------------|---------------|--------------|
| Origin | Vegetable | Vegetable | Animal |
| Molecule | Complex | Simple | More complex |
| Dog milk oligosaccharides (DMO) like | No | No | Yes |
| Thermostable | No | No | Yes |
| Flatulence | Possible | Possible | No |
| Low pH stable | No | No | Yes |
| Browning effect | No | No | Yes |
| Prebiotic effect | Yes | Yes | Yes |
| Direct effect | No | No | Yes |

GOS are quite literally the foundation of gut health, since a healthy gut is initiated in most mammals by consumption of lactose-based oligosaccharides,

which are also found in cats and dogs mother's milk. GOS are produced from natural food grade raw materials in a sustainable biological process.

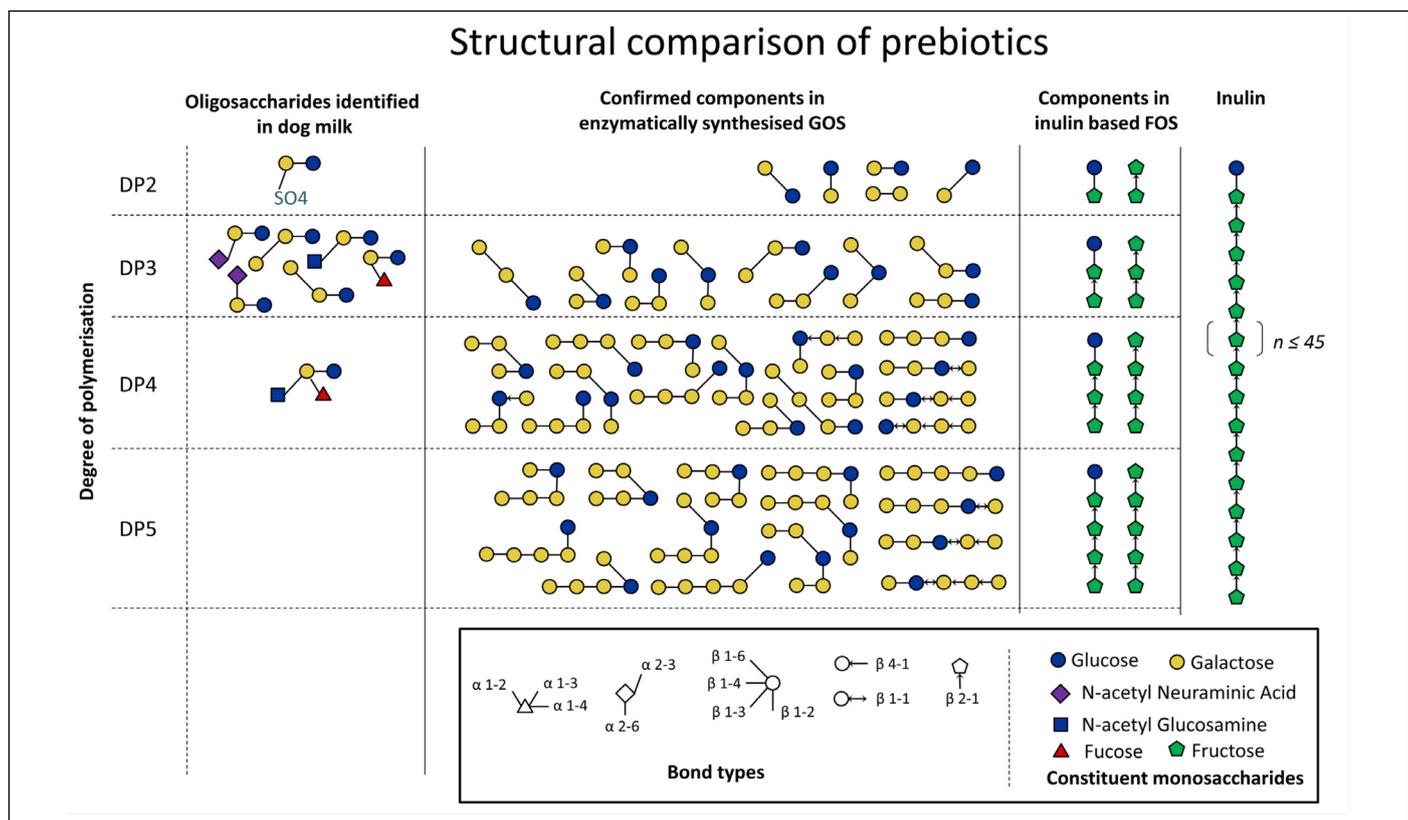


Figure 2: Showing the structural differences between different prebiotics.

GOS are not broken down in the stomach, so it delivers its full prebiotic activity. GOS have a relative complex molecule structure compared to other oligosaccharides, which gives it a prolonged effect in the colon. (See figure 2) It stimulates different types of bacteria to produce a diverse range of short-chain fatty acids (SCFA) which offer additional beneficial effects and aid the production of lipids, energy and vitamins.

GOS solution by IQI

In response to pet food dietary developments and anticipating growing consumer demand, IQI has recently added GOS to its product portfolio. GOS are available from IQI as a high quality supplement

in either premium liquid or premium powder, which can be added to pet food or milk. Made from lactose found naturally in mammalian milk, IQI's GOS ingredient offers effective protection against pet intestinal disorders. Our GOS ingredient is the prebiotic of choice in human infant nutrition and therefore an established, science-based choice for pet foods to replace prebiotics from vegetable origin. (IQI uses Nutrabiotic® GOS from its trusted supplier Saputo Dairy UK, one of the top ten dairy processors in the world.)

For more information about GOS supplements and the finest pet food claim-ingredients please visit our [website](#) or contact us directly.

Want to know more?

[GOS for improved gut health in cats and dogs](#)

[GOS Gut Health](#)

About IQI

IQI is a worldwide supplier of premium claim-ingredients to the top brands in the pet food industry. Founded in 1994 as a trading company in raw pet food materials, today we offer an extensive variety of services to aid and assist our customers and suppliers worldwide. IQI employs highly skilled personnel, supports private storage and handling facilities in Europe and the USA and relies on a global supply network to obtain the purest natural resources available.

For us, quality is key. We go to great length to assure the quality of our products, and we also invest a great deal in maximizing the quality of our partnerships. Since our business is all about trust, we need to bond with our partners to succeed. Working closely together with our customers as well as with our suppliers, we create full transparency in the supply

chain. We oversee and control every step in the process from source to shelf and supply products that are 100% pure and traceable to the source.

About Geert van der Velden

Geert van der Velden is IQI's Innovation Manager responsible for Business Development, generating new products and concepts that fit the needs of existing and new customers. Geert has over 25 years' experience in the international pet food industry and has gained knowledge and experience in many corners of IQI's business.

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