USE OF PREBIOTICS IN BRAVO

WHAT ARE PREBIOTICS

Prebiotics are substances that induce the growth or activity of microorganisms that contribute to the wellbeing of their host. The most common example is in the gastrointestinal tract, where prebiotics can positively alter the composition of organisms in the gut microbiome.

In human diet, prebiotics are typically non-digestible, fiber compounds that pass undigested through the upper part of the gastrointestinal tract and stimulate the growth or activity of advantageous bacteria that colonize the large bowel by acting as substrate for them. They were first identified and named by Marcel Roberfroid in 1995.

WHY ARE MALTODEXTRIN USED AS PREBIOTICS TO ENHANCE BRAVO PROPERTIES

In the process of continuous improvement of an already excellent product, the scientific advisors of Silver Spring, the Swiss Company producing Bravo, decided to implement an *ad hoc* formulated prebiotic formula that was designed to maximize the health effects of the probiotic microbes that constitute Bravo. This proprietary formula is based on maltodextrin, a well-recognized class of prebiotics that offer and number of advantages in comparison to other prebiotics.

- Maltodextrin support the growth of beneficial bacteria and inhibit the overgrowth of pathogenic bacteria.

Maltodextrin were carefully chosen in order to avoid the problems that may be generated by other prebiotics. In fact, it has been demonstrated that it is very difficult to find a suitable prebiotic mixture that exclusively supports the growth of beneficial microbes such as Bifidobacteria and Lactobacilli that are highly represented in Bravo (J Med Food. 2015 Jun;18(6):685-9. doi: 10.1089/jmf.2013.0187. Epub 2014 Dec 19). In this study, the Authors evaluated the effects of maltodextrin together with other oligosaccharides and they demonstrated that mixtures comprising oligosaccharides from milk and maltodextrins exhibited bifidogenic properties, promoting the performance of Bifidobacteria by boosting their growth and inhibiting the growth of undesirable bacteria. This latter result is not always obtained with other prebiotcs, such as xylo-oligosaccharides (XOS), that, on the contrary, may increase the overgrowth of pathogenic bacteria (Some putative prebiotics increase the severity of Salmonella enterica serovar Typhimurium infection in mice.

Petersen A, Heegaard PM, Pedersen AL, Andersen JB, Sørensen RB, Frøkiaer H, Lahtinen SJ, Ouwehand AC, Poulsen M, Licht TR. BMC Microbiol. 2009 Nov 30;9:245).

Growth of undesirable bacteria, also known as bacterial overgrowth, is known to be responsible for the so-called leaky-gut that is at the basis of all chronic diseases and leads to systemic inflammation and acquired immune deficiency (Kidney Int. 2013 Jun;83(6):1010-6).

Some prebiotics other than maltodextrin may favor pathogenic bacteria overgrowth and leaky-gut syndrome.

It is worth noticing that attempts to fight the leaky-gut syndrome with prebiotics other than maltodextrin such as XOS have failed. In a paper published in 2014 by Authors from the Division of Food Microbiology, National Food Institute, Technical University of Denmark (BMC Res Notes. 2014 Sep 19;7:660), it was demonstrated that the intestinal permeability determined in vivo and in vitro showed no effect on intestinal integrity in the XOS group.

- Maltodextrin, at variance with other prebiotics, do not affect resistance to pathogenic infections.

In addition, at variance with other prebiotics, maltodextrins are considered safe and do not show detrimental effects on health as demonstrated in the peer-reviewed papers published by distinguished Authors from the following prestigious research Institutions:

The National Food Institute, Department of Microbiology and Risk Assessment, Technical University of Denmark, Moerkhoej Bygade 19, DK-2860 Soeborg, Denmark.

The National Veterinary Institute, Department of Veterinary Diagnostics and Research, Technical University of Denmark, Bülowsvej 27, DK-1790 Copenhagen V, Denmark.
The Department of Systems Biology, Center for Biological Sequence Analysis, Technical University of Denmark, Soeltofts Plads, Building 221, DK-2800 Kgs. Lyngby, Denmark.

The Department of Basic Sciences and Environment Faculty of Life Sciences Copenhagen University Thorvaldsensvej 40, DK-1871 Frederiksberg C, Denmark.

Danisco Health & Nutrition, Sokeritehtaantie 20, 02460 Kantvik, Finland.

These Authors demonstrated that addition of prebiotics such as XOS to diets fed to mice impairs the resistance to Salmonella Typhimurium infections. According to the Authors,

these observations raise important doubts about the potential use of certain prebiotics for prevention of Salmonella infections since the severity of the infection was increased by the use of XOS.

The decrease of the resistance to infection reported in those papers appears particularly intriguing since it may indicate a decrease of the immunological defenses.

- Maltodextrin have a high level of gut tolerance.

In a study authored by Joanne Slavin of the Department of Food Science and Nutrition, of the University of Minnesota (Nutrients. 2013 Apr; 5(4): 1417–1435) a comparison between different prebiotics showed the following benefits for maltodextrins when compared to other prebiotics. In such study it is demonstrated that fructo-oligosaccharides (FOS) cause symptoms of intestinal intolerance at low doses (10 grams) whereas starch-derived prebiotics, such as maltodextrins, are safe at much higher doses (50 grams) (Grabitske H.A., Slavin J.L. Low-digestible carbohydrates in practice. J. Am Diet Assoc. 2008;108:1677–1681).

- Maltodextrin increase satiety.

Dextrins increase satiety and decrease caloric intake in overweight individuals with obvious benefits for weight control (Guerin-Deremaux L., Pochat M., Reifer C., Wils D., Cho S., Miller L.E. The soluble fiber Nutriose induces a dose dependent beneficial impact on satiety over time in humans. Nutr. Res. 2011;31:665–672).

The effects of maltodextrins on satiety hormone concentration and on body weight reduction were similar to those obtained with FOS without the risk of inducing intestinal intolerance (Parnell J.A., Reimer R.A. Weight loss during oligofructose supplementation is associated with decreased ghrelin and increased peptide YY in overweight and obese adults. Am. J. Clin. Nutr. 2009;89:1751–1759. Cani P.D., Lecourt E., Dewulf E.M., Sohet F.M., Pachikian B.D., Naslain D., De B.F., Neyrinck A.M., Delzenne N.M. Gut microbiota fermentation of prebiotics increases satietogenic and incretin gut peptide production with consequences for appetite sensation and glucose response after a meal. Am. J. Clin. Nutr. 2009;90:1236–1243. Grabitske H.A., Slavin J.L. Low-digestible carbohydrates in practice. J. Am Diet Assoc. 2008;108:1677–1681).

- Maltodextrin are not genotoxic.

In addition, maltodextrins do not show genotoxicity, that is they do not induce damage to DNA, at variance with other prebiotics. Thus, in a paper published in 2013 by Authors from

the preventative Health National Research Flagship, CSIRO Animal, Food and Health Sciences of Adelaide, Australia, the Authors demonstrated that XOS increase the genotoxicity induced by soy protein in the distal region of the colon that is the anatomical region where most human colon cancers occur (Nutrients. 2013 Sep 23;5(9):3740-56. doi: 10.3390/nu5093740). In other words, some prebiotics are consumed together with proteins, and in particular soy proteins, they may increase the carcinogenicity in the distal colon.

- Maltodextrin are gluten-free.

Some individuals suffering from gluten-related disorders may be concerned by the use of maltodextrin sine they can be made from a variety of starches, including corn, potato, rice or wheat. However, maltodextrin are gluten free. The source does not matter because maltodextrin is such a highly processed ingredient that the protein is removed, rendering it gluten free. If wheat is used to make maltodextrin, “wheat” will appear on the label. This might give you pause, but even in this case, the maltodextrin would be gluten free as confirmed by specific laboratory tests on maltodextrin made from wheat.