



Gut health

Perfecting purity: ensuring efficacy in purified commercial galacto-oligosaccharides with Biotis® GOS-OP High-Purity



Galacto-oligosaccharides (GOS) have a well-proven bifidogenic effect.^{1,2,3,4,5} Unpurified commercial GOS contain significant amounts of glucose and lactose but in response to consumer demand for smaller supplement formats like pills and gummies, purified GOS ingredients are increasingly sought after. So, what happens when these prebiotics are purified? And do they remain as efficacious as their non-purified counterparts?

FrieslandCampina Ingredients' Biotis® GOS-OP High-Purity was designed to help brands formulate small yet efficacious gut health supplements with ease. The ingredient is made by treating GOS with β -galactosidase to hydrolyse the lactose into simpler sugars (glucose and galactose). These mono sugars are then removed by sequential simulated moving bed (SSMB) chromatography.

New research shows that equal concentrations of active Biotis® GOS and Biotis® GOS-OP High-Purity have equal bifidogenic effects. This means the galacto-oligosaccharides structures that are important for bifidogenic activity are proven to be retained during FrieslandCampina Ingredients' purification process.

Want to know more? We've summarised the key findings of this study in this document.



What was the study aim?

To optimise the purification process for Biotis® GOS-OP High-Purity and to explore the bifidogenic effects of Biotis® GOS-OP High-Purity compared to non-purified Biotis® GOS.

What methods did the study use?

The study used a design of experiments (DOE) approach to determine the optimal production for HP-GOS that supports lactose hydrolysis and minimizes detrimental effects on GOS composition. Once the optimal conditions were verified, fecal fermentations were conducted in triplicate with Biotis® GOS-OP High-Purity and Biotis® GOS to show if the two ingredients have comparable effects on gut microbiota composition.

The fecal batch fermentations were carried out in a pH and temperature controlled environment under anaerobic conditions that simulated gut conditions. The fermentations were started by inoculation with processed fecal samples from 3 healthy adults. Lactose, galactose and glucose were supplemented to equal the concentrations between both GOS substrates. This was done to ensure any differences observed in the gut bacteria were due to GOS composition, not sugar levels. All fermentations were run simultaneously, and samples were taken after 7.5 and 24 hours of fermentation for analysis of gut microbiota composition.

What were the results of the study?

The study showed that optimized conditions for GOS purification delivered a pure GOS with reduced levels of lactose while maintaining most of its DP2 structures. The study further confirmed that the purification process used to create FrieslandCampina Ingredients' Biotis® GOS-OP High-Purity did not change gut microbiota modulating effects compared to the unpurified GOS. Both Biotis® GOS and Biotis® GOS-OP High-Purity have the same bifidogenic properties and therefore provide the same gut-supporting benefits.

Click here to read the full paper: High purity galacto-oligosaccharides: Optimal process design and prebiotic effect - ScienceDirect

This information is intended for industrial customers only and not intended for consumers.

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References

1. Krumbeck et al., 2018
2. Johnstone et al., 2021
3. Ladirat et al., 2014
4. Walton et al., 2012
5. Schoemaker et al. 2022



Health benefit solutions

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