Effects of a prebiotic soluble fiber NUTRIOSE® on intestinal immune system and gut homeostasis

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Objectives: Prebiotic fibers support immunity. NUTRIOSE® is a resistant dextrin recognized as a prebiotic soluble fiber promoting colonic fermentation and modulating gut microbiota. We evaluate in clinical and preclinical studies the benefits of NUTRIOSE® on the immune/inflammatory responses and gut homeostasis.

Material and methods: In a first cross-over clinical trial, blood markers of the immune/inflammatory responses were compared in T2DM females consuming daily 10g of NUTRIOSE® or maltodextrin for 8 weeks. In a second set of preclinical studies, a) intestinal immune/inflammatory responses were assessed in mice receiving a diet supplemented with 10% of NUTRIOSE® or dextrose for 23 days and b) colonic cytokines and markers of the intestinal barrier and gut homeostasis were quantified in rats fed with a diet supplemented with or without 10% of NUTRIOSE®.

Results: Diabetic volunteers supplemented with NUTRIOSE® exhibit increased CD8 lymphocyte cells and an upregulation of the ratio between anti- and pro-inflammatory cytokines. Similarly, addition of 10% NUTRIOSE® in mice or rats diet improved also the intestinal ratio between anti- and pro-inflammatory cytokines, together with several positive impacts on colonic genes encoding for tight junction proteins and GPCRs such as GPR41 and PPARγ.

Conclusion: Human studies have already demonstrated that NUTRIOSE® supplementation selectively modulates gut microbiota associated to an overall beneficial impact on the gut environment. Here we highlight that NUTRIOSE® also has beneficial impact in the modulation of inflammation, immunity, intestinal barrier and gut homeostasis through a putative mechanism of action involving the production of butyrate and the resulting activation of GPCRs.

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