

The postbiotic *Lactofidus* in combination with GOS/FOS prevents diarrhoea in a suckling rat model of rotavirus infection

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A postbiotic is defined as “a preparation of inanimate microorganisms and/or their components that confers a health benefit on the host” (1). The aim of this study was to analyse the effects of a postbiotic in combination with prebiotics on rotavirus (RV) infection in suckling rats.

Suckling Lewis rats received daily the vehicle (REF) or the combination of the prebiotic mixture (galacto-oligosaccharides and fructo-oligosaccharides, GOS-FOS) and the postbiotic (*Lactofidus*TM), including the human milk oligosaccharide (HMO) 3'-galactosyllactose (GL), and on day 5 also the RV. Faecal samples were clinically evaluated, and immune and microbial variables were analysed.

The prebiotic and postbiotic mixture administration reduced the severity of diarrhoea up to ~50% and the incidence around ~60% ($p < 0.05$). Viral shedding and intestinal permeability were also attenuated. The supplementation showed a dose dependent blocking activity. Although no changes in level of anti-RV antibodies were observed some changes in the immunoglobulin profile was observed. Changes in gut microbiota were also accompanied by changes in short chain fatty acids production. An enhancement of innate defences, bacterial interaction and intestinal maturation was induced as shown by the gene expression up-regulation of mucin 3 and, some Toll-like receptors and the down-regulation of the immaturity marker FcRn.

In conclusion, the combination of postbiotics, including HMO 3'-GL (Lactofidus™) with GOS-FOS mixture supplementation during suckling reduces the severity of diarrhoea caused by the RV and induces clinical amelioration by direct immune and microbiome effects, promoting a more effective defensive response.

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Conflict of Interest

Karen Knipping, Jan Knol and Johan Garssen are employees of Danone Nutricia Research

Authorship

KK, JG, MJR-L and FP-C designed the study. IA-B, C-M-F, MJR-L and FP-C were involved in the experiments; all of them interpreted the results and drafted the abstract.

References

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