

Effect of Maize-Based Corn Fibre Combined with *Lactobacillus rhamnosus* LGG and the Pilus-Deficient Derivative GG-PB12 on Fecal Microbiota, Immune Function and Metabolism in Healthy Elderly (Saimes Study)

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The aging process leads to a potential decline in immune function and adversely affects the gut microbiota. Dietary intervention is one approach to affect gut microbiota composition and improved functioning of the immune system.

We investigated the effects of a probiotic *Lactobacillus rhamnosus* GG (LGG) and pilus-deficient *L. rhamnosus* GG-PB12 combined with Promitor™ Soluble Corn Fibre (SCF, a candidate prebiotic) on fecal microbiota, metabolism, immunity and blood lipids in healthy elderly persons. A prospective, double-blind, placebo controlled, randomized, single centered, cross-over study in 40 healthy elderly subjects (aged 60-80 y) was carried out. Volunteers were randomized to consume either probiotic and prebiotic as synbiotic, prebiotic or placebo (maltodextrin) during 3-weeks. Three-week wash-out periods separated all the treatments. We assessed effects upon blood lipids, glucose, cytokines, NK cell activity, phenotype and intestinal microbiota composition. SCF decreased IL-6, which was not observed with the synbiotics. Consumption of *L. rhamnosus* GG combined with SCF increased NK cell activity compared to baseline in females and the older group. In the fecal microbiota analyses, the strongest community shifts were due to *L. rhamnosus* GG combined with SCF and SCF treatments. *L. rhamnosus* GG combined with SCF and *L. rhamnosus* GG-PB12 combined with SCF significantly increased the genus Parabacteroides. *L. rhamnosus* GG combined with SCF and SCF increased concentrations of *Ruminococcaceae Incertae sedis*. *Oscillospira* and *Desulfovibrio* slightly decreased in the *L. rhamnosus* GG combined with SCF group, whereas *Desulfovibrio* decreased also in the *L. rhamnosus* GG-PB12 combined with SCF group. *L. rhamnosus* GG combined with SCF reduced total cholesterol and LDL-cholesterol in volunteers with initially elevated concentrations. CRP decreased during *L. rhamnosus* GG-PB12 combined with SCF intervention compared to baseline.

Conclusions: Piliated *L. rhamnosus* GG was more potent at inducing beneficial effects compared to *L. rhamnosus* GG-PB12 by modulating the microbiome, increasing NK cell activity compared to SCF alone in older volunteers and decrease of the pro-inflammatory cytokine IL-6.

Biography:

Dr. Costabile joined the University of Roehampton, Health Sciences Research Centre in August 2015 as a Lecturer in Nutrition. Dr Costabile research interest and publications focus on the interactions between human nutrition and gut microbiology. Her publication record has been built through ten years of research fellowship in Professor Glenn Gibson group at the University of Reading where she has lead several human feeding studies, often built on data from initial in vitro microbiology experiments which have resulted in a number of functional food products becoming established within the European market. Dr Costabile research outcomes have broadened our understanding of the interaction between gut microbiome and the host in both health and disease, as well as the modulation of gut microbiome through functional foods. Specifically, Dr Costabile has formed strategic alliances with leading researchers in the fields of human nutrition, metabonomics, lipidomics, immunology and food. Bio- processing. These collaborations have led to joint publications, grant applications and financial support.