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In vitro effect of prebiotics (FOS, inulin and isomaltose) on short-chain fatty acid production by *Lactobacillus casei, Lactobacillus reuteri, Lactobacillus acidophilus, Lactococcus lactis* and *Saccharomices boulardii*

De Marco S, Piccioni M, Zadra C and **Pietrella D**
University of Perugia, Italy

Probiotics and prebiotics are food ingredients whose benefits are, partially, due to short-chain fatty acids (SCFA) production. SCFA (acetic, propionic and butyric acids) promote gut epithelial integrity and exert immune effects, including stimulation of G protein–coupled receptors, promotion of innate (Toll-like receptor 2) immune responses, and induction of regulatory T cells. In this work, the *in vitro* production of bioactive SCFA coupled to the uptake of commercial prebiotics by probiotic bacteria was investigated. The objective was to assess the effect of the prebiotics inulin, fructo-oligofructose (FOS) and isomaltose on growth of the probiotics. *Lactobacillus casei, Lactobacillus reuteri, Lactobacillus acidophilus, Lactococcus lactis* and *Saccharomices boulardii* and the relative SCFA production in RPMI medium containing 1% ofinulin; 1% of FOS or 1% of isomaltose and RPMI containing a combination of FOS, inulin and isomaltose. The kinetics growth of probiotics was followed for 24 h at 37°C by measuring the optical density at 600 nm. The determination of SCFA production was realized after 4, 8, 14 and 24 hours of incubation at 37°C using gas chromatography. Results highlight that the growth of some probiotics is stimulated by the combination of FOS, inulin and isomaltose when compared with medium without prebiotics. The results here obtained show that all the probiotics studied are able to produce SCFA. Moreover, the *in vitro* SCFA production is influenced by the different prebiotics in the medium. These results will be useful for the selection of the optimal prebiotics/probiotics combination and therefore for the development of novel functional food.

Biography

De Marco S is a PhD student in Pharmaceutical Sciences at the Department of Pharmaceutical Science of the University of Perugia (Italy). She graduated in 2014 in Food Science and Human Nutrition at the University of Perugia with a thesis in Food Safety. During her study, she did an internship at RIKILT - Institute of Food Safety of Wageningen (The Netherlands) from March to July 2013 about validation of a new GC-MS method for determination of flavorings in food. She is the co-author of one article in *Food Chemistry Journal* and she presented three posters in two different conferences.

stefania.demarco@studenti.unipg.it

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