Gwenael Jan

Agrocampus Ouest, France

Why buy probiotics while they are already in your fridge? The 2-in-1 effect of dairy bacteria as both immune modulators and cheese starters

Scope: Inflammatory bowel diseases (IBD) constitute a growing public health concern in western countries. Bacteria with anti-inflammatory properties are lacking in the dysbiosis accompanying IBD. Selected strains of probiotic bacteria with anti-inflammatory properties accordingly alleviate symptoms and enhance treatment of ulcerative colitis in clinical trials. Such properties are also found in selected strains of dairy starters such as *Propionibacterium freudenreichii*. Cheese constitutes an important source of bacteria, which can have beneficial effects, depending on the species or strain. We thus investigated the possibility to develop a fermented dairy product, combining both starter and probiotic abilities of propionic acid bacteria, designed to extend remissions in IBD patients.

Methods & Results: We developed a single-strain *P. freudenreichii*-fermented experimental pressed cheese using a strain previously selected for its anti-inflammatory properties. Key immunomodulatory *P. freudenreichii* surface proteins were expressed within the cheese matrix, as evidenced by *in situ* proteomics. Consumption of this experimental fermented dairy product protected mice against TNBS-induced colitis, alleviating severity of symptoms, modulating local and systemic inflammation, as well as colonic oxidative stress and epithelial cell damages. As a control, the corresponding sterile dairy matrix failed to afford such protection.

Biography

Gwénaël Jan focuses his research activity on the "2-in-1" properties of selected strains of dairy bacteria, both as starters for fermented dairy products, and as probiotic beneficial microbes. Following a PhD in Rennes University and Post-doc in Aberdeen Institute of Medical Sciences, he joined INRA in 1998 to study probiotic abilities of dairy propionibacteria. In close collaboration with INSERM, Pasteur Institute, Rennes University Hospital, as well as with dairy industry stakeholders, he develops a research activity spanning from food technology and molecular microbiology to preclinical and clinical investigations.

gwenal.jan@inra.fr

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