DEVELOPMENT OF NEW FUNCTIONAL YOGURTS USING PROBIOTIC LACTIC ACID BACTERIA (LAB) AND/OR BIFIDOBACTERIA AND THE FUTURE STRATEGY IN JAPAN

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Introduction:
R. Fuller (1989) introduced definition of probiotics as live microorganism which beneficially affects the host by improving its intestinal microbial balance. Now, probiotics defined as live microorganisms, which when administered in adequate amounts confer a health benefit on the host (FAO/WHO, 2002). As probiotics, lactic acid bacteria (LAB) and Bifidobacteria (BF) have been investigated as starter strains for functional yogurts. In Japan (1991), the Food for Specified Health Uses (FORSHU, Japanese name TOKUHO) system was inaugurated as the world’s first approval system on health claim labeling for food products. There are 13 health claim categories and the foods to modify gastrointestinal conditions (400 products) including probiotic yogurt are most popular in Japan. In total, 1,250 products are approved under FOSHU as of Feb 2016. The market scale of fermented milk products including functional yogurt from 2006 to 2016 (estimate) was compared by the data of a sum of money and category of yogurt. In Japan, the second probiotic boom has been started. As the market scale of yogurt increase in these 5 years, the breakthrough of 700 billion yen must be true in 2016. The market of drink-type yogurt increased 12% and become 300 billion yen. The market size of plain fat 0 yogurts has been 50 billion yen and will be more increase in the future. Many functions are considered in the selection of probiotics including competitive adhesion and exclusion of enteritic pathogens, cholesterol lowering effects, and positive and negative immuno-modulatory effects. Adhesive activity to the human intestine is one of the most important characteristics of probiotic LAB/BF. Recently, we developed a new screening assay using the BIACORE and found “blood type LAB” expected to improve gastrointestinal health by continuous proliferation in colon and removal of harmful bacteria causing inflammatory bowel disease (IBD) such as UC/CD.

Japanese functional yogurts are classified into 3 big categories such as Functional LAB type yogurt, Functional materials type yogurt and others. As the present topic yogurt in Japan, Probio Yogurt LG21, R-1 yogurt and PA-3 yogurt (Meiji HD) and anti-allergy yogurt. We are proposing “Blood Type Yogurt ABO” as a new type of yogurt in the future. H. pylori and norovirus are known to combine to the sugar portion of ABO blood type antigen of host in the first stage of infection. As we found many strains of blood type LAB, we may be able to use them to remove harmful bacteria which also recognize the human blood type antigen. Moreover, new yogurts in the future were introduced such as anti-obesity yogurt, anti-IBD yogurt and decontamination yogurt etc. Most recently, we have started the new study about the removal of Cesium 137 from human intestine by using LAB. One hundred LAB strains mainly isolated from fermented vegetables were tested to 1) strong binding ability with Cesium and 2) no-binding ability to human colon mucus. A few LAB strains which showed both abilities at the same time could isolate and are expected the removal of the dietary Cs137 from human intestine with quite safe.

Keywords: Functional yogurt, Probiotics, Lactic acid bacteria (LAB), Bifidobacteria, Prebiotics

Citation: