Key Words: milk protein concentrate, processing, functionality

DAIRY FOODS SYMPOSIUM: DAIRY FOODS CONSUMPTION, GUT MICROBIOTA, AND HUMAN HEALTH

0276 Probiotics and health benefits with reference to synthesis of γ-aminobutyric acid by selected probiotic bacteria. N. Shah* and Q. Wu, *The University of Hong Kong, Hong Kong.*

Traditionally, probiotics have been added to yogurt and other fermented foods for health benefits. Currently 56 species of *Lactobacillus,* including *L. acidophilus* and *L. casei* and 32 species of *Bifidobacterium,* exist. These probiotic cultures are able to restore the normal balance of microbial populations in the intestine and offer several therapeutic benefits. There has been an increasing demand for health-promoting food ingredients. Different milks fermented with bacteria, yeasts, molds or enzymes offer a broad range of possibilities to cover different health aspects with new bioactive components such as lactoferrin, micronutrients, CLA, sphingolipids and bioactive peptides or synthesize exo-polysaccharides. In particular, milk-proteins and associated bioactive peptides released during microbial or enzymatic fermentation of milk offer a broad spectrum of new functional properties including anti-hypertensive, anti-microbial, anti-oxidative, and immuno-modulatory properties. Gamma-aminobutyric acid (GABA), a non -protein amino acid, is mainly found in the brain and regulates vertebrate physiological and psychological behaviors such as anxiety and depression blood pressure and hormone secretion. The synthesis of GABA in the brain decreases with age, especially in elders. Hence, there has been increasing interest in use of probiotics for GABA production. In this study, several GABA-producing LAB isolates have been isolated from naturally fermented foods such as Korean kimchi. Previous screening methods are time-consuming and inefficient. In the present study, we have developed a novel screening and identification method for GABA-producing LAB from Korean kimchi. Acid treatment was applied to screening procedure to obtain acid-tolerant LAB isolates, and then a simple identification of GABA-producing LAB based on release of gas by these bacteria has been developed. The amount of GABA produced by LAB isolates at various monosodium glutamate (MSG) concentrations and incubation times in MRS medium was quantified by HPLC. Genetic identification of high GABA-producing LAB was performed by both 16S rRNA gene and glutamate decarboxylase gene. Nine potential GABA-producing LAB isolates were selected by observing gas release during fermentation. The conversion ability of MSG into GABA for all nine LAB isolates was 100% (supplementation level 10 g/L MSG, incubation time 24 h), over 80% (supplementation level 30 g/L MSG, incubation 48 h), over 60% (supplementation level 50 g/L MSG, incubation time 72 h) and over 50% (supplementation level 70 g/L MSG, incubation time 72 h). These nine LAB isolates were genetically identified as *Lactobacillus brevis* by 16S rRNA gene and confirmed by glutamate decarboxylase gene.

Key Words: probiotics, γ-aminobutyric acid, health benefits

0277 Gut mircrobiota, probiotics, bioactives (such as CLA, USFA), trans-fatty acids and their relationship to health. H. Gill*, *RMIT University, Melbourne, Australia.*

The human gastrointestinal tract harbors ten times more microorganisms than somatic cells in the human body. These organisms are part of a diverse and complex ecosystem comprising over 3.3 million genes that encode a vast repertoire of enzymes and metabolites with the ability to significantly influence human health and wellbeing. While a majority of these microbes exert health-promoting effects on the host, some possess the potential to cause disease. In a healthy state, the gut microbiota is known to confer a range of health benefits relating to immune function, nutrition, host metabolism and protection against pathogens. Alterations in the normal composition of the gut microbiota are associated with an enhanced predisposition to immunoinflammatory, autoimmune, metabolic and degenerative disorders. Consequently, there has been an increasing interest in developing nutrition/diet-based strategies for correcting gut microbiota dysbiosis. The use of probiotics is one such strategy that has been found to be effective in restoring perturbed gut microbiota composition and function and promoting/restoring optimal health. Amongst the many health benefits associated with probiotics, a large proportion of research attention over the last two decades has focused on their immunomodulatory and anti-infection properties. There is evidence that specific probiotics strains are effective in preventing and/or managing a range of enteric infections and modulating the functioning of the immune system. In healthy subjects and subjects with suboptimal immunity, specific strains are able to boost immune function, whilst in subjects with dysregulated immune system, such as allergy and inflammatory bowel disease, probiotics are effective in restoring immune homeostasis and reducing the severity of immunoinflammatory disorders. A variety of mechanisms by which probiotics mediate their health-enhancing or disease-preventing effects have been suggested. These include direct interaction with the host immune system and through the production of diverse array of bioactive molecules/metabolites. Dairy-based products are common vehicle for delivering probiotics. Being a rich source of essential nutrients and a variety of biologically active substances with synergistic physiological effects, these products offer a significant advan-