NEW SZÉCHENYI PLAN

III/3

Stimulation of probiotic lactobacilli and bifidobacteria in cultured dairy foods

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INTRODUCTION AND AIMS

Probiotic cultured milks are produced with selected strains of lactobacilli and bifidobacteria species. These microorganisms are thought to confer health and nutritional benefits through their activity in the intestinal tract. Regulatory authorities around the world are looking for assurance that probiotic food products can deliver viable starter organisms at sufficient numbers to the large intestine in order to provide a benefit to the consumer. However, several authors have reported that the viability of bifidobacteria is often low in fermented dairy foods. The objective of this study was to monitor the effects of biologically active natural substances on the characteristic microbiota of cultured milks during fermentation and refrigerated storage at 4°C for up to 6 weeks.

MATERIALS AND METHODS

The products tested included yogurt and fermented ABT milks, the latter containing *Lactobacillus acidophilus* (A), bifidobacteria (B), and *Streptococcus thermophilus* (T) as starter organisms.

RESULTS AND CONCLUSIONS

The growth, acid production, and survival of probiotic dairy starters during manufacture and subsequent refrigerated storage of fermented milks were improved, although to varying degrees, by the addition of oligofructose (**Figure 1**), inulin (**Figure 2**), honey (**Figure 3**), or the dried biomass of *Spirulina* (*Arthrospira*) *platensis* (**Figures 4 to 7**). The stimulatory/protective effect of these substrates on *Bifidobacterium* spp. is an important finding because bifidobacteria do not grow well in milk and, as was mentioned previously, they have poor survival rates in conventional fermented dairy foods. In addition, the substrates tested improved the nutritional and sensory properties of the final products, and some of them also had antifungal effects on spoilage yeasts and molds (**Figure 8**).

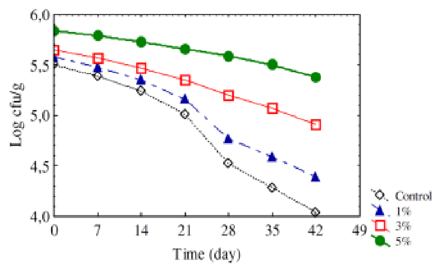

Figure 1: Survival of *Bifidobacterium* spp. in oligofructose-supplemented and control fermented ABT milks during storage at 4°C

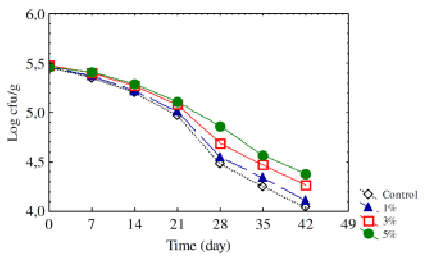

Figure 2: Survival of *Bifidobacterium* spp. in inulin-supplemented and control fermented ABT milks during storage at 4°C

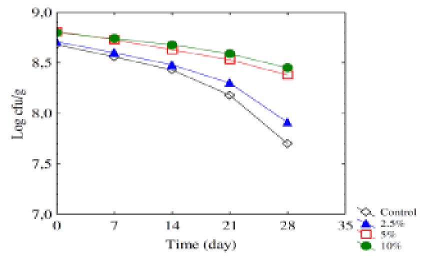

Figure 3: Survival of *Bifidobacterium* spp. in honey-enriched and control fermented ABT milks during storage at 4°C

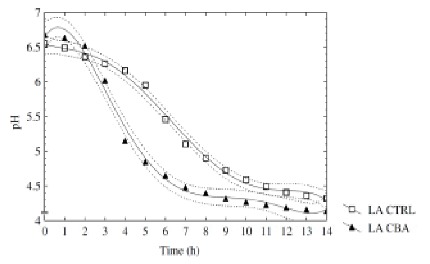

Figure 4: Effect of 0.3% (w/v) *Spirulina platensis* (CBA) biomass on acid production by *Lactobacillus acidophilus* La-5 in milk (CTRL: control)

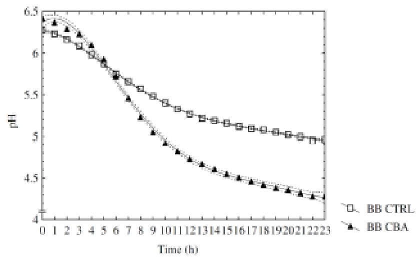

Figure 5: Effect of 0.3% (w/v) *Spirulina platensis* (CBA) biomass on acid production by *Bifidobacterium animalis* subsp. *lactis* Bb-12 in milk (CTRL: control)

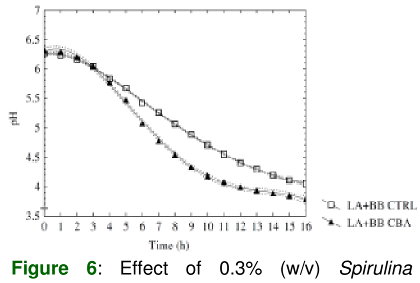

Figure 6: Effect of 0.3% (w/v) *Spirulina platensis* (CBA) biomass on acid production by the mixed culture of *Lactobacillus acidophilus* La-5 and *Bifidobacterium animalis* subsp. *lactis* Bb-12 in milk (CTRL: control)

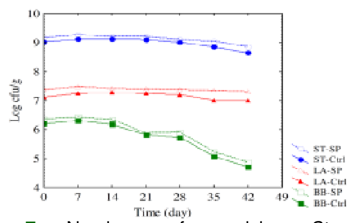

Figure 7: Numbers of surviving *Streptococcus thermophilus* (ST), *Lactobacillus acidophilus* (LA) and *Bifidobacterium* spp. (BB) in *Spirulina*-enriched (SP) and control (Ctrl) fermented ABT milks during storage at 4°C

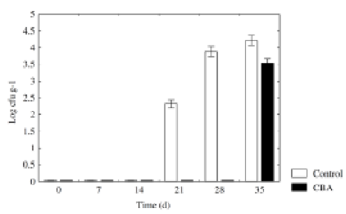

Figure 8: Changes in yeast and mold counts in control and *Spirulina*-enriched (CBA) yogurts during storage at 4°C

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