

## SYNBIOTIC DAIRY PRODUCTS: DEVELOPMENT AND QUALITY ASSESSMENT USING PROBIOTIC CULTURES AND PREBIOTIC INGREDIENTS

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Modern nutrition science emphasizes functional foods that combine traditional nutritional value with preventive effects. However, most current technologies rely only on probiotics, reducing stability and effectiveness. A theoretical challenge is the lack of knowledge about optimal probiotic–prebiotic combinations and contradictory data on their effect on dairy product structure and sensory quality. Hence, developing scientifically sound synbiotic dairy products is an urgent task.

The study builds on the works of Roberfroid [1], Gibson et al. [2], Sanders et al. [3], Sharma R. et al. [4], and Zhang L. et al. [5], who examined mechanisms and synergistic effects of probiotics and prebiotics. The aim was to create a functional dairy product from pasteurized cow's milk using probiotic strains *Lactobacillus acidophilus* SLA, *L. casei* SLC, and *L. bulgaricus* SSV with prebiotics (inulin, arabinogalactan, unipeptin). Tasks included assessing microbial viability, acidity, microflora, sensory characteristics, rheological properties, and dry matter content. Methods involved pasteurization, probiotic inoculation, prebiotic addition, and standard analyses (pH, titrated acidity, viable cell count, MALDI-TOF MS, viscometry, sensory evaluation). Twelve samples (3 control, 9 experimental) were studied.

Results showed a positive effect of prebiotics on probiotic growth. With inulin, viable counts reached  $(6.8\text{--}8.2)\times 10^8$  CFU/g, 2–3 times higher than controls, with the strongest bifidogenic effect. Unipeptin improved consistency, reduced syneresis to 4.8–5.1%, and ensured homogeneity. Arabinogalactan stabilized microbiological diversity and enhanced taste. Organoleptic scores were highest for inulin and unipeptin samples (4.6–4.7/5) compared to controls (4.1–4.2). Physico-chemical

tests confirmed increased viscosity (1100–1150 mPa·s) and dry matter (14.0%). Thus, combining probiotics and prebiotics significantly enhanced nutritional and biological value, improved texture and taste, and strengthened preventive potential. These findings confirm the scientific basis for next-generation synbiotic dairy products with clear public health benefits.

**Keywords:** probiotics, prebiotics, functional dairy products, inulin, arabinogalactan, unipeptin, synbiotic effect.

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