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Effect of josta berry extract addition on the yogurt preservation and stability

Efectul adăugării de extract de fructe de pădure de josta asupra conservării și stabilității iaurtului

Yogurt is a fermented dairy product that exerts beneficial effects on the human body by improving digestion, enhancing lactose assimilation, maintaining the balance of the intestinal microbiota, and supporting immune function. However, during yogurt manufacturing, the formulation is often supplemented with ingredients of synthetic origin to enhance quality characteristics. The present study proposed the use of an extract rich in biologically active compounds derived from Josta berries as a natural colorant, while also evaluating its effect on monitoring the growth of lactic acid bacteria in order to extend the shelf life of the final product.

Five yogurt samples were produced: one control sample without colorant (PM) and four samples supplemented with hydroalcoholic extract of Jostaberries (JE) at concentrations ranging from 0.5% to 2.0%. The pH values, lactic acid content, and the growth of lactic acid bacteria were analyzed throughout a 21-day storage period. In all analyzed samples, a decrease in pH was observed during the first 8 days of storage, followed by only minor fluctuations until day 21. The PM showed a continuous decline in pH (4.53 → 4.12), indicating active post-acidification. Samples containing 0.5% and 1.0% JE reached the lowest final pH values (4.07 and 4.05, respectively), suggesting more pronounced fermentation at low and medium concentrations of JE. In contrast, the 2.0% JE sample exhibited slight stabilization (pH 4.12 on day 21), likely due to the moderate inhibitory effect of the fruit's bioactive compounds on lactic acid bacteria.

The lactic acid content increased progressively in all samples, confirming the expected inverse relationship with pH. The control sample recorded the highest final value (0.1081), reflecting the most intense post-acidification. Yogurts supplemented with 1.0% and 1.5% JE showed moderate and relatively uniform lactic acid accumulation, indicating a balance between fermentation stimulation (through additional substrate availability) and the antimicrobial activity of phenolic compounds. The 2.0% JE sample presented slightly lower final acidity than the control, demonstrating a partial limitation of metabolic activity.

The specific growth rate of lactic bacteria (μ) values were reduced in all samples (10^{-4} – 10^{-5}), which was characteristic of the stationary phase under refrigeration conditions. The control sample displayed the highest intermediate value on day 15, suggesting more intense metabolic activity in the absence of JE. The 0.5% JE sam-

ple showed relatively higher μ values compared to the other supplemented variants, confirming a stimulatory effect at low concentrations. At 1.0–2.0% JE addition, μ values were lower and more stable, indicating improved microbiological stability.

Josta berry extract can serve as a natural colorant in yogurt while enhancing microbial stability. Additions of 1.0–1.5% offer a balance between fermentation and shelf-life extension, supporting its use as an alternative to synthetic additives in industrial production.

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