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Investigation of physico-chemical, microbial and organoleptic properties of yogurt types made from goat's milk (probiotic, fruit, frozen, cow's and goat's milk mixture)

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Abstract

Goat's milk yogurt has a high nutritional value and digestibility and is less allergenic than cow's dairy products. The problem with goat's milk yogurt its special taste due to the high concentrations of volatile fatty acids, which cause the goaty taste and limit the sensory acceptability of this product by consumers.

In this research, 8 treatments of yogurt including control, yogurt containing probiotic bacteria La5 (*Lactobacillus acidophilus*), Bb12 (*Bifidobacterium lactis)*, yogurt containing a combination of probiotic cultures of La5 and Bb12, yogurt contains pineapple nectar and peach nectar, yogurt containing a mixture of 50% goat's milk and 50% cow's milk, and frozen yogurt was prepared and physicochemical, microbial and sensory properties of yogurt samples were evaluated during 28 days of storage at 4°C.

The results of statistical analysis showed that the trend of total solids changes in control yogurt, treatments containing La5, Bb12, the mixture of La5 and Bb12 and treatment of mixture of goat's and cow's milk was decreasing and in treatments containing pineapple and peach nectar was increasing. The amount of fat and protein in yogurt samples did not change during storage. The pH of all treatments except frozen yogurt had a decreasing trend during 21 days storage period at 4°C and increased significantly on the 28th day ($p < 0.05$). The acidity of all experimental treatments, except for the frozen yogurt, increased significantly and insignificantly by 21 days.

The synersis of samples was affected by storage time and type of treatment. The trend of synersis changes in control yogurt, samples containing La5, Bb12, La5 + Bb12 and yogurt made of cow's and goat's milk mixture was increasing until the second week and then decreased significantly until the end of the storage period ($p < 0.05$). The trend of synersis changes in samples containing pineapple and peach nectar was increasing until the 7th day and then decreased until the end of the storage period. The water holding capacity of all treatments (except frozen yogurt) decreased first and then increased during storage. Viscosity increased in all of the samples (except frozen yogurt) until day 7th and then decreased significantly until the end of the storage period ($p < 0.05$).

The results of the mold and yeast enumeration showed that none of the treatments were contaminated. The results of the enumeration of probiotic bacteria showed that the number of these bacteria in the treatments containing La5 and Bb12 increased until the 21st day and then

decreased significantly on the 28th day ($p < 0.05$). In the treatment containing La5 + Bb12 mixture, the number of bacteria increased significantly until the 14th day and then decreased significantly ($p < 0.05$).
The results of the sensory evaluation indicated a significant difference between the treatments ($p < 0.05$). The highest and lowest overall acceptability scores belonged to frozen yogurt and yogurt containing peach nectar, respectively. Based on experiments performed, the use of probiotics, pineapple nectar, combining goat's milk with cow's milk, and producing frozen yogurt are good methods to cover the goaty taste in goat's milk yogurt while maintaining its quality characteristics.
Key words: goat's milk yogurt, probiotics, physicochemical properties, sensory and microbial characteristics