

ABSTRACT

The aim of the work was to apply donkey's milk as a raw material for the production of kefir and to determine the effect of different types of starter cultures on the features of the obtained products. At the same time, on the 1st, 14th and 28th day of chilled storage, a comparison was done of the qualitative indicators of kefir from cow's milk, goat's milk and donkey's milk, which was produced using two types of kefir grains (Tibetan and Biolacta) and the freeze-dried DVS-type starter culture. The analysis of the raw material used for the kefir production showed that donkey's milk had the highest lactose content (7.15%), low protein content (1.68%) with a high proportion of whey protein (0.73%), and the smallest fat content (0.42%), compared to the ruminants' milk. There were no significant differences in dry matter and its components between cow's milk and goat's milk.

With regard to the microbiological quality, donkey's milk had the smallest total counts of microorganisms (6×10^2 CFU/ml), psychrotrophic bacteria (1.45×10^2 CFU/ml) and yeasts (from 0 to 32 CFU/ml). The percentage of lysozyme in donkey's milk proteins was 17.13%, while there was no this compound in the remaining milk species.

All kefir produced using Biolacta and Tibetan grains meet the recommendations of the Codex Alimentarius for the number of yeasts: 5.41 and 5.28 respectively in the fermented products from cow's milk, and 5.03 and 5.28 log CFU/g respectively in the fermented products from goat's milk. The largest number of these microorganisms, however, was determined in the kefir obtained from donkey's milk using Biolacta and Tibetan grains: 6.13 and 7.07 log CFU/g, respectively. The use of kefir grains to ferment donkey's milk resulted in the largest number of thermophilic streptococci, *Lactobacillus delbrueckii* ssp. *bulgaricus* and yeast, as well as better survival of lactobacilli during storage compared to the products from cow's milk and goat's milk fermented by the same starter culture.

Biolacta kefir grains, when fermenting cow's milk, produced the largest amounts of exopolysaccharides whose content also increased during storage, from the initial level of 703.5 up to 932.4 mg/L of kefir. Tibetan kefir grains were the most efficient in terms of ethanol production; the application of the culture for the donkey-milk kefir production led to the largest concentration of alcohol in the product after 28 days of storage (1.0%). Although the fermented donkey's milk was characterized by a liquid consistency, it has gained acceptance of panellists. Donkey milk kefir produced from Tibetan grains stand out from all kefir obtained from such milk and scored the highest value (3.87). In view of the results obtained, the donkey's milk has been assessed as the raw material suitable for the kefir production.

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