Improving the Chemical and Sensory Characteristics of Goat Cheese by the Addition of Cranberry

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Abstract
In recent years, the goat milk cheeses have gained popularity due to the increased interest of consumers in both the tradition of cheese making and the sensorial and nutritional value attributed to goat milk. This study aimed to assess and compare the chemical and sensory characteristics of fresh cheese with a mixture of cranberry fruits in different concentrations. The following average values were obtained for the chemical parameters analyzed: pH 4.85 ± 0.155, titratable acidity (°T) 150 ± 0.094, dry matter (%) 58.33 ± 1.55, and fat (%) 27.74 ± 53.24. Sensory evaluation highlighted the influence of the addition of cranberry on the eating quality of goat cheese and its consumer acceptability. Results showed that the goat cheese supplementation with 9% cranberry significantly improves the stability of acidic flavor during storage.

Keywords: goat cheese, cranberry, quality

Introduction.
The nutritional and health aspects, “natural” and “hand-processing”, and the typical sensory characteristics are leading goat and sheep cheese to increase in popularity with the consumer (Ryffel et al., 2008). Of great importance is the use of goat’s milk products for the nutrition of persons with digestive disorders, and its anti-cancer potential is also discussed. Also, these products play a very important role in the diet of persons with cow’s milk casein allergy (Janštová et al., 2010).

The sensory aspects of goat products, such as a more intense flavor and aroma, contribute to the low acceptance of these products by some consumers (Sant’Ana et al., 2013), but by adding cranberry fruits, these characteristics are significantly improved.

Recent research has linked the consumption of cranberry fruits to many health benefits such as inhibition of carcinogenesis, protection against cardiovascular diseases and the adhesion of Helicobacter pylori to the gastric mucus (Vattem et al., 2005).

Aims.
This study aimed to assess and compare the chemical and sensory characteristics of four types of fresh goat cheese (non-supplemented control goat cheese and supplemented with 3, 5, 7 and 9% cranberry fruits).

Materials and methods.
The fresh goat cheese analyzed was produced from non-standardized goat’s milk. Unprocessed goat milk samples were analyzed with MilkoScan™+FT (form CombiFoss™ FT+, Foss, Denmark). Titratable acidity was determined using the method described by SR 2418:2008 and the fat content by the Gerber method. The cheese pH was determined using a digital pH meter (AOAC, 2005). The microbial evaluation was performed in order to determine the eventual presence of pathogens: Staphylococcus aureus, Salmonella and Escherichia coli according to SR EN ISO 6888-2/A-1/2005, SR ISO 6579/1997 and SR ISO 7251/1996. Sensory analyses of the cheese samples as well as control sample were evaluated by 20 untrained panelists using a 9-point hedonic scale.

The analysis of variance (ANOVA) of the data...
was performed using the SPSS 19.0 statistical analysis system, and Turkey HSD test with a confidence interval of 95 or 99% was used to compare the means. Differences were considered significant at $P < 0.05$.

**Results.** Raw goat milk used for cheese manufacture, meet the Romanian standard requirements. In the samples analysed, were identified as follows: content 4.5%, protein content 3.76%, solid non-fat content 8.18%, casein 2.33 and the titratable acidity 17°T. Based on predictions made by Guo *et al.* (2004) on the composition of cheese, the cheese samples analysed shows a dependence between the chemical composition of raw milk and chemical composition of cheese and technological factors. The measured values of the fresh cheese containing added cranberry correspond to those found in fresh cheese. The presence of *Salmonella spp.* and *S. aureus* was not detected in any of the analysed samples, *E. coli spp* counts were $1 \times 10$ CFU/g. Under the applicable regulations, the new type of fresh cheese analysed was microbiologically safe and had the appropriate physical and chemical characteristics.

The types of cheese evaluated did not differ ($P > 0.05$) with regard to their smooth appearance, soft and homogeneous texture; moreover, the acidity and taste revealed differences ($P < 0.05$) between the cheese samples, as shown in Figure 1.

Sensory evaluation analysis showed that consumers were not familiar with goat cheese, but their preference was for the fresh goat cheese with 9% cranberry.

**Conclusion.** The development of a new desert type product of goat milk can be a viable alternative for high-quality dairy products that meet consumer demands.

**References**