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RESEARCH STUDIES REGARING THE BIOTECHNOLOGICAL QUALITIES OF GOAT MILK

STUDII ŞI EFECTE PRIVIND CALITĂŢILE BIOTEHNOLOGICE ALE LAPTELUI DE CAPRĂ

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The quality and safety of the alimentary products have become a right of the consumers, with direct effects on the quality of life, and the problems based on the quality and the safety of the products is in the center of attention for organisms set up for defending the consumers interests. The milk goat tests were performed using LactoStar and ColonyStar on an effective of 90 goats in three different areas of the county of Sibiu: Răşinari, Cristian, Miercurea Sibiului. Each batch is composed of 30 goats. The test results should prevent the farmer and make him to be more attentive in milk hygiene.
Keywords: analyze, milk, food safe

Introduction

The globalization of the food chain causes the constant appearance of new challenges and risk for the health and the interests of European consumers.

The main objective concerning food safety is touching the highest possible degree of protection for human health and consumers interests regarding the food.

The basic principle is applying an integrated approach, such as "from farm to consumer", covering all sectors of the food chain - including production of feed, animal and plant health, animal welfare, primary production, food processing, storage, transport, retail, and import and export. This comprehensive and integrated approach, in which the responsibilities of operators in the food and feed sector, and the competent authorities are clearly defined, is a food policy more coherent, efficient and dynamic. This aspect is materializing through several analysis and determination showing an important view over the chemical and physical aspects of the goat milk.

Materials and Methods

Tests were performed using LactoStar and ColonyStar on an effective of 90 goats in three different areas of the county of Sibiu: Răşinari (L1), Cristian (L2), Miercurea Sibiului (L3). Each batch is composed of 30 goats.

1. Analysis with Lactostar

The sample to be analyzed was placed in a Berzelius glass of 100 ml in which was then sunk the suction plummet. The milk introduced in LactoStar was electronically analyzed and on the desktop appeared data related to the following coefficients: Fat %, content of Protein %, Black Dry Substance and Frost Point °C. There was a mini-printer connected to the device that would print instantly the analysis result. The analysis bulletin was given every day in which the milk analysis was done for each producer.

2. Analysis with ColonyStar

The material and instruments needed for analyzing each sample of milk was: - 5 tubes 5 pipettes of 1 ml, 1 pipette of 10 ml, 4 Petri plates Ø 90 and growing medium composed of 25x4 ml glucose. Working technique: there were introduced in 5 tubes 9 ml saline and 1 ml of milk in each one. From the last tube there was dropped 1 ml in the 4 Petri plates, over which is added 25 ml simple agar. After the culture media is cooled it is incubated for 48 hours at 35 ° C. After the incubation period the number of ColonyStar bacteria colonies it is count. Then we calculate the total number of germs after the formula:

$$NTG = \frac{M}{D} \text{ ml}$$

M – m media of colonies from plates

D - the dilution factor

3. Determination of the acidity.

Acidity was determined by titration with sodium hydroxide in presence of the phenolphthalein of the milk sample and expressed in T degrees.

4. Determination of the probable number of coliform bacteria and E. Coli: was performed using the multiple tubes in BBLV culture media.

5. NTG was determined by inoculation with specific culture media, agar and czapek-Dox. Bacillus cereus was determined by sowing on medium-blood agar culture medium and MYP / Mossel. Determining the probable number of pathogens clostridium perfringens was performed by inoculation of enrichment media rich in peptone, agar Tipton, and sodium sulphite.

6. Microscopic analysis: where it has been determined the number of somatic cells in the 60 ml analyzed. The presence and the number of somatic cells in milk (white cells, macrophages and epithelial cells) are an important indicator of possible infection in the animal from which it was taken the sample. Depending on their number there can take measures to prevent and combat diseases whose manifestations are not yet visible at the animal.

Results and Discussion

For the 90 analyzed samples were used 5.400 ml goat milk, from breeders in Sibiu County, and dates of these tests are presented in Table 3. In Table 1 and 2 are presented chemical and microbiological indicators on a sample taken randomly.

Table 1

Chemical indicators / goat milk sample

No.	Indicator	Sample1 L 1	Sample 2 L 2	Sample 3 L 3
1	Acidity	19,2	18,7	19,4
2	Fat%	3,9	4,1	4,8
3	Black Dry substance %	10,9	11,3	11,1
4	Protein titre	4,2	4,1	4,8

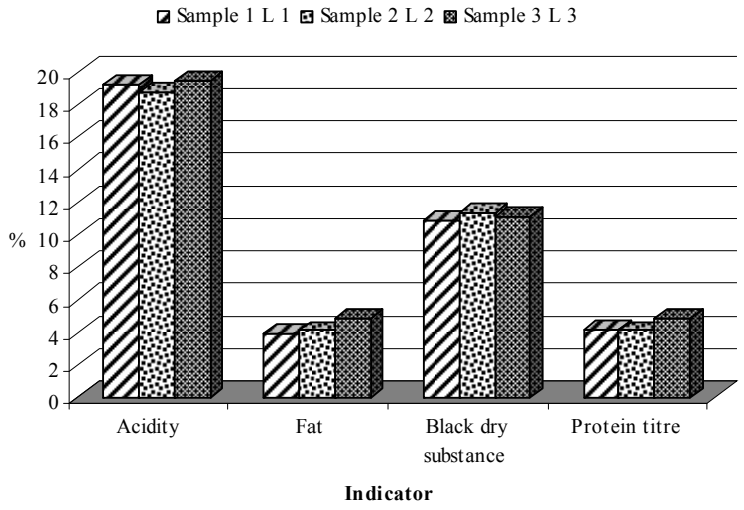

Figure 1. Chemical indicators / goat milk sample

Table 2

Microbiological indicators/ goat milk sample

No.	Indicator	Sample1 L 1	Sample 2 L 2	Sample3 L 3
1	E.coli/ml	5	4	7
2	NTG/ml	$9,6x10^4$	$6,4x10^4$	$8,7x10^4$
3	Bacillus cereus/ml	5	6	5
4	Clostridium perfringens/ml	1	2	1

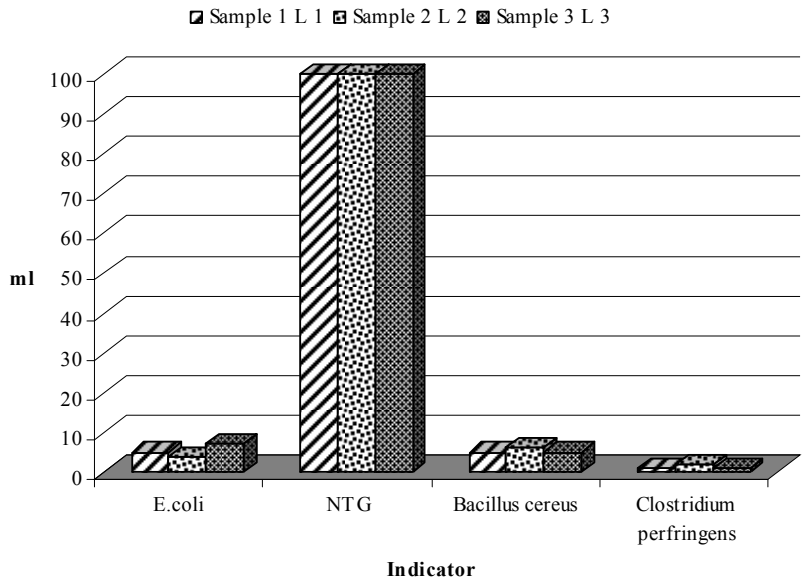

Figure 2. Microbiological indicators / goat milk sample

Table 3

Physical-chemical indicators of raw milk from the three collection areas

Characteristics	L 1 Goat milk Origin: Răşinari (media of analysed subjects)	L 2 Goat milk Origin: Cristian (media of analysed subjects)	L 3 Goat milk Origin: Miercurea Sibiului (media of analysed subjects)
Acidity	19,2	18,7	19,4
Frost point	- 0,703	-0,657	- 0,406
Fat % min	3,2	3,0	3,4
Dry substance % min	7,7	7,2	8,5
Protein titre	3,2	3,0	3,2
NTG /ml	650.000	576.000	450.000
No. Somatic cells	325.000	300.000	290.000

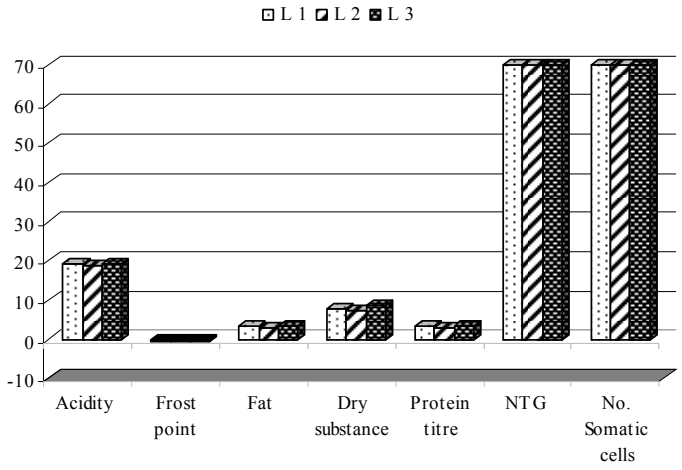

Figure 3. Physical-chemical indicators of raw milk from the three collection areas

Analyzing the chemical indicators from the three different sample of the goat milk we saw that there are small differences regarding the acidity, the value of the sample number 2 is smaller than the sample number 1 and 3. The best results regarding the fat percentage is determinate in the second sample, the sample number 1 has a low value and the third one is close to the minimum admissible. The protein value is maxim at the third sample and minimum at the second one.

The microbiological indicators shows that in goat milk we found between 4 and 7 cells of Escherichia coli per ml, Bacillus cereus between 5 and 6 cells per ml and Clostridium perfringens between 1 and 2 cells per ml. The total number of germs varies between $6,4 \times 10^4$ and $9,6 \times 10^4$**.**

Conclusions

From our test, chemical and microbiological, it has been found that our goat milk, collected from three different regions, can be stabilize, pasteurize and sell to the customers. The contamination microorganisms, which were found, can be eliminated by specific methods so the food safety will be ensured.

The chemical qualities of this milk recommend it as an important food for the people, especially for those who want to have a health and strong organism.

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