

RESEARCH ON THE QUALITY AND HYGIENE OF SHEEP'S MILK USED TO OBTAIN SOME SORTS OF CHEESE

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Abstract

Compliance with hygiene rules in milking animals prevents dirt from contaminating vegetable matter and contaminating it with microorganisms that can get into milk through them, negatively influencing the hygienic quality of milk. The investigations regarding the quality of raw sheep's milk for cheese processing took place between 2017 and 2018 on samples taken from Botoșani and Iași counties, from traditional farms with an average of 250 sheep, where the Turcana breeds predominated and Tigaie. The investigations were conducted to determine the degree of freshness, integrity, and we monitored some physico-chemical and microbiological parameters of the raw material. The sampling was done directly from the collection vessels after milking and filtration mainly during the hot season and their processing was carried out in the Food Control Laboratory of the Faculty of Veterinary Medicine Iasi, where 53 samples of milk were processed sheep. Following sample analysis, 8 samples were inadequate for organoleptic examination and integrity. Deviations from the organoleptic characters of appearance, color, odor and goat parameters were 15.09%. The microbiological determinations imputed a number of 17 samples, representing 32.07%, and the determination of the physico-chemical parameters revealed a number of 6 samples as inappropriate representing 11.3% of the total samples harvested.

Keywords: *sheep's milk, hygienic quality, physico-chemical parameters, microbiological parameters*

Introduction

The characterization of sheep flocks used for milk production has been achieved at the level of some counties with a tradition and an important share in the sheep breeding. The use of insipid milk and lack of integrity is a major risk. Due to its complex chemical structure and composition, it is an excellent nutrient medium for various microorganisms (bacteria), which influences milk quality and dairy (2,4).

The major role in obtaining raw milk from the quality required by the European Union Norms is attributable to the animal husbandry system but also to their state of health.

Processors of sheep's milk processors want the milking milk to be homogeneous, the milk to be opalescent, without its flocks. Opacity changes in the sense of diminishing when the animals are fed with juicy fodder, green fodder or some contamination of milk with proteolytic flora. Milk from animals treated with antibiotics is not used in cheese processing. The abnormal milk, milk with organoleptic defects caused by feed factors, viscous milk, filthy or mucilaginous and bitter are excluded from processing (1, 3).

Shepherds are aware of the fact that the milk obtained from tired, exhausted animals is not processed, they do not pass more than 15 km with the flock, precisely to avoid this fact(6,5).

Craftsman processors collect milk in clean and properly hygienised pots and generally process it as soon as possible after a prior filtering to remove impurities.

Under current regulations, the animal health conditions for obtaining raw raw milk from sheep are that the animals belong to an officially brucellosis-free holdings, the animals do not show any sense of any transmissible infectious disease in humans, the animals give a milk with normal organoleptic characteristics, do not show any damage to the udder, and animals that have been treated with public health-conscious substances that are transmissible through milk comply with the official waiting period (3; 4).

Material and methods

The investigations regarding the quality of raw sheep's milk for cheese processing took place between 2017 and 2018 on samples taken from Botoșani and Iași counties, from traditional farms with an average of 250 sheep, where the Țurcană breeds predominated and Țigaie. The investigations were conducted to determine the degree of freshness, integrity, and we monitored some physico-chemical and microbiological parameters of the raw material. The sampling was done directly from the collection vessels after milking and filtration mainly during the hot season and their processing was carried out in the Food Control Laboratory of the Faculty of Veterinary Medicine Iasi, where 53 samples of milk were processed sheep.

The raw milk must meet the limits of physico-chemical parameters imposed by the actual legislative requirements with respect to the degree of freshness, percentage of fat, protein content, lactose, non-fat dry substance, pH, acidity, degree of contamination, number of somatic cells.

Acidification of milk is due to lactose fermentation under the lactic acid enzyme equipment, with lactic acid formation. At reception, the acidity of the milk, according to STAS standards, across the country must be between 15-19 ° Thorner (°T).

The principle of the method consists in neutralizing the acidity of the milk with a solution of NaOH n / 10 in the presence of phenolphthalein as an indicator.

Determination of density - according to STAS 6352 1 -88 The principle of the method is the ratio between the weight of a milk volume at 20 ° C and the weight of the same volume of water at 4 ° C. The thermolactodensimeter, clean and dry, is introduced into the milk to the 1.0300 division, then allowed to float freely, taking care not to come into contact with the walls of the cylinder. Wait 1 minute and read density (2,3).

Determination of fat content - Butirometric method with Gerber butymeter, and the principle of the method consists in the dissolution and mineralization of protein substances and calcium phosphates in milk with sulfuric acid; releasing fats by breaking the protein shell of the globules with isoamyl alcohol and separating the liquid fat into the column by centrifugation.

Determination of NTGMA was achieved by establishing the number of microorganisms with the colony counting method obtained at 300C in accordance with the requirements of SR ISO 4833/2003.

The determination of coliform bacteria was done according to SR ISO 5541-1 / 1994, the method allows counting colonies at 300C by establishing the number of colonies. The probable number of coliform bacteria is a very important hygienic-sanitary indicator, and their confirmation is by fermentation of lactose (2).

Determination of *E. coli* was done by establishing the number of presumptive *E. coli* colonies by SR ISO 725/96.

Results and discussions

The impurities found in milk most often come from the animal's body: faeces, earth, vegetable, hair, epithelial cells. All of these are loaded with enormous amounts of microorganisms and reach the milk during milking, especially manual milking in large-mouth dishes.

Pathogenic bacteria are infrequently shed in milk and do not alter it, but are dangerous for humans. Microbes, susceptible to convert lactose into lactic acid and thereby acidify milk, are numerous.

Microorganisms worn by objects contaminating milk do not immediately disperse in the milk, which is why it is recommended that milk is filtered in tightly closed containers immediately after milking.

The dirty swallow, with dirty and dirty clothing, with dirty hands or with various inflammation in the hands, face or nasopharyngeal, is a complementary source of milk

contamination. Contaminant infection, especially from those with various conditions, is more dangerous, because it often consists of pathogenic germs for transmissible milk (streptococci, staphylococci).

The objects used in milking, including those used for milking, are the most important source of contamination. The importance of this contamination lies primarily in its massiveness in the case of hygiene negligence, and secondly in the fact that it is mostly made of adapted microorganisms in the logarithmic multiplication phase, which resume their activity as soon as they get into milk. Much of these microorganisms are represented by true lactic and pseudolactic bacteria of the genus *Escherichia* and *Enterobacter*.

Numerous researches show that careful washing and disinfection of objects used considerably reduces the microbial load of milk.

Water can be an important source of milk contamination. Impure water, used to rinse containers and equipment that come in contact with milk, can contaminate it with large amounts of microorganisms.

From the point of view of the organoleptic characteristics of appearance, color, smell and taste, the milk samples were white in yellowish, opaque and homogeneous appearance, with sweet taste and perceptible odor specific to the species.

At 8 samples, the milk showed changes in appearance, impurities due to non-compliance with milking hygiene, fragments of feed or faeces, insects (Table 1).

Table 1

Investigations on the organoleptic characteristics of sheep's raw sheep's milk				
Year	Season	Number of analyzed samples	Organoleptic aspects	
			Conforming	Nonconforming
2017	Warm	38	33	5
			86,84%	13,15%
2018	Warm	15	12	3
			80%	20%

The investigations into the quality of raw sheep's milk focused on the determination of freshness (acidity), fat content and density.

The data on the acidity of sheep's milk revealed from a number of 53 samples analyzed 4 samples had an acidity range of 22-24⁰ T and the rest with an acidity of less than 20⁰ T.

Density data shows us that a number of 2 samples had a value of less than 1,030 and the remainder between 1,030 and 1,033. A general average of the fat was 6.7% with the ranges of 5.8% and 6.9% (Table 2).

Table 2

Investigations on physico-chemical parameters of sheep's raw sheep's milk

Year	Season	Number of analyzed samples	Physico-chemical parameters (Acidity)	Physico-chemical parameters (Density)		
			Conforming	Nonconforming	Conforming	Nonconforming
2017	Warm	38	36	2	37	1
			94,73%	5,26%	97,36%	2,63%
2018	Warm	15	13	2	14	1
			86,66%	13,33%	93,33%	6,67%

Existing microorganisms in milk are characterized by a dual origin, namely mammary origin (intravital milk contamination) and extramammary origin during milk production, handling and processing. Microbiological investigations aimed at determining the NTGMA / ml parameters, coliform bacteria / ml and *Escherichia coli* / ml (Table 3).

Table 3

Investigations on the microbiological parameters of raw sheep's milk extracted from the stalks

Year	Number of analyzed samples	The microbiological parameters analyzed					
		NTGMA/ml		Bacterii coliforme/ml		E.coli/ml	
		C	N	C	N	C	N
2017	38	27	11	30	8	34	4
		71,05%	28,94%	78,94%	21,05%	89,47%	10,52%
2018	15	9	6	10	5	11	4
		60%	40%	66,67%	33,33%	73,33%	26,66%

Of the *Enterobacteriaceae*, an important role is played by coliform germs as hygienic indicator microorganisms used in the production and processing of milk.

Conclusions

1. Hygienic requirements on the concept of food safety and food traceability have led to the choice of the research theme, since sheep's milk cheeses are a product much demanded by consumers.

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2. Human has an important role in achieving and limiting microbial contamination, hygiene and sheep milk quality, and is often the carrier of a natural microflora.
 3. Impurities found in milk most often come from the animal's body: faeces, earth, plants, hair, epithelial cells. All of these are loaded with large amounts of microorganisms and they reach the milk during milking, especially of manual milking in large bowls.
 4. The use of low-fat cheese for cheese processing is a major risk, being an excellent nutrient medium for micro-organisms, they can continue to grow in cheeses by influencing their quality and sanitation.

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