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RESEARCH CONCERNING THE PHISICAL –CHEMICAL, MICROBIOLOGICAL CHARACTERISTICS OF THE GREEN EWE CHEESE OBTAINE IN THE SHEEP FARMS

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Abstract

The study of the hygienic and technological conditions during the processing of sheep milk on farms and small family workshops and the determination of the quality of some dairy products (ripened cottage cheese, fresh cottage cheese, whey cheese) led to the following data: from an organoleptic point of view, out of the 120 analyzed samples 55% showed deviations from the norms. They are mainly caused by the precarious conditions that can be found in the processing places (improvised dairies, with inadequate equipment and containers) as well as by the poor quality of milk in some farms and over some periods of time. The physico – chemical characteristics of the studied cheeses are well within the norms, when it comes to S.U., fat, proteins, water, but the sodim chloride exceeds with 20 – 25% the standard.

Key words: sheep's milk, Coliform Bacteria, Coagulase- positive Staphylococci, bacteriological exam, physicochemical exam

INTRODUCTION

Taking into consideration that most of the milk production is processed into dairy products, milk quality is analyzed in terms of its capability to be processed (BENCINI AND PULINA, 1997). In this context the quality and quantity of cheese depends mostly on the coagulation properties of milk (USTUNOL and Brown 1985; BUTTAZZONI and ALEANDRI 1990; Cavan et al 1991).

Sheep's milk can affect the consumer's health on some occasions, regardless of its significant nutritional and biological qualities.

The main objective in obtaining a high quality, hygienic, and wholesome milk consists of taking all possible measures to prevent the penetration of microbes in the milk from the milking stage to the consumer, as well as of preventing the development of microbes that have eventually infiltrated the milk (Man, 1996). The rules concerning milk hygiene must be satisfied, therefore, from the milking process until its final delivery to the consumer.

MATERIAL AND METHOD

The determinations were performed on samples of cottage cheese, the samples being collected from individual producers (sheepfold and public markets).

The fresh green ewe cheese was analyzed from an chemical (determination of fat using the acid-butyrometric method, with the help of the VAN-GULIK butyrometer or of the milk butyrometer, determination of dry substance, determination of proteinic substances, determination of Sodium Chloride) and microbiological point of view (determination of the number of Coliform bacteria per 1g of product, presence of Escherichia coli/1 g of product, presence of Salmonella/ 25 g of product, determination of the number of coagulase-positive Staphylococci per 1g of product, determination of the number of yeasts and molds per 1g of product).

Standardized appliances and methods were used for these determinations (ROTARU O şi col., 1994).

RESULTS AND DISCUSSIONS

The standard chemical characteristics that both ripened and fresh sheep's milk cottage cheese must have are presented in table 1.

Table 1

Chemical characteristics of green ewe cheese (OMS nr. 975/1998)

Characteristic	Sheep's milk cheese			Stas
	fresh	matured	salt	
GR/SU, % min	45	50	45	6352/2-87
Dry substance, % min	45	50	52	6344-88
Proteinic substances, %, min	16			6355-89
Salt, % max	0,5	0,5	4	6354-84

The following tables, 2 present the chemical characteristics of fresh green ewe cheese collected on location.

Table 2

Chemical characteristics of fresh green ewe cheese from the sheep exploitations

Place of collection	No. of samples	Chemical characteristics of fresh green ewe cheese (%)				
		Dry substance	Water	Fat	Salt	Proteinic substances
Cefa farm	30	44,5 ± 0,3	55,50 ± 0,3	46,6 ± 0,5	0,39 ± 1,1	18,20 ± 0,1
Osorhei farm	30	45,2 ± 0,9	54,80 ± 0,9	45,3 ± 0,8	0,68 ± 0,9	15,95 ±0,4
Sacuieni farm	30	44,2 ± 0,5	55,8 ± 0,5	47,2 ± 0,6	0,52 ± 1,2	17,45 ± 0,8
Tulca farm	30	46,7 ± 0,7	53,3 ± 0,7	44,8 ± 0,9	0,80 ± 0,7	16,50 ± 1,3

The physicochemical characteristics of the studied dairy products fit within the norms regarding dry substance, fat, proteins, water.

The standard microbiological characteristics that fresh and ripened sheep's milk cottage cheese must have are presented in table 3.

Table 3

Microbiological characteristics of green ewe cheese (OMS nr. 975/1998)

Characteristic	Sheep's milk cheese			Stas
	fresh	mature	salt	
Coliform Bacteria /1g of product	10		10	SR ISO 5541/1-94 SR ISO 5541/2-94
Escherichia coli/1g of product	1		absent	6349/4-80
Salmonella/25 g of product	absent		absent	6349/11-83
Coagulase-positive Staphylococci of product	10		10	6349/12-83
Yeasts and molds /1g of product	100		1000	6611-96

The results of the microbiological exam performed of green ewe cheese collected on location are presented in tables 4 (diagrams 1).

Table 4

Bacteriological characteristics of fresh green ewe cheese from the sheep exploitations

Place of collection	No. of samples	Coliform Bacteria / 1 g of product	Escherichia coli/1 g product	Salmonella/ 25 g product	Coagulase-positive Staphylococci / 1 g product	Yeasts and molds/ 1g product
Cefa farm	30	10 p. > 10 20 p. < 10	21 p. abs. 9 p. prez.	abs.	2 p. > 10 28 p. < 10	3p. > 100 27p. < 100
Osorhei farm	30	8 p. > 10 22 p. < 10	26 p. abs. 4 p. prez.	abs.	6 p. > 10 24 p. < 10	6p. > 100 24p. < 100
Sacuieni farm	30	7 p. > 10 23 p. < 10	25 p. abs. 5 p. prez.	abs.	3 p. > 10 27 p. < 10	5p. > 100 25p. < 100
Tulca farm	30	12 p. > 10 18 p. < 10	27 p. abs. 3 p. prez.	abs	5p. > 10 25 p. < 10	9p. > 100 21p. < 100
Total	120	69,17 % adequate samples 30,83% inadequate samples	82,5% adequate samples 17,5% inadequate samples	abs.	86,67 % adequate samples 13,33% inadequate samples	80,84 % adequate samples 19,16% inadequate samples

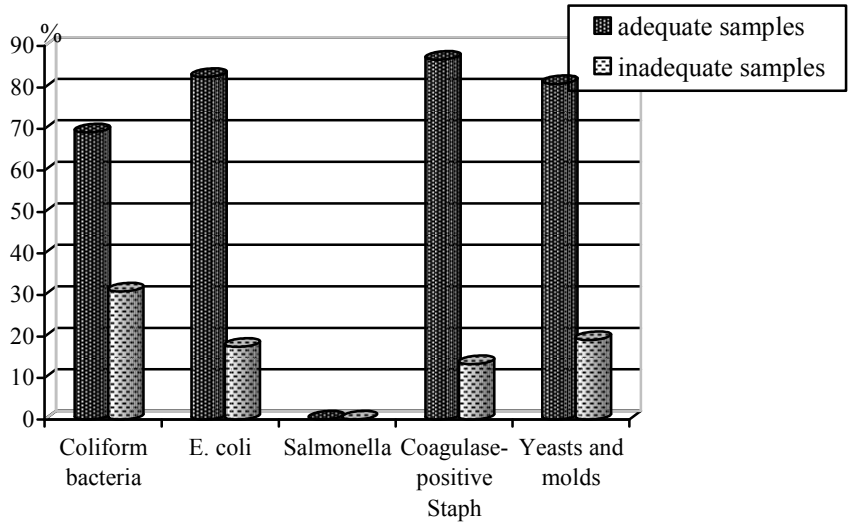

Fig. 1. Graphic representation of the Bacteriological of fresh unsalted sheep′s cream cheese

As to the bacteriological characteristics of fresh green ewe cheese, out of a total of 120 samples, 69,17% are adequate when it comes to Coliform Bacteria, 82,5% of the samples are adequate regarding Escherichia coli, 86,67% of the samples are adequate for the coagulase-positive staphylococcus, whereas 80,84% of the samples are adequate regarding yeasts and molds. Salmonella was absent in all of the studied samples.

CONCLUSIONS

All the samples collected from cheese dairies, public marketplaces and individual farmers contain Coliform Bacteria, and are therefore polluted with enteric bacteria. But it is important to point out that contained 39,16% of the fresh sheep whey cheese contain more than 10 coliform bacteria per gram, digressing from the O.M.S. provisions no. 975/1998. This fact indicates serious deficiencies regarding the hygiene of the milking process and the technological flux. It is worth mentioning that a high number of enteric bacteria induce unwanted changes in the processes of producing, maturing and preserving of various types of dairy products.

Identification of E. coli. With the help of specific tests, E. coli was identified in too high a number of samples: 17,5% in fresh green ewe cheese. Soiling of the milk used as raw material with animal feces is certain and this fact is hard to overcome, considering the poor conditions of hygiene in which the manual milking of the sheep is performed in Romanian farms.

The incidence of samples containing over 10 coagulase-positive Staphylococci per one gram of product is of 13,33% in the fresh green ewe cheese

Salmonella was not discovered in any of the analyzed samples.

Regarding the presence of yeasts and molds in the samples of analyzed dairy products as stipulated in O.M.S. nr. 975/1998, per 1g of product, the dispositions are exceeded in 19,16% of cases. The main causes of this situation are the poor work and hygiene conditions, which are reflected in the dairy products and in their quality.

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