

Production of traditional soft white cheese in Albanian families from cow's milk

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ABSTRACT

The production of traditional cheese in Albanian families from cow's milk has an early tradition and now yours is still largely being produced. This scientific paper is about to describe the traditional method and chemical composition of milk used to produce soft white cheese, the economic benefits of which are still widely used. The non-standardized milk used for the production of this type of cheese, has an average of 3.53% fat, according to the sisters that were taken from 25 families in different villages of Kosova. The amount of milk used for production is from 5 l to 20 l of milk for a production process. The required amount of milk for the production of one kilogram of cheese is from 3.5 l to 4 l of milk. We have continuously followed the whole process of cheese production: from milking the cows to preparing the cheese for the market. We performed three experiments for each family (25 families in total) and took three samples from each family for both milk and cheese (75 analysis of milk and 75 analysis of cheese = 150 x 11 = 1650 analysis in total). We made the calculations statistically.

Physico-chemical analyzes of milk and cheese were performed at the National Agricultural Institute of Kosova in Peja.

Keywords: Cows, Milk, non-standardization, white cheese, traditional, Albanian families.

Introduction

The livestock sector is one of the most important agricultural sectors, whose production in some European countries participates with about 50-60% in the value of agriculture (Netherlands, Denmark, Finland).

Thus, cattle are estimated to be the largest producers of milk and meat in the world, namely the basic items with high albumin value for human food as well as raw material for the food processing industries. In developed European countries about 60% of albumin of animal origin for daily

human consumption is provided by bovine products (milk, meat, and dairy and meat products (Row milk, Shukri MAXHUNI, 2013).

Albanians have an ancient tradition in using types of milk: cows, sheep, goats, and buffaloes. Thus, a long tradition of large-scale use of dairy products has pushed them to process milk into various products, and in particular the traditional soft white cheese in almost all villages of Kosova, without excluding even in some civic family's villages of Kosova, without excluding some family's citizen.



Photo.1. Simental breed of Farmer Leonora Lubovci, in Grajkoc of Suhareka, October 2021, Kosova.

Milk Proteins

Protein is an essential part of our daily diet. The proteins we eat for our needs are broken down into simpler compounds in the body in the digestive system and the liver.

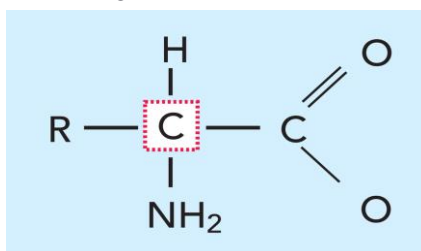
These important compounds for the organism are then transmitted to the cells of the body where they are used as a building material for building body proteins. Say that most of



the various chemical reactions that take place in the body are controlled by certain active proteins, called enzymes.

Proteins are important giant molecules and are made up of smaller units called amino acids. Such a protein molecule consists of one or more such interconnected amino acid chains, wherein the amino acids are arranged in a certain order. Such a protein molecule usually contains about 100 - 200 bound amino acids, but it is known how the smallest and much larger numbers make up a protein molecule. Amino acids, which are the building blocks that make up a protein, are distinguished

by the simultaneous presence of an amino group ($-NH_2$) and a carboxyl group ($-COOH$) present in the molecule. Proteins are formed from a specific type of amino acid, amino acid α . So amino acids have an amino group and a carboxyl group, which are linked to the same carbon atom, α -carbon. These amino acids belong to the group of chemical compounds that can release hydrogen ions into alkaline solutions and absorb hydrogen ions into acidic solutions, and such compounds are called amphoteric electrolytes or ampholytes.



A general structure of amino acid. R in the figure indicates that the organic material is attached to the central carbon atom.

The main milk protein, casein, as such is not considered denaturable by heat within limits normal pH, salt, and protein content.

On the other hand, whey proteins, especially β -lactoglobulin which makes up about 50% of the total protein of whey, are quite sensitive to the presence of heat. Their denaturation starts at $65^\circ C$ and is almost completely denatured when whey proteins are heated to $90^\circ C$ for five minutes.

This denaturation of heat for whey proteins is an irreversible reaction. Until randomly wrapped proteins "open"

and in particular the β -lactoglobulin protein is interconnected by the prominent κ -casein chain from the sulfur bridge.

Blocking a large part of the protein κ -casein interferes with the absorption capacity of milk, because yeast - the mulch used for milk conception and cheese production, is hindered in its action to separate κ -casein from casein micelles.

Milk proteins are: Casein, α_1 -casein *, α_2 -casein *, β -casein, κ -casein, γ -casein; Serum proteins: α -lactalbumin, β -lactoglobulin, Serum Albumin, Immunoglobulins, Miscellaneous (including Proteose-Peptide), Miscellaneous (Membrane incl proteins) (Dairy Processing Handbook, @ Tetra Pak 2019 Sweden).

Table. 1. Results of Physico-chemical analysis of fresh milk

Milk Samples								
Methods		MF-50 Moisture analyzer	Laktoscan			Titrimetry	pH - Mettler Toledo	
Nr.	Codes	Dry matter %	Proteins %	Fat %	Lactose %	Acidity (ml 1N KOH/100 ml)	pH	Water
1	G ₀	13.2	4.0	3.5	4.3	4.0	6.9	86.8
2	G ₁	11.9	3.2	3.5	4.3	6.1	6.9	88.1
3	G ₂	11.4	3.4	3.6	4.4	4.8	7.0	88.6
4	Average	12.16	3.5	3.53	4.33	4.96	6.93	87.84

Work Material Cow's Milk

For the production of soft white cheese with the traditional method, we studied and analyzed non-standardized milk used with an average of 3.53% fat, according to sisters taken from 25 families in different villages of Kosova. The amount of milk used for production is from 5 l to 20 l of milk for a production process. The required amount of milk used on

average for the production of one kilogram of cheese is from 3.5 l to 4 l of milk. The average number of microorganisms per milliliter in milk samples is 1,975,000 m.o/ml.

We have continuously followed the whole process of cheese production: from milking the cows to preparing the cheese for the market. We performed three experiments for each family (25 families in total) and took three samples from

each family for both milk and cheese (75 analysis of milk and 75 analysis of cheese = $150 \times 12 = 1,800$ analysis in total). We made the calculations statistically.

Work methods

Physical-chemical analyzes of milk and cheese were performed at the National Agricultural Institute of Kosova in Peja with international standard methods.

1. For the definition of pH value were used the pH - Mettler Toledo
2. Soxhlet-Henkels method was used to define sour taste, Titrimetri Acidities' (ml 1N KOH/100 ml)
3. For Physical-chemicals utilized LACTOSCAN-D -90,
4. For the definition of Nitrogen (N) were used Khejda's method,
5. For the definition of fat percentage % were using the method of Gerber,
6. For the definition of dry matters until drying up of constant mass, *MF-50 (Moisture analyzer)* Dry quantity of mass without fat has been done in a calculated way,

7. Water quantity has been done in a calculated way,
8. For the definition of saline's (NaCl) with Titrimetri,
9. Microbiological analyzes of milk were done by the standard method **ISO 11290**.
10. IDF Standard 17 A, 1972 & Manual of Methods of Analysis of Foods, Milk and milk products, 2005.

How to make white cheese traditionally from cow's milk

For the production of white cheese traditionally: first the milk in an average amount of 10 l should be warmed to room temperature, then a spoonful of cheese is poured on top and wrapped to maintain the temperature. After a while, for three to four hours, the brine begins to form - the clot and begins to release the whey.

After this time, the coagulum is removed from the whey and it begins to coalesce into a cheese bread dough that is left for 24 hours at room temperature compacted and then placed in a salted liquid, where it must stand for another 24 hours and be prepared to 'were eaten'.



Fresh white cheese traditionally produced.

Diagram of production of soft white cheese traditionally in the villages of Kosova
From 5 l to 20 l of milk for a production process

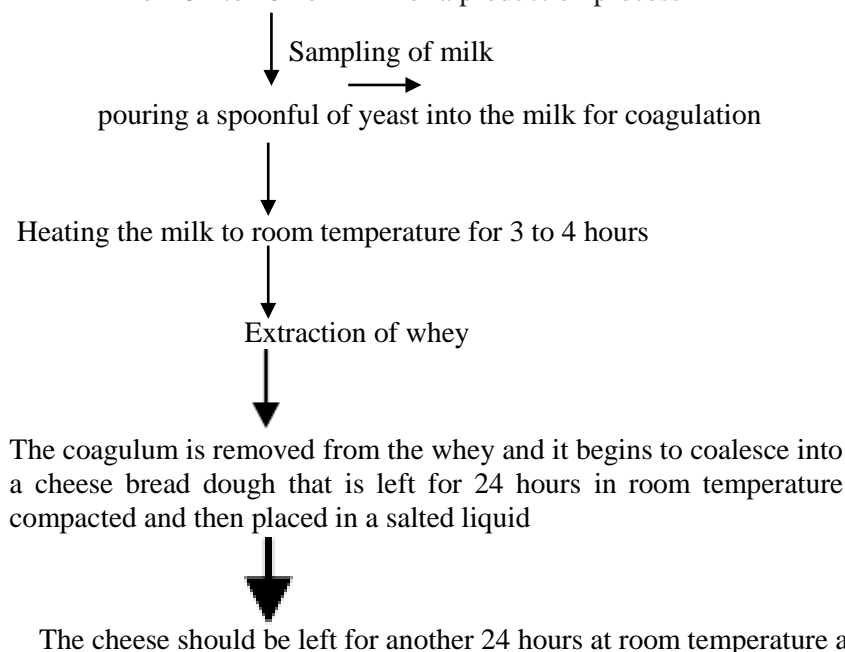




Table. 2. Results of Physico-chemical analysis of fresh cheese

Cheese Samples						
Method's		MF-50 (Moisture analyzer)	Khejdal	Soxhlet	Titrimetri	pH - Mettler Toledo
Nr.	Water	Dry matter %	Proteina %	Yndyra %	NaCl %	pH
1	57.8	42.2	13.6	8.2	2.5	7.3
2	57.1	42.9	14.5	8.0	2.4	7.2
3	57.3	42.7	14.1	8.3	2.6	7.4
Average	57.4	42.6	14.06	8.16	2.5	7.3

Results and Discussion

Without milk quality, we cannot make good cheese.

The percentage of fat, proteins, acidity, and microbiological purity content of milk affects cheese formation. While fat plays a big role in the taste and consistency of production the cheese, proteins also play a crucial role in soft white cheese making. In the dairy milk industry, **casein** is a family of proteins that coagulate around lactose and fat in the milk and solidify to form the cheese. So, why does casein solidify and produce soft cheese while other proteins don't?

For the production of soft white cheese with the traditional method, we studied and analyzed non-standardized milk used with an average of 3.53% fat, according to sisters taken from 25 families in different villages of Kosova. The amount of milk used for production is from 5 l to 20 l of milk for a production process. The required amount of milk used on average for the production of one kilogram of cheese is from 3.5 l to 4 l of milk. The average number of microorganisms per milliliter in milk samples is 1,975,000 m.o/ml.

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placed in a salted liquid, where it must stand for another 24 hours and be prepared to 'were eaten.

The results obtained from the production of white cheese by the traditional method are as follows: the average pH is 7.3. The average percentage of fat is 8.16%. The average percentage of protein is 14.06%. The average percentage of NaCl is 2.5%. The average percentage of dry matter is 42.6%. Whereas, the average percentage of water is 57.4%.

Conclusions

- The quality of milk is the main factor if having a product with the right standards. Also, the production conditions are another very important factor for the production of cheese, which is what bothers this method of production of this type of cheese.
- Farmers for the production of this type of cheese with this traditional method, give everything from the car and the opportunities they have, to produce a cheese of the highest quality and with the highest nutritional wine.
- Milk used for the production of cheese traditionally, does not meet the hygienic conditions according to international standards, where the average number of microorganisms per miller is 1,975,000 m. o / ml.
- Fresh soft white cheese produced from cow's milk, has a soft, light, and sharp aroma with a soft, creamy finish that is almost fluffy.
- The conditions of cheese production are no longer appropriate standards in the houses where this cheese is produced, such as constant temperature, immediate cooling, storage conditions. ...
- In general, farmers in Kosova are in a very difficult situation economically and with very low subsidies from Government. As such, they do not have the opportunity to create favorable conditions for quality dairy products.
- Cheese as such is produced by farmers and sold in markets throughout Kosova.



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