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RESEARCH ON THE QUALITY OF TRADITIONALLY CHEESE COMMERCIALIZED IN THE AGRI-FOOD MARKETS LOCATED IN BEIUȘ AND ȘTEI MUNICIPALITIES, BIHOR COUNTY

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Abstract: The present study focuses on analyzing the physicochemical properties and nutritional composition of cheeses, with a particular emphasis on the preservation of traditional methods while meeting modern quality and safety standards. Last but not least, the research also investigates methods for detecting the falsification of cheeses, such as counterfeiting with non-traditional milk types or other non-compliant ingredients. The findings highlight the importance of preserving Romania's cheese-making traditions while ensuring product authenticity, quality, and safety in response to contemporary consumer demands.

Keywords: cheese, quality, hygiene, physicochemical characteristics

• Introduction

Cheeses are products made by processing milk obtained from different species, which are highly appreciated by consumers, not only in Romania but also worldwide.

The production of traditional cheeses in different regions of our country has a considerable tradition, especially in the south-eastern part of Romania, but also in mountainous areas like Carpathian Mountains. A large part of the cheeses are produced in small-scale units, following traditional recipes, which has made it possible to obtain a diverse number of varieties that are commercialized mainly on the local market. Traditional Romanian cheeses are typically produced using artisanal methods that have been passed down through generations.

The quality of these cheeses is influenced by various factors such as milk type (cow, sheep, goat or buffalo), natural fermentation processes, and specific ripening conditions, often in wooden barrels or caves. Sensory attributes, including texture, flavour, and aroma, are largely shaped by traditional production methods and the use of native microbial cultures. In addition to their distinctive organoleptic properties, these cheeses exhibit notable nutritional benefits, being rich in proteins, fats, and minerals.

• Material and method

Between May and June 2021, a total of 15 samples representing different assortments of traditionally produced cheeses from two agri-food markets located in Bihor County were collected. The cheeses were gathered in the form of whole pieces, in a quantity of approximately 250 grams. The varieties monitored belonged to the following categories: sweet cow's cheese, cottage cheese, soft cheese, sweet curd, salted curd, cheese curd, ripened cottage cheese and sweet udders (Fig. 1). Samples were collected in sterile polyethylene bags and individually labeled. The date on which the sample was collected and the assortment were noted on the label. The samples were transported to the laboratory under refrigerated conditions. The samples were transported to the laboratory under refrigerated conditions as soon as possible.



Fig 1. Different types of cheese sold at the two food markets

In order to determine the quality, salubrity and authenticity of the assortments, physicochemical and microbiological analyses were carried out. The concentration of sodium chloride, water and the percentage of fat and dry matter were determined together with the detection of counterfeit cheeses made from sheep's milk by the addition of cow's milk. For this determination, the "I.C. Bovino" test was used. The principle of the method is based on the formation of the antigen-antibody complex, with the production of a colored compound on the test strip. The test is used to detect immunoglobulin G, specific for cow's milk, in cheese declared as made from sheep's or buffalo milk.

• Results and discussions

The results of the tests for the presence of cow's milk in cheeses declared as made only from sheep's or buffalo milk, based on the identification of immunoglobulin G, are summarized in Table 1. Following the interpretation of the results, out of the 15 cheese samples analyzed, 7 (46.6%) contained cow's milk. Of these samples found to be counterfeit, 13 (86.6%) were declared as sheep and 2 (13.4%) as buffalo cheese.

Table 1. I.C. Bovino Test Results

No.	Cheese variety	Origin of Raw Milk	I.C. Bov.
1.	Sweet curd	Sheep	-
2.	Salted curd	Sheep	-
3.	Ripened cheese	Buffalo	+
4.	Ripened cheese	Sheep	-----
5.	Cheese	Sheep	+
6.	Ripened cheese	Sheep	-
7.	Burdul Cheese	Sheep	+
8.	Ripened cheese	Sheep	--
9.	Sweet curd	Sheep	+
10.	Sweet curd	Sheep	+
11.	Sweet curd	Sheep	+
12.	Sweet curd	Sheep	-
13.	Ripened cheese	Sheep	+
14.	Ripened cheese	Buffalo	-
15.	Sweet curd	Sheep	-

Table 2. Results of the physicochemical composition of cheese varieties

No.	Cheese variety	T.D.S.%	Water%	Fat/T.D.S.%	NaCl%
1.	Sweet curd	50,90	49,10	64,14	-
2.	Salted curd	40,28	59,72	49,65	3,73
3.	Ripened cheese	43,48	56,51	56,33	4,58
4.	Ripened cheese	49,49	51,51	51,55	3,55
5.	Cheese	26,01	73,99	0	-
6.	Ripened cheese	69,66	30,34	30,14	1,68
7.	Burdul Cheese	54,86	45,13	41,91	8,74
8.	Ripened cheese	38,86	61,13	69,46	2,47
9.	Sweet curd	45,05	54,95	49,83	2,95
10.	Sweet curd	39,43	60,57	39,31	2,59
11.	Sweet curd	38,01	61,98	39,45	-
12.	Sweet curd	38,82	61,18	45,07	-
13.	Ripened cheese	48,06	51,94	65,54	-
14.	Ripened cheese	45,19	54,81	45,14	4,34
15.	Sweet curd	54,18	45,82	44,29	-

• Conclusions

Fraud by adding cow's milk to cheese declared as sheep's milk or buffalo milk (reported in some cases) can lead to variation in the chemical composition of the assortment which is reflected in a lower nutritional value of these products.