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Technical, Physical, Chemical and Microbiological Analyses of Siirt Herby Cheese

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Abstract: A total of 19 production and sales points were inspected for their technical and hygiene status. Hygienic inadequacy and labeling deficiencies were determined in the relevant workplaces and products. A total of 20 herby cheese samples taken from the sales points were also analysed for their quality control. The mean±standard deviation (%) values of the samples were determined to be 1.9±0.7 for lactic acid, 49.6±4.8 for dry matter, 46.8±9.2 for fat in dry matter, 5.6±1.5 for ash, 2.9±0.7 for salt in dry matter and 65.7±6.1 moisture in cheese fat-free mass. The mean (log_{10} cfu/g) values of the samples were determined as for total mesophilic aerobic bacteria; 8.7±0.99, *Enterobacteriaceae*; 6.8±2.7, coliform group bacteria; 4.6±2.8, coagulase positive staphylococci; 5.0±1.3 and yeasts- moulds; 8.1±1.3. The cheese has economic importance for the province of Siirt. But, production and sales have been remained at the traditional scale. The contribution of Siirt herby cheese to the economy of the city could be increased by applying standard and hygienic procedures for the cheesemaking.

Keywords: Siirt herby cheese, Economy, Regulations, Hygiene, Quality

Siirt Otlu Peynirinin Teknik, Fiziksel, Kimyasal ve Mikrobiyolojik Analizleri

Özet: Toplam 19 üretim ve satış noktası teknik ve hijyen açısından denetlendi. İlgili işyerlerinde ve ürünlerde hijyenik yetersizlikler ve etiketleme eksiklikleri gözlendi. Satış noktalarından alınan toplam 20 adet otlu peynir numunesi de kalite kontrolleri için analiz edildi. Örneklerin ortalama±standart sapma (%) değerleri laktik asit için 1.9±0.7, kuru madde için 49.6±4.8, kuru maddede yağ için 46.8±9.2, kül için 5.6±1.5, kuru maddede tuz için 2.9±0.7 ve peynir yağsız kitlesinde nem için 65.7±6.1 olarak belirlendi. Örneklerin ortalama (log_{10} cfu/g) değerleri toplam mezofilik aerobik bakteriler için 8.7±0.99, *Enterobacteriaceae* için 6.8±2.7, koliform grubu bakteriler için 4.6±2.8, koagülaz pozitif stafilokoklar için 5.0±1.3 ve mayalar-küfler için 8.1±1.3. Bu peynir Siirt ili için ekonomik öneme sahiptir. Ancak üretim ve satışlar geleneksel ölçekte kalmıştır. Siirt otlu peynirinin şehir ekonomisine katkısı, peynir yapımında standart ve hijyenik prosedürler uygulanarak arttırılabilir.

Anahtar Kelimeler: Siirt otlu peyniri, Ekonomi, Mevzuat, Hijyen, Kalite

1.Introduction

Many varieties of cheese are produced in Turkey. White pickled cheese, kashar cheese and tulum cheese are the most produced ones among them. It has been reported that the consumption of herby cheese per capita is 14.74 kg/year and the Turkey average is 3.2 kg/year in the Eastern and Southeastern regions, where herby cheese consumption is intense (1). There are Siirt, Batman, Bitlis, Hakkari, Erzincan and Trabzon herby cheeses in Turkey. Among them, only Van herby cheese has geographical indication certificate (2). The herbs sirmo, mendo, heliz, wild mint, thyme and siabo and 13 other herbs are mostly used for herby cheese production. The cheese should be left in ripening for at least 4 m when raw milk is used in production and 30-60 d when pasteurized milk is used. Siirt herby cheese, which is an indispensable dairy product on the tables of the people of Siirt, is a type of cheese similar to Van herby cheese which is a semi-hard cheese. It is produced from raw sheep's milk or from a mixture of sheep, cow and goat milk. While the main herb added to cheese is sirmo (sirik, Allium sp.), heliz (Ferula orientalis) and çiriş (Eremurus spectabilis) are also used (2). Differences among Siirt herby cheese and other herby cheeses produced in Turkey has not been investigated yet extensively. Nevertheless, also, chemical composition and hygienic quality of the Siirt herby cheeses have not been investigated extensively yet (3). The minimum technical and hygienic criteria for cheeses are set by official documents and official inspections are carried out accordingly (4-8).

Numerous studies have been conducted on Van herby cheese (9-14). However, very little research has been done on Siirt herby cheese. Due diligence on field samples is necessary in terms of providing basic data for scientific studies. In this study, Siirt herby cheese samples taken from

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sales points were analyzed to the economic and public health aspect of Siirt herby cheese was evaluated. In addition, observations were conducted at production and sales points. The Turkish Standards Institute (TSE) Herby Cheese Standard (TS 13205) (15), Turkish Patent Institute (TPE) Van Herby Cheese Geographical Indication (No: 405) (2) and Turkish Food Codex (TFC) Cheese Communique (No. 2015/6) was benefited for evaluations (4).

2. Materials and Methods

2.1.Status of production and sales points

The findings obtained by observations and interviews with the officials of 14 small production and/or sales points and 5 chain market branches in Siirt city center were evaluated for their compliance with the Turksh Food Codex (4, 5, 7, 8) and related Turkish Standard (6).

2.2.Analysis of Siirt Herby Cheese samples taken from sales points

At least 250 g sample from each of 20 randomly selected sales points in Siirt province, were brought and transferred to the lab within 2 hours. After each sample was mixed thoroughly in a sterile sample bag and turned into a homogeneous sample, it was used in analyzes. Each analyze was repeated 3 consecutive times.

The pH was measured by using a digital pH meter (Milwaukee AZ8686, USA). Titratable acidity (lactic acid, %) was determined by using 0.1 N NaOH and phenolphtalein indicator. The dry matter and ash were determined gravimetrically. The fat content was determined by using Van Gulik method. The salt was determined titrimetrically (15).

For microbiological analysis, reference methos were applied as mentioned in the book of Pouch and Iko (16). Briefly, 10 g of each sample was used for making ten-fold serial dilutions in diluted in 90 ml of steril physiological saline (PS). For mesophilic aerobic bacteria (MAB), Plate Count Agar (PCA, Oxoid CM 0463) was used and the petri dishes were incubated at 30±2°C for 72 h. For *Enterobacteriaceae*, Violet Red Bile Glucose Agar (VRBGA, Oxoid-CM0485) was used for the enumeration of the coliforms, and procedures were performed as instructed on the medium. For coliforms, Violet Red Bile Lactose Agar (VRBLA, Oxoid CM0107) was used. Petri dishes were incubated for 24 hours at 30 °C, the growing pink-red colonies with a pink precipitation ring around were counted. For coagulase positive staphylococci, Baird Parker Agar plates including Baird Parker Agar Base (BPA, Oxoid CM1127) and Egg Yolk Tellurite Emulsion (Oxoid SR0054) were used. The plates were incubated at 37°C for 48 hours. Black shiny coagulase positive colonies with a diameter of 1.5-2.5 mm with a transparent zone around were counted. For yeast – moulds, Yeast Extract Glucose Chloramphenicol Agar (YGCA, Merck 1.16000) was used and the petri dishes were incubated at 25°C for 5 d. Colonies formed on the medium were counted.

2.3.Statistical analysis

The mean values of the samples and the standard deviation values between the samples were calculated by using the Microsoft Excel program.

3. Results

3.1. Status of production and sales points

Local herby cheese production and sales points (14 businesses): During the visits, we personally have inspected some inconveniences at the production and sales points. There were no adequate hygienic prequestions from production places. The cheese making staff had no adequae hygiene prequations during cheese making. Cheese curd and prepared cheese bags were mostly left at room temperature because of unavailability of adequate refrigerators. There were no labels on the prepared cheese bags. We could not demonstrate the sales points as hygienic as required.

Chain Market Branches (5 businesses): One branch of each of 5 different national chain markets operating in the city center of Siirt was visited and the sales department managers were interviewed. It has been observed that the cheeses are the products of local producers, they are kept in plastic bins of 1, 2, 5, 10 and 20 kg, on the cold shelf or in the refrigerator of the market, there are letters and/or numbers on the products with a felt-tip pen, but there is no label. Although there is Van herby cheese in these businesses, its sales are reported to be at most 5% of Siirt herby cheese. In these enterprises, it was observed that the market aisles were cleaner than the above-mentioned production areas and the products were kept under the cold chain. It was understood that these markets bought and sold these products from the herby cheese production points mentioned above, and they did not produce their own. Siirt herby cheese is sold in most of the grocery stores and markets in the city center.

3.2. Analysis of Siirt Herby Cheese samples taken from sales points

The pH, acidity, dry matter, fat, ash and salt levels in the samples are shown in Table 1. The mean values of the analyzes were 5.3±0.5 for pH, 1.9±0.7 % lactic acid, 49.6±4.8 for % dry matter, 46.8±9.2 for % fat in dry matter, 5.6±1.5 for ash and 2.9±0.7 for salt in dry matter.

Table 1: Phsical and chemical analysis results of Siirt herby cheese samples taken from sales points in Siirt.

Sample No.	pH	St. deviation	Lactic acids. %	St. deviation	Dry matter. %	St. deviation	Fat in dry matter. %	St. deviation	% Ash	St. deviation	Salt in dry matter. %	St. deviation
1	5.9	0.1	1.9	0.1	54.6	2.8	43.0	4.9	4.9	0.2	2.6	0.0
2	5.6	0.0	1.6	0.2	55.6	2.8	55.8	3.8	7.6	0.1	2.9	0.0
3	5.2	0.0	1.6	0.2	49.0	1.9	63.3	2.2	7.0	0.2	3.4	0.4
4	5.5	0.0	4.1	0.1	54.3	0.2	52.9	3.3	6.2	0.4	2.9	0.5
5	5.2	0.0	1.7	0.1	48.5	3.2	43.9	0.8	6.3	0.0	2.6	0.1
6	5.8	0.0	0.8	0.2	34.6	1.7	63.5	2.2	7.4	0.8	4.5	0.2
7	5.1	0.0	2.3	0.2	49.4	1.6	42.5	3.3	1.2	0.3	1.1	0.1
8	5.1	0.0	2.0	0.3	48.7	3.4	51.9	0.7	4.9	0.2	2.1	0.0
9	4.8	0.0	2.8	0.3	57.9	6.1	51.4	0.7	8.1	0.4	2.8	0.0
10	5.4	0.0	1.7	0.2	47.1	1.3	57.8	0.6	5.7	0.3	2.8	0.2
11	5.0	0.0	1.9	0.2	43.5	0.5	43.1	0.8	3.7	0.5	2.1	0.0
12	4.4	0.0	2.0	0.3	50.6	1.2	47.9	0.7	5.3	0.8	2.7	0.1
13	5.2	0.0	1.8	0.2	47.7	7.7	49.8	0.7	5.1	0.1	3.5	0.1
14	4.6	0.0	2.5	0.2	50.2	1.9	32.9	0.0	6.1	0.6	3.9	0.1
15	5.6	0.0	2.3	0.2	52.3	0.9	36.8	6.7	4.8	0.5	3.6	0.3
16	6.0	0.0	1.3	0.3	48.2	0.2	48.7	4.4	5.5	0.3	3.7	0.1
17	5.3	0.0	2.1	0.2	51.3	3.5	31.2	6.8	5.1	0.1	2.8	0.1
18	4.9	0.0	1.9	0.3	47.7	3.2	38.7	0.0	5.1	0.3	2.4	0.1
19	5.9	0.0	1.2	0.2	51.5	1.9	48.0	3.7	6.3	0.0	3.0	0.1
20	6.4	0.0	1.1	0.2	49.2	1.9	37.1	1.0	5.2	0.0	2.5	0.1
Mean	**5.3**	**0.5**	**1.9**	**0.7**	**49.6**	**4.8**	**46.8**	**9.2**	**5.6**	**1.5**	**2.9**	**0.7**
Least	4.4	0.0	0.8	0.2	34.6	1.7	31.2	6.8	1.2	0.3	1.1	0.1
Most	6.3	0.0	4.1	0.1	57.9	6.1	63.5	2.2	8.1	0.4	4.5	0.2

Microbiological analysis results of each sample are shown in Table 2. The mean numbers (log_{10} cfu/g) of mesophilic aerobic bacteria, *Enterobacteriaceae*, coliform group bacteria, coagulase positive staphylococci and yeasts- moulds were determined to be 8.7±0.99, 6.8±2.7, 4.6±2.8, 5.0±1.3 and 8.1±1.3, respectively.

Table 2: Microbiological analysis results of Siirt herby cheese samples taken from sales points in Siirt (log_{10} cfu/g).

Sample No.	Mesophilic aerobes	St. deviation	*Enterobacteriaceae*	St. deviation	Coliforms	St. deviation	*Coagulase positive staphylococci*	St. deviation	Yasts- moulds	St. deviation
1	7.6	0.0	1.0	0.0	1.0	0.0	3.4	0.0	7.2	0.0
2	8.8	0.1	7.4	0.0	6.8	0.2	5.1	0.0	8.4	0.1
3	8.6	0.2	1.0	0.0	1.0	0.0	3.7	0.1	5.7	0.2
4	7.4	0.1	1.0	0.0	1.0	0.0	3.2	0.1	6.1	0.0
5	9.7	0.1	8.7	0.1	7.9	0.3	5.3	0.2	9.4	0.0
6	8.0	0.1	5.7	0.4	4.8	0.1	5.6	0.2	7.8	0.2
7	8.9	0.0	6.1	0.2	6.7	0.1	5.4	0.2	8.4	0.2
8	10.4	0.2	9.9	0.1	7.3	0.4	5.6	0.2	10.1	0.3
9	8.5	0.0	7.5	0.0	1.0	0.0	4.4	0.0	7.4	0.0
10	8.7	0.1	8.3	0.2	3.6	0.1	3.8	0.0	8.5	0.1
11	9.9	0.0	9.7	0.2	5.5	0.1	3.4	0.1	9.6	0.0
12	9.5	0.0	7.3	0.3	3.4	0.1	4.3	0.1	6.6	0.1
13	7.9	0.0	7.8	0.0	6.2	0.0	5.7	0.3	7.9	0.1
14	8.5	0.0	7.3	0.1	1.0	0.0	3.5	0.1	7.4	0.2
15	8.7	0.0	7.1	1.0	1.0	0.0	5.0	0.1	7.0	0.0
16	7.7	0.0	7.7	0.1	4.7	0.0	7.0	0.0	7.8	0.1
17	9.8	0.1	9.2	0.0	6.9	0.1	6.2	0.1	9.1	0.0
18	9.1	0.1	7.3	0.1	9.0	0.1	7.3	0.0	9.8	0.0
19	8.3	0.1	7.3	0.0	5.1	0.2	5.6	0.1	8.5	0.1
20	7.7	0.0	7.7	0.1	7.5	0.1	7.2	0.1	10.0	0.1
Mean	**8.7**	**0.9**	**6.8**	**2.7**	**4.6**	**2.8**	**5.0**	**1.3**	**8.1**	**1.3**
Least	7.4	0.1	1.0	0.0	1.0	0.0	3.2	0.1	5.7	0.2
Most	10.4	0.2	9.7	0.2	9.0	0.1	7.3	0.0	10.1	0.1

4. Discussion and Conclusion

It has been reported that raw milk and raw milk cheeses are responsible for 96% of food poisonings caused by consumption of dairy products in the USA (17). Çetin and Durlu Özkaya (18) have demonstrated that cheese is playing an important role in food poisoning cases, and health risks of some dairy products in Turkey between the years 2014 and 2018.

Minimum requirements for production, packaging, labeling and sales points for cheese are stated in the Turkish Food Codex Cheese Communiqué (4). In the codex (4), packaging (Article 13/1), labelling (Article 14/1), product names (Article 4) or local/national names (Article 14/1a) have been regulated as standards for retailed cheese. Cheeses produced from raw or thermized milk are ripenned under cold storage for at least 4 months (Article 5/c). The ripening time period of the cheeses is stated as "has been ripened at least …d or mo" on their labels. Our inspection results have demonstrated that the regulations mentioned abowe have not fully followed as minimum requirements for production and sales process by the relatives.

In many studies, it is concluded that herby cheeses sold in Turkey are unhealthy, poor quality, risky for public health (19-23). Kurt and Akyüz (24) reported in 1984 that primitive conditions should be abandoned and production should be carried out in modern factories. Likewise, the results of this study and formerly made studies demonstrate that the total amount of Siirt herb cheese produced under primitive conditions, and thus the hygienic quality and chemical parameters are variable as seen in Tables 3 and 4.

According to the Codex on the Supply of Raw Milk (8), only the supply of raw milk produced in a milk producing livestock enterprise with permission from the competent authority is allowed (Article 5/1). Farms must have a disease-free certificate (Article 5/2). The Siirt herby cheese is made from raw sheep's and/or goat's milk. We don't have information about the control and certification of herds and raw milk used for Siirt herby cheese production. Also, we could not find any production time or ripening time period for the cheese at the retail.

In the Herby Cheese Standard (6), it is stated that the amount of milk fat in dry matter should be at least 45%, humidity at most 60% and salt amount at most 7.5%. The minimum, (average) and maximum values (%) for the cheese are listed in the Geographical Indication Certificate as such: dry matter (%) 46.78 (43.81) 47.78, protein (%) 22.17 (20.60) 25.52, fat (%) 17.29 (16 .75) 19.21, ash (%) 6.85 (5.07) 7.45, salt (%) 5.73 (4.60) 6.9. When it is classified in terms of % Moisture in Cheese Fat-Free Mass in cheese standards, herby cheese has been reported to be from the semi-hard cheese group, which falls between 57-64% values (6, 20). The % of Moisture in Cheese Fat-Free Mass of cheese samples analyzed was not less than 57%. The mean percentage was determined as 65.7±6.1% (data not given elsewhere).

According to the herby cheese standard (6), herby cheeses should contains at least 45% milk fat in dry matter, that is, it should be in the full-fat cheese category. It was observed that the average findings of the samples were compatible with the value specified in the Standard as shown in Table 1, and 15 samples were in the full-fat cheese category. However, 6 samples from the brined herby cheese samples and seven samples from the dry salted samples did not comply with the Standard as shown in Table 3. It has also been revealed in other studies that herby cheeses sold in the market have not been standardized in terms of fat contents. The results of this and formerly made studies were comparatively given in Table 3. The non-standardization of the production process and the variables from milk used in the production during traditional production has been shown to cause this situation (25). We also demonstrated in this study non-statndardized fat contents from the cheese samples.

The findings of previously made studies ant this study were evaluated in the light of the Turkish Herby Cheese Standard (6). As shown in Table 3, the most of the samles analyzed was out of the Standard values. Only dry matter and results obtained from this study were in compliance with the Herby Cheese Standard (6). Nevertheless, dry matter rates of the two (10%) samples dry matter were minimum 45%), and did not comply with the Standard. Dry matter values found in these two samples are also below the value (at least 43.81%) reported in the Van herby cheese geographical indication certificate (2). Although the production methods of pressed herby cheese are different, their chemical compositions are similar to Erzincan tulum cheese. The humidity rate for Erzincan Tulum cheese has been reported to be 45% at most (50% in low-fat and fat-free tulum cheeses) in the Standard (20). However, this value was reported to be higher (at most 60%) in herby cheese. This value is similar to the value of white cheese. In addition, the minimum 45% dry matter and maximum 60% moisture values in the herb cheese standard do not complement each other. As as shown in Table 3 and Table 4, many of the samples analyzed in previously made studies and in this study have not been in compliance with the standard regulations.

Salt values have been reported as maximum 7.5% in Herby Cheese standard (6), and maximum 6.9% in Van Herby Cheese Geographical Indication Certificate (2). However, we suggest that the maximum value allowed in other tulum cheeses, which is 6%, is also in non-brined herby cheeses, which we prefer to express as herby Tulum cheese in this study. In the Cheese Communiqué (4), a maximum of 7.5% salt rate in dry matter is allowed in brined cheeses. As shown in Table 3, the values given belong to herby tulum

cheeses and there are samples containing 2-3 times more salt than allowed. In order to produce herby cheese with salt content in accordance with the standards, first of all, its technology must be developed and then its production must be carried out in licensed enterprises that have a technological competence certificate. Officially inspected licensed production facilities are needed

In the Turkish Food Codex Microbiological Criteria Regulation (9), it is stated that, as a hygiene criterion, the number of coagulase-positive staphylococci in cheese should not exceed the 104 cfu/g. The values of other microorganisms analyzed (total mesophilic aerobic bacteria, In a study, it was reported that the staphylococcal numbers were within standard values (29). When examined in terms of coagulase-positive staphylococci, which is the only value included as a hygiene criterion in the legal document, it was seen that the herby cheeses on sale did not comply with the standard as shown in Table 4.

Herby cheeses made after pasteurization of different milks were vacuum packed and their chemical changes have been investigated for 90 d (30). No significant changes have been observed in the average values of 50% for dry matter and 28% for fat. Although it is not possible to compare the findings of our study with the study, the findings of the study may be useful for industrial production models to be developed using pasteurized milk. High numbers of coliform bacteria and yeast-mold numbers were found to be high in our study and in same other studies as shown in Table 4. Herby cheese produced from raw milk poses a great risk in terms of pathogenic microorganisms, and although the antimicrobial activities of herbs are known, they carry the same risk, and pasteurization of milk and herbs is necessary for hygiene reasons (31-34). Although pathogenic bacteria analysis was not performed in our study, it can be predicted that the number of bacteria accepted as hygiene criteria is quite high, and pathogenic bacteria may also be present in the samples we examined.

coliforms and yeast-mold) were used only in comparison with the findings of other researchers as shown in Table 4. Since these values were not included in the communiqué, they were not evaluated according to the Communiqué (4). Thirteen (60%) of the 20 samples examined in our study contained coagulase positive staphylococci more than 4 log10 cfu/g. As shown in Table 4, staphylococcal analysis was not performed in 5 of the 9 studies in which microbiological analysis was performed (19, 24, 26, 27). In the other 3 studies in which staphylococcal analysis was performed, it was reported that there was contamination above the values reported in the Communiqué (21, 22, 28).

When Tables 3 and 4, in which the findings of this study and previous studies are presented comparatively, are examined, it is understood that the sale of these cheeses should be controlled because they do not comply with the minimum chemical and microbiological criteria. It has been reported that pickled herbs are also unhygienic and carry health risks (32). Antibiotic residues have also been found in herby cheeses(21).

Table 3: Comparison of the results of physical and chemical analysis of Siirt herb cheese samples taken from sales points (as given in the Table 1) with the results of previous researches.

Refe-rence No.	pH	Lactic acids. %	Dry matter .%	Fat in dry matter .%	Ash. %	Salt in dry matter .%
4	4.2-5.8	NA*	NA	NA	NA	NA
8	4.22-5.19	NA	45.24-57.38	35.33-59.37	NA	4.3-17.7
21	5.02-6.83	NA	NA	NA	NA	NA
22	5.09-5.93	NA	51.05-62.57	NA	NA	NA
23	4.33-4.90	0.87-1.36	50.10-56.69	18.93-21.09	5.21-5.77	6.08-7.28
24	4.32-5.8	0.24-1.45	37.32-58.24	NA	NA	3.62-7.3*
25	NA	0.18-1.75	29.1-61.57	22.74-56.28	NA	2.7-18.64
26	NA	NA	50.81-58.43	37.87-51.56	4.03-7.92	6.44-21.76
27	NA	0.31-1	42.52-52.31	28.12-51.06	3.28-15.21	2-13.81
29		0.11-0.72	36.26-46.8	26.8-48.76	NA	2.78-16.31
31	4.78-5.32	1.37-1.47	44-46	19.5-21.75	5.08-5.3	4.3-4.5
33	4.28-5.54	1.93-2.42	51.2-60.59	21.25-28.75*	5.32-12.51	4.24-14.4*
34	5.45	NA	44.37	NA	8.98	7.58
A	4.4-6.3	0.8-4.1	34.6-57.9	31.2-63.5	1.2-8.1	1.1-4.5
A*	**5.3**	**1.9**	**49.6**	**46.8**	**5.6**	**2.9**
B	NA	NA	En az 45	NA	NA	7.5
C	NA	NA	43.81-47.78	16.78-19.21	5.07-7.45	4.6-6.9
C*	NA	NA	46.78	17.29	6.85	5.73

NA: Not analyzed. A: The values are taken from Table 1. A*: The mean values are taken from Table 1. B: The values are taken from the Turkish Standards - Herby Cheese Standard (15). C: The values are taken from Van Herby Cheese Geographical Indication Certificate (2). C*: The mean values are taken from Van Herby Cheese Geographical Indication Certificate (2).

Table 4: Comparison of the results (log10 cfu/g) of microbiological analysis of Siirt herb cheese samples taken from sales points (as given in the Table 2) with the results of previous researches.

Rference No.	Mesophilic aerobes	*Enterobacteriaceae*	Coliforms	*Coagulase positive staphyllococci*	Yasts - moulds
4	3.5-8.1	<1-6	NA*	NA	1.7-7.5
8	4-8.2	<2-4.49	NA	NA	NA
11	NA	NA	0-3	2-6	1-6
22	6.47	NA	NA	NA	4.85
23	7.04-10.49	3.03	<1-4.68	NA	3.03-5.71
24	5.6-9.31	NA	<1-5.89	1-8.71	2.6-8
25	4.3-9.6	1.3-6.86	1-6.2	1-1.64	2.04-6.68
27	8-10	NA	3-5	NA	5-7
28	6.14-8.55	NA	2.32-5.86	2.43-4.29	2.2-6.86
A	7.4-10.4	1-9.7	1-9	3.2-7.3	5.7-10.1
A*	8.7	6.8	4.6	5.0	8.1

NA: Not analyzed. A: The values are taken from Table 1. A*: The mean values are taken from Table 1.

In conclusion, the production and trade of Siirt herby cheese should be produced and sold in more hygienic places by expert staff. When this progress is achieved, it is certain that the contribution of this cheese to the provincial economy will increase even more. Considering the goat presence and transhumance in Siirt province, the production process should be determined by scientific studies in order to produce Siirt herby cheese from a mixture of sheep and goat milk. Modern Siirt herby cheese production facilities should be established in the province. The brand value of the product should be created and this value should be established as a wide market network and used as a tourism-developing product. For this, the industry-appropriate technology of this cheese should be developed and the possibilities of using pasteurized milk and starter culture in production should be provided.

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Conflict of Interest

The authors declare no conflict of interest.

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