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Research Article

Determination of Chemical and Microbiological Quality of Strained Yoghurt Samples Marketed in Aydın Province

Mahmut GÜLLÜ[1], Devrim BEYAZ[2], Hilal DEMİRPENÇE[3]*

[1]*Eyyübiye Directorate of District Agriculture and Forestry, Şanlıurfa, TÜRKİYE,*

[2]*Aydın Adnan Menderes University, Faculty of Veterinary Medicine, Department of Food Hygiene and Technology, Aydın, TÜRKİYE*

[3]*Aydın Adnan Menderes University, Koçarlı Vocational School, Department of Chemistry and Chemical Technology, Aydın, TÜRKİYE*

A B S T R A C T

In this study, 60 strained yoghurt samples, including 30 public bazaar and 30 dairy-markets were examined in terms of chemical and microbiological properties. According to chemical analysis of bazaar samples, average levels of pH, acidity, fat, protein, salt, total solid and ash are determined; 3.94, 2.19% (LA), 8.09%, 11.21%, 1.83%, 21.74%, 0.71%, respectively. The average levels of given elements above in samples gathered from dairy stores are determined; 3.94, 1.86% (LA), 9.47%, 11.95%, 1.81%, 23.26%, 0.71%, respectively. No presence of starch was found in any of the samples. The chemical analysis results of the strained yoghurt samples were determined in accordance with the values specified in Turkish Food Codex except for the amount of fat analysis gave a result over the specified value. Coliform bacteria level was determined <3 MPN/g in 17 samples, 4-1100 MPN/g in 10 samples and 1100 MPN/G in 3 samples, also *Escherichia coli* Type 1 presence was determined in 12 samples. Lactic acid bacteria were found at 7.32 log cfu/g (Lactobacillus number) and 8.09 log cfu/g (*Streptococcus* number), respectively in bazaar samples. Yeast and mold levels were determined as 5.89 log cfu/g on average. In dairy-market samples, coliform bacteria level was <3 MPN/g in 19 samples, 4-1100 MPN/g in 9 samples and >1100 MPN/g in 2 samples. In addition, in 6 samples the presence of *E. coli* Type 1 has been determined. Lactic acid bacteria in the samples were determined on average at 7.67 log cfu/g (Lactobacillus number) and 8.09 log cfu/g (Streptococcus number), respectively. The yeast and mold levels of dairy-market samples were determined 5.94 log cfu/g on average.In this study, it was determined that strained yoghurt samples were subjected to contamination from raw material to consumption. This situation is very important because it can negatively affect public health as well as product quality.

***Keywords**: Microbial quality, public health, strained yoghurt.*

Aydın'da Tüketime Sunulan Süzme Yoğurtların Kimyasal ve Mikrobiyolojik Kalitesinin Belirlenmesi

Ö Z E T

Bu çalışmada, 30 adet halk pazarlarından ve 30 adet de mandıra-marketlerden olmak üzere toplamda 60 adet süzme yoğurt örneği, kimyasal ve mikrobiyolojik özellikleri yönünden incelenmiştir. Kimyasal analizler sonucunda pazar örneklerinin pH, asitlik, yağ, protein, tuz, kuru madde ve ham kül analiz sonuçlarının ortalama değerleri sırasıyla, 3,94, %2,19 (LA), %8,09, %11,21, %1,83, %21,74 ile ham kül %0,71 olarak tespit edilmiştir. Mandıra-market örneklerinin kimyasal analiz sonuçlarının ortalama değerleri ise sırasıyla, 3,94, %1,86 (LA), %9,47, %11,95, %1,81 %23,26 ve ham kül %0,71 olarak belirlenmiştir. Yapılan nişasta analizi sonucunda hem pazar örneklerinde hem de mandıra-market örneklerinde nişasta varlığına rastlanmamıştır. Süzme yoğurt örneklerinin yağ miktarı hariç kimyasal analiz sonuçları, Türk Gıda Kodeksi'nde belirtilen değerlere uygun olarak tespit edilmiştir. Yağ analizi belirtilen değerin üzerinde sonuç vermiştir. Koliform bakteri düzeyi pazar örneklerinden, 17'sinde <3 EMS/g, 10'unda 4-1100 EMS/g arasında ve 3'ünde ise >1100 EMS/g olarak tespit edilmiş, ayrıca 12 örnekte *Escherichia coli* Tip 1 varlığı belirlenmiştir. Pazar örneklerinde laktik asit bakterileri ortalama olarak sırasıyla 7,32 log kob/g (Lactobacillus sayısı) ve 8,09 log kob/g (Streptococus sayısı) düzeyinde tespit edilmiştir. Maya ve küf düzeyi ise ortalama 5,89 log kob/g olarak saptanmıştır. Mandıra-market örneklerinde, koliform bakteri düzeyinin 19 örnekte <3 EMS/g, 9 örnekte 4-1100 EMS/g arasında ve 2 örnekte de >1100 EMS/g olduğu tespit edilmiştir. Bununla birlikte 6 örnekte, *E. coli* Tip1 varlığı belirlenmiştir. İncelenen örneklerdeki laktik asit bakterileri ortalama olarak sırasıyla 7,67 log kob/g (Lactobacillus sayısı) ve 8,09 log kob/g (Streptococus sayısı) düzeyinde saptanmıştır. Mandıra-market örneklerinin maya ve küf düzeyi ise ortalama 5,94 log kob/g olarak belirlenmiştir. Bu çalışma ile süzme yoğurt örneklerinin ham maddenin elde edilmesinden tüketimine kadar kontaminasyona maruz kaldığı tespit edilmiştir. Bu durum ürün kalitesinin yanı sıra halk sağlığını da olumsuz etkileyebileceği için oldukça önemlidir.

***Anahtar Kelimeler**: Mikrobiyal kalite, halk sağlığı, süzme yoğurt.*

*__Corresponding author__: Hilal DEMİRPENÇE, Aydın Adnan Menderes University, Koçarlı Vocational School, Department of Chemistry and Chemical Technology, Aydın, TÜRKİYE. hilaldemirpence@hotmail.com

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Introduction

Yoghurt is a coagulated dairy product obtained through lactic acid fermentation of milk by symbiotic bacteria such as *Lactobacillus delbrueckii* subsp. *bulgaricus* and *Streptococcus salivarus* subsp. *thermophilus.* Yoghurt is an important food source in terms of the amount of protein, carbohydrate, fat, vitamin and mineral substances in its chemical structure, and the dry matter content it contains is higher than milk. Since most of the lactose in milk is broken down during yoghurt production, consumption of yoghurt is quite comfortable for lactose intolerant individuals. The bacteria used in yoghurt production have a suppressive effect on pathogenic bacteria in the gastrointestinal tract and prevent their growth; therefore, it makes yoghurt an important food for human health (Sömer, 2013).

Due to the high-water content of yoghurt, which is widely consumed around the world, its durability and shelf life are short (Kırdar and Gün, 2007). From past till now, many methods have been applied to increase the shelf life and durability of yoghurt (Sömer, 2013). Removing most of the water in yoghurt is among the known and commonly used methods (Kırdar and Gün, 2007).

The cultural richness of our country has helped to produce various types of yoghurt and thus to consume yoghurt during periods of reduced milk production. Some of these are resistant yoghurt varieties such as Silivri, tulum, strained, winter yoghurt and kurut (Ünsal, 2007; Sömer, 2013). Strained yoghurt, also known as bag or pouch yoghurt among this durable yoghurt, is a type of yoghurt that is more popular and consumed more than the others (Tekinşen and Bayar, 2008). Strained yoghurt is a type of yoghurt with a higher dry matter content than regular yoghurt, with its spreadable feature, and which has a color that can vary between white and yellow depending on the type and chemical structure of the milk used in production (Baladura, 2011).

The production of strained yoghurt is done more commonly within the family in the middle regions of Anatolia, and in small-scale enterprises (Atamer et al., 1990; Uysal, 1993). With the development of technology, the production of strained yoghurt in modern dairy enterprises has also increased and has become a more hygienic product (Baladura, 2011). However, strained yoghurt produced in family and small-scale enterprises are still sold for sale in the market places. For this reason, there is no standard production technique in the production of strained yoghurt. Therefore, there are significant differences in chemical and microbiological quality between strained yoghurt samples offered for sale in bazaar and strained yoghurt samples sold in dairy stores and markets (Tekinşen and Bayar, 2008).

In the production of strained yoghurt; traditionally, natural yoghurt is filtered in cloth bags and clay pots, while reverse osmosis, centrifugation and ultrafiltration processes are applied industrially (Nsabimana et al., 2005).

With this study, it has been aimed to determine the microbiological and chemical properties of strained yoghurt offered for consumption in markets and dairy-markets in Aydın.

Materials and Methods

In this study, 60 samples of strained yoghurt that were obtained from dairy/markets in Aydın, with 30 samples from each source, were used. The samples taken were brought to the laboratory under the cold chain and subjected to microbiological and chemical analyses within the same day.

Chemical Analysis of Strained Yoghurt Samples

Dry matter determination: Dry matter values of strained yoghurt samples were determined using gravimetric method (Sömer, 2013).

Determination of raw ash: In order to determine the amount of ash in strained yoghurt samples, the crucibles were kept in a drying oven at 105 °C for 1 hour, then cooled in a desiccator and their tare was determined. Then, 3-3.5 g of strained yoghurt samples were added to the crucibles and dried in a drying oven at 105±2 °C for one day. At the end of the period, the crucibles were burned in the muffle furnace at 550 °C for 5-6 hours. After the burning process, the crucibles were removed from the muffle furnace, taken into the desiccator, and after cooling, they were weighed again and transferred to the muffle furnace. This process was continued until the crucible weight was stabilized. The ash amount with the fixed value determined in the weighing was calculated as % (Kırdar, 2001).

pH determination: 10 g of strained yoghurt sample was taken into a beaker and homogenized with the help of a glass baguette. Afterwards, pH meter (AD 1030, Hungary) probe was immersed in the sample and waited until a constant value was obtained in the pH meter, and the fixed value was accepted as the pH value (Biberoğlu and Ceylan, 2013).

Titratable acidity determination: In order to determine the titratable acidity of the strained yoghurt samples, 10 g of the homogenized strained yoghurt sample was weighed and 90 ml of distilled water was added into an erlenmeyer flask. The sample in the erlenmeyer flask was mixed thoroughly with the help of a glass baguette. Afterwards, a few drops of 1% phenolphthalein solution (Merck 1.07233.0100) were dropped into the erlenmeyer flask and titrated with 0.1 N NaOH solution (Merck 1.06498.500) until a permanent pink colour was formed. The titratable acidity of strained yoghurt samples was calculated with formula and determined as % lactic acid (TSE, 2006).

The formula used in the analysis: % lactic acid= [(V×N×0.009) / m] × 100 (V: Amount of NaOH spent in the titration (ml), m: Amount of strained yoghurt sample used in titration (g), N: Normality of NaOH solution).

Fat determination: The fat analysis of strained yoghurt was performed by the Gerber method, as specified in TSE 1330 Yoghurt Standard (TSE, 2006).

Crude protein determination: Crude protein analysis of strained yoghurt samples was made by Kjeldahl method (Kurt et al., 2003; Sömer, 2013).

Salt determination: 5 g of strained yoghurt sample was taken homogeneously into an erlenmeyer flask, and hot distilled water was added and shaken vigorously for 10 minutes. The resulting solution was filtered through a filter paper into a 500 ml volumetric flask. In order for the salt remaining in both the erlenmeyer flask and the filter paper to pass into the water, the filtration process was repeated by adding hot distilled water 4-5 times to the solution in the erlenmeyer flask. When the filtrate in the volumetric flask came to room temperature, distilled water was added to the volumetric flask up to the volume line. 25 ml of this filtrate was taken, transferred to an erlenmeyer flask and 2-3 drops of 5% potassium chromate solution (K_2CrO_4) (MERCK 104952.0250) was added. Then, the filtrate was titrated with 0.1 N silver nitrate solution ($AgNO_3$) (MERCK 109990.0001) until a permanent brick red colour was observed in the erlenmeyer flask (Kırdar, 2001).

Starch determination: In order to determine the presence of starch in strained yoghurt samples, 2-3 g strained yoghurt samples were taken into a test tube and a few drops of Lugol's solution (MERCK 109261.1000) were dripped onto it. It was examined whether the blue colour, which is a positive result, was present in the samples or not (Şahan, 2012).

Microbiological Analysis of Strained Yoghurt Samples

Preparation of strained yoghurt for microbiological analysis: From the collected strained yoghurt samples, 10 grams of samples were weighed under sterile conditions, placed in stomacher bags and 90 ml of sterile physiological peptone water (Oxoid CM0009) was added to them. Stomacher bags were homogenized in a stomacher (Bagmixer, Interscience, France) for 2 minutes. Serial dilutions were prepared from the homogenate to determine the number of LAB, yeast and mold and coliform bacteria and to detect the presence of *E. coli.*

Enumeration of lactic acid bacteria

Enumeration of Lactobacilli: Lactobacillus counts were made by the spread plate method using Man Rogosa and Sharpe (MRS) Agar (OXOID CM0361B) medium. From the previously prepared serial dilutions, they were inoculated into 0.1 ml medium, and the sown mediums were left to incubate at 35 °C for 48-72 hours (Özçelik, 1998; Sömer, 2013).

Enumeration of Streptococci: M17 Agar (OXOID CM0785B) was used to determine Streptococcus measurements in strained yoghurt samples. Serial dilutions of 0.1 ml were left in their medium, seeded using the spread plate method and incubated at 42 °C for 48-72 hours (Özçelik, 1998; Halkman, 2005; Sömer, 2013).

Enumeration of yeast and molds: In order to determine the yeast and mold levels in the examined samples, seeding was carried out on Potato Dextrose Agar (PDA) (OXOID CM0139B) medium with 10% tartaric acid addition using the pour plate method. The seeded media were incubated at 22 °C for 5 days (Karahan et al., 2002; TSE, 2006; Sömer, 2013).

Enumeration of coliform bacteria: Coliform group bacteria analysis was performed using the Lauryl Sulphate Tryptose (LST) broth (OXOID CM0451B) medium using the Most Probable Number (MPN) method (Halkman, 2005).

Determining the presence of E. coli Type 1: In order to determine the presence of *E. coli* Type 1, confirmation and completion tests were respectively applied to positive tubes with turbidity and gas formation in coliform bacteria analysis.

A total of 60 strained yoghurt samples of microbiological and chemical data analysis were performed using Microsoft Excel version 2016, mathematical functions and Statistical Package for Social Sciences (SPSS) version 22. Maximum, minimum, mean and standard deviation values were specified for descriptive statistics.

Results

In this study, some chemical (dry matter, fat, acidity, salt, pH, starch, ash and protein presence) and microbiological (coliform bacteria, *E. coli*, lactic acid bacteria and yeast-mold) properties of 60 strained yoghurt samples sold in Aydın province, 30 from the bazaar and 30 from the dairy-markets, were examined.

Chemical Analysis Results of Strained Yoghurt

The chemical analysis results of the strained yoghurt samples obtained from the market are given in Table 1. No starch was found in these samples.

Chemical analysis results of dairy-market samples are given in Table 2. No starch was found in these samples

Microbiological Analysis Results of Strained Yoghurt

Lactic acid bacteria and yeast-mold analysis results in the analysed market samples are shown in Table 3.

The lactic acid bacteria and yeast-mold counts of the samples taken from dairy-markets in our study are given in Table 4.

As a result of the analysis, coliform bacteria were detected in 13 of 30 strained yoghurt samples from bazaars and 11 of 30 samples from dairy-markets.

When the samples were examined in terms of *E. coli* Type 1 presence, *E. coli* Type 1 was detected in 12 (40%) of 30 bazaar samples and 6 (20%) of 30 dairy-market samples.

When evaluated in general, it was determined that 18 (30%) of 60 strained yoghurt samples were contaminated with *E. coli* Type 1.

Table 1. Chemical analysis results of strained yoghurt samples obtained from the bazaar

Chemical analysis		Minimum	Maximum	Mean±SD
Dry Matter	g	0.55	0.87	0.72±0.08
	%	17.43	26.47	21.74±2.41
Raw Ash	g	0.02	0.02	0.02±0.002
	%	0.56	0.81	0.71±0.06
pH		3.79	4.10	3.94±0.1
Acidity	%	1.86	2.88	2.19±0.002
Fat	%	6.30	9.70	8.09±0.01
Protein	%	8.93	13.98	11.21±1.09
Salt	%	0.94	3.39	1.83±0.005

Table 2. Chemical analysis results of strained yoghurt samples obtained from dairy-markets

Chemical analysis		Minimum	Maximum	Mean±SD
Dry Matter	g	0.61	0.90	0.78±0.07
	%	19.21	27.22	23.26±1.84
Raw Ash	g	0.02	0.03	0.02±0.002
	%	0.56	0.90	0.71±0.08
pH		3.70	4.09	3.91±0.08
Acidity	%	1.35	2.30	1.86±0.001
Fat	%	6.60	13.80	9.47±0.02
Protein	%	9.65	13.17	11.95±0.77
Salt	%	0.99	2.36	1.81±0.002

Table 3. Bazaar samples LAB and Yeast-Mold analysis results (log cfu/g)

Microbiological Analysis	Minimum	Maximum	Mean±SD
Lactobacillus number	5.97	8.45	7.32±0.61
Streptococci number	6.66	9.19	8.09±0.43
Yeast and Mold number	4.84	7.08	5.89±0.63

Table 4. LAB and Yeast-Mold analysis results of dairy-market samples (log cfu/g)

Microbiological Analysis	Minimum	Maximum	Mean±SD
Lactobacillus number	6.04	8.47	7.67±0.61
Streptococci number	7.43	8.54	8.09±0.28
Yeast and Mold number	4.67	7.13	5.94±0.73

Discussion

Akın (1999) reported that the dry matter value of concentrated yoghurt made from cow's milk is 23.35% in yoghurt produced by the traditional method in which straining is done with cloth bags, and 22.30% in strained yoghurt produced using ultrafiltration technique. Töral et al. (1985) stated that the average dry matter ratio of 90 bags of yoghurt samples obtained from Denizli, Burdur, Isparta, Antalya and Aydın provinces was 22.74%. According to Şimşek et al. (2010) found the dry matter ratios of 22 strained yoghurt samples collected from the provinces of Isparta and Burdur to be between 17.84% and 27.72%. In our study, dry matter analysis results were found to be 21.740% on average. The ratios obtained in our study show similar results to the studies mentioned above.

Akın (1999), observed that the ash value in concentrated yoghurt made using cow's milk was 0.79% in traditionally produced yoghurt and 0.87% in yoghurt obtained by ultrafiltration technique. In their studies, Kayıkçılar (1971), Seçkin and Nergiz (1997), Çağlar et al. (1997), Kırdar and Gün (2002), Şimşek et al. (2010) determined the ash values as, 1.61%, 0.82%, 0.98%, 0.7%, 0.92%. Sömer (2013) determined the values as 0.79%, 0.65% and 0.67%, respectively, in the determination of ash in 3 samples taken from Aydın province in this study. The values obtained in our study are approximately the same as those of the researchers mentioned above. In our study, the average value found for bazaar and dairy market samples was 0.71%. The differences may be due to differences in the type of milk used, milk composition, and straining time.

Sömer (2013) reported that the pH values of strained yoghurt samples obtained from Afyon province ranged from 3.62 to 4.17, while the values of strained yoghurt samples obtained from Muğla province were 3.53 on average. And also, he reported that the pH values of strained yoghurt samples obtained from Isparta, Burdur, and Aydın provinces were determined to be 3.95, 3.80, and 3.78 on average, respectively. Biberoğlu and Ceylan (2013) determined the average pH value to be 3.81 in their studies on yoghurt obtained from Erzurum and Kars provinces. Akarca and Tomar (2019) found out that the average pH value of 50 yoghurt samples collected at different times from the yoghurt offered for sale in Afyonkarahisar province markets as 3.51. The pH value of yoghurt was approximately determined in the studies of the researchers mentioned in our study. The value for marketing and dairy samples was determined as 3.94 and 3.91, respectively. It is thought that the differences that may occur in the pH values of strained yoghurt may be related to the storage temperatures. As the storage temperatures increase, the pH value decreases and the amount of lactic acid increases.

Kalender (2014), in this study examining the effect of inulin addition in the production of reduced-fat strained yoghurt, stated that the titration acidity of strained yoghurt varied between 1.58% and 1.73% during the storage period. Demirci and Gündüz (1983), as a result of their research on yoghurt with different proportions of milk powder added, stated that the titration acidity increased proportionally as the milk powder ratio increased. In our study, while the average acidity value was 2.19 in market samples, it was determined as 1.86 in dairy-market samples. It is thought that this difference, which emerged as a result of our study, may be related to the storage times, since the increase in the storage time causes the acidity value to decrease.

The percentage fat values obtained in our study were determined as the lowest 6.30%, the highest 9.70% and the average 8.09% in the market samples and in dairy-market samples, the highest 13.80%, the lowest 6.60% and average 9.47%. Sömer (2013), in his study on resistant yoghurt, examined the percentage change in fat values of strained yoghurt, and obtained the lowest 3.00% and the highest 19.60% results. He stated that the fat values obtained as a result of the analyzes in 3 samples taken from Aydın province were 3.80%, 7.30% and 8.40%, respectively. Obtaining different results in terms of fat analysis is thought to be due to the difference in fat ratios of the raw milk used.

In our study, while the average protein value was 11.21% in bazaar samples, it was determined as 11.95% in dairy-market samples. Sömer (2013) stated that he determined protein values between 3.45% and 11.68% in his study on strained yoghurt. He stated that he found the protein values of the strained yoghurt samples taken from Aydın province as 10.99%, 7.74% and 7.00%. Kalender (2014), in this research on strained yoghurt, examined the protein values during storage and stated that the highest protein value was 11.78% on the 1st day, and the lowest protein value was 9.51% on the 21st day. Protein results obtained from other studies are similar to the results of our study.

As a result of the salt analysis made with the samples taken, the salt values of the bazaar samples were the lowest 0.94%, the highest 3.39% and an average of 1.83%, while the salt values of the dairy-market samples were the lowest 0.99% and the highest %. 2.36 and an average of 1.81%. The fact that the salt content of the strained yoghurt produced by the traditional method (home type) and sold in the bazaar reaches up to 3.39%, suggests that the producer may use too much salt in the production of strained yoghurt in order to prevent the deterioration that may occur in yoghurt. Sömer (2013) examined the salt values of strained yoghurt samples in his study and reported that the salt values in 32 samples collected from different provinces were in the range of 0.47-4.10%. He expressed the salt values of 3 samples taken from Aydın as 0.82-0.53-0.76%.

Şahan (2012), in his study on yoghurt samples offered for sale in Erzurum, stated that he detected starch in 3 of the 40 samples he examined, but in our study, starch was not detected in a total of 60 samples taken from the bazaar and dairy-markets.

In our study, the average value of Lactobacilli in bazaar samples was determined as 7.32 log cfu/g and 7.67 log cfu/g in market-dairy samples. The average value of Streptococci in bazaar and market-dairy samples was determined as 8.09 log cfu/g. Sömer (2013), in his study on the microbiological and physicochemical properties of resistant yoghurt, stated that he observed the lowest and highest Lactobacillus numbers in the samples taken from the province of Burdur and were respectively 5.25 and 8.92 log cfu/g. He stated that the lowest value of Streptococci numbers was obtained from the province of Burdur, and the highest value was obtained from the province of Afyon, as 4.40 and 8.74 log cfu/g, respectively. Lactobacillus numbers in 3 samples taken from Aydın province were 6.61, 6.37 and 6.94 log cfu/g, respectively, and Streptococci numbers are 6.20,

7.18 and 7.09 log cfu/g. Şahan (2012), in his study on the physical, chemical and microbiological properties of yoghurt offered for sale in Erzurum, examined the lowest, highest and average Lactobacillus numbers of 7.48, 9.10 and 8.50 log cfu/g, respectively, in 40 samples. indicated its values. He stated that the Streptococci numbers were the lowest 6.30 log cfu/g, the highest 9.01 log cfu/g and the average 8.16 log cfu/g. Considering the average values in our study similar results were obtained in terms of both Lactobacillus numbers and Streptococci numbers in bazaar and dairy-market samples.

Atasoy et al. (2003) stated that they found the yeast and mold numbers of the samples in the range of $1.5x10^4$ cfu/g and $3.6x10^6$ cfu/g in their study on the yoghurt offered for consumption in Urfa. Keleş (2003) determined the average number of yeast and molds as $3x10^5$ cfu/g in his study on homemade yoghurt produced in Konya. Demirkaya and Ceylan (2013), in their study on the chemical and microbiological quality of yoghurt offered for consumption in Bilecik, stated that the number of yeast and molds was between <1.00-5.87 log cfu/g and on average 1.36 log cfu/g.

In this study, no significant difference was observed between bazaar and dairy-market samples in terms of yeast and mold numbers. It is thought that the contamination may be caused by factors such as the tools-equipment used in the process from the supply of raw milk to the final product, working personnel, and storage conditions.

Tekinşen and Bayar (2008), in their study examining the chemical and microbiological properties of strained yoghurt samples produced in Konya, stated that they detected an average of 14.22 EMS/g coliform bacteria between 19-150 MPN/g in 20% of 45 samples from 9 different brands. Çağlar et al. (1997) stated that they detected an average of 16 MPN/g coliform bacteria in 5 of 13 strained yoghurt samples in their study. Kırdar and Gün (2002) detected 1.0-1.25 x 10^3 cfu/g coliform bacteria in 17.5% of the strained yoghurt samples they examined.

In our study, coliform bacteria were detected in 13 of the bazaar samples and in 11 of the dairy-market samples, with values between 4 and >1100 MPN/g. However, the presence of *E. coli* Type1 was determined in 12 of the examined bazaar samples and in 6 of the dairy-market samples. As some researchers stated (Kırdar and Gün, 2002; Karabıyık, 2006), both between bazaar and dairy-market samples, and this study and also the sample studies mentioned above, it is thought that the number of coliform bacteria and the presence of *E. coli* Type1 vary depending on the equipment used in the production of strained yoghurt and the hygiene of the employees and/or the methods preferred in the sanitation processes used in the enterprise.

Conclusion

Strained yoghurt; it is one of the dairy products that is widely consumed in our country and especially in the province of Aydın, also has a very important place in human nutrition. When the results obtained are evaluated, it is concluded that adequate hygiene and sanitation conditions should be provided and precautions should be taken in the production of strained yoghurt. For the production of quality milk and dairy products, both the producer and the consumer should be informed. In addition, controls and inspections should be carried out by experts at frequent intervals without interruption, products offered for sale under inappropriate conditions should not be allowed, and sanctions with a deterrent effect should be applied.

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Conflict of interest

The authors declare that they have no conflict of interest in this study.

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