

QUALITY OF DANI CHEESE MADE FROM GOAT'S MILK FROM DIFFERENT BREEDS

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ABSTRACT

Four batches of soft cheese (Dani cheese) were made from milk of Zaraibi (Z) and Damascus (D) goats coagulated with rennet with or without starter. Yield of fresh cheese and loss of cheese weight, as well as contents of fat, protein, acidity, pH value, total solids and TVFA were determined during pickling period. Results revealed that the differences in yield of fresh Dani cheese made from Z and D cheese made coagulated with rennet with or without starter were not significant, ranging between 26.5% in Z cheese made from rennet with starter and 22.3% in D cheese made from rennet+starter. Yield of fresh cheese was higher for Z than D milk, but the differences were not significant. Loss in fresh weight was the highest ($P<0.05$) in D cheese made from rennet+starter (10%) after 15 days of pickling versus no loss in Z cheese made from rennet alone. Insignificant differences were detected in the mean values of acidity and pH value in fresh cheese made from Z and D milk using rennet with or without starter. Acidity increased ($P<0.05$) and pH values decreased ($P<0.05$) with advancing pickling period cheeses from both breeds and according to the coagulant used, being lower using starter with rennet than that with rennet alone. Acidity was higher ($P<0.05$) in Z than D cheese after 15 days of pickling. The highest acidity (0.800) and pH value (6.4) were obtained from cheese made from rennet alone of D milk after 60 days of pickling. Average salt contents were higher ($P<0.05$) in fresh cheese made from D milk with starter+rennet than in Z cheese made from rennet alone (5.40 vs. 4.70%). However, there were no differences in the salt content at all pickling periods. Fat content was lower ($P<0.05$) in D than in Z cheese, only in fresh cheese made with rennet and after 15 days of pickling. Fat content was almost higher in cheese of both breeds made using starter+rennet than with rennet alone in fresh case or during the pickling period. Protein content was higher ($P<0.05$) in D than in Z cheese at all pickling days. No differences in the total solids content in cheese of both goat breeds made using rennet with or without starter only in the fresh cheese or after 60 days of pickling. Total solids content in cheese of both breeds increased ($P<0.05$) by using starter with rennet in fresh cheese and at all pickling periods. There were no significant differences in TVFA content in cheese of both breeds using rennet with or without starter. Content of TVFA was higher ($P<0.05$) in cheese made from rennet alone than in that made from starter+rennet. TFVA content was higher ($P<0.05$) in Z than in D cheese made by using rennet alone or starter+rennet were observed after 15 and 60 days of pickling.

Keywords: Dani cheese, Zaraibi and Damascus goat's milk.

INTRODUCTION

Goats are an important source of meat and milk and characterized by their ability to adapt in many tropical and subtropical regions and to use wastes, fibrous plant material not eaten by other species of animals (Devendra and Burns, 1983).

The milk of goats and sheep is of particular economic interest in developing countries, since the production of this type of milk has come to be a useful strategy to tackle the problem of under nutrition, especially among the infant population (Haenlein, 1996, 2001, 2004).

Lipid composition is one of the most important components of the technological and nutritional quality of goat's milk. Lipids are involved in cheese yield (per kilogram of milk) and firmness, as well as in the color, and in the flavor of caprine dairy products (Delacroix-Buchet and Lamberet, 2000). Furthermore, the peculiarities of goat milk lipolytic system (Chilliard, 1982) and medium-chain fatty acids (Ha and Lindsay, 1993) could greatly change the content in free fatty acids, playing a major role in the occurrence of the characteristics goat flavor.

Cheese making can definitely add value to high quality goat milk and create another source of income for the goat producers. To meet the demand for goat cheese and to increase profitability of goat dairying, dairy goat producers need skills and techniques to produce high quality goat's milk cheeses (Zeng, 2004).

Goat's milk had been introduced in the manufacture of some Egyptian dairy products (Emara, 1990; El-Abd *et al.*, 1992 and Makled, 1994). Therefore, the objective of the present work was to throw some light on the technological properties of fresh Dani cheese made from Zaraibi and Damascus milk using rennet only as coagulant compared with rennet and starter.

MATERIALS AND METHODS

Four batches of soft cheese (Dani cheese) were made from milk of Zaraibi and Damascus goats. Twenty kg of milk taken at mid and late lactation period (July-August) were used for each batch. Milk of all batches was heated to 72°C for about 15 seconds, cooled to 37°C, salted at 6% and then renneted with or without starter. The milk of all batches was allowed to complete coagulation, the resultant curds were ladled and cheese making process was completed as described for making Domiati cheese by Fahmi and Sharara (1950).

Resultant cheese of all groups was pickled into their own whey after raising its salt content to 8%, and stored in tins at 5°C for 2 months. Fresh cheese yield was recorded. Samples of cheese were taken for chemical analysis and organoleptic evaluation when fresh and monthly during pickling. Experiments were carried out at triplicates and the mean values were calculated:

Yield of fresh cheese:

It was calculated using the following equation:

$$\text{Yield (\%)} = \frac{\text{Weight of the resultant fresh cheese}}{\text{Weight of the milk used}} \times 100$$

Loss of cheese weight during pickling:

This was calculated by determining the loss of weight occurred in a known weight of cheese after 3 months of pickling using the following equation:

$$\text{Loss (\%)} = \frac{W1 - W2}{W1} \times 100$$

Where: W1 = weight of the original fresh cheese.

W2= weight of the same cheese after pickling

Chemical analysis of cheese:

Chemical analysis of soft Dani cheese was carried out as follows:

pH value was determined using HANNA HI 8519 pH meter with glass electrodes. Sodium chloride content was estimated according to Davis (1932). Total solids and fat content (T.S) was determined as given by B.S.I. (1952). Titratable acidity was determined by means of micro Kjeldahl procedure according to Ling (1963). Total volatile fatty acids (TVA's) were detected as described by Kosikowski (1978).

Data were statistically analyzed using analysis of variance and Duncan's test. Means and standard errors were carried out using a SPSS computer program (SPSS, 1999).

RESULTS AND DISCUSSION

Net yield of Dani cheese:

Results presented in Table (1) revealed that the differences in yield of fresh Dani cheese made from Zaraibi and Damascus goat cheese coagulated by rennet with or without starter were not significant, although Zaraibi cheese made from rennet with starter showed the highest yield (26.5%), while that made from Damascus milk with rennet+ starter showed the lowest yield (22.3%).

It is of interest to note that the differences in yield of fresh cheese between both goat breeds were more pronounced when starter was used with rennet, being higher for Zaraibi than Damascus milk, but the differences were not significant (Table 1).

Loss in fresh weight of different types of Dani cheese was affected significantly ($P < 0.05$) by pickling period. Weight loss in Damascus cheese made from coagulant agent (rennet + starter) showed the highest rate (10%) after 15 days of storage period versus no loss in Zaraibi cheese made from rennet alone. Loss of Dani cheese weight fluctuated after 15 days of storage period for different types of cheese, but the highest rate of loss in weight was significantly ($P < 0.05$) observed after 45 days of pickling period in cheese of both breeds made from rennet + starter, being more than 50% (Table 1).

Values of the cheese yield resulted in from goat's milk of both breed groups were lower than those were reported by Emara (1990). Meanwhile, Makled (1994) found that Domiati cheese yield was 20.35% using 6% salt for Zaraibi goat's milk, and 21.4% using milk of unknown breed of goats.

Table (1): Means and standard errors of net of yield for Dani cheese during different days of pickling period.

Item	Rennet		Starter + Rennet	
	Zaraibi	Damascus	Zaraibi	Damascus
Yield (%):				
Fresh	24.44±1.18 ^{A a}	24.17±1.0 ^{C a}	26.52±1.0 ^{C a}	22.31±1.0 ^{B a}
Loss of weight (%):				
15 d	00.0±0.00 ^{D c}	5.00±1.0 ^{E b}	4.00±1.0 ^{E b}	10.0±1.0 ^{D a}
30 d	25.2±0.50 ^{A b}	40.0±1.0 ^{B a}	20.0±1.0 ^{D c}	8.00±1.0 ^{D b}
45 d	13.3±1.01 ^{C b}	10.0±1.0 ^{D b}	52.0±1.0 ^{A a}	50.0±1.0 ^{A b}
60 d	20.0±1.00 ^{B c}	48.0±1.0 ^{A a}	40.0±1.0 ^{B b}	17.5±0.5 ^{C c}

A, B...E and a, b....d: Means within the same column and row with different superscripts are significantly different at P<0.05, respectively.

Acidity and pH values:

Results in Table (2) show insignificant differences in mean values of acidity and pH value in fresh cheese made from Zaraibi and Damascus milk using rennet with or without starter. As affected by pickling period of cheese, titratable acidity significantly (P<0.05) increased and pH values significantly (P<0.05) decreased with the advance of pickling in both breed groups, and according to the coagulant used (rennet or starter + rennet), except for acidity of Zaraibi cheese made from rennet only, which resulted in insignificant trend of change with advancing of the pickling period.

Values of acidity were almost lower in cheese made by using starter + rennet than that made from rennet alone, regardless of goat breed. However, significant (P<0.05) differences in acidity was observed between breeds in cheese made from rennet alone after 15 days of pickling period, being higher in Zaraibi than Damascus cheese. After 45 and 60 days of pickling period, an opposite trend was observed. On the other hand, pH values were not affected by goat breed or using rennet with or without starter (Table 2).

Table (2): Means and standard errors of acidity (%) and pH value in Dani cheese during different days of pickling period.

Item	Rennet		Starter + Rennet	
	Zaraibi	Damascus	Zaraibi	Damascus
Acidity (%):				
Fresh	0.615±0.380	0.245±0.005 ^C	0.105±0.005 ^D	0.135±0.150 ^B
15 d	0.265±0.005 ^a	0.245±0.005 ^{bC}	0.205±0.005 ^{cC}	0.200±0.005 ^{cB}
30 d	0.400±0.030	0.470±0.020 ^B	0.480±0.030 ^B	0.450±0.030 ^A
45 d	0.720±0.040 ^{ab}	0.800±0.100 ^{aA}	0.490±0.010 ^{cB}	0.520±0.025 ^{bca}
60 d	0.570±0.025 ^b	0.950±0.050 ^{aA}	0.630±0.300 ^{bA}	0.630±0.100 ^{bA}
pH value:				
Fresh	6.40±0.05 ^A	6.40±0.05 ^A	6.15±0.05 ^A	6.25±0.05 ^A
15 d	6.10±0.05 ^B	6.05±0.05 ^{AB}	6.10±0.05 ^A	5.95±0.05 ^{AB}
30 d	6.10±0.05 ^B	6.05±0.05 ^{AB}	5.7±0.010 ^B	5.75±0.06 ^B
45 d	5.05±0.05 ^C	5.80±0.05 ^{AB}	5.80±0.05 ^B	5.80±0.01 ^B
60 d	5.05±0.05 ^C	5.40±0.05 ^B	5.05±0.05 ^B	5.00±0.05 ^B

A, B...D and a, b, c: Means within the same column and row with different superscripts are significantly different at P<0.05, respectively.

The highest acidity (0.800) and pH values (6.4) were obtained from cheese made from Damascus milk with rennet alone after 60 days of pickling period, and fresh cheese that made from Zaraibi milk (Table 2).

Generally, the present results indicated negative relationship between acidity and pH values in all types of cheese.

The observed trend of change in acidity and pH values are in accordance with those reported by Rakshy and Hassan (1971) and Makled (1994). The present pH of cheese are within the range (5.15 to 6.28) as reported in Iraqi cheese made from a mixture of ewe and goat milk by Dalaly *et al.* (1976).

Sodium chloride content:

Average salt contents in Dani cheese made from goat's milk of both breed groups at different periods of pickling were significantly ($P < 0.05$) higher in fresh cheese made from Damascus milk with starter + rennet than in Zaraibi cheese made from rennet alone (5.40 vs. 4.70). However, there were no differences in the salt content of cheese between both breeds at all of the pickling periods.

Salt content of cheese made from milk of both breed groups made from rennet with or without starter significantly ($P < 0.05$) decreased with the advance of pickling period, except for Damascus cheese, which showed insignificant differences in salt content at different pickling days (Table 3).

Table (3): Means and standard errors of salt content (%) in Dani cheese during different days of pickling period.

Item	Rennet		Starter + Rennet	
	Zaraibi	Damascus	Zaraibi	Damascus
Sodium chloride content (%):				
Fresh	4.70±0.20 ^{bBC}	5.10±0.05 ^{ab}	5.10±0.10 ^{abA}	5.40±0.05 ^{aA}
15 d	5.10±0.10 ^A	5.05±0.05	5.00±0.10 ^A	5.15±0.05 ^B
30 d	4.90±0.05 ^{AB}	4.80±0.16	4.90±0.005 ^A	4.95±0.05 ^{BC}
45 d	4.73±0.04 ^{ABC}	4.70±0.23	4.70±0.045 ^{AB}	4.60±0.17 ^C
60 d	4.34±0.02 ^C	5.25±1.25	4.50±0.17 ^B	4.70±0.08 ^C

A, B, C and a, b: Means within the same column and row with different superscripts are significantly different at $P < 0.05$, respectively.

The observed trend of reduction in salt content in goat cheese by advancing pickling period could be due to the increase salt in pickling solution, which may be associated with higher loss of salt from cheese to pickling solution to adjust osmolarity level between cheeses and pickling solution.

An opposite trend to that was reported by Emara (1990) and Makled (1994), who found pronounced increase in salt content in Domiati cheese by increasing pickling period.

Fat content:

Results presented in Table (4) show that fat content of cheese made from milk of Damascus goats was significantly ($P < 0.05$) lower than that of Zaraibi goats, only in fresh cheese made with rennet and after 15 days of pickling. However, fat content was almost higher in cheese of both breeds made by using starter + rennet than with rennet only whether fresh or during the pickling period.

Table (4): Means and standard errors of fat content (%) in Dani cheese during different days of pickling period.

Item	Rennet		Starter + Rennet	
	Zaraibi	Damascus	Zaraibi	Damascus
Fat content (%)				
Fresh	11.25±0.25 ^{ab}	10.25±0.25 ^{bAB}	12.75±0.25 ^{aA}	13.00±1.00 ^a
15 d	11.37±0.12 ^{ab}	9.75±0.25 ^{bB}	12.50±0.50 ^{aA}	12.75±0.75 ^a
30 d	11.0±0.50	11.25±0.25 ^A	12.75±0.25 ^A	12.25±0.75
45 d	11.25±0.25	11.25±0.75 ^A	11.25±0.25 ^B	12.75±0.75
60 d	11.75±0.25 ^b	11.50±0.25 ^{bA}	11.75±0.25 ^{bAB}	13.75±0.25 ^a

A, B and a, b: Means within the same column and row with different superscripts are significantly different at P<0.05, respectively.

It could be obvious that the fat content significantly (P<0.05) increased in Damascus cheese made from rennet alone and decreased in Zaraibi cheese made from starter + rennet by prolonging the pickling period. Meanwhile, fat content in Zaraibi cheese made from rennet alone or Damascus cheese made from starter + rennet did not differ significantly by progressing the pickling period (Table 4).

The general trend of change in fat content in Dani cheese by advancing pickling is in accordance to those reported by Emara (1990) and Makled (1994).

Protein content:

Results presented in Table (5) show marked differences in protein content in cheese of both goat breeds either made with the addition of rennet alone or rennet together with starter. Protein content was almost significantly (P<0.05) higher in Damascus than in Zaraibi cheese. These differences were also observed at all of the pickling periods.

Table (5): Means and standard errors of protein content (%) in Dani cheese during different days of pickling period.

Item	Rennet		Starter + Rennet	
	Zaraibi	Damascus	Zaraibi	Damascus
Protein content (%)				
Fresh	10.07±0.02 ^c	10.46±0.03 ^{bAB}	10.32±0.12 ^{bcC}	11.09±0.14 ^{aA}
15 d	11.32±0.35 ^a	11.10±0.60 ^{aA}	11.90±0.45 ^{aB}	9.55±0.02 ^{bB}
30 d	11.68±0.08 ^a	8.89±0.20 ^{bC}	11.76±0.12 ^{aB}	9.79±0.51 ^{bB}
45 d	11.74±0.11 ^a	9.37±0.22 ^{bBC}	12.35±0.15 ^{aA}	7.30±0.30 ^{cC}
60 d	11.92±0.24 ^a	9.16±0.13 ^{bC}	12.40±0.10 ^{aA}	7.90±0.28 ^{cC}

A, B, C and a, b, c: Means within the same column and row with different superscripts are significantly different at P<0.05, respectively.

Furthermore, there was marked decrease in protein content only in Damascus cheese made by using rennet alone, as compared to that made by using starter + rennet.

With the progressing of the pickling period, the protein content showed marked increase after 15 days of pickling in all treatments of cheese, then it increased in Zaraibi cheese made from rennet alone (insignificantly) or starter + rennet (Significantly, P<0.05). However, protein content significantly (P<0.05) decreased in Damascus cheese with the progressing of the pickling period.

Total solids content:

Results presented in Table (6) show no differences in total solids content in cheese of both goat breeds made by using rennet with or without starter only in fresh cheese or after 60 days of pickling period. However, total solids content in cheese of both breeds was found to significantly ($P<0.05$) increase by using starter with rennet in fresh cheese and at all pickling periods.

Table (6): Means and standard errors of total solids content (%) in Dani cheese during different days of pickling period.

Item	Rennet		Starter + Rennet	
	Zaraibi	Damascus	Zaraibi	Damascus
Total solids (%)				
Fresh	27.30±0.10 ^{bC}	27.10±0.40 ^{bA}	31.95±0.45 ^{aA}	31.05±0.84 ^{aAB}
15 d	28.10±0.40 ^{BC}	28.85±0.28 ^A	29.35±0.55 ^B	30.60±1.60 ^B
30 d	30.05±1.35 ^{ABC}	30.87±0.63 ^A	29.69±0.60 ^B	32.05±1.55 ^{AB}
45 d	31.15±1.35 ^{AB}	30.55±2.30 ^A	32.31±0.71 ^A	33.67±0.32 ^{AB}
60 d	31.93±0.62 ^{bcA}	30.17±1.06 ^{cA}	33.08±0.58 ^{abA}	35.25±0.25 ^{aA}

A, B, C and a, b, c: Means within the same column and row with different superscripts are significantly different at $P<0.05$, respectively.

With the progressing the pickling period, total solids content in cheese of both goat breeds made from rennet with or without starter significantly ($P<0.05$) increased. This trend was associated with gradual reduction in moisture content in cheese by increasing pickling period.

Total volatile fatty acids content (TVFA):

It is clearly apparent from the data presented in Table (7) that there were no significant differences in TVFA content in cheese of both goat breeds either made by using rennet alone or rennet together with the starter. However, content of TVFA was significantly ($P<0.05$) higher in cheese made from rennet alone than in that made from starter + rennet.

Table (7): Means and standard errors of total volatile fatty acids (TVFA's) concentration in Dani cheese during different days of pickling period.

Item	Rennet		Starter + Rennet	
	Zaraibi	Damascus	Zaraibi	Damascus
TVFA (0.1 N NaOH /10 g):				
Fresh	33.5±4.5 ^{aC}	25.0±3.0 ^{ab}	20.5±0.5 ^{bC}	20.50±5.0 ^{bC}
15 d	44.0±2.0 ^{aAB}	29.00±1.0 ^b	41.0±3.0 ^{aB}	29.5±2.5 ^{bCD}
30 d	41.5±1.5 ^{aBC}	31.0±1.0 ^{ab}	27.0±5.0 ^{bC}	35.0±3.0 ^{abBC}
45 d	46.5±0.50 ^B	41.0±7.0	57.0±3.0 ^A	48.5±5.5 ^{AB}
60 d	67.85±15.0 ^{aA}	46.5±4.0 ^c	65.5±4.5 ^{abA}	51.0±5.0 ^{bcA}

A, B, C and a, b, c: Means within the same column and row with different superscripts are significantly different at $P<0.05$, respectively.

The breed differences in TFVA content were observed after 15 and 60 days of pickling, being significantly ($P<0.05$) higher in Zaraibi than in Damascus cheese made by using rennet alone or starter + rennet. It could also be noticed that TFVA content markedly increased with advancing

pickling period, being the lowest in fresh cheese and the highest after 60 days of pickling in all types of cheese.

The obtained results showed that FVTA increased gradually in both Zaraibi and Damascus milk during ripening. The highest concentration of volatile fatty acids in all cheeses was more pronounced at the end of cheese ripening. The increased rate of TVFA in cheese during ripening could microorganisms on milk fat and liberation of TVFA. Similar results were obtained by Iyer and Lelievre (1987) and Omar (1988).

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**جودة الجبن الضاني المصنع من لبن سلالات مختلفة من الماعز
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* كلية الزراعة ، جامعة المنصورة
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تم تصنيع اربعة مكررات من الجبنة الطرى (الجبن الضاني) المصنع من لبن ماعز زرايبي ودمشقي وتم التجبن باستخدام المنفحة بـ أو بدون بادىء. تم تقدير تصافى الجبن الطازج والفقد في وزن الجبن وكذلك محتوى الجبن من الدهن والبروتين والحموضة وقيمة الرقم الهيدروجيني والمواد الصلبة والاحماض الدهنية الطيارة خلال فترة التخزين. اوضحت النتائج عدم وجود فروق معنوية في تصافى الجبن الضاني الطازج المصنع من لبن ماعز زرايبي وماعز دمشقي باستخدام المنفحة بـ أو بدون البادىء وتراوحت ما بين ٢٦,٥٪ في الجبن المصنع من لبن ماعز زرايبي باستخدام المنفحة والبادىء معا و ٢٢,٣٪ في الجبن المصنع من لبن ماعز دمشقي المنفحة باستخدام المنفحة والبادىء معا. وكان تصافى الجبن الناتج من لبن ماعز زرايبي اعلا بدون فروق معنوية من ذلك المصنع من لبن ماعز دمشقي. والفقد في الوزن في الجبن الطازج كان اعلا بفروق معنوية في الجبن المصنع من لبن ماعز دمشقي مصنع باستخدام المنفحة والبادىء معا (١٠%) بعد ١٥ يوم من التخزين مقارنة بعدم وجود فقد في الوزن في الجبن المصنع باستخدام لبن ماعز زرايبي سواء باستخدام المنفحة بـ أو بدون البادىء. لم تكن هناك اختلافات معنوية في متوسط قيمة الحموضة والتركيز السالب لايون الهيدروجين في الجبن الطازج المصنع من لبن ماعز زرايبي أو دمشقي باستخدام المنفحة بـ أو بدون البادىء. زاد محتوى الحموضة وتناقص التركيز السالب لايون الهيدروجين بزيادة فترة التخزين في الجبن المصنع من لبن ماعز زرايبي أو دمشقي وكانت اقل في تلك المستخدم بها المنفحة بالبادىء عن المستخدم بها المنفحة فقط. وكانت الحموضة عالية في الجبن المصنع باستخدام لبن ماعز زرايبي عن تلك المستخدم بها لبن ماعز دمشقي بعد ١٥ يوم من التخزين. كان اعلى تركيز للحموضة ٠,٨ و قيمة التركيز السالب لايون الهيدروجين (٦,٤) في الجبن المصنع من منفحة فقط في الجبن المصنع من لبن ماعز دمشقي بعد ٦٠ يوم من التخزين. كان متوسط محتوى الجبن من الملح عاليا في الجبن الطازج المصنع من لبن ماعز دمشقي باستخدام منفحة وبادىء عن الجبن المصنع من لبن ماعز زرايبي المصنع باستخدام المنفحة فقط. (٥,٤ مقارنة بـ ٤,٧%). بينما لم تكن هناك فروق معنوية في محتوى الجبن من الملح خلال فترة التخزين. انخفض محتوى الجبن المصنع من لبن ماعز دمشقي عن لبن ماعز الزرايبي من الدهن فقط في الجبن الطازج المصنع باستخدام المنفحة وبعد ١٥ يوم من التخزين. وكان محتوى الجبن من الدهن عاليا في الجبن المصنع من ماعز كلا السلالتين باستخدام المنفحة والبادىء عن تلك المستخدم بها المنفحة فقط طازجا او خلال فترة التخزين. كان محتوى الجبن من البروتين عاليا عند استخدام لبن ماعز دمشقي عن الزرايبي خلال فترة التخزين. لم تكن هناك فروق في محتوى الجبن المصنع من كلا السلالتين من الجوامد الصلبة باستخدام المنفحة بـ أو بدون البادىء سواء طازجا او بعد ٦٠ يوم من التخزين. زاد محتوى الجبن من الجوامد الصلبة الكلية باستخدام المنفحة مع البادىء في الجبن الطازج وخلال فترات التخزين. لم تكن هناك فروق معنوية في محتوى الجبن المصنع من كلا السلالتين في الاحماض الدهنية الطيارة باستخدام المنفحة بـ أو بدون البادىء. زاد محتوى الجبن من الاحماض الدهنية الطيارة باستخدام المنفحة فقط عن تلك المستخدم بها المنفحة مع البادىء. وكان محتوى الجبن المصنع من لبن ماعز زرايبي عن الدمشقي من الاحماض الدهنية الطيارة باستخدام منفحة فقط أو منفحة وبادىء بعد ١٥ و ٦٠ يوم من التخزين.

