EVALUATION OF SOME PROBIOTIC FERMENTED MILK IN AL-AHSA MRKETS, SAUDI ARABIA

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ABSTRACT

The chemical, microbiological and sensory evaluation of eight commercial probiotic fermented milk products (six full fat and two low fat) in Al-Ahsa markets were studied. Microbiological and sensory evaluations were determined during 3 weeks of refrigerated storage. The results showed variability in chemical composition: fat content ranged from 0.9 to 1.2 in the low fat and from 3.0 to 3.9 in the full fat, protein from 3.1 to 4.7, ash from 0.7 to 1.2 and carbohydrate from 7.5 to 3.7 g/100g. The pH values of all the products declined significantly from the production day to the end of storage period. From the microbiological side, the coliform bacteria, moulds and yeasts counts were not detected in all tested products during the refrigerated storage at $5\pm1^{o}C$. Seven from eight products contained over 10^6 cfu/ml of bifidobacteria in the production day. Only two of these products maintained 10^6 cfu/ml viable count of bifidobacteria until the end of cold storage period. On the other hand, three products showed the highest number of *L. acidophilus* viable count (above 10^8 cfu/ml) in production day. The results of sensory evaluation showed that all tested products recorded high scores in flavor, appearance, texture or consistency and smell (odor) during refrigerated storage period. These results suggest optimal beneficial consumption of probiotic fermented milk with live probiotic bacteria should be within one week of production. More over this research could be used by the industries to develop new technology to ensure that consumers receive high quality products.

INTRODUCTION

Fermented dairy products have long been considered safe and nutritious. The healthy beneficial effects of fermented milk may be further enhanced by supplementation of probiotic bacteria such as *Lactobacillus* and *Bifidobacterium* species. A probiotic is generally defined as a live microbial supplement which beneficially affects the host animal by improving its intestinal microbial balance (Fuller, 1989). Several health benefits are related to the regular consumption of viable probiotic bacteria including improvement of lactose tolerance (Kim and Gilliland, 1983) antimicrobial (Yildirim and Johnson, 1998), anticarcinogenic (Abd El-Gawad, *et al*., 2004), hypocholesterolemic (Kikuchi-Hayakawa, 2000 and Abd El-Gawad, et al., 2005) and antimutagenic (Hsieh and Chou, 2006). Fermented dairy products are considered to be vehicles by which consumers might receive adequate numbers of probiotic bacteria (Samona and Robinson, 1994 and Stanton *et al*., 1998). To produce therapeutic benefits, a sufficient number of viable microorganisms must be present throughout the entire shelf life of the product. In this regard, minimum levels for probiotic bacteria in fermented milks ranging from 10^5 to 10^6 cfu/ ml (Samona and Robinson, 1994) have been suggested. Schuller-Malyoth, *et al*., (1968) considered that a good probiotic culture should contain between 10^6 and 10^8 viable cells per milliliter. For bifidobacteria to provide therapeutic benefits, it has been recommended that they must be viable and ingested in numbers $\geq 10^6$ cells per gram of yoghurt (Kurman and Rasic, 1991). Thus, maintaining viability of probiotic bacteria until the products are consumed in order to ensure the delivery of live organisms has been of much interest. Several factors have been claimed to affect the viability of probiotic bacteria in yoghurt, including acidity, pH, hydrogen peroxide, oxygen content, temperature of storage during manufacture and storage of fermented milk (Samona and Robinson, 1994; Lankaputhra and Shah, 1995 and Lankaputhra *et al*., 1996). In recent years, a wide variety of probiotic fermented milk products are commercially available in the Saudi Arabia. These products exposure to handling at the high temperature degree in Saudi Arabia and cooled storage in the markets for minimum one week until consumed. Building on this knowledge, the aim of this study was to determine the viable count of probiotic bacteria (*Lactobacillus acidophilus* and bifidobacteria) in some probiotic fermented milk in Al-Ahsa market during refrigerated storage and to further assess the effect of pH value and refrigerated storage period at 5±1^{o}C on the viability of probiotic bacteria in these products.

MATERIALS AND METHODS

1. Fermented milk collection

Eight commercial of probiotic fermented milk products (six full fat and two low fat) were collected in the production day from Al-Ahsa markets, Saudi Arabia. These samples were analyzed microbiologically at the production day and every week for three weeks during refrigerated storage at 5±1^{o}C. The same samples were stored in the refrigerator until chemical analysis. A brief description of these products and their labeled ingredients are shown in Table 1.

Table 1: Description of the commercial probiotic fermented milk products.

Product	Description
A	Stirred yoghurt (Fresh milk 50%, recombined milk 50%, fresh cream, contains Bifidobacteria)
B	Laban (Fresh milk 50%, recombined milk 50%, contains Bifidobacteria)
C	Laban (100% Fresh cows milk, contains Bifidobacteria & *Lactobacillus acidophilus*)
D	Laban low fat (100% cows milk, contains Bifidobacteria & *Lactobacillus acidophilus*)
E	Laban (cows milk, contains probiotic culture)
F	Laban low fat (caws milk, contains probiotic culture)
G	Set yoghurt (Fresh caws milk 50%, recombined milk 50% fresh cream, contains Bifidobacteria)
H	Laban (Fresh milk 100%, contains *Lactobacillus helveticus*, *Bifidobacteria*, *Lactobacillus acidophilus*)

2. Analytical methods

2.1. Chemical composition

Samples of each probiotic fermented milk were taken for determination of moisture according to the Association of Official Analytical Chemists method (AOAC, 1995a). Total nitrogen (TN) was determined by Kjeldahl method (AOAC, 1995b) and fat content by the Gerber method as described in the British Standard method (1989). The ash content of the samples was determined according to the AOAC method (AOAC, 1995c).

Total carbohydrate was calculated by difference as follows:

Carbohydrate (g/100g) = 100 - (water + protein + fat + ash) (Manzi *et al.*, 2007)

Total energy was calculated according to the following equation (CEE Directive, 1990).

Energy (kcal/100g) = 4 * (g protein + g carbohydrate) + 9 * (g lipid)

2.2. Determination of pH

The pH of probiotic fermented milk samples was measured with a digital pH meter by using a TPS digital pH meter (Denver Instruments, TX, USA). Before carrying out the measurements the pH meter was adjusted by using freshly prepared pH 7.0 and 4.0 buffer solutions. The pH of yoghurt samples was determined by direct immersion of the electrode into the sample (20-25ml) maintained at room temperature, and the reading was recorded

2.3. Count of coliform bacteria

The count of coliform group was estimated by plating on McConkey agar medium (Oxid), as recommended by the APHA (1992). The plats were incubated at 37°C for 2 days

2.4. Moulds and yeasts

Potato dextrose agar medium (Oxid) was used for enumerating yeasts and moulds count as recommended by the APHA (1992). The plats were incubated at 20-25°C for 2-3 days

2.5. Count of bifidobacteria

The count of bifidobacteria was enumerated according to the method of Dinakar and Mistry (1994), in which a mixture of antibiotics, including 2g paromomycin sulphate, 0.3g nalidixic acid, and 60g lithium chloride, was dissolved in 1L distilled water, filter-sterilised (0.2µm) and stored at 4^oC until use. The antibiotic mixture (5mL) was added to 100mL MRS-agar medium. L-Cysteine-HCl

0.5% (w/v) (Sigma Chemical Co., St Louis, MO, USA) was also added to decrease the redox potential of the medium. Plates were incubated at 37°C for 48 h an-aerobically.

2.6. Count of *Lactobacillus acidophilus*

The count of *Lactobacillus acidophilus* was determined according to Van de Casteele *et al.*, (2006) by using MRS medium + 0.5 ppm filter sterilized clindamycin. Plates were incubated at 37°C for 48 h an-aerobically.

2.7. Sensory evaluation

Sensory evaluation of commercial probiotic fermented milk products was carried out in the production day and for 3 weeks of cold storage using a regular score panel according to Tamime and Robinson (1985).

RESULTS AND DISCUSSION

Table 2: Chemical composition (g/100g) of commercial probiotic fermented milk products [a]

Products [b]	Moisture	Protein	Fat	Ash	Carbohydrate	Energy kcal/100g
A	82.9±0.2	4.7±0.2	3.8±0.1	1.1±0.0	7.5	83
B	88.4±0.0	3.1±0.1	3.9±0.1	0.7±0.0	3.9	63.1
C	88.6±0.0	3.3±0.1	3.5±0.1	0.7±0.0	3.9	42.8
D	90.7±0.0	3.4±0.0	1.2±0.1	1.0±0.0	3.7	39.2
E	88.1±0.4	3.1±0.1	3.9±0.1	0.7±0.0	4.2	64.3
F	90.6±0.0	3.8±0.6	0.9±0.1	0.7±0.1	4.0	39.3
G	85.6±0.2	4.0±0.4	3.0±0.1	1.2±0.1	6.2	67.8
H	88.5±0.1	3.3±0.1	3.1±0.1	0.7±0.0	4.4	58.7

[a]: Analytical data are means of triplicate analyses standard deviation
[b]: Product samples as in Table 1

1. Chemical composition

The chemical composition of commercial probiotic fermented milk products were tabulated in Table 2. The results showed variability in chemical composition: fat content ranged from 0.9 to 3.9, protein from 3.1 to 4.7, ash from 0.7 to 1.2 and carbohydrate from 7.5 to 3.7 g/100g. Low fat products (D and F) have higher water content and less total energy than other products. However, product A recorded higher protein and carbohydrate contents and less moisture content than other tested products; accordingly it has the greatest amount of energy. Whereas, the fat content of products B and E were greater than other products (3.9 g/100g). Products G, A and D have higher ash content when compared with the other products. In Italian market, Manzi *et al.*, (2007), reported that the fat, protein and ash content of probiotic fermented milk ranged from 0.2 to 3.6, 2.7 to 5.8 and 0.4 to 0.8 g/100g, respectively.

Table 3: Changes in pH values of probiotic fermented milk products during refrigerated storage period 5±1°C.

Products*	pH values during storage period (weeks)			
	0 $^{\Psi}$	1	2	3
A	4.64±0.01^{a}	4.63±0.00^{a}	4.60±0.01^{b}	4.46±0.01^{c}
B	4.56±0.01^{a}	4.59±0.01^{a}	4.56±0.02^{a}	4.34±0.01^{b}
C	4.43±0.01^{a}	4.39±0.01^{a}	4.28±0.01^{b}	4.27±0.03^{b}
D	4.46±0.01^{a}	4.42±0.01^{b}	4.41±0.01^{b}	4.32±0.02^{c}
E	4.44±0.01^{a}	4.40±0.01^{b}	4.36±0.01^{c}	4.35±0.01^{c}
F	4.49±0.02^{a}	4.41±0.01^{b}	4.40±0.00^{b}	4.35±0.03^{c}
G	4.76±0.01^{a}	4.70±0.01^{b}	4.68±0.01^{b}	4.58±0.01^{c}
H	4.45±0.01^{a}	4.39±0.01^{b}	4.35±0.01^{c}	3.30±0.01^{d}

a-d: Mean values (± SD; n =3) in row with the same letters are not significantly different from each other at *P>0.05*.
*: Product samples as in Table 1
Ψ : Product in one-day old

2. Changes in pH values

Changes in pH values of probiotic fermented milk products during refrigerated storage at 5±1°C are summarized in Table 3. The initial pH values of fermented products ranged from 4.43 to 4.76. In general, pH of all tested products was decreased gradually from the production day to the end of storage period. All the products recorded significant differences between the pH in production day and the end of storage period. There were no significant differences in pH values among the products A, B and C from production day and the first week of storage. It is important that we draw attention to the decline of pH (3.30) of product H, this decrease may be due to containing three strains of starter *Lactobacillus helveticus*, *Bifidobacteria* and *Lactobacillus acidophilus* (Table 1) compared with other products. Shah *et al*., (1995) also found similar decreases in pH values during storage of commercial yoghurts containing *L. acidophilus* and *B. bifidum*. Similary, the initial pH values in yoghurts containing *L. acidophilus* and bifidobacteria decreased from 4.33-4.41 at day 0 to 4.16-4.22 at the end of 35 days of storage (Dave and Shah, 1997). In parallel, Akalin, *et al*., (2004) found the initial pH values for the different yoghurt types ranged from 4.51 to 4.48 and they decreased slightly during storage.

3. Count of coliform bacteria, moulds and yeasts

The coliform bacteria and moulds and yeasts counts not detected in all tested products in the production day and during the refrigerated storage at 5±1ºC for 3 weeks. These findings may be due to the high hygienic systems which implemented in these factories

Table 4: Survival (log cfu/ml) of bifidobacteria in commercial probiotic fermented milk products during refrigerated storage.

Products*	Count of bifidobacteria during storage period (weeks)				Log reduction
	0 Ψ	1	2	3	
A	8.36±0.13^a	7.18±0.01^b	6.41±0.30^c	5.42±0.33^d	2.94
B	7.57±0.10^a	7.50±0.14^a	6.44±0.11^b	6.38±0.11^b	1.19
C	7.49±0.01^a	6.78±0.08^b	5.65±0.35^c	4.28±0.04^d	3.21
D	7.88±0.01^a	6.14±0.01^b	5.68±0.39^b	4.14±0.02^c	3.74
E	7.21±0.15^a	6.18±0.40^b	5.65±0.13^{bc}	5.41±0.13^c	1.80
F	5.34±0.03^a	5.17±0.06^a	5.35±0.35^a	4.84±0.12^a	0.50
G	9.88±0.04^a	9.35±0.30^a	6.93±0.59^b	6.71±0.56^b	3.17
H	7.43±0.22^a	7.26±0.07^a	6.04±0.25^b	4.83±0.06^c	2.60

a-d: Mean values (±SD; n =3) in row with the same letters are not significantly different from each other at *P>0.05*.

*: Product samples as in Table 1

Ψ :Product in one-day old

4. Survival of bifidobacteria

The effect of refrigerated storage period at 5±1ºC on the survival of bifidobacterial count in commercial probiotic fermented products was showed in Table 4. The populations of bifidobacteria in all products were decline significantly from production day to the end of refrigerated storage period at 5±1ºC. Nonetheless, during the two weeks of cold storage the population of bifidobacteria remained above 10^5 cfu/ml. The losses of viability of bifidobacteria showed between 0.5 and 3.74 log cycles in products F and D respectively. Moreover, product G recorded a maximum of viable count of bifidobacteria in the production day as well as the end of storage (9.88 and 6.71 log cfu/ml respectively) when compared with all other products, this may due to the highest pH value than other products (Table 3). In contrast, product F showed a minimum count of this organism.

Table 5: Survival (log cfu/ml) of *Lactobacillus acidophilus* in commercial probiotic fermented milk products during refrigerated storage

Products*	Count of *Lactobacillus acidophilus* during storage period (weeks)			
	0^Ψ	1	2	3
A	$8.66{\pm}0.01^{a}$	$7.40{\pm}0.42^{b}$	$6.86{\pm}0.36^{bc}$	$6.26{\pm}0.21^{c}$
B	$8.66{\pm}0.01^{a}$	$7.52{\pm}0.54^{ab}$	$6.44{\pm}0.37^{bc}$	$6.10{\pm}0.71^{c}$
C	$5.20{\pm}0.14^{a}$	$4.45{\pm}0.21^{b}$	$4.10{\pm}0.28^{bc}$	$3.75{\pm}0.21^{c}$
D	$5.72{\pm}0.68^{a}$	$4.67{\pm}0.16^{b}$	$4.55{\pm}0.07^{b}$	$3.74{\pm}0.23^{b}$
E	$6.54{\pm}0.06^{a}$	$5.77{\pm}0.23^{b}$	$5.35{\pm}0.22^{bc}$	$5.15{\pm}0.06^{c}$
F	$5.76{\pm}1.17^{a}$	$4.97{\pm}0.19^{a}$	$4.76{\pm}0.06^{a}$	$4.55{\pm}0.03^{a}$
G	$9.53{\pm}0.04^{a}$	$7.34{\pm}0.32^{b}$	$6.62{\pm}0.69^{b}$	$6.40{\pm}0.14^{b}$
H	$6.42{\pm}0.07^{a}$	$6.21{\pm}0.04^{a}$	$5.17{\pm}0.01^{b}$	$4.08{\pm}0.18^{c}$

a-d: Mean values (±SD; n =3) in row with the same letters are not significantly different from each other at $P>0.05$.
*: Product samples as in Table 1
Ψ :Product in one-day old

According to Kurman and Rasic, 1991, the viable of bifidobacteria level must be above 10^6 cfu/ml to provide therapeutic benefits, products B and G fulfilled this requirement for viability of bifidobactera until the end of cold storage period. These reductions of bifidobacterial count may be due to the decrease of pH values, post process acid production (Wang, *et al*., 2002), sensitivity to oxygen (Shimamura *et al.* 1992), metabolites such as hydrogen peroxide and ethanol, and to bacteriocins produced by lactic acid bacteria (Frank and Marth 1988). These results were in agreement with Samona and Robinson, 1994, Medina and Jordano, 1994, Lankaputhra and Shah, 1995 and Lankaputhra *et al*., 1996 they found poor viability of bifidobacteria in yoghurt during storage.

5. Survival of *Lactobacillus acidophilus*

Table (5) shows the survival of *Lactobacillus acidophilus* in commercial probiotic fermented milk products during refrigerated storage. Generally, the viability of *L. acidophilus* decreased gradually and significantly during cold storage. In production day, among all products, A, B and G products recorded the highest number of *L.acidophilus* viable count (8.66, 8.66 and 9.53 log cfu/ml respectively). In contrast, products C, D and F have a minimum count of this organism. During storage period, all the products showed viable count ranged from 3.7 to 7.5 log cfu/ml. Speck, (1976) reported that 10^8 to 10^9 viable cells of *L. acidophilus* should be ingested daily to ensure that consumers receive health benefits. Products A, B and G fulfilled this requirement for viability of *L. acidophilus* in production day. The reduction of the count of *L. acidophilus* through the cold storage may be due to the production of antimicrobials such as bacteriocins, H_2O_2, or organic acids. Characterizing bacteriocins and bacteriocin-like inhibitory substances produced by *L. acidophilus* and other lactic-acid bacteria has been reviewed by Shah and Dave (2002). These results were in agreement with Shah, et al., (1995) they reported that three out of five brands of fresh yogurt contained 10^7 to 10^8 viable cells of *L. acidophilus* per gram while the remaining two brands contained less than 10^5 *L. acidophilus* cells per gram. Nighswonger et al., (1996) found that some strains of *L. acidophilus* lost viability during storage at 7ºC for 28 day. Dave and Shah (1997) found that the survival of *L. acidophilus* in yogurts after 35 days of storage was only approximately 0.1% to 5% compared to after 5 days of storage. Olson and Aryana (2008) found that the *L. acidophilus* counts in yogurt tended to decrease from 6.84 to 4.43 log cycles during 8 week of storage time.

6. Sensory evaluation

The average sensory scores of all panelists are shown in Table 6. The results showed that all tested products scored high points in flavor, appearance, texture or consistency and smell (odor) during the refrigerated storage period. However, the statistical analysis explained no significant differences (*P>0.05*) in the appearance, body and texture and smell (odor) of all tested products during storage period. Concerning flavor score, products A, B, E and G revealed significant differences in third week of storage periods.

Table 6: Sensory evaluation of commercial probiotic fermented milk products during storage period

Products*	Flavor point (50)				Appearance point (20)			
	Storage period (week)				Storage period (week)			
	0 [¥]	1	2	3	0	1	2	3
A	44.0±4.0a	43.4±3.0a	43.4±6.4a	36.4±3.0b	17.4±1.2a	16.0±3.4a	17.4±3.0a	16.0±1.0a
B	40.6±3.2a	44.0±2.0a	41.4±6.4a	35.6±4.2b	16.6±1.2a	17.4±1.2a	14.0±5.2a	15.4±2.4a
C	42.0±5.4a	42.6±4.2a	40.6±5.0a	39.4±4.2a	14.6±1.2a	13.4±2.4a	14.6±3.0a	13.4±3.0a
D	42.0±5.2a	44.0±2.0a	42.6±3.0a	40.0±2.0a	16.0±0.0a	16.0±0.0a	15.4±3.0a	13.4±1.2a
E	46.0±2.0a	44.6±4.2a	44.0±5.2a	35.6±4.2b	17.4±1.2a	17.4±1.2a	16.0±3.4a	14.6±2.4a
F	45.4±2.6a	42.6±6.4a	43.4±5.0a	42.0±4.0a	18.0±0.0a	12.6±6.4a	15.4±4.6a	14.0±3.4a
G	45.4±1.2a	44.0±4.0a	43.4±6.4a	33.0±5.2b	17.4±3.0a	16.6±1.2a	16.0±2.4a	16.0±2.0a
H	42.0±5.2a	44.0±4.0a	42.6±4.2a	39.4±4.2a	16.0±0.0a	16.0±3.4a	15.4±4.6a	14.0±2.0a

[a-d]: Mean values (±SD; n =3) in row with the same letters are not significantly different from each other at *P>0.05*.
[*]: Product samples as in Table 1
[¥] :Product in one-day old

Products*	Texture or consistency point (20)				Smell or odor point (10)				Total point (100)			
	Storage period (week)				Storage period (week)				Storage period (week)			
	0	1	2	3	0	1	2	3	0	1	2	3
A	17.4±1.2a	16.6±1.2a	17.4±3.0a	16.0±2.0a	8.6±1.2a	8.0±0.0a	7.4±1.2a	7.4±1.2a	87.4	84.0	85.6	73.8
B	16.0±2.0a	16.0±2.0a	15.2±2.4a	14.0±2.0a	9.4±1.2a	8.6±1.2a	8.0±0.0a	8.0±0.0a	80.6	86.0	78.6	73.0
C	16.0±2.4a	14.0±2.0a	15.2±1.2a	14.0±2.0a	7.4±1.4a	7.4±1.2a	6.4±1.2a	6.0±2.0a	80.0	77.4	75.0	72.8
D	16.0±2.4a	16.0±2.0a	15.4±2.4a	14.6±1.2a	90±1.0a	8.0±0.0a	8.0±0.0a	6.6±2.4a	83.0	84.0	81.4	74.6
E	16.6±3.2a	17.4±1.2a	16.6±2.4a	15.4±1.2a	8.6±1.2a	8.0±0.0a	8.0±2.0a	7.4±1.2a	88.6	87.4	84.6	73.0
F	18.0±0.0a	18.0±2.0a	16.0±3.4a	14.6±2.4a	8.0±2.0a	7.4±1.2a	7.4±1.2a	7.4±1.2a	89.4	80.6	82.2	78.0
G	16.6±2.4a	16.6±1.2a	17.4±3.0a	16.6±2.4a	8.0±0.0a	8.0±0.0a	8.0±2.0a	7.4±1.2a	87.4	85.2	84.8	73.0
H	17.4±3.0a	16.0±2.4a	15.4±2.4a	14.6±1.2a	90±1.0a	8.6±1.2a	8.0±0.0a	8.0±0.0a	84.4	84.0	81.4	68.1

[a-d]: Mean values (±SD; n =3) in row with the same letters are not significantly different from each other at *P>0.05*.
[*]: Product samples as in Table 1
[¥] :Product in one-day old

Formation of exopolysaccharide by the starter and probiotic cultures may contribute to prevention of synersis and an increase in viscosity, combined with a better mouthfeel (Hussein, *et al.,* 1996). Griffin, *et al*., (1996) reported that polysaccharide producing yoghurt bacteria were important determinants of yoghurt viscosity and texture. These starter cultures improve the viscosity of yoghurt leading to resistance to mechanical damage (Tamime and Deeth, 1980).

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تقييم بعض الألبان المتخمرة المدعمة للحيوية في اسواق منطقة الإحساء بالمملكة العربية السعودية

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تم دراسة التقييم الكيميائي والميكروبيولوجي والحسي لثمانية منتجات من الألبان المتخمرة المدعمة للحيوية (ست كاملة الدسم واثنتان منخفضة الدسم) وذلك في أسواق منطقة الإحساءحيث تحليل العينات طوال فترة التخزين في الثلاجة لمدة ثلاث أسابيع. وقد أظهرت النتائج المتحصل عليها اختلاف في التركيب الكيميائي بين العينات حيث كانت نسبة الدهن تتراوح ما بين 0.9 إلي 1.2 في العينات منخفضة الدسم وبين 3.0 إلي 3.9 في العينات كاملة الدسم والبروتين من 3.1 إلي 4.7 والرماد من 0.7 إلي 1.2 والكربوهيدرات من 3.7 إلي 7.5 جرام /100 جرام. بينما لوحظ انخفاض في رقم الـ (pH) لجميع العينات مع تقدم فترة التخزين. ومن الناحية الميكروبيولوجية فلم يتم العثور علي أي خلية من بكتيريا القولون وكذلك الفطريات والخمائر علي مدار مدة التخزين. بينما زجد أن أعداد بكتيريا البيفيدو (البكتيريا المدعمة للحيوية) كان أعلي من مليون خلية / مل في ستة عينات فقط من ضمن الثمانية عينات التي خضعت للدراسة وذلك في يوم الإنتاج من بينهم عينتين فقط استمر بهما أعداد بكتيريا البيفيدو إلي مليون خلية / مل حتي نهاية فترة التخزين. ومن ناحية أخري أظهرت ثلاث عينات فقط أعداد مرتفعة (أكبر من 10^8خلية / مل) من بكتيريا الاسيدوفليس (البكتيريا المدعمة للحيوية) وذلك في يوم الإنتاج. أما التقييم الحسي فقد سجل قيم مرتفعة في جميع العينات التي تم فحصها من حيث النكهة والرائحة والقوام والتركيب والمظهر الخارجي وذلك خلال فترة التخزين.

وبالتالي توصي هذه الدراسة باستهلاك الألبان المتخمرة المدعمة للحيوية خلال الأسبوع الأول من الإنتاج نظرا لاحتوائها علي أعداد حية كافية من البكتيريا المدعمة للحيوية خلال هذا الاسبوع. كما تفيد هذه الدراسة مصانع الأغذية لتطوير تقنيتها لضمان وصول منتج ذات جودة عالية للمستهلكيين.