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USING OF DEFATTED SOY FLOUR IN THE PRODUCTION OF YOGHURT

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ABSTRACT

Defatted soy flour was mixed at 4, 8, 12 or 16% with buffaloes' milk for preparing yoghurt. Acidity developed in all the examined blends indicated the suitability of such blends for the growth of yoghurt starter. Increasing the level of added defatted soy flour resulted in an increase in the content of total solids, total nitrogen, soluble nitrogen and non-protein nitrogen of the resultant yoghurt. However, fat content declined with the increase in the percent of defatted soy flour. All of the resultant yoghurt contained no coliform bacteria or *Staphylococcus aureus*. But the control yoghurt had higher total bacterial, proteolytic and lipolytic counts compared to the yoghurt made with the addition of soy flour. Lower total points of sensory evaluation were given to the yoghurt made with the addition of soy flour compared to buffaloes' (control) yoghurt. Amongst the former, yoghurt containing 4 or 8% soy flour gave scores more similar to those of the control yoghurt. Addition of 3 or 1.5% butter starter has improved the flavour of such treatments which kept the same trend of chemical composition.

INTRODUCTION

Shortage in the local milk production directed the attention of dairy producers for preparing milk substitutes. Of these substitutes soy bean derivatives, which have proved to be the most appropriate one. This is due to their food value which is similar to that of cow milk, and simplicity and low cost of preparation. Accordingly, numerous studies employed soymilk, soy protein or soy flour in the manufacture of cheese (Hang and Jackson, 1967; Matsuoka *et al*., 1968; Kim and Shin, 1971; Hofi *et al*., 1976 and El-Safty and Mehanna, 1977), ice-cream (Mahfouz, 1972 and Hammad *et al*., 1985; Kanda *et al*., 1981 and Khader *et al*., 1983). Although Nelson *et al*. (1971 and 1976) have suggested procedures to overcome the beany flavour, which was considered as the main defect of soy dairy products, low scores have still been given to these products.

In the present investigation defatted soy flour was added at various levels to buffaloes' milk for the preparation of yoghurt. Fermentation with butter starter alone or mixed with yoghurt starter was adopted as a trail to improve the flavour of the resultant product, which had given the highest total score amongst the yoghurt preparations made with the addition of soy flour.

MATERIALS AND METHODS

Milk:

Fresh buffaloes' milk was supplied by the herd of the Faculty of Agriculture, Mansoura University, Mansoura, Egypt.

Defatted soy flour:

It was obtained from the Agricultural Research Center, Giza, Cairo.

Starter cultures:

Lyophilized cultures of yoghurt starter (*Lactobacillus delbrueckii* subsp. *bulgaricus* + *Streptococcus thermophilus*) and butter starter (*Lactococcus lactis* subsp. *lactis* + *Lactococcus lactis* subsp. *cremoris* + *Leuconostoc citrovorum*) were obtained from Chr. Hansen's Lab. Denmark.

Chemical analysis:

Yoghurt samples were analyzed for titratable acidity as a percent of lactic acid and pH-values according to Ling (1963). Total solids (T.S.) and fat content according to the British Standard Institutions' (B. S. I.) method (1955). The total nitrogen (T. N.), soluble nitrogen (S. N.) and non-protein nitrogen (N.P.N.) as described by Ling (1963). The total volatile fatty acids (T.V.F.A.) was determined according to Kosikowiski (1978). The total carbonyl compounds were estimated as described by Bassett and Harper (1958).

Microbiological analysis:

The total bacterial count of yoghurt was determined according to the American Public Health Association (1978) by plating suitable dilution in duplicates using nutrient agar medium (Difco Manual, 1966).

The spore-forming count was determined according to Chalmer (1962). The coliform bacterial count as described in Oxoid Manual (1982). The proteolytic bacteria count as described by Chalmer (1962). The lipolytic bacteria count according to Berry (1933). The staphylococci count by (Difco, 1974). The molds and yeasts as described by the Oxoid Manual (1962).

Sensory evaluation:

Yoghurt made with the addition of soy flour was scored for flavour out of 50 points, for body and texture out of 40 points and for appearance out of 10 points (Farahat *et al.*, 1974).

RESULTS AND DISCUSSION

Activity of yoghurt from buffaloes' milk mixed with various levels of defatted soy flour:

Buffaloe's milk had an average of 84.23% moisture, 15.77% total solid, 3.96% total protein and 5.46% total fat content, respectively (Table 1). The pH-values and acidity of buffaloe's milk were 6.61 and 0.18, respectively. Also table (1) showed the average composition of defatted soy flour. It contained 5% moisture, 95% total solids, 48.00% total protein and 5.2% total fat content, respectively.

It's clear from table (2) that the addition of increasing levels of defatted soy flour (DSF) resulted in an increase in the titratable acidity. This is due to the higher total solid content of (DSF) compared with buffaloe's milk (table 1). On the other hand, data in the same table indicate that acidity developed in all the blends during the four hours of incubation. This coincides with Khader *et al.* (1983) and reflects the suitability of these blends for the growth of yoghurt starter. It's obvious from table (3) that pH values and acidity continued to decrease and increase, in order, during the cold storage.

Table (1): Chemical composition of soy flour and buffaloe's milk.

Item	Buffaloe's milk	Soybean flour
Moisture %	84.23	5 %
Total solids %	15.77	95.0 %
Total protein %	3.96	48.0 %
Total fat %	5.46	5.2 %
PH	6.61	---
Acidity	0.18	---

Table (2): Changes of acidity and pH-values during the preparation of yoghurt made from buffaloe's milk and soy flour with yoghurt starter (3%).

Treatments / Time	Control		(1)		(2)		(3)		(4)	
	A	pH	A	pH	A	pH	A	pH	A	pH
After past	0.18	6.69	0.22	6.66	0.23	6.64	0.25	6.63	0.26	6.62
After adding starter	0.20	6.63	0.25	6.59	0.26	6.60	0.27	6.61	0.28	6.90
1h	0.32	6.06	0.40	6.23	0.46	6.38	0.54	6.33	0.72	6.30
2h	0.40	5.90	0.67	5.58	0.68	5.48	1.03	5.36	1.09	5.33
3h	0.68	5.35	0.99	5.02	1.08	5.06	1.26	4.96	1.45	4.90
4h	0.72	4.94	1.13	4.72	1.26	4.58	1.49	4.44	1.57	4.38

Control = Buffaloe's milk.
(1) = 96% buffaloe's milk + 4% soy flour.
(2) = 92% buffaloe's milk + 8% soy flour.
(3) = 88% buffaloe's milk + 12% soy flour.
(4) = 84% buffaloe's milk + 16% soy flour.

Chemical composition:

Table (3) shows that the total solids content of the resultant yoghurt increased with adding soy flour because of its higher total solid content (table 1). However, decrease in fat content was reported with increasing the amounts of defatted soy flour (table 3). This is due to the lower fat content of the latter. On the other hand, as shown in table (3) cold storage increased both the total solid and fat contents in all of the examined yoghurt variants. This is in accordance with Magdoub *et al*. (1992) and could be ascribed to the adsorption of some amount of free water by milk proteins under cold temperatures (Jenness and Patton, 1959). Regarding the total nitrogen (T.N.), soluble nitrogen (S.N.) and non-protein nitrogen (N.P.N.) contents, it's obvious from table (4) that increases in all of these contents were observed with adding defatted soy flour. This is because of the higher total protein of the defatted soy flour (table 4). On the other hand, SN, NPN and total volatile fatty acids increased during the storage period. This indicates microbial and/or enzymatic proteolytic and lipolytic activities. Total carbonyl (T.C) content decreased with increasing the level of added defatted soy flour as shown in table (4). Moreover, the T.C content declined with cold storage. This might be due to volatility of the carbonyl compounds. Similar results with plain yoghurt were indicated by Ibrahim (1984). Furthermore, the same trend was observed by Magdoub *et al.* (1992) in regard to determining the acetaldehyde content of yoghurt prepared by using various levels of defatted soy protein extract.

Table (3): Changes of total solids (T.S.%), Fat (%), acidity, and pH value during storage of yoghurt made from buffaloe's milk and soy flour with yoghurt starter (3%).

Treatments	T.S.%	Fat%	Acidity	pH value
Fresh				
Control	15.77	5.46	0.72	4.94
(1)	19.45	4.66	1.13	4.72
(2)	25.53	4.20	1.26	4.58
(3)	29.14	3.90	1.49	4.44
(4)	32.79	3.78	1.57	4.38
5 days				
Control	16.50	5.80	1.12	4.48
(1)	20.00	4.88	1.19	4.39
(2)	25.92	4.50	1.48	4.35
(3)	29.80	4.20	1.54	4.31
(4)	33.14	3.96	1.58	4.28
10 days				
Control	17.00	5.86	1.17	4.13
(1)	20.94	4.96	1.27	4.10
(2)	26.24	4.64	1.53	4.08
(3)	30.12	4.25	1.57	4.04
(4)	34.20	4.08	1.62	4.00

Control = Buffaloe's milk.
(1) = 96% buffaloe's milk + 4% soy flour.
(2) = 92% buffaloe's milk + 8% soy flour.
(3) = 88% buffaloe's milk + 12% soy flour.
(4) = 84% buffaloe's milk + 16% soy flour.

Table (4): Changes of total nitrogen (T.N.), non-protein nitrogen (N.P.N.), soluble nitrogen (S.N.), total volatile fatty acids (T.V.F.A.) and total carbonyl (T.C.) of yoghurt made from buffaloe's milk and soy flour with yoghurt starter (3%).

Treatments	T.N.	S.N.	N.P.N.	T.V.F.A.	T.C
Fresh					
Control	0.792	0.718	0.126	1.8	1.67
(1)	1.026	0.725	0.144	3.2	1.65
(2)	1.338	0.753	0.155	4.4	1.62
(3)	1.718	0.788	0.168	6.0	1.40
(4)	2.000	0.875	0.203	6.2	1.14
5 days					
Control	0.850	0.735	0.144	4.0	1.17
(1)	1.040	0.745	0.214	4.2	1.16
(2)	1.350	0.770	0.224	5.0	1.10
(3)	1.738	0.805	0.238	6.2	1.00
(4)	2.056	0.893	0.252	6.8	0.95
10 days					
Control	0.880	0.752	0.175	4.2	0.72
(1)	1.338	0.765	0.225	4.4	0.70
(2)	1.430	0.810	0.247	5.4	0.66
(3)	1.786	0.980	0.296	6.4	0.50
(4)	2.142	1.070	0.480	7.0	0.42

Control = Buffaloe's milk.
(1) = 96% buffaloe's milk + 4% soy flour.
(2) = 92% buffaloe's milk + 8% soy flour.
(3) = 88% buffaloe's milk + 12% soy flour.
(4) = 84% buffaloe's milk + 16% soy flour.

Microbiological quality:

Data presented in table (5) indicate that higher content of total viable count (TVC), lipolytic and proteolytic bacteria were observed in buffaloe's (control) yoghurt as compared to defatted soy flour yoghurt. This is due to the superiority of buffaloe's milk for the growth of bacteria as compared to defatted soy flour. On the other hand, it's clear from the same table that no coliform group or *Staphylococcus aureus* was detected in all treatments. This agrees with Magdoub *et al.* (1992). However, molds and yeasts reached detectable levels after 10 days. Sporeforming bacteria were found in all the treatments. Since they were affected by the heat treatment.

Table (5): Microbiological analysis of yoghurt made from buffaloe's milk and soy flour with yoghurt starter (3%).

Treatments	Cfu x 10^6						
	TVC	L.B.	P.B.	Coliform	M&Y	Staph aureus	S.B
Fresh							
Control	6.5	0.003	3.3	ND	ND	ND	0.0026
(1)	6.0	0.0028	2.8	ND	ND	ND	0.0024
(2)	5.8	0.0027	2.7	ND	ND	ND	0.0027
(3)	5.3	0.0026	2.6	ND	ND	ND	0.0022
(4)	5.1	0.0024	2.4	ND	ND	ND	0.0020
5 days							
Control	7.4	0.0033	3.4	ND	ND	ND	0.0025
(1)	6.2	0.0032	3.1	ND	ND	ND	0.0023
(2)	6.1	0.0029	3.0	ND	ND	ND	0.0021
(3)	5.8	0.0027	3.0	ND	ND	ND	0.0021
(4)	5.5	0.0026	2.8	ND	ND	ND	0.0019
10 days							
Control	7.1	0.0028	2.9	ND	0.0028	ND	0.0024
(1)	5.8	0.0026	2.6	ND	0.0027	ND	0.0022
(2)	5.7	0.0021	2.5	ND	0.0021	ND	0.0020
(3)	5.3	0.0019	2.3	ND	0.0021	ND	0.0019
(4)	4.9	0.0018	2.1	ND	0.0019	ND	0.0018

TVC= total viable count; L.B.= lipolytic bacteria; P.B.= proteolytic bacteria, M&Y= molds and yeasts and S.B= sporeforming bacteria.

Sensory evaluation:

Data in table (6) indicate that the highest total score were reported with the control (buffaloe's) yoghurt. Of the defatted soy flour contained yoghurts, the treatment of 4 or 8% defatted soy flour gained higher scores, whether in the fresh or stored state. On the other hand, the lowest scores were reported with the treatments of 12 or 16% defatted soy flour. This in agreement with Abou-Donia *et al.* (1980) and Magdoub *et al.* (1992) who pointed out that increasing the defatted soy protein extract more than 10% tended to impair the sensory properties of the resultant Zabadi. The same trend occurred with the individual characters (appearance, body & texture and flavour). Furthermore, degradation in appearance, body & texture and flavour was observed with cold storage, particularly, after 10 days, as a result of increase in acidity.

Table (6): Organoleptic scoring points of yoghurt made from buffaloe's milk and soy flour with yoghurt starter (3%).

Treatments	Appearance (10)	Body & Texture (40)	Flavour (50)	Total (100)
Fresh				
Control	9.5	38.50	48.60	96.60
(1)	8.8	37.00	47.60	93.40
(2)	7.8	33.60	44.20	85.60
(3)	6.6	32.00	38.20	76.80
(4)	5.8	31.00	31.20	68.00
5 days				
Control	8.8	36.80	46.30	92.00
(1)	8.1	36.00	44.30	88.40
(2)	7.3	32.00	43.50	82.80
(3)	6.2	31.00	37.40	74.60
(4)	5.6	30.00	31.00	66.60
10 days				
Control	7.5	36.50	44.60	88.50
(1)	5.0	30.40	38.80	74.20
(2)	4.4	28.80	37.20	70.40
(3)	4.2	28.40	32.20	64.80
(4)	3.6	26.80	30.00	60.40

Improving the flavour of certain defatted soy protein contained yoghurt with fermentation by butter starter (1.5 or 3%):

Acidity development:

As shown in table (7a&b) acidity developed in all the treatments. Since the addition of 4 or 8% defatted soy protein increased the total solid content, a satisfactory coagulum was obtained with these treatment after time shorter time (4h) than that with the control (buffaloe's) yoghurt.

Table (7a): Changes of acidity and pH-values during the preparation of yoghurt made from buffaloe's milk and soy flour with (1.5 + 1.5) of yoghurt starter + butter starter.

Treatments / Time	Control		(1)		(2)	
	Acidity	pH	Acidity	pH	Acidity	pH
After pasteurization	0.15	6.76	0.20	6.71	0.21	6.66
After adding starters	0.19	6.54	0.25	6.53	0.26	6.52
1h	0.23	6.33	0.27	6.46	0.36	6.42
2h	0.25	6.29	0.32	6.20	0.49	6.05
3h	0.29	6.12	0.45	5.81	0.68	5.58
4h	0.38	5.87	0.86	4.89	0.99	4.90
5h	0.68	4.79	---	---	---	---

Control = buffaloe's milk.
(1) + 96% buffaloe's milk + 4% soy flour.
(2) = 92% buffaloe's milk + 8% soy flour.

Table (7b): Changes of acidity and pH-values during the preparation of yoghurt made from buffaloe's milk and soy flour with butter starter. (3%)

Treatments	Control		(1)		(2)	
Time	Acidity	pH	Acidity	pH	Acidity	PH
After pasteurization	0.14	6.77	0.19	6.73	0.20	6.67
After adding starters	0.18	6.63	0.24	6.62	0.25	6.60
1h	0.20	6.54	0.32	6.52	0.34	6.50
2h	0.22	6.46	0.35	6.05	0.39	6.33
3h	0.24	6.26	0.54	5.40	0.45	6.13
4h	0.27	5.93	0.76	4.80	0.50	5.72
5h	0.61	4.85	---	---	0.78	5.18
6h	---	---	---	---	0.90	4.86

Chemical composition:

Data presented in tables (8a&b and 9a&b) indicate that fermentation with butter starter alone (3%) or mixed with yoghurt starter had no effect on the trend of chemical composition which was previously elucidated with fermentation by yoghurt starter. However, it's of not that higher amounts of total carbonyl compounds were attained with the addition of butter starter, particularly, with 3% of the starter. This is attributed to the formation of amounts of volatile fatty acids from the fermentation of citric acid naturally present in milk, by *Leuconostoc citrovorum* contained in the added butter starter (Hammer and Babel, 1957).

Table (8a): Changes of total solids (T.S.), Fat (F), acidity (A), and pH value during storage of yoghurt made from buffaloe's milk and soy flour (1.5 + 1.5) of (yoghurt starter + butter starter).

Treatments	T.S.	Fat	Acidity	PH value
Fresh				
Control	15.46	5.68	0.68	4.79
(1)	19.20	5.48	0.86	4.89
(2)	23.37	5.25	0.99	4.90
5 days				
Control	17.74	5.76	0.85	4.30
(1)	21.00	5.58	1.53	4.16
(2)	25.00	5.45	1.98	4.18
10 days				
Control	18.19	5.86	0.94	4.22
(1)	21.26	5.62	1.70	4.15
(2)	27.00	5.56	2.20	4.14

Control = Buffaloe's milk.
(1) = 96% buffaloe's milk + 4% soy flour.
(2) = 92% buffaloe's milk + 8% soy flour.

Table (8b): Changes of total solids (T.S.), Fat (F), acidity (A), and pH value during storage of yoghurt made from buffaloe's milk and soy flour with butter starter (3%).

Treatments	T.S.	Fat	Acidity	pH
Fresh				
Control	16.20	6.72	0.61	4.85
(1)	20.22	6.60	0.76	4.80
(2)	24.84	6.24	0.90	4.86
5 days				
Control	18.00	6.78	0.90	4.15
(1)	21.00	6.72	1.24	4.54
(2)	25.12	6.36	1.35	4.74
10 days				
Control	18.41	6.92	0.97	4.14
(1)	21.67	6.88	1.35	4.50
(2)	25.97	6.48	1.53	4.69

Control = Buffaloe's milk.
(1) = 96% buffaloe's milk + 4% soy flour + butter starter (3%).
(2) = 92% buffaloe's milk + 8% soy flour + butter starter (3%).

Table (9a): Changes of total nitrogen (T.N.), non-protein nitrogen (N.P.N.), soluble nitrogen (S.N.), total volatile fatty acids (T.V.F.A.) and total carbonyl (T.C.) of yoghurt made from buffaloe's milk and soy flour with yoghurt starter + butter starter (1.5 + 1.5).

Treatments	T.N.	S.N.	N.P.N.	T.V.F.A.	T.C.
Fresh					
Control	0.800	0.682	0.140	6.4	1.70
(1)	1.260	0.690	0.154	8.0	1.65
(2)	1.540	0.700	0.175	8.8	1.60
5 days					
Control	0.840	0.700	0.154	6.8	1.24
(1)	1.320	0.710	0.210	8.4	1.20
(2)	1.640	0.770	0.245	9.2	1.16
10 days					
Control	0.860	0.730	0.175	9.2	0.86
(1)	1.390	0.735	0.217	10.0	0.75
(2)	1.690	0.805	0.259	12.0	0.70

Control = Buffaloe's milk.
(1) = 96% buffaloe's milk + 4% soy flour + yoghurt starter + butter starter (1.5 + 1.5).
(2) = 92% buffaloe's milk + 8% soy flour + yoghurt starter + butter starter (1.5 + 1.5).

Table (9b): Changes of total nitrogen (T.N.), non-protein nitrogen (N.P.N.), soluble nitrogen (S.N.), total volatile fatty acids (T.V.F.A.) and total carbonyl (T.C.) of yoghurt made from buffaloe's milk and soy flour with butter starter (3%).

Treatments	T.N.	S.N.	N.P.N.	T.V.F.A.	T.C.
Fresh					
Control	0.782	0.680	0.130	16.0	1.75
(1)	1.190	0.700	0.154	10.2	1.72
(2)	1.750	0.730	0.161	12.4	1.70
5 days					
Control	0.820	0.710	0..154	16.4	1.27
(1)	1.260	0.735	0.210	10.8	1.24
(2)	1.820	0.875	0.224	12.8	1.19
10 days					
Control	0.850	0.725	0.170	16.8	1.00
(1)	1.330	0.770	0.224	14.0	0.78
(2)	1.890	0.910	0.259	16.8	0.74

Sensory evaluation:

It's quite clear from table (10a&b) that higher scores for the flavour of yoghurt were attained with fermentation by butter starter whether at 3 or 1.5%. This should be related with the formation of some volatile compounds by *Leuconostoc citrovorum*. However, control yoghurt remained of the highest total score. The trend of each character (appearance, body & texture and flavour) as influenced by the cold storage remained as formerly described with yoghurt starter.

Table (10a): Organoleptic scoring points of yoghurt made from buffaloe's milk and soy flour with yoghurt starter and butter starter (1.5 + 1.5%).

Treatments	Appearance (10)	Body & Texture (40)	Flavour (50)	Total (100)
Fresh				
Control	9.5	38.00	48.00	95.50
(1)	9.0	37.30	45.60	91.90
(2)	8.8	35.60	44.00	88.40
5 days				
Control	8.8	36.60	46.30	91.70
(1)	7.8	34.30	42.60	84.70
(2)	7.6	34.00	40.00	81.60
10 days				
Control	8.5	35.00	45.00	88.50
(1)	7.5	34.00	41.00	82.50
(2)	7.0	33.50	38.00	78.50

Control = Buffaloe's milk.
(1) = 96% buffaloe's milk + 4% soy flour + yoghurt starter + butter starter (1.5 + 1.5).
(2) = 92% buffaloe's milk + 8% soy flour + yoghurt starter + butter starter (1.5 + 1.5).

Table (10b): Organoleptic scoring points of yoghurt made from buffaloe's milk and soy flour with yoghurt starter (3%).

Treatments	Appearance (10)	Body & Texture (40)	Flavour (50)	Total (100)
Fresh				
Control	9.5	38.00	48.50	96.00
(1)	9.3	37.50	46.50	93.30
(2)	8.5	36.50	45.00	90.00
5 days				
Control	8.8	36.60	47.30	92.60
(1)	8.2	35.00	43.50	86.70
(2)	8.0	34.00	41.00	83.00
10 days				
Control	8.5	35.00	45.50	89.00
(1)	7.5	33.00	42.00	82.50
(2)	7.0	32.80	39.20	79.00

It could be concluded that the addition of 4 or 8% defatted soy flour to buffaloe's milk could be an acceptable substitution since it gave yoghurt of organoleptic characters much similar to those of buffaloe's yoghurt. On the other hand, the addition of butter starter alone or mixed with yoghurt starter resulted in improving the flavour without significant impact on the coagulation time or chemical composition of the resultant yoghurt. Herewith we recommend such addition.

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إستخدام دقيق الصويا المنزوع الدهن فى صناعة اليوجورت

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تم خلط دقيق الصويا منزوع الدهن بمستويات 4 ، 8 ، 12 أو 16% باللبن الجاموسى وذلك لتصنيع اليوجورت ، وقد لوحظ تطور الحموضة فى جميع المعاملات مما يدل على صلاحية تلك الخلطات لنمو ميكروبات بادئ اليوجورت ، وأدى زيادة مستوى دقيق الصويا المضاف إلى زيادة الجوامد الكلية والنيتروجين الكلى والنيتروجين الذائب والنيتروجين غير البروتينى في اليوجورت الناتج ، على أن زيادة نسبة دقيق الصويا المضاف أدى إلى خفض نسبة الدهن ، ميكروبيولوجياً كانت جميع العينات خالية من بكتيريا القولون أو ميكروب *Staphylococcus aureus* ، وسجلت أعلى أعداد من البكتيريا والبكتيريا المحللة للبروتين والمحللة للدهن فى اليوجورت الكنترول المصنع من اللبن الجاموسى مقارنة بذلك الناتج من اليوجورت الناتج من اللبن الجاموسى المحتوى على دقيق الصويا ، وسجلت درجات تحكيم حسى أقل للنوع الأخير على أن اليوجورت الناتج من إستخدام 4 أو 8% دقيق صويا أعطى أعلى درجات مقارنة بالنسب الأخرى ، وأدت إضافة 3 أو 1.5% بادئ زبد إلى تحسين نكهة المعاملات المحتوية على دقيق الصويا