2nd Sci.Congr. of Egypt. Soc. Anim. Mang., 29-31 Oct.(2007):72- 82

IMPROVEMENT OF MICROBIOLOGICAL QUALITY of BALADY YOGHURT

By

SALWA, R.S. HEGAZY AND GHADA, S. E. SALEM

Food Hygiene Department, Animal Health Research Institute.
Agricultural Research Center.

SUMMARY

Part I: A total of 40 random Samples of balady yoghurt collected from small milk and dairy products shops in Cairo and Giza Governments. Each sample was divided into four parts. The first part was examined microbiologically, and revealed that mean counts of, Enterobacteriacae, *Staphylococcus aureus* and (yeast & mold) were 10^5, 10^2 and $3x\ 10^3$ cfu/g respectively. The incidence of isolated *Staphylococcus aureus* was 75%, and all examined samples proved to be free from *Bacillus cereus, Escherichia coli, Listeria monocytogens* and *Salmonellae* spp. The second, third and forth parts were mixed with 0.05%, 0.06% and 0.07% potassium sorbate respectively to study its reduction effect on bacterial and fungal counts, then these samples were examined microbiologically and found that the mean counts of Enterobacteriacae were 10^3,10^2 and 40 while for *Staphylococcus aureus* were 60, 21 and 11 and for yeast & mold were 21,0 and 0 respectively. These indicated that the reduction % for Enterobacteriacae counts, *Staphylococcus aureus* counts and (yeast & mold) counts after addition of potassium sorbate with concentration of 0.05% were 99.00%,40.00% and 99.30% respectively ,while in samples mixed with 0.06% potassium sorbate were 99.90%,79.00% and 100.00 %respectively and in those mixed with 0.07% potassium sorbate were 99.96%,89.00% and 100.00% respectively.

Part II: Manufacture of yoghurt in the laboratory: Milk was divided into four parts, first part without any addition of potassium sorbate (control), second, third and fourth parts were mixed respectively with 0.05%, 0.06% and 0.07% potassium sorbate for determination of shelf life of prepared yoghurt. Yoghurt mixed with 0.05%,0.06% and 0.07% was subjected to sensory evaluation which revealed that yoghurt mixed with 0.06% and 0.07% was unaccepted organoleptically, but yoghurt mixed with 0.05% potassium sorbate was accepted (i.e. no change in color, taste and appearance). The shelf life of yoghurt without any addition(control) was 1 week and its pH started at 4.4 While yoghurt mixed with 0.05% potassium sorbate its shelf life extend to 45 days & its pH started from 4.6 till reached 4.2. While PH of yoghurt mixed with 0.06% and 0.07% potassium sorbate reached 5 and was unaccepted.

INTRODUCTION

Fermentation is one of the oldest methods practiced by human beings for the transformation of milk into products with an extended shelf life. The exact origin(s) of the making of fermented milks is difficult to establish, but it could

date from some 10–15 00 years ago as the way of life of human beings changed from being food gatherer to food producer **(Pederson, 1979).**It is likely that the origin of yoghurt was the Middle East, and the evolution of this fermented product through the ages can be attributed to the culinary skills of the nomadic people living in that part of the world. Today, fermented milk products are manufactured in many countries **(Campbell-Platt, 1987).**

The accepted homeland of yoghurt is the Balkan Peninsula and the Middle East region. To the communities living in those parts of the world, this type of fermented milk product is identified and known as natural/plain unsweetened yoghurt. It is evident that yoghurt plays an important role in the diets of these communities. The great popularity of yoghurt lies in the facts that yoghurt consumed not only as a refreshing drink and thirst quenching in hot weather but also for its unique nutritional and therapeutic attributes, furthermore it is a main ingredient during the preparation of a wide variety of dishes including salads and soups; such food habits and their ensuing consumer attitudes may well be a contributory factor to the high annual consumption. Incidentally, recipes for yoghurt dishes are increasingly being included in cookery books all over the world **(Tamime and Robinson, 2000)** .Also yoghurt is an excellent source of high quality proteins, vitamins, minerals and considers a rich source of calcium. It could supply many lactic acid bacteria that may induce changes in the equilibrium and metabolism of the intestinal micro flora and thus excrete a healthful influence on the host and also improves the bioavailability of other nutrients and decrease yeast infection. **(Weinsier and Krumdieck, 2000 and Piaia, 2001)** . Moreover, yoghurt exhibits significant anti-mutagenic activities against colon carcinogens, beneficial effects against osteoporosis, impaired lactose indigestion, in addition yoghurt can lower cholesterol, has positive

effect on immune defense mechanism and cardiovascular diseases. **(Heyman, 2000)**.

Middle East has a subtropical climate and summer temperatures can reach as high as 40°C. In such climate, milk turns sour and coagulates within a short time of milking, particularly as the milk is produced under primitive conditions. Thus, the animals are hand milked, no cooling of the milk is possible, and the risk of contamination by micro-organisms from the air, the animal, the feeding stuffs or the hands of the milker is extremely high, **(Tamime and Robinson, 2000)** .Under these conditions the possibility of transporting or even keeping milk for long length of time is non-existent, and as a result the tendency of milk manufacture appear to be of great importance.

In Egypt, small producers manufacture Zabadi by boiling buffalo's milk for 30 min, cooling it to 40–42°C, inoculating with a starter (i.e. previous day zabadi) and incubating in the retail container, finally the milk is fermented in the retail container **(Mahran, 1996and Iniguez et al., 1997)** .This type of locally produced zabadi (balady yoghurt) is so much available for risk of contamination by different micro organisms ,yeast and molds beside that its way of manufacture not decrease but on contrary it increases the sources of contamination, and we find that its expire date is 3 day as a maximum period for consumption during which its physical and sensory attributes changes. Although yoghurt has many desirable properties, it is still prone to deterioration, especially at ambient temperature, within a matter of days, and one discernible trend in the Middle East has been the search for simple techniques to extend its keeping quality. **(Tamime and Robinson, 2000).**

Sorbic acid and its potassium salt, commonly named as sorbates are generally recognized as safe compounds and are some of the most widely used food additives in the world. They are extensively used in the dairy industry, as they are effective preservatives due to their inhibitory action on yeast and mold growth and their ability to selectively depress bacterial growth including pathogenic strains. The usefulness of sorbates to the dairy industry is acute due to the fact that, it is a successful antimicrobial against pathogens of concern, but does not destroy fermentative and desirable bacteria **(Roberts, 2002).**

Sorbate is an approved preservative and is added in Brazil at up to 300μg-1 **(Moreira et al., 2001).** A maximum concentration of 0.3%by weight is permitted in Federal Definitions and Standards of identity as a preservative for many cheeses and cheese products **(Collins and Moustafa, 1968). Egyptian Ministry of Health (1992)** low No., 32 allowed the presence of 20 ppm sorbic acid in white cheese , in 1995 this law was modified by law No.,478 which raises this concentration up to 1000ppm sorbic acid in unripened fresh cheese **(ElShazly et al.,1998).**

The purpose of the present study is to provide information about microorganisms which may indicate contamination and have public health significance occurring in balady yoghurt, also a trial to improve microbiological and keeping quality by addition of potassium sorbate during manufacture of balady yoghurt.

MATERIALS AND METHODS

Part 1:

A total of forty random samples of balady yoghurt were collected from Cairo and Giza Governments., transferred to the laboratory with minimum of delay (

Each sample was divided into four parts ,first part was subjected directly to microbiological examination, while second ,third and fourth parts were thoroughly mixed under aseptic conditions with potassium sorbate 0.05%, 0.06% and 0.07% respectively , after 15 min the samples were subjected to the following microbiological examinations .

Microbiological examinations:-

1-Determination of microbial counts:-

1.1-Enterobacteriaceae count: was performed according to **APHA (1992)**

1.2-Coliforms and Fecal coliforms (MPN): Carried out according to,**Fenget al.(1998).**

1.3-*Staph aureus* count:Was adopted by the technique described by **FAO (1992)**

1.4-Mould and yeast count: Were applied according to **Koneman et al. (1994)**

2-Isolation and identification of food borne illness bacteria:

2.1-*Bacillus cereus*: According to the procedures of **Oxoid (1996).**

2.2- Staph aureus: Were done according to **APHA (1992).**

2.3 - *Listeria monocytogenes*: According to **FAO (1992).**

2.4- *E. coli*: According to **FAO (1992).**

2.5- *Salmonella* spp.: According to **Andrews and Hammack (1998).**

Part II:

Manufacture of yoghurt in the laboratory .According to **Hui (1993).**The experiment was repeated 3 times. Before fermentation, milk was divided into four parts, first part without any additions (control), second, third and fourth parts were mixed separately with potassium sorbate in concentrations of

0.05%, 0.06% and 0.07% respectively, after fermentation (yoghurt manufacture) samples were stored refrigerated at 4°C. Then subjected to the following:

3.1- Sensory evaluation: According to **Hui (1993).** Samples were evaluated for their sensory attributes by 5 panelists; the panelist evaluated overall acceptability of yoghurt by giving scores for flavor& body and texture &appearance of manufactured yoghurt which was mixed with 0.05%, 0.06% and 0.07% potassium sorbate.

3.2- Determination of pH: According to **O'Connor (1995)** and **Tamime and Robinson (2000).**

3.3- Determination of shelf-life: According to **Kilcast and Subramaniam (2000):**

The shelf-life was defined as the no., of days in which yoghurt could be stored without change in its pH and its appearance, flavor and /or taste.

Results

Table (1) Statistical analytical results of micro biological counts/ gm of purchased yoghurt samples:

Microbiological Count/g	yoghurt											
	Without addition of p.sorb(control)			Second part (mixed with 0.05%p.sorb)			Third part (mixed with 0.06%p.sorb)			Fourth part (mixed with 0.07% p.sorb)		
	Min	Max	Mean ±SE	Min	Max	Mean ±SE	Min	Max	Mean ±SE	Min	Max	Mean ±SE
Enterobacteriacae	10^2	$4x10^5$	$10^5±3x10^4$	12	$5x10^3$	$10^3±3x10^2$	0	$3x10^2$	$10^2±20$	0	10^2	40±10
Staph. aureus	0	$7x10^2$	$10^2±5$ x 10	0	$3x10^2$	60±19	0	10^2	21±9	0	9±5	11±4
Yeast &Mold	10^2	$3x10^4$	$3x10^3±10^3$	0	10^2	21±9	0	0	0	0	0	0

Table (2): Reduction % of potassium Sorbate for microbial counts

Concentration of p.sorbate / Microbial counts	0.05 %	0.06%	0.07 %
Enterobacteriacae	99.00	99.90	99.96
Staph. aures	40.00	79.00	89.00
Yeast & Mold	99.30	100.00	100.00

Table (3): Incidence of food borne illness bacteria isolated from examined yoghurt.

Microorganisms	Number of examined samples	Positive samples	
		No.,	%
Bacillus cereus	40	0	0
E.coli	40	0	0
L. monocytogenes	40	0	0
Salmonella. spp	40	0	0
Staph. aureus	40	30	75 %

Table (4): Statistical analytical results of sensory evaluation of (score card) examined yoghurt samples (No.,=15)

Samples / Sensory evaluation	yoghurt mixed with 0.06%p.sorb			yoghurt mixed with 0.07%p.sorb					
Flavour criticism	Score			Number of samples			%		
No criticisms	10			5			33.33		
	Intensity of defect								
	Slight			Definite			Pronounced		
	Score	No.	%	Score	No.	%	Score	No.	%
Bitter	9	5	33.33	7	2	13.33	5	3	20
Low acid	9	5	33.33	8	1	6.67	6	4	26.67
Body and texture	Score			Number of samples			%		
No criticisms	5			5			33.33		
	Intensity of defect								
	Slight			Definite			Pronounced		
	Score	No.	%	Score	No.	%	Score	No.	%
Too thin	4	5	33.33		2	13.33	2	3	20
Appearance	Score			Number of samples			%		
No criticisms	5			5			33.33		
	Intensity of defect								
	Slight			Definite			Pronounced		
	Score	No.	%	Score	No.	%	Score	No.	%
Free whey	4	5	33.33	3	1	6.67	2	4	26.67
Atypical color	4	5	33.33	3	5	33.33	-	-	-

No criticisms : In yoghurt samples mixed with 0.05% potassium. sorbate

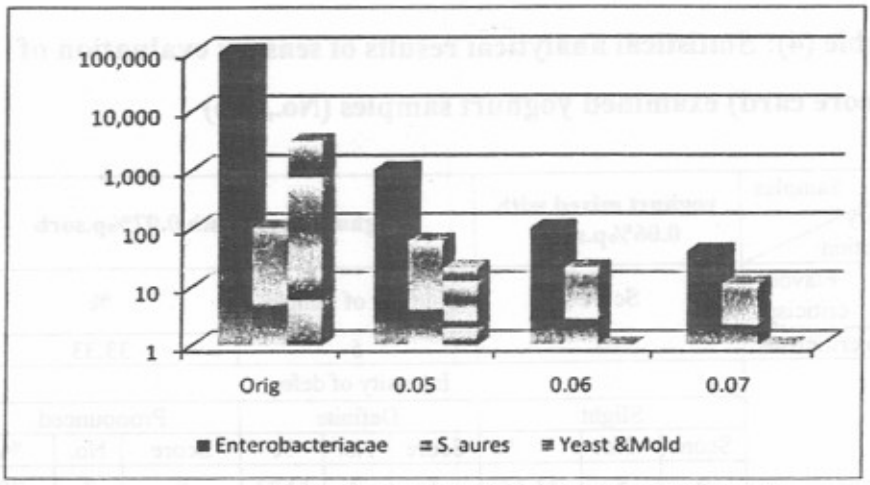

Fig (1): Reduction % of pot. Sorbate.

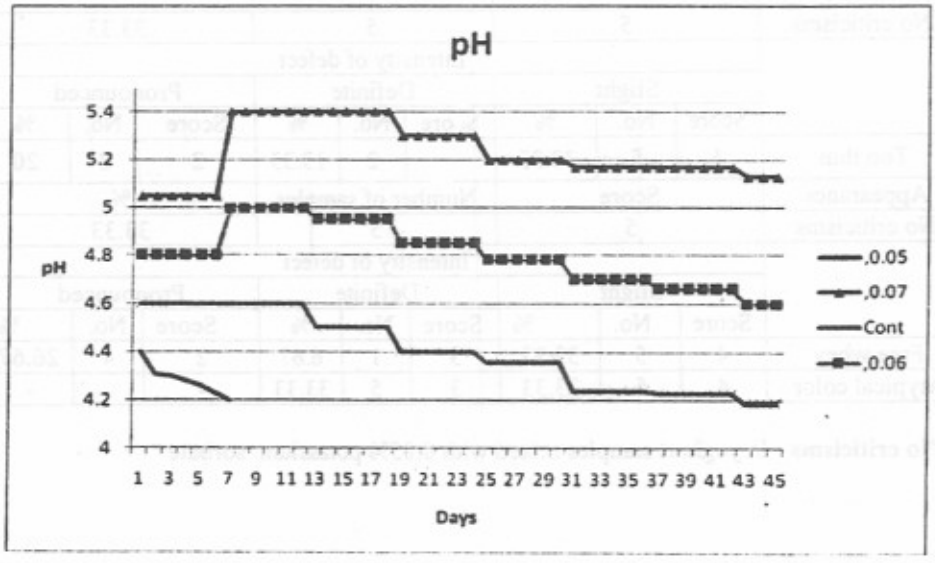

Fig (2): pH measurement and shelf life .

DISCUSSION

Part I

From the results recorded in table (1) it was evident that the mean value of Enterobacteriacea ± S.E in examined yoghurt samples was $10^5 \pm 3x10^4$.

The reason for the existence of enterobacteriacea with high incidence in the above samples may be attributed to either absence of any kind of heat treatment to milk or due to post contamination and presence of poor sanitary packaging and storage conditions at the production area While the mean value of *Staph aureus* ±S.E in yoghurt samples was $10^2 \pm 50$, nearly similar results were recorded by **Abd Elhafiez and Mervat-Ragab (2004),** while were lower than **(Azza, 1999)** and higher than **(Al-Tahiri, 2005),** the incidence of *Staph. aureus* was 75%,this result was higher than **(Aisha,1996).**

Most literature refers that *Staph aureus* appears in milk from lactating animals affected with mastitis, or it may be transmitted directly to milk or other dairy products by human through nasal and throat discharges. Raw milk was often implicated in outbreaks of staphylococcal intoxication due to slow or inefficient cooling or imperfect pasteurization .As well as *staph aureus* favors a high protein and high salt environment, so it is found in many dairy products, acidity and heat can limit the number of outbreaks due to *staph aureus* but this limitation occurs in heat treated or pasteurized yoghurt and when high acidity due to milk fermentation during yoghurt manufacturing **(Bryan,1983 and Al-Tahiri,2005).** On the other hand, the mean values of Yeast & Mold were $3x10^3 \pm 10^3$. This result was similar to **Moustafa et al., (1988), Azza(1999), El Bagory and Mosaad (2002), and Susan and Hammad (2002),**but lower than those obtained **by Aisha(1996) and Al-Tahiri (2005).** Although bacteria can be spoilage organisms, low PH value of yoghurt and its high lactic acid

concentration act as a high selective environment favoring growth of yeasts and filamentous fungi which are often involved in the deterioration of yoghurt **(Fleet, 1990and 1992)** yeast and molds are responsible for off-flavors, loss of texture quality due to gas production, package swelling and shrinkage **(Foschino et al., 1993)** causing economic loss due to rejection of the product.

The achieved results in table (2), Fig(1) revealed that the reduction % for Enterobacteriacae, *Staph aureus* and Yeast & Mold counts were (99.00%, 40.00% and 99.30%), (99.90%, 79.00% and 100.00%) and (99.96%, 89.00% and 100.00%) in samples containing 0.05%, 0.06% and0.07% potassium Sorbate respectively. Potassium sorbate have antimicrobial activity, and is effective against yeasts, molds, and select bacteria. it is widely used at 0.025 to 0.10 % levels in yoghurt **Tamime and Robinson (2000).**

Part II

From figure (2) the results showed that shelf life of manufactured yoghurt without addition of potassium Sorbate (control) was one week and the pH started at 4.4 within normal level then started to decrease till reached 4.2 at the end of the week beside appearance of mold growth .While the pH of yoghurt mixed with potassium Sorbate 0.06% and 0.07% started at 4.8 and 5 then began to elevate till reached 5 and 5.4 after which declination occurred till reached 4.6 and 5.1 respectively ,these results were higher than normal level so they were not acceptable. Yoghurt mixed with potassium Sorbate 0.05% was examined daily for appearance and measurement of pH. The pH started from 4.6 till reached 4.2 within 45 days, beside that normal appearance up to 60 days after which mold growth appears and pH decreases.

The achieved results in table (4) declare that 5 samples which contain 0.05% potassium Sorbate had no criticisms for (flavor& body and texture &appearance).Ten yoghurt samples were unaccepted due to defect in flavor (5 samples with slight bitter flavor, which contained 0.06% potassium Sorbate and 2 samples with definite bitter flavor and 3 samples with pronounced bitter flavor defect resulted from addition of 0.07% potassium Sorbate),this result agreed with that reported by **Kristoffer and Chakraborty (1964)** who mentioned a slight bitterness in cottage cheese with 0.065 % potassium Sorbate, but contrasted with **Geminder (1959)**who Observed that sorbic acid or potassium Sorbate contributed a bitter flavor at 0.10% but not at 0.075%. Also slight low acid flavor was reported in 5 yoghurt samples mixed with 0.06% potassium Sorbate, but definite and pronounced low acid flavor was reported in 2&3 yoghurt samples mixed with 0.07% potassium Sorbate.

On the other hand the two concentrations 0.06% and 0.07% declared defects in body and texture of manufactured yoghurt as 5 samples were slight too thin and 2 &3 samples showed definite and pronounced too thin (weak) body and texture. And for appearance , slight free whey appeared in 5 samples (which were mixed with 0.06% potassium Sorbate),but definite and pronounced free whey appeared in 1&4 samples (which were mixed with 0.07% potassium Sorbate) ,while slight atypical color appeared in 5 samples(which were mixed with 0.06% potassium Sorbate)and definite atypical color appeared in 5 samples(which were mixed with 0.07% potassium Sorbate).

Although the higher reduction % obtain from samples mixed with potassium Sorbate 0.06% and 0.07% but unaccepted organoleptically, while samples mixed with potassium Sorbate 0.05% were accepted organoleptically. So, the

results suggest that concentration of potassium Sorbate of 0.05% by weight might be used advantageously as a way of increasing the shelf life of balady yoghurt.

REFERENCES

Abd_El-Hafiez,E. M. E. and Mervat, K.I. Ragab.(2004): Application of hazarded analysis critical control point (HACCP)system to produce high quality and safe plain yoghurt. Alex. J.Vet, Vol 21 No.1 2-Addis Ababa, Ethiopia.

Aisha,A.M. Riad (1996):Microbiological monitoring for some dairy products as indices of sanitary quality. Ph.D.Thesis .Fac.of Vet.Med. Alex Univ.

Al-Tahiri, R. (2005): A comparison on microbial conditions between traditional dairy products sold in Karak and same products produced by modern dairies. Pakistan J .of Nutrition 4(5):345-348.Nostrand Reinhold, New York.

Andrews, W. H. and Hammack, T. S. (1998): Salmonella Spp. Bacteriological Analytical Manual. 8th Ed.

American Public Health Association APHA (1992): Compendium of methods for the microbiological examination of food .3rd Ed.APHA technical committee on microbiological methods for foods, Washington, D. C., USA.

Azza, H.El-Baba(1999): Sensory, chemical and bacteriological evaluation of yoghurt in Cairo markets.Beni-Suef Vet. Med. J., Vol IX, No., 1, Jan.199..

Bryan, F. L.(1983): Epidemiology of milk borne diseases. J.Food Pro. 46:637-649.

Campbell-platt, G. (1987) In Fermented Foods of the World, Butterworth, London.

Collins,E., and Moustafa,H .H.(1968): Sensory and shelf-life evaluation of cottage cheese treated with potassium sorbate .

El-Bagoury, A.M. And Mosaad, A.A.(2002): Mycological quality of yoghurt with special reference to Aflatoxigenic moulds. Minufyia Vet. J. Vol. 2 No., 1 April.

El-Shazly, A.A., El-Tahra, M. A.A., Abdel-Kader, Y.I. and Ismail, M.M.(1998): Effect of certain preservatives on the properties of Domiatti cheese. J . Agric.Sci. MansouraUniv..23 (1),January.

FAO (1992): Meat and meat products in human nutrition in developed countries. Food and Agriculture Organization of the United Nations. Rome. Food and Nutrition paper, 53: 43. Federation, Brussels, Belgium, pp. 3–4.

Feng, p., Weagant, S.D. and Grant. A. (1998): *E.coli.* In: Bacteriological analytical manual. 8th Ed. Revision A. Chapter 4.

Fleet,G.(1990): Yeasts in dairy products. J. Appl. Bacteriol.,68:199.

Fleet,G.(1992): Spoilage yeasts.Crit.Rev. Biotechnol.,12:1-44.

Foschino, R.,Garzarolli, C. And Ottogli, G.(1993): Microbial contaminants cause swelling and inward collapse of yoghurt packs. Lait,73:395-400..

Geminder,J.(1959): Extending the shelf –life of creamed cottage cheese with sorbic acid. Milk Dealer, 48:44..

Heyman, M. (2000): Effect of lactic acid bacteria on diarrheal diseases. J. Am. Coll. Nutr., 19 (2 suppl.): 137s-146s..

Hui, Y. K.(1993): Dairy Science and Technology Handbook..Eureka, California 95501,U.S.A..

Iniguez, g., cardoso, f. and de hombre, r. (1997): Dairy Science Abstracts, 59, 727.

Kilcast,D. and Subramaniam, P (2000): The stability and shelf-life of food.Woodhead Pub., Limit., Cambridge England.

Koneman, E. W.; Allen, S. D.; Janda, M. W.; Schreckenberger, P.C. and Winn, C. W. (1994): Diagnostic microbiology 6th Ed. JB Lippincott, Philadelphia.

Kristoffer, T., and Chakraborty, B.K.(1964): Keeping quality of creamed cottage cheese. J.Dairy Sci.,47:931.

Mahran, g.a. (1996): In International Symposium on Buffalo Products, Eds. by Gigli, S., Chupin, D., Galal,

Marchant, I. M. and Parker, R. A. (1983): Veterinary bacteriology and virology. 7th Ed. Indian Edition, Iowa State Univ.

Morrira, R. S., Schwan, R. F.,DeCarvalho, E.P.and Wheals,A.E.(2001): Isolation and Identification of Yeasts and Filamentous fungi from yoghurts in Brazil. Brazilian J. Of Microbiol .,32:117-122.

Moustafa, M.K., Ahmed, A.A.H. and Abd El-Hakiem,E.H.(1988): Sanitary condition of commercially available yoghurt in Assuit city. Assuit Vet. Med. J. Vol 20, No.,39..

Oxoid Manual (1996): Culture media, ingredients and other laboratory services. 15th Ed. Published by Oxoid Limited, London.

pederson, c.s. (1979) In Microbiology of Food Fermentation, 2nd Edition, AVI, Connecticut, pp. 1–29.

Perry, G. A., and Lawrence, R. L.(1960): Preservation effect of sorbic acid on creamed cottage cheese. Agr. And Food Chem., 8:37

Piaia, M. (2001): Fermented milk and successful aging. Danon World Newsletter No. 22, 1-14.

Roberts,A.K.(2002): The effect of sorbic acid on the survival of *Escherichia coli O157:H7,Salmonella, Listeria monocytogenes,* and *Staphylococcus aureus* On shredded cheddar and mozzarella cheese. M.D.thesis of science in food

science and technology, Fac. Virginia Polytechnic Institute and State University.

Susan, M.A.Abuzied and Hammad, A. M. (2002): Microbiological evaluation of locally produced yoghurt.J Egypt Vet. Med. Assoc. 62, No., 60:353-362.

Tamime ,A. Y.and Robinson, R. K.(2000): Yoghurt Science and Technology. Published by Woodhead Publishing Limited Abington Hall, AbingtonCambridge CB1 .

Weinsier, R.L. and Krumdieck, C.L. (2000): Dairy foods and bone health: Examination of the evidence. Am. J. Clin. Nut, 72(3):681-689.

تحسين الجوده الميكروبيولوجية للزبادى البلدى

سلوى رجب سليمان حجازى و غادة سعد الدين سالم

قسم صحة الاغذية معهد بحوث صحة الحيوان الدقى

أجرى البحث على 40 عينة عشوائية من الزبادى البلدى المصنع فى معامل محلات الألبان الموجودة فى مناطق القاهرة و الجيزة.قسمت كل عينه الى أربع أجزاء :،الجزء الأول تم فحصه ميكروبيولوجيا و كان متوسط العد البكتيرى للميكروبا ت المعوية و الميكروب المكور العنقودى الدهبى و الخمائر و الفطريات هو10^5, $3,^2 10\times 10^3$على التوالى. وكانت نسبة الميكروب المكور العنقودى الذهبى75 ٪ ولم يتم عزل أى من ميكروب الباسيلس سيرس أو الميكروب القولونى البرازى أو ميكروب الليستيريا مونوسيتوجينز أوالسالمونيلا. و تم ,إضافة البوتاسيوم سوربات الى الجزء الثانى و الثالث والرابع بالنسب التالية، 0،05%، 0.06%، 0.07% على التوالى لدراسة تاثيرالبوتاسيوم سوربات على العد البكتيري والفطرى و كان متوسط العد البكتيرى للميكروبات المعويه 10^3و10^2 و4× 10 على التوالى وبالنسبة للميكروب المكور العنقودى الذهبى كان متوسط العد الكلى 60و21 و11 على التوالى بينما متوسط العد للخمائر والفطريات كان 21و0و0 على التوالى..وبذلك كانت نسبة الانخفاض فى متوسط العد البكتيرى للميكروبا ت المعوية والميكروب المكور العنقودى الذهبى والخمائر والفطريات بعد أضافه سوربات البوتاسيوم بتركيز 0.05% (99.00% و 40.00% و99.30%) على التوالى. بينما للعينات المضاف لها سوربات البوتاسيوم بنسبه 0.06% كانت (99.90%و 79.00% و100.00%) على التوالى .وبالنسبة للعينات المضاف اليها سوربات البوتاسيوم بنسبه 0.07% كانت (99.96% و89.00% و100.00%) على التوالى.

الجزء الثانى:

تم تصنيع الزبادى داخل المعمل وقسم اللبن الى أربع أجزاء . الجزء الأول بدون أى إضافات. والجزء الثانى والثالث والرابع تم أضافه سوربات البوتاسيوم لها بتركيزات 0،05%، 0.06%، 0.07% على التوالى لتعيين مده صلاحيتها وأجراء الاختبارات الحسيه عليها .وقد اظهر ت النتائج ان العينات المضاف إليها البوتاسيوم سوربات بنسبة،

، 0.06%، 0.07% غير مقبولة حسيا بينما المضاف اليها0،05% كانت مقبولة حسيا (لا يوجد تغيير فى اللون أو الطعم أو الشكل).وكانت مدة صلاحية الجزء الأول من عينات الزبادى ألمصنعه معمليا (بدون أي إضافات) 7ايام ودرجة الحموضة بدأت من 4.4 . بينما امتدت مده الصلاحيه للزبادى المضاف له سوربات البوتاسيوم بنسبه 0.05% إلى 45 يوم و درجة حموضة بدأت من 4.6 ووصلت إلى 4.2 بينما درجه الحموضه فى عينات الزبادى المضاف لها سوربات البوتاسيوم بنسبتي 0.06%، 0.07% وصلت إلى 5 وكانت غير مقبوله حسيا.