Int.J.Curr.Microbiol.App.Sci (2024) *13*(02): 46-53

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 13 Number 2 (2024)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2024.1302.008

Evaluation of Hygienic Quality of Yoghurt Sold in Local Market in Sana'a City- Yemen

Mohammed, Ahmed Qasem Alsebaeai[1*], Mohammed Algadri[2], Abdulnaser Hajeb[3], Mohammed Kaid[3], Mohammed Al-Asli[3], Waleed Rokan[3], Talal Swaid[3], Sara Haider[3], Neven Alshadadi[3], Haneen Shoga'a Aldeen[3], Rawan Hamed Al-Deen[3], Tasbeeh Al-Absi[3], Heba Alqershi[3] and Roua Alrefai[3]

[1]*Department of Food Science and Technology, College of Food and Agricultural Sciences, Ibb University*
[2]*Sanhan Community College, Sana'a, Yemen*
[3]*Department of Public Health and Therapeutic Nutrition Al-Razi University, Yemen*

**Corresponding author*

Keywords

Hygienic, Quality, Yoghurt, Yemen, Sana'a City, *Lactobacillus bulgaricus*

Article Info

Received:
05 December 2023
Accepted:
22 January 2024
Available Online:
10 February 2024

A B S T R A C T

This study aimed to Evaluate the Hygienic Quality of Yoghurt Sold in local markets in Sana'a City- Yemen. A total of five random samples of yoghurt were collected from the local markets in Sana'a City- Yemen to assess the hygienic quality of yoghurt. All samples were examined for Physicochemical Parameters, Microbial Content and Sensory Evaluation. The experiment was conducted in two nutrition laboratories; Al-Razi University Laboratory and the Microbiology and Biotechnology Laboratory of First Science Center for Testing and Consultation, Sana'a - Yemen. The results given revealed that the Whey layer (ml) ranged between (0.51-1.21%), while the Net weight ranged from (167.83 - 202.23 g). There were variations among the fat content, as it ranged from 2.1 % to 5.3 %. The total aerobic mesophilic bacterial count varied between 3.1 ×10cfu/g. - 3.9×10^2 cfu/g. the yeasts and mould were analysed from the examined yoghurt samples with a count that was ranged less than 10 cfu/g, while Total coliform count and *E.coli* weren't detected. All samples showed ideal and consistent quality in terms of texture, appearance, colour, flavour and taste in the quality assessment test. These findings suggest that yogurt traded in whole sale markets in Sana'a City- Yemen have good microbiological quality control.

Introduction

Yoghurt, the natural product, is a very versatile product that suits all palates and meal occasions (Isleten and Karagul-Yuceer, 2006). It is one of the most popular fermented milk products (El-Ansary, 2014). Its attractiveness has grown and is used in most parts of the world nowadays (Lee and Lucey, 2010). Yoghurt is a coagulated milk product obtained by lactic fermentation, through the action of *Lactobacillus bulgaricus* and *Streptococcus thermophilus* from fresh milk and pasteurized milk with or without addition (Majoie *et al.*, 2020). Milk and its derivatives are mostly sold as ready to consume product, dubiously in local markets, on

roadsides and schools in particular (Tchekessi *et al.,* 2021). Yoghurt is consumed by both children and adults because it provides energy and essential elements for growth and maintaining health (Dror and Allen, 2014). It also contains probiotics and elements with immune-stimulant properties that help it adapt to environmental variations (Aspri *et al.,* 2017). Yoghurt has been an important part of the human diet in many societies and is known by many names throughout the world.

The word Yoghurt is believed to have come from the Turkish word yoğurmak, which means to thicken, coagulate, or curdle (Donovan and Hutkins, 2018). Yoghurt is a fermented dairy product obtained by lactic acid fermentation through the action of *Lactobacillus delbrueckii ssp*. Bulgaricus and *Streptococcus thermo-philus*.

The resulting lactic acid reacts with milk protein, promoting the characteristic texture and sensorial properties of this product. Yogurt is highly appreciated, and since it is regarded as an important component in human diet, it is produced and consumed massively in many countries (Caleja *et al.,* 2016).

Yogurts differ according to their chemical composition, method of production, flavor, and the nature of post incubation processing (Caballero *et al.,* 2012). Yoghurt diversification is reflected by various textures (set-type or firm, stirred, drinking, frozen, concentrated, or powder yogurts), numerous flavors (natural, sweetened, flavored, or with added pieces of fruits or honey), and diverse shelf life and nutritional (fat content and residual lactose content) properties (Corrieu and Béal, 2016).

Despite their nutritional interest, milk products are excellent environments for the multiplication of all kinds of microorganisms. They can present a health hazard due to the possibility of contamination with pathogenic bacteria when consumed unpasteurized or exposed to contaminated environment (Majoie *et al.,* 2020).

Fermented milk, like freshly milked milk product, is liable to contamination. Knowledge of the behavior of yoghurt during storage is important, because its shelf life is based on whether the product displays any of the physical, chemical, or sensory characteristics that are unacceptable for consumption (El-Ansary, 2014).
Yeast and mold are the major contaminants in yoghurt (El-Ansary, 2014). Micotoxigenic fungi and pathogenic bacteria are able to grow at refrigeration temperatures to a great extent, which can result in an infection. Presence of yeasts and moulds in milk and dairy products are undesirable even when found in few numbers, as they result in objectionable changes that render the products to inferior quality (Abdel-Hameed and El-Malt, 2009).

Moulds and yeasts growing in yoghurt utilize some of the acid and produce a corresponding decrease in the acidity, which may favor the growth of putrefactive bacteria (Oyeleke, 2009).

The quality of the ingredients used in the manufacturing and the compliance with hygiene rules are among factors that can affect the microbiological quality of the final product that can be source of public health problems (Bawa *et al.,* 2015). Foodborne diseases are a major public health issue worldwide causing several deaths in developing countries).

Yemen is one of Arab country that has been under attack since 2015. Therefore, the import of foreign products decreased and local production increased. Yoghurt is one of the most important foods in Yemeni dishes, because of that there are many companies that produce yoghurt.

Unfortunately, three months ago there was word about contamination of yoghurt in Yemen. This study aims to evaluate the hygienic quality of yoghurt sold by physicochemical and microbiological analysis of yoghurt samples in local market in Sana'a city- Yemen.

Materials and Methods

Collection of Samples

Yogurt samples (Nana, Nana active, Hana, Hanaiah, and Safi Yogurt) were randomly collected from the local market of Sana, under hygienic conditions. Five samples were collected from each manufacturer and the samples were separately pooled, kept directly in a refrigerator at 6 ± 1 °C.

Physiochemical Examination

Net weight was determined by the difference between the weight of the bottle and the total weight, Whey layer was determined according to AOAC (1990). In proximate analysis Moisture, Fat, Protein, Sugar, Total Solid fat nonsolid contents were analyzed by Ekomilk analyzer (Manufactured by EON TRADING LLC),while the

acidity was determined as described by AOAC (1990). Ash content was determined according to the difference between moister and total solid.

Microbiological Analysis

25 grams of each sample were aseptically transferred to a sterile homogenizer flask containing 225 ml of sterile normal Saline (0.9%) then the contents were homogenized thoroughly using stomacher. One ml from sample homogenate was transferred to a sterile test tube containing 9 ml of sterile peptone water (1%), from which ten-fold serial dilutions up to $10^{-}4$ were prepared.

Enumeration of total aerobic mesophilic was determined according to (FDA, 1992) and Detection and Isolation of *E. coli* was examined by (ISO, 2001) while Enumeration of mould and yeast was done by (APHA, 1992).

Sensory Evaluation

A panel of 15 judges was selected based up on the hedonic scale for sensory evaluation. The most widely used scale for measuring food acceptability is the 9-point hedonic scale. David Peryam and colleagues developed the scale at the Quartermaster Food and Container Institute of the U.S. Armed Forces, for the purpose of measuring the food preferences of soldiers.

The scale was quickly adopted by the food industry, and now is used not just for measuring the acceptability of foods and beverages, but also of personal care products, household products, and cosmetics.

Statistical Analysis

All the means of the triplicate values and standard deviations from the obtained data were calculated and statistically analyzed using SPSS version 23 (SPSS, 2020).

Results and Discussion

Physiochemical parameters of yoghurt sample

Whey layer

Data in Table (1) shows the Whey layer of the collected yoghurt from the local markets. The amount of Whey layer (ml) ranged between (0.51-1.21 ml). The NANA sample contains the highest Whey in comparison to other samples, it can be due to the poor distribution and storage of the NANA sample.

Net weight

The Net weight of the collected yoghurt from the local markets were presented in table (1). The Net weight were ranged from (167.83 - 202.23 g). The HANA sample contained the highest Net weight in comparison to other samples, while the sample SAFI contained the lowest value, there are no Yemeni standards for Net weight.

Acidity percentage

The titratable acidity which is an expression of the percentage lactic acid content. Table 1 showed that the titratable acidity % of the examined samples ranged from 0.75- 0.84%. In 2004, Nigerian Industrial Standard (NIS) recommended a maximum of 1.5% lactic acid in yoghurt and the range (0.75- 0.84%) recorded in this study is considered to be satisfactory. The lactic acid contents obtained in this study also compared favorably with the range (0.17 – 1.16%) reported by Olubamiwa and Kolapo (2010).

The Fat Content

Regarding the fat content in examined Yoghurt samples sold in local markets in Sana'a city there was a variation among the fat content as it ranged from 2.1 % to 5.3 % as shown in table (1), the sample NANA contained less fat (2.1), while the sample HANAIAH contained the highest value (5.3), our findings were not matching with Yemeni standards.

Total solids nonfat content

Results of table (1) revealed that the total solids nonfat content of Yoghurt samples sold in local markets in Sana'a city were ranged from 5.1 to 12.2 %, the HANIA sample reported the lowest value (5.1%) while the SAFI sample had the highest value (12.2).

The Yemeni standards for yoghurt reported that Total solids nonfat content should be no less than (8.2%), so the samples NANA ACTIVE, HANA, HANAIAH were out of range of Yemeni standards. It has been reported that the variations in total solids nonfat content of Yoghurt samples can be due to chemical composition of

the milk used in the production of Yoghurt. As well as the manufacture technique, temperature level, and pressing method during the straining stage.

pH

The pH of the samples ranged from 4.12 – 4.37 and it was less than the reading by (Osundahunsi *et al.,* 2007) with the range (4.4-4.7) reported in literature for yoghurt. Mital and Steinkraus (1994) reported a pH range of 4.26 – 4.70, and these results are also higher than our findings.

Though the pH of all the yoghurt blends decreased with fermentation time, the differences observed in the degree of pH decrease in the fermenting yoghurt blends may be a reflection of the ability of the yoghurt bacteria to grow in the blends and ferment the carbohydrates they contained.

Moisture

The moisture contents of the Yoghurt samples sold in local market in Sana'a city are presented in Table 1. Sample (NANA) was the highest (86.76%) while sample (HANA) was the lowest (83.31%) respectively. The high moisture content could be attributed to the fact that yoghurt is a liquid food product. The moisture content of the Yoghurt samples sold in local markets compared favorably with the value of 87.80% reported by Osundahunsi *et al.,* (2007) but lower than the range (90.94 – 92.09%) reported by Olubamiwa and Kolapo (2010).

Protein

The result of the yoghurt samples in Table 1 the proportion of sample (Hanaiah) having the lowest value (3.4%) and sample (Safi) having the highest protein content of 5.40%. Protein content is an important factor that effects the quality of acid coagulation of protein gel products.

Microbial analysis of yoghurt Sample

Total mesophilic count

The results of microbiological analysis of yoghurt samples are shown in table (2). The total aerobic mesophilic bacterial count varied between 1³cfu/g. - 3.9×10^2 cfu/g. These results are in agreement with the findings of Caglar *et al.,* (1997) and Yerlikay *et al.,* (2015).

Higher counts were obtained by Thabet *et al.,* (2014), they found that the total aerobic mesophilic bacterial count of 30 torba (strained yoghurt) samples was ranged from 95 to 92x 10^6 cfu/g, lower results were obtained by Guizani *et al.,* (2000); Younus *et al.,* (2002); Eissa *et al.,* (2010) and Saleh (2013). Lower aerobic mesophilic bacterial load in yoghurt samples may be attributed to poor distribution and storage.

Total Coliform count

According to the table (2) the results revealed that the examined yoghurt samples weren't contaminated with coliforms, similar results were reported by Soltani and Guzeler (2012) and Zaky *et al.,* (2013). They could not detect coliforms in there examined samples.

Occurrence of coliform bacteria has been used as an indicator of microorganisms for bacteriological quality of milk and its products (ICMSF, 1986). Moreover, its occurrence shows improper sanitation, as its presence indicates fecal contamination or post-process contamination, often caused by a lack of hands hygiene of food handlers (El Bakri and El Zubier, 2009).

With respect to the present data, it is observed that hygienic measures are not applied during production, storage and distribution of labenah sold in Egyptian public markets.

E.coli count

E.coli count was not detected in all the examined samples of yoghurt. Similar results were recorded by Abdallah and Hussain (2010). Presence of Total coliform count in any food sample indicates unhygienic conditions and fecal contamination of the product through processing, transportation and storage. Its presence concern a public health hazard (Foley and Lynne, 2007).

Total count of yeast and mould

In this study, the yeasts were isolated from the examined yoghurt samples with a count ranged less than 10 cfu/g, as shown in table (2).

Table.1 Chemical analysis of Yoghurt Sample

Parameters	Yoghurt Sample				
	NANA	SAFI	NANA ACTIVE	HANA	HANAIAH
Moisture content (%)	86.76±0.89	84.56±0.66	84.20±0.97	83.31±0.88	85.16±1.17
pH	4.14±0.02	4.20±0.03	4.12±0.02	4.34±0.01	4.37±0.13
Acidity %	0.81±0.07	0.84±0.07	0.84±0.06	0.81±0.18	0.75±0.13
Ash (%)	0.43±0.02	0.2±0.01	0.15±0.01	0.31±0.02	0.46±0.03
Total Fat (%)	2.18±0.12	2.56±0.31	4.95±0.88	4.92±0.89	5.32±0.22
Protein (%)	4.12±0.59	5.44±0.36	5.32±0.38	4.48±0.25	3.42±0.26
lactose (%)	1.53±0.31	1.37±0.25	1.26±0.37	1.1±0.21	1.27±0.19

*Each value is Mean ± Standard Deviations (n = 3).

Table.2 Microbial analysis of Yoghurt Sample

Parameters	Yoghurt Sample				
	NANA	SAFI	NANA ACTIVE	HANA	HANAIAH
Total Plate count	TNTC	3.1×10	1	3.9×10^2	1
Mould and yeast count	<10	<10	<10	<10	<10
Total coliform count	NIL	NIL	NIL	NIL	NIL
E. coli	NIL	NIL	NIL	NIL	NIL

*Each value is Mean ± Standard Deviations (n = 3).

Table.3 Sensory evaluation of Yoghurt Sample

Parameters	Yoghurt Sample				
	Color	**Flavor**	**Texture**	**appearances**	**Overall acceptable**
NANA	7.65	7.29	6.82	7.65	7.59
SAFI	7.65	7.06	6.94	7.53	7.35
NANA ACTIVE	7.24	6.35	6.88	7.24	7.18
HANA	7.65	7.24	7.35	7.41	7.71
HANAIAH	7.41	6.71	6.71	7.06	7.59

Higher results were reported by El-Ansary (2014) who isolated yeasts from yoghurt samples with mean value $5.6x10^4 \pm 4.98x10^3$ cfu/g.

Sensory evaluation of yoghurt samples by Hedonic Scaling

The sensory studies of yoghurt samples were carried out. The sensory evaluation carried out using 9 point hedonic by taking parameter like color, flavor, texture, appearances and overall acceptability. The products were evaluated using sensory attributes by a panel of 15 judges. The results are present in Table 3.

Texture Acceptability

Mean score of texture in the yogurt sample of NANA, SAFI, NANA ACTIVE, HANA, HANAIAH are 6.82, 6.94, 6.88, 7.35, 6.71, respectively. In texture acceptability test, Hedonic scale showed that the HANA yogurt sample was moderately consistent overall and the rest were considered slightly lower in texture quality.

Flavors Acceptability

The flavors mean score were 7.29, 7.06, 6.35, 7.24 and 6.71 respectively. In the flavor acceptability test, Table (3), Hedonic scale showed that the all yogurt samples were liked moderately and the NANA ACTIVE sample was slightly lower in taste quality (mean score is 6.35).

Colour Acceptability

It appeared that HANA, SAFI and NANA obtained the highest score for its colour (mean is 7.65). In the color acceptability test, from Table 3, Hedonic scale showed that the all yogurt sample were liked moderately.

Appearances Acceptability

The appearances score of NANA, SAFI, NANA ACTIVE, HANA, HANAIAH were 7.65, 7.53, 7.24, 7.41 and 7.06 respectively. In the appearances acceptability test, from Table 3, Hedonic scale showed that all yogurt samples were liked moderately.

While the introduction of pasteurization has helped to ensure the safety of dairy products, progress has been slower in preventing the microbial spoilage of dairy products. All samples were handled appropriately with utmost precautions and standard protocol before lab testing to obtain accurate microbial quality and further investigative analysis. It is very necessary to protect yoghurt from contamination during and after its processing and great attention should be taken for the quality of milk used for the manufacture of yoghurt. From this study, it was observed that quality of the most of the samples was average. The fat percentage of yogurt (2.1-5.3%) slightly differs from the milk fat (3.5%). The total microbial count was low in all sample, so it maybe a disadvantage for all the samples. The pathogenic microbial analysis did not detect any pathogenic microbes in all samples. All samples showed ideal and consistent quality in terms of texture, appearance, colour, flavor and taste in the quality assessment test. Finally, it can be said that an overall good quality of yogurt in terms of texture, appearance, color and taste was observed.

Author Contribution

Mohammed, Alsebaeai: Investigation, formal analysis, writing—original draft. Mohammed Algadri: Validation, methodology, writing—reviewing. Abdulnaser Hajeb:—Formal analysis, writing—review and editing. Mohammed Kaid: Investigation, writing—reviewing. Mohammed Al-Asli: Resources, investigation writing—reviewing. Waleed Rokan: Validation, formal analysis, writing—reviewing. Talal Swaid: Conceptualization, methodology, data curation, supervision, writing—reviewing the final version of the manuscript. Sara Haider: Investigation, formal analysis, writing—original draft. Neven Alshadadi: Validation, methodology, writing—reviewing. Haneen Aldeen:—Formal analysis, writing—review and editing. Rawan Hamed Al-Deen: Investigation, writing—reviewing. Tasbeeh Al-Absi: Resources, investigation writing—reviewing. Heba Alqershi: Validation, formal analysis, writing—reviewing. Roua Alrefai: Conceptualization, methodology, data curation, supervision, writing—reviewing the final version of the manuscript.

Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical Approval: Not applicable.

Consent to Participate: Not applicable.

Consent to Publish: Not applicable.

Conflict of Interest: The authors declare no competing interests.

References

Abdalla, M. O. M, and Hussain. S. I. K. (2010): Enumeration and identification of microflora in roube, Asudanese traditional fermented dairy product. British journal of dairy sciences 1 (2): 30-33, 2010.

Abdel-Hameed, K. G., and El-Malt, L. M. (2009). Public health hazard of *Staphylococcus aureus* isolated from raw milk and ice cream in Qena Governorate. Assiut Veterinary Medical Journal, 55(121), 191-200. https://doi.org/10.21608/AVMJ.2009.174615

AOAC, (1990)

APHA, American Public Health Association (1992) standard methods for examination of dairy products.I.N.C.16TH Ed.

Aspri, M., Economou, N. and Papademas, P. 2017. Donkey milk: An overview on functionality, technology, and future prospects. Food reviews international, 33, 316-333. https://doi.org/10.1080/87559129.2016.1175014

Bawa, I. H., Tchamba, G. B., Bagré, T. S., Bouda, S. C., Konaté, A., Bako, E.,... and Barro, N. (2015). Antimicrobial susceptibility of *Salmonella enterica* strains isolated from raw beef, mutton and intestines sold in Ouagadougou, Burkina Faso. Journal of Applied Biosciences, 95, 8966-8972. https://doi.org/10.4314/jab.v95i1.6

Caballero, B., Trugo, L. C. and Finglas, P. M. 2012. Encyclopedia of food sciences and nutrition, Academic.

Caglar. A, Ceylan. Z. G, Kokosmanl, M. (1997): A study for chemical and microbiological properties of strained yoghurt. Gida 22: 209-215.

Caleja, C., Barros, L., Antonio, A. L., Carocho, M., Oliveira, M. B. P. and Ferreira, I. C. 2016. Fortification of Yogurts with Different Antioxidant Preservatives: A Comparative Study Between Natural And Synthetic Additives. Food Chemistry, 210, 262-268. https://doi.org/10.1016/j.foodchem.2016.04.114

Corrieu, G. and Beal, C. 2016. Yogurt: The Product And Its Manufacture. Academic Press . https://doi.org/10.1016/B978-0-12-384947-2.00766-2

Donovan, S. M. and Hutkins, R. 2018. Introduction To The Fifth Global Summit On The Health Effects Of Yogurt. Nutrition Reviews, 76, 1-3 https://doi.org/10.1093/nutrit/nuy054

Dror, D. K. and Allen, L. H. 2014. Dairy Product Intake In Children And Adolescents In Developed Countries: Trends, Nutritional Contribution, And A Review Of Association With Health Outcomes. Nutrition Reviews, 72, 68-81 https://doi.org/10.1111/nure.12078

Eissa, E. A, Ahmed, M. I. A, Yagoub. A. E. A and Babiker, E. E (2010): Physicochemical, microbiological and sensory characteristics of yoghurt produced from goat's milk. Li estock research for rural development 22 (8) 2010.

El-Ansary. A. M. (2014): Assessment of microbiological quality of yoghurt sold in El-Behera governorate department of food hygiene, faculty of Vet.Med Alexandria University, Egypt. Alexandria journal of veterinary sciences 2014, 43: 52-57. ISSN 1110-2047 https://doi.org/10.5455/ajvs.168635.

El-Bakri, J. M and El Zubier, I. E. M. (2009): Chemical and microbiological evaluation of plain and fruit yoghurt in Khartoum state, Sudan. International journal of dairy science, 4 (1):1-7. https://doi.org/10.3923/ijds.2009.1.7

FDA, (1992). Food and Drug Administration (1992). Aerobic plate count.FDA Bacteriological Analytical Manual, 7th ed. n.Pp.17-26. Arlington, VA: FDA.

FDA. (1996). Yoghurt. 21 CFR 131.200, Code Of Federal Regulations. U.S. Dept. Of Health And Human Services, Washington, DC.

FDA. (2013). Lowfat Yogurt. 21 CFR 131.203, Code Of Federal Regulations. U. S. Dept. Of Health And Human Services, Washington, DC.

Foley and Lynne, 2008. Salmonella challenges: prevalence in swine and poultry and potential pathogenicity of such isolates. J Anim Sci. 86(14 Suppl):E149-62. https://doi.org/10.2527/jas.2007-0464.

Guizani, N, Kasapis, S and Al-Ruzeiki. M (2000): Microbial, chemical and Rheological properties of laban (cultured milk). International journal of food science and technology 2001, 36, 199-205. https://doi.org/10.1111/j.1365-2621.2001.00451_36_2.x

ISO, 2001

ICMSF (International Commission on Microbiological Specification for Food, 1986). Microbial Ecology of Foods, Vol. 1 -2. Univerisity of Toronto Press, Toronto.

Isleten, M. and Karagul-Yuceer, Y. 2006. Effects Of Dried Dairy Ingredients On Physical And Sensory Properties Of Nonfat Yogurt. Journal Of Dairy Science, 89, 2865-2872. https://doi.org/10.3168/jds.S0022-0302(06)72559-0

Lee, W. J., and Lucey, J. A. (2010). Formation And Physical Properties Of Yogurt. Asian-Australasian Journal Of Animal Sciences, 23(9), 1127-113 https://doi.org/10.5713/ajas.2010.r.05

Majoie, G., Mousse, W., Haziz, S., Farid, B., Ahouissou, O. R., Adjanohoun, A. and Lamine, B.-M. 2020. Microbial Quality Of Artisanal Yoghurt And Dgu Products Collected In Schools Of Cotonou And Abomey-Calavi (Benin). African Journal of Food Science, 14, 112-118 . https://doi.org/10.5897/AJFS2020.1946

Mital, B. K. and Steinkraus, K. H. (1994). Utilization of

oligosaccharides by lactic acid bacteria during fermentation of soymilk. Journal of Food Science, 40:114 – 118. https://doi.org/10.1111/j.1365-2621.1975.tb03749.x

Olubamiwa, A. O. and Kolapo, A. L. (2010). Improvement of Soy Yoghurt Acceptability using Soy-Coconut Milk as Premix. Journal of Biological Sciences, 89 (2): 345 – 350

Osundahunsi, O. F., Amosu, D. and Ifesan, B. O. T. (2007). Quality Evaluation and Acceptability of soy-yoghurt with different colours and fruit flavours American Journal of Food Technology, 2: 273 – 280 https://doi.org/10.3923/AJFT.2007.273.280

Oyeleke, S. 2009. Microbial Assessment of Some Commercially Prepared Yoghurt Retailed In Minna, Niger State. African Journal of Microbiology Research, 3, 245-248.

Saleh, F. A. (2013): Isolation and identification of microorganisms and antibacterial activity of labanzeer, an Egyptian traditional fermented milk product. Scientific journal of microbiology (2013)2(2)31-42. https://doi.org/10.14196/SJMI.V2I2.494

Soltani M. and Güzeler N. (2012): The production and quality properties of liquid Kashks. GIDA (2013) 38 (1): 1-7.

Tchekessi, C. C., Choucounou, O. I., Matha, D. R., Gandeho, G. J., Sachi, S. P., Banon, S. J., Bleoussi, T. R., Djogbe, A., Assogba, T. K. and Yaou, P. I. B. 2021. Technological And Socio-Economic Study of Akandji, A Neglected Traditional Foodstuff Made From Corn (*Zea mays* L.) In Benin. International Journal Of Biological And Chemical Sciences, 15, 1629-1647 https://dx.doi.org/10.4314/ijbcs.v15i4.26

Thabet S, Simonet F, Lemaire M, Guillard C, Cotton P. 2014. Impact of photocatalysis on fungal cells: depiction of cellular and molecular effects on Saccharomyces cerevisiae. Appl Environ Microbiol 80(24):7527-35.

Yerlikaya, O, Akpinar, A., Kilic, S. (2015): A research on microbiological properties of torba yoghurt sold in Izmir province. Ege.univ.Ziraatfak.Derg., 2015, 52 (1): 63-68 ISSN 1018-8851.

Younus, S., Masud, T, Aziz. T (2002): Quality evaluation of market yoghurt/dahi. Pakistan journal of nutrition 1(5): 226-230, 2002. https://doi.org/10.3923/pjn.2002.226.230

Zaky, W. M, Kassem, J. M, Abbas, H. M and Mohamed, S. H. S (2013): Evaluation of salt free labneh quality prepared using dill and caraway essential oils. Life science journal 2013: 10 (4).

How to cite this article:

Mohammed, Ahmed Qasem Alsebaeai, Mohammed Algadri, Abdulnaser Hajeb, Mohammed Kaid, Mohammed Al-Asli, Waleed Rokan, Talal Swaid, Sara Haider, Neven Alshadadi, Haneen Shoga'a Aldeen, Rawan Hamed Al-Deen, Tasbeeh Al-Absi, Heba Alqershi and Roua Alrefai. 2024. Evaluation of Hygienic Quality of Yoghurt Sold in Local Market in Sana'a City- Yemen. *Int.J.Curr.Microbiol.App.Sci.* 13(2): 46-53.
doi: https://doi.org/10.20546/ijcmas.2024.1302.008