Tikrit Journal for Agricultural Sciences (2019) 19 (2):55-65
https://doi.org/10.25130/tjas.19.2.7

IRAQI Academic Scientific Journals
العراقية المجلات الأكاديمية العلمية

ISSN:1813-1646 (Print); 2664-0597 (Online)
Tikrit Journal for Agricultural Sciences
Journal Homepage: http://tujas.tu.edu.iq

TJAS
Tikrit Journal for Agricultural Sciences

Hussam Sh. Mohamed*;
Rafid K. Abdul Razzaq;
Mohammed A. Jassim

Department of Food Science, College of Agriculture, University of Tikrit, Tikrit, Iraq

KEY WORDS:
Dairy products, Microbial contamination.

ARTICLE HISTORY:
Received: 09/08/2017
Accepted: 18/03/2019
Available online: 30/06/2019

Effect of Yoghurt Starter Culture and Pasteurization on Some Pathogenic Microorganisms in Domestic Soft Cheese

ABSTRACT

The study was conducted to detect the contamination of some dairy products (cheese, butter, yukurt, cream, milk) in the local markets of Tikrit city. The results detected of micro-pollutantion in dairy products revealed to presence of aerobic bacteria in milk samples and in numbers reached. (3.1×10^1 and 0.7×10^1) (c.f.u /gm), with the total number of Bacterial Count (2.7×10^1 to 1.81×10^2) (c.f.u/gm). The study showed that the milk samples were free from the Coliform, psychrophilic and Thermoduric Bacteria . Yeast and mold were found in the milk samples in numbers ranging from 1.03×10^1 to 3.6×10^1(c.f.u/gm). The result of the detection of microbial pollutants in cheese revealed the presence of aerobic and Coliform Bacteria except for Ch5, the Coliform and the thermoduric Bacteria in the cheese samples were 35.1×10^1, 1.06×10^1 and 2.75×10^1. (c.f.u/gm). However this study showed the absence of Thermoduric Bacteria in the cheese models of Ch 5 and Ch2, as well as the absence of all samples of cheese from the psychrophilic Bacteria. Yeasts and molds in the cheese models ranged from 1.03×10^1 to 3.6×10^1 (c.f.u/gm). The results of the detection of the microbial contaminants in Yogurt showed that the Yogurt samples of the Yo4 and the Yo2 were absent from the Coliform Bacteria, and the samples of Yo5 and Yo2 were found to be absent from psychrophilic Bacteria. It has been observed through the results, that absence of all cream samples from Coliform Bacteria, as well as the psychrophilic Bacteria and the Thermoduric Bacteria. while the yeast and molds ranged from 3.3×10^1 to 0.55×10^1 (c.f.u/gm). The results of the detection of microbial pollutants in butter revealed the presence of aerobic bacteria in the butter samples and the absence of all butter samples from the Coliform Bacteria, while the Thermoduric Bacteria ranged from 2.25×10^1 to 0.4×10^1 (c.f.u/gm). The psychrophilic Bacteria in the butter samples were ranged from 0.45×10^1 to 0.9×10^1 (c.f.u/gm).

INTRODUCTION

The basic and important conditions in the milk and its products offered in commercial markets and for human consumption is that these products are free of pathogens, whether chemical or biological, as microbiology is one of the most important pollutants of milk and its products, which are polluted extensively, the most important are soil, water, air and faeces and milking tools ((Jonghe et al., 2010), animal feed and housing cleanliness. As well as the importance of the process of milking, trading and manufacturing until the arrival of the product to the consumer is a critical period, which can be through the contamination of milk or its products in microorganisms and neglect of the utensils that work in milking and not clean and sterilized correctly helps greatly increase the number of microorganisms contaminated with milk and milk products. People responsible for milking and

* *Corresponding author: E-mail*: hu.sh92@yahoo.com

circulation are often considered to be another major source of pollution, so their handling conditions should be controlled in terms of health, non-complacency, and slow application of healthy production rules (Little and Louvois, Brisabois, 1999). Raw milk (non-pasteurized) is contaminated with microorganisms and is often harmful and may cause many diseases to humans such as fever, dysentery and tuberculosis (Hassan et al., 2009). Dairy products differ in their microbiological content and contamination, depending on sterilization procedures and production safety. Sterilized milk is considered to be one of the least dairy products in terms of microbial content due to heat treatment and at relatively high temperatures. All of these factors limit the extent to which the product is contaminated with microorganisms However, a number of microbes have been shown to have resistance to sterilization temperatures in milk and milk products (Rajput et l., 2009). The contamination of milk by microorganisms can be due to the contamination of raw milk, especially those that are resistant to the temperature of sterilization. The presence of microorganisms, especially resistance to sterilization temperature, in the final product is evidence of contamination of the product after or during manufacture (Rueckert et al., 2006). The microbes that are resistant to the temperature of sterilization and the composition of the spores are among the main problems facing the production of milk and its products (Foltys and Kirchnerova, 2006).The research aims to estimate the number of microorganisms in dairy products available in local markets in Tikrit city of Iraq.

MATERIALS AND METHODS

The samples were collected from local market of Tikrit city were collected. The samples included different types of dairy products and the most prevalent types in the local markets, as well as the desired by consumers**.**

Microbiological tests

1 -Estimation of total number of aerobic bacteria

The total number of aerobic bacteria in the soft cheese samples was estimated according to (AOAC method, 2005) using the Nutrient Agar medium and incubated at 37 ° C for 48 hours**.**

2 -Estimation of the total number of Bacterial Count

The total number of intestinal bacteria in the soft cheese samples was estimated according to (AOAC, 2005) using MacConkey Agar medium and incubated at 37 ° C for 48 hours**.**

3 -Estimation of the total number of Coliform Bacteria

The total number of yeasts and molds was estimated by the method of cast plates using Potato Dextrose Agar medium and incubated (at 25 ° C for 5 days (APHA, 2004).

4 -Estimation of the total number of psychrophilic Bacteria

Followed APHA (2004), using the center of Nutrient Agar and poured the middle in the dishes and left solidify with add 0.1 ml of the appropriate dilution and then spread on the surface of the well and incubated the dishes at 5 degrees C and for 5-7 days and according to the colonies developing on the center**.**

5 -Estimation of the total number of Thermoduric Bacteria

The examination was carried out after the dilution. The tubes were placed in a water bath at a temperature of 65 ° C and the tubes were left on this level for 30 minutes, and the planting was done in the dishes using the nutritious medium. Incubated dishes at a temperature of 37 ° C for 24-48 hours**.**

All the agars used and listed below were used according to the instructions of the companies producing them, and the autoclave was sterilized at 121 ° C for 15 minutes **.**

The method of work

The method of pouring the dishes from APHA (2004) was used to enumerate the microorganisms found in the contaminated food according to the following steps**:**

1 **-**weight of 10 gm of each sample and added to the bottles containing 90 ml of pre-prepared peptone water separately and the shake well to obtain the dilution 10/1**.**

2 -Pull l ml of dilution in sample (1) for each foodstuff and transfer it to a dilution tube containing 9 ml of peptone solution. The dilution process continued in the same manner and the appropriate one was selected for growth and counting**.**

Pull 1 ml of appropriate dilutions for each sample into Petri dishes after sterilization and apply the appropriate plant medium and according to the microorganisms required number and as mentioned in paragraphs 1, 2**.**

3 -Mixing the samples in the middle of the agares through stirring and leaving the medium for the purpose of hardening**.**

RESULTS AND DISCUSSIONS

- The total number of aerobic bacteria

The study showed that the high numbers of total aerobic bacteria may be due to non-application of sanitary conditions and the lack of cleanliness of the tools used and the length of time required to transport milk from the place of production to the place of manufacture or sale (ICMSF 1998). Table (1) shows that the total number of aerobic bacteria in cheese samples was highest in Ch3 (1.085×10^2). It was the lowest value in the Ch5 with a rate of 0.35×10^1 (c.f.u/gm). It is noted that the total number of all cheese samples was within the limits allowed by the Central Organization for Standardization and Quality Control of Iraq for the year 2006 and also found through the study in Table (1) that the total number of bacteria in the samples of Yogurt, highest value Yo1 2.5×10^5 (c.f.u/gm). The lowest value was in the Yo2, where it reached 2.8×10^3 (c.f.u/gm) **.**

The reason for the increase in the total number of air bacteria in dairy products was back to storage, where the presence of aerobic bacteria in yogurt and cheese is not an important sign on the quality of the product because yogurt and cheese contain mainly a large number of bacteria and initiates environmental conditions such as heat play an important role in increasing the number of air bacteria in the Product, Aziz **(1983).** His results showed that the total count of the milk bacteria in the milk was highest in the Ml5, which reached 1.55×10^2 (c.f.u/gm). The approach was compared to (Meshref 2015), the study of the microbial type of milk taken from cows It was found that the microbial load of the airborne bacteria is (2.1×10^3) (c.f.u/gm)**...**

The results differed with the findings of Khuzaie (2006), where the number of aerial bacteria was 8.1×10^7 (c.f.u/gm). The study also differed with Edward (2013), a study of the microbiological quality of milk in Nigeria, where the total number of milk was found to be 1.1×10^8 (c.f.u/gm). The lowest numbers were in the Ch4 samples, which reached 0.7×10^1 (c.f.u/gm). The reason for this is that the total number of milk is also high due to the non-application of sanitary conditions, the lack of cleanliness of the tools used and the length of time required to transport milk from the place of production to the place of sale (ICMSF, 1998). It was found through the study that the total number of air bacteria in the cream was the highest value in the sample Cr2, which amounted to 3.75×10^1 (c.f.u/gm). The results were less than what Al-Mayahi (2009) found in a study to evaluate the microbial contamination of dairy in the city of Diwaniyah, which reached 32×10^3 (c.f.u/gm). And 3×10^7 (c.f.u/gm). The results also differed with the findings of al-Khuzaie (2006) for studying some microbial contaminants for milk and its products in Diwaniyah city, where it reached 4.5×10^6 (c.f.u/gm)., While, the study showed that all samples of the cream were in accordance with the Iraqi standard specifications for the year 2006. As shown by the study, the total number of bacteria in the butter samples was the highest in the sample of the Bu1 which reached 4.5×10^1 (c.f.u/gm). And the results compared to what found alhadidi (2011), reaching 1.44×10^2 (c.f.u/gm). And the lowest value in the sample Bu4, where it reached 1.25×10^1 (c.f.u/gm). All the results agreed with the aerobic bacteria of butter with what was specified by the Central Organization for Standardization and Quality Control of Iraq for 2006, within the limits allowed**.**

Table (1) Total number of microorganisms in dairy products

Type of milk	**The total number**
Ml 1	$10^1 \times 2.75$
Ml 2	1.235×10^2
Ml 3	3.1×10^1
Ml 4	0.7×10^1
Ml 5	1.55×10^2
Type of cream	**The total number**
Cr 1	$10^1 \times 0.3$
Cr 2	$10^1 \times 3.75$
Cr 3	$10^1 \times 1.5$
Cr 4	$10^1 \times 2.6$
Cr 5	$10^1 \times 1$
Type of butter	**The total number**
Bu1	$10^1 \times 4.5$
Bu 2	$10^1 \times 2.05$
Bu 3	$10^1 \times 1.45$
Bu4	$10^1 \times 1.25$
There is no more	There is no more
Type of Yogurt	**The total number**
Yo 1	$10^5 \times 2.5$
Yo 2	$10^3 \times 2.8$
Yo 3	$10^4 \times 5.1$
Yo 4	$10^4 \times 3.9$
Yo 5	$10^3 \times 7.2$
Type of Cheese	**The total number**
Ch 1	$10^1 \times 5.3$
Ch 2	$10^1 \times 0.5$
Ch 3	$10^2 \times 1.085$
Ch 4	$10^1 \times 5.8$
Ch 5	$10^1 \times 0.35$

- Coliform Bacteria

It is evident from the study that the high rates of the number of Coliform bacteria more than the permissible limit as the health standards do not allow the existence of dairy products, and this indicates the non-application of the health conditions followed in the production of milk and its derivatives and the growth of Coliform bacteria during the period between milking and manufacturing, These bacteria in the milk and its products also indicate that these products are not cleaned and also due to the lack of skim milk enough or the occurrence of contamination after the milk pasteurization in addition to the failure to observe the health rules in the manufacture, storage, marketing, circulation and supply and the existence of Coliform bacteria in milk and milk products For the product pollution Al-Khuzai (2006).

Table (2) Number of Coliform bacteria in dairy products

Type of milk	**The total number**
Ml 1	$10^1 \times 2.7$
Ml 2	1.81×10^2
Ml 3	There is no more
Ml 4	There is no more
Ml 5	There is no more
Type of cream	**The total number**
Cr 1	There is no more
Cr 2	There is no more
Cr 3	There is no more
Cr 4	There is no more
Cr 5	There is no more
Type of butter	**The total number**
Bu1	There is no more
Bu 2	There is no more
Bu 3	There is no more
Bu4	There is no more
There is no more	There is no more
Type of Yogurt	**The total number**
Yo 1	$10^2 \times 3.05$
Yo 2	There is no more
Yo 3	$10^2 \times 2.1$
Yo 4	There is no more
Yo 5	$10^2 \times 1.75$
Type of Cheese	**The total number**
Ch 1	$10^1 \times 2.25$
Ch 2	$10^1 \times 5.1$
Ch 3	$10^1 \times 2.0$
Ch 4	$10^1 \times 4.75$
Ch 5	There is no more

The standard of health does not allow the presence of these bacteria in cheese, where it was the highest value of the average number of Coliform bacteria in the Ch2, which amounted to 5.1×10^1 (c.f.u/gm). And the lowest value was in the same Ch3 as it reached 2.0×10^1 (c.f.u/gm). While the sample is free of Ch5 from the Coliform bacteria, which is considered the only sample conforming to the standard specifications. The results differed with those of al-Saadi (2003), with the number of Coliform bacteria in the samples of cheese was 2.24×10^5 (c.f.u/gm). This is due to the role of pasteurization in reducing the number of these bacteria in cheese, and in addition to the conditions of manufacturing and storage, or non-treatment of milk and raw heat well, as well as the poor application of manufacturers to health conditions despite the low temperatures in winter, and these results all of which did not conform to what was set by the Central Organization for Standardization and Quality Control of Iraq in 2006. The Central Organization for Standardization and Quality Control (COSA) in 2006 indicated that the Coliform bacteria should be free of cheese. The results showed that the total number of Count bacteria in yogurt was highest in Yo1 at 3.05×10^2 (c.f.u/gm). The results were identical to those found by Ghazban and Hussein (2016) in their study of Iranian yogurt, where they found 30×10^2 (c.f.u/gm). The study showed that the lowest values are 1.75×10^2 (c.f.u/gm). The results agreed with the findings of ,where it was found that the Coliform bacteria in the yogurt is 20×10^2 (c.f.u/gm). The study showed that the results were less than those reached by Talal, and Rasool (2012), which recorded the number of Coliform bacteria 2.6×10^4 (c.f.u/gm). As well as the results of Aziz (1983), which amounted to 2×10^4 (c.f.u/gm). The results showed that samples of Yo2 and Yo4 yogurt were absent from Coliform bacteria. The reason for this is the bacteria in the product to

the water used in the industry which is be sterilized or contaminated and also likely to increase the number of Coliform bacteria in the milk due to lack of care for cleanliness and non-skim milk or perhaps using contaminated primer. The Central Agency for Standardization and Quality Control of Iraq in 2006 allowed the presence of one cell in the product. All the results are not in accordance with the Iraqi specifications for 2006, except for Yo2 and Yo4, However the study showed \ free number of Coliform bacteria. It was found in the study that the milk samples contain the bacteria and the highest percentage was found in Ml5 was 1.81×10^2 (c.f.u/gm) The results differed with the findings of Khuzaie (2006), in the study of some microbial contaminants for milk and its products in the city of Diwaniyah, where it was found that the total number of the Coliform bacteria reached 7.0×10^6 (c.f.u/gm). The results of the study (Edward, 2013) in the study of the microbial quality of milk in Nigeria, where it was 9.5×10^7, and the lowest result in the milk samples Ml1, which amounted to 2.7×10^1 (c.f.u/gm). All the reported results are not in compliance with the Iraqi Standards for 2006.As indicated by the results, free samples of Ml2and Ml3 and Ml4 from the Coliform bacteria, if the results are considered to conform to the standard specifications in the study, the results showed that the cream and butter did not contain the Coliform bacteria **.**

- Thermoduric Bacteria

The study showed table (3) that there was an increase in the number of Thermoduric bacteria in the samples of cheese in the study of cheese, which was found that the highest value was in the sample Ch4 was 2.75×10^1 (c.f.u/gm). It was the lowest value in the sample Ch3 as it was 1.6×10^1 (c.f.u/gm). It was noted that the absence of Ch2 and Ch5 from the Thermoduric bacteria and these samples are in conformity with the specifications mentioned by the device and the quality control of Iraq. Alnashy (2009) reported that the number of Thermoduric bacteria in the cheese produced at the Qadisiyah Dairy Lab was 72 x 10^3 (c.f.u/gm). And the increase in the preparation of Thermoduric bacteria is due to the lack of bake raw milk well or not to clean the pots used in the manufacture or storage conditions and showed the results as well as the absence of all samples of milk and cream and butter from the Thermoduric bacteria, while it was found that the preparation of bacteria - The highest value in yogurt the Yo1, which reached 12×10^4 and was the lowest value in kind to Yo2, which amounted to 1.4×10^3 (c.f.u/gm)**.**

- psychrophilic Bacteria

The results showed in Table (4) the absence of the number of psychrophilic Bacteria in the cheese and cream samples. The study showed the presence of the bacteria in the Yogurt, which reached the highest value in the sample of the Yo1, which amounted to 9.1×10^4 The lowest values were in the Yo4 sample, which reached 1.45×10^3 (c.f.u/gm). The study showed that the samples were free of Yo2 and Yo5 psychrophilic bacteria. The study also revealed the presence of the psychrophilic bacteria in the butter samples, where the highest value was in the sample of the Bu1, which reached 2.25×10^1 (c.f.u/gm). The results were lower than those found by Al-hadidi and others (2011), where the results reached 2.30×10^2 (c.f.u/gm). The study also examined the absence of all samples of milk and cream from the bacteria that psychrophilic**.**

- Yeasts and molds

The study shows the high number of molds and yeast in milk and its products and may be due to the resistance of their spores to high temperatures and their ability to grow again when appropriate conditions AL-Khuzai (2006). It is noticed through the study table (5) the high number of molds and yeast in some samples of cheese, with the highest value in the Ch3 5.25×10^1 (c.f.u/gm). The lowest value was in Ch2, which reached 1.45×10^1 (c.f.u/gm). The results differed from that of Aziz (1983) where the rate of yeast and mold in the cheese produced at the Faculty of Agriculture University of Baghdad was 1×10^5 (c.f.u/gm). It was noted that all samples were not conforming to the strict specifications. The reason for the triangulation of cheese with yeast and mold is the ability of yeast to grow in cheese to resist acidity, or contamination during manufacturing processes, or due to the poor quality of milk used in manufacturing Sajt (2010). Al-Khuzaie (2006) pointed out that the

presence of yeast and mold in cheese is due to resistance to high temperatures and their ability to grow again when appropriate conditions are available. The results showed that yoghurt samples and were highest in Yo1 samples (5.35×10^4). This is consistent with the findings of Aziz (1983), who pointed out that the number of yeast and mold in the yoghurt of Baghdad, where it reached 4.9×10^4 (c.f.u/gm). And the lowest values in Yo2, which amounted to 1.1×10^3 and these results are consistent with what found Al-Hafiz, and others (2012), where it was found that the number of yeast and mold in the yoghurt of Arbil amounted to 1.9×10^3 (c.f.u/gm). The reason for the increase in the number of yeast and mold in yoghurt samples is the possibility of a decrease in pH, which encourages the growth of yeast and mold, with the possibility of contamination of the user prefix. It was noted that all the results is a question of what the Iraqi standardization and quality control system of 2006, which are all not in conformity with standard specifications. The study showed that the total number of yeasts and molds in the milk samples was highest in the sample of Ml5, which reached 3.6×10^1 (c.f.u/gm). The lowest values were in Ml4 samples (0.55×10^1).

Table (3) Number of Thermoduric Bacteria

Type of milk	**The total number**
Ml 1	There is no more
Ml 2	There is no more
Ml 3	There is no more
Ml 4	There is no more
Ml 5	There is no more
Type of cream	**The total number**
Cr 1	There is no more
Cr 2	There is no more
Cr 3	There is no more
Cr 4	There is no more
Cr 5	There is no more
Type of butter	**The total number**
Bu1	$10^1 \times 2.25$
Bu 2	$10^1 \times 1.75$
Bu 3	$10^1 \times 0.95$
Bu4	$10^1 \times 0.4$
There is no more	There is no more
Type of Yogurt	**The total number**
Yo 1	$10^4 \times 12$
Yo 2	$10^3 \times 1.4$
Yo 3	$10^3 \times 7.1$
Yo 4	$10^3 \times 1.8$
Yo 5	$10^3 \times 2.1$
Type of Cheese	**The total number**
Ch 1	$10^1 \times 1.35$
Ch 2	There is no more
Ch 3	$10^1 \times 1.6$
Ch 4	$10^1 \times 2.75$
Ch 5	There is no more

Table (4) Number of psychrophilic Bacteria

Type of milk	**The total number**
Ml 1	There is no more
Ml 2	There is no more
Ml 3	There is no more
Ml 4	There is no more
Ml 5	There is no more
Type of cream	**The total number**
Cr 1	There is no more
Cr 2	There is no more
Cr 3	There is no more
Cr 4	There is no more
Cr 5	There is no more
Type of butter	**The total number**
Bu1	$10^1 \times 0.7$
Bu 2	$10^1 \times 0.45$
Bu 3	$10^1 \times 0.8$
Bu4	$10^1 \times 0.9$
There is no more	There is no more
Type of Yogurt	**The total number**
Yo 1	$10^4 \times 9.1$
Yo 2	There is no more
Yo 3	$10^3 \times 3.2$
Yo 4	$10^3 \times 1.45$
Yo 5	There is no more
Type of Cheese	**The total number**
Ch 1	There is no more
Ch 2	There is no more
Ch 3	There is no more
Ch 4	There is no more
Ch 5	There is no more

As all the results are not in conformity with the Iraqi standard specifications for the year 2006.The study also included the containment of the cream on yeast and mold, where it reached the highest values in the sample of the Cr1, which amounted to 3.3×10^1, while the study showed the lowest result was in the sample of Cr5, which amounted to 0.55×10^1. It is attributed to the high number of yeast and mold in the samples of pasteurized cream to resist the high temperatures and their ability to grow again when the appropriate conditions are available. The increase in the number of yeast and fungus also affects the climatic conditions, (Aziz,1983). All the samples of the cream are not identical to the Iraqi standard specifications for the year 2006. As indicated by the study, the number of yeast and mold in butter samples reached the highest value in the sample Bu2, where it reached 1.7×10^1 (c.f.u/gm). The results were identical to those of Hadidi, et all (2011), where the results reached 80×10^1 (c.f.u/gm). The study showed that the lowest value in the sample Bu4, where it reached 0.2×10^1 (c.f.u/gm). Where the numbers were few but differ with what the Central Agency for Standardization and Quality Control of Iraq for the year 2006**.**

Table (5) Total number of yeasts and molds

Type of milk	**The total number**
Ml 1	$10^1 \times 2.7$
Ml 2	0.3×10^1
Ml 3	1.45×10^1
Ml 4	0.55×10^1
Ml 5	3.6×10^1
Type of cream	**The total number**
Cr 1	$10^1 \times 3.3$
Cr 2	$10^1 \times 1.1$
Cr 3	$10^1 \times 1.55$
Cr 4	$10^1 \times 0.9$
Cr 5	$10^1 \times 0.55$
Type of butter	**The total number**
Bu1	$10^1 \times 0.65$
Bu 2	$10^1 \times 1.7$
Bu 3	$10^1 \times 0.5$
Bu4	$10^1 \times 0.2$
There is no more	There is no more
Type of Yogurt	**The total number**
Yo 1	$10^4 \times 5.35$
Yo 2	$10^3 \times 1.1$
Yo 3	$10^4 \times 6.35$
Yo 4	$10^4 \times 2.95$
Yo 5	$10^3 \times 10.1$
Type of Cheese	**The total number**
Ch 1	$10^1 \times 2.1$
Ch 2	$10^1 \times 1.45$
Ch 3	$10^1 \times 5.25$
Ch 4	$10^1 \times 1.95$
Ch 5	$10^1 \times 3.2$

REFERENCES

Ali, A. (2009). Microbial contamination of some types of cheese produced in the city of Diwaniya. Faculty of Education - University of Qadisiyah - Journal of Wasit Science and Medicine - Second Issue, Volume I.16-27.

Al-Mayahi, F. S. and Haider, H. (2009) assess bacterial contamination of local and imported dairy products in the markets of Diwaniya. University of Qadisiyah, Journal of Karbala University, Volume 7 Issue 2.

Aziz, G. M. (1983). Microbiological and chemical quality of Iraqi soft cheese - MA thesis - Faculty of Agriculture - University of Baghdad**.**

Al-Saadi, A. T. A. (2003). Effect of extracts of some medicinal plants on microorganisms isolated from the cheese in the city of Diwaniyah, MA - College of Education - University of Qadisiyah.

Salem, S. A, Mahdi, D. and Alia, S. A. (2012), The level of heavy elements in milk and yoghurt, Baghdad Science Journal, Issue 9 (1).

Khuzaie, A. M. F (2006). Study of some microbial contaminants of milk and its products traded in the city of Diwaniyah.

Hayat,G.S. (2010). Study of Microbial Pollution of Dairy Products, Local Soft Cheese and Local Cannabis in Baghdad Markets, College of Dentistry, Al - Mustansiriyah University, Al - Mustansiriyah Journal, Volume 21 Issue 3 of.

Al-Hadidi, L. T. and Kifah, S. D. and Hassan, R. A. (2011) Processing of therapeutic foam using Lactobacillus casei, Journal of the Euphrates for Agricultural Sciences - 3 (1) 150- 169.

Central Organization for Standardization and Quality Control. (2006). The Mekongian border of milk and its products (Part V) No. 2770/5.

Amal, K. G, Zeinab A. H. (2016). Microbiological Evaluation of the Yugurt Faculty of Agriculture - University of Basra - Journal of the University of Kufa, Volume VIII, No. 1. Of 2016.

A.O.A.C (2005). Association of Official Analytical Chemists, Official Methods of analysis Microbiological food testing.Ch., 17. USA.

APHA, (2004). Standard Methods for the Examination of Dairy Products, 17th ed., American Puplic Health Association, USA.

Edward , K. C., Inya, I. M. (2013) The microbial quality of raw milk from four locations in Abia state, Nigeria. IOSR. Journal of Pharmacy and Biological Science. Vol, 5, Issus 3 : PP : 30-33

Foltys, V. and Kirchnerová, K. (2006). Mesophilic and psychrotrophic aerobic sporulating microorganisms in raw cow's milk. Archiva Zootechnica, 9:121-129.

Hassan, A.; Imran A. and Shahid M.(2009). Microbiological and physicochemical analysis of different UHT milks available in market. African Journal of Food Science Vol. 3(4). pp. 100-106.

Jonghe, V.; Coorevits, A. ; Jan, D. ; Els, V.; Koen, G. ; Lieve, H. ; Paul, D. V. and Marc, H. (2010). Toxinogenic and spoilage potential of aerobic spore-formers isolated from raw milk. International Journal of Food Microbiology. 136 : 318–325

Little, C.L. and Louvoise, J. DC. (1999) Health risks associated with un pasteurized goats and ewes milk on retail sale in England and Wales. APIILS Dairy Products Working Group Study, Epidemic. Infect. J, 122: 403-408.

Rajput, I. R.; Khaskheli, M.; Rao, S. ;Fazlani, S.A. ;Shah, Q.A. and Khaskheli, G.B. (2009). Microbial Quality of Formulated Infant Milk Powders. Pakistan Journal of Nutrition, 8 (10): 1665-1670.

Rueckert, A.; Ron, S. R. and Hugh, W. M. (2006). Development of a real-time PCR assay targeting the sporulation gene, spo0A, for the enumeration of thermophilic bacilli in milk powder. Food Microbiology, 23 : 220–230.

Aziz, Ghazi Menem (1983). Microbial and chemical quality of Iraqi soft cheese - Master Thesis - Faculty of Agriculture - University of Baghdad.

Meshref, A. M. S., Hassan, G. M., Gomaa, S. A. (2015). Microbiological Quality and Safety of Fluid Milk Marketed in Cairo and Giza Governorates, Egypt, Current Research in Dairy Sciences., 7, 18-25.

Ghadban, A. K, Hussein, Z. A. (2016) Microbiological evaluation of locally produced and imported yogurts in al-Basrah markets. Faculty of Agriculture - University of Basrah - Journal of Kufa University, Volume VIII, the first issue. Of 2016

Talal, A. K, Rasool, S. M. A. (2012). Study of microbial contaminants in some local dairy products in Baghdad City. Faculty of Applied Medical Sciences - Karbala University - The First Scientific Conference of the College of Education for Pure Sciences.

Alnashy, A. A. (2009). Microbial contamination of some types of cheese produced in Diwaniya city. Faculty of Education - University of Qadisiyah - Wasit Magazine for Science and Medicine - Second Issue, Volume I.16-27.

تأثير بادئ اليوكرت والبسترة في محتوى الجبن الأبيض الطري المصنع مختبرياً من بعض المسببات المرضية

حسام شاكر محمد ورافد خليل عبدالرزاق ومحمد احمد جاسم

قسم علوم الأغذية/كلية الزراعة/جامعة تكريت

المستخلص

اجريت الدراسة للكشف عن التلوث المايكروبي لبعض منتجات الألبان (جبن، زبد، يوكرت، قشطة، حليب) في الاسواق المحلية لمدينه تكريت وأظهرت نتائج الكشف عن الملوثات الميكروبية في منتجات الالبان عن وجود البكتيريا الهوائية في نماذج الحليب وبأعداد بلغت. (3.1×10^{1} و0.7×10^{1}) (و.ت.م/غم)، في تراوح العدد الكلي لبكتريا القولون (2.7×10^{1} الى 1.81×10^{2}) (و.ت.م/غم). واتضحت من خلال الدراسة خلو بقيه نماذج الحليب من بكتريا القولون وكذلك خلو جميع عينات الحليب من البكتريا المحبة للبرودة والبكتريا المحبة للحرارة، اما الخمائر والاعفان بلغت في نماذج الحليب وبأعداد تتراوح 1.03×10^{1} الى 3.6×10^{1} (و.ت.م/غم).

أوضحت نتائج الكشف عن الملوثات الميكروبية في الجبن عن وجود البكتيريا الهوائية وبكتريا القولون عدا جبنه يولند بكتريا القولون اما البكتريا المحبة للحرارة في نماذج الجبن على التوالي وبأعداد بلغت 35. 1×10^{1} و1.06×10^{1} و2.75×10^{1} (و.ت.م/غم). اتضح من خلال الدراسة عدم تواجد البكتريا المحبة للحرارة في نماذج جبن Ch5 وCh2 وكذلك لوحظ خلو جميع عينات الجبن من البكتريا المحبة للبرودة، اما الخمائر والاعفان في نماذج الجبن تراوحت بين و1.03×10^{1} الى3.6×10^{1} (و.ت.م/غم).

كما أوضحت نتائج الكشف عن الملوثات الميكروبية في (اليوكرت) خلو نموذج Yo4 و Yo2 من بكتريا القولون ، كما لوحظ خلو النماذج Yo5 و Yo2 من البكتريا المحبة للبرودة ، وقد لوحظ من خلال النتائج خلو جميع نماذج القشطة من بكتريا القولون والبكتريا المحبة للحرارة والبكتريا المحبة للبرودة، اما الخمائر والاعفان فقد تراوحت بين 3.3×10^{1} الى و0.55×10^{1} (و.ت.م/غم). كما أوضحت نتائج الكشف عن الملوثات الميكروبية في الزبد عن وجود البكتيريا الهوائية في نماذج الزبد وخلو جميع نماذج الزبد من بكتريا القولون، اما البكتريا المحبة للحرارة فقد تراوحت 25. 2×10^{1} الى 0.4×10^{1}(و.ت.م/غم). اما البكتريا المحبة للبرودة في نماذج الزبد فقد تراوحت بين و0.45×10^{1} الى 0.9×10^{1}(و.ت.م/غم).

الكلمات المفتاحية: بادئ اليوكرت، البسترة، الجبن الأبيض الطري، المسببات المرضية.