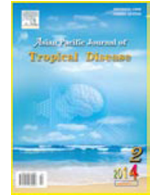




Contents lists available at ScienceDirect

Asian Pacific Journal of Tropical Disease

journal homepage: www.elsevier.com/locate/apjtd

Document heading

doi: 10.1016/S2222-1808(14)60735-0

© 2014 by the Asian Pacific Journal of Tropical Disease. All rights reserved.

Monitoring microbial quality of commercial dairy products in West Azerbaijan province, northwest of Iran

Ramin Teymori¹, Nasser Ghazanfarirad¹, Kamran Dehghan¹, Aghakhan Kheyri¹, Ghader Hajigholizadeh¹, Behzad Kazemi-Ghoshchi¹, Mahmoud Bahmani^{1,2*}

¹Deputy for Food and Drug, Urmia University of Medical Sciences, Urmia, Iran

²Food and Beverages Safety Research Center, Urmia University of Medical Sciences, Urmia, Iran

ARTICLE INFO

Article history:

Received 25 Feb 2014

Received in revised form 12 May 2014

Accepted 13 Jul 2014

Available online 10 Aug 2014

Keywords:

Microbial quality
Commercial dairy products
West Azerbaijan province
Iran

ABSTRACT

Objective: To evaluate the extent of microbial contamination such as coliform, *Escherichia coli*, positive coagulase *Staphylococcus aureus*, molds and yeast in cheese, buttermilk, yogurt, and milk in West Azerbaijan province.

Methods: Between March and November 2012, 93 samples of cheese, buttermilk, milk, and yogurt were collected from factories of West Azerbaijan province, northwest of Iran. The samples were tested by standard numbers 5486, 5234, 6806, and 10154 for monitoring their microbial quality.

Results: The results of this study revealed that 33% of cheese samples were unauthorized. Also, 22% of buttermilk, 23% samples of yogurt, and 15% of milk samples were unauthorized. Other examples of microbial aspects were normal.

Conclusions: It is necessary to determine the critical control points inorganizing factories and automated control systems in order to eliminate or minimize the threat of pollution. Microbial quality of the present products was excellent. Meanwhile, training and familiarizing manufacturers of dairy products are very important in terms of health standards.

1. Introduction

Despite the advances of modern production methods, food safety and consumer safety are increasingly in public health importance. In industrialized countries, 30% of people have been estimated to suffer from eating disorders once a year. So, it is required to reduce or eliminate pathogenic microorganisms in food sources using different methods^[1,2]. Dairy foods refer to all the milk products. The first material for producing dairy products is cow milk. However, the milk of other mammals such as goats, sheep, *etc.* is sometimes used. Milk is a substance that is secreted from the breast tissue of cattle and mammals^[3].

Cheese or other fresh products that are obtained from

milk cheese juice after coagulation and exit of whole milk, cream, buttermilk, butter, milk fat, or a mixture of them is obtained^[3]. Iranian yogurt drink is made by mixing water and enough salt^[3]. Yoghurt is the fermented product of milk, which is highly consumed in the Mediterranean, Asian, and Central European countries. Bulgaria has been identified as the original country in terms of yoghurt production^[3].

Dairy foods are always exposed to pathogenic microorganisms and infections. Controlling microorganisms in food is one of the most important maintenance aspects^[4], because in a country like the United States, 6.5 to 33 million people are annually infected by the disease-causing germs in food, which entails damage of 2.9 to 6.7 billion dollars^[5].

Coliform is found in human and animal fecal and is usually plentiful in nature. It is extremely risky and toxic for food and water and could cause an intestinal disease. Coliforms are divided into two categories of non-fecal and fecal, which only live in the intestines, however, some coliforms are not only in the intestine, but also can be seen in the soil and plants. *Escherichia coli* (*E. coli*) is one of the

*Corresponding author: Dr. Mahmoud Bahmani, Food and Beverages Safety Research Center, Urmia University of Medical Sciences, Urmia, Iran.

Tel: 0984412772023

E-mail: mahmood.bahmani@gmail.com

Foundation Project: Supported the Deputy for Food and Drug, Urmia University of Medical Sciences, Urmia, Iran (Grant No. 777–29–92).

coliforms that exists in large numbers in the human intestine, it also can be present in water, food, and the environment after fecal contamination[6–8].

Staphylococcus aureus (*S. aureus*) is one of the most common infectious pathogens due to having various enzymes such as coagulase, hyaluronidase, ucase, lipase, hemolysin, and leukocidin, which is able to cause an infection anywhere in body[9].

In West Azerbaijan province, there are many traditional farms for produce milk. So milk is produced the form of non industrial. This study was designed to access microbial quality of dirty products.

2. Materials and methods

2.1. Sampling

Between March and November 2012, 93 samples of cheese, buttermilk, milk, and yogurt were collected from factories of West Azerbaijan province, northwest of Iran.

2.2. Microbial tests

Technique and reference methods under International Standardization Organization standards were used for monitoring the samples' microbial quality.

2.3. Coliform (standard no. 5486)

About 1 mL of the samples was taken and dilution 10^{-3} was prepared thus added to sterile plates. The medium (lauryl sulfate tryptose broth) was then added to tube. The plates were incubated at 30 °C for 1–3 d[10].

2.4. *E. coli* (Iranian national standard no. 5234)

About 1 mL of sterile sample was poured and added to lauryl sulfate tryptose medium. Then, it was incubated at 37 °C. If gas was formed, the sample was reported as negative; and after culturing the samples, if gas was observed, it was positive. From positive (gas+) samples were taken and was added to the second tube. One was added to peptone water tube and incubated at 44 °C and for another tube and other tube to the EC broth. On Day 3, if the EC broth was positive, pepton water medium was added. Ultimately of the tube shall be counted[10].

2.5. *S. aureus* (positive coagulase) (Iranian national standard no. 6806)

The samples were prepared and incubated. If black

colonies were observed, the sample test was positive[10].

2.6. Mold and yeast (Iranian national standard no. 10154)

First, standard dilution was prepared and into 15 mL of medium containing tetracycline and chloramphenicol oxytocin was inoculation into the plates and incubated at 45 °C. The colonies were then counted by the following formula: $N = \Sigma c / (n_1 + 0.1N_2) d$

Where Σc is total number of colonies on selective plates from two successive dilutions; n_1 is number of plates with minimum 10 and maximum 150 colonies in the countable dilution; n_2 is number of plates with minimum 10 and maximum 150 colonies to be counted in the second dilution; d is coefficient dilution in the first choice.

If more than 2 dilutions were counted between 10 and 150 colonies, the results are going to change formula so that subsequent dilution are taken into account[10].

3. Results

After examination of microbial and fungal contamination, the samples were observed low. Survey results showed that milk production was processed with the mechanization of good quality and was sanitary. The results of this study revealed that 33% samples of cheese, 22% samples of buttermilk, 23% samples of yogurt, and 15% samples of milk were unauthorized. Other examples of microbial aspects were normal.

Detailed results of the microbial quality of the tested samples for cheese, buttermilk, yoghurt, and milk are given in Tables 1–5.

According to Table 1, 8 out of 30 samples of cheese were above coliform. Six of the *E. coli* were positive. *Staphylococcus* was observed in 2 and 4 of them were from standard molds and yeast. In total, 18 out of 27 samples were acceptable. Microbial quality of the present products was excellent. About 67% of the cheese samples were acceptable in terms of microbial.

According to Table 2, for buttermilk samples were determined. For the 4 cases were positive to coliform. All samples of buttermilk were negative *E. coli* and no cases of *Staphylococcus* were reported. In total, 25 out of 32 samples of buttermilk were acceptable. Microbial quality of the products was excellent. About 78% of the buttermilk samples were acceptable in terms of microbial.

Based on Table 3, 18 out of 23 samples were acceptable. Four and three samples were contaminated with coliform and *E. coli* and were positive, respectively. In the present samples, one *S. aureus* was positive and three samples were also contaminated with mold and yeast. Microbial quality of

Download English Version:

<https://daneshyari.com/en/article/3455003>

Download Persian Version:

<https://daneshyari.com/article/3455003>

[Daneshyari.com](https://daneshyari.com)