

Evaluation of Some Microorganism Groups in The Dairy Products of Industrial and Home-Made Production

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ABSTRACT

Fermented foods play an important role in human daily lives. Among them the dairy products are the most popular. Growing amount of researches are devoted to the assessment of the effects of the dairy products on human health. Lactic acid bacteria are the main group of microorganisms used to produce fermented milk products. The present study demonstrated the results of the microbiological analysis of industrial and home-made dairy products and quantitative evaluation of enterococci content in them. The results revealed that microbiome of both, industrial and home-made products, consisted of bacteria and fungi; the highest amount of enterococci was detected in feta cheese, the lowest – in milk.

Keywords: dairy products; enterococci; lactic acid bacteria; qPCR

INTRODUCTION

Fermented foods are defined as foods or beverages made by the controlled growth of microbes and the enzymatic conversion of food components [1]. There are many various types of fermented foods that were produced as a result of association between microorganisms.

Recently, many studies have focused on the influence causing by fermented dairy products on human health. The results of these studies have demonstrated the positive effects of different dairy products, such yogurt, kefir, fermented milk, acidophilus milk, koumiss, cheese and others on the physiological and mental state of human life [2, 3]. These properties are making the popularity increasing of fermented dairy products.

Lactic acid bacteria occupy an important place in various spheres of human activity; in particular they are widely used in medicine and food industry. The fermented dairy products are obtained through the fermentation process of diverse types of milk with the participation of specific microorganisms or complex microbial groups. The most abundant group of bacteria that are used for production of fermented milk products is lactic acid bacteria. However, the microbiome of dairy products can also contain some opportunistic pathogens evoking product spoilage and negatively affecting human health.

OBJECTIVES

The purpose of this work was to study the diversity of microorganisms, qualitative and quantitative assessment of lactic acid bacteria in fermented milk products of industrial and home-made production.

METHODOLOGY

To perform research the dairy products of industrial and home-made production were used: milk (2 samples), kefir (1 sample), sour cream (2 samples), soft cheese (2 samples) and feta cheese (1 sample). The analysis of

microbiome was carried out using conventional microbiological methods. The antibiotic resistance analysis was conducted with disk diffusion test. The qPCR analysis was carried out as described in [4].

RESULTS

In order to assess the diversity of microorganisms in fermented milk products samples of these products were inoculated and cultivated on different microbiological media. It was found the representatives of lactic acid bacteria, staphylococci, enterobacteria and fungi in the dairy products as a result of the microbiological analysis. In milk samples bacteria *Escherichia coli*, *Klebsiellaoxytoca*, *Ralstoniapickettii*, *Serratiamarcescens* and fungi belonging to the genus *Candida* were detected while samples of sour cream contained only bacteria. Results of antibiotic sensitivity analysis revealed resistance fungi of genus *Candida* containing in milk samples to nine antibiotics. The size of the inhibition zone varied from 15 to 34 mm depending on the antibiotic. It was the largest for voriconazole, 34 mm, and the smallest was for amphotericin b, 15 mm.

The molecular genetic analysis defined lactic acid bacteria of 3 genera, *Enterococcus*, *Lactobacillus* and *Bifidobacterium*, in all samples of dairy products with the majority of genus *Enterococcus*. Analysis of the number of enterococci relative to the total number of bacteria in dairy products found that the highest percentage was observed in feta cheese and the lowest was in milk.

CONCLUSION

The results obtained in the study have demonstrated the occurrence of some opportunistic pathogens in the dairy products of both industrial and home-made production. It suggests that the more careful and severe analysis and control of milk and the fermented milk products, industrial and home-made production, should be applied.

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