UDC 637.141.3

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The study of peculiarities of pasteurized dairy products of Osakarov district

The article presents the characteristics of milk before and after pasteurization. Depending on the season, changes of microbiological composition of milk and its dynamics are given. Physical and chemical characteristics of cow's milk are described. The complete composition of cow's milk of this district is described and also a comparative characteristic is given. Analysis of cow's milk is made. Comparative characteristics of home milk and milk from a store also were presented in this article. A biological composition, fat content and protein content are considered.

Key words: pasteurization, sterilization, autoclave, lacto densimeter, innovation, dynamics.

Providing consumers with pure cow's milk, increase of its quality is currently a today's requirement. Production of milk over the last 5 years develops rapidly. Development of milk production in the USA for the last years is observed. In Russia 2.6 million tons of whole milk and 2.5 million tons of milk are made.

In 2001 export of milk was 2,5 million tons [1,2]. In recent years development of production of dairy products in the Republic of Kazakhstan is closely connected with the history of Russia where the first production of milk in the form of cooperative was made. At the moment there are more than two hundred enterprises in the dairy industry, the majority of them are small and medium-sized ones. There are enterprises with innovative technologies, new equipment, new types of foodstuff and technologies of their wrapping, but they are few in number [3,4]. The analysis of methods of identifying efficiency and negative sides of pasteurization lowers quality of variability of physical and chemical properties of milk. This method is used for removing pathogenic bacteria and other microorganisms. Milk of sick cows (brucellosis and other infectious diseases) will be pasteurized on a mandatory basis. Therefore, determining the most effective method of processing of milk increases its quality. At present importance of an innovative method for the solution of these problems is determined.

One of the most widespread methods of disinfecting of milk is pasteurization. Due to this method taste, color and smell of a product remain and period of storage is extended, biological value, vitamins and minerals, enzymes also remain. After disinfecting a heat treatment is conducted. Currently, the most often used hygienic requirements is the use of high temperature for milk sterilization. Disinfecting is used for the disinfection of drinking milk and dairy products. Temperature and total time of pasteurization are determined by the pasteurization standard [5,6].

In this regard, the goal which we set for ourselves is determining a quality of dairy products during the pasteurization. Toaccomplishthisgoal, the following tasks were determined:

1. To compare the pasteurized dairy products;
2. To determine dynamics of quality indicators of milk.

To accomplish the goals and tasks, we carried out pasteurization of cow's milk by the device. When performing laboratory work we poured cow's milk in a special vessel and carried out sterilization within 30 minutes. It was carried out in the special autoclave device at a temperature +75–80C°. Under such conditions the majority of bacteria are removed. Afterwards milk pasteurization was carried out by the physical and chemical device. In the course of work we poured in the glass cylinder of 200–250 ml and with a diameter of 5 cm of ¾ milk part. Then we took the $^{3}/_{0}$ of the purest and powdered lacto densimeter milk. A number of studies were carried out to determine a biological composition of cow's milk.

Determining a composition of hydrogen and fat content of milk. Without touching the device to determine fat content, we took 10 ml of sulfuric acid and added by the Mironenko's device. Then 10,77 ml of milk is taken from a specimen accurately, without stirring a pipette at a temperature of 20 and 1 ml of isoamil alcohol is added. Afterwards determinant of fat content is densely closed by a plug and content is thoroughly stirred. Then from the side of the plug the determinant is put in a water bathtub with a temperature of 65±20 °C for 5 minutes. After a water bath we place on the centrifuge with 1000 rpm for 5 minutes. After the centrifuge we install the device in a water bath.

Determination of protein in milk. There is at average 3,3 % of protein in cow's milk, including 2,7 % of casein, 0,5 % of albumin and 0,1 % of globulin on average. The following methods are currently used for the determination of protein content in milk:

A) formaltitration;

B) refractometric method (AM-2 device);

C) orange — Zhdyeing adsorption;

D) Kjeldal method.

For obtaining exact data under the laboratory conditions the first method was used.

Determination of protein in milk by formal titration.The method is based on the content of formalin. During the reaction methylamine is formed, it increases acidity of protein that, in turn, determines amount of protein.

Technique of determination.10 ml of the studied milk is put in a glass with a pipette, 10–12 drops from 1 % of phenolphtalein are added. 0,1 H is titrated by alkali solution to coloring on a sample basis. We add 2 ml of nitrated 37–40 % formalin. Reddish salt disappears. Alkali level in a burette is determined and titrated repeatedly to coloring on a sample basis. To determine total amount of proteins,0,1 H of alkali solution is multiplied by 1,94 coefficient, for the determination of casein is multiplied by coefficient 1,51. Parallels mustn't be less than a determinant. During the titration the difference is no more than 0.05 ml of alkali.

In this study we have determined a microbiological composition of milk, studied its quality. This method is determined as «microbiological research method». This method is characterized by connection of a molecule of oxygen from methylene blue by the enzyme of microorganism reductase. The quicker methylene blue, oxygen and decolouration will disappear the more microorganisms occur. In this test we place 1 ml of methylene blue in a sterile test tube, then we add 20 ml of the studied milk and close with a plug. We heat a test tube in a water bath at a temperature of 38°C, we determine time and watch the happenings each 2 hours. Methylene blue decolouration indicates about the completion time. In our case, milk decolouration took place after 5 hours. It indicates about high quality of milk. As a result, the studied milk meets the state standards of quality, has necessary amount of microflora, compliance is higher than norm.

The study revealed dynamics of quality indicators and the results are shown below (Figures 1–4):

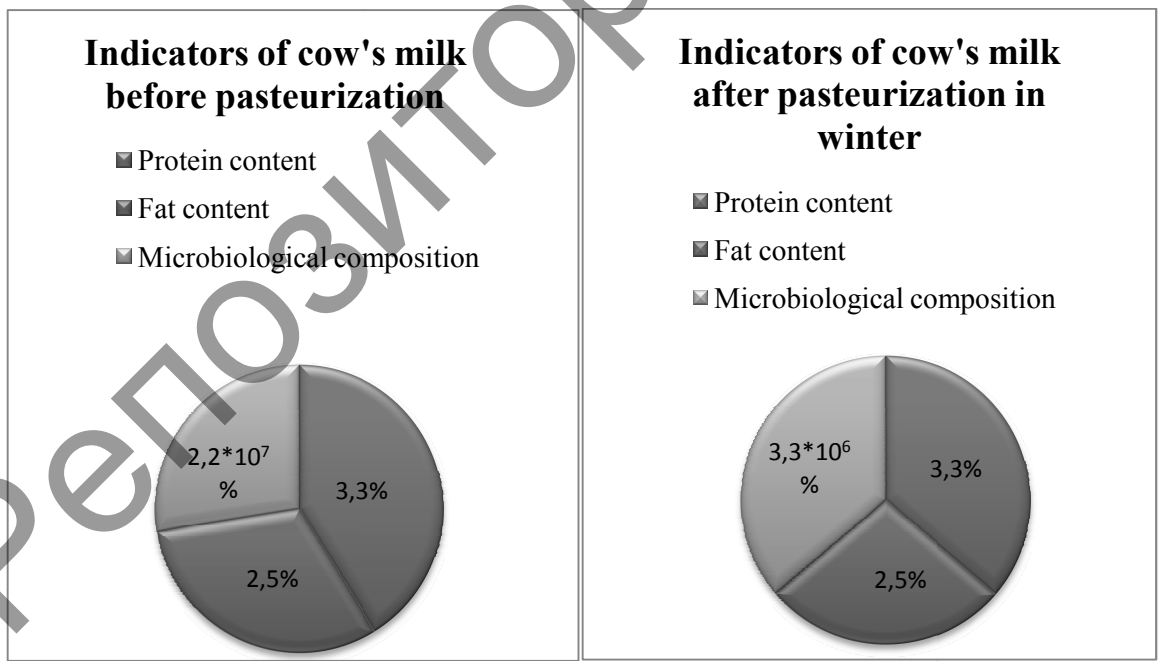

Figure 1. Dynamics of quality indicators of cow's milk in winte

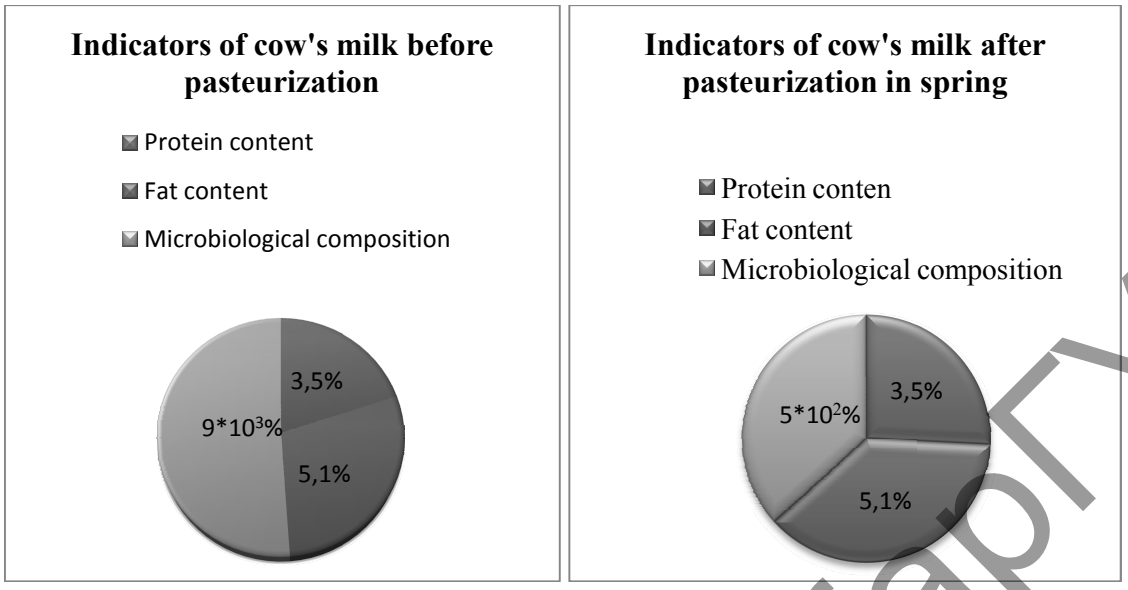

Figure 2. Dynamics of quality indicators of cow's milk in spring

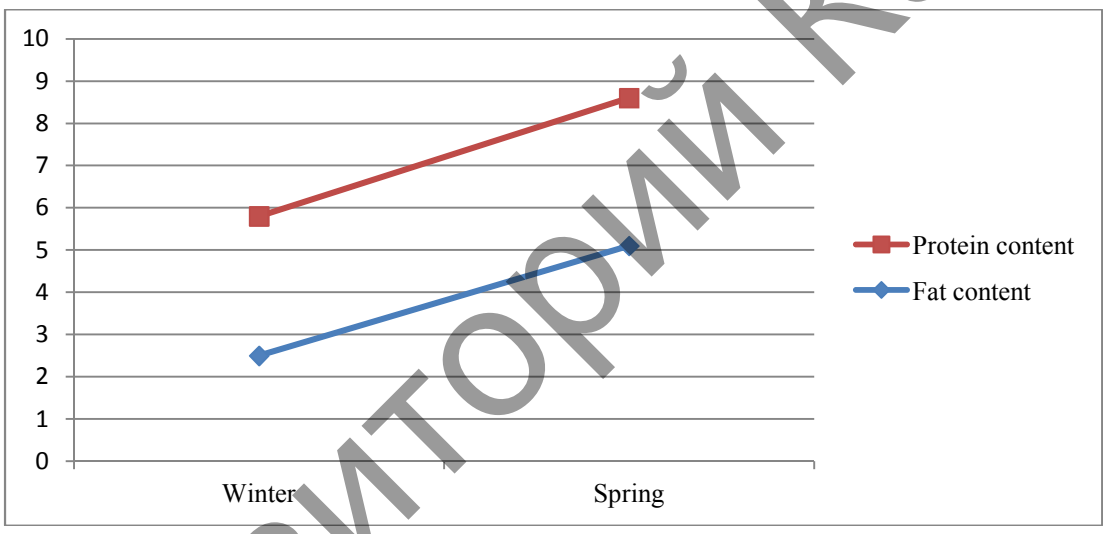

Figure 3. Comparative chart of quality indicators of cow's milk in winter and spring

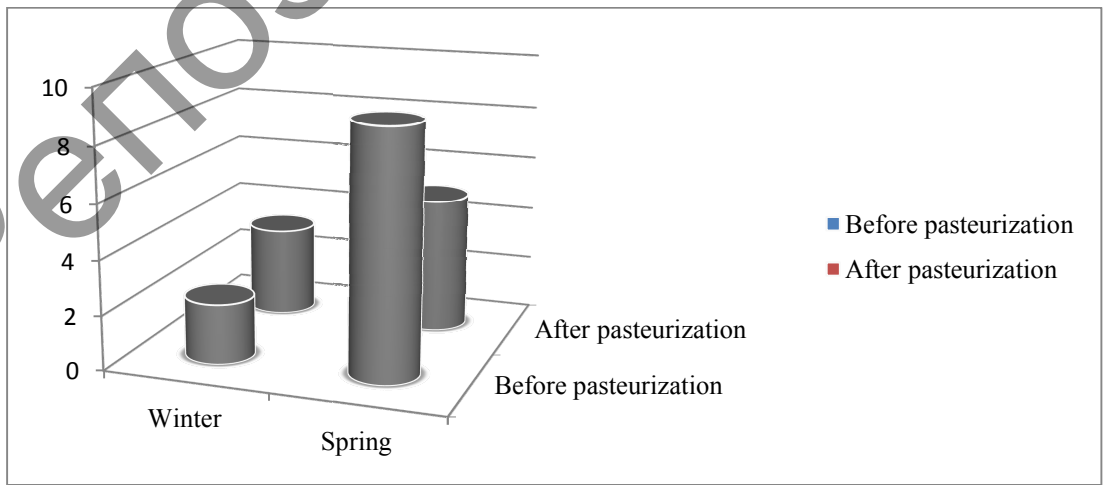

Figure 4. Comparative chart of a microbiological composition of dairy products in winter and spring

Thus, summing up the results of studies, we obtained the following data:

1.When comparing the pasteurized milk, it was clear that in winter contents of protein in it 3,3 %, fat content 2,5 %; microbiological indicators from 2,2*107 to 3,3*106 determined the value. During the spring, protein 3,5 %, fat content 5,1 % increased, microbiological composition is 9*103.

2.As dynamics of quality indicators of cow's milk shows, increase in protein and fat content is observed in the winter-spring season. The microbiological composition changes after pasteurization.

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Осакаров ауданының залалсыздырылған сүт өнімдерінің ерекшелігін зерттеу

Мақалада сүт залалсыздырғанға дейінгі және кейінгі көрсеткіштері берілді. Маусымға байланысты сиыр сүтінің микробиологиялық құрамының өзгерісі, динамикасы көрсетілді. Сиыр сүтінің физикалық және химиялық ерекшеліктері сипатталды. Осы ауданның сиыр сүтінің толық құрамы анықталды және үй сүтімен салыстырылып, майлылығы, ақуызы мен микробиологиялық құрамы көрсеткіштері зерттелді.

Г.Т. Картбаева, К.А. Ельшина

Исследование особенностей пастеризованной молочной продукции Осакаровского района

В статье рассмотрены показатели молока до и после пастеризации. В зависимости от сезона даны изменения микробиологического состава молока и его динамика. Описаны физические и химические особенности коровьего молока. Изучены состав и качество молока коров в Осакаровском районе. Дана сравнительная характеристика домашнего и продаваемого в магазинах г. Караганды молока. Проведен анализ биологического состава, жирности и содержания белка в молоке.

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