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Analyzing the Testing Ways of Milk and Milk Products

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Abstract: In the given article the testing analysis of milk products, identifying the acid of milk and using the several ways on GOST standard as well ; our aim is to research the milk products and on the gained results to give the new code numbers.

Density is the mass of milk at 20 ° C, enclosed in a unit volume. The measurement units are g / cm^3 or kg / m^3. Milk of cow usually has a density in the range of 1027 to 1033 kg / m^3.

The density of milk depends on temperature (it is decreased with its increase), chemical composition (it is decreased with increasing the fat content and it is increased with an increase in the amount of proteins, lactose and salts) and some conditions of technological processing of milk.

The density of milk, determined immediately after milking, operation is lower than the density of cooled milk by 0.8–1.5 kg / m^3. It is explained by the volatilization of some of the gas parts and the increase in the density of fat and proteins (due to the changes in the coefficients of thermal expansion) with a gradual decrease in the temperature of milk. Therefore, the density of milk must be determined no earlier than 2 hours after milking. By this time, the milk structure is stabilized.

The density of milk also changes during the lactation period and under the influence of various zoo technical factors. Due to the density usually the naturalness of milk is judged. By adding the milk to the water its density is decreased and the raising of cream or dilution with skim milk causes the increase in density.

The density of milk is determined by aerometric method and it is expressed in degrees of the hydrometer, i.e., numbers following the tenths of the true density of milk. For example, if the density of milk is 1.0285 g / cm^3, then in degrees of the hydrometer it will be 28.5 ° A.

The used equipment : lactodensimeter, thermometer, 250 cm^3 cylinder.

Technique of definition. The density of cow's milk is determined at (20 ± 50) ° C. A sample in the amount of 250 cm^3 is thoroughly mixed and carefully, avoiding foaming, milk is poured along the wall into the dry cylinder, which is kept in a slightly inclined position. A dry and clean lactodensimeter is slowly lowered into milk to the level of 1,030 and left free-floating in it so that it does not touch the walls. The cylinder should stand on a flat horizontal surface in such position to the source light that makes it possible to clearly see the scale of density and temperature scale.

The indication of the density and acidity indicators are performed 1–2 minutes after setting the lactosensimeter stationary. Density indicators are minutes are determined by the upper meniscus of milk with an accuracy of half division, and temperature indicators are determined up to 0.5 ° C. The discrepancy between repeated density determinations in the same milk sample must not exceed 0.0005

g / cm^3. If the temperature of the milk deviates from 20°C, correction is made: for each degree above 20 density units 0.0002 are added or subtracted (if the temperature is below 20° C).

Determination of density using a pycnometer

The pycnometer is a flask of a certain capacity (Fig.1). Pycnometers are used to determine the density of dilute aqueous solutions of sugar substances (e.g. caramel mass) and other liquids 15.

The used Equipment: analytical scale, pycnometers, thermometer, filter paper.

Technique of definition. The empty pycnometer is weighed 3-5 times and the medium arithmetic mean of mass of the empty pycnometer is calculated. Then to the pycnometer till the mark boiled distilled water is poured, which is cooled to a temperature of 20°C and it is placed in a water bath at a temperature of (20 ± 0.5) C for 30 min (if the meniscus of the liquid is above the mark, then filter paper rolled into a tube is taken and the meniscus of water strictly is set at the level of the mark). After that, the pycnometer is wiped and weighed on the scales 3 times; the the medium arithmetic mean of the mass of the pycnometer with water is calculated. Then the pycnometer is filled with being tested liquid, having previously been washed with this liquid, and the operations described above are repeated (heating in a water bath, weighing). The relative density is calculated by the formula.

$$Д_{20}^{20} (m_2 - m_0) / (m_1 - m_0),$$

where m_0 is the mass of the empty pycnometer, g; m_1 is the mass of the pycnometer with distilled water, g; m_2 is the mass of the pycnometer with the test fluid, g.

Gravimetric methods

The determination of moisture and dry substance (GOST31449-2013.)

Milk contains 86–89% of water, most of which is in a free state (83–86), and the smaller one is in a bound state (3–3.5%). Free water is a solvent of organic and inorganic compounds of milk and it is participated in all biochemical processes taking place in it. It is easily removed by thickening, drying and freezing of milk. Bound water in the form of bonding with components, according to the classification of academician P.A. Rebinder, is divided into three groups: water of chemical, physicochemical and mechanical bonds. Forms of communication are distinguished by the nature and strength of communication. The strongest is a chemical bond, the least is mechanical one. The bound water in its properties is significantly different from free. It does not freeze at low temperatures, does not dissolve electrolytes, and is not removed by drying. Bound water is inaccessible to microorganisms. Therefore for suppressing the development of micro flora in food products, free water is either completely removed or converted into bound water by adding water-binding components (salt, sugar, polyhydric alcohols). With a decrease in the content of free water, the value of water activity is decreased. Under the water activity αw it is understood as the ratio of vapor pressure above the given product to vapor pressure above pure water at the same temperature. For the normal growth of microorganisms, the activity of water should not be less than 0.8–0.9; for yeast and mold -not less than 0.6–0.9. At lower values, micro flora is not developed.

The essence of the method. The determination of moisture and solids is based on drying a sample of the being tested product at a constant temperature (102 ± 2) C to a constant weight. The mass fraction of dry substance depends on the composition of milk and it is ranged from 11to 13%.

The used Equipment : drying cupboard, analytical scale, desiccators, metal boxes, 5 cm^3 pipettes, gauze.

The technique of definition. The analysis is carried out according to an accelerated method. Two mugs of gauze are placed in the bottom of the metal bottle and with an open lid at 105°C is dried in drying cupboard for 20-30 minutes. Removing from the oven, it is closed with lid and it is cooled in a desiccators for 20-30 minutes. Then it is weighed. Drying is continued to the constant weight. The weight is recorded. To the prepared by this way bottle is pipette to 3 cm^3 of milk, evenly distributing it over the entire surface of the gauze and it is weighed by closing the lid. The weight is recorded. Due to the difference of mass, the weight of milk is determined. The open bottle with a hitch is placed in a

drying cupboard at 105 ° C for 60 minutes. Then the bottle is closed, cooled in a exiccator and weighed. Drying and weighing continue in 20-30 minutes till receiving the difference in results of no more than 0.001g. The mass fraction of dry substance (MW) in percent is determined by the formula:

$CB = (M_1 - M_o)\ 100 / (M - M_o)$,

where M_o is the mass of bottle with gauze, g; M is the weight of the bottle with a hinge before drying, g; M_1– mass of bottle with a hitch after drying, g.

The mass fraction of moisture in percent is calculated by the formula

W = 100 - CB,

where CB is the mass fraction of dry substance,%.

Mass fraction of dry skim milk residue

(COMO) is calculated by the formula

SOMO = CB -J,

where CB is the mass fraction of dry substance,%; W - mass fraction of fat,%.

Titrimetric (volumetric) methods

Determination of the acidity of milk

The used Equipment: flasks with a capacity of 100 cm^3; pipettes per 1 cm^3, 10 cm^3, 20 cm^3; 1% alcohol solution of phenolphthalein; 0.1 n solution of NaOH ; 2.5% solution of cobalt sulfate.

1. In a flask with a capacity of 100 cm^3, measure with a pipette of 10 cm^3 of the being tested milk and 20 cm^3 of distilled water. Water is added in order to catch the pink tint clearer during titration. Add 3 drops of a 1% alcohol solution of phenolphthalein to the mixture and stir.

2. From the burette (noting the level of alkali) By drops add to the flask with constant stirring 0.1 n. solution of caustic soda (or SCS) until the appearance of slightly pink color, corresponding to the control of standard color, which does not disappear for 1 min. The preparation of the control standard for coloring. In a flask per 100 cm^3, measure with a pipette 10 cm^3 of milk, 20 cm^3 of water, 1 cm^3 of a 2.5% solution of cobalt sulfate and stir. The standard is suitable for working during one shift. For longer storage of the standard add one drop of formalin.

3. Count the amount of alkali (cm^3) that entered into titration of 10 cm3 of milk.

4. For expressing the acidity of milk in degrees of Turner in accordance with GOST 32901-2014, the amount of alkali (cm^3) spent on titration of 10 cm^3 of milk multiply by 10, that is, recalculate by 100 cm^3 of milk. The discrepancy between parallel definitions should be no more than 1 ° T. Sometimes acidity is expressed in degrees of lactic acid (acidity coefficient is set). For doing this it is necessary to multiply the value of the titration degrees to 0.009 (the amount of lactic acid in grams, equivalent to 1 cm^3 of 0.1 N alkali). In some cases, for the titration is taken.

5. 10, 20 cm^3 of milk, however, the calculation is always carried out on 100 parts of milk. In the absence of distilled water, a determination can be made without it. In this case, the results should be reduced by 2 ° T, as it is more difficult to catch a pink tint in undiluted with water milk it is more difficult to catch a pink tint.

References:

1. ”GLOBAL SCIENCE AND INNOVATIONS 2018; CENTRAL ASIA” II International scientific-practical conference
2. Krishtafovich V.I., Kolobov S.V.”Methods and technical provision of quality control (productional goods).-M.:ITK “Dashkov and T”.

3. Programme of Designing technical reglaments for 2019-2021 years.
4. Tverlahleb G.N. and others. Technology of milk and milk products, Moscow : VO Agropromizdat 2019.
5. Law of the Republic of Uzbekistan about”Security of food products and quality”.