SRI LANKA STANDARD 735 : PART 5 : 1988

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METHODS OF TEST FOR

MILK AND MILK PRODUCTS

PART 5 - DETERMINATION OF TOTAL SOLIDS

SRI LANKA STANDARDS INSTITUTION

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SRI LANKA STANDARD
METHODS OF TEST FOR MILK AND MILK PRODUCTS
PART 5 : DETERMINATION OF TOTAL SOLIDS

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 1988 - 12 - 12, after the draft, finalized by the Drafting Committee on Milk and Milk Products, had been approved by the Agricultural and Food Products Divisional Committee.

In order to accommodate the large number of test methods within the scope of one standard, this standard is published in several parts.

This standard forms Part 5 of Sri Lanka Standard Methods of Test for Milk and Milk Products.

In reporting the result of a test or an analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with CS 102.

In the preparation of this standard, the assistance derived from the publications of the International Organization for Standardization and the International Dairy Federation is gratefully acknowledged.

1 SCOPE

This part of the standard prescribes the methods of determination of total solids of ice cream, milk ice, sweetened condensed milk, evaporated milk, milk, curd and yoghurt.

2 REFERENCES

ISO 707 Milk products sampling.
CS 102 Presentation of numerical values.
CS 124 Test sieves.

3 SAMPLING

Test samples for the use in the tests specified in this part shall be obtained in accordance with ISO 707.

4 PREPARATION OF THE TEST SAMPLES

4.1 Ice cream and milk ice

4.1.1 For samples taken in small packages, remove the packaging and place the sample in a clean, dry container fitted with an air-tight lid.

For samples taken from bulk or large packages, remove the packages, keep the samples in sampling containers.

4.1.2 Melt the sample by keeping the container in a water bath maintained at 35 °C to 40 °C until the sample becomes a homogeneous, smooth paste.

4.1.3 Take for testing about 3 g of the prepared sample.

4.2 Sweetended condensed milk and evaporated milk

4.2.1 Open the container and thoroughly mix the sample with a spoon or spatula using up and down and rotary movements to mix the upper and lower layers.

4.2.2 Transfer the sample completely to a container provided with an air-tight lid ensuring the incorporation of any milk adhering to the wall and the ends of the container.

4.2.3 Take for testing about 2.5 g of the prepared sample.

NOTE

In the case of evaporated milk, if fat separates, do not test the sample.

4.3 Milk

4.3.1 If the temperature of the sample is below room temperature, allow the sample to reach the room temperature.

4.3.2 Mix the sample thoroughly ensuring a homogeneous mixture of fat throughout the sample. Avoid vigorous agitation as it may cause frothing of milk or churning of fat.

If it is difficult to disperse the cream layer, warm the sample slowly on a water bath to 35 °C to 40 °C mixing carefully and incorporating any cream adhering to the container. Allow the sample to cool to room temperature.

A homogenizer should be used if necessary to assist the dispersion of the fat.

4.3.3 Take for testing about 2.5 g of the prepared sample.

NOTE - Correct results cannot be expected if the sample contains separated liquid fat or irregularly shaped white particles adhering to the walls of the container.

4.4 Curd

4.4.1 If the sample is contained in a pot, divide the sample into four equal segments. Scoop two opposite segments and place in an air-tight container with a lid.

4.4.2 Mix the sample gently in the air-tight container using a spatula until the curd is of uniform consistency.

4.4.3 Take for testing about 2 g of the prepared sample.

4.5 Yoghurt

4.5.1 If the original container allows smooth mixing, mix the sample in the original container. If not transfer the sample to an air-tight container.

4.5.2 Mix the sample smoothly using a spatula ensuring thorough mixing of the top and bottom layers. Do not stir vigorously.

4.5.3 Take for testing about 2 g to 5 g of the prepared sample.

5 APPARATUS AND MATERIAL

5.1 *Flat dish,* about 25 mm in height and 75 mm in diameter with a well fitting lid and a glass rod having a flat end. The dish shall be non corrodable under the test conditions.

5.2 *Analytical balance,* with an accuracy of 0.1 mg.

5.3 *Drying oven,* well ventilated and maintained at 102 $\pm$ 2 °C.

5.4 *Desiccator*

5.5 *Water bath*

5.6 *Quartz sand or sea sand,* passing through 500 µm sieve and retained by 180 µm sieve. Sieves shall conform to **CS 124.** The sand shall be washed with concentrated hydrochloric acid and subsequently with distilled water until free of chlorides, dried and ignited.

NOTE

The acid- washed sand shall pass the following test for suitability. Dry about 25 g of the sand to constant mass at a temperature of 102 ± 2 °C in the oven. Cool and weigh to the nearest 0.1 mg. Moisten the sand with distilled water, dry again to constant mass. Cool and weigh to the nearest 0.1 mg. the difference between the two masses shall not exceed 0.5 mg.

6 PROCEDURE

The procedure given in **6.1** shall apply to ice cream, milk ice, sweetened condensed milk and sweetened yoghurt. The procedure given in **6.2** shall apply to milk, evaporated milk, curd, and yoghurt (without sugar).

6.1 Place about 25 g of the sand (5.6) in the dish (5.1). Transfer the dish with the lid and glass rod to the oven (5.3) and dry for about 2 hours. Transfer the dish to the desiccator (5.4) and allow to cool to room temperature. Weigh the dish with sand, glass rod and the lid to the nearest 0.1 mg.

Tilt the dish until the sand moves to one side. Place the required quantity of the sample (Refer 4) in the other side of the dish and weigh to the nearest 0.1 mg.

Add about 3 ml of distilled water to the test sample and mix using the glass rod. Mix the diluted test sample thoroughly with the sand.

Place the dish with the glass rod on the boiling water bath (5.5) for about 30 minutes, stirring carefully so that the mass when dry, will not form a cake but a well aerated crumbly mixture.

Place the open dish with the lid in the oven (5.3) for 2 hours to 3 hours. Close the dish, transfer to the desiccator and allow to cool to room temperature. Weigh to the nearest 0.1 mg.

Repeat the process of drying, cooling and weighing at 1 hour intervals until the difference between two successive weighings does not exceed 0.1 mg.

6.2 Heat the open dish and lid (see Note) in the oven (5.3) for at least 1 hour.

NOTE

The dish described in 5.1 could be used without the glass rod.

Allow the closed dish to cool in the desiccator to room temperature. Weigh to the nearest 0.1 mg.

Place the sample in the dish. Weigh to the nearest 0.1 mg. In the case of milk, tilt the dish to spread the sample evenly. In the case of evaporated milk, add 3 ml to 5 ml of water, tilt the dish to mix and spread the sample evenly. Place the dish on the water bath (5.5) for about 30 minutes.

Heat the open dish and lid in the oven for 2 hours.

Allow the closed dish to cool in the desiccator to room temperature. Weigh to the nearest 0.1 mg.

Repeat the process of drying, cooling and weighing at 1 hour intervals until the difference in mass between two successive weighings does not exceed 0.1 mg.

7 CALCULATION

7.1 For the procedure given in 6.1, the calculation shall be as follows:

$$\text{Total solids content, per cent by mass} = \frac{m_2 - m_0}{m_1 - m_0} \times 100$$

where,

m_0 is the mass, in g, of the dish, sand, lid and the glass rod;
m_1 is the mass, in g, of the dish, sand, lid, glass rod and the sample before drying; and
m_2 is the mass, in g, of the dish, sand, lid, glass rod and the sample after drying.

7.2 For the procedure given in 6.2, the calculation shall be as follows :

$$\text{Total solids content, per cent by mass} = \frac{m_2 - m_0}{m_1 - m_0} \times 100$$

where,

m_0 is the mass, in g, of the dish and the lid;
m_1 is the mass, in g, of the dish, lid and the sample before drying; and
m_2 is the mass, in g, of the dish, lid and the sample after drying.

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