SRI LANKA STANDARD 735 : PART 4 : 1988

UDC 637. 1/.3:546.131

METHODS OF TEST FOR

MILK AND MILK PRODUCTS

PART 4 - DETERMINATION OF SALT

SRI LANKA STANDARDS INSTITUTION

METHODS OF TEST FOR MILK AND MILK PRODUCTS

PART 4 : DETERMINATION OF SALT

SLS 735 : Part 4 : 1988

Gr. 4

SRI LANKA STANDARDS INSTITUTION
53, Dharmapala Mawatha,
Colombo 3,
Sri Lanka.

SRI LANKA STANDARD
METHODS OF TEST FOR MILK AND MILK PRODUCTS
PART 4 : DETERMINATION OF SALT

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 1988 - 10 - 04, 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 accomodate the large number of test methods within the scope of one standard, this standard is published in several parts.

This standard forms Part 4 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 International Organization for Standardization is gratefully acknowledged.

1 SCOPE

This part of the standard prescribes the methods of determination of salt content of butter and cheese.

2 REFERENCES

ISO 707 Milk and Milk products sampling.
CS 102 Presentation of numerical values.

3 SAMPLING

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

4 DETERMINATION OF SALT CONTENT OF BUTTER

Either of the following methods may be used.

4.1 Method 1

4.1.1 *Reagents*

During the analysis, unless otherwise stated, reagents of recognized analytical grade and only distilled water or water of equivalent purity shall be used.

4.1.1.1 Silver nitrate, standardized volumetric solution, $c(AgNO_3) = 0.1$ mol/l.

4.1.1.2 Potassium chromate, 50 g/l solution.

4.1.2 *Procedure*

4.1.2.1 Leave the sample at room temperature in a closed container until it is soft enough to facilitate thorough mixing to a homogeneous state. This could also be achieved by keeping the sample in a water bath, temperature not exceeding 40 °C, for few minutes and thoroughly mixing it at room temperature.

Mix the sample thoroughly by shaking the sample container until the sample has cooled to a thick, creamy consistency.

4.1.2.2 Weigh, to the nearest 0.01 g, about 5 g of the sample prepared as in 4.1.2.1 in to a 250-ml conical flask.

Add 100 ml of boiling water and mix well. Add 2 ml of potassium chromate solution (4.1.1.2). Titrate with the silver nitrate solution (4.1.1.1) at 50 °C to 55 °C swirling continuously until the colour changes from yellow to orange-red which persists for 30 seconds.

Carry out a blank titration.

4.1.3 *Calculation*

One millilitre of 0.1 mol/l solution of silver nitrate is equivalent to 0.00585 g of sodium chloride.

$$\text{Salt content, as NaCl, per cent by mass} = \frac{5.85\ (V_1 - V_2)\ c}{m}$$

where,

V_1 is the volume, in ml, of silver nitrate solution required for the titration;
V_2 is the volume, in ml, of silver nitrate solution required for the blank titration;
c is the concentration, in mol/l, of the silver nitrate solution; and
m is the mass, in g, of the sample taken for the test.

4.2 Method 2

4.2.1 *Reagents*

4.2.1.1 Silver nitrate, approximately 0.05 mol/l solution.

Prepare the solution using silver nitrate which has been dried over phosphorus pentoxide (P_2O_5). Calculate the exact concentration by titrating with standard 0.05 mol/l sodium chloride solution using 5 per cent (m/m) potassium chromate as the indicator.

4.2.1.2 Concentrated nitric acid, rel. den. = 1.42.

4.2.1.3 Urea

4.2.1.4 Nitrobenzene

4.2.1.5 Ammonium ferric sulfate indicator solution

Dissolve 50 g of ammonium ferric sulfate, $(NH_4)_2SO_4.Fe_2(SO_4)_3.24H_2O$, in 95 ml of water containing 5 ml of 31.5 per cent (m/m) nitric acid solution.

4.2.1.6 Potassium thiocyanate, approximately 0.05 mol/l solution, standardized as follows:

Pipette 20 ml of the silver nitrate solution (4.2.1.1) in to a 250-ml conical flask. Add 25 ml of water, 5 ml of 31.5 per cent (m/m) nitric acid and 1 ml of ammonium ferric sulfate solution. Titrate with the potassium thiocyanate solution and calculate its concentration.

NOTE

0.05 mol/l ammonium thiocyanate could be used instead of potassium thiocyanate.

4.2.2 *Procedure*

4.2.2.1 Weigh, to the nearest 0.01 g, about 2 g of the sample in to a 250-ml conical flask. Add 10 ml of water and 25 ml of silver nitrate solution (4.2.1.1). Warm the contents of the flask to melt the sample and shake well. Add 10 ml of concentrated nitric acid (4.2.1.2) and gently boil for about 10 minutes until the curd is dissolved and the silver chloride precipitate is granular. The liquid is then a clear lemon colour and the layer of fat is clear and free from solid material. Add about 0.3 g of urea to the hot solution, mix and cool. Add 1 ml of nitrobenzene and mix.

Add 2 ml of ammonium ferric sulfate indicator solution (4.2.1.5) and 50 ml of water. Determine the excess silver nitrate by titrating with potassium thiocyanate solution (4.2.1.6) until the appearance of an orange tint which persists for 30 seconds.

4.2.2.2 Take 25 ml of silver nitrate solution (4..2.1.1), add 2 ml of ammonium ferric sulfate indicator and titrate with potassium thiocyanate solution (4.2.1.6) until the same end point is reached as in 4.2.2.1.

4.2.3 *Calculation*

One millilitre of 0.05 mol/l solution of potassium thiocyanate is equivalent to 0.00292 g of sodium chloride.

$$\text{Salt content, as NaCl, per ceny by mass} = \frac{0.292\ (V_1 - V_2)c}{0.05\ m}$$

where,

V_1 is the volume, in ml, of potassium thiocyanate slution required for the titration in 4.2.2.2;

V_2 is the volume, in ml, of potassium thiocyanate solution required for the titration in 4.2.2.1;

c is the concentration, in mol/l, of the potassium thiocyanate solution; and

m is the mass, in g, of the sample taken for the test.

5 DETERMINATION OF SALT CONTENT OF CHEESE

5.1 Reagents

As in 4.2.1.1 to 4.2.1.6.

5.2 Procedure

5.2.1 Grate the sample quickly or cut into small pieces.

5.2.2 Weigh, to the nearest 0.01 g, about 2 g of the sample prepared as in 5.2.1 in a 300-ml Erlenmeyer flask. Add 10 ml of distilled water and 25 ml of silver nitrate solution (4.2.1.1). Warm the contents of the flask to 75 °C to 80 °C, swirling vigorously to facilitate the dispersion of the sample. Add 10 ml of concentrated nitric acid (4.2.1.2) and boil gently for 10 minutes. Add about 0.3 g of urea to the hot solution, mix and cool. Add 1 ml of nitrobenzene and mix.

Proceed as given in the second paragraph of 4.2.2.1, commencing with the addition of 2 ml of ammonium ferric sulfate indicator.

5.3 Calculation

Calculate as given in 4.2.3.

SLS CERTIFICATION MARK

The Sri Lanka Standards Institution is the owner of the registered certification mark shown below. Beneath the mark, the number of the Sri Lanka Standard relevant to the product is indicated. This mark may be used only by those who have obtained permits under the SLS certification marks scheme. The presence of this mark on or in relation to a product conveys the assurance that they have been produced to comply with the requirements of the relevant Sri Lanka Standard under a well designed system of quality control inspection and testing operated by the manufacturer and supervised by the SLSI *which includes surveillance inspection of the factory, testing of both factory and market samples.*

Further particulars of the terms and conditions of the permit may be obtained from the Sri *Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.*

Printed at SLSI (Printing Unit)

SRI LANKA STANDARDS INSTITUTION

The Sri Lanka Standards Institution (SLSI) is the National Standards Organization of Sri Lanka established under the Sri Lanka Standards Institution Act No. 6 of 1984 which repealed and replaced the Bureau of Ceylon Standards Act No. 38 of 1964. The Institution functions under the Ministry of Science & Technology.

The principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote standardization and quality control by educational, consultancy and research activity.

The Institution is financed by Government grants, and by the income from the sale of its publications and other services offered for Industry and Business Sector. Financial and administrative control is vested in a Council appointed in accordance with the provisions of the Act.

The development and formulation of National Standards is carried out by Technical Experts and representatives of other interest groups, assisted by the permanent officers of the Institution. These Technical Committees are appointed under the purview of the Sectoral Committees which in turn are appointed by the Council. The Sectoral Committees give the final Technical approval for the Draft National Standards prior to the approval by the Council of the SLSI.

All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution endeavours to ensure adequate representation of all view points.

In the International field the Institution represents Sri Lanka in the International Organization for Standardization (ISO), and participates in such fields of standardization as are of special interest to Sri Lanka.

Printed at the Sri Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.