

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 2785 (1979): Natural Cheese (Hard Variety), Processed Cheese, Processed Cheese Spread and Soft Cheese [FAD 19: Dairy Products and Equipment]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



IS : 2785 - 1979

(Reaffirmed ~~1999~~)

2010

Indian Standard

SPECIFICATION FOR NATURAL CHEESE (HARD VARIETY), PROCESSED CHEESE, PROCESSED CHEESE SPREAD AND SOFT CHEESE

(First Revision)

Second Reprint FEBRUARY 1992

UDC 637.352+637.354+637.358

© Copyright 1979

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR NATURAL CHEESE (HARD VARIETY), PROCESSED CHEESE, PROCESSED CHEESE SPREAD AND SOFT CHEESE (*First Revision*)

Dairy Products Sectional Committee, AFDC 34

<i>Chairman</i>	<i>Representing</i>
DR D. SUNDARESAN	National Dairy Research Institute (ICAR), Karnal
<i>Members</i>	
DR N. C. GANGULI (<i>Alternate to</i> Dr D. Sundaresan)	
AGRICULTURAL MARKETING ADVISER TO THE GOVERNMENT OF INDIA	Directorate of Marketing & Inspection (Ministry of Agriculture & Irrigation), Faridabad
SHRI S. JAYARAMAN (<i>Alternate</i>)	
DR R. P. ANEJA	National Dairy Development Board, Anand
DR S. R. AGARWAL (<i>Alternate</i>)	
SHRI B. R. BĒDEKAR	Hindustan Milkfood Manufacturers Ltd, Nabha
SHRI M. P. RAJEN PILLAI (<i>Alternate</i>)	
DR V. R. BHALERAO	Indian Council of Agricultural Research, New Delhi
DR N. R. BEASIN	Rajasthan State Dairy Development Corporation Ltd, Jaipur
SHRI P. H. BHATT	Kaira District Co-operative Milk Producers' Union Limited, Anand
DR C. V. PATEL (<i>Alternate</i>)	
SHRI D. S. CHADHA	Central Committee for Food Standards (Ministry of Health & Family Welfare), New Delhi
ASSISTANT SECRETARY (PFA) (<i>Alternate</i>)	
CHAIRMAN	Technical Standardization Committee (Foodstuffs) (Ministry of Agriculture & Irrigation), New Delhi
SECRETARY (<i>Alternate</i>)	
SHRI SANJAY DALMIA	Dalmia Dairy Industries, New Delhi
BRIG R. C. DATTA	Directorate of Military Farms, Quartermaster General's Branch (Army Headquarters), New Delhi
LT-COL K. A. PATIL (<i>Alternate</i>)	

(*Continued on page 2*)

© Copyright 1979

BUREAU OF INDIAN STANDARDS

This publication is protected under the *Indian Copyright Act* (XIV. of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(Continued from page 1)

<i>Members</i>	<i>Representing</i>
SHRI S. V. GUPTA	National Physical Laboratory (CSIR), New Delhi
SHRI MOHINDER NATH (<i>Alternate</i>)	
SHRI L. C. JAVA	Joy Ice Creams (Bangalore) Pvt Ltd, Bangalore
SHRI P. K. DWARAKANATHAN (<i>Alternate</i>)	
SHRI G. M. JHALA	National Dairy Development Board, Anand
JOINT COMMISSIONER (DAIRY DEVELOPMENT)	Ministry of Agriculture & Irrigation (Department of Agriculture), New Delhi
DEPUTY COMMISSIONER (DAIRY DEVELOPMENT) (<i>Alternate</i>)	
SHRI C. D. KHANNA	The Punjab Dairy Development Corporation Ltd, Chandigarh
SHRI B. M. MAHAJAN (<i>Alternate</i>)	
MANAGER (QUALITY CONTROL)	Delhi Milk Scheme, New Delhi
SHRI S. C. SAXENA (<i>Alternate</i>)	
MANAGING DIRECTOR	The Andhra Pradesh Dairy Development Corporation Limited, Hyderabad
DIRECTOR (PRODUCTION) (<i>Alternate</i>)	
SHRI B. L. MITTAL	The Haryana Dairy Development Cooperative Federation Limited, Chandigarh
SHRI B. VISHWANATHAN (<i>Alternate</i>)	
SHRI K. PADAMABHAIAH	Dairy Development Commissioner, Government of Maharashtra, Bombay
SHRI N. D. KOTNIS (<i>Alternate</i>)	
SHRI I. M. PATEL	Gujarat Cooperative Milk Marketing Federation Limited, Anand
SHRI J. M. CONTRACTOR (<i>Alternate</i>)	
SHRI A. RAMANATHAN	National Co-operative Development Corporation, New Delhi
SHRI S. P. SHARMA (<i>Alternate</i>)	
SHRI S. RAMASWAMY	Directorate General of Technical Development, New Delhi
SHRI B. B. DABRAL (<i>Alternate</i>)	
DR D. S. SARASWAT	Indian Dairy Association, New Delhi
SHRI M. M. MALIK (<i>Alternate</i>)	
SHRI C. R. SEETHARAMAN	Milk Commissioner, Government of Tamil Nadu, Madras
SHRI K. SHRIKRISHNA (<i>Alternate</i>)	
DR N. SEN	Hindustan Lever Ltd, Bombay
SHRI B. K. CHAUDHURY (<i>Alternate</i>)	
DR A. SEN GUPTA	Milk Commissioner, Government of West Bengal, Calcutta
SHRI K. K. GUPTA (<i>Alternate</i>)	
SHRI M. R. SRINIVASAN	The Andhra Pradesh Dairy Development Corporation Limited, Hyderabad
SHRI N. SUBRAMANIAN	Central Food Technological Research Institute (CSIR), Mysore
SHRI G. RAMANATHAN (<i>Alternate</i>)	
COL R. N. TANEJA	Food Inspection Organization, Quartermaster General's Branch (Army Headquarters), New Delhi
LT-COL K. N. ACHARYA (<i>Alternate</i>)	

(Continued on page 19)

Indian Standard
SPECIFICATION FOR
NATURAL CHEESE (HARD VARIETY),
PROCESSED CHEESE, PROCESSED
CHEESE SPREAD AND SOFT CHEESE
(*First Revision*)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 28 May 1979, after the draft finalized by the Dairy Products Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Cheese making is one of the important methods adopted for conserving surplus of milk. Cheese provides fat and protein concentrate in a highly nutritious and palatable form.

0.3 The cheese most popular in India may be grouped into two varieties, namely, hard (Cheddar, Edam, Gouda, etc) and soft (for example, cottage cheese). Low moisture content and long keeping quality are the characteristics of the hard varieties which are also used for the manufacture of processed cheese. Soft cheese contain high percentage of moisture and are meant to be consumed within a short interval after their manufacture.

0.4 This standard has been prepared with a view to providing an optimum quality in natural and processed cheeses. It covers hard as well as soft varieties of cheese.

0.5 It is not possible to produce high grade cheese from raw materials which are initially of poor hygienic quality irrespective of the subsequent method of treatment or handling. It is, therefore, important to exercise the utmost care in obtaining milk and other ingredients of good hygienic quality to ensure that the product is really good.

0.6 This standard was first published in 1964. This revision has been brought out to incorporate an additional type of cheese, namely, soft cheese, besides updating the various definitions and provisions in the standard. The revision also incorporates the three amendments issued to the standard earlier.

0.7 While formulating this standard, necessary consideration has been given to the relevant Rules prescribed by the Government of India under the Prevention of Food Adulteration Act (PFA), 1954. However, this standard is subject to the restrictions imposed under that Act and the Rules framed thereunder wherever applicable.

0.8 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for natural cheese (hard variety), processed cheese, processed cheese spread, and soft cheese.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Natural Cheese (Hard Variety) — Cheese made from milk and other ingredients according to the general procedure prescribed in **3.2.2** and containing ingredients as specified in Table 1.

2.2 Processed Cheese — The food prepared by comminuting and mixing into a homogeneous plastic mass with the aid of heat one or more types of hard cheeses with or without the ingredients mentioned in **3.1.1** to **3.1.10**.

2.3 Processed Cheese Spread — The product is similar to that in **2.2** except that this product has more spreadable characteristic and has more moisture content.

2.4 Soft Cheese — The product prepared by coagulating whole or skim or recombined or reconstituted milk of dairy animals or their mixture with or without the addition of rennet or with organic acids such as lactic and citric (artificially acidulated or naturally developed by use of selective species of bacteria), heat and salt. Skim milk cheese may be dressed with homogenized pasteurized cream.

3. REQUIREMENTS

3.1 Ingredient Requirements — All ingredients used shall be clean and in everyway fit for human consumption.

*Rules for rounding off numerical values (revised).

3.1.1 Dairy Ingredients — Butter, cream, butter oil, milk, skim milk, milk powder, cheese whey, sweet butter milk, or one or more of these or any of the foregoing from which part of water has been removed.

3.1.1.1 Milk — The milk may be standardized as required to enable the end product to comply with the composition, body and texture of the cheese. Standardization may be done by either fresh skim milk or fresh cream or skim milk obtained from reconstituted milk powder. Unless heated to a higher temperature before use, milk, skim milk and cream shall be pasteurized by holding it at a temperature of not less than 62·8 to 65·6°C for a period of not less than 30 minutes, or for a time and a temperature equivalent thereto needed for phosphatase destruction.

3.1.2 Emulsifying Agents — One or more of the sodium or potassium salts of citric acid, phosphoric acid, tartaric acid, lactic acid, in such quantities that the mass of the solids of such emulsifying agents is not more than 4 percent of the mass of the processed cheese spread.

3.1.3 Acidifying Agents — Agents, such as lactic acid, citric acid, acetic acid and phosphoric acid in such quantity that the pH of the pasteurized cheese spread is not below 4·0.

3.1.4 Sweetening Agents — Agents, such as sugar, dextrose, cane sugar, cane syrup, honey, cane syrup solids, maltose, malt syrup and hydrolyzed lactose in a quantity necessary for seasoning.

3.1.5 The salt used shall be sodium chloride conforming to IS : 253-1970*.

3.1.6 No colouring matter other than annatto colour or carotene shall be added.

3.1.7 Harmless and permitted stabilizers (other than gums *see* 3.1.9) or emulsifiers or both may be used in quantities not exceeding 4·0 percent in the case of processed cheese and cheese spread. They shall be clean and free from any taste or odour and shall be protected from dust and contamination during storage.

3.1.8 Spices or flavourings permitted under the Prevention of Food Adulteration Rules.

3.1.9 Other Optional Ingredients — One or more of the following ingredients may be used. The total mass of such substances should be not more than 0·8 percent of the mass of the finished food:

Gelatin, algin (sodium alginate) and algin derivatives, propylene glycol ester of alginic acid and edible gums as permitted in the Prevention of Food Adulteration Rules.

*Specification for edible common salt (*second revision*).

3.1.10 Preservatives — Sorbic acid or nisin or both to the maximum extent of 0.1 percent by mass.

3.2 Preparation and Processing

3.2.1 Hygienic Requirements — The product shall be processed and packed in the premises maintained under hygienic conditions (see IS : 2491-1972*). It shall be also stored and distributed under hygienic conditions.

3.2.2 Natural Cheese (Hard Variety) — Milk which shall be pasteurized or adequately heated shall be subjected to the action of harmless lactic-acid-producing bacteria with or without the addition of other harmless flavour-producing bacteria present in such milk. Annatto or carotene may be added. Milk coagulating enzymes with or without purified calcium chloride (as anhydrous salt) and sodium citrate in a quantity not exceeding 0.02 percent of the mass of the milk shall be added to set the milk to a semi-solid mass. The mass shall then be cut into small pieces, stirred and heated. The curd shall be separated from the whey by draining and shall be made into forms and pressed. The curd shall be salted at some stage of the manufacturing process. The rind may be coated with paraffin wax or wrapped in some transparent material.

3.2.3 Processed Cheese — During its preparation, the processed cheese should be heated for not less than 30 seconds at a temperature of not less than 66°C.

3.3 Requirements for Finished Product

3.3.1 Appearance — Cheese shall be clean and sound, free from dirt, and insect and rodent contamination.

3.3.2 Odour and Flavour — The cheese shall have a pleasant odour and characteristic flavour.

3.3.3 Texture and Consistency — The cheese shall be of good texture and uniform consistency.

3.3.4 The materials shall also comply with the requirements specified in Table 1.

4. PACKING AND MARKING

4.1 Packing — All the material used for wrapping or packaging the cheese shall be of such a nature as to impart no off-flavour or odour, nor in any other way contaminate the product packed under normal conditions of manufacture, storage and use.

*Code for hygienic conditions for food processing units (first revision).

TABLE 1 REQUIREMENTS OF CHEESE (HARD VARIETY) PROCESSED CHEESE, PROCESSED CHEESE SPREAD AND SOFT CHEESE*(Clauses 2.1 and 3.3.4)*

Sl. No.	CHARACTERISTIC	NATURAL CHEESE (HARD VARIETY)	PROCESSED CHEESE	PROCESSED CHEESE SPREAD	SOFT CHEESE		METHODS OF TEST (REF TO APPENDIX)
					Milk	Skim Milk	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	Moisture, percent by mass	Max 43	Max 47	Max 60	48 to 70	48 to 70	A
ii)	Milk fat (on dry basis), percent by mass	Min 42	Min 40	Min 40	Min 50	Max 13	B
iii)	Salt (added sodium chloride), percent by mass, <i>Max</i>	3.0	3.0	3.0	Optional	Optional	C

4.1.1 The metal cans when used for packing cheese shall be open top type with a soldered side-seam and compound-lined, double-seamed end. The inside of the can shall be coated with a suitable lacquer finish.

4.2 Marking — The containers shall be suitably marked so as to give the following information:

- Name and type of the product,
- Name and address of the manufacturer,
- Net mass, and
- Batch or code number.

4.2.1 The containers may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

5. SAMPLING

5.1 The method of drawing representative samples of the material and the criteria for conformity shall be as prescribed in Appendix D.

6. TESTS

6.1 Tests shall be carried out as prescribed in the appropriate appendices specified in col 8 of Table 1.

6.2 Quality of Reagents — Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (*see* IS : 1070-1977*) shall be used when the use of water as a reagent is intended.

NOTE — ' Pure chemicals ' shall mean chemicals that do not contain impurities which affect the result of analysis.

A P P E N D I X A

[*Table 1, Item (i)*]

DETERMINATION OF MOISTURE

A-1. APPARATUS

A-1.1 Flat-Bottomed Dishes — of nickel or other suitable metal not affected by boiling water, 7 to 8 cm in diameter and not more than 2.5 cm deep, provided with short glass stirring rods having a widened flat end.

A-1.2 Sand — which passes through 500-micron IS Sieve and is retained by 180-micron IS Sieve. It shall be prepared by digestion with concentrated hydrochloric acid, followed by thorough washing with water. It shall then be dried and ignited till it is dull red.

A-1.3 Well-Ventilated Oven — capable of operating at 102°C air temperature.

A-2. PROCEDURE

A-2.1 Heat the necessary number of metal dishes, each dish containing about 20 g of prepared sand and a stirring rod, in the oven for about one hour. Allow to cool in an efficient desiccator for 30 to 40 minutes. Weigh accurately about 3 g of the prepared sample of cheese into a dish. Saturate the sand by the careful addition of a few drops of distilled water, and thoroughly mix the wet sand with the cheese by stirring with the glass rod, smoothing out lumps and spreading the mixture over the bottom of the dish.

*Specification for water for general laboratory use (*second revision*).

A-2.1.1 Place the dish on a boiling water-bath for 20 to 30 minutes, then wipe the bottom of the dish and transfer it, with the glass rod, to the well-ventilated oven at $102 \pm 1^\circ\text{C}$. The bulb of the oven control thermometer shall be immediately above the shelf carrying the dish. Dishes shall not be placed near the walls of the oven, and should be insulated from the shelf by suitable silica or glass supports.

A-2.1.2 After four hours, remove the dish to an efficient desiccator, allow to cool as before, and weigh. Replace the dish in the oven for a further period of one hour at $102 \pm 1^\circ\text{C}$, remove to the desiccator, and cool and weigh again. Repeat the process of heating, cooling and weighing every one hour till consecutive weighings agree to within 0.5 mg.

A-3. CALCULATION

A-3.1 From the loss in mass observed, calculate the percentage by mass of moisture.

APPENDIX B

[Table 1, Item (ii)]

DETERMINATION OF MILK FAT

B-1. GENERAL

B-1.1 When a number of samples of cheese are required to be analyzed for routine purposes, the method prescribed in IS : 9070-1979* may be used. However, for reference purposes, the method given in **B-2** shall be used.

B-2. METHOD FOR REFERENCE PURPOSES

B-2.1 Apparatus

B-2.1.1 All apparatus listed under 5.1 of IS : 1479 (Part II)-1961† are required.

B-2.2 Reagents

B-2.2.1 *Hydrochloric Acid* — sp gr 1.125.

B-2.2.2 *Ethyl Alcohol* — 95 to 96 percent by volume.

B-2.2.3 *Diethyl Ether* — sp gr 0.720, peroxide-free.

NOTE — Diethyl ether may be maintained free from peroxide by adding wet-zinc foil (approx 80 cm² per litre, cut in strips long enough to reach at least half way up the container) that has been completely immersed in dilute acidified copper sulphate solution for 1 minute and subsequently washed with water.

*Determination of fat in cheese by Van Gulik method.

†Methods of test for dairy industry: Part II Chemical analysis of milk.

B-2.2.4 Light Petroleum — boiling range 40 to 60°C.

B-2.3 Procedure

B-2.3.1 Weigh accurately 1.0 to 1.5 g of the prepared sample (see **D-5.6.1**) into the extraction tube. Add 10 ml of the hydrochloric acid and boil gently, with shaking, either over a flame or in a boiling water-bath, until all solid particles are dissolved. Cool the tube in running water. Add 10 ml of alcohol and again mix. Complete extraction of the fat is dependent on satisfactory mixing at each stage. Proceed further as in para (2) of **5.3.1** of IS : 1479 (Part II)-1961*.

APPENDIX C

[Table 1, Item (iii)]

DETERMINATION OF SALT

C-1. REAGENTS

C-1.1 Concentrated Nitric Acid — sp gr 1.42 and chloride-free.

C-1.2 Iron Alum Solution — cold saturated solution in 10 percent nitric acid.

C-1.3 Potassium Chromate Solution — 5 percent in water.

C-1.4 Standard Silver Nitrate Solution — Prepare a 0.05 N solution by dissolving 8.5 g of solid silver nitrate in one litre of distilled water. Standardize the silver nitrate solution against a solution of sodium chloride of known strength by Volhard method in the following manner.

C-1.4.1 Preparation of 0.05 N Sodium Chloride — Place on a watch-glass about 5 g of sodium chloride and dry in an oven at 250 to 350°C for 1-2 hours. Cool in a desiccator. Weigh in a tared weighing bottle 2.9227 g of the dried salt. Transfer the salt without loss to a small beaker. Dissolve the salt in distilled water, washing into the beaker any fragments remaining in the weighing bottle. Transfer the solution to a one-litre measuring flask, washing the beaker repeatedly with distilled water and adding the washings to the content of the flask. Finally, make up to the mark with distilled water. Mix well. The solution is then exactly 0.05 N.

C-1.4.2 Standardization of Silver Nitrate Solution — Pour the silver nitrate solution into a burette and pipette out 25 ml of the 0.05 N sodium chloride into the Erlenmeyer flask. Add 1 ml of potassium chromate solution,

*Methods of test for dairy industry: Part II Chemical analysis of milk,

place the flask on a white tile, add the silver nitrate solution in a steady slow stream, rotating flask continuously. The red colour of silver chromate rapidly disappears at first, but as the concentration of sodium chloride is progressively weakened, the red colour will become more persistent until the addition of one drop of the silver nitrate causes the turbid yellow liquid to move towards a reddish colour, which persists after briskly shaking the flask. Repeat the titration until concordant results are obtained. Deduct from this value the amount of silver nitrate required to produce the similar change of colour in a mixture of 50 ml of distilled water, 1 ml of indicator and about 0.25 g of pure calcium carbonate to produce approximately the same degree of turbidity.

C-1.4.3 Suppose 25 ml of 0.05 N sodium chloride solution is required for 24.8 ml of the silver nitrate solution, then every 24.8 ml of the silver nitrate solution would need dilution with water to 25 ml. If 900 ml of the solution remain, they should be diluted to 907.2 ml. Add the required quantity of water and mix thoroughly. Repeat the titration with the diluted solution, which should now require 25 ml for 25 ml of the salt solution. Store the solution in an amber-coloured bottle.

C-1.5 Standard Potassium Thiocyanate Solution — Prepare approximately 0.05 N solution by dissolving about 5.5 g of potassium thiocyanate in one litre of the solution. Place the thiocyanate solution in a burette and pipette 25 ml of the silver nitrate into an Erlenmeyer flask. Add about 5 ml of nitric acid solution (one volume of pure acid diluted with 2 volumes of distilled water), followed by 1 ml of the iron alum indicator. Add the thiocyanate solution with constant brisk rotation of the flask until the reddish-brown colour of ferric thiocyanate becomes more persistent. Proceed more slowly, adding the thiocyanate drop by drop until one drop produces a faint brown colour which persists on shaking the flask. Repeat the titration until concordant results are obtained. If 25 ml of silver nitrate solution require less than 25 ml of the thiocyanate solution, it is then diluted with the calculated quantity of water as in the case of standardization of silver nitrate solution. Check the solution after dilution to make sure that it is exactly equivalent to the 0.05 N silver nitrate.

C-2. PROCEDURE

C-2.1 Weigh about two grams of the prepared sample of cheese to an accuracy of 1 mg in a 300-ml Erlenmeyer flask. Add 10 ml of distilled water and 25 ml of 0.05 N standard silver nitrate solution. Warm the contents of the flask at 75 to 80°C to facilitate the dispersion of the cheese on vigorous swirling. Add 10 ml of concentrated nitric acid and boil the contents of the flask gently until the curd is digested. This operation takes from 7 to 10 minutes. The finishing of the stage may be detected

when the silver chloride is granular, the liquid is of a clear lemon yellow colour and the fat layer is free from solid material.

NOTE — The procedure could be modified by adding about 10 ml of saturated potassium permanganate solution and 25 ml of concentrated nitric acid and then boiling the contents of the flask gently until the curd is digested. At the end of the procedure as given above, add about 0.25 g of urea to remove any nitrous acid and 6 ml of acetone to improve the end point.

C-2.2 Add 2 ml of the iron alum solution and add about 50 ml of distilled water.

C-2.3 Determine the excess silver nitrate by titration with the 0.05 N potassium thiocyanate solution until the first appearance of an orange tint persists for 15 seconds. Determine in the same manner the equivalent of 25 ml of silver nitrate solution as thiocyanate, using the same volumes of reagent and water.

C-3. CALCULATION

C-3.1 The salt content of the cheese is calculated by using the following formula:

$$\text{Salt, percent by mass} = \frac{0.292 (V_1 - V_2)}{M}$$

where

V_1 = volume in ml of standard potassium thiocyanate equivalent to 25 ml of silver nitrate,

V_2 = volume in ml of thiocyanate used in the titration of excess silver nitrate, and

M = mass in g of cheese taken for the test.

A P P E N D I X D

(Clause 5.1)

SAMPLING OF CHEESE

D-1: GENERAL REQUIREMENTS OF SAMPLING

D-1.0 In drawing, preparing and handling samples the following precautions and directions shall be observed.

D-1.1 Samples shall be taken in a place protected against dust, soot, heat, dampness and contamination.

D-1.2 The samples, the material being sampled, the sampling instrument and the containers for samples shall be protected from adventitious contamination.

D-2. SCALE OF SAMPLING

D-2.1 Lot — In a single consignment all the containers of one type of material drawn from a single batch of manufacture shall constitute a lot.

D-2.2 Samples shall be tested from each lot separately for ascertaining the conformity of the material to the requirements of this specification.

D-2.3 If the product is supplied in bulk containers, the number of units to be selected for sampling shall be according to col 1 and 2 of Table 2.

TABLE 2 SAMPLING OF BULK UNITS

TOTAL NO. OF UNITS IN THE LOT	NO. OF UNITS TO BE SELECTED
(1)	(2)
<i>N</i>	<i>n</i>
1	1
2 to 8	2
9 ,, 25	3
26 ,, 50	4
51 ,, 100	5
Over 100	8

D-2.4 If the product is supplied in retail containers, the number of units to be sampled shall be according to col 1 and 2 of Table 3.

TABLE 3 SAMPLING OF RETAIL UNITS

TOTAL NO. OF UNITS IN THE LOT	NO. OF UNITS TO BE SELECTED
(1)	(2)
<i>N</i>	<i>n</i>
Up to 25	3
26 ,, 100	5
101 ,, 500	8
501 ,, 1 000	10
1 001 ,, 5 000	13
Over 5 000	20

D-2.5 From lots composed of packages of retail units, firstly a number of packages (at least 20 percent subject to a minimum of 2) shall be selected at random. The selected packages shall then be opened and from each approximately equal number of units shall be selected at random so as to make the size of the sample as given in col 2 of Table 3.

D-2.6 The units in **D-2.3**, **D-2.4** and **D-2.5** shall be chosen at random and to ensure randomness of selection, reference may be made to IS : 4905-1968*. In case this standard is not readily available, the following procedure may be adopted.

D-2.6.1 Starting from any unit at random, count them in one order as 1, 2, 3,, up to r and so on, where r is the integral part of N/n . Every r th unit thus counted shall be separated until the requisite number of units is obtained from the lot.

D-3. SAMPLING EQUIPMENT

D-3.1 The sampling equipment mentioned below may be used:

- a) Cheese triers made from good quality hard steel or stainless steel which are easy to clean and sterilize and are free from metallic odour. The triers shall correspond in size and shape to the cheese to be sampled. The principal dimensions are recommended in Table 4 and the shape of cheese triers is shown in Fig. 1;
- b) A stainless steel knife with a sharp pointed blade; and
- c) Tin, aluminium or other suitable metal plate.

TABLE 4 PRINCIPAL DIMENSIONS OF CHEESE TRIERS

(Clause D-3.1 and Fig. 1)

SL No.	DIMENSION	TYPE A (LONG)	TYPE B (MEDIUM)	TYPE C (SHORT)
(1)	(2)	(3)	(4)	(5)
		mm	mm	mm
i)	Length (A) of blade (with a tolerance of 10 percent)	230	156	120
ii)	Minimum thickness (B) of metal in middle of blade	1.3	1.2	1.2
iii)	Minimum frontal breadth (C) at 15 mm from point of blade	19	16	6.6

*Methods for random sampling.

D-3.2 The sampling equipment shall be capable of withstanding a sterilizing temperature of 180°C. All surfaces shall be smooth and free from crevices and all corners shall be rounded. It shall be clean and dry and sterile when used. It shall not impart any flavour or odour to the material.

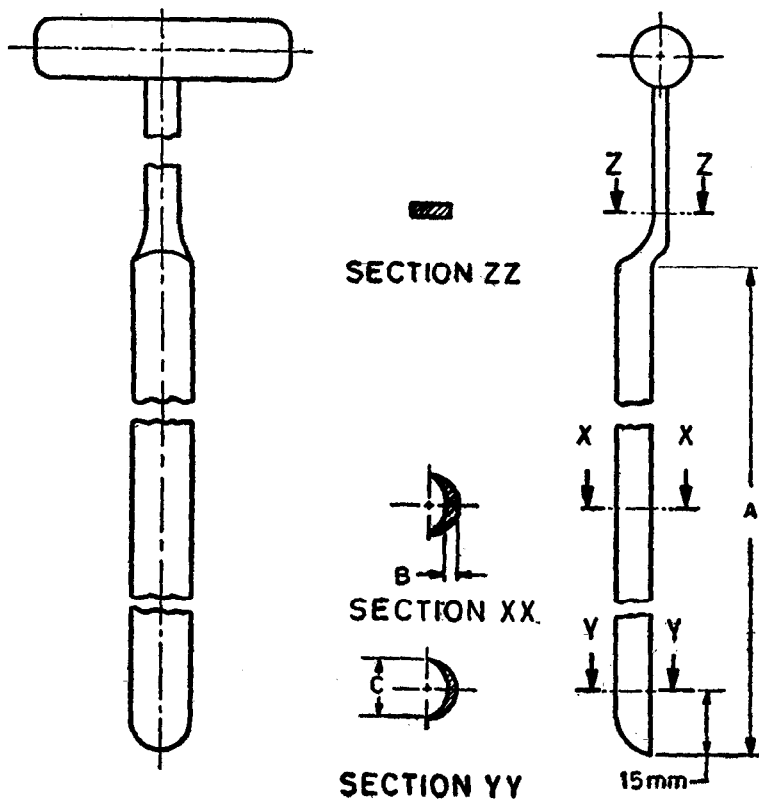


FIG. 1 CHEESE TRIER

D-4. SAMPLE CONTAINERS

D-4.1 The sample containers shall be wide-mouth jars which shall be made of glass, stainless steel or other suitable material which is easy to clean and sterilize. The diameter of the mouth of the jar shall be about 4.5 cm and the capacity of the jar adequate to hold 200 to 300 g of the material. The jars shall be closed by means of screw-cap or suitable

closer made of fat-proof non-absorbent insoluble material which shall not impart any foreign odour or taste to the contents. If desired, the jars may be sandblasted over a suitable area for inscription. The containers shall not impart any odour or flavour to the material.

D-4.2 Each sample container shall be sealed air-tight after filling and marked with full details of sampling; batch or code number; name of the manufacturer and other important particulars of the lot; and place, date and time of sampling.

D-5. SAMPLING FOR ANALYSIS

D-5.1 One of the following three methods of sampling shall be employed depending upon the shape, size, mass and type of the cheese:

- a) Sampling by cutting a sector,
- b) Sampling by means of a trier, and
- c) Taking whole cheese as a sample.

D-5.1.1 While making a choice between methods at (a) and (b), it should be taken into account that method at (a) is often more exact and method at (b) is easier especially in the case of large hard cheeses.

D-5.2 Sampling by Cutting a Sector — Using a knife with a sharp blade, two random cuts are made radially proceeding from the centre of the cheese. The size of the sector thus obtained shall be such that after removal of the non-edible surface layer (1 to 2 cm thick) the weight of the edible part should be not less than 100 grams.

D-5.3 Sampling by Means of a Trier — The trier is driven obliquely into the surface of the cheese towards the centre once or several times at a point at least 10 to 20 cm from the edge of the cheese. From the boring or borings thus obtained a part of at least 2 cm length is cut off together with the crust and is used to close the hole in the cheese. The remaining portions of the boring or borings constitute the sample. Great care should be taken in closing the bore-holes especially in the case of large cheeses and, if possible, they should be pasted over with some compound agreed for this purpose. This method is suited for the sampling of cheese like the Cheddar.

D-5.3.1 When the cheese is delivered in drums, cases or other larger containers or is formed in large compact block, sampling may be carried out by driving the trier obliquely through the content of the container from the top to the bottom. This method is suited for sampling of processed cheese.

D-5.4 Sampling by Taking a Whole Cheese — This method is made use of for cheese packed in small containers.

D-5.5 Preparation of Composite Sample — Taking approximately equal amount of cheese from each of the containers selected in **D-2.3** and **D-2.4**, collect about 300 g of the material which shall be mixed and divided into three parts. Each part shall be transferred to a separate sample container. One of these composite samples shall be for the purchaser, one for the vendor and the third for the referee.

D-5.5.1 The referee sample shall bear the seals of both the purchaser and the supplier. It shall be kept at a place agreed to between the purchaser and the supplier and shall be used in case of dispute between the two.

D-5.6 Preparation of Sample for Analysis

D-5.6.1 Samples shall be prepared for chemical analysis by passing them quickly through a suitable grater, by grinding them quickly in a mortar and returning them to the sample container or by cutting them into small pieces with a sharp knife in the container.

D-5.6.2 All samples shall be carefully mixed before each analysis. The analysis shall be performed without delay.

D-6. TREATMENT AND STORAGE OF THE SAMPLE

D-6.1 Immediately after sampling, the samples shall be placed in the sample container. The sample may be cut into pieces for insertion into the container, but it shall not be compressed or ground up.

D-6.2 No preservative substance shall be introduced into the sample container.

D-6.3 If the sample does not fill the container at least to its half, it shall be wrapped previously in foils.

D-6.4 The sample containers shall be sent as quickly as possible to the examining laboratory.

D-6.5 Sample containers shall be kept during storage and transit between 0°C and 5°C. This may be achieved by keeping them in an insulating transport container capable of maintaining the required temperature. The sample shall also be protected from light.

D-6.6 The samples shall be stored under such conditions which avoid fat and moisture separation.

D-7. NUMBER OF TESTS

D-7.1 Tests for all the characteristics given in the specification shall be conducted on the composite sample.

D-8. CRITERIA FOR CONFORMITY

D-8.1 The lot shall be declared as conforming to the requirements of the specification if all the test results on the composite sample meet the relevant specification requirements.

(Continued from page 2)

<i>Members</i>	<i>Representing</i>
SHRI W. VONCKX	Food Specialities Limited, Moga
DR M. K. K. IYENGAR (<i>Alternate</i>)	
DR J. V. VORA	Glaxo Laboratories (India) Ltd, Bombay
SHRI S. M. KHAN (<i>Alternate</i>)	
SHRI T. PURNANANDAM, Director (Agri & Food)	Director General, ISI (<i>Ex-officio Member</i>)

Secretary

SHRI S. K. SUD
Deputy Director (Agri & Food), ISI

Milk Products Subcommittee, AFDC 34 : 1

Convener

SHRI M. R. SRINIVASAN The Andhra Pradesh Dairy Development Corporation Limited, Hyderabad

Members

DR K. T. ACHAYA	Protein Foods Association of India, Bombay
AGRICULTURAL MARKETING ADVISER TO THE GOVERNMENT OF INDIA	Directorate of Marketing & Inspection (Ministry of Agriculture & Irrigation), Faridabad
SHRI S. JAYARAMAN (<i>Alternate</i>)	
DR B. C. BHATT	Mehsana District Cooperative Milk Producers Union Ltd, Mehsana
SHRI V. M. PATEL (<i>Alternate</i>)	
DR B. K. CHAKRABORTY	National Dairy Research Institute (ICAR), Karnal
DR K. M. NARAYANAN (<i>Alternate</i>)	
BRIG R. C. DATTA	Directorate of Military Farms, Quartermaster General's Branch (Army Headquarters), New Delhi
LT-COL K. A. PATIL (<i>Alternate</i>)	
DIRECTOR (CFL)	Directorate General of Health Services, New Delhi
SHRI D. S. CHADHA (<i>Alternate</i>)	
SHRI B. M. L. GARG	The Punjab Dairy Development Corporation Ltd, Chandigarh
SHRI D. GHOSH	Milk Commissioner, Government of West Bengal, Calcutta
SHRI H. P. RAY (<i>Alternate</i>)	
DR P. K. GUPTA	National Physical Laboratory (CSIR), New Delhi
SHRI J. C. TREHAN (<i>Alternate</i>)	
SHRI R. S. IYER	Glaxo Laboratories (India) Ltd, Bombay
DR V. S. MOHAN (<i>Alternate</i>)	
SHRI L. C. JAVA	Joy Ice Creams (Bangalore) Pvt Ltd, Bangalore
SHRI P. K. DWARAKANATHAN (<i>Alternate</i>)	
JOINT COMMISSIONER (DAIRY DEVELOPMENT)	Ministry of Agriculture & Irrigation (Department of Agriculture), New Delhi
DEPUTY COMMISSIONER (DAIRY DEVELOPMENT) (<i>Alternate</i>)	

(Continued on page 20)

(Continued from page 19)

<i>Members</i>	<i>Representing</i>
DR G. P. KALLE	Hindustan Lever Ltd, Bombay
DR P. J. THOMAS (<i>Alternate</i>)	
SHRI I. K. KAPUR	Directorate General of Technical Development, New Delhi
SHRI M. M. MALIK	Indodan Milk Products Ltd, Muzaffarnagar
SHRI S. VERMA (<i>Alternate</i>)	
MANAGING DIRECTOR	Bihar State Dairy Corporation Ltd, Patna
GENERAL MANAGER (<i>Alternate</i>)	
DR C. V. PATEL	Kaira District Co-operative Milk Producers' Union Ltd, Anand
DR A. K. CHOUDHURY (<i>Alternate</i>)	
DR I. M. PATEL	Gujarat Cooperative Milk Marketing Federation Limited, Anand
DR J. M. CONTRACTOR (<i>Alternate</i>)	
SHRI M. P. R. PILLAI	Hindustan Milk Food Manufacturers' Ltd, Nabha
QUALITY CONTROL OFFICER	Bombay Milk Scheme, Bombay
SHRI V. JASWANTHA RAO	The Andhra Pradesh Dairy Development Corporation Limited, Hyderabad
SHRI P. CHANDRASEKHAR REDDY (<i>Alternate</i>)	
DR B. RANGANATHAN	National Dairy Research Institute (ICAR), Karnal
SHRI Y. M. SOOD	The Haryana Dairy Development Cooperative Federation Limited, Chandigarh
SHRI N. SRINIVASAN	Government Analyst, Madras
SHRI N. SUBRAMANIAN	Central Food Technological Research Institute (CSIR), Mysore
SHRI G. RAMANATHAN (<i>Alternate</i>)	
DR CHANDAN SUKHANI	Dalmia Dairy Industries, New Delhi
COL R. N. TANEJA	Food Inspection Organization, Quartermaster General's Branch (Army Headquarters), New Delhi
LT-COL D. D. VOHRA (<i>Alternate</i>)	
SHRI W. VONCKX	Food Specialities Limited, Moga
DR M. K. K. IYENGAR (<i>Alternate</i>)	