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Indian Standard
MILK-CEREAL BASED COMPLEMENTARY FOODS — SPECIFICATION
(Fourth Revision)

First Reprint JUNE 2007

ICS 67.100.99

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

January 2007

Price Group 3
AMENDMENT NO. 2 NOVEMBER 2012
TO
IS 1656 : 2007 MILK-CEREAL BASED COMPLEMENTARY FOODS — SPECIFICATION

( Fourth Revision )

(Page 4, Table 1, Sl No. (i), col 4) — Substitute ‘IS 11623 for reference purpose and IS 16072 for routine purpose’ for ‘IS 11623’.

(Page 5, Annex A) — Insert the following at the end:

‘IS No.                                   Title
16072 : 2012   Determination of moisture content in milk powder and similar products (Routine method)’.

(FAD 19)

Reprography Unit, BIS, New Delhi, India
AMENDMENT NO. 1 AUGUST 2007
TO
IS 1656: 2007 MILK-CEREAL BASED
COMPLEMENTARY FOODS —
SPECIFICATION

(Lo nth Revision)

(Page 1, clause 5.2, line 2) — Substitute ‘protem’ for ‘casein’

[Page 4, Table 1, SI No (ii), col 3] — Substitute ‘18 0’ for ‘12 0’

[Page 4, Table 1, SI No (v), col 3] — Substitute ‘1 0’ for ‘0 1’

(FAD 19)
FOREWORD

This Indian Standard (Fourth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Dairy Products and Equipments Sectional Committee had been approved by the Food and Agriculture Division Council.

This standard was first published in 1960 and subsequently revised in 1969, 1985 and then in 1997 to harmonize the standard with Statutory Rules and Regulations. In this revision, recommendatory list of sources of vitamin compounds and minerals salts, list of permitted food Additives have been included and the chemical and microbiological requirements updated. In view of the above inclusions and updates, the standard is harmonized with the standards for milk cereal based complementary foods laid down under the Prevention of Food Adulteration Rules 1955.

Milk cereal based complementary foods are mainly intended to accustom the infant's digestive tract to solid foods. Nutritionally, this category of foods serve as an important source of calories to meet the energy requirements due to increased physical activity of infant. Beginning with the introduction of cereals after four months of age, the intake is slowly increased so that by 8 months of age and onwards nearly half of the total intake is from milk and remaining from cereals and a variety of other foods. With such a feeding practice milk almost completely meets the protein requirements while cereals and/or other foods meet the energy and satiety requirements of the infant.

Under the Infant Milk Substitutes, Feeding Bottles and Infant Foods (Regulation of Production, Supply and Distribution) Act, 1992 various types of foods for infants being marketed in our country have been placed under the following two categories:

1. Infant milk substitutes
2. Infant foods

"Infant milk substitute" means any food being marketed or otherwise represented as partial or total replacement for mother's milk whereas "Infant food" means any food being marketed or otherwise represented as complement to mother’s milk to meet the growing nutritional needs of the infant after the age of six months.

At present mainly two types of infant foods are being marketed in our country namely milk cereal based complementary foods and processed cereal based complementary foods. This standard covers the requirements for milk-cereal based complementary foods and a separate standard, namely, IS 11536 1997 Specification for processed cereal based complementary foods for infants.


The various statutory Rules indicated were valid at the time of publication of this standard. Since the statutory Rules and Acts are updated from time to time, this standard is subject to the restrictions imposed under these Acts and Rules wherever applicable.

A scheme for labelling environment friendly products known as ECO Mark has been introduced at the instance of the Ministry of Environment and Forests (MEF) Government of India. The ECO-Mark shall be administered by the Bureau of Indian Standards (BIS) under the BIS Act, 1986 as per the Resolution No 71 dated 20 February 1991 and No 425 dated 28 October 1992 published in the Gazette of the Government of India. For a product to be eligible for marking with the ECO Mark it shall also carry the Standard Mark of BIS for quality besides meeting additional environment friendly (EF) requirements given in the standard which are based on the Gazette Notification No GSR 624 (E) dated 6 September 1995 for labelling beverages, infant foods and processed fruits and vegetable products as Environment Friendly Products, published in the Gazette of the Government of India.

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 'Rules for rounding off numerical values (revised)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.
Indian Standard

MILK-CEREAL BASED COMPLEMENTARY FOODS — SPECIFICATION
(Fourth Revision)

1 SCOPE
This standard prescribes the requirements, methods of test and sampling for milk-cereal based complementary foods intended for feeding infants at the weaning stage.

2 REFERENCES
The Indian Standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated.

3 TERMINOLOGY
For the purpose of this standard, the following definitions shall apply:

3.1 Milk-Cereal Based Complementary Food — Milk-cereal based complementary foods commonly called as weaning foods or supplementary foods means foods obtained from milk, variety of cereals, pulses, soybeans, millets, nuts and edible oilseeds after processing to low moisture content. It may contain edible vegetable oils, milk solids, fruits and vegetables, egg and egg products, different carbohydrates, such as sucrose, dextrose, dextrins/maltodextrin, maltose and lactose, iron and calcium salts, phosphates and citrates and other nutritionally significant minerals and vitamins.

Milk-cereal based complementary foods are intended to supplement the diet of infants after the age of six months and up to the age of two years.

3.2 Routine Tests — Tests carried out on each lot to check the essential requirements which are likely to vary during production.

3.3 Type Test — The tests to prove conformity to the requirements of this standard. These are intended to approve the formulation and quality of the product at least in the beginning of marketing or certification or both. These tests are also conducted periodically to supplement the routine tests, or whenever the basic formula or method is changed.

4 DESCRIPTION
The milk-cereal based complementary food shall be in the form of powder, small granules or flakes, free from lumps, so as to permit dilution with water, milk or other suitable medium and shall be uniform in appearance.

5 REQUIREMENTS
5.1 The milk-cereal based complementary food shall be free from dirt and extraneous matter, preservatives, added colour, added flavour. It shall be reasonably free from scorched particles. It shall also be free from any material which is harmful to human health.

5.2 It shall contain a minimum of 10 per cent milk casein by mass of the product and a minimum of 5 per cent milk fat by mass of the product. It shall not contain hydrogenated fats containing trans fatty acids. It may contain fungal alpha amylase up to a maximum extent of 0.025 per cent by mass. It may also include amino acids such as lysine, methionine, taurine, carnitine etc.

NOTE — Since there is no reliable method to present for the estimation of separate contents of milk fat and vegetable fat in the infant food records for these shall be maintained by the manufacturer.

5.3 The product may contain food additives listed below:

<table>
<thead>
<tr>
<th>Food Additives</th>
<th>Maximum Level at 100 g of the Product on a Dry Weight Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emulsifiers:</td>
<td></td>
</tr>
<tr>
<td>Lecithin</td>
<td>1.5 g</td>
</tr>
<tr>
<td>Mono and Diglycerides</td>
<td>1.5 g</td>
</tr>
</tbody>
</table>
5.4 Quality of Ingredients

5.4.1 All ingredients used shall be clean, of good quality, safe and suitable for ingestion by infants.

5.4.2 The vitamins and minerals shall be of food grade. Iron salts should be such so as to ensure high bioavailability of iron. The source of mineral salts and vitamin compounds may be used from:

- **Minerals**
  1. Calcium (Ca) — Calcium carbonate, calcium phosphate tribasic, calcium sulphate
  2. Phosphorous (P) — Calcium phosphate tribasic
  3. Chloride (Cl) — Sodium chloride
  4. Iron (Fe) — Hydrogen reduced iron, electrolytic iron
  5. Magnesium (Mg) — Magnesium chloride, magnesium oxide, magnesium phosphate dibasic
  6. Sodium (Na) — Sodium chloride
  7. Zinc (Zn) — Zinc sulphate

- **Antioxidants**
  1. Vitamin A — Retinyl acetate, retinyl palmitate, retinyl propionate
  2. Provitamin A — Beta-carotene
  3. Vitamin D — Vitamin D2 — Ergocalciferol, Vitamin D3 — Cholecalciferol, cholecalciferol-cholesterol

5.5 Hygienic Conditions

The material shall be manufactured and packed under hygienic conditions (see IS 2491)

5.6 Flavour and Odour

The flavour and odour of the milk-cereal based complementary food in the powder form or when reconstituted with water shall be fresh and sweet (see IS 10641). It shall not have a rancid taste or a musty odour.

5.7 Bacteriological Specifications

- **Bacterial Count**

  The bacterial colony count per gram of the product shall not be more than 10,000 when determined according to the method prescribed in IS 5402

- **Coliform Count**

  The coliform bacteria shall be absent per 0.1 g of the product when tested as per the method prescribed in IS 5887 (Part 1)

- **Staphylococcus Aureus**

  Staphylococcus aureus shall be absent per 0.1 g of the product.
product when tested as per the method prescribed in IS 5887 (Part 2)

5.7.5 Salmonella and Shigella

Salmonella and Shigella shall be absent per 25g of the product when tested as per the method prescribed in IS 5887 (Part 3) and IS 5887 (Part 7) respectively (see Note)

Note: — The requirements for Salmonella and Shigella shall be tested in a laboratory situated away from the production area.

5.7.6 Yeast and Mould Count

Yeast and mould shall be absent per 0.1g of the product when tested as per IS 5403

5.8 The milk-cereal based complementary food shall also comply with the requirements given in Table I

5.9 Optional Requirements for ECO-Mark

5.9.1 General Requirements

5.9.1.1 The product shall conform to the requirements prescribed under 5.1 to 5.7

5.9.1.2 The manufacturer shall produce the consent clearance as per the provisions of Water (PCP) Act 1974, Water (PCP) Cess Act 1977 and Air (PCP) Act 1981 along with the authorization it required under Environment (Protection) Act 1986 and the Rules made thereunder to the Bureau of Indian Standards, while applying for the ECO-Mark and the product shall also be in accordance with the Prevention of Food Adulteration Act 1954 and the Rules made thereunder. Additionally, FPO 1955 (Fruit Product Order) framed under Essential Commodities Act 1966, Standards of Weights and Measures Act 1977 and 1985 requirements wherever applicable, has to be complied with

5.9.1.3 The product/package may also display in brief the criteria based on which the product has been labelled environment friendly

5.9.1.4 The material used for product packing shall be recyclable or biodegradable

5.9.1.5 The date of manufacture and date of expiry shall be declared on the product package by the manufacturer.

5.9.1.6 The product shall be microbiologically safe when tested as per IS 5887 (Part 5) and should be free from bacterial and fungal toxins

5.9.1.7 The pesticide residues (if any) in the product shall not exceed the limit as prescribed in FPA Act, 1954 and the Rules made thereunder

5.9.1.8 The product packaging may also display instruction of proper use, storage and transport (including refrigeration temperature compliance) so as to maximize the product performance, safety and minimize waste

5.9.2 Specific Requirements

5.9.2.1 The material used inside the metal cap of the product shall conform to the relevant Indian Standards of food grade plastics as permitted under the Prevention of Food Adulteration Act 1954 and the Rules made thereunder. Caps and closures shall not be treated as labels

5.9.2.2 The percentage of fruit juice/pulp if any added shall be mentioned on the product package

5.9.2.3 No synthetic food colour and artificial sweetener shall be added or used in the product

5.9.2.4 Product shall be free from additives when tested in accordance with the method prescribed in Appendix J of IS 4684

6 PACKING AND MARKING

6.1 Packing

The milk-cereal based complementary foods shall be packed in hermetically sealed clean and sound metal containers (see IS 11078) or in a flexible pack so as to protect it from deterioration. In case plastic material is used for flexible packaging, only food grade plastic shall be used (see IS 101/1)

6.1.1 The infant food shall be packed in quantities as stipulated under Standards of Weights and Measures (Packaged Commodities) Rules 1972 as well as in accordance with requirements under PFA Act 1954 and Rules, 1955

6.2 Marking

6.2.1 The containers shall bear legibly and indelibly the following information

a) Name of the material, and brand name, if any
b) Name and address of the manufacturer,
c) Batch or Code number,
d) Month and year of manufacturing or packing,
e) Net mass (see 6.1.1),
f) Date before which the contents should be consumed be indicated by marking the words ‘Use before’ (month and year),
g) Composition — Indicating the approximate composition of nutrients per 100g of the product as well as the energy value in joules,
j) Feed chart and directions for use and
### Table 1 Requirements for Milk-Cereal Based Complementary Foods
(Clauses 5.8)

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Characteristic</th>
<th>Requirement</th>
<th>Method of Test/ Ref to</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Moisture g/100 g</td>
<td>Max 5.0</td>
<td>IS 11623</td>
</tr>
<tr>
<td>(2)</td>
<td>Total protein g/100 g</td>
<td>Min 12.0</td>
<td>IS 7239</td>
</tr>
<tr>
<td>(3)</td>
<td>Fat g/100 g</td>
<td>Min 7.5</td>
<td>Annex B</td>
</tr>
<tr>
<td>(4)</td>
<td>Total carbohydrates g/100 g</td>
<td>Min 55.0</td>
<td>Annex A of IS 14433</td>
</tr>
<tr>
<td>(5)</td>
<td>Total ash g/100 g</td>
<td>Max 5.0</td>
<td>Annex B of IS 14433</td>
</tr>
<tr>
<td>(6)</td>
<td>Acid insoluble ash g/100 g</td>
<td>Max 0.1</td>
<td>Annex C of IS 14433</td>
</tr>
<tr>
<td>(7)</td>
<td>Vitamin A (as retinol) µg/100 g</td>
<td>Min 150</td>
<td>IS 3886</td>
</tr>
<tr>
<td>(8)</td>
<td>Vitamin C mg/100 g</td>
<td>Min 25</td>
<td>IS 5838</td>
</tr>
<tr>
<td>(9)</td>
<td>Iron mg/100 g</td>
<td>Min 5.0</td>
<td>Annex D of IS 14433</td>
</tr>
<tr>
<td>(10)</td>
<td>Crude fibre (on dry basis) g/100 g</td>
<td>Min 0.1</td>
<td>IS 10226 (Part 1)</td>
</tr>
<tr>
<td>(11)</td>
<td>Added vitamin D (expressed as cholecalciferol or ergocalciferol) µg/100 g</td>
<td>Min 5</td>
<td>IS 5875</td>
</tr>
<tr>
<td>(12)</td>
<td>Thiamine mg/100 g</td>
<td>Min 0.5</td>
<td>IS 5398</td>
</tr>
<tr>
<td>(13)</td>
<td>Riboflavin mg/100 g</td>
<td>Min 0.1</td>
<td>IS 5399</td>
</tr>
<tr>
<td>(14)</td>
<td>Nicotinamide mg/100 g</td>
<td>Min 0.1</td>
<td>IS 4460</td>
</tr>
<tr>
<td>(15)</td>
<td>Folic acid µg/100 g</td>
<td>Min 20</td>
<td>IS 7213</td>
</tr>
<tr>
<td>(16)</td>
<td>Zinc mg/100 g</td>
<td>Min 2.5</td>
<td>Clause 15 of IS 1699</td>
</tr>
<tr>
<td></td>
<td>Max 5.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(17)</td>
<td>Copper µg/100 g</td>
<td>Min 280</td>
<td>Clause 16 of IS 1699</td>
</tr>
<tr>
<td></td>
<td>Max 500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(18)</td>
<td>Heavy metals</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Lead mg/kg</td>
<td>Min 0.2</td>
<td>IS 12074</td>
</tr>
<tr>
<td></td>
<td>Max</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Arsenic mg/kg</td>
<td>Min 0.05</td>
<td>IS 11124</td>
</tr>
<tr>
<td></td>
<td>Max</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Tin mg/kg</td>
<td>Min 5.0</td>
<td>Clause 17 of IS 2860</td>
</tr>
<tr>
<td></td>
<td>Max</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Cadmium mg/kg</td>
<td>Min 0.1</td>
<td>Clause 18 of IS 1699</td>
</tr>
<tr>
<td></td>
<td>Max</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTES**

1. For the purpose of Type test all tests mentioned above need to be carried out and for the purpose of routine tests, the tests given from Sl No (1) to (18) are to be carried out.

2. The Indian Standards methods of test indicated in col 4 against Sl No (11) (13) (14) and (15) are only given for guidance and may be in use in any other method at present. There is no other suitable and easily workable method to determine Vitamin D Thiamine, Riboflavin and Niacinamide content of a product like milk-cereal based complementary foods. The manufacturers would be required to maintain a record showing the quantity of these added vitamins added in each batch.

### 6.2.2 BIS Certification Marking

The product may also be marked with the Standard Mark.

**6.2.2.1** The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act 1986 and the Rules and Regulations made thereunder. The details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

**6.2.2.2** ECO Mark

The product may also be marked with the ECO-Mark, the details of which may be obtained from the Bureau of Indian Standards.

### 7 SAMPLING

Representative samples of the material shall be drawn and tested for conformity to this standard as prescribed in Annex E of IS 14433.

**NOTE:** The crude fibre content (Table 1 Sl No (10)) shall be used in the composite sample.
### ANNEX A

**(Clause 2)**

**LIST OF REFERRED INDIAN STANDARDS**

<table>
<thead>
<tr>
<th>IS No</th>
<th>IS Title</th>
<th>IS No</th>
<th>IS Title</th>
</tr>
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<tbody>
<tr>
<td>1690</td>
<td>Methods of sampling and test for food colours (second revision)</td>
<td>1999</td>
<td>General guidance on methods for the detection of <em>Salmonella</em> (second revision)</td>
</tr>
<tr>
<td>2491</td>
<td>Food hygiene - General principles Code of practice (second revision)</td>
<td>1984</td>
<td>Method for determination of proteins in food and feed ingredients</td>
</tr>
<tr>
<td>2860</td>
<td>Methods of sampling and test for processed fruits and vegetables</td>
<td>1975</td>
<td>General guidance on methods for isolation and identification of <em>Shigella</em></td>
</tr>
<tr>
<td>4684</td>
<td>Specification of edible groundnut flour (expelled pressed) (first revision)</td>
<td>5398</td>
<td>Method for determination of thiamine (vitamin B₁) in foodstuffs</td>
</tr>
<tr>
<td>5398</td>
<td>Method for determination of thiamine (vitamin B₁) in foodstuffs</td>
<td>5399</td>
<td>Method for determination of riboflavin (vitamin B₂) in foodstuffs</td>
</tr>
<tr>
<td>5400</td>
<td>Methods for estimation of niacin (Niacin) in foodstuffs</td>
<td>5400</td>
<td>Method for estimation of niacin (Niacin) in foodstuffs</td>
</tr>
<tr>
<td>5401</td>
<td>Microbiology - General guidance for the enumeration of coliforms Part 1</td>
<td>5402</td>
<td>Microbiology - General guidance for the enumeration of microorganisms - Colony count technique at 30°C (first revision)</td>
</tr>
<tr>
<td>5403</td>
<td>Method for yeast and mould count of foodstuffs (first revision)</td>
<td>5403</td>
<td>Method for yeast and mould count of foodstuffs (first revision)</td>
</tr>
<tr>
<td>5835</td>
<td>Method for estimation of vitamin D in foodstuffs</td>
<td>5835</td>
<td>Method for estimation of vitamin D in foodstuffs</td>
</tr>
<tr>
<td>5838</td>
<td>Method for estimation of vitamin C in foodstuffs</td>
<td>5838</td>
<td>Method for estimation of vitamin C in foodstuffs</td>
</tr>
<tr>
<td>5886</td>
<td>Methods for estimation of carotenes and vitamin A (Retinol) in foodstuffs</td>
<td>5886</td>
<td>Methods for estimation of carotenes and vitamin A (Retinol) in foodstuffs</td>
</tr>
<tr>
<td>5887</td>
<td>Methods for detection of bacteria responsible for food poisoning</td>
<td>5887</td>
<td>Methods for detection of bacteria responsible for food poisoning</td>
</tr>
<tr>
<td>5887</td>
<td>Methods for detection of bacteria responsible for food poisoning</td>
<td>12074</td>
<td>Method for determination of lead by atomic absorption spectrophotometry</td>
</tr>
<tr>
<td>5887</td>
<td>Methods for detection of bacteria responsible for food poisoning</td>
<td>14433</td>
<td>Infant milk substitutes - Specification (first revision)</td>
</tr>
</tbody>
</table>
ANNEX B

[Table 1, SI No. (iii)]

DETERMINATION OF FAT

B-1 APPARATUS
As prescribed in 6 of IS 11721

B-2 REAGENTS
As prescribed in 5 of IS 11721 and the reagents given in B-2.1 and B-2.2

B-2.1 Iodine Solution — 0.1 N

B-2.2 Diastase or Amylase

B-3 PROCEDURE
B-3.1 Weigh accurately about 1 g of the sample in a

Mentonier fat extraction flask. After introducing the
sample into the flask, add approximately 0.5 g diastase
or amylase. Then add 8 to 10 ml distilled water (see
IS 1070) at 45°C to facilitate suspension

B-3.2 Place the stoppered extraction flask in the
water bath for 2 h, shaking it from time-to-time taking
care that the product does not stick to the walls of the
flask. Check if the starch is digested. Add 2 drops of
iodine solution. No blue colouration should appear
if required, place the flask again in water-bath till the
digestion of the starch is complete. Proceed further
as prescribed in 8.3 to 9.1 of IS 11721, excluding 8.5.1
of IS 11721

ANNEX C

[Table 1, SI No. (iv)]

DETERMINATION OF TOTAL CARBOHYDRATES

C-1 Total carbohydrates are calculated as follows, after
determining the percentage of moisture, total protein,
fat and total ash

Total carbohydrates, including sucrose, dextrose
and dextrins, maltose or lactose, percent by mass
= 100 - (A + B + C + D)

where

A = percent by mass of moisture,
B = percent by mass of total protein,
C = percent by mass of fat, and
D = total ash, percent by mass
Bureau of Indian Standards

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This Indian Standard has been developed from Doc No I AD 19 (1722)

Amendments Issued Since Publication

<table>
<thead>
<tr>
<th>Amendment No</th>
<th>Date of Issue</th>
<th>Text Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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SCO 335-336, Sector 34-A, CHANDIGARH 160 022

Telephone: 260 3843, 260 9285

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Telephone: 2254 1216, 2254 1442

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