IS 11536 (2007): Processed -cereal based complementary foods [FAD 19: Dairy Products and Equipment]

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भारतीय मानक

प्रसंस्कृत-अनाज आधारित अनुपूरक आहार — विशिष्टि

(दूसरा पुनरीक्षण)

Indian Standard

PROCESSED-CEREAL BASED COMPLEMENTARY FOODS — SPECIFICATION

(Second Revision)

ICS 67.060

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

January 2007

Price Group 3

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Foodgrains, Starches and Ready-to-Eat Foods Sectional Committee had been approved by the Food and Agriculture Division Council.

This standard was first published in 1985 and subsequently revised 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 updations, the standard is being revised for harmonizing the requirements and title of the standard with the standard for Processed-cereal based complementary foods laid down under the *Prevention of Food Adulteration Rules*, 1955.

Processed-cereal based complementary foods are mainly intended to accustom the infant's digestive tract to solid foods. Nutritionally, this category of foods serves 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.

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

a) Infant milk substitutes, and
b) Infant foods.

'Infant milk substitute' means any food being marketed or otherwise represented as a partial or total replacement for mother's milk, whether or not it is suitable for such replacement. The requirements of infant milk substitute are covered in IS 14433.

'Infant food' means any food being marketed or otherwise represented as a 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 processed-cereal based complementary foods and a separate standard, IS 1656 covers the requirements for milk-cereal based complementary foods.

While formulating this standard, due consideration has been given to the relevant rules prescribed by the Government of India, namely Rule 37-A, 37-B, 49(19) and items under Appendix B of *PFA Rules*, 1955; *Infant Milk Substitutes, Feeding Bottles and Infant Foods (Regulation of Production, Supply and Distribution) Act*, 1992 and *Rules* 1993; Rule 5 and 'Third Schedule' of the *Standards of Weights and Measures (Packaged Commodities) Rules*, 1971.

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

(Continued on third cover)

AMENDMENT NO. 1 NOVEMBER 2012
TO
IS 11536 : 2007 PROCESSED-CEREAL BASED COMPLEMENTARY FOODS — SPECIFICATION

(Second 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

Indian Standard

PROCESSED-CEREAL BASED COMPLEMENTARY FOODS — SPECIFICATION

(Second Revision)

1 SCOPE

This standard prescribes the requirements, methods of test and sampling for processed-cereal based complementary foods intended to supplement the diet of infants after the age of six months and upto the age of two years.

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

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

3.1 Processed-Cereal Based Complementary Food — Processed-cereal based complementary food, commonly called as weaning food or supplementary food means foods based on cereals and/or legumes (pulses), soyabean, millets, nuts and edible oilseeds, processed to low moisture content and so fragmented as to permit dilution with water, milk or other suitable medium. Processed-cereal based complementary foods are obtained from variety of cereals, pulses, soyabean, millets, nuts and edible oilseeds after processing.

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 processed-cereal based complementary food shall be in the form of powder, small granules or flakes, free from lumps and shall be uniform in appearance.

5 REQUIREMENTS

5.1 The processed-cereal based complementary food shall be free from preservatives, added colour and flavour.

5.2 It shall contain milled cereal and legumes combined not less than 75 percent. Where the product is intended to be mixed with water before consumption, the minimum content of protein shall not be less than 15 percent on a dry weight basis and the quality of the protein shall not be less than 70 percent of that of casein. The sodium content of the product shall not exceed 100 mg/100 g of the ready-to-eat product.

5.3 Hydrogenated fats containing trans-fatty acids shall not be added to the products.

5.4 The product may contain food additives listed below:

Food Additives	*Maximum Level in 100 g of the Product on a Dry Weight Basis*
Emulsifiers:	
Lecithin	1.5 g
Mono and Diglycerides	1.5 g
***p*H-Adjusting Agents:**	
Sodium hydrogen carbonate	Limited by good manufacturing practice and within the limits for sodium
Potassium hydrogen carbonate Calcium carbonate	Limited by good manufacturing practice
L (+) Lactic acid	1.5 g
Citric acid	2.5 g
Antioxidants:	
Mixed tocopherols concentrate Alpha-tocopherol	300 mg/kg fat, singly or in combination
L-Ascorbyl palmitate	200 mg/kg fat
L-Ascorbic acid and its sodium and potassium salts	50 mg, expressed as ascorbic acid and within the limits for sodium

Food Additives	*Maximum Level in 100 g of the Product on a Dry Weight Basis*
Enzymes:	
Malt carbohydrates	Limited by good manufacturing practice
Leavening Agents:	
Ammonium carbonate Ammonium hydrogen carbonate	Limited by good manufacturing practice

5.5 Quality of Ingredients

5.5.1 All ingredients, including optional ingredients, shall be clean, safe, suitable and of good quality.

5.5.2 It may also contain following ingredients: protein concentrates, essential amino acids (only natural L forms of amino acids shall be used), iodized salt; milk and milk products; eggs; edible vegetable oils and fats, fruits and vegetables; various carbohydrates such as sucrose, dextrose, dextrin, maltose dextrin, lactose and carbohydrate rich foods like honey, cornsyrup, malt and potatoes.

5.5.3 The vitamins and minerals used shall be of food grade. The source of vitamin compounds and mineral salts may be used from:

a) *Minerals*

1) *Calcium* (Ca) — Calcium carbonate, calcium phosphate tribasic, calcium sulphate;
2) *Phosphorous* (P) — Calcium phosphate tribasic, phosphoric acid;
3) *Chloride* (Cl) — Sodium chloride, hydrochloric acid;
4) *Iron* (Fe) — Hydrogen reduced iron, electrolytic iron;
5) *Sodium* (Na) — Sodium chloride; and
6) *Zinc* (Zn) — Zinc acetate, zinc chloride, zinc oxide, zinc sulphate.

b) *Vitamins*

1) *Vitamin* A — Retinyl acetate, retinyl palmitate, retinyl propionate;
2) *Provitamin* A — Beta-carotene;
3) *Vitamin* D — *Vitamin* D_2 — Ergocalciferol, *Vitamin* D_3 — Cholecalciferol, cholecalciferol-cholesterol;
4) *Vitamin* E — d-alpha-tocopherol, dl-alpha-tocopherol, d-alpha-tocopheryl acetate, dl-alpha-tocopheryl acetate, d-alpha-tocopheryl succinate, dl-alpha-tocopheryl succinate;
5) *Thiamin* (*Vitamin* B_1) — Thiamin chloride hydrochloride, thiamin mononitrate;
6) *Riboflavin* (*Vitamin* B_2) — Riboflavin, riboflavin 5' — phosphate sodium;
7) *Niacin* — Nicotinamide, nicotinic acid;
8) *Vitamin* B_6 — Pyridoxine hydrochloride;
9) *Biotin* (*Vitamin* H) — d-biotin;
10) *Folacin* — Folic acid;
11) *Pantothenic acid* — Calcium pantothenate, pantothenol;
12) *Vitamin* B_{12} — Cyanocobalamin, hydroxy-cobalamin;
13) *Vitamin* K — Phytylmenaquinone;
14) *Vitamin* C — Ascorbic acid, sodium ascorbate, calcium ascorbate, ascorbyl-6-palmitate;
15) *Choline* — Choline bitartrate, choline chloride;
16) *Inositol*; and
17) *Selenium* — Sodium selenite.

5.6 Hygienic Conditions

The material shall be manufactured and packed under hygienic conditions (*see* IS 2491). The basic principle of hygiene underlining the technical advice in this code should be applied with appropriate modification.

5.7 Flavour and Odour

The flavour and odour of the processed-cereal based weaning 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 off flavour or a musty odour.

5.8 Bacteriological Specifications

5.8.1 *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.

5.8.2 *Coliform Count*

The coliform bacteria shall be absent in 0.1 g of the product when determined according to the method prescribed in IS 5401 (Part 1).

5.8.3 *Yeast and Mould Count*

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

5.8.4 *Salmonella and Shigella*

Salmonella and *Shigella* shall be absent in 25 g 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.

5.8.5 *Escherichia coli*

Escherichia coli shall be absent in 0.1 g of the product when tested as per the method prescribed in IS 5887 (Part 1).

5.8.6 *Staphylococcus aureus*

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

5.9 The processed-cereal based complementary food shall also comply with the requirements given in Table 1.

5.10 The aflatoxins content in the product when tested in accordance with the method prescribed in Appendix J of IS 4684 shall not exceed 0.03 mg/kg.

5.11 Additional Requirements for ECO-Mark

5.11.1 *General Requirements*

5.11.1.1 The product shall conform to the requirements prescribed under **5.1** to **5.10**.

5.11.1.2 The manufacturers 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 if required under *Environment (Protection) Act*, 1986 and the *Rules* made thereunder to the Bureau of Indian Standards, while applying for the ECO-Mark. The product shall also be in accordance with the *Prevention of Food Adulteration Act*, 1954 and the *Rules* made thereunder. Additionally, *FPO (Fruit Product Order)*, 1955 framed under *Essential Commodities Act*, 1966, *Standards of Weights and Measures Act*, 1977 and 1985 requirements wherever applicable, has to be complied with.

5.11.1.3 The product/packaging may also display in brief the criteria based on which the product has been labelled environment friendly.

5.11.1.4 The material used for product packing shall be recyclable or biodegradable.

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

5.11.1.6 The product shall be microbiologically safe when tested as per IS 5403 and IS 5887 (Part 5) and should be free from bacterial and fungal toxins.

5.11.1.7 The pesticide residues (if any) in the product shall not exceed the limit as prescribed in *PFA Act*, 1954 and the *Rules* made thereunder.

5.11.1.8 The product package or leaflet accompanying it may display instruction of proper use, storage and transport (including refrigeration temperature compliance) so as to maximize the product performance, safety and minimize wastage.

5.11.2 *Specific Requirements*

5.11.2.1 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.

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

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

6 PACKING AND MARKING

6.1 Packing

The processed-cereal based complementary foods shall be packed in hermetically sealed, clean and sound containers (*see* IS 11078), or in a flexible pack made from film or combination of any of the substrates made of board paper, polyethylene, polyester, metallized films or aluminium foil 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 10171).

6.1.1 The processed-cereal based complementary food shall be packed in quantities as stipulated under Rule 5 and 'The Third Schedule' of the *Standards of Weights and Measures (Packaged Commodities) Rules*, 1977 as well as in accordance with requirements under *PFA Act*, 1954 and *Rules*, 1955.

6.2 Marking

6.2.1 The package 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)';

Table 1 Requirements for Processed-Cereal Based Complementary Foods

(*Clause* 5.9)

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Moisture, percent by mass, *Max*	4.0	IS 11623
ii)	Total protein, percent by mass, *Min*	15.0	IS 7219
iii)	Total carbohydrates, percent by mass, *Min*	55.0	Annex C of IS 1656
iv)	Total ash, percent by mass, *Max*	5.0	Annex B of IS 14433
v)	Ash insoluble in dilute hydrochloric acid, percent by mass, *Max*	0.1	Annex C of IS 14433
vi)	Iron, mg/100 g, *Min*	5.0	Annex D of IS 14433
vii)	Vitamin A (as retinol), µg/100 g, *Min*	350	IS 5886
viii)	Vitamin C, mg/100 g, *Min*	25	IS 5838
ix)	Added vitamin D (expressed as Cholecalciferol or Ergocalciferol), µg/100 g, *Min*	5.0	IS 5835
x)	Thiamine (as hydrochloride), mg/100 g, *Min*	0.5	IS 5398
xi)	Riboflavin mg/100 g, *Min*	0.3	IS 5399
xii)	Niacin mg/100 g, *Min*	3.0	IS 5400
xiii)	Folic acid, µg/100 g, *Min*	20	IS 7234
xiv)	Crude fibre (on dry basis), percent by mass, *Max*	1.0	IS 10226 (Part 1)
xv)	Zinc, mg/100 g, *Min*	2.5	Clause **15** of IS 1699
	Max	5.0	
xvi)	Heavy metals:		
	a) Lead, mg/kg, *Max*	0.2	IS 12074
	b) Copper, mg/kg, *Min*	2.8	Clause **15** of IS 1699
	Max	15.0	
	c) Arsenic, mg/kg, *Max*	0.05	IS 11124
	d) Tin, mg/kg, *Max*	5.0	Clause **17** of IS 2860
	e) Cadmium, mg/kg, *Max*	0.1	Clause **15** of IS 1699

NOTES

1 For the purpose of type tests, all tests mentioned above are to be carried out and for the purpose of routine tests, the tests given from Sl No. (i) to (viii) are to be carried out.

2 The Indian Standards on methods of test indicated in col 4 against Sl No. (ix) to (xii) are presently given for guidance only as they are under revision at present. As there is no other suitable and easily workable method at present for determining Vitamin D, Thiamine, Riboflavin and Nicotinic acid (Niacin) content of a product like processed-cereal based complementary foods, the manufacturers would be required to maintain a record showing the quantity of these 'added vitamins', added to each batch.

g) *Composition* — Indicating the approximate composition of nutrients per 100 g of the product as well as the energy value in joules;

h) Feed chart and directions for use; and

j) Any other requirements as stipulated under *PFA Rules*, 1955, *Infant Milk Substitutes, Feeding Bottles and Infant Foods Act*, 1992 and *Rules* 1993, and *Standards of Weights and Measures (Packaged Commodities) Rules*, 1977.

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 shall be tested on the composite sample [*see* Table 1, Sl No. (xiv)].

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
1656 : 2006	Milk cereal based complementary foods (*fourth revision*)
1699 : 1995	Methods of sampling and test for food colours (*second revision*)
2491 : 1998	Food hygiene — General principles — Code of practice (*second revision*)
2860 : 1964	Methods of sampling and test for processed fruits and vegetables
4684 : 1975	Specification of edible groundnut flour (expeller pressed) (*first revision*)
5398 : 1969	Method for estimation of thiamine (vitamin B_1) in foodstuffs
5399 : 1969	Methods for estimation of riboflavin (vitamin B_2) in foodstuffs
5400 : 1969	Methods for estimation of nicotinic acid (Niacin) in foodstuffs
5401 (Part 1) : 2002	Microbiology — General guidance for the enumeration of coliforms: Part 1 Colony count technique (*first revision*)
5402 : 2002	Microbiology — General guidance for the enumeration of micro-organisms — Colony count technique at 30°C (*first revision*)
5403 : 1999	Method for yeast and mould count of foodstuffs and animal feeds (*first revision*)
5835 : 1970	Method for estimation of vitamin D in foodstuffs
5838 : 1970	Method for estimation of vitamin C in foodstuffs
5886 : 1970	Methods for estimation of carotenes and vitamin A (Retinol) in foodstuffs
5887	Methods for detection of bacteria responsible for food poisoning:
(Part 1) : 1976	Isolation, identification and enumeration of *Escherichia coli* (*first revision*)
(Part 2) : 1976	Isolation, identification and enumeration of *Staphylococcus aureus* and faecal streptococci (*first revision*)
(Part 3) : 1999	General guidance on methods for the detection of *Salmonella* (*second revision*)
(Part 5) : 1976	Isolation, identification and enumeration of vibrio cholerae and vibrio parahaem lyticus (*first revision*)
(Part 7) : 1999	General guidance on methods for isolation and identification of *Shigella*
7219 : 1973	Method for determination of proteins in food and feed ingredients
7234 : 1974	Method for estimation of folic acid in foodstuffs
10171 : 1999	Guide on suitability of plastics for food packaging (*second revision*)
10226 (Part 1) : 1982	Method for determination of crude fibre content: Part 1 General method
10641: 1983	Recommended methods for determination of aroma and taste thresholds
11078 : 1993	Round open top sanitary cans for milk powder (*first revision*)
11124 : 1984	Method for atomic absorption spectrophotometric determination of arsenic
11623 : 1986	Method for determination of moisture content in milk powder and similar products
12074 : 1987	Method for determination of lead by atomic absorption spectrophotometry
14433 : 2006	Infant milk substitutes — Specification (*first revision*)

(*Continued from second cover*)

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.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act,* 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

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Amendments Issued Since Publication

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