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Jawaharlal Nehru
“Step Out From the Old to the New”

Indian Standard

'READY-TO-EAT' EXTRUDED SNACKS — SPECIFICATION

UDC 664·696·1

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

July 1989

Price Group 2
AMENDMENT NO. 1 SEPTEMBER 1990
TO:
IS 12566 : 1989 'READY-TO-EAT' EXTRUDED
SNACKS — SPECIFICATION

[Page 1, clause 3(p)] — Substitute 'High protein flours (vegetable or
animal source)' for 'High protein flours'.

[Page 1, clause 3(s) and (v)] — Delete.

(Page 1, clause 4.3, line 1) — Insert the words 'and emulsifying/
stabilizing agents' after the word 'colours'.

(Page 1, clause 5.1, line 5) — Insert the words 'and water vapour'
after the word 'oxygen'.

[Page 2, clause 5.2(g)] — Insert the following new item after '(g)'
and renumber the subsequent item accordingly:

'In case protein rich flours of animal sources have been used, the
specific source shall be declared on the label.'

(FADC 21)
FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards on 25 January 1989, after the draft finalized by the Nutrition Sectional Committee had been approved by the Agricultural and Food Products Division Council.

'Ready-to-eat' extruded snacks are made by a process known as 'extrusion cooking'. This is a process by which pre-conditioned raw food material is subjected to high-temperature short-time cooking which results in the material becoming of plastic consistency. This material is then extruded through specially tapered dies. As it emerges from the dies, it passes from a high pressure to a low pressure zone and this results in puffing of the product. The cooked dough is cut to the desired size, after which it is dried to the desired moisture. Finally, the product is coated with oil, flavours, salt, spices or sweetening agent, etc, and packed. These ingredients may also be added before extrusion.

Several types of such snacks, both sweet and savoury, have been recently introduced under different names. To safeguard the health of the consumers which are mainly children, and at the same time, to provide guidelines for manufacture of such foods, it has been felt necessary to prescribe requirements for them.

This standard does not define any particular composition of the 'ready-to-eat' extruded snack but leaves to option of using different types of raw materials in optional proportions to the manufacturers.

A standard on 'ready-to-eat', protein-rich, extruded foods (IS 9487:1980 Specification for 'ready-to-eat' protein rich extruded foods) has already been published. This is a nutritive food and covers the minimum levels of nutrients, namely, proteins, vitamins, minerals, etc. A standard on extruded breakfast cereals is also being brought out.

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, 1954. Consideration has also been given to the Standard of Weights and Measures (Packaged Commodities) Rules, 1977. However, this standard is subject to restrictions imposed under these wherever applicable.

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

'READY-TO-EAT' EXTRUDED SNACKS — SPECIFICATION

1 SCOPE
This standard prescribes the requirements and methods of sampling and test for 'ready-to-eat' extruded snacks.

2 REFERENCES
The standards listed in Annex A are necessary adjuncts to this standard.

3 RAW MATERIALS
The following raw materials may be used for the production of ready-to-eat extruded snacks. They should be clean and of good quality and should conform to the relevant Indian Standards wherever available:

- a) Dehusked and/or degermed cereals and millets;
- b) Wheat flour/semolina (see IS 1009: 1979/IS 1010: 1968);
- c) Edible tubers and starches;
- d) Dehusked pulses;
- e) Refined edible vegetable oils, edible hydrogenated fat (see IS 10633: 1986) or Ghee singly or in combination;
- f) Salt (see IS 253: 1985 or IS 7224: 1985);
- g) Spices, spice extracts and condiments;
- h) Tomato, onion and garlic powder;
- i) Powder of other edible vegetables and fruits;
- j) Cheese powder (see IS 9584: 1980);
- k) Skimmed milk powder;
- l) Dextrins;
- m) High protein flours;
- n) Sugar and sugar products;
- o) Jaggery;
- p) Permitted flavourings;
- q) Citric acid/tartaric acid (see IS 9504: 1980);
- r) Monosodium glutamate (see IS 9505: 1980); and
- s) Permitted emulsifying/stabilizing agents.

4 REQUIREMENTS

4.1 Description
The method of production shall be extrusion cooking. The cooker extruder configuration used for the purpose of extrusion cooking shall ensure adequate cooking of raw ingredients. The shape and size of the extruded product shall be reasonably uniform, being governed by the nature of die used for extrusion-cooking. The product shall be fully cooked. It shall also be free from insects, insect residues, rodent hair and excreta, fungal infection and any other extraneous and harmful material. The product shall be crisp, and free from grits or uncooked particles.

4.2 Flavour
The 'ready-to-eat' extruded snacks shall be of pleasant taste and smell, and free from rancid, soapy, bitter or burnt taste and smell. They shall have an aroma and taste characteristic of the flavours and spices used.

4.3 Additives
Preservatives, flavours and colours permitted under the Prevention of Food Adulteration Act, 1954 may be added.

4.4 The ready-to-eat extruded snacks shall also comply with the requirements given in Table 1.

Table 1 Requirements for 'Ready-to-Eat' Extruded Snacks
( Clauses 4.4, 7.1, B-5.1 and B-5.3 )

<table>
<thead>
<tr>
<th>Sl No.</th>
<th>Characteristic</th>
<th>Requirement</th>
<th>Methods of Test, Ref to</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Moisture, percent by mass, Max</td>
<td>≤ 6.0</td>
<td>Annex A of IS 1011: 1981</td>
</tr>
<tr>
<td>ii)</td>
<td>Fat (on dry basis), percent by mass, Max</td>
<td>≤ 25</td>
<td>Annex F of IS 4681: 1975</td>
</tr>
<tr>
<td>iii)</td>
<td>Peroxide value meq oxygen/kg fat, Max</td>
<td>≤ 10</td>
<td>Clause 22 of IS 3508: 1986</td>
</tr>
<tr>
<td>iv)</td>
<td>Total bacterial count, per g, Max</td>
<td>≤ 50,000</td>
<td>IS 3402: 1969</td>
</tr>
<tr>
<td>v)</td>
<td>Coliform count, per g, Max</td>
<td>≤ 10</td>
<td>IS 5401: 1969</td>
</tr>
<tr>
<td>vi)</td>
<td>Salmonella</td>
<td>Absent</td>
<td>IS 5887</td>
</tr>
<tr>
<td>vii)</td>
<td>Shigella</td>
<td>Absent</td>
<td>IS 5887</td>
</tr>
<tr>
<td>viii)</td>
<td>E Coli</td>
<td>Absent</td>
<td>IS 5887</td>
</tr>
</tbody>
</table>

4.5 Hygienic Conditions
The product shall be processed, packed, stored and distributed under hygienic conditions in licensed premises (see IS 2491: 1972).

5 PACKING AND MARKING

5.1 Packing
The product shall be packed in flexible thermoplastic films of multi-layer or mono-layer construction, or their laminates with paper and/or aluminium foil so as to provide a high resistance to the passage of oxygen and to produce an effective heat seal. The sealing shall
be done hermetically with or without nitrogen flushing to retain the contents in a fresh condition.

5.2 Marking

The following particulars shall be marked or labelled on each container:

a) Name of the material and trade-mark, if any;
b) Name and address of the manufacturer;
c) Batch or code number;
d) Net mass in grams or kilograms;
e) Date of manufacture;
f) List of ingredients;
g) The words 'Best before ——' (the date to be given by the manufacturer); and
h) Any other details required under the Standards of Weights and Measures (Packaged Commodities) Rules 1977.

6 SAMPLING

Representative samples of material shall be drawn and criteria for ascertaining conformity to the requirements of this specification shall be as prescribed in Annex B.

7 TESTS

7.1 Tests shall be carried out as prescribed in 3.1 and Table 1.

7.2 Quality of Reagents

Unless otherwise specified, pure chemicals and distilled water (see IS 1070:1977) shall be employed in tests.

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

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

<table>
<thead>
<tr>
<th>IS No.</th>
<th>Title</th>
<th>IS No.</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1010 : 1968</td>
<td>Specification for SUJI or RAWA (semolina) (first revision)</td>
<td>2491 : 1972</td>
<td>Specification for water for general laboratory use (second revision)</td>
</tr>
<tr>
<td>2491 : 1972</td>
<td>Code for hygienic conditions for food processing units (first revision)</td>
<td>9505 : 1980</td>
<td>Specification for monosodium L-glutamate, food grade</td>
</tr>
<tr>
<td>3508 : 1966</td>
<td>Methods of sampling and test for ghee (butterfat)</td>
<td>4684 : 1975</td>
<td>Specification for edible ground-nut flour (expeller pressed) (first revision)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10633 : 1986</td>
<td>Specification for vanaspati (first revision)</td>
</tr>
</tbody>
</table>

ANNEX B

(Clause 6)

SAMPLING OF ‘READY-TO-EAT’ EXTRUDED SNACKS

B-1 GENERAL REQUIREMENT OF SAMPLING

B-1.1 In drawing, preparing, storing and handling samples, the following precautions and directions shall be observed.

B-1.1.1 Samples shall be taken in a protected place, not exposed to damp air, dust or soot.

B-1.1.2 The sampling instrument shall be clean and dry when used. When taking samples for bacteriological examination, it shall be sterile.
B-1.1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination.

B-1.1.4 The samples shall be placed in clean and dry containers. The sample containers shall be of such a size that they are almost completely filled with the sample. The sample containers shall, in addition, be sterile when they are used for samples for bacteriological examination.

B-1.1.5 Each container shall be sealed air-tight after filling and marked with full details of sampling, such as, date of sampling, date of manufacture and batch number or code number, if any.

B-1.1.6 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature.

B-2 SCALE OF SAMPLING

B-2.1 Lot

In any consignment all the containers of the same size and belonging to the same batch of manufacture shall be grouped together to constitute a lot.

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

B-2.3 The number of containers to be tested from a lot shall depend upon the size of the lot and shall be in accordance with Table 2.

Table 2 Scale of Sampling

<table>
<thead>
<tr>
<th>Number of Containers in the Lot</th>
<th>Sample Size (For Tests Other than Microbiological)</th>
<th>Sub-sample Size (For Microbiological Tests)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 25</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>26 to 50</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>51 to 100</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>101 to 150</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>151 and above</td>
<td>8</td>
<td>4</td>
</tr>
</tbody>
</table>

B-2.3.1 The containers shall be chosen at random from the lot. In order to ensure the randomness of selection, procedures given in IS 4905 : 1968 may be followed.

B-3 TEST SAMPLES AND REFEREE SAMPLES

B-3.1 Empty the contents of the container on a sheet of paper and mix thoroughly. Take equal quantities of the material from each selected container and mix thoroughly as to form a composite sample weighing about 500 g. This composite sample shall be divided into three equal parts, one for the purchaser, another for the supplier and the third for the referee.

B-3.2 From the remaining portion of the material from each container, draw three samples each weighing not less than 100 g. These will constitute individual test samples for the container. These individual samples shall be

separated into three identical sets of samples in such a way that each set has an individual test sample representing each container selected. One of these three sets shall be for the purchaser, another for the supplier and the third to be used as the referee sample.

B-3.3 From the containers selected according to Table 2, the number of containers given in Table 2 shall be randomly selected. Draw with a suitable sampling instrument which is sterile, the representative quantity of material under aseptic conditions to form a sample for microbiological examination. Divide the sample (taking care not to bring in microbiological combination in the material) into three equal parts. Each part so obtained shall constitute a test sample representing the container and shall be transferred to sterile containers, sealed air-tight and labelled with full identification particulars given in B-1.1.5. These shall be marked, in addition, with the words ‘For microbiological examination’. The sample so obtained shall be divided into three sets in such a way that each set has a sample representing each selected container. One of these sets shall be marked for the purchaser, another for the vendor and third for the referee.

B-3.4 Refer to samples shall consist of a set of individual samples, the composite sample and a set of samples for microbiological examination marked for this purpose and shall bear the seals of the purchaser and the vendor. These shall be kept at a place agreed to between the purchaser and the vendor to be used in case of dispute between the two.

B-4 NUMBER OF TESTS

B-4.1 Tests for determination of moisture, fat and peroxide value shall be conducted on each of the samples constituting a set of individual samples.

B-4.2 Tests for description and flavour shall be conducted on the composite sample.

B-4.3 Tests for bacterial count, coliform count, Salmonella, Shigella and E. coli shall be conducted on each of the samples constituting a set of test samples labelled with the words ‘For microbiological examination’.

B-5 CRITERIA FOR CONFORMITY

B-5.1 For Individual Samples

The lot shall be declared to satisfy the requirements of moisture, fat and peroxide value, if each of the test results satisfies the corresponding requirements given in Table 1.

B-5.2 For Composite Sample

The test result on the composite samples shall meet the corresponding requirements specified in 4.1 and 4.2.

B-5.3 For Samples for Microbiological Examination

The test results on the sample for microbiological examination shall meet the corresponding requirements specified in Table 1.
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Amendments Issued Since Publication

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<th>Amend No.</th>
<th>Date of Issue</th>
<th>Text Affected</th>
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