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IS 1010 (1968): Suji or Rava (Semolina) [FAD 16:
Foodgrains, Starches and Ready to Eat Foods]



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“Knowledge is such a treasure which cannot be stolen”

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IS : 1010 - 1968

Indian Standard
SPECIFICATION FOR
SUJI OR RAVA (SEMOLINA)
(First Revision)

Fourth Reprint OCTOBER 1995
(Incorporating Amendment No. 1)

UDC 664.231

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BHADUR SHAH ZAFAR MARG
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Indian Standard
SPECIFICATION FOR
SUJI OR RAVA (SEMOLINA)
(First Revision)

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AMENDMENT NO. 2 JANUARY 1981
TO
IS:1010-1968 SPECIFICATION FOR *SUJI*
OR *RAYA* (SEMOLINA)

(First Revision)

Alteration

(Page 9, clause B-1.1, lines 3 and 4) - Substitute '130 to 133°C for two hours' for '105 ± 1°C for five hours'.

(AFDC 32)

Printed at Printograph, New Delhi-5 (INDIA)

**AMENDMENT NO. 3 DECEMBER 2000
TO
IS 1010 : 1968 SPECIFICATION FOR
SUJI OR RAVA (SEMOLINA)**

(First Revision)

(Page 5, Table 1, Sl No.(i), col 3] — Substitute '14.0' for '13.5'.

(Page 12, clause F-2.1, lines 2 and 3) — Substitute 'Stopper and shake vigorously for 1 hour' for 'Stopper, shake and allow to stand for 24 hours, with occasional shaking'.

(Page 12, clause F-2.1) — Insert the following sentence at the end:

'A blank is also run using 10 ml of alcohol, in place of 10 ml of extract.'

(Page 12, clause F-3.1) — Substitute the following for the existing text:

'Alcoholic acidity (as H₂SO₄) with 90 percent alcohol, percent by mass = $\frac{24.52 (A - B) N}{W}$

where

A = volume in ml of standard NaOH solution used in titration of sample,

B = volume in ml of standard NaOH solution used in titration of blank,

N = normality of standard NaOH solution, and

W = mass in g of the material taken for the test.'

(FAD 16)

Indian Standard
SPECIFICATION FOR
SUJI OR RAVA (SEMOLINA)
(*First Revision*)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 2 April 1968, after the draft finalized by the Processed Cereals and Pulses Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 *SUJI* or *RAVA* (Semolina) is made by grinding and bolting cleaned wheat to a certain degree of fineness (see 3.2) and freeing it from bran, germ, etc, to the desired extent.

0.2.1 In certain parts of the country, the terms *SUJI* and *RAVA* are used as synonyms, while in other parts they denote the material of two different particle sizes, namely, one having a larger particle size and the other comparatively smaller. In view of this, the Sectional Committee responsible for the preparation of this standard decided not to distinguish between the terms *SUJI* and *RAVA* but classified the material into two grades depending upon the particle size (see 2.1 and 3.2).

0.3 This Indian Standard was first published in 1957. Since then, the position in the supply of wheat has changed considerably and compulsory washing of wheat before milling has been introduced in the country. The limit for moisture content has, therefore, been raised. The limit for gluten content has been lowered and the method of determination of gluten (see Appendix E) has been modified. Besides, the limit for alcoholic acidity has been revised while the requirement for acidity has been deleted. In addition, this draft revision incorporates two amendments issued earlier.

0.4 The Sectional Committee responsible for the preparation of this standard took into consideration the available data on the composition of *SUJI* or *RAVA* manufactured from different varieties of wheat produced in various parts of India and imported from abroad. In addition to this, due consideration has also been given to the relevant rules prescribed by the Government of India under the Prevention of Food Adulteration Act, 1954. This standard is, however, subject to the restrictions imposed under that Act, wherever applicable.

0.5 This standard contains clauses (see 4.1.1 and 4.1.2) which call for agreement between the purchaser and the vendor.

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0.6 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 test for *SUJI* or *RAVA* (Semolina).

2. GRADES

2.1 The material shall be of the following two grades, differing only in particle size:

- a) Large Particle (LP), and
- b) Small Particle (SP).

3. REQUIREMENTS

3.1 Description — The material shall be obtained from sound and clean wheat. It shall have a characteristic taste and smell. It shall be free from musty or other off odour, insect or fungus infestation, rodent contamination, dirt and other extraneous matter.

NOTE — The appearance, taste and odour shall be determined by organoleptic tests.

3.2 Particle Size

3.2.1 Large Particle Grade — When tested by the method prescribed in Appendix A:

- a) all the material shall pass through a sieve of silk or nylon bolting cloth 20 GG (aperture 1.16 mm) or 1.18-mm IS Sieve,
- b) not less than 90 percent of the material shall be retained on a sieve of silk or nylon bolting cloth 30 GG (aperture 0.73 mm) or 710-micron IS Sieve, and
- c) not less than 98 percent of the material shall be retained on a sieve of silk or nylon bolting cloth 70 GG (aperture 0.24 mm) or 250-micron IS Sieve.

*Rules for rounding off numerical values (*revised*).

3.2.2 Small Particle Grade — When tested by the method prescribed in Appendix A:

- a) all the material shall pass through a sieve of silk or nylon bolting cloth 20 GG (aperture 1·16 mm) or 1·18-mm IS Sieve;
- b) not more than 10 percent of the material shall be retained on a sieve of silk or nylon bolting cloth 30 GG (aperture 0·73 mm) or 710-micron IS Sieve; and
- c) not less than 98 percent of the material shall be retained on a sieve of silk or nylon bolting cloth 70 GG (aperture 0·24 mm) or 250-micron IS Sieve.

NOTE — Since the sieves made of commercial silk or nylon bolting cloth may vary in the average mesh openings from those given in 3.2.1 and 3.2.2, a tolerance of ± 7.5 percent is permitted.

3.3 Microscopic Appearance of Starch — When the finely powdered material is subjected to microscopic examination, the starch granules shall have a characteristic appearance as shown in photomicrograph reproduced in Fig. 1, revealing concentric rings and more small granules than large ones.

3.4 The material shall also comply with the requirements given in Table 1.

TABLE 1 REQUIREMENTS FOR SUJI OR RAVA (SEMOLINA)

Sl. No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST (REF TO APPENDIX)
(1)	(2)	(3)	(4)
i)	Moisture, percent by weight, <i>Max</i>	13·5	B
ii)	Total ash (on dry basis), percent by weight, <i>Max</i>	1·0	C
iii)	Acid insoluble ash (on dry basis), percent by weight, <i>Max</i>	0·05	D
iv)	Gluten (on dry basis), percent by weight, <i>Min</i>	6·0	E
v)	Alcoholic acidity (as H_2SO_4) with 90 percent alcohol, percent by weight, <i>Max</i>	0·1	F

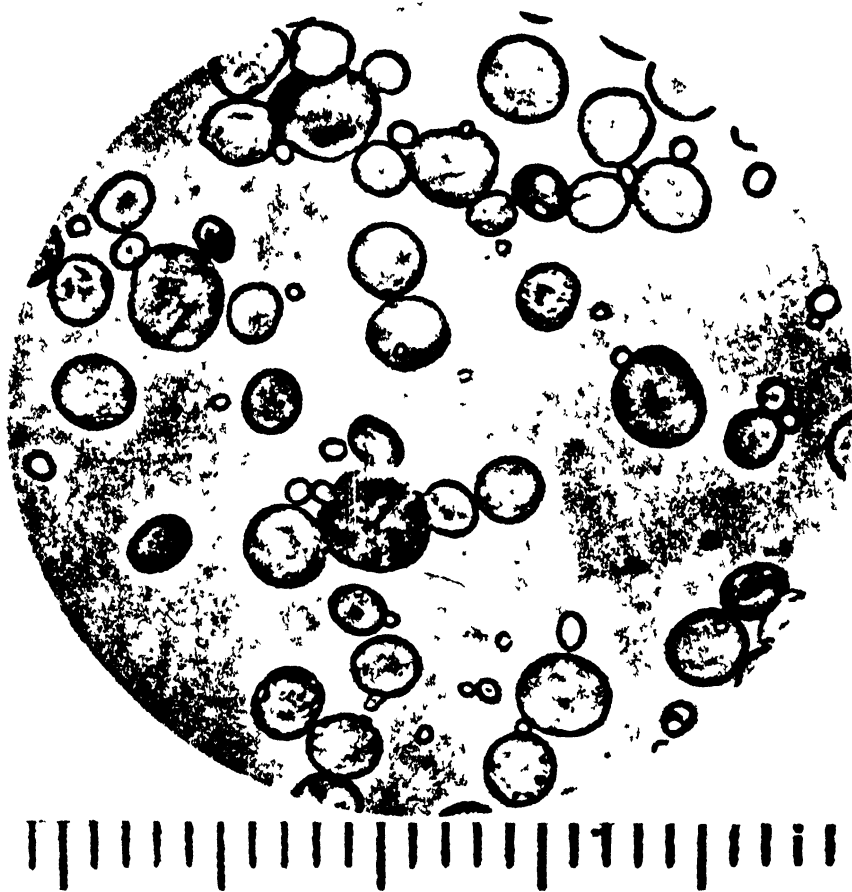


FIG. 1 PHOTOMICROGRAPH OF *SUJI* STARCH ($\times 325$)

(Scale : 1 division = 10 microns)

4. PACKING AND MARKING

4.1 Packing — The packages may preferably be of 1 kg, 2 kg, 10 kg, 20 kg, 40 kg, 65 kg, 75 kg, or 90 kg, as desired by the purchaser.

4.1.1 For packages above 65 kg, unless otherwise agreed to between the purchaser and the vendor, the material for packing shall be single, sound A-twill or B-twill jute bags or DW-flour bags conforming to IS : 1943-1964*, IS : 2566-1965† and IS : 3984-1967‡ respectively.

4.1.2 The bags used for smaller packs may be polyethylene bags or polyethylene lined jute bags or any other suitable material as agreed to between the purchaser and the vendor.

4.1.3 The mouth of the bag shall be either machine stitched or hand stitched. If it is hand stitched, the mouth shall be rolled over and then stitched. The stitches shall be in two cross-rows with at least 14 stitches in each row for jute bags of 65 kg and above.

4.2 Marking — Each bag shall be suitably marked so as to give the following information:

- a) Name of the material,
- b) Grade,
- c) Name and address of the manufacturer,
- d) Batch or code number, and
- e) Net weight.

4.2.1 All markings shall be applied on the bags in such a manner that the dye or ink does not penetrate into the material.

4.2.2 Each bag 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 the ' Indian Standard methods of sampling for processed cereals and pulses ' (*see Note*).

NOTE — This standard is under preparation. Until it is published the method of sampling and the criteria for conformity shall be as agreed to between the purchaser and the vendor.

*Specification for A-twill jute bags (*revised*).

†Specification for B-twill jute bags (*revised*).

‡Specification for DW-flour bags.

6. TESTS

6.1 Tests shall be carried out as prescribed under 3.1 and in the appropriate appendices specified under 3.2 and in col 4 of Table 1.

6.2 Quality of Reagents — Unless specified otherwise, pure chemicals shall be employed in tests, and distilled water (*see* IS : 1070-1960*) shall be used where the use of water as a reagent is intended.

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

APPENDIX A

(*Clauses 3.2.1 and 3.2.2*)

DETERMINATION OF PARTICLE SIZE

A-1. SIEVES

A-1.1 Make a nest of 3 sieves of silk or nylon bolting cloth or IS Sieves, the uppermost having a designation 20 GG (aperture 1.16 mm) or 1.18-mm IS Sieve the middle of 30 GG (aperture 0.73 mm) or 710-micron IS Sieve and the lowermost 70 GG (aperture 0.24 mm) or 250-micron IS Sieve with a cover on top of the uppermost sieve and a receiver below the lowermost sieve.

A-2. PROCEDURE

A-2.1 Weigh accurately about 100 g of the material into the uppermost sieve and fit it with the cover. Shake the nest of sieves with the receiver thoroughly and ensure that all the material on the uppermost sieve has passed through it. Stop shaking, remove the nest of sieves and examine the uppermost sieve to be assured that all the material has passed through it. Transfer the residues on the lower sieves separately to two tared weighing dishes using a brush and weigh each dish.

A-3. CALCULATION

A-3.1 Material retained on sieve 30 GG or 710-micron
IS Sieve, percent by weight
$$= \frac{100 W_1}{W}$$

where

W_1 = weight in g of the material retained on sieve 30 GG or
710-micron IS Sieve, and

W = weight in g of the material taken for the test.

*Specification for water, distilled quality (*revised*).

A-3.2 Material retained on sieve 70 GG or 250-micron IS Sieve, percent by weight $= \frac{100 (W_1 + W_2)}{W}$

where

W_1 = weight in g of the material retained on sieve 30 GG or 710-micron IS Sieve,

W_2 = weight in g of the material retained on sieve 70 GG or 250-micron IS Sieve, and

W = weight in g of the material taken for the test.

APPENDIX B

[Table 1, Item (i)]

DETERMINATION OF MOISTURE

B-1. PROCEDURE

B-1.1 Weigh accurately about 5 g of the material in a dish made of porcelain, silica or platinum, previously dried in an electric oven and weighed. Place the dish in an electric oven maintained at $105 \pm 1^\circ\text{C}$ for five hours. Cool the dish in a desiccator and weigh with the lid on. Repeat the process of heating, cooling and weighing at half-hour intervals until the loss in weight between two successive weighings is less than one milligram. Record the lowest weight obtained.

Note — Preserve the dish containing this dried material for the determination of total ash (see C-1.1).

B-2. CALCULATION

B-2.1 Moisture, percent by weight $= \frac{100 (W_1 - W_2)}{W_1 - W}$

where

W_1 = weight in g of the dish with the material before drying,

W_2 = weight in g of the dish with the material after drying, and

W = weight in g of the empty dish.

APPENDIX C

[Table 1, Item (ii)]

DETERMINATION OF TOTAL ASH

C-1. PROCEDURE

C-1.1 Ignite the dried material in the dish (see B-1.1) with the flame of a suitable burner for about one hour. Complete the ignition by keeping in a muffle furnace at 550 to 600°C until grey ash results. Cool in a desiccator and weigh. Repeat the process of igniting, cooling and weighing at half-hour intervals until the difference in weight between two successive weighings is less than one milligram. Note the lowest weight.

NOTE — Preserve the dish containing this ash for the determination of acid insoluble ash (see D-2.1).

C-2. CALCULATION

C-2.1 Total ash (on dry basis), percent by weight = $\frac{100 (W_2 - W)}{W_1 - W}$

where

W_2 = weight in g of the dish with the ash,

W = weight in g of the empty dish, and

W_1 = weight in g of the dish with dried material (see W_2 in B-2.1).

APPENDIX D

[Table 1, Item (iii)]

DETERMINATION OF ACID INSOLUBLE ASH

D-1. REAGENT

D-1.1 Dilute Hydrochloric Acid — approximately 5 N, prepared from concentrated hydrochloric acid (see IS : 265-1962*).

D-2. PROCEDURE

D-2.1 To the ash contained in the dish (see C-1.1) add 25 ml of dilute hydrochloric acid, cover with a watch-glass and heat on a water-bath for

*Specification for hydrochloric acid (revised).

10 minutes. Allow to cool and filter the contents of the dish through a Whatman filter paper No. 42 or its equivalent. Wash the filter paper with water until the washings are free from the acid and return it to the dish. Keep it in an electric air-oven maintained at $135 \pm 2^\circ\text{C}$ for about 3 hours. Ignite in a muffle furnace at 550 to 600°C for one hour. Cool the dish in a desiccator and weigh. Repeat the process of igniting in the muffle furnace, cooling and weighing at half-hour intervals until the difference in weight between two successive weighings is less than one milligram. Note the lowest weight.

D-3. CALCULATION

D-3.1 Acid insoluble ash (on dry basis), percent by weight =
$$\frac{100 (W_2 - W)}{W_1 - W}$$

where

W_2 = weight in g of the dish with the acid insoluble ash,

W = weight in g of the empty dish, and

W_1 = weight in g of the dish with the dried material (see W_2 in **B-2.1**).

APPENDIX E

[Table 1, Item (iv)]

DETERMINATION OF GLUTEN

E-1. PROCEDURE

E-1.1 Preparation of Material — Grind about 100 g of the material in a pestle and mortar or in a suitable mechanical pulverizer. Sieve through fine treble extra silk with an aperture of 0.16 mm (No. 10 XXX) or 150-micron IS Sieve and collect the material that has passed through. Use this prepared material for the determination of gluten.

E-1.2 Weigh accurately into a dish about 25 g of the material. Add about 15 ml of water to the material and make it into a dough, taking care to see that all the material is taken into the dough. Keep the dough gently in a beaker filled with water and let it stand for one hour. Remove the dough and place it in a piece of bolting silk cloth with an aperture of 0.16 mm size (No. 10 XXX) or 150-micron IS Sieve and wash it with a gentle stream of tap water till water passing through the silk does not turn blue when a drop of iodine solution is added to it. Spread the silk tight on a porcelain plate for facilitating scraping. Transfer the residue from the silk by means of a spatula, to a tared porcelain dish. Spread the wet gluten into a thin layer and cut into small pieces. Transfer any residue

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sticking to the spatula into the porcelain dish. Place the porcelain dish in an air-oven maintained at $133 \pm 2^\circ\text{C}$. Dry for two hours. Cool in a desiccator and weigh.

E-2. CALCULATION

E-2.1 Gluten, on dry basis, percent
by weight
$$= \frac{10\,000 (W_2 - W_1)}{W (100 - M)}$$

where

W_2 = weight in g of the dish with dry gluten,

W_1 = weight in g of the empty dish,

W = weight in g of the material taken, and

M = percentage of the moisture in the sample (see B-2.1).

APPENDIX F

[Table 1, Item (v)]

DETERMINATION OF ALCOHOLIC ACIDITY

F-1. REAGENTS

F-1.1 Neutral Ethyl Alcohol — 90 percent by volume.

F-1.2 Standard Sodium Hydroxide Solution — approximately 0.05 N.

F-1.3 Phenolphthalein Indicator Solution — Dissolve 0.50 g of phenolphthalein in 100 ml of ethyl alcohol, 95 percent by volume.

F-2. PROCEDURE

F-2.1 Weigh 5 g of sample into a conical stoppered flask and add 50 ml of neutral ethyl alcohol. Stopper, shake and allow to stand for 24 hours, with occasional shaking. Filter the alcoholic extract through a dry filter paper. Titrate 10 ml of the combined alcoholic extract against the standard sodium hydroxide solution using phenolphthalein as indicator. Calculate the percentage of alcoholic acidity as sulphuric acid.

F-3. CALCULATION

F-3.1 Alcoholic acidity (as H_2SO_4) with 90 percent
alcohol, percent by weight
$$= \frac{24.52 A N}{W}$$

where

A = volume in ml of standard sodium hydroxide solution used in titration,

N = normality of standard sodium hydroxide solution, and

W = weight in g of the material taken for the test.

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