

Quality Standards for Coconut products

Indian Standards for Coconut Products

IS 8676 : 1977 - Specification for edible coconut flour (solvent extracted)

Used as protein supplement in dietaries. Used in both blended and processed foods.

Raw material - fresh coconut kernels or dried coconut copra of good quality free from moulds. Flour is white to pale brownish-yellow in colour, free from rancidity, insect or fungal infestation and added colour and flavour. Free from harmful foreign oil cakes like castor and mahua, also free from neem cake, jaggery and molasses. Food grade hexane to be used for solvent extraction of coconut flour.

Particle size - such that material passes through 250 micron IS sieve

Requirements

Parameters	Dry Process	Wet Process
Moisture	9% max	5% max
Protein	22% max	17% max
Total ash	6% max	6% max
Acid insoluble ash	0.35% max	0.35 % max
Fat	2% max	1% max
Hexane (Food Grade)	10 ppm	
Crude fibre	9% max	8% max
Aflatoxin	30 PPb	30 ppb
Total bacterial count	50000/ g max	50000/ g max
Coliforms	10 / g max	10 / g max
Salmonella	Nil	Nil

IS 9488:1980 - Specification for edible coconut protein concentrates

Used as protein supplements in human dietary. Can be incorporated in sweet and savoury preparations. Made from fresh coconut kernels by pressing out the milk and separating protein from emulsion and extracting the residual oil in the protein concentrate with food grade hexane.

Description - free flowing powder, white to off-white colour, free from rancidity, insect or fungal infestation and added colour and flavour.

Particle size - such that material passes through 150 micron IS sieve

Requirements

Moisture	6% max
Protein	55% max
Total ash	9% max
Acid insoluble ash	0.5% max
Fat	1.5% max
Crude fibre	2.5% max
Aflatoxin	30 PPb
Residual Solvent	170 ppm
Total bacterial count	50000 per g max
Coliforms	10 per g max
Salmonella	Nil

IS 12069 : 1987 - Specification for edible coconut fatty acids

Coconut fatty acids are produced by hydrolysis of coconut oil.

Comprise about 90% saturated acids, mainly low molecular weights. The main fatty acid is lauric acid which constitutes about 50% of the total.

Grades Grade 1 - Distilled grade subjected to vacuum distillation

Grade 2 - Undistilled grade

Parameters	Grade I	Grade II
Moisture	0.1 % max	1.0 % max
Saponification value	262-275	260-275
Acid value shall not differ from Saponification value, max	4	14
Iodine value	12 max	12 max
Mineral acidity	Nil	Nil
Ash	0.1 % max	0.1 % max
Unsaponifiable matter	0.2 % max	0.8 % max
Titre	24-28° c	22-27° c
Colour (Lovibond scale)	6 max	-
Lauric acid	45% min	45% min
Flash point	100° C	100° C

INDIAN STANDARD SPECIFICATIONS FOR COCONUT OIL (IS-542-1968)

Characteristics	Requirements						
	Expressed				Solvent Extracted		
	Refined Grade	Grade IA (Raw)	Grade IB (Raw)	Grade 2 (Raw)	Refined Grade	Semi refined	Grade 1 Raw
1. Moisture and insoluble impurities % wt., Max.	0.1	0.25	0.25	0.2	0.1	0.25	1.0
2. Colour in 1/4" cell Lovibond Y+5R.	2	4	11	30	2	10	30
3. Refractive Index at 40°C	1.4480 to 1.4490						
4. Specific Gravity at 30°/30°C	0.915 to 0.920						
5. Saponification Value, Min	250						
6. Iodine value (Wij's)	7.5 to 10.0				8.0 to 13.0		
7. Acid value, Max.	0.5	2.0	6.0	8.0	0.5	1.0	10.0
8. Unsaponifiable matter % by wt., Max.	0.5	0.8	0.8	0.8	0.5	0.8	1.0
9. Polenske Value, Min.	13.0	13.0	13.0	–	13.0	–	–
10. Flash point. °C Min.	–	–	–	–	225	100	90

ISI SPECIFICATIONS FOR DESICCATED COCONUT (IS : 966 - 1975)

SI No	Characteristics	Requirements
1	Moisture, per cent by mass, Max.	3.0
2	Fat, per cent by mass, Min	65.0
3	Fat acidity, as lauric acid, Max.	0.3

IS 8664:1977 specification for edible coconut flour (expeller pressed)

Used as protein supplement in dietaries. Used in both blended and processed foods.

Raw material - fresh coconut kernels or dried coconut copra of good quality free from moulds.

Flour is light brown in colour, free from rancidity, insect or fungal infestation and added colour and flavour. Free from harmful foreign oil cakes like caster and mahua, also free from neem cake, jaggery and molasses.

Particle size - such that material passes through 250 micron IS sieve.

Requirements

Moisture	9% max
Protein	20% max
Total ash	5% max
Acid insoluble ash	0.35% max
Fat	9% max
Acid value of extracted fat	4 max
Crude fibre	9% max
Aflatoxin	6 PPb
Total bacterial count	50000 per g max
Coliforms	10 per g max
Salmonella	Nil

Agmark Specifications for different coconut products

The Directorate of Marketing and Inspection has specifications for the following coconut products:

- 1) Coconut oil 2) Desiccated coconut powder 3) Coconuts in shells 4) Copra (edible/milling)

AGMARK GRADE DESIGNATIONS AND DEFINITIONS OF QUALITY OF COCONUT IN SHELL

Grade Designation	Colour	Size ⁽¹⁾ (Diameter) in Millimeters	Description
Extra special	Brown	110 and above	The coconut shall be well developed, matured and husked (2) with or without water. These shall be free from bad smell, damage and blemish due to fungus and insect infestation and dark brown colour at the top. When struck at the shell with finger or metal, it shall give the characteristic metallic sound without any dull note.
Special	I Brown White or II Brown & White	100 and above	
Standard	I Brown White or II Brown & White	90 and above	
General Non Specified ⁺⁽³⁾	Mixed	Below 90	

Note:

- (1) To find out the size, the nuts should be husked and the size should be measured by passing the nuts in the iron rings made to the size required.
- *(2) The husk not exceeding 10% of the weight of the nuts is permissible
- + (3) Packing under "Non-specified" grade will be allowed only against a specific order from the foreign buyer indicating the quantity and quality of the produce desired.

AGMARK GRADE DESIGNATIONS AND DEFINITIONS OF QUALITY OF BALL COPRA FOR EDIBLE USE

Grade Designation	Size (Diameter) Minimum in mm.	Foreign matter % by weight Maximum	Mouldy Black Kernels % by count maximum	Wrinkled Kernels % by Count Maximum	Moisture content % by weight Maximum	Chips % by weight Maximum	Description
1	2	3	4	5	6	7	8
Grade 1	85	0.2	2.0	10.0	7.0	1.0	(i) These shall be the kernels obtained intact and in the form of balls from the fruits of <i>Cocos nucifera</i> Linn. fam-palmar.
Grade 2	75	0.2	2.0	10.0	7.0	1.0	(ii) These shall be well dried, reasonably firm and in sound merchantable condition.
Grade 3	60	0.2	2.0	10.0	7.0	1.0	(iii) These may be fumigated by sulphur or other fumigants permissible under PFA Rules, 1955, and shall be free from rancid taste and objectionable odour. The testa shall be whitish to dark brown in colour and the meat shall be pearly white to ash white in colour and shall be sweet in taste.

Grade Size Designation	Size (Diameter) Minimum in mm.	Foreign matter % by weight Maximum	Mouldy Black Kernels % by count maximum	Wrinkled Kernels % by count maximum	Chips % by weight maximum	Moisture content % by weight maximum	Acid value of extracted oil maximum	Description
1	2	3	4	5	6	7	8	9
Grade I	70	0.05	2.0	10.0	1.0	6.0	2	These shall be the kernels obtained from the fruits of <i>Cocos nucifera</i> Linn. fam-palmae, which have been cut into approximate two equal pieces forming a cup shape. These shall be well dried reasonably firm and in sound merchantable condition. It may be fumigated by sulphur or other fumigants permissible under PFA Rules, 1955 and shall be free from rancid taste and objectionable odour. The testa shall be whitish to dark brown in colour and the meat shall be pearly white to ash white in colour and shall be sweet in taste.
Grade II	-	0.5	2.0	10.0	1.0	6.0	2	
Non-specified	-	-	-	-	-	-	-	

AGMARK GRADE DESIGNATIONS AND DEFINITIONS OF QUALITY OF CUP COPRA FOR OIL MILLING

Grade Size Designation	Foreign matter % by weight Maximum	Mouldy Black Kernels % by count maximum	Wrinkled Kernels % by count maximum	Chips % by weight maximum	Moisture content % by weight maximum	Oil content (on moisture free basis) % by weight minimum	Acid value of extracted oil maximum	Description
1	2	3	4	5	6	7	8	9
Grade I	0.5	5.0	10.0	5.0	6.0	70.0	2	These shall be the kernels obtained from the fruits of <i>Cocos nucifera</i> Linn. fam-palmae, which have been cut into approximate two equal pieces forming a cup shape. These shall be well dried reasonably firm and in sound merchantable condition. It may be fumigated by sulphur or other fumigants permissible under PFA Rules, 1955 and shall be free from rancid taste and objectionable odour. The testa shall be whitish to dark brown in colour and the meat shall be pearly white to ash white in colour.
Grade II	1.0	10.0	10.0	10.0	6.0	68.0	4	
Grade III	2.0	15.0	15.0	15.0	6.0	66.0	10	

Note:

- Foreign matter includes sand, dust, straw and shell.
- Mouldy and black kernels include balls in which more than 5% of the inner surface is covered with mould and / or is dark brown to black in colour.
- Wrinkled kernels include balls that are shrunk out of normal shape or are not fully matured or developed or have a rubbery structure and uneven surface. Such kernels are often discoloured.
- Chips include pieces of kernel which are smaller in size.
- Meat means the soft body enclosed in the shell which carries the oil.
- Packing under Non-Specified grade will be allowed only against a specified order from the foreign buyer indicating the quantity and quality of the produce desired.

AGMARK GRADE DESIGNATION AND DEFINITIONS OF QUALITY OF COCONUT OIL

Grade Designation	Moisture and insoluble impurities per cent by weight (max)	Colour on Lovibond sale* in 1 inch cell expressed Y+5R (not deeper than)	Specific gravity at 30°C/30°C	Refractive index at 40 °C	Saponification Value (min)	Iodine Value (Wiji's Method)	Unsaponifiable matter per cent by weight (max)	Acid Value (max)	Polenske Value (min)	Description	General requirements
1	2	3	4	5	6	7	8	9	10	11	12
Refined	0.10	2	0.915 to 0.920	1.4481 to 1.4491	250	7.5 to 10.0	0.5	0.5	13.0	Coconut oil shall be obtained either by a process of expression of good quality copra (Cocos nucifera), or by a process of solvent extraction of good quality coconut cake using approved food grade solvents. The refining of the oil shall be done by neutralisation with alkali and/or physical refining and/or by miscella refining followed by bleaching with absorbent earth and/or activated carbon and deodorization with steam. No chemical agent shall be used.	The oil shall have natural sweet taste. It shall be clear and free from turbidity when a filtered sample is kept for 24 hrs. at 30°C. The oil shall be free from rancidity, admixture of other oils or substances or adulterants. The oil shall be free from mineral oil, sediments, suspended matter, separated water, obnoxious odour added colouring and flavouring agents. The oil may contain permitted anti-oxidants not exceeding in concentration as specified under Prevention of Food Adulteration Rules, 1955.
Grade 1	0.25	4	0.915 to 0.920	1.4481 to 1.4491	2.50	7.5 to 10.0	0.8	3.0	13.0	The oil shall be the product obtained by expression of good quality copra (Cocos nucifera) only.	The oil shall have natural sweet taste and characteristic odour. It shall be clear and free from rancidity, admixture of any other oils, substances or adulterants. It shall also be free from mineral oil, sediments, suspended matter, separated water, obnoxious odour, added colouring and flavouring agents. The oil may contain permitted anti-oxidants not exceeding in concentration as specified under Prevention of Food Adulteration Rules, 1955.
Grade 2	0.25	4	0.915 to 0.920	1.4481 to 1.4491	2.50	7.5 to 10.0	0.8	6.0	13.0	The oil shall be the product obtained by expression of good quality copra (Cocos nucifera) only.	The oil shall have natural sweet taste and characteristic odour. It shall be clear and free from rancidity, admixture of any other oils, substances or adulterants. It shall also be free from mineral oil, sediments, suspended matter, separated water, obnoxious odour, added colouring and flavouring agents. The oil may contain permitted anti-oxidants not exceeding in concentration as specified under Prevention of Food Adulteration Rules, 1955.

* In the absence of Lovi-bond Tintometer, the colour shall be matched against standard colour comparator.
 ** In case of solvent extracted oil, the flash point by Pensky - Martans (closed cup) method shall not be less than 225°C and the container shall be marked "Solvent Extracted"

Codex Standard for Aqueous Coconut Products

Coconut Milk and Coconut Cream- (CODEX STAN 240-2003)

1) Scope

This Standard applies to packaged aqueous coconut milk and coconut cream products, as defined in Section 2 below, and offered for direct consumption, including for catering purposes or for repacking if required. It does not apply to the product when indicated as being intended for further processing or to sweetened and/or flavoured coconut milk or cream.

2) Description

2.1) Product definition

Coconut milk and coconut cream are the products:

(a) prepared by:

- (i) using a significant amount of separated, whole, disintegrated, macerated or comminuted fresh endosperm (kernel) of coconut palm (*Cocos nucifera* L.) and expelled, where most filterable fibres and residues are excluded, with or without coconut water, and/or with additional water; or
- (ii) reconstituting coconut cream powder with potable water; or
- (iii) dispersing finely comminuted dehydrated coconut endosperm with potable water; or
- (iv) combining (i) and (iii) above.

(b) processed by heat, in an appropriate manner, before or after being hermetically sealed in a container, so as to prevent spoilage.

2.2) STYLES

2.2.1) Light Coconut Milk

Light coconut milk shall be the product obtained from either the bottom portion of centrifuged coconut milk or by further dilution of coconut milk and complies with the requirements in Section 3 of this Standard.

2.2.2) Coconut Milk

Coconut milk is the dilute emulsion of comminuted coconut endosperm (kernel) in water with the soluble and the suspended solids distributed and complies with the requirements in Section 3 of this Standard.

2.2.3) Coconut Cream

Coconut cream is the emulsion extracted from matured endosperm (kernel) of the coconut fruit with

or without any addition of coconut water/ water and complies with the requirements in Section 3 of this Standard.

2.2.4) Coconut Cream Concentrate

Coconut cream concentrate is the product obtained after the partial removal of water from coconut cream and complies with the requirements in Section 3 of this Standard.

3) Essential Composition and Quality Factors

3.1) Composition

3.1.1) Basic Ingredients

- (a) Coconut cream powder;
- (b) Endosperm (kernel) of coconut palm (*Cocos nucifera* L.);
- (c) Water.

3.1.2) Other Permitted Ingredients

- (a) Coconut water;
- (b) Maltodextrin;
- (c) Sodium caseinate.

3.1.3) Other Composition

Product	Total Solids (% m/m)	Nonfat Solids (% m/m)	Fat (% m/m)	Moisture (% m/m)	pH
	Min.- max	min	min.	max.	min.
(a) Light Coconut Milk	6.6- 12.6	1.6	5.0	93.4	5.9
(b) Coconut Milk	12.7- 25.3	2.7	10.0	87.3	5.9
(c) Coconut Cream	25.4- 37.3	5.4	20.0	74.6	5.9
(d) Coconut Cream Concentrate	37.4 min	8.4	29.0	62.6	5.9

3.2) Quality criteria

Coconut milk and coconut cream shall have normal colour, flavour and odour characteristic of the products.

3.3) Classification of "Defectives"

A container that fails to meet one or more of the applicable quality requirements, as set out in Sections 3.1.3 and 3.2 should be considered as a "defective".

3.4) Lot Acceptance

A lot should be considered as meeting the applicable quality requirements referred to in Sections 3.1.3 and 3.2 when the number of "defectives", as defined in Section in Section 3.3, does not exceed the acceptance number (c) of an appropriate sampling plan with an AQL of 6.5.

4) Food Additives

4.1) Bleaching Agents

INS No.	Name of the Food Additive	Maximum Level
223	Sodium metabisulphite	30 mg/kg
224	Potassium metabisulphite	

4.2) Emulsifiers

INS No.	Name of the Food Additive	Maximum Level
432	Polyoxyethylene (20) sorbitan monolaurate	1000 mg/kg
433	Polyoxyethylene (20) sorbitan monooleate	
434	Polyoxyethylene (20) sorbitan monopalmitate	
435	Polyoxyethylene (20) sorbitan monostearate	
436	Polyoxyethylene (20) sorbitan tristearate	
471	Mono- and diglycerides	Limited by GMP 1500 mg/kg
473	Sucrose esters of fatty acid	

4.3) Preservatives

INS No.	Name of the Food Additive	Maximum Level
211	Sodium benzoate	1000 mg/kg only for pasteurized coconut milk

4.4) Stabilizers / Thickeners

INS No.	Name of the Food Additive	Maximum Level
412	Guar gum	Limited by GMP
415	Xanthan gum	
418	Gellan gum	
466	Sodium carboxymethyl cellulose	

5) Contaminants

5.1) Heavy Metals

The products covered by the provisions of this Standard shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for these products.

5.2) Pesticide Residues

The products covered by the provisions of this Standard shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for these products.

6) Hygiene

6.1) It is recommended that the products covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the Recommended International Code of Practice – General Principles of Food Hygiene (CAC/RCP 1-1969), Recommended International Code of Hygienic Practice for Aseptically Processed and Packaged Low-Acid Foods (CAC/RCP 40-1993), Recommended International Code of Hygienic Practice for Low-Acid and Acidified Low-Acid Canned Foods (CAC/RCP 23-1979) and other relevant Codex texts such as codes of hygienic practice and codes of practice.

6.2) The products should comply with any microbiological criteria established in accordance with the Principles for

the Establishment and Application of Microbiological Criteria for Foods (CAC/GL 21-1997).

7) Weights and Measures

7.1) Fill of Container

7.1.1) Minimum Fill

7.1.1.1) The hermetically sealed container should be well filled with the product, and it should occupy not less than 90% v/v of the water capacity of the container. The water capacity of the container is the volume of distilled water at 20°C which the sealed container will hold when completely filled.

7.1.1.2) Flexible containers should be filled as full as commercially practicable.

7.1.2) Classification of “Defectives”

A container that fails to meet the requirement for minimum fill as described in Section 7.1.1 should be considered as a “defective”.

7.1.3) Lot Acceptance

A lot should be considered as meeting the requirement of Section 7.1.1 when the number of “defectives”, as defined in Section 7.1.2, does not exceed the acceptance number (c) of an appropriate sampling plan with an AQL of 6.5.

8) Labelling

The products covered by the provisions of this Standard shall be labelled in accordance with the Codex General Standard for the Labelling of Prepackaged Foods (CODEX STAN 1-1985). In addition, the following specific provisions apply:

8.1) Name of The Product

8.1.1) The name of the product shall be:

- (a) Light coconut milk
- (b) Coconut milk
- (c) Coconut cream
- (d) Coconut cream concentrate

8.1.2) Coconut milk and coconut cream prepared by reconstituting coconut cream powder or the finely comminuted dehydrated coconut endosperm shall be labelled to indicate that these are reconstituted products.

8.1.3) An appropriate description of the heat treatment should be given, either as part of the name or in a prominent position in the same field of vision.

9) Methods of Analysis and Sampling

See relevant Codex texts on methods of analysis and sampling.

APCC Standards for Virgin Coconut Oil

1. Scope

This Standard applies for Virgin Coconut Oil (VCO).

1. References

- SNI (Indonesia National Standard) 7381:2008
- PNS (Philippine National Standard)/BAFPS 22:2007: ICS 67.200.10
- MS (Malaysian Standard) 2043:2007
- TCS (Thailand Coconut Community Standard) 670-2004
- APCC Standard for Virgin Coconut Oil

2. Definition

3.1. Virgin Coconut Oil

Virgin coconut oil (VCO) is obtained from fresh and mature kernel (12 months old from pollination) of the coconut (*Cocos nucifera L.*) by mechanical or natural means with or without the application of heat, which does not lead to alteration of the nature of the oil. VCO has not undergone chemical refining, bleaching or deodorizing. It can be consumed in its natural state without the need for further processing. Virgin coconut oil consists mainly of medium chain tryglycerides, which are resistant to peroxidation. The fatty acids in virgin coconut oil are distinct from animal fats which contain mainly of long chain saturated fatty acids. Virgin coconut oil is colorless, free of sediment with natural fresh coconut scent. It is free from rancid odor or taste.

4. Essential Composition and Quality Factors of Virgin Coconut Oil

Parameter	
Moisture (%)	Max 0.1
Matters Volatile at 1200 C (%)	Max 0.2
Free Fatty Acid (%)	Max 0.2
Peroxide Value meq/kg	Max 3
Relative density	0.915 – 0.920
Refractive index at 400 C	1.4480 – 1.4492
Insoluble impurities per cent by mass	Max 0.05
Saponification Value	250 – 260 min
Iodine Value	4.1 -11
Unsaponifiable matter % by mass, max	0.2 - 0.5
Specific gravity at 30 deg./30 deg. C	0.915 – 0.920
Polenske Value, min	13
Total Plate Count	< 0.5
Color	Water clean
Odor and Taste	Natural fresh coconut scent, free of sediment, free from rancid odor and taste

5. Food Additives

None permitted

6. Contaminants

Parameter	Mg/kg
Iron (Fe)	Max 5
Copper (Cu)	Max 0.4
Lead (Pb)	Max 0.1
Arsenic (As)	Max 0.1

7. Gas Liquid Chromatography (GLC) ranges of Fatty Acid Component

Common name	Composition	(%)
Caproic acid	C 6:0	0.10 – 0.95
Caprylic acid	C 8:0	4 – 10
Capric acid	C 10:0	4 – 8
Lauric acid	C 12:0	45 – 56
Myristic acid	C 14:0	16 – 21
Palmitic acid	C 16:0	7.5 – 10.2
Stearic acid	C 18:0	2 – 4
Oleic acid	C 18:1	4.5 - 10
Linoleic acid	C 18:2	0.7 – 2.5

8. Hygiene

It is recommended that the product covered by the provisions of this standard shall be in

accordance with the appropriate sections of the General Principles of Food Hygiene recommended by the CODEX Alimentarius Commission (CAC/RCP 1-1969, Rev. 4- 2003).

9. Labelling and Packaging

The name of the food on the label shall be "Virgin Coconut Oil". The provisions of the General Standard for the labelling of Pre-packaged Foods (CODEX STAN 1 – 1985, Rev. 6 - 2008) shall apply.

10. Methods of Analysis and Sampling

Based on Codex Alimentarius (Volume 13).