

CHAPTER 2 FOOD PRODUCT STANDARDS

2.8: Sweetening agents including Honey

2.8.1: SUGAR

1. PLANTATION WHITE SUGAR (commonly known as sugar) means the crystallised product obtained from sugarcane or sugar beet. It shall be free from dirt, filth, iron filings, and added colouring matter. Extraneous matter shall not exceed 0.1 per cent by weight. It shall also conform to the following standards, namely:-

(a)	Moisture (when heated at 105 degree \pm 1°C for 3 hours)	Not more than 0.5 per cent by weight.
(b)	Sucrose	Not less than 98 per cent by weight.

The product may contain food additives permitted in these Regulations and Appendices.

2. REFINED SUGAR means the white crystallised sugar obtained by refining of plantation white sugar. It shall be free from dirt, filth, iron filings and added colouring matter. Extraneous matter shall not exceed 0.1 per cent by weight. It shall also conform to the following standards, namely: -

(a)	Moisture (when heated at 105 ⁰ \pm 1 ⁰ C for 3 hours)	Not more than 0.5 per cent by weight.
(b)	Sucrose	Not less than 99.5 per cent by weight.

The product may contain food additives permitted in these Regulations and Appendices.

3. KHANDSARI SUGAR obtained from sugarcane juice by open pan process may be of two varieties, namely:

- (i) Khandsari Sugar Desi; and
- (ii) Khandsari Sugar (sulphur) also known as "Sulphur Sugar".

It may be crystalline or in powder form. It shall be free from dirt, filth, iron filings and added colouring matter. Extraneous matter shall not exceed 0.25 per

cent by weight. It may contain sodium bicarbonate (food grade). It shall also conform to the following standards, namely: -

	<i>Khandsari Sugar (Sulphur Sugar)</i>	<i>Khandsari Sugar (Desi)</i>
(i) Moisture (when heated at 105° ± 1° C for 3 hours)	Not more than 1.5 per cent by weight.	Not more than 1.5 per cent by weight.
(ii) Ash insoluble in dilute hydrochloric acid	Not more than 0.5 per cent by weight	Not more than 0.7 per cent by weight.
(iii) Sucrose	Not less than 96.5 per cent by weight.	Not less than 93.0 per cent by weight.

The product may contain food additives permitted in these Regulations and Appendices.

NOTE: - Khandsari sugar can be distinguished from plantation white sugar on the following characteristics, namely:

	<i>Khandsari Sugar (Sulphur Sugar)</i>	<i>Khandsari Sugar (Desi)</i>
(i) Conductivity (106 mho/cm ²)	100-300 in 5% solution at 30°C	Not more than 100 in 5% solution at 30°C
(ii) Calcium oxide (mg/100gms)	Not more than 100	Not more than 50

The product may contain food additives in Appendix A

4. BURA SUGAR means the fine grain size product made out of any kind of sugar. It shall be free from dirt, filth, iron filing and added colouring matter. Extraneous matter shall not exceed 0.1 per cent by weight. It shall also conform to the following standards, namely: -

(a)	Sucrose	Not less than 90.0 per cent by weight.
(b)	Ash insoluble in dilute hydrochloric acid	Not more than 0.7 per cent by weight.

The product may contain food additives permitted in these Regulations and Appendices.

5. CUBE SUGAR means the sugar in the form of cube or cuboid blocks manufactured from refined crystallised sugar. It shall be white in colour, free from dirt and other extraneous contamination. It shall conform to the following standards: -

(a)	Sucrose	Not less than 99.7 per cent by weight.
(b)	Moisture	Not more than 0.25 per cent by weight.
(c)	Total ash	Not more than 0.03 per cent by weight

The product may contain food additives permitted in these Regulations and Appendices.

6. ICING SUGAR means the sugar manufactured by pulverizing refined sugar or vacuum pan (plantation white) sugar with or without edible starch. Edible starch, if added, shall be uniformly extended in the sugar. It shall be in form of white powder, free from dust, or any other extraneous matter.

The product may contain food additives permitted in these Regulations and Appendices. It shall conform to the following standards: -

(a)	Total starch and sucrose (moisture free)	Not less than 99.0 per cent by weight.
(b)	Moisture	Not more than 0.80 per cent by weight.
(c)	Starch	Not more than 4.0 percent by weight on dry basis.

2.8.2: MISRI

1. **MISRI** means the product made in the form of candy obtained from any kind of sugar or palmyrah juice. It shall be free from dirt filth, iron filings and added colouring matter. Extraneous matter shall not exceed 0.1 per cent by weight. It shall also conform to the following standards, namely: -

(a)	Total ash	Not more than 0.4% by weight
(b)	Total Sugar (Called, known or expressed as Sucrose)	Not less than 98.0% by weight

The product may contain food additives permitted in these Regulations and Appendices.

⁵¹[2.8.3: Honey and it's by products:

1. Honey. -

⁷⁷[(I) Honey is the natural sweet substance produced by honey bees from the nectar of plants or from secretions of living parts of plants or excretions of plant sucking insects on the living parts of plants, which the bees collect, transform by combining with specific substances of their own, deposit, dehydrate, store and leave in the honey comb to ripen and mature.

(a) Blossom Honey or Nectar Honey is the honey which comes from nectars of plants.

(b) Honeydew Honey is the honey which comes mainly from excretions of plant sucking insects (Hemiptera) on the living parts of plants or secretions of living parts of plants]

(II) Honey shall be free from organic and inorganic matter including visible mould, insects and insect debris, fragments of bees, brood, pieces of bees wax, grains of sand, and any other extraneous matter.

(III) Honey consists essentially of different sugars, predominantly fructose and glucose as well as other substances such as organic acids, enzymes and solid particles derived from honey collection. The colour of honey varies from nearly colourless to dark brown. The consistency can be fluid, viscous or partly to entirely crystallised.

(IV) Honey sold as such shall not have added to it any food ingredient, including food additives, nor shall any other addition be made other than honey.

(V) Honey shall comply with the following requirements:

⁷⁷ [Sl. No.	Parameters	Limits
1.	Specific gravity at 27° C, Min.	1.35
2.	Moisture, per cent. by mass, Max.	20.0
3.	Total reducing sugars, per cent. by mass, Min.	
	(a) For the Honey not listed below	65.0
	(b) Carvia callosa and Honeydew honey	60.0
	(c) Blends of Honeydew honey with blossom honey	45.0
4.	Sucrose, per cent. by mass, Max.	
	(a) For the Honey not listed below	5.0
	(b) Carvia callosa and Honeydew honey, Max.	10.0
5.	Fructose to Glucose ratio (F/G Ratio)	0.95-1.50
6.	Total Ash, per cent. by mass, Max.	0.50
7.	(a)Acidity expressed as formic acid, per cent. by mass, Max.	0.20
	(b) Free Acidity milliequivalents acid/ 1000 g, Max.	50.0
8.	Hydroxymethylfurfural (HMF) mg/kg, Max.	80.0
9.	Diastase activity, Schade units per gram, Min.	3.0
10.	Water insoluble matters, per cent. by mass, Max.	
	(a) For the Honey not listed below	0.10
	(b) For Pressed honey	0.5
11.	C4 Sugar, per cent. by mass, Max.	7.0
12.	Pollen count and plant element/g, Min.	5000

13.	2-Acetylfuran-3-Glucopyranoside (2-AFGP) as Marker for Rice Syrup	Absent**	
14.	Foreign oligosaccharides (Max. Percent Peak Area)	0.7	
15.	Proline, mg/kg, Min.	180.0	
16.	Electrical Conductivity:		
	(a)	Honeys not listed under Honeydew, Max.	0.8mS/cm
	(b)	Honeys listed under Honeydew, Min.	0.8 mS/cm
17.	(a) $\Delta\delta^{13}\text{C}$ Max*. (Maximum difference between all measured $\delta^{13}\text{C}$ values); per mil (‰)	± 2.1	
	(b) $\Delta\delta^{13}\text{C}_{\text{Fru}} - \text{Glu}$ (The difference in $^{13}\text{C}/^{12}\text{C}$ ratio between fructose and glucose); per mil(‰)	± 1.0	
	(c) $\Delta\delta^{13}\text{C}$ Protein – Honey (The difference in $^{13}\text{C}/^{12}\text{C}$ between honey and its associated protein extract); per mil(‰)	≥ -1.0	

* $\Delta\delta^{13}\text{C}$ Max. is the maximum difference observed between all possible isotopic ratios measured ($\Delta\delta^{13}\text{C}_{\text{fructose-disaccharides}} / \Delta\delta^{13}\text{C}_{\text{fructose-trisaccharides}} / \Delta\delta^{13}\text{C}_{\text{fructose-protein}} / \Delta\delta^{13}\text{C}_{\text{glucose-disaccharides}} / \Delta\delta^{13}\text{C}_{\text{glucose-trisaccharides}} / \Delta\delta^{13}\text{C}_{\text{glucose-protein}} / \Delta\delta^{13}\text{C}_{\text{disaccharides-trisaccharides}} / \Delta\delta^{13}\text{C}_{\text{disaccharides-protein}} / \Delta\delta^{13}\text{C}_{\text{trisaccharides-protein}}$).

**Minimum Required Performance Level- 1mg/kg]

⁷⁷[(VI) Honey shall not be heated or processed to such an extent that it's essential composition is changed and/or it's quality is impaired.

(VII) In addition to the labelling provisions as given in the Food Safety and Standards (Packaging and Labelling) Regulations, 2011, the following specific provisions shall be applicable for labelling of honey:

(a) Honey shall be labelled as:

A. Honeydew Honey - If the product complies with the definitions given in part 1 (i) of this standard;

B. Blend of Honeydew Honey and Blossom Honey – If the product is mixture of Blossom or Nectar Honey and Honeydew honey

C. Carvia Callosa Honey - If the honey is derived from flower of *Carviacallosa* plant which is described as thixotropic and is gel like extremely viscous when standing still and turns into liquid when agitated or stirred.

(b) If the honey is obtained by pressing broodless combs, honey shall be labelled as “Pressed Honey”. If honey belongs to any of the categories mentioned at a) above and also falling into the category of pressed honey, it shall be labelled as “Pressed Honeydew Honey” or “Pressed and Blend of Honeydew Honey and Blossom Honey” or “Pressed Carvia Callosa Honey”.

(VIII) Honey may be labelled as follows, according to floral or plant source, if it comes from any particular source and has the organoleptic, physicochemical and microscopic properties corresponding with that origin. It shall be in addition to the labelling requirements as given at vii) above:

A. Monofloral Honey - If the minimum pollen content of the plant species concerned is not less than 45 percent of total pollen content;

B. Multi Floral Honey – If the pollen content of any of the plant species does not exceed 45 percent of the total pollen content.]

⁷⁷[(IX) The said standards are applicable to packaged/ processed honey.]

2. Bees Wax.- (i) Beeswax is obtained from the honeycombs of bees (Family: *Apidae* e.g. *Apis mellifera* L) after the honey has been removed by draining or centrifuging. The combs are melted with hot water, steam or solar heat and the melted product is filtered and cast into cakes of yellow beeswax. White beeswax is obtained by bleaching the yellow beeswax with oxidizing agents, e.g. hydrogen peroxide, sulfuric acid, or sunlight.

Beeswax consists of a mixture of esters of fatty acids and fatty alcohols, hydrocarbons and free fatty acids; minor amounts of free fatty alcohols are also present.

(II) Description.- (a) Yellow beeswax: Yellow or light-brown solid that is somewhat brittle when cold and presents a dull, granular, non-crystalline fracture when broken; it becomes pliable at about 35°. It has a characteristic odour of honey.

(b) White beeswax: White or yellowish white solid (thin layers are translucent) having a faint and characteristic odour of honey.

(III) Requirements: When tested in accordance with method specified in JECFA for Beeswax (INS No. 901) shall conform to the following requirement:

Sl.No.	Parameter	Limit
1.	Solubility	Insoluble in water; sparingly soluble in alcohol; very soluble in ether
2.	Melting point range, °C	62 – 65
3.	Acid value	17 – 24
4.	Peroxide value, Max	5
5.	Saponification value	87 -104
6.	Carnauba wax	Absent
7.	Ceresin, paraffins and certain other waxes	Absent
8.	Fats, Japan wax, rosin and soap	Absent
9.	Glycerol and other polyols, per cent. by mass, Max.	0.5
10.	Lead, mg/kg, Max.	2.0
11.	Ash, per cent. by mass, Max.	0.50
12.	Total Volatile matter, per cent. by mass, Max.	0.75

3. Royal Jelly.- (a) Royal jelly is the mixture of secretions from hypopharyngeal and mandibular glands of worker bees, free from any additive. It is the food of larval and adult queens.

It is a raw and natural food, unprocessed except for filtration which does not undergo addition of substances. The color, taste and the chemical

composition of royal jelly are determined by absorption and transformation by the bees fed with the following two types of foods during the royal jelly production time:

- (i) type 1: only bee's natural foods (pollen, nectar and honey);
- (ii) type 2: bee's natural food and other nutrients (proteins, carbohydrates)

(b) 10-hydroxy-2-decenoic acid (HDA): HDA is the characteristic component of royal jelly.

(c) Requirements,-

(i) Description Royal jelly is milky white, pale yellow, with lustre. It is pasty or jelly-like at normal temperature with fluidity, and shall be free from the bubble and foreign substances. Minor crystallization phenomena can occur naturally in royal jelly during storage.

(ii) Odor and taste: It is pungent, unfermented and shall not be rancid. It is acerb, spicy, and brings acrid taste to palate and throat.

(iii) Chemical requirements: Royal jelly shall comply with the requirements as follows:

Table - Chemical requirements of royal jelly

Sr.No.	Characteristic	Permissible limit	
		Type 1	Type 2
1.	Moisture content per cent. by mass, Max.	62-68.5	
2.	10-HDA per cent. by mass, Min.	1.4	
3.	Protein, per cent. by mass	11-18	
4.	Total sugar, per cent. by mass	7-18	
5.	Fructose, per cent. by mass	2-9	
6.	Glucose, per cent. by mass	2-9	
7.	Sucrose, per cent. by mass, Max.	3	NA*
8.	Erllose, per cent. by mass, Max.	0.5	NA*

Sr.No.	Characteristic	Permissible limit	
9.	Maltose, per cent. by mass, Max.	1.5	NA*
10.	Maltotriose, per cent. by mass, Max.	0.5	NA*
11.	Total acidity, ml of 1 mol/l NaOH l/100 g	30.0-53.0	
12.	Total lipid, per cent. by mass	2-8	
13.	C13/C12 Isotopic ratio (δ ‰)	-29 to -20	-29 to -14

*NA = Not applicable

(iv) Furosine is an additional, optional quality parameter which shows freshness of royal jelly.]

2.8.4: GUR OR JAGGERY

1. GUR OR JAGGERY means the product obtained by boiling or processing juice ⁴⁷[omit] extracted from palmyra palm, date palm or coconut palm. It shall be free from substances deleterious to health and shall conform to the following analytical standards, on dry weight basis: -

Total sugars expressed as invert sugar Not less than 90 percent and
sucrose not less than
60 percent

Extraneous matter insoluble in water Not more than 2 per cent

Total ash Not more than 6 per cent

Ash insoluble in hydrochloric acid (HCl) Not more than 0.5 per cent

Gur or jaggery other than that of the liquid or semi liquid variety shall not contain more than 10% moisture. The product may contain food additives permitted in these Regulations and Appendices.

Sodium bicarbonate, if used for clarification purposes, shall be of food grade quality.

⁴⁷[2. CANE JAGGERY OR CANE GUR:

(1) Cane Jaggery or Cane Gur: Cane Jaggery or Cane Gur means the product obtained by boiling or processing juice pressed out of sugarcane (*Saccharum officinarum*). It shall be free from substances unsafe to health and shall conform to the following analytical standards on dry weight basis:-

Sl. No.	Characteristics	Permissible limit
1	Moisture, per cent. by mass, Max	7.0
2	Sucrose, per cent. by mass, Min	70.0
3	Total Sugars, Min	90.0
4	Reducing sugars, per cent. by mass, Max	20.0
5	Sulphate ash, per cent. by mass, Max	4.0
6	Ash insoluble in dilute hydrochloric acid, per cent. by mass, Max	0.5
7	Extraneous matter and water insoluble matter, per cent. by mass, Max	2.0
⁸² [8.	Reducing sugars, per cent. by mass, Min	5.5]

Sodium bicarbonate, if used for clarification purpose, shall be of food grade quality.

(2) Food Additives

Additives permitted under these regulations shall be used. Added colour shall not be permitted.

(3) Hygiene

The product shall be prepared and handled in accordance with the guidelines specified in Schedule 4, Part-II of the Food Safety and Standards (Licensing and Regulation of Food Businesses) Regulations, 2011 and any other guidelines as provided from time to time under the Act.

(4) Contaminants, Toxins and Residues

The product covered in this standard shall comply with the Food Safety and Standards (Contaminants, toxins and Residues) Regulations, 2011.

The product covered in this standard shall conform to the microbiological requirements specified in Appendix B of these regulations.

(5) Packaging and Labelling The product shall comply with the packaging and labelling requirements specified in the Food Safety and Standards (Packaging and Labelling) Regulations, 2011.]

2.8.5: DEXTROSE

1. **DEXTROSE** is a white or light cream granular powder, odourless and having a sweet taste.

When heated with potassium cupritartrate solution it shall produce a copious precipitate of cuprous oxide. It shall conform to the following standards:-

Sulphated ash	Not more than 0.1 per cent on dry basis
Acidity	0.5 gm. Dissolved in 50 ml. of freshly boiled and cooled water requires for neutralisation not more than 0.20 ml. of N/10 sodium hydroxide to phenolphthalein indicator.
Glucose	Not less than 99.0 per cent on dry basis.

The product may contain food additives permitted in these Regulations and Appendices.

2.8.6: GOLDEN SYRUP

1. **GOLDEN SYRUP** means the syrup obtained by inversion of sugar. It shall be golden yellow in colour, pleasant in taste and free from any crystallisation.

It shall conform to the following standards:-

Moisture	Not more than 25.0 per cent by weight
Total Ash	Not more than 2.5 per cent by weight
Total Sugar as invert sugar	Not less than 72.0 per cent by weight

The product may contain food additives permitted in these regulations including Appendix A. Sodium bicarbonate, if used, for clarification purposes, shall be of

Food Grade Quality.

2.8.7 DRIED GLUCOSE SYRUP means the material in the form of coarse or fine, white to creamish white powder, sweet to taste, bland in flavour and somewhat hygroscopic. It shall be free from fermentation, evidence of mould growth, dirt or other extraneous matter or added sweetening or flavouring agent. It shall also not contain any added natural or coal tar food colour. It shall conform to the following standards:—

Total solid contents	Not less than 93.0 per cent by weight.
Reducing sugar content	Not less than 20.0 per cent by weight.
Sulfated Ash	Not more than 1.0 per cent by weight.

The product may contain food additives permitted in these Regulations and Appendices.

⁴⁷**[2.8.8: Sodium Saccharin (Food Grade)-**

(1) Sodium Saccharin is white crystals or white crystalline powder. It is odourless or having a faint odour. It is intensely sweet to taste, even in dilute solution. 1 g is soluble in 1.5 ml of water and in about 50 ml of alcohol. When tested in accordance with method specified in Indian Standard, IS 5345, it shall conform to the following standards:

Sl. No.	Characteristics	Permissible limit
1.	Purity as $C_7H_4NNaO_3S$, after drying at 120°C for 4 h, per cent. by mass, min	99.0
2.	Moisture, per cent. by mass, Max	15.0
3.	Acidity and alkalinity	To pass the test
4.	Benzoate and salicylate	To pass the test
5.	Readily carbonizable substances	To pass the test
6.	Toluene sulfonamides, ppm, Max	25.0

(2) Hygiene The product shall be prepared and handled in accordance with

the guidelines specified in Schedule 4, Part-II of the Food Safety and Standards (Licensing and Regulation of Food Businesses) Regulations, 2011 and any other guidelines as provided from time to time under the Act.

(3) Contaminants, Toxins and Residues The product covered in this standard shall comply with the Food Safety and Standards (Contaminants, toxins and Residues) Regulations, 2011. The products covered in this standard shall confirm to the microbiological requirements specified in Appendix B of these regulations.

(4) Packaging and Labelling The product shall comply with the packaging and labelling requirements as specified in the Food Safety and Standards (Packaging and Labelling) Regulations, 2011]

2.8.9: ASPARTYL PHENYL ALANINE METHYL ESTER (ASPERTAME)

1. Aspartyl Phenyl Alanine Methyl Ester commonly known as Aspartame, having empirical formula as $C_{14}H_{18}N_2O_5$ and molecular weight as 294.31 shall be the material which is slightly soluble in water and Methanole. It shall contain not less than 98 per cent and not more than 102 per cent of Aspartame on dried basis. It shall not contain more than 3 ppm of Arsenic and 10 ppm of Lead.

The loss on drying of the material at 105°C for 4 hours shall not be more than 4.3 per cent of its weight. The sulphate ash shall not be more than 0.2 per cent. It shall not contain more than 1 per cent of diketo-piper-azine.

2.8.10: Acesulfame Potassium

1. Acesulfame Potassium commonly known as Acesulfame-K, having empirical formula $C_4H_4KNO_4S$, molecular weight as 201.24 shall be the material which is odourless, white crystalline powder having intensely sweet taste and is very slightly soluble in ethanol but freely soluble in water. It shall contain not less than 99 per cent and not more than 101 per cent of Acesulfame-K on dried basis. It shall not contain more than 3 ppm. Flouride. Heavy metals content shall not be more than 10 ppm. The loss on drying of material at 105 degree centigrade for two hours shall not be more than 1 percent of its weight.

2.8.11: Sucralose

1. Sucralose:

Chemical name - 1, 6-Dichloro-1, 6-Dideoxy-β-D-Fructofuranosyl-4-Chloro-4-Deoxy-α-D-galactopyranoside;

Synonyms -4, 1 '6'-Trichlorogalactosucrose; INS 955

Chemical formula

- $C_{12}H_{19}Cl_3O_8$

Molecular

weight- 397.64

It shall be white to off-white, odourless, crystalline powder, having a sweet taste. It shall be freely soluble in water, in methanol and in alcohol and slightly soluble in ethyl acetate. It shall contain not less than 98.0% and not more than 102.0% of $C_{12}H_{19}Cl_3O_8$ calculated on anhydrous basis. It shall not contain more than 3PPM of Arsenic (as AS) and 10PPM or heavy metals (as Pb). It shall not contain more than 0.1% of methanol. Residue on ignition shall not be more than 0.7% and ⁷³[water not more than 2.0%]

⁴⁷[2.8.12: Calcium Saccharin (Food Grade)- (1) Calcium Saccharin is white crystals or white crystalline powder. It shall be odourless or having a faint odour and an intensely sweet taste even in dilute solution. One gram is soluble in 1.5 ml of water. When tested in accordance with method specified in Indian Standard, IS 5345, it shall conform to the following standards:

Sl. No.	Characteristics	Permissible limit
1.	Purity as $C_{14}H_8CaN_2O_6S_2$, on dry basis, per cent. by mass, Min	99.0
2.	Moisture, per cent. by mass, Max	15.0
3.	Benzoate and salicylate	To pass the test
4.	Readily carbonizable substances	To pass the test
5.	Toluene sulfonamides, ppm, Max	25.0

(2) Hygiene

The product shall be prepared and handled in accordance with the guidelines specified in Schedule 4, Part-II of the Food Safety and Standards (Licensing and Regulation of Food Businesses) regulations, 2011 and any other guidelines as

provided from time to time under the Act.

(3) Contaminants, Toxins and Residues

The product covered in this standard shall comply with the Food Safety and Standards (Contaminants, toxins and Residues) Regulations, 2011. The products covered in this standard shall conform to the microbiological requirements specified in Appendix B of these regulations.

(4) Packaging and Labelling

The product shall comply with the packaging and labelling requirements specified in the Food Safety and Standards (Packaging and Labelling) Regulations, 2011].