

هيئة التقييس لدول مجلس التعاون لدول الخليج العربية
GCC STANDARDIZATION ORGANIZATION (GSO)

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المانجو المعلب
CANNED MANGOES

Prepared by
The Gulf Technical committee for Standards of Food and Agriculture products

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This document is a draft GSO Standard circulated for comments. It is, therefore, subject to alteration and modification and may not be referred to as a GSO Standard until approved by GSO.

Foreword

GCC Standardization Organization (GSO) is a regional Organization which consists of the National Standards Bodies of GCC member States. One of GSO main functions is to issue Gulf Standards /Technical regulations through specialized technical committees (TC5).

GSO through the technical program of committee TC No.: 5 " *The Gulf Technical committee for Standards of Food and Agriculture products* " has prepared this Standard. The Draft Standard has been prepared by (*Republic of Yemen*).

This standard has been approved as a Gulf (Standard / Technical Regulation) without any technical modifications / with technical modifications (*to be stated*) by GSO Board of Directors in its meeting No.(),held on / / H , / / G.

CANNED MANGOES**1. SCOPE AND FIELD OF APPLICATION**

This standard is concerned with canned mangoes and its different types.

2. COMPLEMENTARY REFERENCES

- 2.1 GSO 9 “Labelling of Prepackaged Foods”.
- 2.2 GSO 20 “Methods for the Determination of Contaminating Metallic Elements in Foodstuffs”.
- 2.3 GSO 21 “Hygienic Regulations for Food Plants and Their Personnel”.
- 2.4 GSO 22 “Methods of Test for Colouring Matter Used in Foodstuffs”.
- 2.5 GSO 150 “Expiration Periods of Food Products-Part I”.
- 2.6 GSO 244 “Methods of Test for Vegetable, Fruits and Their Products, First Part: Organoleptic Examination, Determination of Net Weight and Drained Weight, Determination of Apparent Viscosity, Determination of Head-Space, Determination of Extraneous Matter and Defective Fruits”.
- 2.7 GSO 382 “Maximum Limits for Pesticides Residues in Food Products, Part 1
- 2.8 GSO 383 “Maximum Limits for Pesticides Residues in Food Products,Part 2
- 2.9 GSO 590 “Microbiological Methods of Food Examination – Part 3 Commercial Sterility Test”.
- 2.10 GSO 1287 “Methods of Sampling of Prepackaged Fruit and Vegetable Products”.
- 2.11 GSO Standard on “Hermetically Sealed Round Tin Cans Used for Canning Foodstuffs”.
- 2.12 GSO 1290 “Methods of Test for Fruit Juices”.
- 2.13 GSO Standard on “Methods of Determination of Pesticides Residues in Food Products”.
- 2.14 GSO 988 “Limits of Radioactivity Levels Permitted in Foodstuffs – Part 1”.
- 2.15 GSO 998 “Methods for Detection of Permissible Radionuclides Limits in Food – Part 1: Gamma Spectrometry Analysis: A–Cs-134, Cs-137.
- 2.16 GSO CAC 192, " Codex General Standard For Food Additives.
- 2.17 GSO 1016, Microbiological Criteria For Foodstuffs – Part 1
- 2.18 GSO 1804, Sensory analysis of foods – part2 – General requirements.
- 2.19 GSO 1805-3, Sensory analysis of foods – part3 –
- 2.20 GSO 842, Microbiology - General Guidance For Enumeration Of Yeasts And Moulds - Colony Count Technique At 25 °C.
- 2.21 GSO ISO 4831, Microbiology — General Guidance For The Enumeration Of Coliforms – Most Probable Number Technique.
- 2.22 GSO ISO 4832, Microbiology – General Guidance For The Enumeeration Of Coliforms – Colony Count Technique.
- 2.23 GSO ISO 4833, Microbiology – General Guidance For The Enumeration Of Micro-Organisms – Colony Count Technique At 30 °C.
- 2.24 GSO 1694, General Principles Of Food Hygiene.

- 2.25 GSO ISO 2173, Fruit and vegetable products – Determination of soluble solids - Refractometric method.
- 2.26 GSO ISO 2448, Fruit and vegetable products – Determination of ethanol content.
- 2.27 GSO 1791, Three piece steel round cans used for canning food stuffs.
- 2.28 GSO 1795, methods of test for two -piece steel round cans used in canning food – stuffs.

3. DEFINITIONS

3.1 Canned mangoes

An alimentary product prepared from peeled, stemmed, fresh, sound, clean, and mature fruit, and conforming to the properties characterized for the fruit of [Mangifera indica L.] packed with or without a suitable liquid packing medium, nutritive sweeteners, seasoning or flavouring ingredients suitable for the product, and processed by heat, in an appropriate manner, before or after being sealed in a container, in order to preserve its essential composition and quality factors.

- 3.2 Mango pulp: It produces from edible portion of sound ripe mangoes after mixing ,grinding ,naturalization and then filtered.

3.3 Defects

3.3.1 Blemishes

Surface discolouration and spots arising from physical, pathological, insect or other agents that definitely contrast with the overall colour, and which may penetrate into the flesh. Examples include bruises, scab and dark discolouration.

3.3.2 Crushed units

Means a unit which has been crushed to the extent that it has lost its normal shape (not due to ripeness) or has been severed into definite parts (partially disintegrated halves are not counted as broken). All portions that collectively equal the size of a full size unit are considered one unit in applying the allowance herein.

3.3.3 Harmless extraneous material

Means any vegetable substance (such as, but not limited to a leaf or portion thereof or a stem or portion thereof) that is harmless but which tends to detract from the appearance of the product.

3.3.4 Trim

Considered a defect only in halved and sliced canned mangoes in liquid media packs. The trimming must be excessive and includes serious gouges (whether due to physical trimming or other means) on the surface of the units which definitely detract from the appearance of the product.

4. CLASSIFICATION

Canned mangoes shall be classified according to styles of preparation, type of pack or packing media.

4.1 According to styles of preparation:

- 4.1.1 Halves - cut into two approximately equal parts along the stone from stem to apex and the flesh separated from the skin.
- 4.1.2 Slices - long, slender pieces cut lengthwise or crosswise.

- 4.1.3 Pieces - (or mixed pieces or irregular pieces) - pitted and comprising irregular shapes and sizes.
- 4.1.4 Diced - flesh cut into cube - like parts with a dimension of at least 12 mm on the longest side.
- 4.1.5 Other styles - Any other presentation of the product which is sufficiently distinctive from other previous forms.
- 4.2 According to type of pack:
- 4.2.1 Regular pack - fruits packed with liquid packing medium.
- 4.2.2 Solid pack - closely packed fruits prepared by packing without a liquid packing medium; a dry nutritive sweetener may be used.
- 4.3 According to packing media: Where a packing medium is used, it may consist of:
- 4.3.1 Water: in which water is the sole liquid packing medium;
- 4.3.2 Fruit juice: in which mango juice-or any other compatible fruit juice is the sole packing medium;
- 4.3.3 Mixed fruit juices - in which two or more compatible fruit juices which may include mango juice, are combined to form the packing medium;
- 4.3.4 Water and fruit juice (s) - in which water and mango juice, or water and any other single fruit juice or water and two or more fruit juices are combined in any percentage to form the packing medium.
- 4.3.5 Any of the foregoing packing media item (4.3) may have one or more of the following nutritive sweeteners added: sucrose, invert sugars syrup, dextrose, dried glucose syrup, glucose syrup, fructose, fructose syrup, honey.
- 4.3.6 Dry nutritive sweeteners: In which one or more of the following nutritive sweeteners is the packing medium namely: (sucrose, invert sugar, dextrose and dried glucose syrup), and without adding liquid except such slight amounts of steam, water, or natural juice, during regular packing for the product.
- 4.3.7 Classification of packing media when nutritive sweeteners are added.
- 4.3.7.1 When nutritive sweeteners are added to fruit juice the packing media shall be not less than 11° Brix, and shall be classified on the basis of the cut-out strength as follows:
Lightly sweetened fruit juice: Not less than 11° Brix.
Heavily sweetened fruit juice: Not less than 15° Brix.
- 4.3.7.2 When nutritive sweeteners are added to water or water and fruit juice or water and nectar the liquid media shall be classified on the basis of the cut-out strength according to table (1).

Table (1)
Cut - out strength of liquid packing medium

Liquid packing media	Cut-out strength
Water slightly sweetened or Extra light syrup	From 10° Brix to less than 14° Brix
Light syrup	From 14° Brix to less than 18° Brix
Heavy syrup	From 18° Brix to less than 24° Brix
Extra heavy syrup	From 24° Brix to 35° Brix

- 4.3.7.3 When nutritive sweeteners are added to water and fruit juice and the minimum fruit juice content of the packing medium is not less than 40% m/m, the packing medium may be classified as a nectar provided the cut-out strength is not less than 20° Brix.
- 4.3.7.4 The cut-out strength for any packing medium shall be determined on average, but no container may have a Brix value lower than that of the next category below.

5. REQUIREMENTS

- 5.1 The following requirements shall be met in canned mangoes:
- 5.1.1 The production shall comply with hygienic conditions stated in the GSO standard mentioned in (2.3).
- 5.1.2 The raw materials used in the production shall comply with relevant GSO standards.
- 5.1.3 Canned mangoes shall have a flavour and odour characteristic of the variety or type used for canning and shall be free from odours or flavours foreign to the product; and canned mangoes with special ingredients shall have the characteristic flavour of the mangoes and the other substances used.
- 5.1.4 The colour of the product shall be characteristic of the type or variety of mango, canned mangoes containing special ingredients shall be considered to be of characteristic colour when there is no abnormal discolouration of the respective ingredient used.
- 5.1.5 90% by count of the units [in case of halved] shall be reasonably uniform in size. Where a unit has broken within the container, the combined broken pieces are considered as a single unit.
- 5.1.6 Not more than 20% by count of units shall be sliced in a direction other than parallel to the crease and of these not more than half may have been sliced horizontally.
- 5.1.7 Size of packed product (fruits and packing medium) shall occupy not less than 90% of the water capacity of the container.
- 5.1.8 The drained weight of the product shall be not less than 55% of the water capacity of container.
- 5.1.9 Defects-if founded-shall not exceed the limits mentioned in table (2).

Table (2) *
Maximum limits of defects

Defects	Liquid media packs	Solid packs
Blemishes and trim	30 % by count	3 units per 500 g
Crushed units	5 % by weight	—
Rind	not more than 6 cm ² aggregate area per 500 g	not more than 12 cm ² aggregate area per 500 g
Pit or pit material [average]	1/8 stone or equivalent per 500 g	1/8 stone or equivalent per 500 g
Harmless extraneous material	2 pieces per 500 g	3 pieces per 500 g

- 5.1.10 Ratio of contaminating metallic elements in the final product shall not exceed the following:

- Lead : 1 ppm
Tin : 250 ppm
- 5.1.11 The additive which is allowed is according to the GSO standard mentioned in item (2.16).
- 5.2 The following requirements shall be met in mangoes pulp:
- 5.2.1 Homogeneity of textures, color and clarity of taste and smell of full maturity mangoes.
- 5.2.2 free from the strange taste resulting from the era of parts of the peels.
- 5.2.3 free from peels and impurities and any other similar exotic materials.
- 5.2.4 The percentage of total dissolved solids not be less than 14-25% estimated by refractometer at a temperature of (20)°C without modifying the acidity.
- 5.2.5 The percentage of natural mango pulp shall not be less than (95%) in unsweetenedpulp, and (85%) in the sweetenedpulp.
- 5.2.6 Percentage of total sugars in the final product shall not be less than (15% w / w).
- 5.2.7 The percentage of ethanol in the final product should not exceed (0.3% w / w).
- 5.2.8 The acidness percentage expressed as citric acid shall not exceed (0.3% w / w).
- 5.2.9 The additive which is allowed is according to the GSO standard mentioned in item (16.2).
- 5.2.10 The following substances may be added in quantities consistent with good manufacturing :
- Sugars (sucrose ,dextrose , glucose syrup).
- Honey.
- Lemon juice.
- Citric acid.
- Malic acid.
- 5.2.11 The ratio of contaminating metallic elements , if any , in the product must not exceed:
- | | |
|--------------------------|-------------|
| Arsenic (As) | 0.2 mg / kg |
| Lead (Pb) | 0.3 mg / kg |
| Copper (Cu) | 5 mg / kg |
| Zinc (Zn) | 5 mg / kg |
| Iron (Fe) | 15 mg / kg |
| Tin (Sn) | 250 mg / kg |
| Total iron, copper, zinc | 20 mg / kg |
- 5.2.12 The total number of microbes must not exceed the following limits, taking into account the requirements in the GSO standard mentioned in item (17.2).
- The total number of bacteria not more than 10³/ g or ml.
- The number of yeasts and molds not more than 10³ / g or ml.
- The product shall be free of coliform bacteria.
- 5.2.13 Mango pulp should be appropriate with few fibers ,It can be of variable texture and not dough or extremely rigidity when packing with a liquid medium and not be extremely rigidity when packaged with a dry medium.
- 5.3 The following requirements shall be met in canned mango and mango pulp.
- 5.3.1 The preparation at production operation of these proxucts shall be according to the requirements mentioned in item (2.24).

- 5.3.2 The ratio of pesticides residues in the product shall not exceed the limits stated in the GSO standards mentioned in (2.7) and (2.8).
- 5.3.3 The limits of radioactive levels in the product shall not exceed those mentioned in the GSO standard mentioned in (2.14).
- 5.3.4 The product shall be pass commercial sterility test.

6. PACKAGING , TRANSPORTATION AND STORAGE

- The following shall be met during packaging, transportation and storage:
- 6.1 **Packaging**
The containers shall be clean, hygienic, suitable, dry and hermetically sealed. In the case where tin cans are used, they shall comply with the GSO standard mentioned in (2.11)
- 6.2 **Transportation**
Transportation shall be carried out in such a way to protect the container from mechanical damage and contamination.
- 6.3 **Storage**
The containers shall be stored in well ventilated stores far away from sources of heat and contamination.

7. SAMPLING

The samples shall be taken according to the GSO standard mentioned in (2.10).

8. TESTING

- 8.1 **Methods of Test**
- Drained weight, defects ratio, extraneous matter and head space shall be determined according to the GSO standard mentioned in (2.6).
 - Toxic metallic elements shall be determined according to the GSO standard mentioned in (2.2).
 - Colouring matter shall be determined according to the GSO standard mentioned in (2.4), artificial sweeteners and ascorbic acid shall be determined according to the GSO standard mentioned in (2.12).
 - Determination of pesticides residues shall be carried out according to the GSO standard mentioned in (2.13).
 - Detection of limits of radioactive levels shall be carried out according to the GSO standard mentioned in (2.15).
 - Microbiological tests shall be carried out according to the GSO standard mentioned in (2.9).
 - Sensory tests:
Sensory tests are performed according to the GSO standards mentioned in items (2.18, 2.19). And to be carried out by people trained in this type of test.
 - Chemical tests:

- A - Determination of dissolved solids: according to GSO standard mentioned in item (2.25).
- B - Determination of total acidity (estimated as citric acid): According to the GSO standard mentioned in item (2.12).
- C - Determination of ethyl alcohol: According to GSO standard mentioned in item (2.26).

8.2 Tests

Tests shall be carried out on the representative sample taken according to (8) to determine its conformity to all items of this standard.

9. LABELLING

Without prejudice to what is mentioned in the GSO standards mentioned in (2.1) and in (2.5) the following information shall be declared on the container:

- 9.1 Name of canned product: "Mangoes".
- 9.2 Styles of preparation: "Halves", "Slices", "Diced", "Pieces", or "Mixed pieces" or "Irregular pieces".
- 9.3 The packing medium and its concentration according to (4.3).
- 9.4 The fruit juice component of any packing medium shall not be declared in the name of the product if it comprises less than 10% (m/m) of the total packing medium but it shall be declared in the list of ingredients.
- 9.5 The packing type according to (4.2).
- 9.6 Product Name and address of the brand, if any.
- 9.7 Ingredients in descending order according to their percentages.
- 9.8 Net weight by using international units.
- 9.9 Production date and expiration date in month and year.
- 9.10 Storage conditions and conservation (the optimum storage temperature).