

# CODEX ALIMENTARIUS

INTERNATIONAL FOOD STANDARDS



Food and Agriculture  
Organization of  
the United Nations



World Health  
Organization

E-mail: [codex@fao.org](mailto:codex@fao.org) - [www.codexalimentarius.org](http://www.codexalimentarius.org)

---

## STANDARD FOR QUICK FROZEN STRAWBERRIES

CXS 52-1981

Adopted in 1981. Amended in 2019, 2022.

**2022 Amendment**

Following decisions taken at the Forty-fifth Session of the Codex Alimentarius Commission in December 2022, amendments were made in Section 6.5 Labelling of non-retail containers.

## 1. SCOPE

This standard (formerly CAC/RS 52-1971) shall apply to quick frozen strawberries (excluding quick frozen strawberry puree) of the species *Fragaria grandiflora* L. and *Fragaria vesca* L. as defined below and offered for direct consumption without further processing, except for size grading or repacking if required. It does not apply to the product when indicated as intended for further processing or for other industrial purposes.

## 2. DESCRIPTION

### 2.1 Product definition

Quick frozen strawberries are the product prepared from fresh, clean, sound, ripe and stemmed strawberries of firm texture conforming to the characteristics of *Fragaria grandiflora* L. or *Fragaria vesca* L.

### 2.2 Process definition

Quick frozen strawberries are the product subjected to a freezing process in appropriate equipment and complying with the conditions laid down hereafter. This freezing operation shall be carried out in such a way that the range of temperature of maximum crystallization is passed quickly. The quick-freezing process shall not be regarded as complete unless and until the product temperature has reached -18 °C (0 °F) at the thermal centre after thermal stabilization. The recognized practice of repacking quick frozen products under controlled conditions is permitted.

### 2.3 Handling practice

The product shall be handled under such conditions as will maintain the quality during transportation, storage and distribution up to and including the time of final sale. It is recommended that during storage, transportation, distribution and retail, the product be handled in accordance with the provisions in the *Code of Practice for the Processing and Handling of Quick Frozen Foods* (CXC 8-1976).<sup>1</sup>

### 2.4 Presentation

#### 2.4.1 Style

- (a) Quick frozen strawberries shall be presented as whole, halved, sliced or cut.
- (b) Quick frozen strawberries may be presented as free-flowing (i.e. as individual berries not adhering to one another) or non free-flowing (i.e. as a solid block).
- (c) Other styles

Any other presentation of the product shall be permitted provided that it:

- i) is sufficiently distinctive from other forms of presentation laid down in this standard;
- ii) meets all other requirements of this standard; and
- iii) is adequately described on the label to avoid confusing or misleading the consumer.

#### 2.4.2 Sizing

- (a) Whole strawberries may be presented as sized or unsized.
- (b) If whole strawberries are size graded, they shall be reasonably uniform within each package such that the diameter of the largest berry does not exceed the diameter of the smallest berry by more than 10 mm, measured according to the maximum diameter.
- (c) In the case of *Fragaria grandiflora* L., the maximum diameter of each berry whether sized or unsized shall not be less than 15 mm.

## 3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

### 3.1 Optional ingredients

Sugars (sucrose, invert sugar, dextrose, fructose, glucose syrup, dried glucose syrup).

### 3.2 Composition

**3.2.1 Strawberries prepared with dry sugars:** The total soluble solids content of the liquid extracted from the thawed, comminuted sample shall be not more than 35 percent m/m nor less than 18 percent m/m expressed as sucrose, as determined by refractometer at 20 °C.

**3.2.2 Strawberries prepared with syrup:** The amount of syrup used shall be not more than that required to cover the berries and fill the spaces between them. The total soluble solids content of the liquid extracted from the thawed, comminuted sample shall be not more than 25 percent m/m nor less than 15 percent m/m expressed as sucrose, as determined by refractometer at 20 °C.

### 3.3 Quality factors

#### 3.3.1 *Organoleptic and other characteristics*

Quick frozen strawberries shall be:

- (a) of good colour;
- (b) free from foreign flavour and odour;
- (c) intact, if whole, and not materially disintegrated;
- (d) intact, if halved, sliced or cut and not seriously affected by disintegrated fruit;
- (e) clean, practically free from sand and grit and free from other foreign material;
- (f) practically free from stalks, parts of stalks, calyces, leaves and other extraneous vegetable material;
- (g) sound, practically free from mould, insect bites and other blemishes;
- (h) normally developed;
- (i) of similar varietal characteristics in each package; and
- (j) when presented as free-flowing, practically free from berries adhering to one another (whole, halved, sliced or cut), which cannot be easily separated by hand without damage when in a frozen state; not icy.

#### 3.3.2 *Analytical characteristics*

Mineral impurities such as sand no more than 0.1 percent m/m on a whole product basis.

### 3.4 Definition of defects

- |  |  |
|--|--|
| <b>3.4.1</b> Partially uncoloured      | - 25%–75% of the outer surface area without the colour characteristic of the variety     |
| <b>3.4.2</b> Completely uncoloured     | - 75% or more of the other surface area without the colour characteristic of the variety |
| <b>3.4.3</b> Disintegrated             | - broken, crushed or smashed   |
| <b>3.4.4</b> Stalks or parts of stalks | - if each greater than 3 mm in one dimension   |
| <b>3.4.5</b> Blemished                 | - showing visible signs of pest attack or pathological or physical injury                |
| <b>3.4.6</b> Misshapen                 | - not normally developed and more in particular containing hard parts in the fruit flesh |

### 3.5 Tolerances for defects

**3.5.1** Based on a sample unit of 500 g, the drained fruit ingredient of the product as defined in paragraph 3.5.2 a) shall have not more than the following:

- |  |                   |
|--|-------------------|
| (a) stalks or parts of stalks each greater than<br>3 mm in one dimension | 3 by number       |
| (b) calyces  | 3 cm <sup>2</sup> |
| (c) other extraneous vegetable material                                  | 3 cm <sup>2</sup> |
| (d) completely uncoloured whole berries                                  | 1 by number       |
| (e) partially uncoloured whole berries                                   | 5% m/m            |
| (f) disintegrated whole berries  | 5% m/m            |
| (g) blemished  | 5% m/m            |
| (h) misshapen whole berries  | 2% m/m            |
| (i) dissimilar varieties   | 6% m/m            |

### 3.5.2 *Drained fruit ingredient*

- (a) The drained fruit ingredient is determined by thawing the product until it is practically free from ice crystals and then draining on a screen "3 mesh/cm" (8 mesh/inch) for two minutes. The weight of fruit retained on the screen is "drained fruit ingredient". Any of the material described in paragraph 3.5.1(a), (b) or (c) found in the drained syrup shall be added to the drained fruit ingredient for the purpose of applying the tolerances.
- (b) When dry sugar has been added to whole berries after freezing, the dry sugar shall be washed off with water before draining.

### 3.6 Tolerances for sizes of whole strawberries

**3.6.1** When presented as sized, a tolerance of ten percent by number is allowed for fruit that fail to meet the requirements of paragraph 2.4.2(b).

**3.6.2** In the case of *Fragaria grandiflora* L. whether sized or unsized, the amount of fruit having a maximum diameter of less than 15 mm (paragraph 2.4.2(c)) shall not exceed five percent by number.

### 3.7 Classification of "defectives"

**3.7.1** Any sample unit from a sample taken in accordance with an appropriate sampling plan with an AQL 6.5, (see relevant Codex texts on methods of analysis and sampling) shall be regarded as "defective" when:

- (a) the total soluble solids of the sample unit is outside the range specified in 3.2.1 or 3.2.2 as appropriate; or
- (b) any one of the organoleptic and other characteristics under 3.3.1 are not complied with; or
- (c) (i) any one of the defects listed under 3.5 is present in more than twice the amount of the specified tolerance for the individual defect; or
  - (ii) the total of defects in (e) to (i) exceeds 15% for whole strawberries; or
  - (iii) the total of defects in (g) and (i) exceeds 12% for halved, sliced or cut strawberries; or
- (d) the tolerance for sizes of whole strawberries as listed in 3.6 is exceeded.

### 3.8 Lot acceptance

A lot is considered acceptable when the number of such defectives as specified in a) or b) or c) or d) in 3.7 when treated independently of each other does not exceed the acceptance number c) of an appropriate sampling plan with an AQL of 6.5. (See relevant Codex texts on methods of analysis and sampling).

## 4. FOOD ADDITIVES

### Maximum level

Ascorbic acid }

Citric acid }

Limited by GMP

## 5. HYGIENE

**5.1** It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *General Principles of Food Hygiene* (CXC 1-1969),<sup>2</sup> and other codes of practice recommended by the Codex Alimentarius Commission which are relevant to this product.

**5.2** To the extent possible in good manufacturing practice, the product shall be free from objectionable matter.

**5.3** When tested by appropriate methods of sampling and examination, the product:

- shall be free from microorganisms in amounts which may represent a hazard to health;
- shall be free from parasites which may represent a hazard to health; and
- shall not contain any substance originating from microorganisms in amounts which may represent a hazard to health.

## 6. LABELLING

In addition to the requirements of the *General Standard for the Labelling of Pre-packaged Foods* (CXS 1-1985),<sup>3</sup> the following specific provisions apply:

## 6.1 The name of the food

- 6.1.1** The name of the food as declared on the label shall include "strawberries" or in the case of *Fragaria vesca* L., "wild strawberries" or "alpine strawberries". The words "quick frozen" shall also appear on the label, except that the term "frozen"<sup>i</sup> may be applied in countries where this term is customarily used for describing the product processed in accordance with subsection 2.2 of the standard.
- 6.1.2** In addition, there shall appear on the label in conjunction with, or in close proximity to, the word "strawberries":
- (a) the style, as appropriate: "halves", "slices" or "cut".
  - (b) the packing medium: "with (name of the sweetener and whether as such or as the syrup)".
- 6.1.3** If the product is presented in accordance with subsection 2.4.1.c) the label shall contain in close proximity to the word "strawberry" such additional words or phrases that will avoid misleading or confusing the consumer.

## 6.2 Size designation

- 6.2.1** If a term designating the size of the strawberries is used:
- (a) it shall be supported by a correct graphic representation on the label of the size range to which the strawberries predominantly conform; and/or
  - (b) by a statement of the predominant range of the maximum diameter of the strawberries in millimetres, or fractions of an inch in those countries where the English system is in general use: and/or
  - (c) it shall conform to the customary method of declaring size in the country in which the product is sold.

## 6.3 Additional requirements

Information for keeping and thawing of the product shall be given on retail packs.

## 6.4 Bulk packs

In the case of quick frozen strawberries in bulk the information required above must either be placed on the container or be given in accompanying documents, except that the name of the food accompanied by the words "quick frozen" (the term "frozen" may be used in accordance with subsection 6.1.1 of this standard) and the name and address of the manufacturer or packer must appear on the container.

## 6.5 Labelling of non-retail containers.

The labelling of non-retail containers should be in accordance with the *General Standard for the Labelling Non-Retail Containers of Foods* (CXS 346-2021).<sup>4</sup>

## 7. PACKAGING

- 7.1** Packaging used for quick frozen strawberries must:
- 7.1.1** protect the organoleptic and quality characteristics of the product;
  - 7.1.2** protect the product from bacteriological and other contamination (including contamination from the packaging material itself);
  - 7.1.3** protect the product from moisture loss, dehydration and, where appropriate, leakage as far as technologically practicable; and
  - 7.1.4** not pass on to the product any odour, taste, colour or other foreign characteristics.

## 8. METHODS OF ANALYSIS AND SAMPLING

For checking the compliance with this standard, the methods of analysis and sampling contained in the *Recommended Methods of Analysis and Sampling* (CXS 234-1999)<sup>5</sup> relevant to the provisions in this standard shall be used.

---

<sup>i</sup> This term is used as an alternative to "quick frozen" in some English-speaking countries.

## NOTES

<sup>1</sup> FAO and WHO. 1976. *Code of Practice for the Processing and Handling of Quick Frozen Foods*. Codex Alimentarius Code of Practice, No. CXC 8-1976. Codex Alimentarius Commission. Rome.

<sup>2</sup> FAO and WHO. 1969. *General Principles of Food Hygiene*. Codex Alimentarius Code of Practice, No. CXC 1-1969. Codex Alimentarius Commission. Rome.

<sup>3</sup> FAO and WHO. 1985. *General Standard for the Labelling of Pre-packaged Foods*. Codex Alimentarius Standard, No. CXS 1-1985. Codex Alimentarius Commission. Rome.

<sup>4</sup> FAO and WHO. 2021. *General Standard for the Labelling Non-Retail Containers of Foods*. Codex Alimentarius Standard, No. CXS 346-2021. Codex Alimentarius Commission. Rome.

<sup>5</sup> FAO and WHO. 1999. *Recommended Methods of Analysis and Sampling*. Codex Alimentarius Standard, No. CXS 234-1999. Codex Alimentarius Commission. Rome.