

# CODEX ALIMENTARIUS

INTERNATIONAL FOOD STANDARDS



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

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## STANDARD FOR QUICK-FROZEN BLUEBERRIES

CXS 103-1981

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 6.4 Labelling of non-retail containers.

## 1. SCOPE

This standard (formerly CAC/RS 103-1978) shall apply to quick-frozen blueberries of the species *Vaccinium corymbosum* L.<sup>i,ii</sup>, *Vaccinium angustifolium* Ait.<sup>iii</sup> and *Vaccinium ashei* READE,<sup>iv</sup> as defined below and offered for direct consumption without further processing, except for repacking, if required. It does not apply to the product when indicated as intended for further processing or for other industrial purposes, nor to bilberries<sup>v</sup> as covered by the *Standard for Quick-Frozen Bilberries* (CXS 76-1981).<sup>1</sup>

## 2. DESCRIPTION

### 2.1 Product definition

Quick-frozen blueberries are the product prepared from fresh, clean, sound, ripe and stemmed blueberries of firm texture, conforming to the characteristics of *Vaccinium corymbosum* L., *Vaccinium angustifolium* Ait. and *Vaccinium ashei* READE, and which are packed with or without a dry sugar or a sugar syrup and frozen in an appropriate manner.

### 2.2 Process definition

Quick-frozen blueberries 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>2</sup>

### 2.4 Presentation

#### 2.4.1 Style

Quick-frozen blueberries 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).

## 3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

### 3.1 Optional ingredients

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

### 3.2 Composition

#### 3.2.1 Blueberries 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 Blueberries prepared with syrup

The amount of syrup used shall be no 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.

#### 3.2.3 Definition of "defective" for composition

Any sample unit that falls outside the limits for the soluble solids range specified in Sections 3.2.1 and 3.2.2 shall be regarded as a "defective".

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<sup>i</sup> There appear to be many natural hybrids of *Vaccinium corymbosum* L. and other (wild) species of the genus *Vaccinium* rendering the taxonomy very difficult.

<sup>ii</sup> Common name: Highbush blueberry.

<sup>iii</sup> Common name: Lowbush blueberry.

<sup>iv</sup> Common name: Rabbiteye blueberry.

<sup>v</sup> *Vaccinium myrtillus* L.

### 3.2.4 **Lot acceptance for composition**

A lot is considered acceptable for compositional criteria when the number of "defectives", as defined in Section 3.2.3 does not exceed the acceptance number (c) of an appropriate sampling plan with an acceptable quality limit (AQL) of 6.5, (see relevant Codex texts on methods of analysis and sampling).

## 3.3 **Quality factors**

### 3.3.1 **General requirements**

The product shall be:

- (a) of similar varietal characteristics;
- (b) of good colour;
- (c) free from foreign flavour and odour; and
- (d) clean, sound and practically free from mould and other harmless foreign matter;

and with respect to visual defects or other defects subject to a tolerance, shall be:

- (e) practically free from sand and grit;
- (f) when presented as free-flowing, practically free from berries adhering one to another and which cannot be easily separated by hand without damage when in the frozen state;
- (g) practically free from extraneous vegetable material;
- (h) reasonably free from cap stems (stalks);
- (i) practically free from unripe berries;
- (j) practically free from dissimilar varieties of edible berries other than blueberries;
- (k) reasonably free from blemished berries; and
- (l) reasonably free from undeveloped or mummified berries.

### 3.3.2 **Analytical requirements**

Mineral impurities such as sand, grit and silt shall be not more than 0.04 percent m/m on the whole product (berries and packing medium, if any).

### 3.3.3 **Free-flowing characteristics**

When presented as "free-flowing" a tolerance of 10 percent m/m shall be allowed for berries which are stuck together and not easily separated in the frozen state. The sample unit for free "flowing" is the entire contents of the container or as large a quantity as practicable.

### 3.3.4 **Definitions and tolerances for visual defects**

#### 3.3.4.1 **Definitions**

- (a) **Extraneous vegetable material (EVM)** means leaves or portions of the blueberry plant, or other similar vegetable material which is harmless;
- (b) **Cap stems (stalks)** means the immediate stem that attaches the blueberry to the plant, whether or not attached to the berry, and which is 2 mm, or greater in length;
- (c) **Unripe berries** means completely green berries or berries that have a green cast that predominates over the normal reddish-purple colour of blueberries;
- (d) **Dissimilar varieties** means other edible berries that are distinctly different in colour or shape, which have definitely different internal characteristics than blueberries;
- (e) **Blemished** means blueberries which show visible signs of damage by insects or by pathological or mechanical injury;
- (f) **Undeveloped or mummified** means berries that are badly shrivelled, dried or hard.

#### 3.3.4.2 **Standard sample size**

The sample size for evaluating visual defects, including application of tolerances is 300 grammes of drained berries (see relevant Codex texts on methods of analysis and sampling).

### 3.3.4.3 Tolerances for visual defects

For tolerances based on the standard sample sizes indicated in Section 3.3.4.2, visual defects shall be assigned points in accordance with Table 1 in this section. The maximum number of defects permitted in the total allowable points rating indicated for the respective categories minor and major or the combined total of the foregoing categories.

**TABLE 1**  
**(Sample size 300 grammes)**

Defect	Unit of measurement	Defect categories		
		Minor	Major	Total
(a) EVM	Each piece 1 cm <sup>2</sup>	1		
	Each piece 1 cm <sup>2</sup> and larger		2	
(b) Cap stems	Each stem	1		
(c) Unripe berries	Each berry		2	
(d) Dissimilar varieties	Each berry		2	
(e) Blemished	Slightly	1		
	Materially		2	
(f) Undeveloped or mummified	Each berry		2	
<b>TOTAL ALLOWABLE POINTS</b>		<b>15</b>	<b>8</b>	<b>15</b>
Disintegrated, badly crushed or smashed ----- 10% m/m				

## 3.4 Lot acceptance for quality factors

### 3.4.1 Definition of "defective" for quality factors

Any sample unit 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 a "defective" for the respective characteristics, as follows:

- that exceeds the tolerance for mineral impurities in Section 3.3.2;
- that exceeds the tolerance for "free-flowing" in Section 3.3.3; or
- that exceeds the "maximum total allowable points for visual defects" in any one or more of the categories in Table 1 (3.3.4.3); or that exceeds the tolerance for disintegrated, badly crushed, or smashed in Table 1 (3.3.4.3).

### 3.4.2 Lot acceptance for quality factors

A lot will be considered acceptable with respect to quality factors when the number of "defectives" as defined in Section 3.4.1 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). In applying the acceptance procedure, each "defective" (as defined in Section 3.4.1 subparagraphs (a) or (b) or (c)) is treated individually for the respective characteristics.

## 4. FOOD ADDITIVES

None permitted.

## 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>3</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>4</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 "blueberries".

**6.1.2** There shall appear on the label in conjunction with or in close proximity to the word "blueberries", the packing medium: "with (name of sweetener and whether as such or as the syrup)".

**6.1.3** In addition, there shall appear on the label the words "quick frozen", except that the term "frozen"<sup>vi</sup> may be applied in countries where this term is customarily used for describing the product processed in accordance with Section 2.2 of this standard.

### **6.2 Additional requirements**

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

### **6.3 Bulk packs**

In the case of quick-frozen blueberries in bulk, the information required above shall 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 Section 6.1.3 of this standard) and the name and address of the manufacturer or packer shall appear on the container.

### **6.4 Labelling of non-retail containers**

The labelling of non-retail containers should be in accordance with the *General Standard for the Labelling of Non-Retail Containers of Foods* (CXS 346-2021).<sup>5</sup>

## **7. PACKAGING**

Packaging used for quick-frozen blueberries shall:

- (a) protect the organoleptic and other quality characteristics of the product;
- (b) protect the product against microbiological and other contamination;
- (c) protect the product from dehydration and, where appropriate, leakage as far as technologically practicable; and
- (d) do not pass on to the product any odour, taste, colour or other foreign characteristics throughout the processing (where applicable) and distribution of the product up to the time of final sale.

## **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>6</sup> relevant to the provisions in this standard shall be used.

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

## NOTES

<sup>1</sup> FAO and WHO. 1981. *Standard for Quick Frozen Bilberries*. Codex Alimentarius Standard, No. CXS 76-1981. Codex Alimentarius Commission. Rome.

<sup>2</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>3</sup> FAO and WHO. 1969. *General Principles of Food Hygiene*. Codex Alimentarius Code of Practice, No. CXC 1-1969. Codex Alimentarius Commission. Rome.

<sup>4</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>5</sup> FAO and WHO. 2021. *General Standard for the Labelling of Non-Retail Containers of Foods*. Codex Alimentarius Standard, No. CXS 346-2021. Codex Alimentarius Commission. Rome.

<sup>6</sup> FAO and WHO. 1999. *Recommended Methods of Analysis and Sampling*. Codex Alimentarius Standard, No. CXS 234-1999. Codex Alimentarius Commission. Rome.