

C O D E X A L I M E N T A R I U S

INTERNATIONAL FOOD STANDARDS



Food and Agriculture
Organization of
the United Nations



World Health
Organization

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STANDARD FOR QUICK FROZEN BRUSSELS SPROUTS

CXS 112-1981

Adopted in 1981.

1. SCOPE

This Standard shall apply to quick frozen Brussels sprouts of the species *Brassica oleracea* L. var. *gemmifera* (DC) Schulz, 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 Brussels sprouts are the product prepared from fresh, clean, sound, whole axillary buds of the plant conforming to the characteristics of *Brassica oleracea* L. var. *gemmifera* (DC) Schulz - which buds are trimmed, sorted, washed and sufficiently blanched to ensure adequate stability of colour and flavour during normal marketing cycles.

2.2 Process Definition

2.2.1 Quick frozen Brussels sprouts 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.

2.2.2 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).

2.4 Presentation

2.4.1 Form

Quick frozen Brussels sprouts may be presented as free flowing (i.e. in which the individual sprouts are not adhering to one another) or non-free flowing (i.e. as a solid block).

2.4.2 Tolerance for "Free Flowing"

When the product is presented as "free flowing" a tolerance of 10% m/m shall be allowed for pieces which are stuck together to such an extent that they cannot easily be separated in the frozen state.

2.4.3 Sizing

2.4.3.1 Quick frozen Brussels sprouts may be presented sized or unsized.

2.4.3.2 Whether sized or unsized, the amount of frozen sprouts passing a square hole sieve of 12 mm, shall not exceed 5 percent by number.

2.4.3.3 If quick frozen Brussels sprouts are presented as size graded, they shall conform when measured in the frozen condition to the following system of specifications of the size names:

Size Designation	Diameter of sprouts in mm using a square hole sieve
"very small"	12 - 22 mm
"small"	22 - 26 mm
"medium"	26 - 36 mm
"large"	over 36 mm

2.4.4 *Tolerances for sizes*

If represented as size graded, of the sprouts 12 mm or larger, a minimum of 80% by number shall be of the declared size and a maximum of the following percentages by number of other sizes:

Size Designation	"Very small"	"small"	"medium"	"large"
Max % 12 - 22 mm	-	-	20	5
Max % 22 - 26 mm	20	-	-	-
Max % 26 - 36 mm	5	20	-	20
Max % over 36 mm	0	5	20	-
Total max. %	20	20	20	20

2.4.5 *Standard Sample Size*

The standard sample size shall be 1 kg.

2.4.6 *Definition of "Defective" for Presentation*

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" for the respective characteristics where:

- (a) the requirement for free-flowing in Section 2.4.1 is not complied with;
- (b) the sizing requirements in Section 2.4.2 are not complied with.

2.4.7 *Lot Acceptance for Presentation Factors*

A lot will be considered as acceptable with respect to free-flowing and sizing when the number of "defectives" as defined in Sections 2.4.1 and 2.4.2 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).

3. **ESSENTIAL COMPOSITION AND QUALITY FACTORS**

3.1 **Optional Ingredients**

- (a) Sugars (sucrose, invert sugar, dextrose, fructose, glucose syrup, dried glucose syrup);
- (b) Salt (sodium chloride)
- (c) Condiments, such as spices and herbs

3.2 **Quality Factors**

3.2.1 *General Requirements*

Quick frozen Brussels sprouts shall be:

- free from foreign flavour and odour, taking into account any added optional ingredients;
- clean, free from sand and grit and free from other foreign material;
- of a normal colour for the variety used;

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

- reasonably free from extraneous vegetable material (E.V.M.);
- reasonably free from loosely structured buds;
- reasonably free from poorly trimmed or mechanically damaged units;
- reasonably free from damage by insects or disease;
- reasonably free from loose leaves.

3.2.2 Definition of Visual Defects

- (a) *Extraneous Vegetable Material (E.V.M.):* Extraneous material from the Brussels sprouts plant including stem and leaf, but excluding bud leaves and fragments thereof; harmless vegetable material from other plants.
- (b) *Yellow Colour:* More than 50% of the outer surface of a sprout yellow in colour due to loss of outer leaves resulting either from overtrimming or mechanical damage.
- (c) *Loosely structured:* Sprout not compact, having loosely packed or open leaves. A sprout in which the leaves form a rosette appearance.
- (d) *Perforated leaves (by insects):* A sprout with one or more surface perforations (due to insects, etc.), larger than 6 mm in diameter, showing scar tissue at the edge of the perforation(s).
- (e) *Decayed:* A sprout which shows significant internal or external decay.
- (f) *Seriously Blemished:* A sprout which is stained, spotted, discoloured or otherwise blemished, covering an aggregate area greater than that of a circle 15 mm in diameter, in such a way as to detract seriously from its appearance/eating quality, and to such an extent that it would be discarded under normal culinary preparation.
- (g) *Blemished:* A sprout which is stained, spotted, discoloured, or otherwise blemished to the extent that the aggregate area affected is greater than the area of a circle 6 mm in diameter, or in such a way as to detract materially but not seriously from its appearance. Sprouts with slight blemishes may be ignored.
- (h) *Poorly Trimmed or Mechanically Damaged Unit:* A unit in which:
- (i) the butt end is very ragged leaving a heel extending more than 10 mm beyond the point of attachment of the lowest outer leaves;
 - (ii) 4 or more outer leaves have been damaged such that only the petioles remain attached to the butt;
 - (iii) the butt extends more than 10 mm below the point of attachment of the lowest outer leaves;
 - (iv) the appearance is damaged to an extent that the sprout is lacerated, can be separated easily into two pieces, or more than 25% of its volume has been removed;
- (i) *Loose Leaf:* Leaf or leaf fragments detached from the bud.

3.2.3 Standard Sample Size

The standard sample size shall be 1 kilogramme for the assessment of E.V.M. and loose leaf, and 100 sprouts for the assessment of other visual defects.

3.2.4 Tolerances for Visual Defects

For tolerances based on the standard sample size indicated in Section 3.2.3 visual defects shall be assigned points in accordance with the Table in this Section. The maximum number of defects permitted is the Total Allowable Points rating indicated for the respective categories 1, 2 and 3 or the Combined Total of the foregoing categories.

Defect	Unit of Measurement	Category	Category	Category	Total
		1	2	3	
(a) E.V.M.	Each piece	2			
(c) Loosely structured	Each sprout		2		
(d) Perforated leaves	Each sprout		1		
(e) Decayed	Each sprout			4	
(f) Seriously blemished	Each sprout			2	
(g) Blemished	Each sprout		2		
(h) Poorly trimmed or mechanically damaged	Each sprout		1		
(i) Loose leaf	Each 1 % m/m	1			
Maximum Total Allowable Points		10	45	10	55

Maximum percentage of (b) Yellow Sprouts: 25

3.3 Definition of "Defective" for Quality Factors

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) any one of the general requirements in Section 3.2.1 is not complied with;
- (b) the total in Section 3.2.4 (a) to (i) exceeds the Total Allowable Points in any of the respective defect categories.

3.4 Lot Acceptance for Quality Factors

A lot is considered acceptable when the number of "defectives" as defined in paragraph 3.3 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" (sub-paragraph (a) and (b) of 3.3) is treated individually for the respective characteristics.

4. FOOD ADDITIVES

None permitted.

4.1 Carry-Over Principle

Section 4.1 of the *General Standard for Food Additives* (CXS 192-1995) shall apply.

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), 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 Prepackaged Foods* (CXS 1-1985), the following specific provisions apply:

6.1 The Name of the Food

6.1.1 The name of the product as declared on the label shall include "Brussels Sprouts". The words "quick frozen" shall also appear on the label, except that the term "frozen"¹ 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.

6.1.2 Where a characterizing ingredient has been added, this shall be stated as "with X" or "X flavoured" as appropriate.

6.2 Size Designation

If a term designating the size of the Brussels sprouts is used:

- (a) it shall be supported by the sieve size in mm; and/or
- (b) the words "very small", "small", "medium" or "large" as appropriate; and/or;
- (c) by a size representation on the label of the size range to which the Brussels sprouts predominantly conform; and/or
- (d) the customary method of declaring size in the country in which the product is sold.

¹ "Frozen": This term is used as an alternative to "quick frozen" in some English-speaking countries.

6.3 Additional Requirements

The packages shall bear clear directions for keeping from the time they are purchased from the retailer to the time of their use, as well as directions for cooking.

6.4 Bulk Packs

In the case of quick frozen Brussels sprouts 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 6.1.1 of this Standard) and the name and address of the manufacturer or packer shall appear on the container.

7. PACKAGING

7.1 Packaging used for quick frozen Brussels sprouts must:

- (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;
- (d) 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) relevant to the provisions in this Standard shall be used.