

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

E-mail: codex@fao.org - www.codexalimentarius.org

STANDARD FOR QUICK-FROZEN VEGETABLES

CXS 320-2015

Adopted in 2015. Revised in 2017, 2020. Amended in 2022.

2022 Amendments

Following decisions taken at the Forty-fifth Session of the Codex Alimentarius Commission in December 2022, amendments were made in Section 9.3 Labelling of non-retail containers.

1. SCOPE

This standardⁱ shall apply to quick-frozen vegetables as defined in Section 2 below and in the corresponding annexes and offered for direct consumption including for catering purposes without further processing, except for size-grading or re-packing 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 vegetables are the products:

- (1) prepared from substantially sound, fresh (barring mature processed peas) or frozen vegetables, as defined in the corresponding annexes, having reached appropriate maturity for processing. None of their essential characteristic elements are removed from them but they shall be washed and prepared appropriately, depending on the product to be produced. They undergo operations such as washing, peeling, grading, cutting, blanching/deactivation of enzyme activity, etc. depending on the type of product.
- (2) made from vegetables which were subjected to a quick-freezing process,ⁱⁱ and maintained at -18 °C or colder at all points in the cold chain, subject to permitted temperature tolerances.

2.2 Process definition

Quick-frozen vegetable is the product subject to a freezing process in appropriate equipment and complying with the conditions laid down hereafter and in the corresponding annexes. 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 at the thermal centre after thermal stabilization. The recognized practice of re-packing quick-frozen products under temperature-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 of the *Code of practice for the processing and handling of quick-frozen foods* (CXC 8-1976).¹

2.4 Styles

In addition to the styles defined in the corresponding annexes, any other styles should be permitted as indicated in Section 2.4.1.

Note: Quick-frozen vegetables may be “free flowing” i.e. in which the individual units (individual quick-frozen [IQF]) are not stuck to one another, stuck together or in blocks to an extent that they cannot easily be separated in a frozen state.

2.4.1 Other styles

Any other style in addition to those described in the various annexes should be permitted provided that the product:

- (1) is sufficiently distinctive from other forms of presentation laid down in the standard;
- (2) meets all relevant requirements of the standard, including requirements relating to limitations on defects and any other requirements which are applicable to that style which most closely resembles the style or styles intended to be provided for under this provision; and
- (3) is adequately described on the label to avoid confusing or misleading the consumer.

ⁱ This standard supersedes individual standards for: *Quick-frozen carrots* (CXS 140-1983), *Quick-frozen corn-on-the-cob* (CXS 133-1981), *Quick-frozen leeks* (CXS 104-1981), *Quick-frozen whole kernel corn* (CXS 132-1981), *Quick-frozen broccoli* (CXS 110-1981), *Quick-frozen brussels sprouts* (CXS 112-1981), *Quick-frozen cauliflower* (CXS 111-1981), *Quick-frozen French-fried potatoes* (CXS 114-1981), *Quick-frozen green and wax beans* (CXS 113-1981), *Quick-frozen peas* (CXS 41-1981), and *Quick-frozen spinach* (CXS 77-1981).

ⁱⁱ A process, which is carried out in such a way, that the range of temperature of maximum ice crystallization is passed as quickly as possible (*Code of practice for the processing and handling of quick-frozen foods* [CXC 8-1976]).

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Composition

3.1.1 Basic ingredients

Vegetables as defined in Section 2. Specific provisions are provided for in the corresponding annexes.

3.1.2 Optional ingredients

In accordance with the relevant provisions in the corresponding annexes.

3.2 Quality criteria (factors)

3.2.1 General requirements

In addition to the provisions provided for in the corresponding annexes, quick-frozen vegetables shall:

- have a reasonably uniform colour characteristic of the variety;
- be sound, clean, practically free from sand, grit and other foreign material;
- be practically free from pests and damage caused by them; and
- have a normal flavour and odour/smell, taking into consideration any added ingredients as indicated in Section 3.1.

3.2.1.1 Sample size: See individual annexes for sample size for each product.

3.2.2 Analytical characteristics

Analytical characteristics should be in accordance with the provisions provided for in the corresponding annexes.

3.2.3 Definition of defects

In accordance with the relevant provisions in the corresponding annexes.

3.2.4 Defects and allowances

Quick-frozen vegetables should be substantially free from defects. Certain common defects should not be present in amounts greater than the limitations provided for in the corresponding annexes.

3.3 Classification of defectives

A container that fails to meet one or more of the applicable quality requirements, as set out in Section 3.2 and in the corresponding annexes (except those based on sample averages), should be considered as a “defective”.

3.4 Lot acceptance

A lot will be considered acceptable when the number of “defectives” as defined in Section 3.3 and in the corresponding annexes does not exceed the acceptance number (c) of the appropriate sampling plan with an acceptable quality level (AQL) of 6.5.

For factors evaluated on a sample average, a lot will be considered acceptable if the average meets the specified tolerance, and no individual sample is excessively out of tolerance.

4. FOOD ADDITIVES

Only those food additive classes listed in the corresponding annexes are technologically justified and may be used in products covered by this standard. Within each additive class only those food additives listed in the corresponding annexes, or referred to, may be used and only for the functions, and within limits, specified.

5. PROCESSING AIDS

The processing aids used for products covered by this standard shall comply with the *Guidelines on substances used as processing aids* (CXG 75-2010).²

6. CONTAMINANTS

6.1 The products covered by this standard shall comply with the maximum levels of the *General standard for contaminants and toxins in food and feed* (CXS 193-1995).³

6.2 The products covered by this standard shall comply with the maximum residue limits for pesticides established by the Codex Alimentarius Commission.

7. HYGIENE

- 7.1 It is recommended that the products 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),⁴ the *Code of practice for the processing and handling of quick-frozen foods* (CXC 8-1976),⁵ *Code of hygienic practice for fresh fruits and vegetables* (CXC 53-2003)⁶ and other relevant Codex texts such as codes of hygienic practice and codes of practice.
- 7.2 The products should comply with any microbiological criteria established in accordance with the *Principles and guidelines for the establishment and application of microbiological criteria related to foods* (CXG 21-1997).⁷

8. WEIGHTS AND MEASURES

8.1 Net weight

The weight of the products covered by the provisions of this standard shall be indicated in accordance with the *General standard for the labelling of pre-packaged foods* (CXS 1-1985).⁸

When the vegetables are glazed, in conformity with a specific annex, the declaration of net content of the foods shall be exclusive of the glaze.ⁱⁱⁱ

8.1.1 Classification of “defectives”

A container that fails to meet the net weight declared on the label should be considered as a “defective”.

8.1.2 Lot acceptance

A lot should be considered as meeting the requirement of Section 7.1 when the number of “defectives”, as defined in Section 7.1.1, does not exceed the acceptance number (c) of the appropriate sampling plan with an AQL of 6.5.

9. LABELLING

- 9.1 The products covered by the provisions of this standard shall be labelled in accordance with the *General standard for the labelling of pre-packaged foods*.⁸ In addition, the following specific provisions apply:

9.2 Name of the product

- 9.2.1 The name of the product shall be as defined in the corresponding annexes.

- 9.2.2 The words “quick-frozen” shall also appear on the label, except that the term “frozen”^{iv} may be applied in countries where this term is customarily used for describing the product processed in accordance with Section 2.2 of the standard. The type of quick-freezing process may be included on the label.

- 9.2.3 When any ingredient has been added which impart(s) a distinctive flavour to the food, the name of the product shall be accompanied by the term “with X”, as appropriate.

9.2.4 Styles

- 9.2.4.1 *Styles* – there shall appear on the label in conjunction with, or in close proximity to the name of the product, the style (cut/description/presentation), as defined in the corresponding annexes.

- 9.2.4.2 *Other styles* – if the product is produced in accordance with the other styles provision (Section 2.4.1), the label shall contain in conjunction with, or in close proximity to the name of the product, such additional words or phrases that will avoid misleading or confusing the consumer.

- 9.2.5 When the vegetables are sized, the size, as defined in the corresponding annexes, may be declared in conjunction with, or in close proximity to the name of the product.

ⁱⁱⁱ Glazing: the application of a protective layer of ice formed at the surface of a frozen product by spraying it – with or dipping it into potable water or potable water with approved ingredients and additives, as appropriate. If glazed, the water used for glazing or preparing glazing solutions shall be of potable quality. Potable water is freshwater fit for human consumption. Standards of potability shall not be less than those contained in the *WHO Guidelines for Drinking Water Quality*.

^{iv} The term “frozen” is used as an alternative to “quick-frozen” in some English-speaking countries.

9.3 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).⁹

10. PACKAGING

Packaging used for quick-frozen vegetables shall be in accordance with the relevant provisions of the *Code of practice for the processing and handling of quick-frozen foods* (CXC 8-1976).⁵

11. 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)¹⁰ relevant to the provisions in this standard, shall be used.

NOTES

¹ 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.

² FAO and WHO. 2010. *Guidelines on substances used as processing aids*. Codex Alimentarius Guideline, No. CXG 75-2010. Codex Alimentarius Commission. Rome.

³ FAO and WHO. 1995. *General standard for contaminants and toxins in food and feed*. Codex Alimentarius Standard, No. CXS 193-1995. Codex Alimentarius Commission. Rome.

⁴ FAO and WHO. 1969. *General principles of food hygiene*. Codex Alimentarius Code of Practice, No. CXC 1-1969. Codex Alimentarius Commission. Rome.

⁵ 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.

⁶ FAO and WHO. 2003. *Code of hygienic practice for fresh fruits and vegetables*. Codex Alimentarius Code of Practice, No. CXC 53-2003. Codex Alimentarius Commission. Rome.

⁷ FAO and WHO. 1997. *Principles and guidelines for the establishment and application of microbiological criteria related to foods*. Codex Alimentarius Guideline, No. CXG 21-1997. Codex Alimentarius Commission. Rome.

⁸ FAO and WHO. 1985. *General standard for the labelling of pre-packaged foods*. Codex Alimentarius Standard, No. CXS 1-1985. Codex Alimentarius Commission. Rome.

⁹ 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.

¹⁰ FAO and WHO. 1999. *Recommended methods of analysis and sampling*. Codex Alimentarius Standard, No. CXS 234-1999. Codex Alimentarius Commission. Rome.

ANNEX ON CARROTS

In addition to the general provisions applicable to quick-frozen vegetables, the following specific provisions apply:

1. DESCRIPTION

1.1 Product definition

Quick-frozen carrots are the product prepared from fresh, clean, sound, roots of carrot varieties (cultivars) conforming with the characteristics of the species *Daucus carota* L. from which the leaves, green tops, peel and secondary roots have been removed and which have been washed and may or may not be blanched.

1.2 Presentation

1.2.2 Styles:

(a) **whole:**

- (i) **conical and cylindrical:** Consist of carrots which, after processing, retain the approximate conformation of a whole carrot. The largest diameter at the greatest circumference measured at right angles to the longitudinal axis shall not exceed 50 mm. The variation in diameter between the largest and smallest carrot shall not exceed 4:1.
 - (ii) **spherical:** Consist of fully mature carrots of a roundish shape of which the largest diameter in any direction shall not exceed 45 mm.
- (b) **finger:** Carrots of the cylindrical type, including sections obtained thereof by transverse cutting, being not less than 30 mm long (apart from arising end pieces).
- (c) **halved:** Carrots cut longitudinally into two approximately equal halves.
- (d) **quartered:** Carrots cut longitudinally into four approximately equal sections.
- (e) **sliced lengthwise:** Carrots sliced approximately longitudinally, either smooth or corrugated into four or more units of approximately equal size. Not less than 20 mm long and not less than 5 mm in width measured at the maximum width.
- (f) **shoestring or julienne:** Carrots cut longitudinally, either smooth or corrugated, into strips. The cross-section shall not exceed 9.5 mm (measured at the longest side of the cross-section).
- (g) **sliced or ring cut or roundels:** Carrots cut, either smooth or corrugated at right angles to the longitudinal axis into rings, having a minimum thickness of 2 mm, a maximum thickness of 10 mm and a maximum diameter of 50 mm.
- (h) **pieces:** Carrots cut crosswise into sections having a thickness greater than 10 mm but less than 30 mm or whole carrots which are halved and then cut crosswise into sections or sections of carrots that may be irregular in shape and size, and which are larger than ring cut or double diced.
- (i) **diced:** Carrots cut into cubes with edges not exceeding 12.5 mm.
- (j) **double dice:** Carrots cut into uniformly shaped units having a cross-section that is square and of which the longest dimension is approximately twice that of the shortest dimension – the shortest dimension not exceeding 12.5 mm.

1.2.3 Sizing

- (a) Quick-frozen carrots of the styles whole and finger may be presented sized or unsized.
- (b) If presented as size graded, the styles in Section 1.2.2 (a) shall conform to one of the three following systems of specification for the size names.
- (c) The diameter shall be measured at the point of largest transverse cross-section of the unit in accordance with the following table. However, when other sizes and size designations are used they should be indicated on the sales package.

Table 1 – Sizing

Size Designation	Diameter
Specification for cylindrical carrots	
(a) Small	6–23 mm
(b) Medium	23–27 mm
(c) Large	Greater than 27 mm
Specification for conical carrots	
(a) Small	10–30 mm
(b) Medium	30–36 mm
(c) Large	Greater than 36 mm
Specification for spherical carrots	
(a) Very small	Less than 18 mm
(b) Small	18–22 mm
(c) Medium	22–27 mm
(d) Large	27–35 mm
(e) Extra large	Over 35 mm

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Composition

2.1.1 Basic ingredients

Carrots as described in Section 1.

2.1.2 Optional ingredients

- (a) Salt (sodium chloride) as defined in the *Standard for food-grade salt* (CXS 150-1985);¹
- (b) Sugars as defined in the *Standard for sugars* (CXS 212-1999);²
- (c) Aromatic herbs and spices as defined in the standards for spices and culinary herbs; stock or juice of vegetables and aromatic herbs; garnishes composed of one or more vegetables (e.g. lettuce, onions, pieces of green or red peppers, or mixtures of both) up to a maximum of 10 percent m/m of the total drained vegetable ingredient.

2.2 Quality factors

2.2.1 General requirements

Quick-frozen carrots shall be free from objectionable tough parts; and with respect to visual defects subject to a tolerance shall be:

- (a) not misshapen (this regards whole and finger carrot style only);
- (b) reasonably free from blemishes;
- (c) reasonably free from mechanical damage this regards whole and finger carrot style only);
- (d) reasonably free from green tops;
- (e) reasonably free from extraneous vegetable materials (EVM);ⁱ and
- (f) reasonably free from unpeeled areas.

ⁱ Excluding those in Section 2.1.2.

2.2.2 Analytical characteristics

Mineral impurities measured on a whole product basis not more than 0.1 percent m/m.

2.2.3 Definition of visual defects

Defect	Definition
(a) Extraneous vegetable material	Harmless vegetable material which does not consist of mature carrot roots.
(b) Misshapen	Units showing branching, twisting, or other forms of distortion which detract seriously from the appearance of the product (styles: whole and finger). Units (other than small pieces) not possessing the configuration of the defined style.
(c) Major blemishes	Units with one or more black, dark brown and other intensely discoloured areas due to disease, insect damage, inadequate topping or physiological factors covering an area or aggregate area greater than that of a circle 6 mm in diameter, which detract in a major way from the appearance of the product.
(d) Blemishes	Units with one or more black, dark brown or other intensely discoloured areas due to disease, insect damage, inadequate topping or physiological factors covering an area or aggregate area greater than that of a circle 3 mm in diameter but less than 6 mm in diameter. Other types of discolouration which detract noticeably but not in a major way from the appearance of the product.
(e) Unpeeled	Units showing noticeable unpeeled areas larger than a circle of 6 mm diameter.
(f) Damaged	Units which are crushed or broken.
(g) Cracked	Cracks greater than 3 mm wide or other splits which detract materially from the appearance of the product (styles: "whole", "finger" and "sliced").
(h) Greening	Units showing green colouration extending down the shoulder or green ring at the top (whole and finger styles). Units showing green colouration (other styles).
(i) Small pieces	Units less than 25 mm long for the styles "whole, conical and cylindrical", "finger", "halved", "quartered" and "shoestring or julienne". Units less than one third the volume of the standard product for the other styles.
(j) Woody	The core of the carrot is not tender, but has tough, woody texture; it separates very easily from the outer flesh.

2.2.4 Minimum sample unit

The minimum sample unit for style, sizing and other visual defects should be as follows:

(a) EVM and small pieces	1 000 g
(b) Whole, finger, halved, quartered	25 units
(c) Diced, double dice, shoestring or julienne, sliced or ring cut, sliced lengthwise, pieces styles	400 g

2.2.5 Defects and allowances

A tolerance of 10 percent by weight of non-conforming units applies to the whole style and 20 percent for all other styles. If presented size graded the product shall contain not less than 80 percent by mass of carrots of the declared size.

When the product is presented as “free flowing” a tolerance of 10 percent (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.

For tolerances based on the minimum sample unit indicated in Section 2.2.4, visual defects will be scored in accordance with the appropriate tables in this Section.

Table 1 – Whole, finger, halved and quartered styles

Defects	Percentage by number	Percentage by weight
(a) Misshapen	3	-
(b) Major blemishes and unpeeled areas	4	-
(c) Blemishes	10	-
(d) Damaged and cracked	4	-
(e) Small pieces	-	15
(f) Greening	12	-
(g) EVM: Not to exceed 2 pieces or 1 g / 1 000 g	-	-
(h) Woody	1	

Total maximum allowance: 22 percent by number

Table 2 – Ring cut, sliced lengthwise, diced, double diced, Shoestring and pieces

Defects	Percentage by weight	
	Ring cut, sliced lengthwise	Diced, double diced, shoestring and pieces
(a) Misshapen	6	-
(b) Major blemishes and unpeeled areas	4	5
(c) Blemishes	10	12
(d) Damaged and cracked	4	10
(e) Small pieces	15	20
(f) Greening	12	-
(g) EVM: Not to exceed 2 piece / 1 000 g	-	-
(h) Woody	1	1

Total maximum allowance: 20 percent by weight for diced, double diced, shoestring and pieces, and 25 percent by weight for ring cut, sliced lengthwise

2.3 Classification of “defectives”

Any minimum sample unit which fails to comply with the quality requirements, as set out in Sections 2.2.1 and 2.2.5 shall be regarded as a “defective”.

2.4 Lot acceptance

A lot will be considered acceptable when the number of “defectives” as defined in Section 2.3 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

In applying the acceptance procedure each “defective”, as indicated in Section 2.3, is treated individually for the respective characteristics.

3. FOOD ADDITIVES

None permitted.

4. LABELLING

4.1 Name of the product

4.1.1 The name of the product shall include the designation “carrots”.

4.1.2 As regard styles declaration, “whole” and “finger” carrots may be simply designated as “carrots” in countries where this is a customary practice.

4.1.3 As regard sizing declaration, carrots meeting the size requirements for “small” may be designated “baby” within countries where this practice is permitted.

4.1.4 When other sizes and size designations not included in this standard are used, they should be indicated on the sales package.

NOTES

¹ FAO and WHO. 1985. *Standard for food-grade salt*. Codex Alimentarius Standard, No. CXS 150-1985. Codex Alimentarius Commission. Rome.

² FAO and WHO. 1999. *Standard for sugars*. Codex Alimentarius Standard, No. CXS 212-1999. Codex Alimentarius Commission. Rome.

ANNEX ON CORN-ON-THE-COB

In addition to the general provisions applicable to quick-frozen vegetables, the following specific provisions apply:

1. DESCRIPTION

1.1 Product definition

Quick-frozen corn-on-the-cob is the product prepared from fresh, clean, sound, properly matured whole or pieces of ears conforming to the characteristics of the sweet corn variety *Zea mays* L. convar *saccharata* Koern which are trimmed (except for the style "whole"), separated from husk and silk, sorted and washed and sufficiently blanched to ensure stability of colour and flavour during normal marketing cycles.

Corn-on-the-cob can be of the following types:

- (a) **Super sweet varieties** – means kernels (or grains) of corn that provide higher naturally occurring sugar, and/or crisper texture (maybe yellow, white or combination of each) typical for the variety. These varieties may be slightly darker in colour, and some varieties have slightly tougher pericarp (kernel skin) than conventional sweet corn.
- (b) **Sweet varieties** – means kernels of sweet corn that convert sugars to starch by going through distinct stages of maturity – milk, cream, then dough stages.

1.2 Presentation

1.2.1 Style

- (a) **Whole** – The whole, intact ear of corn to which a small part of the stalk may be attached.
- (b) **Trimmed whole** – The product obtainable from one whole ear after trimming of both ends.
- (c) **Cut cob** – Portions of the whole trimmed ear cut transversely into pieces.

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Composition

2.1.1 Basic ingredients

Corn as described in Section 1.

2.1.2 Optional ingredients

- (a) Sugars as defined in the *Standard for sugars* (CXS 212-1999).¹
- (b) Salt (sodium chloride) as defined in the *Standard for food-grade salt* (CXS 150-1985).²
- (c) Spices, seasonings, butter, edible oils, named sauces, flavourings as defined in the relevant standards.
- (d) Other appropriate vegetables.

2.2 Quality factors

2.2.1 General requirements

With respect to visual defects subject to a tolerance, quick-frozen corn-on-the-cob shall be:

- (a) of reasonably uniform white, cream to yellow (golden) to darker yellow colour; except for mixed colour varieties;
- (b) reasonably tender and sufficiently developed;
- (c) reasonably uniform in size;
- (d) reasonably free from blemished or mechanically damaged areas;
- (e) reasonably free from poorly trimmed units (except for whole style); and
- (f) reasonably free from extraneous vegetable matter (EVM).

2.2.2 Definition of visual defects

- (a) **Uniform white, cream yellow (golden) to darker yellow colour** – Means, that all kernels on one ear are of the same colour and that the different units in one sample unit are of the same colour.
- (i) **Light variation** – Some difference in colour exists, only slightly affecting the appearance.
 - (ii) **Pronounced variation** – Difference in colour between the different kernels and/or ears are noticeable and affecting the appearance.

Uniformity of colour is not applied to mixed coloured varieties.

- (b) **Uniform in size** – means that the length of the longest ear in the sample unit does not exceed the length of the shortest ear by more than 50 mm for whole and trimmed whole styles or by more than 20 mm for cut style, and that the largest diameter of the largest unit does not exceed the largest diameter of the smallest unit by more than 15 mm.
- (i) **Minor** – outside one of the limits (length or diameter) by maximum 5 mm = 1 defect;
 - (ii) **Major** – outside both limits by maximum 5 mm = 2 defects;
 - (iii) **Major** – outside one or both of the limits by more than 5 mm = 4 defects.
- (c) **Well developed** – means that the kernels shall be positioned in a symmetrical pattern in distinct lines or rows which are not seriously affected by missing or shrunken kernels. The whole style may have some shrunken or underdeveloped parts.
- (i) **Minor** – appearance materially affected by irregular pattern of kernels = 1 defect;
 - (ii) **Major** – more than 10 percent but less than 15 percent by count of the kernels missing or shrunken = 2 defects;
 - (iii) **Serious** – 15 percent or more by count of the kernels missing or shrunken = 4 defects.
- (d) **In “whole style”** – the length of the part of ear which is shrunken or underdeveloped shall be considered as follows:
- (i) **Minor** – more than 20 mm and up to 25 mm = 1 defect;
 - (ii) **Major** – more than 25 mm and up to 30 mm = 2 defects;
 - (iii) **Serious** – more than 30 mm = 4 defects.
- (e) **Blemished or mechanically damaged areas**
- (i) **Blemished** – a unit affected by pathological or insect injury with associated discolouration which affects the kernels.
 - (ii) **Mechanically damaged** – a unit affected by cuts or by crushing of the kernels. Kernels at the ends of the units which are damaged by cutting shall not be considered as damaged by mechanical injury.
 - **Minor** – more than 5 percent but less than 10 percent by count of the kernels are slightly affected but not more than 0.5 percent by count of all kernels are seriously blemished or damaged = 1 defect.
 - **Major** – 10 percent or more but less than 15 percent by count of the kernels are slightly affected but not more than 1 percent by count of all kernels are seriously blemished or damaged = 2 defects.
 - **Serious** – more than 15 percent by count of the kernels are slightly affected or more than 1 percent by count of the kernels are seriously affected = 4 defects.
- (f) **Poorly trimmed** means (i) ears or cut cobs where at the stem end a small part of stalk remains attached and also means (ii) that the top end of the ear or the cut cob is cut too high leaving underdeveloped kernels on-the-cob. For the style “whole” the top is untrimmed and a piece of the stalk of maximum 15 mm may remain attached, and not be considered a defect.
- **Minor** – at one end of unit less than 6 mm left = 1 defect.
 - **Major** – at one end of unit 6–12 mm left = 2 defects
 - **Serious** – at one end of unit more than 12 mm left = 4 defects.

(g) EVM (extraneous vegetable material)

- (i) **Husk** – means the membranous outer covering and one of the constituent parts of an ear of corn that is removed during processing.
- (ii) **Silk** – means the coarse thread-like filaments that are one of the constituent parts of an ear of corn. Such silk is found beneath the husk and in immediate contact with the corn kernels (on-the-cob). Corn silk is normally removed during processing. Silk to the total length twice of that of the unit in question are considered normal and not a defect.
- **Minor** – silk to a total length of 2–6 times the length of the units = 1 defect;
 - **Minor** – husks not more than 2 cm² in total surface = 1 defect;
 - **Major** – silk to a total length greater than six times the length of the units or husks larger than 2 cm² square cm in total surface = 2 defects.

2.2.3 Minimum sample unitⁱ

The minimum sample unit for the respective styles shall be:

- (a) Whole and trimmed whole 4 ears
- (b) Cut cob 8 pieces of ears

2.2.4 Defects and allowances

Based on the minimum sample unit defined in Section 2.2.4, 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 is indicated for the respective categories: minor, major and serious or the combined total of the foregoing categories.

Table 1 – Defects allowances for all styles

Defect	Unit of measurement	Defect categories			
		Minor	Major	Serious	Total
(a) Kernel colour variation for single colour varieties (i) Light (ii) Pronounced	One ear	1	2	-	-
(b) Colour variation (ears) (i) Light (ii) Pronounced	Minimum sample unit	1	2	-	-
(c) Difference in size outside given range (in minimum sample unit)		1	2 or 4	-	-
(d) Not well developed	Each ear	1	2	4	-
(e) Blemished or damaged	Each ear	1	2	4	-
(f) Poorly trimmed	Each ear	1	2	4	-

ⁱ “Minimum sample unit”: This term should not be confused with individual units of product i.e., whole ear, trimmed whole ear or cut cob.

Defect	Unit of measurement	Defect categories			
		Minor	Major	Serious	Total
(g) Extraneous vegetable matter	Minimum sample unit	1	2	-	-
Total allowable points		21	6	4	21

2.6 Classification of “defectives”

Any minimum sample unit which fails to comply with the quality requirements, as set out in Sections 1.2.1, 2.1.1, 2.1.2, 2.2.1 and 2.2.4 shall be regarded as a “defective”.

2.7 Lot acceptance

A lot will be considered acceptable when the number of “defectives” as defined in Section 2.6 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

In applying the acceptance procedure each “defective”, as indicated in Sections 2.1.1, 2.1.2, 2.2.1 and 2.2.4, is treated individually for the respective characteristics.

3. FOOD ADDITIVES

None permitted.

4. LABELLING

4.1 Name of the product

4.1.1 The name of the product shall include “corn-on-the-cob”.

4.1.2 In addition, there shall for the styles “whole” and “trimmed whole” appear on the label, in conjunction with or in close proximity to the name a clear indication of the number of units included in the package.

NOTES

¹ FAO and WHO. 1999. *Standard for sugars*. Codex Alimentarius Standard, No. CXS 212-1999. Codex Alimentarius Commission. Rome.

² FAO and WHO. 1985. *Standard for food-grade salt*. Codex Alimentarius Standard, No. CXS 150-1985. Codex Alimentarius Commission. Rome.

ANNEX ON LEEK

In addition to the general provisions applicable to quick-frozen vegetables, the following specific provisions apply:

1. DESCRIPTION

1.1 Product definition

Quick-frozen leek is the product prepared from fresh, clean, sound, edible parts of the leek plant conforming to the characteristics of the species *Allium porrum* L., and which have been trimmed, washed, possibly blanched to ensure adequate stability of colour and flavour during normal marketing cycles.

1.2 Presentation

1.2.1 Styles

- (a) **Whole leek** – the leek plant with roots and non-tender leaves removed.
- (b) **Leek** – parts of the whole leek with a length, corresponding to the longest dimension of the package, but not less than 70 mm.
- (c) **Cut leek** – parts of the whole leek, cut perpendicularly to the longitudinal axis, minimum length 30 mm, maximum length 70 mm.
- (d) **Leek rings** – parts of the whole leek, cut perpendicularly to the longitudinal axis into slices, not thinner than 10 mm and not thicker than 30 mm.
- (e) **Chopped leek** – the whole leek chopped into pieces, such that the original structure is almost entirely lost, resulting in a “unit” generally smaller than 15 mm in size.

1.2.3 Colour

Leek may be presented as white; when not more 10 percent m/m shall be present of leaves or parts of leaves with a green colour.

1.2.4 Sizing

- (a) Whole leek and leek, may be presented as sized or unsized;
- (b) The minimum diameter of whole leek and leek, measured perpendicularly to the axis immediately above the swelling at the neck shall be not less than 10 mm;
- (c) When sized, the difference between the largest and smallest diameter of the leeks in the same package, measured perpendicularly to the axis immediately above the swelling at the neck, shall be not more than 10 mm.

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Composition

2.1.1 Basic ingredients

Leeks as described in Section 1.1.

2.1.2 Optional ingredients

- (a) Salt (sodium chloride) as defined in the *Standard for food-grade salt* (CXS 150-1985);¹
- (b) Condiments such as spices and herbs as defined in relevant standards for spices and culinary herbs.

2.2 Quality factors

2.2.1 General requirements

Quick-frozen leek shall have similar varietal characteristics and be free from objectionable tough parts; and with respect to visual defects or other defects subject to a tolerance, shall be:

- (a) free from yellow and/or yellowish leaves;
- (b) reasonably free from damage such as staining, discolouration, or insect injury;
- (c) reasonably free from extraneous vegetable material (EVM);
- (d) reasonably well trimmed;
- (e) practically free from loose or detached leaves (in whole style only); and
- (f) practically free from hard parts as “seed heads”.

2.2.2 Analytical characteristics

Mineral impurities – not more than 0.1 percent m/m, measured on the whole product basis.

2.2.3 Definition of visual defects

(a) Discolouration	- Discolouration of any kind on the product and which materially detracts from the appearance of the product.
(i) Minor	- Discolouration which is light in colour. Each area or combined area of 4 cm ² = 1 defect; or if the greatest dimension is less than 20 mm.
(ii) Major	- Discolouration which is dark in colour. Each area or combined area of 4 cm ² = 1 defect, or the greatest dimension is over 20 mm.
(b) Damaged	- Each leaf or part of leaf that is affected by blemishes, staining or insect injury.
(c) Extraneous vegetable material (EVM)	- Each cm ² harmless vegetable material other than from the leek.
(d) Roots	- Each disk of roots attached to the leek or loose.
(e) Parts of roots	- Parts of roots attached to the leek or loose.
(f) Poorly trimmed	- The white or pale green portion is less than one-third of the total product.
	- For the presentation "white" (Section 1.2.3) not more than 10% m/m of green leaves is permitted. - Parts of the seed head.
(g) Loose leaves	- Leaf or part of it, which is detached from the shaft (in whole style only).

2.2.4 Minimum sample size

The minimum sample size for segregating and evaluating visual defects shall be as follows:

Style	Minimum sample size
(a) Whole leek	20 pieces
(b) Leek, cut leek	500 g
(c) Leek rings	300 g
(d) Chopped leek	300 g

2.2.5 Method of examination

For separation and enumeration of visual defects the standard sample (see minimum sample size) is placed in water in a deep tray, and the shafts or leaf portions separated one by one.

2.2.6 Defects and allowances

If size graded, the product shall contain not less than 80 percent by number of whole leek of the declared size.

For tolerances based on the minimum sample unit indicated in Section 2.2.4, visual defects shall be assigned points in accordance with the appropriate tables in this Section. The maximum number of defects permitted is the total allowable points rating indicated for the respective defect categories: minor and major or the combined total of the foregoing categories.

Table 1 – Whole leek

Defect	Defect categories		
	Minor	Major	Total
(a) Discolouration			
(i) Minor	2		
(ii) Major		2	
(b) Damaged		2	
(c) EVM	1		
(d) Roots		2	
(e) Parts of roots	1		
(f) Poorly trimmed		2	
(g) Loose leaves	1		
Total allowable points	8	6	10

(Sample size 20 pieces)

Table 2 – Leek, cut leek, leek rings and chopped leek

Defect	Defect categories		
	Minor	Major	Total
(a) Discolouration			
- Minor	2		
- Major		2	
(b) Damaged		2	
(c) EVM	1		
(d) Roots		2	
(e) Parts of roots	1		
(f) Poorly trimmed		2	

Minimum sample size 500 g (leek and cut leek)

Minimum sample size 300 g (leek rings and chopped leek)

Total allowable points	Minor	Major	Total
(a) Leek and cut leek	10	10	12
(b) Leek rings and chopped leek	5	6	6

2.3 Classification of “defectives”

Any minimum sample unit which fails to comply with the quality requirements, as set out in Sections 2.2.1, 2.2.2 and 2.2.6 shall be regarded as a “defective”.

2.4 Lot acceptance

A lot will be considered acceptable when the number of “defectives” as defined in Section 2.3 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

In applying the acceptance procedure each “defective”, as indicated in Section 2.3, is treated individually for the respective characteristics.

3. FOOD ADDITIVES

None permitted.

4. LABELLING

4.1 Name of product

4.1.1 The name of the product shall include the designation “leek”.

4.1.2 *Size designation*

If a term designating the size of whole leek is used, it shall:

- (a) be supported by a statement of the predominant range of the maximum diameter of the leek in mm, or fractions of an inch in those countries where the English system is in general use; and/or
- (b) conform to the customary method of declaring size in the country of retail sale.

NOTES

¹ FAO and WHO. 1985. *Standard for food-grade salt*. Codex Alimentarius Standard, No. CXS 150-1985. Codex Alimentarius Commission. Rome.

ANNEX ON WHOLE KERNEL CORN

In addition to the general provisions applicable to quick-frozen vegetables, the following specific provisions apply:

1. DESCRIPTION

1.1 Product definition

Quick-frozen whole kernel corn is the product prepared from fresh, clean whole sound, succulent kernels of sweet corn species *Zea mays* L. convar. *saccharata* Koern of either the white or yellow varieties by removing husk and silk; by sorting, trimming and washing; and by sufficiently blanching before or after removal from the cob to ensure adequate stability of colour and flavour during normal marketing cycles.

Whole kernel corn can be of the following types:

- (a) **Super sweet varieties** – means kernels (or grains) of corn that provide higher naturally occurring sugar, and/or crisper texture (maybe yellow, white or combination of each) typical for the variety. These varieties may be slightly darker in colour, and some varieties have slightly tougher pericarp (kernel skin) than conventional sweet corn.
- (b) **Sweet varieties** – means kernels of sweet corn that convert sugars to starch by going through distinct stages of maturity – milk, cream, then dough stages.

1.2 Presentation

1.2.1 Colour

- (a) Yellow
- (b) White
- (c) Other – colour depends on characteristics of the variety.

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Composition

2.1.1 Basic ingredients

Corn as described in Section 1.

2.1.2 Optional ingredients

Garnishes, such as pieces of green peppers or red peppers, or mixture of both, either of which may be sweet or hot or may be dried. Other vegetables may be used as garnishes. A garnish may not exceed 5 percent m/m of the finished food.

2.2 Quality factors

2.2.1 General requirements

Quick-frozen whole kernel corn shall be:

- (a) of similar varietal characteristics;
- (b) of a reasonably uniform colour which may be slightly dull;
- (c) before and after cooking, free from foreign flavour and odour, taking into consideration any added optional ingredients;
- (d) reasonably tender and sufficiently developed; and
- (e) reasonably free from loose skins.

and with respect to visual defects subject to tolerances shall be:

- (f) reasonably free from ragged, crushed or broken kernels;
- (g) reasonably free from damaged or blemished kernels;
- (h) reasonably free from pieces of cob, husk or silk;
- (i) practically free from harmless EVM; and
- (j) reasonably free from pulled kernels.

2.2.2 Definitions of visual defects

- (a) **Damage or blemish** – means any kernel affected by insect injury or damaged by discolouration, pathological injury, mechanical injury, or by any other means to the extent that the appearance or eating quality is affected. This category of defect may be further classified as minor, major or serious depending upon the extent to which the appearance is affected.
- (i) **Minor** – means damage or blemish that affects the kernel to only a slight degree.
- (ii) **Major** – means damage or blemish that is quite noticeable and materially affects the kernel.
- (iii) **Serious** – means damage or blemish that is very noticeable and of such nature that it would customarily be discarded under normal culinary preparation.
- (b) **Cob** – means the very firm to hard cellulose-like material to which the kernels of corn are attached and from which the kernels are removed during processing.
- (c) **Husk** – means the membranous outer covering and one of the constituent parts of an ear of corn that is removed during processing.
- (d) **Silk** – means the coarse thread-like filaments that are one of the constituent parts of an ear of corn. Such silk is found beneath the husk and in immediate contact with the corn kernels. Corn silk is normally removed during processing.
- (e) **Harmless extraneous vegetable material** – means vegetable matter other than cob, husk, or silk which is harmless. Such material may include, but is not limited to, grass, weeds, leaves and portions of stalk. This category of defect may be further classified as minor, major or serious, depending upon the amount of severity of the material.
- (i) **Minor** – only slightly noticeable and affects the product to only a slight degree.
- (ii) **Major** – readily noticeable and affects the product to a material degree.
- (iii) **Serious** – very noticeable and objectionable and would customarily be discarded under normal culinary preparation.
- (f) **Pulled kernels** – means kernels of corn that have been so cut or removed from the ear of corn that portions of cob or hard tissue remain. This category of defect may be further classified as minor or major depending upon the amount of adhering cob that is present.
- (i) **Minor** – slight amount of cob material or hard tissue remains around the base of the kernel.
- (ii) **Major** – moderate to noticeable amount of adhering cob material. (If there is an excessive amount of cob material adhering, apply tolerance given in Table 1).

2.2.3 Minimum sample unit

The minimum sample unit shall be 250 g.

2.2.4 Defects and allowances

For tolerances based on the minimum sample unit indicated in Section 2.2.3, visual defects shall be scored in accordance with Table 1 in this section. The maximum percentage of defects permitted in the total allowable percentage rating is indicated for the respective categories: minor, major, serious and pulled kernels or the combined total of the foregoing categories.

- | | |
|---------------------------------------|---------------------|
| (a) Pieces of cob – maximum tolerance | 0.6 cm ³ |
| (b) Husk – maximum tolerance | 4.4 cm ² |
| (c) Silk – maximum tolerance | 160 cm |
| (d) Ragged, crushed or broken kernels | (60 pieces) |

Table 1

Defects	% m/m
Damage or blemish (minor)	5
Damage or blemish (major)	3
Damage or blemish (serious)	1
Harmless EVM	0.2
Pulled kernels	
– Minor	7
– Major	2
Total allowable percentage	9

2.3 Definition of “defectives”

Any minimum sample unit, which fails to comply with the quality requirements, as set out in Sections 2.1.1, 2.2.1 and 2.2.4 shall be regarded as a “defective”.

2.4 Lot acceptance

A lot will be considered acceptable when the number of “defectives” as defined in Section 2.3 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

In applying the acceptance procedure each defective, as indicated in Section 2.3, is treated individually for the respective characteristics.

3. FOOD ADDITIVES

None permitted.

4. LABELLING

4.1 Name of the product

4.1.1 The name of the food shall include the designation “corn”.

4.1.2 In addition, there shall appear on the label in conjunction with or in close proximity to the word “corn”:

- (a) The words “whole kernel” except that the description “whole grain”, “cut”, “sweet” or “kernels” may be used if this is customary in the country of retail sale.
- (b) The colour for example; “yellow” or “white” except that the colour “golden” may be used in lieu of “yellow”, if this is customary in the country of retail sale.

ANNEX ON BROCCOLI

In addition to the general provisions applicable to quick-frozen vegetables,
the following specific provisions apply:

1. DESCRIPTION

1.1 Product definition

Quick-frozen broccoli is the product prepared from the fresh, clean, sound stalks or shoots of the broccoli plant conforming to the characteristics of the species *Brassica oleracea* L. var. *italica* Plenck (sprouting broccoli) which have been sorted, trimmed, washed and sufficiently blanched to ensure adequate stability of colour and flavour during normal marketing cycles.

1.2 Presentation

1.2.1 Styles

- (a) **Spears** – the head and adjoining portion of the stem, with or without small tender attached leaves, ranging in length from more than 7 cm to 16 cm. The spears may be split longitudinally. Within each sample unit not more than 20 percent by count fall outside the designated length.
- (b) **Florets** – the head and adjoining portion of the stem, with or without small tender attached leaves ranging in length from 15 mm to 80 mm with sufficient attached stem to maintain a compact head. The florets may be split longitudinally. Within each sample unit not more than 20 percent by count fall outside the designated length.
- (c) **Cut spears** – spears, which have been cut into portions and which may be irregular in shape. Pieces from 1.5 cm to 5 cm in the longest dimension. Leaf material may be present but shall not exceed 35 percent m/m and head material shall not be less than 15 percent m/m.
- (d) **Chopped** – broccoli finely cut into pieces less than 1.5 cm in the longest dimension. Leaf material may be present but shall not exceed 35 percent m/m and head material shall not be less than 15 percent m/m.

1.2.2 Sizing

Quick-frozen broccoli florets may be presented sized or unsized.

When sized, a size name designation and size parameter in mm should be indicated on the package. The package shall contain no less than 80 percent by weight of the declared size.

Table 1: Sizing

Size designation	Diameter size range of the head of the florets (mm)
(a) Small florets	12–40 mm
(b) Florets	> 40–80 mm

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Composition

2.1.1 Basic ingredients

Broccoli as defined in Section 1.1.

2.1.2 Optional ingredients

- (a) Sugars as defined in the *Standard for sugars* (CXS 212-1999);¹
- (b) Salt (sodium chloride) as defined in the *Standard for Food-Grade Salt* (CXS 150-1985);²
- (c) Edible fats and oils as defined in the *Standard for Named Vegetable Oils* (CXS 210-1999)³ and in the *Standard for Named Animal Fats* (CXS 211-1999);⁴
- (d) Spices and culinary herbs;ⁱ
- (e) Named sauces.

ⁱ In accordance with the relevant standards for spices and culinary herbs, when available.

2.2 Quality factors

2.2.1 General requirements

Quick-frozen broccoli shall be of reasonably uniform dark green to light green depending on the varieties. The inflorescences shall be firm, compact of fine/close grained with floral buttons completely closed.

With respect to visual or other defects with a tolerance, quick-frozen broccoli shall be reasonably free from:

- (a) an excessive amount of leaf material, particularly large coarse leaves;
- (b) detached fragments and loose leaves (only for spears and florets);
- (c) extraneous vegetable material;
- (d) yellow or brown coloured florets;
- (e) damage due to mechanical, pathological, or insect injury;
- (f) poorly trimmed units (spears and florets);
- (g) flowered or poorly developed units; and
- (h) fibrous or woody units.

2.2.2 Definition of visual defects

- (a) **Extraneous vegetable material (EVM)** – means leaf, stem, or similar harmless vegetable material other than from the broccoli plant.
- (b) **Detached leaves** (for spears and florets) – mean broccoli leaves and pieces thereof not attached to a unit.
- (c) **Fragments** (for spears and florets) – means pieces less than 20 mm in length for spears and weighing less than 5 g for florets.
- (d) **Blemished** – a unit or product, which is stained, spotted, affected by discolouration or disease or insect injury.
 - (i) **Minor** – slightly affecting the appearance or eating quality.
 - (ii) **Major** – materially affecting the appearance or eating quality.
 - (iii) **Serious** – seriously affecting the appearance or objectionably affecting the eating quality to such an extent that customarily it would be discarded under normal culinary preparation.
- (e) **Mechanical damage** (for spears and florets) – means a unit bearing the general configuration of a spear or floret, but from which more than 50 percent of the buds have become detached, or otherwise mechanically damaged so as to materially affect the appearance of the product.
- (f) **Poorly trimmed** (for spears and florets) – means units in which the appearance is seriously affected by attached coarse leaves or pieces thereof, or ragged removal of leaves, or small side shoots, or poor cutting of the stem.
- (g) **Overmature or poorly developed** – means individual buds are in the flowered stage and with respect to spears and florets branching bud clusters which comprise the head are spread so as to seriously affect the appearance of the unit, or the bud clusters are of such advanced maturity that individual buds and supporting stems from loosely structured clusters.
- (h) **Fibrous** – means tough fibre that is normally developed near the outside portion of the broccoli stem; such units are tough but still edible.
- (i) **Woody** – means tough fibre that is normally developed near the outside portion of the broccoli stem, such units are extremely tough and highly objectionable.

2.2.3 Standard sample size

The standard sample size for presentation (styles) shall be 300 g.

2.2.4 Defects and allowances

In addition, the following sample size applies for visual defects:

Table 2: Sample size

Styles	Sample size for visual defects
(a) Spears, florets	300 g for detached fragments, loose leaves, and EVM; for other defects 25 units
(b) Cut spears and other styles	300 g
(c) Chopped	100 g

Table 3: Classification of defects by count for spears and florets

Visual defects	Unit of measurement	Defect categories			
		Minor	Major	Serious	Total
(a) EVM	Each piece		2		
(b) Detached leaves	Each 5 g	1			
(c) Fragments					
(i) Spears	Each 20 mm	1			
(ii) Florets	Each 5 g	1			
(d) Blemished	Each unit				
(i) Minor		1			
(ii) Major			2		
(iii) Serious				4	
(e) Mechanical damage	Each unit		1		
(f) Poorly trimmed	Each unit	1			
(g) Overmature/poorly developed	Each unit				
(h) Fibrous	Each unit		2		
(i) Woody	Each unit		2		
Total allowable points		25	12	4	25

For tolerance based on the standard sample sizes indicated in Section 2.2.3, visual defects shall be assigned points in accordance with the appropriate table in this Section. The maximum number of defects permitted is the total allowable points rating indicated for the respective categories: minor, major and serious or the combined total of the foregoing categories.

Table 4 – Chopped

Visual defects	Unit of measurement	Defect categories			
		Minor	Major	Serious	Total
(a) EVM	Each piece		2		
(b) Blemished	Each piece				
(i) Minor		1			
(ii) Major			2		
(iii) Serious				4	
(c) Overmature/poorly developed	Each 10 g for cut		2		
	Each 2 g for chopped		2		
(d) Fibrous	Each 2 g		2		
(e) Woody	Each 2 g t			4	
Total allowable points		25	12	4	25

2.3 Definition of “defectives”

Any standard sample unit, which fails to comply with the quality requirements, as set out in Sections 1.2.1, 2.2.1 and 2.2.4 shall be regarded as a “defective”.

2.4 Lot acceptance

A lot will be considered acceptable when the number of “defectives” as defined in Section 2.2 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

In applying the acceptance procedure each “defective”, as indicated in Sections 2.2.1 and 2.2.4, is treated individually for the respective categories.

3. FOOD ADDITIVES

None permitted.

4. LABELLING

4.1 Name of the product

The name of the product shall include the designation “broccoli” and the size or size designation when the broccoli is sized.

NOTES

¹ FAO and WHO. 1985. *Standard for food-grade salt*. Codex Alimentarius Standard, No. CXS 150-1985. Codex Alimentarius Commission. Rome.

² FAO and WHO. 1999. *Standard for sugars*. Codex Alimentarius Standard, No. CXS 212-1999. Codex Alimentarius Commission. Rome.

³ FAO and WHO. 1999. *Standard for Named Vegetable Oils*. Codex Alimentarius Standard, No. CXS 210-1999. Codex Alimentarius Commission. Rome.

⁴ FAO and WHO. 1999. *Standard for Named Animal Fats*. Codex Alimentarius Standard, No. CXS 211-1999. Codex Alimentarius Commission. Rome.

ANNEX ON BRUSSELS SPROUTS

In addition to the general provisions applicable to quick-frozen vegetables, the following specific provisions apply:

1. DESCRIPTION

1.1 Product definition

Quick-frozen Brussels sprouts are the product prepared from fresh, clean, sound, whole auxiliary buds of the plant conforming to the characteristics of *Brassica oleracea* L. var. *gammier* Gemmifera (DC) Schulz – whose buds are trimmed, sorted, washed and sufficiently blanched to ensure adequate stability of colour and flavour during normal marketing cycles.

1.2 Presentation

1.2.1 Sizing

- (a) Quick-frozen Brussels sprouts may be presented sized or unsized.
- (b) Whether sized or unsized, the amount of frozen sprouts passing a square holed sieve of 12 mm, shall not exceed 5 percent by number.
- (c) If quick-frozen Brussels sprouts are presented as size graded, they shall conform to a, size name designation and size parameter in mm should be indicated on the package when measured in the frozen condition. The following system of size designations and diameters is a guide. Other designations including mixtures of sizes are allowed.

Table 1: Size designation

Size designation	Diameter of sprouts in mm using a square hole sieve or calliper
(a) Very small	12–22 mm
(b) Small	> 22–26 mm
(c) Medium	> 26–36 mm
(d) Large	over 36 mm

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Composition

2.1.1 Basic ingredients

Brussels sprouts as defined in Section 1.

2.1.2 Optional ingredients

- (a) Sugars as defined in the *Standard for sugars* (CXS 212-1999);¹
- (b) Salt (sodium chloride) as defined in the *Standard for food-grade salt* (CXS 150-1985);²
- (c) Edible fats and oils as defined in the *Standard for named vegetable oils* (CXS 210-1999)³ and in the *Standard for named animal fats* (CXS 211-1999);⁴
- (d) Spices and culinary herbsⁱ
- (e) Named sauces.

ⁱ In accordance with the relevant standards for spices and culinary herbs, when available.

2.2 Quality factors

2.2.1 General requirements

With respect to visual defects or other defects subject to a tolerance, quick-frozen Brussels sprouts shall be reasonably free from:

- (a) extraneous vegetable material (EVM);
- (b) loosely structured buds;
- (c) poorly trimmed or mechanically damaged units;
- (d) damage by insects or disease; and
- (e) loose leaves.

2.2.2 Definition of visual defects

- (a) **Extraneous vegetable material (EVM)** – 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 percent of the outer surface of a sprout yellow in colour due to loss of outer leaves resulting either from over trimming 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 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 decomposition.
- (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 stem 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 stem;
 - iii) the stem extends more than 10 mm below the point of attachment of the lowest outer leaves; or
 - iv) the appearance is damaged to an extent that the sprout is lacerated, can be separated easily into two pieces, or more than 25 percent of its volume has been removed.
- (i) **Loose leaf:** Leaf or leaf fragments detached from the bud.

2.2.3 Standard sample size

2.2.3.1 Presentation (styles and sizing)

The standard sample size shall be 1 kg.

2.2.3.2 Visual defects

The standard sample size shall be 1 kg for the assessment of EVM and loose leaf, and 100 sprouts for the assessment of other visual defects.

2.2.4 Defects and allowances

2.2.4.1 Styles – “free flowing”

When the product is presented as free flowing, a tolerance of 10 percent 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.

2.2.4.2 Sizing

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

Table 2: Sizing

Size designation	Very small	Small	Medium	Large
(a) Max% 12–22 mm	-	20	20	5
(b) Max% 22–26 mm	20	-	20	-
(c) Max% 26–36 mm	5	20	-	20
(d) Max% over 36 mm	0		20	-
Total max%	20	20	20	20

2.2.4.3 Visual defects

For tolerance based on the standard sample sizes indicated in Section 2.2.3.2, 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.

Table 3: Defects allowances

Defect	Unit of measurement	Defect categories			Total
		1	2	3	
(a) EVM	Each piece	2			
(b) Loosely structured	Each sprout		2		
(c) Perforated leaves	Each sprout		1		
(d) Decayed	Each sprout			4	
(e) Seriously blemished	Each sprout			2	
(f) Blemished	Each sprout		2		
(g) Poorly trimmed or mechanically damaged	Each sprout		1		
(h) Loose leaf	Each 1% m/m	1			
Maximum total allowable points		10	45	10	55

Maximum percentage by count of (b) yellow sprouts: 25

2.3 Classification of “defectives”

Any standard sample unit, which fails to comply with the quality requirements, as set out in Sections 2.2.1 and 2.2.4 shall be regarded as a “defective”.

2.4 Lot acceptance

A lot will be considered acceptable when the number of “defectives” as defined in Section 2.3 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

In applying the acceptance procedure each “defective”, as indicated in Sections 2.2.1 and 2.2.4.3, is treated individually for the respective characteristics.

3. FOOD ADDITIVES

None permitted.

4. LABELLING

4.1 Name of the product

The name of the product shall include the designation “Brussels sprouts”.

4.2 Size designation

4.2.1 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.

NOTES

¹ FAO and WHO. 1999. *Standard for sugars*. Codex Alimentarius Standard, No. CXS 212-1999. Codex Alimentarius Commission. Rome.

² FAO and WHO. 1985. *Standard for food-grade salt*. Codex Alimentarius Standard, No. CXS 150-1985. Codex Alimentarius Commission. Rome

³ FAO and WHO. 1999. *Standard for Named Vegetable Oils*. Codex Alimentarius Standard, No. CXS 210-1999. Codex Alimentarius Commission. Rome.

⁴ FAO and WHO. 1999. *Standard for Named Animal Fats*. Codex Alimentarius Standard, No. CXS 211-1999. Codex Alimentarius Commission. Rome.

ANNEX ON CAULIFLOWER

In addition to the general provisions applicable to quick-frozen vegetables, the following specific provisions apply:

1. DESCRIPTION

1.1 Product definition

Quick-frozen cauliflower is the product prepared from fresh, clean, sound heads of the cauliflower plant conforming to the characteristics of the species *Brassica oleracea* L. var. *botrytis* L., which heads may be trimmed and separated into parts, and which are washed and sufficiently blanched to ensure stability of colour and flavour during normal marketing cycles.

1.2 Presentation

1.2.1 Style

- (a) **Whole** – the whole, intact head, which is trimmed at the base. Small tender modified leaves may be present or attached to the unit;
- (b) **Split** – the whole head, cut vertically into two or more sections which may have attached small, tender, modified leaves;
- (c) **Florets**ⁱ - segments of the head, which may have a portion of the attached, measuring at least 12 mm across the top in the greatest dimension. A maximum tolerance of 20 percent m/m is permitted for units in which the greatest dimension across the floret is more than 5 mm and less than 12 mm. Small, tender modified leaves may be present or attached to the units.

1.2.2 Sizing

1.2.2.1 Quick-frozen cauliflower florets may be presented sized or unsized. When sized, size is determined by the maximum diameter of the equatorial section.

1.2.2.2 If presented as size graded, they shall conform to the following specifications.

- (a) **Large florets** – segments of head measuring at least 30 mm across the top in the greatest dimension and of which a portion of secondary stem may be attached. Small tender modified leaves may be present or attached to the unit.
- (b) **Small florets** – segments of head measuring at least 12 mm but less than 30 mm across the top in the greatest dimension and to which a small portion of secondary stem may be attached. Small tender modified leaves may be present or attached to the unit.

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Composition

2.1.1 Basic ingredients

Cauliflower as defined in Section 1.

2.1.2 Optional ingredients

- (a) Sugars as defined in the *Standard for sugars* (CXS 212-1999);¹
- (b) Salt (sodium chloride) as defined in the *Standard for food-grade salt* (CXS 150-1985);²
- (c) Edible fats and oils as defined in the *Standard for named vegetable oils* (CXS 210-1999)³ and in the *Standard for named animal fats* (CXS 211-1999);⁴
- (d) Spices and culinary herbs;ⁱⁱ
- (e) Named sauces.

2.2 Quality factors

2.2.1 General requirements

Quick-frozen cauliflower shall be of reasonably uniform white to dark cream colour over the tops of the units which may be slightly dull and have a tinge of green, yellow or pink. The inflorescences shall be firm, compact, of fine/close grained.

ⁱ The term “clusters” is used as an alternative to “florets” in some English-speaking countries.

ⁱⁱ In accordance with the relevant standards for spices and culinary herbs, when available.

The stem or branch portions may be light green or have a tinge of blue; and with respect to visual defects or other defects subject to a tolerance shall be reasonably:

- (a) free from discoloured areas confined essentially to the surface;
- (b) free from damaged or blemished areas;
- (c) free from fibrous stems;
- (d) free from poorly trimmed units;
- (e) free from fragments;
- (f) compact and reasonably well developed;
- (g) free from coarse green leaves; and
- (h) free from loose stems (for floret styles).

2.2.2 Definition of visual defects

Table 1 – Definition of visual defects

(a) Discolouration	(i) Light – the discolouration disappears almost entirely upon cooking.
	(ii) Dark – the discolouration does not disappear upon cooking.
(b) Blemished	(i) Minor – the appearance of the unit is only slightly affected.
	(ii) Major – the appearance of the unit is materially affected.
	(iii) Serious – the appearance of the unit is objectionably affected to such an extent that it would customarily be discarded under normal culinary preparation.
(c) Mechanically damaged	(i) Major – a unit in which more than 50% of the curd has been mechanically damaged or is missing (for split and floret styles).
	(ii) Major – a unit in which more than 25% of the curd has been mechanically damaged or is missing (for whole style).
(d) Fibrous	(i) Major – a unit which possesses tough fibres that are quite noticeable and materially affect the eating quality.
	(ii) Serious – a unit which possesses tough fibres that are objectionable and of such nature that it would be customarily discarded.
(e) Poorly trimmed	– a unit which has deep-knife gouges or a ragged appearance.
(f) Leaves	– coarse green leaves or parts thereof whether or not attached to the unit.
(g) Fragments	– portions of the floret 5 mm or less across the greatest dimension.
(h) Not compact	– a unit in which the florets are spreading, or the flowerhead has a “ricey” appearance or the flowerhead is very soft or mushy.
(i) Loose stem	– each piece of stem exceeding 2.5 cm in length detached from a cauliflower unit.

2.2.3 Standard sample size

The standard sample size for presentationⁱⁱⁱ shall be 500 g having a minimum of 50 florets.

2.2.4 Defects and allowances

When cauliflower is presented as sized, a tolerance of 20 percent by weight is permitted as not conforming to the size indicated on the package.

ⁱⁱⁱ For whole style, the minimum number of heads weighing in total at least 500 g.

For tolerances based on the standard sample size indicated in Section 2.2.3, visual defects shall be assigned points in accordance with the Tables 2 and 3. The maximum number of defects permitted is the total allowable points rating indicated for the respective categories minor, major and serious or the combined total of the foregoing categories.

Table 2 – Whole style

Defect		Unit of measurement	Defect categories			
			Minor	Major	Serious	Total
(a) Discolouration	(i) Light	Each area or combined area of 8 cm ²	1			
	(ii) Dark	Each area or combined area of 4 cm ²		2		
(b) Blemished	(i) Minor	Each head	1			
	(ii) Major			2		
	(iii) Serious				4	
(c) Mechanically damaged	(i) Major	Each head		2		
(d) Fibrous	(i) Major	Each head		2		
	(ii) Serious				4	
(e) Poorly trimmed leaves		Each head		2		
		Each 2 cm ²		2		
(f) Not compact		Each area or combined area of 12 cm ²		2		
Total allowable points			10	6	4	10

Table 3 split, florets and other styles

Defect		Unit of measurement	Defect categories			
			Minor	Major	Serious	Total
(a) Discolouration	(i) Light	Each area or combined area of 8 cm ²	1			
	(ii) Dark	Each area or combined area of 4 cm ²		2		
(b) Blemished	(i) Minor	Each unit	1			
	(ii) Major			2		
	(iii) Serious				4	
(c) Mechanically damaged	(i) Major	Each unit		2		
(d) Fibrous	(i) Major	Each unit		2		
	(ii) Serious				4	
(e) Poorly trimmed leaves		Each unit	1			
		Each 2 cm ²		2		
(f) Fragments		Each 3% m/m		2		

Defect		Unit of measurement	Defect categories			
			Minor	Major	Serious	Total
(g)	Not compact	Each area or combined area of 12 cm ²		2		
(h)	Loose stem	Each piece	1			
Total allowable points			25	16	4	25

2.3 Classification of “defectives”

Any standard sample unit which fails to comply with the quality requirements, as set out in Sections 2.2.1 and 2.2.4 shall be regarded as a “defective”.

2.4 Lot acceptance

A lot will be considered acceptable when the number of “defectives” as defined in Section 2.2 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

3. FOOD ADDITIVES

None permitted.

4. LABELLING

4.1 Name of the product

4.1.1 The name of the product shall include the designation “cauliflower”.

4.1.2 If a term designating the size of the florets is used:

- (a) the words “large florets”, “medium florets”, “small florets” or “cut florets” as appropriate; and/or
- (b) by a correct representation on the label of the size range to which the florets predominantly conform; and/or;
- (c) the customary method of declaring size in the country of retail sale.

NOTES

¹ FAO and WHO. 1999. *Standard for sugars*. Codex Alimentarius Standard, No. CXS 212-1999. Codex Alimentarius Commission. Rome.

² FAO and WHO. 1985. *Standard for food-grade salt*. Codex Alimentarius Standard, No. CXS 150-1985. Codex Alimentarius Commission. Rome.

³ FAO and WHO. 1999. *Standard for Named Vegetable Oils*. Codex Alimentarius Standard, No. CXS 210-1999. Codex Alimentarius Commission. Rome.

⁴ FAO and WHO. 1999. *Standard for Named Animal Fats*. Codex Alimentarius Standard, No. CXS 211-1999. Codex Alimentarius Commission. Rome.

ANNEX ON FRENCH-FRIED POTATOES

In addition to the general provisions applicable to quick-frozen vegetables, the following specific provisions apply:

1. DESCRIPTION

1.1 Product definition

Quick-frozen French-fried potatoes are the product prepared from clean, sufficiently developed, sound tubers of the potato plant conforming to the characteristics of the species *Solanum tuberosum* L, *Solanum Andigena* L and rhizomes of the sweet potato plant conforming to the characteristics of the species of *Ipomoea batatas*. They shall have been sorted, washed, peeled or unpeeled, cut into various shapes and treated as necessary to achieve satisfactory colour and fried or pre-cooked in edible oil, fat, or water blanched. The treatment, pre-cooking and frying operations shall be sufficient to ensure adequate stability of colour and flavour during normal marketing cycles. Following the frying or pre-cooking operation the product is quickly cooled and quick-frozen. Products that have not been fried or pre-cooked are not covered by this annex.

1.2 Presentation

1.2.1 Styles

The styles of the product shall be determined by the nature of the surface and the nature of the cross-section.

1.2.1.1 Nature of the surface

The product may be presented in any one of the following styles including:

- (a) **Straight cut** – strips of potato with practically parallel sides and with smooth surfaces; or
- (b) **Crinkle cut** – strips of potato with practically parallel sides and in which two or more sides have a corrugated surface.

1.2.1.2 Dimensions of the cross-section

The cross-sectional dimensions of strips of quick-frozen French-fried potatoes that have been cut on all four sides (styles (a) and (b) above) shall not be less than 4 mm when measured in the frozen condition. The quick-frozen French-fried potatoes within each pack shall be of similar cross-sectional dimensions.

The product may be identified:

- (a) by the approximate dimensions of the cross-sections or by reference to the following system for designations:

Table 1. Size designations

Designation	Dimension in mm across the largest cut surface
(a) Shoestring	4–8
(b) Medium	> 8–12
(c) Thick cut	> 12–16
(d) Extra large	> 16

Uniformity

Uniformity may be expressed as a tolerance of 10 percent by length of non-conforming styles units applies, when specific lengths are not indicated.

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Composition

2.1.1 Basic ingredients

- (a) Potatoes as defined in Section 1.1;
- (b) Edible fats and oils as defined in the *Standard for named vegetable oils* (CXS 210-1999)¹ and in the *Standard for named animal fats* (CXS 211-1999).²

2.1.2 *Optional ingredients*

- (a) sugars as defined in the *Standard for sugars* (CXS 212-1999);³
- (b) salt (sodium chloride) as defined in the *Standard for food-grade salt* (CXS 150-1985);⁴
- (c) spices and culinary herbs; and
- (d) batters.

2.2 *Quality factors*

2.2.1 *General requirements*

Quick-frozen French-fried potatoes shall:

- (a) be free from any foreign flavours and odours;
- (b) be clean, sound and practically free from foreign matter; and
- (c) have a reasonably uniform colour.

With respect to visual defects subject to a tolerance shall be:

- (a) without excessive external defects such as blemishes, eyes and discolouration;
- (b) without excessive sorting effects, such as slivers, small pieces and scrap; and
- (c) reasonably free from frying defects, such as burnt parts.

When prepared in accordance with the manufacturer's instructions quick-frozen French-fried potatoes shall:

- (a) have a reasonably uniform desired colour; and
- (b) have a texture characteristic of the product and be neither excessively hard nor excessively soft or soggy.

2.2.2 *Analytical requirements*

2.2.2.1 Moisture – the maximum moisture content of the whole product in the styles: shoestring, medium and thick cut shall be 76 percent m/m; and in extra-large and other styles 78 percent m/m.

2.2.2.2 *Definition of visual defects*

External defects: are blemishes or discolouration (either internally or on the surface) due to exposure to light, mechanical, pathological or pest agents, eye material or peeling remnants.
(a) Minor defect – a unit affected by disease, dark or intense discolouration, eye material, or dark peel covering an area or a circle greater than 3 mm but less than 7 mm in diameter; pale brown peel or light discolouration of any area greater than 3 mm in diameter.
(b) Major defect – a unit affected by disease, dark or intense discolouration, eye material, or dark peeling covering an area or a circle greater than 7 mm but less than 12 mm in diameter.
(c) Serious defect – a unit affected by disease, dark or intense discolouration, eye material, or dark peel covering an area or a circle of 12 mm in diameter or more.
Note: "Slight" external defects which in either area or intensity fall below the definition shown for minor defects shall be ignored.
Sorting defects
(a) Sliver – a very thin unit (generally an edge piece) which will pass through a slot the width of which is 50% of the minimum dimension of the nominal or normal size.
(b) Small piece – any unit less than 25 mm in length.
(c) Scrap – potato material of irregular form not conforming to the general conformation of French-fried potatoes.
Frying defects
Burnt pieces – any unit which is dark brown to black and hard due to gross over frying.

2.2.3 *Standard sample size*

The standard sample size shall be 1 kg.

2.2.4 Tolerances for visual defects

For tolerances based on the standard sample size as specified in Section 2.2.4 the visual external defects are classified as “minor” or “major” or “serious”. The tolerances in respect of external defects are dependent on the cross-section of the French-fried potatoes.

To be acceptable, the standard samples shall not contain units in excess of the numbers shown for the respective categories, including total, in Table 2.

Table 2: Tolerances for external defects

Defect category	Number of units affected cross-section of strips	
	4–16 mm	over 16 mm
(a) Serious	7	3
(b) Serious + major	21	9
Total (serious + major + minor)	60	27

The tolerances for the other defects (not depending on cross-section) (depending on the style) are:

Table 3. Sorting defects (grades)

Slivers	maximum 12% m/m
Small pieces and scraps	maximum 6% m/m
Total sorting defects	maximum 12% m/m
Frying defects	maximum 0.5% m/m

2.3 Classification of “defectives”

Any sample unit taken shall be regarded as a “defective” for the respective characteristics when it:

- fails to meet any of the requirements given in Section 2.1;
- fails to meet any of the general requirements given in Section 2.2.1; and
- exceeds the tolerances for visual defects in any one or more respective defect categories in Section 2.2.5.

2.4 Lot acceptance for composition and quality factors

A lot will be considered acceptable with respect to composition and quality factors when the number of “defectives” as defined in Section 2.2 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

In applying the acceptance procedure, each “defective”, as indicated in Section 2.3(a) to (c), is treated individually for the respective characteristics.

3. FOOD ADDITIVES

Sequestrants used in accordance with Table 1 and Table 2 of the *General standard for food additives* (CXS 192-1995)⁵ in Food Category 0.4.2.2.1 Frozen Vegetables (including mushrooms and fungi, roots and tubers, pulses and legumes, and aloe vera), seaweeds, and nuts and seeds, are acceptable for use in food conforming to this standard.

4. LABELLING

4.1 Name of the product

4.1.1 The name of the product shall be “French-fried potatoes” or the equivalent designation used in the country in which the product is intended to be sold. Where the sweet potato variety is used, the name of the product shall be “French-fried sweet potatoes”.

4.1.2 In addition, there shall appear on the label a designation of the style as appropriate, for example “straight cut” or “crinkle cut” and there may also appear an indication of the approximate dimensions of the cross-section or the appropriate designation, i.e. “Shoestring”, “medium”, “thick cut” or “extra large”.

4.2 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.

NOTES

¹. FAO and WHO. 1999. *Standard for named vegetable oils*. Codex Alimentarius Standard, No. CXS 210-1999. Codex Alimentarius Commission. Rome.

². FAO and WHO. 1999. *Standard for named animal fats*. Codex Alimentarius Standard, No. CXS 211-1999. Codex Alimentarius Commission. Rome.

³. FAO and WHO. 1999. *Standard for sugars*. Codex Alimentarius Standard, No. CXS 212-1999. Codex Alimentarius Commission. Rome.

⁴. FAO and WHO. 1985. *Standard for food-grade salt*. Codex Alimentarius Standard, No. CXS 150-1985. Codex Alimentarius Commission. Rome.

⁵. FAO and WHO. 1995. *General standard for food additives*. Codex Alimentarius Standard, No. CXS 192-1995. Codex Alimentarius Commission. Rome.

ANNEX ON GREEN BEANS AND WAX BEANS

In addition to the general provisions applicable to quick-frozen vegetables,
the following specific provisions apply:

1. DESCRIPTION

1.1 Product definition

Quick-frozen green beans is the product prepared from fresh, clean, sound, succulent pods of the plants conforming to the characteristics of suitable varieties of the species *Phaseolus vulgaris* L. or *Phaseolus coccineus* L. Strings (if any), stems, and stem ends are removed, and the pods washed and sufficiently blanched to ensure adequate stability of colour and flavour during normal marketing cycles.

1.2 Presentation

1.2.1 Type

Green beans or wax beans having distinct varietal differences with regard to shape may be designated as:

- (a) **Round** – pods having a width not greater than 1½ times the thickness.
- (b) **Flat** – pods having a width greater than 1½ times the thickness.

1.2.2 Styles

Quick-frozen green beans and quick-frozen wax beans shall be presented in the following styles:

- (a) **Whole**: whole pods of any length.
- (b) **Cut**: transversely cut pods in which 70 percent or more by count of the units are at least 20 mm long but not longer than 65 mm.
- (c) **Short cut**: transversely cut pods in which 70 percent or more by count of the units are more than 10 mm but less than 20 mm long.
- (d) **Diagonal cut**: pods cut approximately 45° to the longitudinal axis in which 70 percent by count of the units are more than 6 mm long.
- (e) **Sliced/French cut**: pods sliced lengthwise or at an angle up to approximately 45° to the longitudinal axis, with a maximum thickness of 7 mm.

1.2.3 Colour (for wax beans only)

The predominant colour of the pods of wax beans excluding the seeds and immediate surrounding tissue shall be yellow, or yellow with a green tinge.

1.2.4 Sizing

- (a) Quick-frozen whole and cut green beans and wax beans may be presented sized or unsized.
- (b) If round type beans are presented as size graded on diameter, they shall conform when measured in the thawed conditions, to the following size designation for the size names. However, other size designations may be used, and should be labelled accordingly.

Table 1: Size designation

Size designations	Bean pod diameter in mm measured by passing through parallel bars
(a) Extra small	up to 6.5
(b) Very small	up to 8
(c) Small	up to 9.5
(d) Medium	up to 11
(e) Large	over 11

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Composition

2.1.1 Basic ingredients

Green beans and wax beans as defined in Section 1.

2.1.2 Optional ingredients

- (a) Sugars as defined in the *Standard for sugars* (CXS 212-1999).¹
- (b) Salt (sodium chloride) as defined in the *Standard for food-grade salt* (CXS 150-1985).²
- (c) Edible fats and oils as defined in the *Standard for named vegetable oils* (CXS 210-1999)³ and in the *Standard for named animal fats* (CXS 211-1999).⁴
- (d) Spices and culinary herbs.ⁱ
- (e) Named sauces.

2.2 Quality factors

2.2.1 General requirements

With regard to visual defects subject to a tolerance, quick-frozen beans shall be:

- (a) without excessive small pieces;
- (b) normally developed (for whole beans);
- (c) reasonably free from extraneous vegetable material (EVM);
- (d) reasonably free from stem ends;
- (e) reasonably free from damage by insects or disease;
- (f) reasonably free from mechanically damaged units; and
- (g) reasonably free from tough strings and fibrous units.

2.2.2 Definition of visual defects

- (a) **Extraneous vegetable material:** vegetable material from the bean plant, other than pod, such as leaf or vine, but excluding stem ends; other harmless vegetable material, not purposely included as an ingredient. For the purpose of assessment, EVM comprising bean leaf material will be differentiated from other EVM
- (b) **Stem end:** a piece of the immediate stem which attaches the pod to the vine stem whether still attached to the unit or loose in the product.
- (c) **Major blemish:** each piece blemished due to insect or pathological damage affecting an area greater than a 6 mm diameter circle, 2 mm to 4 mm for the “extra-small” size or blemished by other means to a degree which seriously detracts from its appearance.
- (d) **Minor blemish:** each piece blemished due to insect or pathological damage affecting an area greater than a 3 mm diameter circle, 2 mm to 4 mm for the “extra-small” size or blemished by other means to a degree which seriously detracts from its appearance.
- (e) **Mechanical damage** (whole and cut styles): a unit that is broken or split into two parts, crushed, or has very ragged edges to an extent that the appearance is seriously affected.
- (f) **Undeveloped** (whole style only): each unit which measures less than 3 mm at its widest point.
- (g) **Tough strings:** tough fibre which will support a weight of 250 g for 5 seconds or more when tested in accordance with the procedure as given in CAC/RM 39-1970.
- (h) **Fibrous unit:** each piece having parchment – like material formed during the ripening of the pod, to the extent that the eating quality is seriously affected.
 - (i) **Edible fibre** means fibre developed in the wall of the bean pod that, after cooking, is noticeable upon chewing, but can be consumed with the rest of the bean material without objection.
 - (ii) **Inedible fibre** means fibre developed in the wall of the bean pod that, after cooking, is objectionable upon chewing and tends to separate from the rest of the bean material.
 - (iii) **Small pieces** (cut and sliced styles): bean pieces less than 10 mm in length including loose seeds and pieces of seeds; (whole style) bean pieces less than 20 mm in length including loose seeds and pieces of seeds.

¹ In accordance with the relevant standards for spices and culinary herbs, when available.

2.2.3 Standard sample size

2.2.3.1 Presentation

The standard sample size for sizing shall be 1 kg.

2.2.3.2 Visual defects

The standard sample size is 1 kg for EVM and stem ends, and 300 g for other defect categories.

2.2.4 Defects and allowances

2.2.4.1 Presentation

- (a) When the product is presented as “free flowing”, a tolerance of 10 percent (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. When assessing this factor, the sample unit shall be the entire contents of the pack or 1 kg.
- (b) If presented as size graded, the product shall contain not less than 80 percent by number of bean pods of the declared size or smaller sizes. Of the 20 percent by number which may be of larger sizes, not more than a quarter may be of the second size larger and none may be larger than the second size larger.

2.2.4.2 Visual defects

For tolerance based on the standard sample size indicated in Section 2.2.3, visual defects shall be assigned points in accordance with Table 2. 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.

Table 2. Defect tolerances by count

Defect	Defect categories			Total
	1	2	3	
(a) EVM				
(i) Bean leaf (each piece)	1			
(ii) Other EVM (each piece)	2			
(b) Stem end	1			
(c) Major blemish		3		
(d) Minor blemish		1		
(e) Mechanical damage (whole and cut styles)		1		
(f) Undeveloped (whole style)		2		
(g) Tough strings			3	
(h) Fibrous unit			1	
(A) All but whole style	15	50	10	60
(B) Whole style only	15	30	6	40
(i) Small pieces (whole, cut and sliced styles) – maximum 20% m/m				

2.3 Definition of “defectives”

Any standard sample unit, which fails to comply with the quality requirements, as set out in Sections 2.2.1 and 2.2.4 shall be regarded as a “defective”.

2.4 Lot acceptance

A lot will be considered acceptable when the number of “defectives” as defined in Section 2.3 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

In applying the acceptance procedure each “defective”, as indicated in Sections 2.2.1 and 2.2.4.2, is treated individually for the respective characteristics.

3. FOOD ADDITIVES

None permitted.

4. LABELLING

4.1 Name of the product

4.1.1 The name of the product shall include the designations “green beans” or “wax beans” as applicable.

4.1.2 A statement regarding type (“round” or “flat”) may be made if customary in the country of retail sale.

4.2 Size designation

If a term designating the size of the beans is used:

- (a) it shall be supported by the size in mm as shown in Section 2.4.5.2; and/or
- (b) the words “extra small”, “very small”, “small”, “medium”, or “large” as appropriate; and/or
- (c) by a correct graphic representation on the label of the size range to which the beans predominantly conform; and/or
- (d) the customary method of declaring size in the country in which the product is sold.

NOTES

¹ FAO and WHO. 1999. *Standard for sugars*. Codex Alimentarius Standard, No. CXS 212-1999. Codex Alimentarius Commission. Rome.

² FAO and WHO. 1985. *Standard for food-grade salt*. Codex Alimentarius Standard, No. CXS 150-1985. Codex Alimentarius Commission. Rome.

³ FAO and WHO. 1999. *Standard for Named Vegetable Oils*. Codex Alimentarius Standard, No. CXS 210-1999. Codex Alimentarius Commission. Rome.

⁴ FAO and WHO. 1999. *Standard for Named Animal Fats*. Codex Alimentarius Standard, No. CXS 211-1999. Codex Alimentarius Commission. Rome.

ANNEX ON PEAS

In addition to the general provisions applicable to quick-frozen vegetables,
the following specific provisions apply:

1. DESCRIPTION

1.1 Product definition

Quick-frozen peas are the product prepared from fresh, clean, sound, whole, young and tender peas conforming to the characteristics of the species *Pisum sativum* L. which have been washed, sufficiently blanched to ensure adequate stability of colour and flavour during normal marketing cycles.

1.1.1 Types

- (a) Any suitable variety of peas conforming to species *Pisum sativum* L may be used.
- (b) The product shall be presented as “peas” or may be presented as “garden peas” provided they meet the organoleptic and analytical characteristics.
- (c) Sweet green wrinkled varieties or hybrids having similar characteristics included.

1.2 Presentation

1.2.1 Sizing

1.2.1.1 Quick-frozen peas of either type may be presented sized or unsized.

1.2.1.2 If peas are size graded, they shall conform to one of the two following systems of specifications for the size names. Other size ranges and designations may be used and should be labelled accordingly.

Table 1 – Specifications for sizing

Size designation	Round hole sieve size in mm
Specification A	
1) Small	up to 8.75
2) Medium	up to 10.2
3) Large	over 10.2
Specification B	
1) Extra small	up to 7.5
2) Very small	up to 8.2
3) Small	up to 8.75
4) Medium	up to 10.2
5) Large	over 10.2

1.2.1.3 Tolerances for sizes

If size graded, the product shall have a minimum of 80 percent either by number or weight of peas of the declared size, or of smaller sizes. It shall contain no more than 20 percent either by number or weight of peas of the next two larger adjoining sizes when applicable.

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Composition

2.1.1 Basic ingredients

Peas as defined in Section 1.

2.1.2 *Optional ingredients*

- (a) Sugars as defined in the *Standard for sugars* (CXS 212-1999);¹
- (b) Salt (sodium chloride) as defined in the *Standard for food-grade salt* (CXS 150-1985);²
- (c) Edible fats and oils as defined in the *Standard for named vegetable oils* (CXS 210-1999)³ and in the *Standard for named animal fats* (CXS 211-1999);⁴
- (d) Spices and culinary herbs;ⁱ
- (e) Named sauces.

2.2 *Quality factors*

2.2.1 *Organoleptic and other characteristics*

2.2.1.1 The product shall be of a reasonably uniform green colour according to type, whole, clean, practically free from foreign matter, free from any foreign taste or smell and practically free from damage by insects or diseases.

2.2.1.2 The product shall have a normal flavour, taking into consideration any seasonings or ingredients added.

2.2.2 *Analytical characteristics*

The alcohol-insoluble solids content as determined by the method specified in the *Recommended methods of analysis and sampling* (CXS 234-1999)⁵ must not exceed:

- (a) for peas /garden peas 23% m/m;
- (b) for sweet green peas 19% m/m.

2.2.3 *Definition of defects*

- (a) **Blond peas** means peas which are yellow or white, but which are edible (that is, not sour or rotted).
- (b) **Blemished peas** means peas which are slightly stained or spotted.
- (c) **Seriously blemished peas** means peas which are either hard, shrivelled, spotted, discoloured, worm-eaten or otherwise blemished to an extent that the appearance or eating quality is seriously affected.
- (d) **Pea fragments** means portions of peas, separated or individual cotyledons, that are crushed, partially broken, broken or loose skins, excluding entire intact peas with skins detached.
- (e) **Extraneous vegetable material (EVM)** means any vine, leaf or pod material from the pea plant, or other harmless vegetable material.

2.2.4 *Standard sample size*

The standard sample size for presentation shall be 500 g.

2.2.5 *Tolerances for visual defects*

Based on a sample unit of 500 g the end product shall have not more than the following:

Table 2. Tolerances for visual defects

Blond peas	2% m/m
Blemished peas	5% m/m
Seriously blemished peas	1% m/m
Pea fragments	12% m/m
EVM	0.5% m/m but not more than 12 cm ² in area

2.3 *Classification of “defectives”*

Any standard sample unit, which fails to comply with the quality requirements, as set out in Section 2.2.1 and Section 2.2.2 shall be regarded as a “defective”.

¹ In accordance with the relevant standards for spices and culinary herbs, when available.

In addition, any standard sample unit which fails to comply with the quality requirements shall be regarded as a “defective” when any of the defects listed under Section 2.2.3 is present in more than twice the amount of the specified tolerance for the individual defect as listed under Section 2.2.4 or if the total of Section 2.2.4 from (a) to (d) inclusive exceeds 15 percent m/m.

2.4 Lot acceptance

A lot will be considered acceptable when the number of “defectives” as defined in Section 2.3 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

3. FOOD ADDITIVES

3.1. Flavourings

The flavourings used in products covered by this standard shall comply with the *Guidelines for the use of flavourings* (CXG 66-2008).⁶

4. LABELLING

4.1 Name of the product

4.1.1 The name of the product shall include the designation “peas”, except that where peas are presented in conformity with Section 1.1.1.

4.1.2 Types “garden peas”, sweet green peas, the designation shall be “garden peas” or the equivalent designation used in the country of retail sale.

NOTES

¹ FAO and WHO. 1999. *Standard for sugars*. Codex Alimentarius Standard, No. CXS 212-1999. Codex Alimentarius Commission. Rome.

² FAO and WHO. 1985. *Standard for food-grade salt*. Codex Alimentarius Standard, No. CXS 150-1985. Codex Alimentarius Commission. Rome.

³ FAO and WHO. 1999. *Standard for Named Vegetable Oils*. Codex Alimentarius Standard, No. CXS 210-1999. Codex Alimentarius Commission. Rome.

⁴ FAO and WHO. 1999. *Standard for Named Animal Fats*. Codex Alimentarius Standard, No. CXS 211-1999. Codex Alimentarius Commission. Rome.

⁵ FAO and WHO. 1999. *Recommended methods of analysis and sampling*. Codex Alimentarius Standard, No. CXS 234-1999. Codex Alimentarius Commission. Rome.

⁶ FAO and WHO. 2008. *Guidelines for the use of flavourings*. Codex Alimentarius Guideline, No. CXG 66-2008. Codex Alimentarius Commission. Rome.

ANNEX ON SPINACH

In addition to the general provisions applicable to quick-frozen vegetables, the following specific provisions apply:

1. DESCRIPTION

1.1 Product definition

Quick-frozen spinach is the product prepared from fresh, clean, sound edible parts of the spinach plant conforming to the characteristics of the species *Spinacia oleracea* L., and which have been sorted, washed, sufficiently blanched to ensure adequate stability of colour and flavour during normal marketing cycles and properly drained.

1.2 Presentation

1.2.1 Styles

- (a) **Whole spinach** – the complete tender/young spinach plant with root removed;
- (b) **Leaf spinach** – substantially whole leaves most of which are separated from the root crown with a maximum length of the stem of 10 cm;
- (c) **Cut leaf spinach** – parts of leaves of spinach generally larger than 20 mm in the smallest dimension;
- (d) **Chopped spinach** – spinach leaves cut into small pieces ranging from 3 to 10 mm in the largest dimension, but not comminuted to a pulp or puree;
- (e) **Pureed spinach** (spinach puree) – spinach finely chopped which passes through a sieve such that the leaf particles are less than 3 mm dimension.

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Composition

2.1.1 Basic ingredients

Spinach as defined in Section 1.

2.1.2 Optional ingredients

- (a) Sugars as defined in the *Standard for sugars* (CXS 212-1999);¹
- (b) Salt (sodium chloride) as defined in the *Standard for food-grade salt* (CXS 150-1985);²
- (c) Edible fats and oils as defined in the *Standard for named vegetable oils* (CXS 210-1999)³ and in the *Standard for named animal fats* (CXS 211-1999);⁴
- (d) Spices and culinary herbs;ⁱ
- (e) Named sauces.

2.2 Quality factors

2.2.1 Uniformity

A tolerance of 10 percent by weight of non-conforming styles applies.

2.2.2 General requirements

Quick-frozen spinach shall be practically free from tough fibrous material and for the styles of “whole leaf” and “cut leaf” not materially disintegrated due to mechanical damage; and, with respect to visual defects or other defects subject to a tolerance, shall be:

- (a) well drained and containing no excess water;
- (b) practically free from sand and grit;
- (c) practically free from loose or detached leaves in “whole” style only;
- (d) practically free from root material;
- (e) reasonably free from discoloured leaves or portions thereof;
- (f) reasonably free from flower stems (seed heads);

ⁱ In accordance with the relevant standards for spices and culinary herbs, when available.

- (g) reasonably free from flower buds;
- (h) reasonably free from crown and portion thereof, except for “whole” spinach; and
- (i) reasonably free from extraneous vegetable material (EVM).

2.2.3 Analytical characteristics

- (a) Mineral impurities such as sand, grit and silt shall be not more than 0.1 percent m/m, measured on the whole product basis.
- (b) Sodium chloride-free dry matter – not less than 5.5 percent m/m.

2.2.4 Definition of visual defects

- (a) **Loose leaves (“whole” style only)** – leaves which are detached from the crown.
- (b) **Discolouration** – discolouration of any kind on the leaves or stem portions and which materially detracts from the appearance of the product.
 - (i) **Minor** – discolouration which is light in colour.
 - (ii) **Major** – discolouration which is dark brown or black in colour.
- (c) **Extraneous vegetable matter** – harmless vegetable material such as grass, (EVM) weeds, straw, etc.
 - (iii) **Minor** – EVM which is green and tender.
 - (iv) **Major** – EVM which is other than green or is coarse.
- (d) **Seed heads (flower stems)** – the flower bearing portion of the spinach plant, which is longer than 25 mm;
- (e) **Flower buds** – the separate flower buds detached from the seed head;
- (f) **Crowns (exclusive of “whole” style)** – the solid area of the spinach plant between the root and the attached leaf clusters;
- (g) **Root material** – any portion of the root, either loose or attached to leaves.

2.2.5 Standard sample size

The standard sample size for segregating and evaluating visual defects shall be as indicated in Table 1.

Table 1. Sample size

Style	Standard sample size (g)
(a) Whole and leaf	300
(b) Cut leaf	300
(c) Chopped	100
(d) Pureed	100

2.2.6 Method of examination

For separation and enumeration of visual defects the test sample (standard sample size) is placed in water in a deep tray, and the leaves or leaf portion separated one by one.

2.2.7 Defects and allowances

For tolerances based on the standard sample sizes indicated in Section 2.2.4, visual defects shall be assigned points in accordance with the appropriate table in this section. The maximum number of defects permitted is the total allowable points rating indicated for the respective categories minor, major and serious or the combined total of the foregoing categories.

Table 2 - Whole leaf and cut leaf style

Defect	Unit of measurement	Defect categories			
		Minor	Major	Serious	Total
(a) Loose leaves (whole style only)	Each leaf	1			
(b) Discolouration	Each 4 cm ²				
(i) Minor		1			
(ii) Major			2		
(c) EVM	Each 5 cm				
(i) Minor		1			
(ii) Major			2		
(d) Seed heads	Each whole head		2		
	Each portion	1			
(e) Crown (exclusive of "whole" style)	Each whole crown		2		
	Each part				
(f) Root material	Each piece			4	
Total allowable points		20	10	4	20

Table 3 – Chopped style

Defect	Unit of measurement	Defect categories		
		Minor	Major	Total
(a) Discolouration	Each cm ²			
(i) Minor		1		
(ii) Major			2	
(b) EVM	Each 1 cm			
(i) Minor		1		
(ii) Major			2	
(c) Flower buds	Each 50 pieces	1		
(d) Crown material	Each piece		2	
(e) Root material	Each piece		2	
Total allowable points		20	10	20

Table 4 – Pureed style

Defect	Allowance
Any dark particle or flower bud	Shall not affect the overall appearance of the product

2.3 Classification of “defectives”

Any standard sample unit, which fails to comply with the quality requirements, as set out in Sections 2.1.1, 2.1.6 and 2.2.1 shall be regarded as a “defective”.

2.4 Lot acceptance

A lot will be considered acceptable when the number of “defectives” as defined in Section 2.2 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

In applying the acceptance procedure each “defective”, as indicated in Section 2.2, is treated individually for the respective characteristics.

3. FOOD ADDITIVES

None permitted.

4. LABELLING**4.1 Name of the product**

The name of the product shall include the designation “spinach”.

NOTES

¹ FAO and WHO. 1999. *Standard for sugars*. Codex Alimentarius Standard, No. CXS 212-1999. Codex Alimentarius Commission. Rome.

² FAO and WHO. 1985. *Standard for food-grade salt*. Codex Alimentarius Standard, No. CXS 150-1985. Codex Alimentarius Commission. Rome.

³ FAO and WHO. 1999. *Standard for Named Vegetable Oils*. Codex Alimentarius Standard, No. CXS 210-1999. Codex Alimentarius Commission. Rome.

⁴ FAO and WHO. 1999. *Standard for Named Animal Fats*. Codex Alimentarius Standard, No. CXS 211-1999. Codex Alimentarius Commission. Rome.