KENYA STANDARD

DKS 2689: 2016
ICS 67.160

Quick frozen Vegetables - Specification

TECHNICAL COMMITTEE REPRESENTATION

The following organizations were represented on the Technical Committee:
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Victoria Juice Co ltd
Kevian Kenya Ltd
Government chemist
Consumer Information Network
Premier Foods Ltd.
Pest control products board
Kenya Industrial Research and Development Institute
Ministry of Health- Food Safety Unit
Ministry of Agriculture, Livestock and Fisheries
Kenya plant health inspectorate services
National Public Health Laboratory services
Coca-Cola East Africa Ltd
Del Monte Kenya Ltd
Agri Pro-pak Ltd

Horticultural Crops Directorate
Kenya Bureau of Standards — Secretariat

REVISION OF KENYA STANDARDS

In order to keep abreast of progress in industry, Kenya Standards shall be regularly reviewed. Suggestions for improvements to published standards, addressed to the Managing Director, Kenya Bureau of Standards, are welcome.

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FOREWORD

This Kenya Standard was developed by the Technical Committee on Processed Fruits and Vegetables under the guidance of the Standards Projects Committee, and it is in accordance with the procedures of the Kenya Bureau of Standards.

The standard stipulates the essential compositional, quality, microbiological, contaminants and labelling requirements for canned vegetables as defined in this standard. These vegetables include canned asparagus, carrots, green peas, green beans and wax beans, mature processed peas, palmito, canned sweet corn

In the preparation of this standard useful information was derived from members of the technical committee, Codex standard for quick frozen vegetables (CODEX STAN 320-2015) and local manufacturers

This Kenya standard replaces the following standards:

Quick Frozen Carrots (KS CODEX STAN 140-1983),
Quick Frozen Corn-on-the-Cob (KS CODEX STAN 133-1981),
Quick Frozen Leeks (KS CODEX STAN 104-1981), and
Quick Frozen Whole Kernel Corn (KS CODEX STAN 132-1981

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1. SCOPE

This Kenya Standard specifies requirements and methods of test and sampling for Certain Quick frozen vegetables, as defined in Section 3 below. The products covered by this standard include quick Frozen; Carrot, Whole Kernel Corn, Leeks Corn-on-the-Cob and mixed vegetables

This products are Intended for direct Consumption without further processing except for size-grading or re-packing if required.

It does not apply to the product when indicated as being intended for further processing or for other industrial purposes.

2. Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

AOAC 968.30 (Codex General Method for processed fruits and vegetables)

AOAC 971.33 (Codex General Method for processed fruits and vegetables)

KS EAS 38, labeling of prepackaged foods

KS EAS 39, Code of practice for hygiene in the food and drink manufacturing industry

KS EAS 12, Drinking (Potable) water- Specification

KS EAS 803; Nutrition labeling – Requirements

KS EAS 804:2013 Claims on foods – Requirements

KS EAS 805; Use of Nutrition and health claims

Codex Stan 195, General Standard for Food Additives

Codex Stan 193, General Standard for contaminants

KS 38, Plantation (mill) white sugar — Specification

KS 344; Honey- Specification

KS EAS 5, Refined white sugar — Specification

KS ISO 4833-1; Microbiology of the food chain -- Horizontal method for the enumeration of microorganisms -- Part 1: Colony count at 30 degrees C by the pour plate technique

KS ISO 6888-1; Microbiology of food and animal feeding stuffs -- Horizontal method for the enumeration of coagulase-p-staphylococci (Staphylococcus aureus and other species) -- Part 1: Technique using Baird-Parker agar medium

KS ISO 16649-1:; Microbiology of food and animal feeding stuffs -- Horizontal method for the enumeration of beta-glucuronidase-positive Escherichia coli -- Part 1: Colony-count technique at 44 degrees C using membranes and 5-bromo-4-chloro-3-indolyl beta-D-glucuronide

KS ISO 762; Fruit and vegetable products -- Determination of mineral impurities contentKS ISO 7251, Microbiology of food and animal feeding stuffs - Horizontal method for the detection and enumeration of presumptive Escherichia coli - Most probable number technique

KS ISO 763, Fruits and vegetable products - Determination of ash insoluble in hydrochloric acid

KS ISO 2448, Fruit and vegetable products - Determination of ethanol content

KS ISO 2172, Eruit juice - Determination of soluble solids content - Pyknometric method

KS ISO 2173, Fruit and vegetable products - Determination of soluble solids - Refractometric method

KS ISO 5522, Fruits, vegetables and derived products - Determination of total *sulphur dioxide content*

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3 DESCRIPTION

3.1 Product definition

3.2. Quick frozen vegetables are the:

(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[1], and maintained at -18°C or colder at all points in the cold chain, subject to permitted temperature tolerances.

3.2.1. Quick frozen carrots

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.

3.2.2. Quick frozen corn-on-the-cob

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

3.2.3. Quick frozen leek

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

3.2.4. Quick frozen whole kernel corn

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.

3.2.5. Quick Frozen Mixed Vegetables

A product prepared from a mixture of three or more types of fresh or frozen or dry washed clean and sound vegetables, prepared via appropriate manufacturing processes and subjected to quick freezing process to reach a temperature of – 18 °C.

3.2.6. 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 repacking quick frozen products under temperature controlled conditions is permitted.

3.2.7. 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 (CAC/RCP 8-1976).

3.2.8. Baby corn or young corn

stands for the product prepared from selected young corn cob fresh or canned, without pollination of commercial varieties conforming to the characteristics of Zea mays L., from which silk and husk are removed.

3.2.9. Mixed Vegetables

3.3 Styles and Sizing

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.

3.3.1 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

5. Essential composition and quality factors

5.1. Composition

5.1.1. Basic Ingredients

Vegetables as defined in clause 3

5.1.1.1. Other Permitted Ingredients

5.1.1.1.1 for the quick frozen Carrots:

(a) Salt (sodium chloride) as defined in the Standard for Food Grade Salt (CODEX STAN 150-1985);

(b) Sugars as defined in the Standard for Sugars (CODEX STAN 212-1999);

(c) Aromatic herbs and spices as defined in the Codex 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% m/m of the total drained vegetable ingredient.

5.1.1.1.2 for quick frozen Corn-On-The-Cob

(a) Sugars as defined in the Standard for Sugars (CODEX STAN 212-1999);

(b) Salt (sodium chloride) as defined in the Standard for Food Grade Salt (CODEX STAN 150-1985);

(c) Spices, seasonings, butter, edible oils, named sauces, flavourings as defined in the relevant Codex standards;

(d) Other appropriate vegetables

5.1.1.1.3 for quick frozen leeks

(a) Salt (sodium chloride) as defined in the Standard for Food Grade Salt (CODEX STAN 150-1985);

(b) Condiments such as spices and herbs as defined in relevant Codex standards for spices and culinary herbs

5.1.1.1.5 for quick frozen Whole Kernel Corn

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% m/m of the finished food

5.1.1.2 General Requirements

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

I. Shall have a reasonably uniform colour characteristic of the variety;
II. Shall be sound, clean, practically free from sand, grit and other foreign material;
III. Shall be practically free from pests and damage caused by them
IV. Shall have a normal taste, flavour and free from any foreign odour/smell, taking into consideration any added ingredients as indicated in Section 5.1.1
V. Shall be reasonably tender; uniform in texture and ripeness.
VI. Shall be free from impurities and foreign materials, and all the stages of insect life cycle.
VII. Shall be free from any added preservatives or artificial colors.
VIII. Raw materials used in the final product should be complying with their relevant Kenya standards
IX. Each vegetable component shall retain its physical properties, be homogenous in size.
X. The proportion of each single vegetable ingredient in the mixed vegetables shall not be less than 25 % of the total weight

5.1.1.2 Sample *Size*:

See individual Annexes for sample size for each product.

5.1.1.2.2 Analytical Characteristics

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

5.2.2 Definition of Defects

In accordance with the relevant provisions in the corresponding Annexes.

5.2.3 Defects and Allowances

Canned vegetables should be substantially free from defects. Certain common defects should not be present in amounts greater than the limitations fixed in the corresponding Annexes.

5.2.3.1 Classification of "Defectives"

A container that fails to meet one or more of the applicable quality requirements, as set out in Section 5.2 (except those based on sample averages), should be considered as a "defective".

5.2.3.2 Lot Acceptance

A lot should be considered as meeting the applicable quality requirements referred to in Section 3.2 when:

(1) for those requirements which are not based on averages, the number of "defectives", as defined in Section 3.3, does not exceed the acceptance number (c) of the appropriate sampling plan with an AQL of 6.5; and

(2) The requirements of Section 3.2, which are based on sample averages, are complied with.

6. FOOD ADDITIVES

No Permitted food additives

7. PROCESSING AIDS

The processing aids used for products covered by this Standard shall comply with the Guidelines on Substances Used as Processing Aids (CAC/GL 75-2010

7. Contaminants

The products covered by this Standard shall comply with the maximum levels of the General Standard for Contaminants and Toxins in Food and Feed (CODEX STAN 193-1995).

7.1 Pesticide residues

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

7.2 Heavy Metal Contaminants

The products covered by the provisions of this standard shall conform to those maximum limits for Heavy metals contaminants established by the Codex Alimentarius Commission for these products in table 5 below

TABLE 5- Contaminants

CONTAMINANTS		MAXIMUM LEVEL	Method of Test
Arsenic	(As)	0.2 mg/kg	*AOAC 942.17*
Lead	(Pb)	0.3 mg/kg	AOAC 972.25 / KS ISO 6733
Copper	(Cu)	5.0 mg/kg	AOAC 999.10
Zinc	(Zn)	5.0 mg/kg	AOAC972.25 / KS ISO 5738
Iron	(Fe)	15 mg/kg	AOAC 999.10
Tin	(Sn)	250 mg/kg	AOAC 999.10
Mercury	(Hg)	0.01	AOAC 999.10
Cadmium	(cd)	0.05 mg/kg	AOAC 999.11/ KS ISO 6732

7.3 Other contaminants

The products covered by the provisions of this standard shall conform to those maximum levels for contaminants established by the Codex Alimentarius Commission for these products

8. Hygiene

8.1

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 (CAC/RCP 1-1969), the Code of Practice for the Processing and Handling of Quick Frozen Foods (CAC/RCP 8-1976), Code of Hygienic Practice for Fresh Fruits and Vegetables (CAC/RCP 53/2003) and other relevant Codex texts such as codes of hygienic practice and codes of practice.

8.2 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 (CAC/GL 21 1997).

The products shall conform to microbiological criteria in Table 6 and those provided in KS 2455; Food Safety - general standard

Table 6 - Microbiological limits for canned citrus fruits

SL No.	Microorganism	Limit	Method of Test
	Total plate count, cfu/g, max	**40000**	**KS ISO 4833**
i.	Escherichia coli, (cfu/g), max	Absent	KS ISO 7251
ii.	Staphylococcus aureas, (cfu/25g)	Absent	KS ISO 6888-1
iii.	Shigella, cfu/25g,max	Absent	KS ISO4833
iv.	Salmonella. Cfu/25g, max	Absent	KS ISO 6579
v.	Colostridium botulinum, cfu/25g, max	Absent	KS ISO 4833
vi.	Vibrio cholera, cfu/25g, max	Absent	KS ISO 4833
vii.	Moulds (cfu/25g), max	Absent	KS ISO 7954

9.3 WEIGHTS AND MEASURES

9.3.1 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 (CODEX STAN 1-1985).

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.

9.1.2 Classification of "Defectives"

A container that fails to meet the requirement for minimum fill of Section 7.1.1 should be considered as a "defective".

9.1.3 Lot Acceptance

A lot should be considered as meeting the requirement of Section 7.1.1 when the number of "defectives", as defined in Section 7.1.2, does not exceed the acceptance number (c) of the appropriate sampling plan with an AQL of 6.5.

9.1.4 Minimum Drained Weight

9.1.4.1 The drained weight of the product should be not less than the percentages indicated in the corresponding Annexes, calculated on the basis of the weight of distilled water at 20oC which the sealed container will hold when completely filled.

9.1.5 Packaging

The products covered by the provisions of this standard shall be packaged in clean food grade packaging material to protect the product from contamination. The packaging materials and process shall not contaminate the product or otherwise affect its technological, nutritional or sensory quality.
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 (CAC/RCP 8-1976).

10. Labelling

In addition to the Standard for the Labelling of Pre-packaged Foods (KS EAS 38), the following specific provisions apply:

10.1 Name of the product

10.1.1 The name of the product shall be as defined in section 3

10.1.2 The words "quick frozen" shall also appear on the label, except that the term "frozen 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.

10.1.3 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.

10.1.5 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.

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

For the Corn-on-the-Cob, 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.

10.1.6 For the whole kernel cob; 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.

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

10.1.7 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.
As regard styles declaration, "whole" and "finger" carrots may be simply designated as "carrots" in countries where this is a customary practice.

10.1.8 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.

10.1.9. 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.

10.1.10 If an added ingredient, as defined in Sections 3.1.2 and 3.1.3, alters the flavour characteristic of the product, the name of the food shall be accompanied by the term "flavoured with X" or "X flavoured" as appropriate.

10.1.11 In the case of mixed vegetables; List of the names of the various vegetables species used in the mix shall be listed in descending order of the proportions

10.2 Additional Requirements

10.2.1 Drain weight declaration content- Canned vegetables must be labelled with a declaration of "Drained weightr content __%.10.1.2.6 Ingredient declaration

10.2.2 Nutrition declaration - Any added essential nutrients declaration should be labelled in accordance with the Guidelines on Nutrition Labelling (CAC/GL 2-1985), General Guidelines on Claims (CAC/GL 1-1979) and the CAC/GL 23-1997; Guidelines for Use of Nutrition and Health Claims

10.2.3 Frozen vegetables containing spices and/or aromatic herbs

Where the products contains spices and/or aromatic herbs in accordance with Section 5.1.1.1.2 (c) and 5.1.1.1.3(d), the term "spiced" and/or the common name of the aromatic herb shall appear on the label near the name of the jproduct.

10.2 Non-retail containers

Information for non-retail containers not destined to final consumers shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, net contents and the name and address of the manufacturer, packer, distributor or importer, as well as storage instructions, shall appear on the container, except that for tankers the information may appear exclusively in the accompanying documents.

However, lot identification, and the name and address of the manufacturer, packer, distributor or importer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

10.3 List of Ingredients — a complete list of ingredients including added syrup shall be declared on the label in descending order of proportion.

10.4 Net Contents — the net contents shall be declared by volume in metric units (*Systeme Internationale*).

10.5 Name or business name and Address of the manufacturer, packager, distributor, importer, exporter or vendor of the product, whichever may apply, shall be declared.

10.6 Instructions for use shall be declared

10.7 Storage conditions or conditions for use

10.8 Lot Identification — each container shall be embossed or otherwise permanently marked in code or in clear identity the producing factory and the lot.

10.9 Place/country of origin

10.8 Date of expiry

10.9 irradiation status, where applicable

11. Methods of sampling and test

The products covered by the provisions of this standard shall be tested using appropriate standard methods declared in this standard. Other test may be performed as per the methods given in the latest AOAC/ Codex/ ISO and other internationally recognized methods. Sampling shall be as described in the Standard

ANNEX A: quick frozen carrots

A.1 Defects and Allowances

A.2 Presentation

A.2.1 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 length-wise***: 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 cross-wise into sections having a thickness greater than 10 mm but less than 30 mm or whole carrots which are halved and then cut cross-wise 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.

A.2.2 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

A.3 Quality Factors

A.3.1 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 top

(e) reasonably free from extraneous vegetable materials(E.V.M.)1;

(f) reasonably free from unpeeled areas.

A.3.2 Analytical Characteristics

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

A.3.3 Definitions *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

1 Excluding those in Section 2.1.2.

A.3.4 Minimum *Sample Unit*

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

(a) E.V.M. 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

A.3.5 Defects and Allowances

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

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

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) E.V.M.: Not to exceed 2 pieces or 1 g / 1,000 g	-	-
(h) Woody	1	

TOTAL maximum allowance: 22% 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) E.V.M.: Not to exceed 2 piece / 1,000 g	-	-
(h) Woody	1	1

Total maximum allowance: 20% by weight for diced, double diced, Shoestring and pieces, and 25% by weight for ring cut, sliced lengthwise.

ANNEX B: Quick frozen corn-on-the-cob

B.1 Presentation

B.1.1 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.

B.2 Quality Factors

B.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);

(f) reasonably free from extraneous vegetable matter (E.V.M.).

B.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 under-developed parts.

(i) Minor - Appearance materially affected by irregular pattern of kernels = 1 defect;

(ii) Major - More than 10% but less than 15% by count of the kernels missing or shrunken = 2 defects;

(iii) Serious - 15% 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% but less than 10% by count of the kernels are slightly affected but not more than 0.5% by count of all kernels are seriously blemished or damaged = 1 defect;
- Major - 10% or more but less than 15% by count of the kernels are slightly affected but not more than 1% by count of all kernels are seriously blemished or damaged = 2 defects;
- Serious - More than 15% by count of the kernels are slightly affected or more than 1% 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 under-developed 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) **E.V.M. (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 squares cm in total surface = 1 defect;
- Major - silk to a total length greater than 6 times the length of the units or husks larger than 2 cm^2 square cm in total surface = 2 defects.

B.2.3 *Minimum Sample Unit*[1]

The minimum sample unit for the respective styles shall be: (a)

Whole and trimmed whole 4 ears

(b) Cut cob 8 pieces of ears

B.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	-
(g) Extraneous vegetable matter	Minimum sample unit	1	2	-	-
Total Allowable Points		**21**	**6**	**4**	**21**

ANNEXC: ON Quick frozen leeks

C.1 Presentation

C.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.

C.2. *Colour*

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

C.2.1 *Sizing*

(a) Whole leek and leek, may be presented as sized or unsized;

(b) The minimum diameter of whole leak 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.

C.3 Quality Factors

C.3.1 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 (E.V.M.);

(d) reasonably well trimmed;

(e) practically free from loose or detached leaves (in whole style only);

(f) practically free from hard parts as "seed heads".

C.3.2 Analytical Characteristics

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

C.3.3 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 (E.V.M.)**	- 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).

C.3.4 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

C.3.5 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.

C.3.6 Defects and Allowances

If size graded, the product shall contain not less than 80% 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) E.V.M.	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) E.V.M.	1		
(d) Roots		2	
(e) Parts of roots	1		
(f) Poorly trimmed		2	

C.3.6 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

.

ANNEX D: ANNEX ON Quick frozen whole kernel corn

D.1 Presentation

D.1.1 Colour

(a) Yellow;

(b) White;

(c) "Other" - colour depends on characteristics of the variety.

D.2 Quality Factors

D.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;

(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 extraneous vegetable material; and

(j) reasonably free from pulled kernels.

D.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.

(b) ***Serious*** - means damage or blemish that is very noticeable and of such nature that it would customarily be discarded under normal culinary preparation.

(c) ***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.

(d) ***Husk*** - means the membranous outer covering and one of the constituent parts of an ear of corn that is removed during processing.

(e) ***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.

(f) ***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.

(g) ***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).

D.2.3 Minimum *Sample Unit*

The minimum sample unit shall be 250 g.

D.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 Percentages 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)d	Silk - maximum tolerance	160 cm
)(c	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 E.V.M.	0.2
Pulled Kernels - Minor - Major	 7 2
Total Allowable Percentage	**9**

TOTAL DEFECTS without (4)	25%

DETERMINATION OF WATER CAPACITY OF CONTAINERS (CAC/RM 46-1972)

1. SCOPE

This method applies to glass containers.

2. DEFINITION

The water capacity of a container is the volume of distilled water at 20°C which the sealed container will hold when completely filled.

3. PROCEDURE

3.1 Select a container which is undamaged in all respects.

3.2 Wash, dry and weigh the empty container.

3.3 Fill the container with distilled water at 20°C to the level of the top thereof, and weigh the container thus filled.

4. CALCULATION AND EXPRESSION OF RESULTS

Subtract the weight found in 3.2 from the weight found in 3.3. The difference shall be considered to be the weight of water required to fill the container. Results are expressed as ml of water.

Sampling Plans

The appropriate inspection level is selected as follows:

Inspection level I - Normal Sampling

Inspection level II - Disputes, (Codex referee purposes sample size), enforcement or need for better lot estimate

SAMPLING PLAN 1 (Inspection Level I, AQL = 6.5)

NET WEIGHT IS EQUAL TO OR LESS THAN 1 KG (2.2 LB)		
Lot Size (N)	**Sample Size (n)**	**Acceptance Number (c)**
4,800 or less	6	1
4,801 - 24,000	13	2
24,001 - 48,000	21	3
48,001 - 84,000	29	4
84,001 - 144,000	38	5
144,001 - 240,000	48	6
more than 240,000	60	7
NET WEIGHT IS GREATER THAN 1 KG (2.2 LB) BUT NOT MORE THAN 4.5 KG (10 LB)		
Lot Size (N)	**Sample Size (n)**	**Acceptance Number (c)**
2,400 or less	6	1
2,401 - 15,000	13	2
15,001 - 24,000	21	3
24,001 - 42,000	29	4
42,001 - 72,000	38	5
72,001 - 120,000	48	6
more than 120,000	60	7
NET WEIGHT GREATER THAN 4.5 KG (10 LB)		
Lot Size (N)	**Sample Size (n)**	**Acceptance Number (c)**
600 or less	6	1
601 - 2,000	13	2
2,001 - 7,200	21	3
7,201 - 15,000	29	4
15,001 - 24,000	38	5
24,001 - 42,000	48	6
more than 42,000	60	7

SAMPLING PLAN (Inspection Level II, AQL = 6.5)

NET WEIGHT IS EQUAL TO OR LESS THAN 1 KG (2.2 LB)		
Lot Size (N)	**Sample Size (n)**	**Acceptance Number (c)**
4,800 or less	13	2
4,801 - 24,000	21	3
24,001 - 48,000	29	4
48,001 - 84,000	38	5
84,001 - 144,000	48	6
144,001 - 240,000	60	7
more than 240,000	72	8
NET WEIGHT IS GREATER THAN 1 KG (2.2 LB) BUT NOT MORE THAN 4.5 KG (10 LB)		
Lot Size (N)	**Sample Size (n)**	**Acceptance Number (c)**
2,400 or less	13	2
2,401 - 15,000	21	3
15,001 - 24,000	29	4
24,001 - 42,000	38	5
42,001 - 72,000	48	6
72,001 - 120,000	60	7
more than 120,000	72	8
NET WEIGHT GREATER THAN 4.5 KG (10 LB)		
Lot Size (N)	**Sample Size (n)**	**Acceptance Number (c)**
600 or less	13	2
601 - 2,000	21	3
2,001 - 7,200	29	4
7,201 - 15,000	38	5
15,001 - 24,000	48	6
24,001 - 42,000	60	7
more than 42,000	72	8