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First edition

World Health Organization

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THE CODEX ALIMENTARIUS COMMISSION

The Codex Alimentarius Commission is an intergovernmental body with over 170 members, within the framework of the Joint FAO/WHO Food Standards Programme established by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO), with the purpose of protecting the health of consumers and ensuring fair practices in the food trade. The Commission also promotes coordination of all food standards work undertaken by international governmental and non governmental organizations.

The *Codex Alimentarius* (Latin, meaning Food Code) is the result of the Commission's work: a collection of internationally adopted food standards, guidelines, codes of practice and other recommendations. The texts in this publication are part of the Codex Alimentarius.

FRESH FRUITS AND VEGETABLES
First edition

Codex standards for fresh fruits and vegetables and related texts such as the *Code of Hygienic Practice for Fresh Fruits and Vegetables* are published in this compact format to allow their wide use and understanding by governments, regulatory authorities, food industries and retailers, and consumers. This first edition includes texts adopted by the Codex Alimentarius Commission up to 2007.

Further information on these texts, or any other aspect of the Codex Alimentarius Commission, may be obtained from:

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FRESH FRUITS AND VEGETABLES
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CODEX STANDARD FOR ASPARAGUS

CODEX STAN 225-2001, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to shoots of commercial varieties of asparagus grown from *Asparagus officinalis* L., of the *Liliaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Asparagus for industrial processing is excluded.

Asparagus shoots is classified into four groups according to colour:

- white asparagus;
- violet asparagus, having tips of a colour between pink and violet or purple and part of the shoot white;
- violet/green asparagus, part of which is of violet and green colouring;
- green asparagus having tips and most of the shoot green.

This Standard does not apply to green and violet/green asparagus of less than 3 mm diameter and white and violet asparagus of less than 8 mm diameter, packed in uniform bundles or unit packages.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the asparagus must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;
- fresh in appearance and fresh-smelling;
- practically unbruised;
- free of damage caused by unsuitable washing or soaking.

The cut at the base of the shoots must be as clean as possible.

In addition, shoots must be neither hollow, split, peeled nor broken. Small cracks which have appeared after harvesting are, however, allowed, so long as they do not exceed the limits laid down in Section 4.1, Quality Tolerances.

2.1.1 The development and condition of the asparagus must be such as to enable it:
- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

2.2 Classification

Asparagus is classified in three classes defined below:

2.2.1 "Extra" Class

Shoots in this class must be of superior quality, very well formed and practically straight. Having regard to the normal characteristics of the group to which they belong, their tips must be very compact.

Only a few very slight traces of rust caused by non-pathogenic agents on the shoot, removable by normal peeling by the consumer, are allowed.

For the white asparagus group, the tips and shoots must be white; only a faint pink tint is allowed on the shoots.

Green asparagus must be green for at least 95% of the length.

No traces of woodiness are allowed for the shoots in this class.

The cut at the base of the shoots must be as square as possible. However, to improve presentation when the asparagus is packed in bundles, those on the outside may be slightly bevelled, so long as the bevelling does not exceed 1 cm.

2.2.2 Class I

Shoots in this class must be of good quality and well formed. They may be slightly curved. Having regard to the normal characteristics of the group to which they belong, their tips must be compact.

Slight traces of rust caused by non-pathogenic agents removable by normal peeling by the consumer are allowed.

For the white asparagus group, a faint pink tint may appear on the tips and the shoots.

Green asparagus must be green for at least 80% of the length.

In the white asparagus group, no woody shoots are allowed. For the other groups, a trace of woodiness on the lower part is permissible, provided this woodiness disappears by normal peeling by the consumer.

The cut at the base of the shoots must be as square as possible.

2.2.3 Class II

This class includes shoots which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above.

Compared with Class I, shoots may be less well formed, more curved and having regard to the normal characteristics of the group to which they belong, their tips may be slightly open.

Traces of rust caused by non-pathogenic agents, removable by normal peeling by the consumer are allowed.

The tips of white asparagus may have a colouration including a green tint.

The tips of violet asparagus may have a slight green tint.

Green asparagus must at least be green for 60 percent of the length.
Shoots may be slightly woody.
The cut at the base of the shoots may be slightly oblique.

3. PROVISIONS CONCERNING SIZING

Size is determined by the length and diameter of the shoot.

3.1 Sizing by length

The length of the shoots must be:

- above 17 cm for long asparagus;
- 12 to 17 cm for short asparagus;
- for Class II asparagus arranged, but not bundled in the package:
  a) white and violet: 12 to 22 cm,
  b) violet/green and green: 12 to 27 cm.
- under 12 cm for asparagus tips.

The maximum length allowed for white and violet asparagus is 22 cm and for violet/green and green asparagus 27 cm.

The maximum difference in length of shoots packed in firmly bound bundles must not exceed 5 cm.

3.2 Sizing by diameter

The diameter of the shoots shall be measured 2.5 cm from the cut end.
The minimum diameter and sizing shall be:

White and violet

Class	Minimum diameter	Sizing
Extra	12 mm	Maximum variation of 8 mm between the thinnest and the thickest shoot in the same package or the same bundle.
I	10 mm	Maximum variation of 10 mm between the thinnest and the thickest shoot in the same package or the same bundle.
II	8 mm	No provision as to uniformity.

Violet/green and green asparagus

Class	Minimum diameter	Sizing
Extra and I	3 mm	Maximum variation of 8 mm between the thinnest and the thickest shoot in the same package or the same bundle.
II	3 mm	No provision as to uniformity.

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of shoots not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class, or having slight unscarred cracks appearing after harvesting.

4.1.2 **Class I**

Ten percent by number or weight of shoots not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class, or having slight unscarred cracks appearing after harvesting.

4.1.3 **Class II**

Ten percent by number or weight of shoots satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

In addition to the above, 10% by number or weight can be allowed for hollow shoots or shoots showing very slight cracks due to washing. In no case can there be more than 15% hollow shoots in each package or bundle.

4.2 Size tolerances

For all classes, 10% by number or weight of shoots not corresponding to the size indicated and deviating from the specified limits with a maximum deviation of 1 cm in length.

For all classes, 10% by number or weight of shoots not corresponding to the size indicated and deviating from the specified limits with a maximum deviation of 2 mm in diameter. In no case shall the diameter be less than 3 mm.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package, each unit package or each bundle in the same package must be uniform and contain only asparagus of the same origin, quality, colour group and size (if sized).

Nevertheless, with respect to colour, shoots of a different colour group may be allowed within the following limits:

a) white asparagus: 10% by number or weight of violet asparagus in Classes Extra and I and 15% in Class II.
b) violet, violet/green and green asparagus: 10% by number or weight of asparagus of another colour group.

In the case of Class II a mixture of white and violet asparagus is allowed provided it is appropriately marked.

The visible part of the contents of the package, unit package or bundle must be representative of the entire contents.

5.2 Packaging

Asparagus must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[1], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Packages must be free of all foreign matter.

Asparagus shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

5.3 Presentation

The asparagus may be presented under one of the following forms:

(i) In bundles firmly bound;
Shoots on the outside of each bundle must correspond in appearance and diameter with the average of the whole bundle.
In "Extra" Class, asparagus shoots packed in bundles must be of the same length.
Bundles must be arranged evenly in the package, each bundle may be protected by paper.
In any one package, bundles must be of the same weight.

(ii) Arranged, but not bundled in the package;

(iii) In prepackaged units placed in another package.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 Nature of produce

If the produce is not visible from the outside, each package shall be labelled as to the name of the produce and may be labelled as to name of the variety.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment.

[1] For the purposes of this Standard, this includes recycled material of food-grade quality.

6.2.1 **Identification**
Name and address of exporter, packer and/or dispatcher. Identification code (optional).[2]

6.2.2 **Nature of Produce**
"Asparagus" followed by the indication "white", "violet", violet/green" or "green" if the contents of the package are not visible from the outside and, where appropriate, the indication "short" or "tips" or "mixture white and violet".

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Class;
- Size expressed:
  a) for asparagus subject to the uniformity rules as minimum and maximum diameters,
  b) for asparagus not subject to the uniformity rules, as minimum diameter followed by maximum diameter or the words "and over".
- Number of bundles or number of unit packages, for asparagus packed in bundles or unit packages.

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals
Asparagus shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues
Asparagus shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CAC/RCP 53-

[2] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

2003), and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

8.2 The produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR AVOCADO

CODEX STAN 197-1995, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial varieties (cultivars) of avocados grown from *Persea americana* Mill. (Syn. *Persea gratissima* Gaertn), of the *Lauraceae* family, to be supplied fresh to the consumer, after preparation and packaging. Parthenocarpic fruit and avocados for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the avocados must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;
- free of damage caused by low temperatures;
- having a stalk not more than 10 mm in length which must be cut off cleanly. However, its absence is not considered a defect provided the place of the stalk attachment is dry and whole.

2.1.1 The avocados must have been carefully picked. Their development should have reached a physiological stage which will ensure a continuation of the maturation process to completion. The mature fruit should be free of bitterness.

The development and condition of the avocados must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

2.2 Classification

Avocados are classified in three classes defined below:

2.2.1 **"Extra" Class**

Avocados in this class must be of superior quality. In shape and colouring they must be characteristic of the variety. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the

produce, the quality, the keeping quality and presentation in the package. If present, the stalk must be intact.

2.2.2 **Class I**

Avocados in this class must be of good quality and show the typical colour and shape of the variety. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape and colouring;
- slight skin defects (corkiness, healed lenticels) and sunburn; the maximum total area should not exceed 4 cm^2.

The defects must not, in any case, affect the flesh of the fruit.

The stalk, if present, may be slightly damaged.

2.2.3 **Class II**

This class includes avocados which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the avocados retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape and colouring;
- skin defects (corkiness, healed lenticels) and sunburn; the maximum total area should not exceed 6 cm^2.

The defects must not, in any case, affect the flesh of the fruit.

The stalk, if present, may be damaged.

3. PROVISIONS CONCERNING SIZING

Size is determined by the weight of the fruit, in accordance with the following table[1]:

Size code	Weight *(in grams)*
2	> 1220
4	781 to 1 220
6	576 to 780
8	461 to 575
10	366 to 460
12	306 to 365

[1] Nevertheless, no account should be taken for a given fruit of a deviation of more or less than 2% with regard to the size code indicated.

Size code	Weight *(in grams)*
14	266 to 305
16	236 to 265
18	211 to 235
20	191 to 210
22	171 to 190
24	156 to 170
26	146 to 155
28	136 to 145
30	125 to 135

The minimum weight of avocados must not be less than 125 g.

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of avocados not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of avocados not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of avocados satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting, marked bruising or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For all classes, 10% by number or weight of avocados corresponding to the size immediately above or below that indicated on the package.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform and contain only avocados of the same origin, variety, quality and size. The visible part of the contents of the package must be representative of the entire contents.

5.2 Packaging

Avocados must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[2], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Avocados shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

5.2.1 **Description of containers**

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the avocados. Packages must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 **Nature of produce**

If the produce is not visible from the outside, each package shall be labelled as to the name of the produce and may be labelled as to name of the variety.

6.2 **Non-retail containers**

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment. For produce transported in bulk, these particulars must appear on a document accompanying the goods.

6.2.1 **Identification**

Name and address of exporter, packer and/or dispatcher. Identification code (optional)[3].

[2] For the purposes of this Standard, this includes recycled material of food-grade quality.

[3] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

6.2.2 **Nature of produce**
Name of the produce if the contents are not visible from the outside. Name of the variety or commercial type (optional).

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Class;
- Size expressed in minimum and maximum weight in grams;
- Code number of the size scale and number of fruits when it is different from reference number;
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals
Avocados shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues
Avocados shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR BABY CORN

CODEX STAN 188-1993, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to the cobs, without the silk and anthers, of commercial varieties of baby corn (corn inflorescence) grown from *Zea mays* L, of the *Gramineae* family, separated from silk, husk and anthers, to be supplied fresh to the consumer, after preparation and packaging. Baby corn for industrial processing is excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the cobs of baby corn must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- free of damage caused by pests;
- free of abnormal external moisture;
- free of any foreign smell and/or taste;
- fresh in appearance;
- practically free of silk.

The cut that is made on the base of the cobs should be clean and well defined. A slight discolouration of the cut surface due to storage is acceptable.

2.1.1 The development and condition of the baby corn must be such as to enable it:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

2.2 Classification

The cobs of baby corn are classified in three classes defined below:

2.2.1 **"Extra" Class**

The cobs of baby corn in this class must be well trimmed, free of husk, stalk and silk, intact and of superior quality. They must be characteristic of the variety and/or commercial type. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 **Class I**

The cobs of baby corn in this class must be well trimmed, free of husk and stalk and of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape, colour and texture;
- slight defects in irregular arrangement of undeveloped kernels (ovules);
- slight defects on the surface due to bruising, scratches or other mechanical damage. The total area affected shall not exceed 5% per cob;
- silk attached to and/or broken from the cob shall be minimal without affecting the appearance.

2.2.3 **Class II**

This class includes cobs of baby corn which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the cobs of baby corn retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape, colour and texture;
- defects in irregular arrangement of undeveloped kernels (ovules);
- defects on the surface due to bruising, scratches or other mechanical damage. The total area affected shall not exceed 10% per cob;
- silk attached to and/or broken from the cob shall be minimal without affecting the appearance.

3. PROVISIONS CONCERNING SIZING

Size is determined by the length of the cob of baby corn, in accordance with the following table:

Size code	Length *(in centimetres)*
A	5.0 – 7.0
B	7.0 – 9.0
C	9.0 – 12.0

For all sizes, the minimum width should not be less than 1.0 cm and the maximum width not more than 2.0 cm.

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of cobs of baby corn not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of cobs of baby corn not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

In the case of cobs of baby corn with incompletely removed husk and stalk, only 5 per cent by number or weight of 0.5 cm long of the husk and stalk is allowed.

4.1.3 **Class II**

Ten percent by number or weight of cobs of baby corn satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

In the case of cobs of baby corn with incompletely removed husk and stalk, only 5% by number or weight of 0.5 cm long of the husk and stalk is allowed.

4.2 Size tolerances

For "Extra" Class, 5%; and for Class I or Class II 10%; by number or weight of cobs of baby corn not satisfying the requirements as regards sizing, but falling within the class immediately above or below those indicated in Section 3.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform and contain only cobs of baby corn of the same origin, quality and size. The visible part of the contents of the package must be representative of the entire contents.

5.2 Packaging

The cobs of baby corn must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[1], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

The cobs of baby corn shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

[1] For the purposes of this Standard, this includes recycled material of food-grade quality.

5.2.1 **Description of containers**
The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the cobs ob baby corn. Packages must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 **Nature of produce**
If the produce is not visible from the outside, each package (or lot for produce presented in bulk) should be labelled as to the name of the produce and may be labelled as to name of the variety.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment. For produce transported in bulk, these particulars must appear on a document accompanying the goods.

6.2.1 **Identification**
Name and address of exporter, packer and/or dispatcher. Identification code (optional).[2]

6.2.2 **Nature of produce**
Name of the produce if the contents are not visible from the outside. Name of the variety or commercial type (optional).

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Class;
- Size (size code);
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

[2] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

7. CONTAMINANTS

7.1 Heavy metals

The cobs of baby corn shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues

The cobs of baby corn shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997)

CODEX STANDARD FOR BANANAS

CODEX STAN 205-1997, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial varieties of bananas grown from *Musa* spp. (AAA), of the *Musaceae* family, in the green state, to be supplied fresh to the consumer, after preparation and packaging. Bananas intended for cooking only (plantains) or for industrial processing are excluded. Varieties covered by this Standard are included in the Annex.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the bananas must be:

- whole (taking the finger as the reference);
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage, and bananas packed under modified atmosphere conditions;
- free of any foreign smell and/or taste;
- firm;
- free of damage caused by low temperatures;
- practically free of bruises;
- free of malformation or abnormal curvature of the fingers;
- with pistils removed;
- with the stalk intact, without bending, fungal damage or desiccation.

In addition, hands and clusters must include:

- a sufficient portion of the crown of normal colouring, sound and free of fungal contamination;
- a cleanly cut crown, not bevelled or torn, with no stalk fragments.

2.1.1 The development and condition of the bananas must be such as to enable them:

- to reach the appropriate stage of physiological maturity corresponding to the particular characteristics of the variety;
- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination in order to ripen satisfactorily.

2.2 Classification

Bananas are classified in three classes defined below:

2.2.1 "Extra" Class

Bananas in this class must be of superior quality. They must be characteristic of the variety and/or commercial type. The fingers must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 Class I

Bananas in this class must be of good quality. They must be characteristic of the variety. The following slight defects of the fingers, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape and colour;
- slight skin defects due to rubbing and other superficial defects not exceeding 2 cm^2 of the total surface area.

The defects must not, in any case, affect the flesh of the fruit.

2.2.3 Class II

This class includes bananas which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the bananas retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape and colour, provided the product retains the normal characteristics of bananas;
- skin defects due to scraping, scabs, rubbing, blemishes or other causes not exceeding 4 cm^2 of the total surface area.

The defects must not, in any case, affect the flesh of the fruit.

3. PROVISIONS CONCERNING SIZING

For the purposes of sizing bananas of the Gros Michel and Cavendish sub-groups, the length of the fingers is determined along the outside curve from the blossom end to the base of the pedicel where the edible pulp ends and the diameter is defined as the thickness of a transverse section between the lateral faces. The reference fruit for measurement of the length and grade is:

- for hands, the median finger on the outer row of the hand;
- for clusters, the finger next to the cut section of the hand, on the outer row of the cluster.

The minimum length should not be less than 14.0 cm and the minimum grade not less than 2.7 cm.

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of bananas not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of bananas not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of bananas satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting, major imperfections or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For all classes, 10% by number or weight of bananas not satisfying the requirements as regards sizing, but falling within the size immediately above or below those indicated in Section 3.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform and contain only bananas of the same origin, variety, and quality. The visible part of the contents of the package must be representative of the entire contents.

5.2 Packaging

Bananas must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[1], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Bananas shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

[1] For the purposes of this Standard, this includes recycled material of food-grade quality.

5.2.1 **Description of containers**
The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the bananas. Packages must be free of all foreign matter and smell.

5.3 Presentation

- The bananas must be presented in hands and clusters (parts of hands) of at least four fingers. Bananas may also be presented as single fingers;
- Clusters with no more than two missing fingers are allowed, provided the stalk is not torn but cleanly cut, without damage to the neighbouring fingers;
- Not more than one cluster of three fingers with the same characteristics as the other fruit in the package may be present per row.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 **Nature of produce**
If the produce is not visible from the outside, each package shall be labelled as to the name of the produce and may be labelled as to name of the variety.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment.

6.2.1 **Identification**
Name and address of exporter, packer and/or dispatcher. Identification code (optional).[2]

6.2.2 **Nature of produce**
Name of the produce if the contents are not visible from the outside. Name of the variety or commercial type (optional).

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

[2] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

6.2.4 **Commercial identification**

- Bananas in fingers (when appropriate);
- Class;
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals

Bananas shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues

Bananas shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the Recommended International Code of Practice – General Principles of Food Hygiene (CAC/RCP 1-1969, Rev. 4-2003), 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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

ANNEX

LIST OF THE MAIN GROUPS, SUBGROUPS AND CULTIVARS OF BANANAS FOR DESSERT

Groups	Subgroups	Main cultivar
AA	Sweet-fig	Sweet-fig, Pisang Mas, Amas Date, Bocadillo
AB	Ney Poovan	Ney Poovan, Safet Velchi
AAA	Cavendish	Dwarf Cavendish Giant Cavendish Lacatan Poyo (Robusta) Williams Americani Valery Arvis
	Gros Michel	Gros Michel Highgate
	Pink Fig	Pink Fig Green pink Fig
	Ibota	
AAB	Apple Fig	Apple Fig, Silk
	Pome (prata)	Pacovan Prata Ana
	Mysore	Mysore, Pisang Ceylan, Gorolo

CODEX STANDARD FOR CAPE GOOSEBERRY[1]

CODEX STAN 226-2001, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial varieties of cape gooseberries grown from *Physalis peruviana* (L.), of the *Solanaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Cape gooseberries for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the cape gooseberries must be:

- whole, with or without calyx;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;[2]
- firm;
- fresh in appearance;
- with a smooth and shiny skin.

If the calyx is present, the peduncle must not exceed 25 mm in length.

2.1.1 The cape gooseberries must have been carefully picked and have reached an appropriate degree of development and ripeness account being taken of the characteristics of the variety and the area in which they are grown.

The development and condition of the cape gooseberries must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

[1] Commonly known in certain regions by: physalis, capuli, groseilles du Cap, Amour en cage, baguenaude, Lanterne japonaise, etc.

[2] This provision allows for smell caused by conservation agents used in compliance with corresponding regulations.

2.1.2 **Maturity requirements**

The maturity of the cape gooseberry can be visually assessed from its external colouring, which changes from green to orange as the fruit ripens. Its condition can be confirmed by determining total soluble solids.

A change in colouring of the calyx is not indicative of ripening of the fruit.

The soluble solids content should be at least 14.0°Brix.

2.2 Classification

Cape gooseberries are classified in three classes defined below, regardless of size and colour:

2.2.1 **"Extra" Class**

Cape gooseberries in this class must be of superior quality. They must be characteristic of the variety and/or commercial type. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 **Class I**

Cape gooseberries in this class must be of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape;
- slight defects in colouring;
- slight skin defects.

The defects must not, in any case, affect the pulp of the fruit.

2.2.3 **Class II**

This class includes cape gooseberries which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the cape gooseberries retain their essential characteristics as regards the quality, the keeping quality, the general appearance and presentation:

- defects in shape;
- defects in colouring;
- skin defects;
- small healed cracks not covering more than 5% of the total surface area of the fruit.

The defects must not, in any case, affect the pulp of the fruit.

3. PROVISIONS CONCERNING SIZING

Size is determined by the maximum diameter of the equatorial section of the fruit, with a minimum diameter of 15 mm, in accordance with the following table:

Size code	Diameter *(in millimetres)*
A	15.0 – 18.0
B	18.1 – 20.0
C	20.1 – 22.0
D	≥22.1

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" class**

Five percent by number or weight of cape gooseberries with or without calyx not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of cape gooseberries with or without calyx not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of cape gooseberries with or without calyx satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by severe bruising, rotting or any other deterioration rendering it unfit for consumption. Up to a maximum of 20% by number or weight of fruit with small healed cracks covering an area greater than 5% is accepted in this class.

4.2 Size tolerances

For all classes, 10% by number or weight of cape gooseberries corresponding to the size immediately above and/or below that indicated on the package.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform and contain only cape gooseberries of the same origin, variety, quality, colouring, size and type of presentation (with or without calyx). The visible part of the contents of the package must be representative of the entire contents.

5.2 Packaging

Cape gooseberries must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[3], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Cape gooseberries shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

5.2.1 **Description of containers**

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the cape gooseberries. Packages must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 **Nature of produce**

If the produce is not visible from the outside, each package shall be labelled as to the name of the produce and may be labelled as to name of the variety and/or commercial type.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment.

[3] For the purposes of this Standard, this includes recycled material of food-grade quality.

6.2.1 **Identification**
Name and address of exporter, packer and/or dispatcher. Identification code (optional).[4]

6.2.2 **Nature of produce**
Name of the produce if the contents are not visible from the outside. Name of the variety (optional).

6.2.3 Origin of produce
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Class;
- Size (size code or minimum and maximum diameter in millimeters);
- Number of units (optional);
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals
Cape gooseberries shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues
Cape gooseberries shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

[4] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

CODEX STANDARD FOR CARAMBOLA

CODEX STAN 187-1993, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to the fruit of commercial varieties of carambolas grown from *Averrhoa carambola* L., of the *Oxalidaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Carambolas for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the carambolas must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;
- firm;
- fresh in appearance;
- free of damage caused by low temperatures;
- free of pronounced blemishes;
- sufficiently developed and display satisfactory ripeness, depending on the nature of the produce.

2.1.1 The development and condition of the carambolas must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

2.2 Classification

Carambolas are classified in three classes defined below:

2.2.1 **"Extra" Class**

Carambolas in this class must be of superior quality. They must be characteristic of the variety, well-formed and free of blemishes, with the exception of very slight superficial defects in the skin and ribs due to rubbing and bruises, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 **Class I**

Carambolas in this class must be of good quality. They must be characteristic of the variety, fairly well-formed and fairly free of blemishes. Slight superficial defects in the skin and the ribs due to rubbing and bruises, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package. The total surface area affected shall not exceed 5%.

2.2.3 **Class II**

This class includes carambolas which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. They must be reasonably well-formed and reasonably free of blemishes. Slight defects in the skin and the ribs due to rubbing and bruises, however, may be allowed, provided the carambolas retain their essential characteristics as regards the quality, the keeping quality and presentation. The total surface area affected shall not exceed 10%.

3. PROVISIONS CONCERNING SIZING

Size is determined by the weight of the carambola, in accordance with the following table:

Size code	Weight *(in grams)*
A	80 – 129
B	130 – 190
C	> 190

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package (or in each lot for produce presented in bulk) for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of carambolas not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of carambolas not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of carambolas satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For "Extra" Class, 5%; and for Class I or Class II, 10%; by number or weight of carambolas not satisfying the requirements as regards sizing, but falling within the class immediately above or below those indicated in Section 3.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package (or lot for produce presented in bulk) must be uniform and contain only carambolas of the same origin, variety, quality and size. For "Extra" Class, colour and ripeness should be uniform. The visible part of the contents of the package (or lot for produce presented in bulk) must be representative of the entire contents.

5.2 Packaging

Carambolas must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[1], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Carambolas shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

5.2.1 **Description of containers**

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the carambolas. Packages (or lot for produce presented in bulk) must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 **Nature of produce**

If the produce is not visible from the outside, each package shall be labelled as to the name of the produce and may be labelled as to name of the variety.

[1] For the purposes of this Standard, this includes recycled material of food-grade quality.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment. For produce transported in bulk, these particulars must appear on a document accompanying the goods.

6.2.1 **Identification**

Name and address of exporter, packer and/or dispatcher. Identification code (optional).[2]

6.2.2 **Nature of produce**

Name of the produce if the contents are not visible from the outside. Name of the variety or commercial type (optional).

6.2.3 **Origin of produce**

Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**

- Class;
- Size (Size code or weight range in grams);
- Number of units (optional);
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals

Carambolas shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues

Carambolas shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CAC/RCP 53-

[2] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

2003), and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

8.2 The produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR CHAYOTES

CODEX STAN 216-1999, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial varieties of chayotes grown from *Sechium edule* (Jacq.) Sw., of the *Cucurbitaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Chayotes for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the chayotes must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;
- firm;
- fresh in appearance;
- free of damage caused by low temperatures;
- practically free of bruising;
- free of damage caused by the sun;
- free of fibrous flesh;
- free of hard spines;
- free of visible signs of germination.

2.1.1 The chayotes must have been carefully picked and have reached an appropriate degree of development and ripeness in accordance with criteria proper to the variety and to the area in which they are grown.

The development and condition of the chayotes must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

2.2 Classification

Chayotes are classified in three classes defined below:

2.2.1 **"Extra" Class**

Chayotes in this class must be of superior quality. They must be characteristic of the variety and/or commercial type. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 **Class I**

Chayotes in this class must be of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape, i.e. lightly marked longitudinal grooves and slight depressions;
- slight defects in colouring, not exceeding 25% of the total surface area;
- slight skin defects due to scarring, not exceeding a total of 3 cm^2.

The defects must not, in any case, affect the pulp of the fruit.

2.2.3 **Class II**

This class includes chayotes which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the chayotes retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape, i.e. lightly marked longitudinal grooves and slight depressions;
- defects in colouring, not exceeding 35% of the total surface area;
- skin defects due to scarring, not exceeding a total of 5 cm^2.

The defects must not, in any case, affect the pulp of the fruit.

3. PROVISIONS CONCERNING SIZING

Size is determined by weight or by length, with a minimum weight of 200 grams or a minimum length of 12 cm, in accordance with the following table:

Size code	Weight *(in grams)*	Length *(in centimetres)*
A	200 – 300	12 – 14
B	301 – 400	15 – 16
C	401 – 500	> 16
D	> 500	

The difference in weight between individual fruits under size code D may not exceed 150 grams.

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of chayotes not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of chayotes not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of chayotes satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For all classes, 10% by number or weight of chayotes corresponding to the size immediately above or below that indicated on the package.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform and contain only chayotes of the same variety and/or commercial type, origin, quality, colour and size. The visible part of the contents of the package must be representative of the entire contents.

5.2 Packaging

Chayotes must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[1], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Chayotes shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

[1] For the purposes of this Standard, this includes recycled material of food-grade quality.

5.2.1 **Description of containers**
The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the chayotes. Packages must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex General *Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 **Nature of produce**
If the produce is not visible from the outside, each package should be labelled as to the name of the produce and may be labelled as to name of the variety.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment.

6.2.1 **Identification**
Name and address of exporter, packer and/or dispatcher. Identification code (optional).[2]

6.2.2 **Nature of produce**
Name of the produce if the contents are not visible from the outside. Name of the variety or commercial type (optional).

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Class;
- Size (size code or minimum and maximum weight or length in grams or mm, respectively);
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

[2] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

7. CONTAMINANTS

7.1 Heavy metals

Chayotes shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues

Chayotes shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR GINGER

CODEX STAN 218-1999, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to the rhizome of commercial varieties of ginger grown from *Zingiber officinale* Roscoe, of the *Zingiberaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Ginger for industrial processing is excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the ginger must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of damage caused by pests affecting the general appearance of the produce;
- free of abnormal external moisture, and properly dried if washed, excluding condensation following removal from cold storage
- free of any foreign smell and/or taste;
- firm;
- free of abrasions, provided light abrasions which have been dried properly are not regarded as a defect;
- sufficiently dry for the intended use; skin, stems and cuts due to harvesting must be fully dried.

2.1.1 The development and condition of the ginger must be such as to enable it:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

2.2 Classification

Ginger is classified in three classes defined below:

2.2.1 **"Extra" Class**

Ginger in this class must be of superior quality. It must be characteristic of the variety and/or commercial type. The roots must be cleaned, well shaped and free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 **Class I**

Ginger in this class must be of good quality. It must be characteristic of the variety and/or commercial type. The roots must be firm, without evidence of shrivelling or dehydration and without evidence of sprouting. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- Slight skin defects due to rubbing provided they are healed and dry and the total surface area affected not exceeding 10%.

2.2.3 **Class II**

This class includes ginger which does not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The roots should be reasonably firm. The following defects, however, may be allowed, provided the ginger retains their essential characteristics as regards the quality, the keeping quality and presentation:

- skin defects due to rubbing, provided they are healed and dry and the total surface area affected not exceeding 15%;
- early signs of sprouting (not more than 10% by weight by unit of presentation);
- slight markings caused by pests;
- healed suberized cracks, provided they are completely dry;
- slight traces of soil;
- bruises.

3. PROVISIONS CONCERNING SIZING

Size is determined by the weight of the ginger.

Size code	Weight *(in grams)*
A	300
B	200
C	150

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of ginger not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of ginger not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of ginger satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For "Extra" Class 5%; and for Class I and Class II, 10%; by number or by weight of ginger not satisfying the requirements as regards sizing.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform and contain only ginger of the same origin, variety, and/or commercial type, quality and size. The visible part of the contents of the package must be representative of the entire contents.

The weight of the heaviest hand (rhizome) may not be more than twice the weight of the lightest hand (rhizome) in the same package.

5.2 Packaging

Ginger must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[1], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Ginger shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

5.2.1 **Description of containers**

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the ginger. Packages must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

[1] For the purposes of this Standard, this includes recycled material of food-grade quality.

6.1.1 **Nature of produce**
If the produce is not visible from the outside, each package shall be labelled as to the name of the produce and may be labelled as to name of the variety and/or commercial type.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment.

6.2.1 **Identification**
Name and address of exporter, packer and/or dispatcher. Identification code (optional).[2]

6.2.2 **Nature of produce**
Name of the produce if the contents are not visible from the outside. Name of the variety and/or commercial type (optional).

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial Identification**
- Class;
- Size (size code or minimum and maximum weight in grams);
- Number of units (optional);
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals

Ginger shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues

Ginger shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

[2] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR GRAPEFRUITS

CODEX STAN 219-1999, Amd. 2-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial varieties of grapefruits grown from *Citrus paradisi* Macfad., of the *Rutaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Grapefruits for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the grapefruits must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;
- firm;
- free of damage caused by low and/or high temperatures or frost;
- practically free of bruising.

2.1.1 The grapefruits must have been carefully picked and have reached an appropriate degree of development and ripeness in accordance with criteria proper to the variety and/or commercial type and to the area in which they are grown.

The development and condition of the grapefruits must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

2.1.2 **Maturity requirements**

The minimum juice content is calculated in relation to the total weight of the fruit.
Minimum Juice Content: 35%.

2.1.3 **Colouring**[1]

Colouring must be typical of the variety. However, fruits of a greenish colour are allowed, provided they comply with the minimum requirements. Red-pulp varieties

[1] Colour refers to the characteristic colour and not to discoloration caused by rust mite, melanose and other blemishes.

may have reddish patches on the rind. Grapefruits meeting the minimum requirements as regards ripeness may be "degreened", on condition that this treatment does not modify other organoleptic characteristics.

2.2 Classification

Grapefruits are classified in three classes defined below:

2.2.1 "Extra" Class

Grapefruits in this class must be of superior quality. They must be characteristic of the variety and/or commercial type. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 Class I

Grapefruits in this class must be of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape;
- slight defects in colouring;
- slight skin defects inherent in the formation of the fruit;
- slight healed skin defects due to mechanical causes, such as impact of hail, rubbing, damage from handling;
- slight skin discolouration due to rust mite, melanoses, and other blemishes not exceeding more than one-fifth of the surface of the fruit.

The defects must not, in any case, affect the pulp of the fruit.

2.2.3 Class II

This class includes grapefruits which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the grapefruits retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape;
- defects in colouring;
- defects skin from healed superficial wounds on the skin;
- healed defects due to mechanical causes, such as impact of hail, rubbing, damage from handling;
- slight skin discolouration due to rust mite, melanoses, and other blemishes not exceeding more than two-fifths of the surface of the fruit;
- rough skin.

The defects must not, in any case, affect the pulp of the fruit.

3. PROVISIONS CONCERNING SIZING

Size is determined by the maximum diameter of the equatorial section of the fruit, in accordance with the following table:

Size code	Diameter *(in millimetres)*
0	>139
1	109 – 139
2	100 – 119
3	93 – 110
4	88 – 102
5	84 – 97
6	81 – 93
7	77 – 89
8	73 – 85
9	70 – 80

Grapefruit may be packed by count. In this case, provided the size uniformity required by the standard is retained, the size range in the package may fall outside a single size code, but within two adjacent codes.

Grapefruit of a diameter below 70 mm are excluded.

Uniformity in size is achieved by the above mentioned size scales, except in the case of fruit in bulk bins and fruit in individual non-rigid (nets, bags) packages for direct sale to the consumer, for which the maximum size difference between the smallest and the largest fruit in the same lot or package must not exceed the range obtained by grouping three consecutive sizes in the size scale.

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package (or in each lot for produce presented in bulk) for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of grapefruits not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of grapefruits not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of grapefruits satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

Within this tolerance, a maximum of 5% is allowed of fruit showing slight superficial unhealed damage, dry cuts or soft and shrivelled fruit.

4.2 Size tolerances

For all classes, 10% by number or weight of grapefruits corresponding to the size immediately above or below that indicated on the package.

In the case of bulk consignment, the 10% tolerance only applies to fruit with a diameter of not less than 70 mm.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package (or lot for produce presented in bulk) must be uniform and contain only grapefruits of the same origin, variety and/or commercial type, quality, size and colour. The visible part of the contents of the package (or lot for produce presented in bulk) must be representative of the entire contents.

5.2 Packaging

Grapefruits must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[2], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Grapefruits shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

5.2.1 **Description of containers**

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the grapefruits. Packages must be free of all foreign matter and smell.

5.3 Presentation

The grapefruits shall be presented under one of the following forms:

[2] For the purposes of this Standard, this includes recycled material of food-grade quality.

a) Aligned in regular layers, according to size ranges, in closed or open packaging. This form of presentation is mandatory for the "Extra" Class and optional for Classes I and II.
b) Non-aligned in closed or open packaging according to size ranges. In bulk in one means of transport or one transport compartment, with a maximum difference in size between the fruits of the sum of three consecutive sizes in the size ranges. These types of presentation are only allowed for Classes I and II.
c) In bulk, by one means of transport or in one transport compartment, without further requirement than that of minimum size. This form of presentation is only allowed for Class II.
d) In individual packages for direct consumer sale with a maximum weight of 5 kg.
   1) When these containers are made up by number of grapefruits, the size scales are mandatory for all classes;
   2) When these containers are made up by weight, the size scales are not compulsory but the maximum difference between the grapefruits must not exceed the sum of three consecutive sizes in the size scales.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 Nature of produce

If the produce is not visible from the outside, each package should be labelled as to the name of the produce and may be labelled as to name of the variety and/or commercial type.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment. For produce transported in bulk these particulars must appear on a document accompanying the goods.

6.2.1 Identification

Name and address of exporter, packer and/or dispatcher. Identification code (optional).[3]

6.2.2 Nature of produce

Name of the produce if the contents are not visible from the outside. Name of the variety or commercial type (optional). The indication "pink" or "red" where appropriate.

[3] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Class;
- Size (size code or minimum and maximum diameter in millimetres);
- Net weight (optional);
- Size code (or, when fruit packed by count fall under two adjacent codes, size codes or minimum and maximum diameter in mm) and number of fruit, in the case of fruit arranged in layers in the package.

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals
Grapefruits shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues
Grapefruits shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR GUAVAS

CODEX STAN 215-1999, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial varieties of guavas grown from *Psidium guajava* L., of the *Myrtaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Guavas for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the guavas must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;
- firm;
- practically free of bruising.

2.1.1 The guavas must have been carefully picked and have reached an appropriate degree of development and ripeness in accordance with criteria proper to the variety and to the area in which they are grown.

The development and condition of the guavas must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

2.2 Classification

Guavas are classified in three classes defined below:

2.2.1 **"Extra" Class**

Guavas in this class must be of superior quality. They must be characteristic of the variety and/or commercial type. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 **Class I**

Guavas in this class must be of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects of colour or shape;
- slight defects on the skin due to rubbing and other superficial defects such as sunburns, blemishes and scabs not exceeding 5% of the total surface area.

The defects must not, in any case, affect the pulp of the fruit.

2.2.3 **Class II**

This class includes guavas which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the guavas retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape and colour;
- defects on the skin due to rubbing and other defects such as sunburns, blemishes and scabs not exceeding 10% of the total surface area.

The defects must not, in any case, affect the pulp of the fruit.

3. PROVISIONS CONCERNING SIZING

Size is determined by the weight or maximum diameter of the equatorial section of the fruit, in accordance with the following table:

Size code	Weight *(in grams)*	Diameter *(in millimetres)*
1	> 450	> 100
2	351 – 450	96 – 100
3	251 – 350	86 – 95
4	201 – 250	76 – 85
5	151 – 200	66 – 75
6	101 – 150	54 – 65
7	61 – 100	43 – 53
8	35 – 60	30 – 42
9	< 35	< 30

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of guavas not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of guavas not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of guavas satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For all classes, 10% by number or weight of guavas corresponding to the size immediately above or below that indicated on the package.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform and contain only guavas of the same origin, variety and/or commercial type, quality and size. The visible part of the contents of the package must be representative of the entire contents.

5.2 Packaging

Guavas must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[1], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Guavas shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

[1] For the purposes of this Standard, this includes recycled material of food-grade quality.

5.2.1 **Description of containers**
The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the guavas. Packages must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 **Nature of produce**
If the produce is not visible from the outside, each package should be labelled as to the name of the produce and may be labelled as to name of the variety.

6.2 Non-retail Containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment.

6.2.1 **Identification**
Name and address of exporter, packer and/or dispatcher. Identification code (optional).[2]

6.2.2 **Nature of produce**
Name of the produce if the contents are not visible from the outside. Name of the variety or commercial type (optional).

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Class;
- Size (size code or minimum and maximum weight or diameter in grams or mm, respectively);
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

[2] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

7. CONTAMINANTS

7.1 Heavy metals

Guavas shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues

Guavas shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR LIMES

CODEX STAN 213-1999, Amd. 3-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial varieties of limes grown from *Citrus latifolia* Tanaka[1], of the *Rutaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Limes for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the limes must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;
- firm;
- free of damage caused by low temperatures;
- practically free of bruising;
- pipless.

2.1.1 The limes must have been carefully picked and have reached an appropriate degree of development and ripeness in accordance with criteria proper to the variety and to the area in which they are grown.

The development and condition of the limes must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

2.1.2 **Minimum juice content and colouring**

The minimum juice content is calculated in relation to the total weight of the fruit.

Minimum Juice Content: 42%

Colouring must be typical of the variety on at least two-thirds of the surface of the fruit. The fruit should be green but may show discolouring (yellow patches) up to 30% of its surface.

[1] It is an acid lime having large fruits called also, depending upon the country: Bearss, Persian, Tahiti.

2.2 Classification

Limes are classified in three classes defined below:

2.2.1 "Extra" Class

Limes in this class must be of superior quality. They must be characteristic of the variety. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 Class I

Limes in this class must be of good quality. They must be characteristic of the variety. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape;
- slight defects in colouring;
- slight skin defects not exceeding more than 1.0 cm^2.

The defects must not, in any case, affect the pulp of the fruit.

2.2.3 Class II

This class includes limes which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the limes retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape;
- defects in colouring;
- skin defects not exceeding more than 2.0 cm^2.

The defects must not, in any case, affect the pulp of the fruit.

3. PROVISIONS CONCERNING SIZING

Size is determined by the maximum diameter of the equatorial section of the fruit, in accordance with the following table:

Size code	Diameter *(in millimetres)*
1	58 – 67
2	53 – 62
3	48 – 57
4	45 – 52
5	42 – 49

Limes may be packed by count. In this case, provided the size uniformity required by the standard is retained, the size range in the package may fall outside a single size code, but within two adjacent codes.

Limes of a diameter below 42 mm are excluded.

Uniformity in size is achieved by the above mentioned size scales, unless otherwise stated as follows:

(i) for fruit arranged in regular layers in the package, including unit consumer packages, the maximum difference between the smallest and the largest fruit, within a single size code or, in the case of limes packed by count, within two adjacent codes, must not exceed 7 mm (for size codes 1 to 5).

(ii) for fruit not arranged in regular layers in packages and fruit in individual rigid packages for direct sale to the consumer, the difference between the smallest and the largest fruit in the same package must not exceed the range of the appropriate size grade in the size scale, or, in the case of limes packed by count, the range in mm of one of the two adjacent codes concerned.

(iii) for fruit in bulk bins and fruit in individual non-rigid (nets, bags) packages for direct sale to the consumer, the maximum size difference between the smallest and the largest fruit in the same lot or package must not exceed the range obtained by grouping three consecutive sizes in the size scale.

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of limes not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of limes not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of limes satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For all classes, 10% by number or weight of limes corresponding to the size immediately above or below that indicated on the package.

In no case can the diameter be less than 40 mm.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform and contain only limes of the same origin, variety, quality and size. For "Extra" Class, the colour must be uniform. The visible part of the contents of the package must be representative of the entire contents.

5.2 Packaging

Limes must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[2], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Limes shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

5.2.1 Description of containers

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the limes. Packages must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 Nature of produce

If the produce is not visible from the outside, each package should be labelled as to the name of the produce and may be labelled as to name of the variety.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment.

6.2.1 Identification

Name and address of exporter, packer and/or dispatcher. Identification code (optional).[3]

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[2] For the purposes of this Standard, this includes recycled material of food-grade quality.

[3] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

6.2.2 **Nature of produce**
Name of the produce if the contents are not visible from the outside. Name of the variety (optional).

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Class;
- Size (size code or minimum and maximum diameter in millimetres);
- Net weight (optional);
- Size code (or, when fruit packed by count fall under two adjacent codes, size codes or minimum and maximum diameter in mm) and number of fruit, in the case of fruit arranged in layers in the package.

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals
Limes shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues
Limes shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR LITCHI

CODEX STAN 196-1995, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial varieties (cultivars) of litchis grown from *Litchi chinensis* Sonn., of the *Sapindaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Litchis for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the litchis must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;[1]
- free of damage and abrasion;
- practically free of brown markings.

2.1.1 The litchis must have been carefully picked and must be sufficiently developed and mature.

The development and condition of the litchis must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

The colouring of litchis may vary from pink to red in the case of untreated litchis; from pale yellow to pink for litchis that have been fumigated with sulphur dioxide.

2.2 Classification

Litchis are classified in three classes defined below:

2.2.1 **"Extra" Class**

Litchis in this class must be of superior quality. They must have the shape, development and colouring that are typical of the variety or varietal type. They must be free of

[1] This provision allows for smell caused by conservation agents used in compliance with corresponding regulations.

defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 **Class I**

Litchis in this class must be of good quality. They must be characteristic of the variety or varietal type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight misshaping;
- slight defects in colouring;
- slight skin defects provided these do not exceed a total area of 0.25 cm².

2.2.3 **Class II**

This class includes litchis which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the litchis retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape;
- defects in colouring;
- skin blemishes provided these do not exceed a total area of 0.5 cm².

3. PROVISIONS CONCERNING SIZING

- Size is determined by the maximum equatorial diameter.
- The minimum size for "Extra" Class is 33 mm.
- The minimum size for Classes I and II is 20 mm.
- A maximum size range of 10 mm between fruit in each package is permitted.

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of litchis not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of litchis not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of litchis satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For all classes, 10% by number or weight of litchis not satisfying the requirements as regards the minimum size, provided, however, that the diameter is not less that 15 mm in all classes, and/or the maximum size range of 10 mm.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform and contain only litchis of the same origin, variety or varietal type, quality, size and colour. The visible part of the contents of the package must be representative of the entire contents.

5.2 Packaging

Litchis must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[2], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Litchis shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

However, the presence of a limited number of fresh leaves is permitted where litchis are presented in bunches.

5.2.1 **Description of containers**

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the litchis. Packages (or lot for produce presented in bulk) must be free of all foreign matter and smell.

5.3 Presentation

The litchis must be presented under one of the following forms:

5.3.1 **Individually**

In this case the pedicel must be cut at the first knot and the maximum length of the stalk must not extend more than 2 mm beyond the top of the fruit. "Extra" Class litchis must be presented individually.

[2] For the purposes of this Standard, this includes recycled material of food-grade quality.

5.3.2 **In bunches**
In this case, the bunch must include more than three attached and well-formed litchis. The branch must not exceed 15 cm in length.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex Gene*ral Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 **Nature of produce**
If the produce is not visible from the outside, each package shall be labelled as to the name of the produce and may be labelled as to name of the variety or varietal type.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment. For produce transported in bulk, these particulars must appear on a document accompanying the goods.

6.2.1 **Identification**
Name and address of exporter, packer and/or dispatcher. Identification code (optional).[3]

6.2.2 **Nature of produce**
Name of the produce if the contents are not visible from the outside. Name of the variety or commercial type (optional). "Bunch" specification, when applicable.

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Class;
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

[3] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

7. CONTAMINANTS

7.1 Heavy metals

Litchis shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues

Litchis shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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.

8.1 The produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR LONGANS

CODEX STAN 220-1999, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial varieties of longans grown from *Dimocarpus longan* Lour., of the *Sapindaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Longans for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the longans must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding top icing condensation following removal from cold storage;
- free of any foreign smell and/or taste[1];
- fresh in appearance;
- free of damage caused by low and/or high temperatures;
- free of pronounced blemishes.

2.1.1 The longans must have been carefully picked and have reached an appropriate degree of development and ripeness in accordance with criteria proper to the variety and to the area in which they are grown.

The development and condition of the longans must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

The colour of the longan's flesh and skin may vary according to the variety. The longan's skin may be lighter in colour than normal when treated by sulphur dioxide gas.

2.2 Classification

Longans are classified in three classes defined below:

[1] This provision allows for smell caused by conservation agents used in compliance with corresponding regulations.

2.2.1 **"Extra" Class**

Longans in this class must be of superior quality. They must be characteristic of the variety. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 **Class I**

Longans in this class must be of good quality. They must be characteristic of the variety. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

— slight skin defects such as bruising, scratches or other mechanical damage not exceeding a total area of 0.5 cm^2.

2.2.3 **Class II**

This class includes longans which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the longans retain their essential characteristics as regards the quality, the keeping quality and presentation:

— skin defects such as bruising, scratches or other mechanical damage not exceeding a total area of 0.5 cm^2.

3. PROVISIONS CONCERNING SIZING

Size is determined by the number of fruits per kilogram or the diameter of the equatorial section of the fruit, in accordance with the following table:

Size code	Number of fruits *(per kilogram)*	Diameter *(in millimetres)*
1	< 85	> 28
2	85 – 94	> 27 – 28
3	95 – 104	> 26 – 27
4	105 – 114	> 25 – 26
5	> 115	24 – 25

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of longans not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of longans not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of longans satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For all classes, 20% by number or weight of longans corresponding to the size immediately above and/or below that indicated on the package for fruit sold in bunches and 10% for fruit sold individually.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform and contain only longans of the same origin, variety, quality and size. The visible part of the contents of the package must be representative of the entire contents.

5.2 Packaging

Longans must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[2], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Longans shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

5.2.1 **Description of containers**

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the longans. Packages must be free of all foreign matter and smell.

[2] For the purposes of this Standard, this includes recycled material of food-grade quality.

5.3 Presentation

The longans must be presented under one of the following forms:

5.3.1 **Individually**

In this case, the pedicel must be cut at the first knot and the maximum length of the stalk must not exceed 5 mm beyond the top of the fruit.

5.3.2 **In bunches**

In this case, each stem in a bunch should have at least three attached longans. The branch must not exceed 15 cm in length. A maximum of 10% by number or weight of detached fruit is allowed in each package.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 **Nature of produce**

If the produce is not visible from the outside, each package should be labelled as to the name of the produce and may be labelled as to name of the variety.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment.

6.2.1 **Identification**

Name and address of exporter, packer and/or dispatcher. Identification code (optional).[3]

6.2.2 **Nature of produce**

Name of the produce if the contents are not visible from the outside. Name of the variety (optional).

6.2.3 **Origin of produce**

Country of origin and, optionally, district where grown or national, regional or local place name.

[3] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

6.2.4 **Commercial identification**

- Class;
- Size (size code or minimum and maximum diameter in millimetres);
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals

Longans shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues

Longans shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR MANGOES

CODEX STAN 184-1993, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial varieties of mangoes grown from *Mangifera indica* L., of the *Anacardiaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Mangoes for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the mangoes must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;
- firm;
- fresh in appearance;
- free of damage caused by low temperatures;
- free of black necrotic stains or trails;
- free of marked bruising; and
- sufficiently developed and display satisfactory ripeness.

When a peduncle is present, it shall be no longer than 1.0 cm.

2.1.1 The development and condition of the mangoes must be such as to enable them:

- to ensure a continuation of the maturation process until they reach the appropriate degree of maturity corresponding to the varietal characteristics;
- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

In relation to the evolution of maturing, the colour may vary according to variety.

2.2 Classification

Mangoes are classified in three classes defined below:

2.2.1 **"Extra" Class**

Mangoes in this class must be of superior quality. They must be characteristic of the variety. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 **Class I**

Mangoes in this class must be of good quality. They must be characteristic of the variety. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape;
- slight skin defects due to rubbing or sunburn, suberized stains due to resin exudation (elongated trails included) and healed bruises not exceeding 3, 4, 5 cm^2 for size groups A, B, C respectively.

2.2.3 **Class II**

This class includes mangoes which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the mangoes retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape;
- skin defects due to rubbing or sunburn, suberized stains due to resin exudation (elongated trails included) and healed bruises not exceeding 5, 6, 7 cm^2 for size groups A, B, C respectively.

In Classes I and II, scattered suberized rusty lenticels, as well as yellowing of green varieties due to exposure to direct sunlight, not exceeding 40 per cent of the surface and not showing any signs of necrosis are allowed.

3. PROVISIONS CONCERNING SIZING

Size is determined by the weight of the fruit, in accordance with the following table:

Size code	Weight *(in grams)*
A	200 – 350
B	351 – 550
C	551 – 800

The maximum permissible difference between fruit in the same package belonging to one of the above mentioned size groups shall be 75, 100 and 125 g respectively. The minimum weight of mangoes must not be less than 200 g.

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of mangoes not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of mangoes not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of mangoes satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting, marked bruising or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For all classes, 10% by number or weight of mangoes in each package are permitted to be outside (above or below) the group size range by 50% of the maximum permissible difference for the group. In the smallest size range, mangoes must not be less than 180 g and for those in the largest size range a maximum of 925 g applies, as follows:

Size code	Normal size range	Permissible size range *(≤ 10% of fruit/package exceeding the normal size range)*	Max. permissible difference between fruit in each package
A	200 – 350	180 – 425	112.5
B	351 – 550	251 – 650	150
C	551 – 800	426 – 925	187.5

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform and contain only mangoes of the same origin, variety, quality and size. The visible part of the contents of the package must be representative of the entire

5.2 Packaging

Mangoes must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[1], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Mangoes shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

5.2.1 **Description of containers**

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the mangoes. Packages (or lot for produce presented in bulk) must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 **Nature of produce**

If the produce is not visible from the outside, each package shall be labelled as to the name of the produce and may be labelled as to name of the variety.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment. For produce transported in bulk these particulars must appear on a document accompanying the goods.

6.2.1 **Identification**

Name and address of exporter, packer and/or dispatcher. Identification code (optional).[2]

6.2.2 **Nature of produce**

Name of the produce if the contents are not visible from the outside. Name of the variety or commercial type (optional).

[1] For the purposes of this Standard, this includes recycled material of food-grade quality.

[2] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

6.2.3 **Origin of produce**

Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**

- Class;
- Size (size code or weight range in grams);
- Number of units (optional);
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals

Mangoes shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues

Mangoes shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR MANGOSTEENS

CODEX STAN 204-1997, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial varieties of mangosteens grown from *Garcinia mangostana* L., of the *Guttiferae* family, to be supplied fresh to the consumer, after preparation and packaging. Mangosteens for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the mangosteens must be:

- whole;
- with the calyx and pedicel intact;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;
- fresh in appearance, have a shape, colour and taste characteristic of the species;
- free of latex;
- free of pronounced blemishes;
- allowing the fruit to be cut open normally.

2.1.1 The development and condition of the mangosteens must be such as to enable them:

- to ensure a continuation of the ripening process until they reach the appropriate degree of ripeness (the skin should be at least of a pink colour);
- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

2.2 Classification

Mangosteens are classified in three classes defined below:

2.2.1 **"Extra" Class**

Mangosteens in this class must be of superior quality. They must be characteristic of the variety and/or commercial type. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 **Class I**

Mangosteens in this class must be of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape;
- slight defects on the peel and calyx such as bruising, scratches or other mechanical damage. The total area affected shall not exceed 10%.

The defects must not, in any case, affect the pulp of the fruit.

3. PROVISIONS CONCERNING SIZING

Size is determined by the weight or the diameter of the equatorial section of the fruit, in accordance with the following table:

Size code	Weight *(in grams)*	Diameter *(in grams)*
A	30 – 50	38 – 45
B	51 – 75	46 – 52
C	76 – 100	53 – 58
D	101 – 125	59 – 62
E	> 125	> 62

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package (or in each lot for produce presented in bulk) for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of mangosteens not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of mangosteens satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For all classes, 10% by number or weight of mangosteens not satisfying the requirements as regards sizing, but falling within the size immediately above or below those indicated in Section 3.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package (or lot for produce presented in bulk) must be uniform and contain only mangosteens of the same origin, quality and size. The visible part of the contents of the package (or lot for produce presented in bulk) must be representative of the entire contents.

5.2 Packaging

Mangosteens must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[1], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Mangosteens shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

5.2.1 Description of containers

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the mangosteens. Packages (or lot for produce presented in bulk) must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 Nature of produce

If the produce is not visible from the outside, each package shall be labelled as to the name of the produce and may be labelled as to name of the variety.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment. For produce transported in bulk, these particulars must appear on a document accompanying the goods.

[1] For the purposes of this Standard, this includes recycled material of food-grade quality.

6.2.1 **Identification**
Name and address of exporter, packer and/or dispatcher. Identification code (optional).[2]

6.2.2 **Nature of produce**
Name of the produce if the contents are not visible from the outside. Name of the variety or commercial type (optional).

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Class;
- Size (size code or minimum and maximum weight or length in grams or millimetres, respectively);
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals
Mangosteens shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues
Mangosteens shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

[2] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

CODEX STANDARD FOR MEXICAN LIMES

CODEX STAN 217-1999, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial varieties of Mexican limes grown from *Citrus aurantifolia* Swingle, of the *Rutaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Mexican limes for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the Mexican limes must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;
- firm;
- free of damage caused by low temperatures.

2.1.1 The Mexican limes must have been carefully picked and have reached an appropriate degree of development and ripeness in accordance with criteria proper to the variety and to the area in which they are grown.

The development and condition of the Mexican limes must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

2.1.2 **Minimum juice content and colouring**

The minimum juice content is calculated in relation to the total weight of the fruit.

- Minimum juice content: 40%

Colouring must be typical of the variety on at least two-thirds of the fruit surface. The fruit should be green but may show discolouring (yellow patches) up to 30% of its surface.

2.2 Classification

Mexican limes are classified in three classes defined below:

2.2.1 "Extra" Class

Mexican limes in this class must be of superior quality. They must be characteristic of the variety. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 Class I

Mexican limes in this class must be of good quality. They must be characteristic of the variety. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape;
- slight defects in colouring;
- slight skin defects not exceeding more than 1 cm^2.

The defects must not, in any case, affect the pulp of the fruit.

2.2.3 Class II

This class includes Mexican limes which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the Mexican limes retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape;
- defects in colouring;
- defects in the skin due to scratches, scabs, abrasions, spots or other skin defects not exceeding more than 2 cm^2.

The defects must not, in any case, affect the pulp of the fruit.

3. PROVISIONS CONCERNING SIZING

Size is determined by the maximum diameter of the equatorial section of the fruit, in accordance with the following table:

Size code	Diameter *(in millimetres)*
1	> 45
2	40.1 – 45
3	35.1 – 40
4	30.1 – 35
5	25 – 30

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package (or in each lot for produce presented in bulk) for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of Mexican limes not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of Mexican limes not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of Mexican limes satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For all classes, 10% by number or weight of Mexican limes corresponding to the size immediately above or below that indicated on the package.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package (or lot for produce presented in bulk) must be uniform and contain only Mexican limes of the same origin, variety, quality and size. For "Extra" Class, the colour must be uniform. The visible part of the contents of the package (or lot for produce presented in bulk) must be representative of the entire contents.

5.2 Packaging

Mexican limes must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[1], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Mexican limes shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

[1] For the purposes of this Standard, this includes recycled material of food-grade quality.

5.2.1 **Description of containers**
The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the Mexican limes. Packages (or lot for produce presented in bulk) must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 **Nature of produce**
If the produce is not visible from the outside, each package should be labelled as to the name of the produce and may be labelled as to name of the variety.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment. For produce transported in bulk, these particulars must appear on a document accompanying the goods.

6.2.1 **Identification**
Name and address of exporter, packer and/or dispatcher. Identification code (optional).[2]

6.2.2 **Nature of produce**
Name of the produce if the contents are not visible from the outside. Name of the variety (optional).

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Class;
- Size (size code or minimum and maximum diameter in mm);
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

[2] The national legislation of a number of countries requires the explicit declaration of the name and address. However, isn the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

7. CONTAMINANTS

7.1 Heavy metals

Mexican limes shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues

Mexican limes shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR NOPAL

CODEX STAN 185-1993, Amd. 1-2005

1.DEFINITION OF PRODUCE

This Standard applies to modified stem of commercial varieties of nopals grown from *Opuntia ficus indica*, *O. tomentosa, O. hyptiacantha, O. robusta, O. inermis, O. ondulata*, of the *Cactaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Nopals for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the nopals must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;
- firm;
- free of damage caused by low temperatures;
- free of prickles;
- free of pronounced blemishes;
- sufficiently developed and display satisfactory ripeness, depending on the nature of the produce.

They must have a shape, colour, taste and smell characteristic of the species.

2.1.1 The development and condition of the nopals must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

2.2 Classification

Nopals are classified in three classes defined below:

2.2.1 **"Extra" Class**

Nopals in this class must be of superior quality. They must be characteristic of the variety and/or commercial type. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 **Class I**

Nopals in this class must be of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape and colour;
- slight skin defects such as bruising, scarring, crusting, blemishes or other superficial defects. The total area affected shall not exceed 5%.

2.2.3 **Class II**

This class includes nopals which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. They must be characteristic of the variety and/or commercial type. The following defects, however, may be allowed, provided the nopals retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape and colour, as long as the produce has the characteristics common to nopals;
- skin defects due to bruising, scarring, crusting, spots or other defects. The total area affected shall not exceed 10%.

3. PROVISIONS CONCERNING SIZING

Size is determined by the length of the nopal, in accordance with the following table:

Size code	Length *(in centimetres)*
A	9 – 13
B	13 – 17
C	17 – 21
D	21 – 25
E	25 – 30

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of nopals not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of nopals not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of nopals satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting, pronounced irregularities or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For "Extra" Class, 5%; and for Class I or Class II, 10%; by number or weight of nopals not satisfying the requirements as regards sizing, but falling within the class immediately above or below those indicated in Section 3.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package (or lot for produce presented in bulk) must be uniform and contain only nopals of the same origin, variety, quality and size. For "Extra" Class, colour and ripeness should be uniform. The visible part of the contents of the package (or lot for produce presented in bulk) must be representative of the entire contents.

5.2 Packaging

Nopals must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[1], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Nopals shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

5.2.1 **Description of containers**

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the nopals. Packages (or lot for produce presented in bulk) must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

[1] For the purposes of this Standard, this includes recycled material of food-grade quality.

6.1.1 **Nature of produce**
If the produce is not visible from the outside, each package shall be labelled as to the name of the produce and may be labelled as to name of the variety.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment. For produce transported in bulk these particulars must appear on a document accompanying the goods.

6.2.1 **Identification**
Name and address of exporter, packer and/or dispatcher. Identification code (optional).[2]

6.2.2 **Nature of produce**
Name of the produce if the contents are not visible from the outside. Name of the variety or commercial type (optional).

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Class;
- Size (size code or length range in centimetres);
- Number of units (optional);
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals

Nopals shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues

Nopals shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

[2] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR ORANGES

CODEX STAN 245-2004, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial varieties of oranges grown from *Citrus sinensis* (L.) Osbeck, of the *Rutaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Oranges for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the oranges must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;
- free of damage caused by low and/or high temperatures;
- free of damage caused by frost;
- free of signs of internal shrivelling;
- practically free of bruising and/or extensive healed-over cuts.

2.1.1 The oranges must have been carefully picked and have reached an appropriate degree of development and ripeness account being taken of the characteristics of the variety, the time of picking and the area in which they are grown.

The development and condition of the oranges must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

Oranges satisfying these requirements may be "degreened". This treatment is permitted only if the other natural organoleptic characteristics are not modified.

2.2 Maturity criteria

The maturity of oranges is defined by the following parameters:

- Colouring;
- Minimum juice content, calculated in relation to the total weight of the fruit and after extraction of the juice by means of a hand press.

2.2.1 **Colouring**

The degree of colouring shall be such that, following normal development, the oranges reach their normal variety colour at their destination point, account being taken of the time of picking, the growing area and the duration of transport.

Colouring must be typical of the variety. Fruits with a light green colour are allowed, provided it does not exceed one-fifth of the total surface area of the fruit.

Oranges produced in areas with high air temperatures and high relative humidity conditions during the developing period can be of a green colour exceeding one fifth of the total surface area, provided they satisfy the criteria mentioned in Section 2.2.2 below.

2.2.2 **Minimum juice content**

– Blood oranges	30%
– Navels group	33%
– Other varieties	35%
– Varieties Mosambi, Sathgudi and Pacitan with more than one-fifth green colour	33%
– Other varieties with more than one-fifth green colour	45%

2.3 Classification

Oranges are classified in three classes defined below:

2.3.1 **"Extra" Class**

Oranges in this class must be of superior quality. In shape, external appearance, development and colouring, they must be characteristic of the variety and/or commercial type. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.3.2 **Class I**

Oranges in this class must be of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defect in shape;
- slight defect in colouring;
- slight skin defects occurring during the formation of the fruit, such as silver scurfs, russets, etc.;
- slight healed defects due to a mechanical cause such as hail damage, rubbing, damage from handling, etc.

The defects must not, in any case, affect the pulp of the fruit.

2.3.3 **Class II**

This class includes oranges which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the oranges retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defect in shape;
- defect in colouring;
- skin defects occurring during the formation of the fruit, such as silver scurfs, russets, etc.;
- healed defects due to a mechanical cause such as hail damage, rubbing, damage from handling, etc.;
- rough skin;
- superficial healed skin alterations;
- slight and partial detachment of the pericarp.

The defects must not, in any case, affect the pulp of the fruit.

3. PROVISIONS CONCERNING SIZING

Size is determined by the maximum diameter of the equatorial section of the fruit, in accordance with the following table:

Size code	Diameter *(in millimetres)*
0	92 – 110
1	87 – 100
2	84 – 96
3	81 – 92
4	77 – 88
5	73 – 84
6	70 – 80
7	67 – 76
8	64 – 73
9	62 – 70
10	60 – 68
11	58 – 66
12	56 – 63
13	53 – 60

Oranges of a diameter below 53 mm are excluded.

Oranges may be packed by count. In this case, provided the size uniformity required by the Standard is retained, the size range in the package may fall outside a single size code, but within two adjacent codes.

Uniformity in size is achieved by the above mentioned size scale, unless otherwise stated, as follows:

(i) for fruit arranged in regular layers in the package, including unit consumer packages, the maximum difference between the smallest and the largest fruit, within a single size code or, in the case of oranges packed by count, within two adjacent codes, must not exceed the following maxima:

Size code	Maximum difference between fruit in the same package in mm
0 to 2	11
3 to 6	9
7 to 13	7

(ii) for fruit not arranged in regular layers in packages and fruit in individual rigid packages for direct sale to the consumer, the difference between the smallest and the largest fruit in the same package must not exceed the range of the appropriate size grade in the size scale, or, in the case of oranges packed by count, the range in mm of one of the two adjacent codes concerned.

(iii) for fruit in bulk bins and fruit in individual non-rigid (nets, bags) packages for direct sale to the consumer, the maximum size difference between the smallest and the largest fruit in the same lot or package must not exceed the range obtained by grouping three consecutive sizes in the size scale.

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of oranges not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of oranges not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of oranges satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

Within this tolerance, a maximum of 5% is allowed of fruit showing slight superficial unhealed damage, dry cuts or soft and shrivelled fruit.

4.2 Size tolerances

For all classes, 10% by number or weight of oranges corresponding to the size immediately above and/or below that indicated on the package.

The 10% tolerance only applies to fruit whose diameter is not less than 50 mm.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform and contain only oranges of the same origin, variety and/or commercial type, quality and size, and appreciably of the same degree of ripeness and development. The visible part of the contents of the package must be representative of the entire contents. In addition, uniformity of colouring is required for "Extra" Class.

5.2 Packaging

Oranges must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[1], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Oranges shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables (*CAC/RCP 44-1995, Amd. 1-2004).

5.2.1 **Description of containers**

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the oranges. Packages must be free of all foreign matter and smell.

5.3 Presentation

The oranges may be presented as follows:

(a) Arranged in regular layers in the package. This form of presentation is mandatory for "Extra" Class and optional for Classes I and II;

(b) Not arranged in packages. This type of presentation is only allowed for Class I and II;

(c) In individual packages for direct consumer sale of a weight less than 5 kg, either made up by number or by weight of fruit.

[1] For the purposes of this Standard, this includes recycled material of food-grade quality.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex General *Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 **Nature of produce**

If the produce is not visible from the outside, each package (or lot for produce presented in bulk) shall be labelled as to the name of the produce and may be labelled as to the name of the variety and/or commercial type.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment.

6.2.1 **Identification**

Name and address of exporter, packer and/or dispatcher. Identification code (optional).[2]

6.2.2 **Nature of produce**

Name of the produce if the contents are not visible from the outside. Name of the variety and/or commercial type (optional)[3].

6.2.3 **Origin of produce**

Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**

- Class;
- Size code for fruit presented in accordance with the size scale or the upper and the lower limiting size code in the case of three consecutive sizes of the size scale;
- Size code (or, when fruit packed by count fall under two adjacent codes, size codes or minimum and maximum diameter in mm) and number of fruit, in the case of fruit arranged in layers in the package;
- If appropriate, a statement indicating the use of preservatives;
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

[2] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

[3] The national legislation of a number of countries requires the explicit declaration of the variety.

7. CONTAMINANTS

7.1 Heavy metals

Oranges shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues

Oranges shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR PAPAYA

CODEX STAN 183-1993, Rev. 1-2001, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to fruits of commercial varieties of papayas grown from *Carica papaya* L., of the *Caricaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Papayas for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the papayas must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of damage caused by pests;
- practically free of pests affecting the general appearance of the produce;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste.[1]
- firm;
- fresh in appearance;
- free of damage caused by low and/or high temperatures.

The peduncle, if present, should not exceed a length of 1 cm.

2.1.1 The papayas must have been carefully picked and have reached an appropriate degree of development and ripeness account being taken of the characteristics of the variety and/or commercial type and the area in which they are grown.

The development and condition of the papayas must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

[1] This provision allows for smell caused by conservation agents used in compliance with corresponding regulations.

2.2 Classification

Papayas are classified in three classes defined below:

2.2.1 "Extra" Class

Papayas in this class must be of superior quality. They must be characteristic of the variety and/or commercial type. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 Class I

Papayas in this class must be of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape;
- slight skin defects (i.e. mechanical bruising, sun spots and/or latex burns). The total area affected shall not exceed 10% of the total surface.

The defects must not, in any case, affect the pulp of the fruit.

2.2.3 Class II

This class includes papayas which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the papayas retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape;
- defects in colouring;
- skin defects (i.e., mechanical bruising, sun spots and latex burns). The total area affected should not exceed 15% of the total surface;
- slight marks caused by pests.

The defects must not, in any case, affect the pulp of the fruit.

3. PROVISIONS CONCERNING SIZING

Size is determined by the weight of the fruit with a minimum weight of 200 g, in accordance with the following table:

Size code	Weight *(in grams)*
A	200 – 300
B	301 – 400
C	401 – 500
D	501 – 600
E	601 – 700
F	701 – 800
G	801 – 1100
H	1101 – 1500
I	1501 – 2000
J	> 2001

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package (or in each lot for produce presented in bulk) for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of papayas not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of papayas not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of papayas satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For all classes, 10% by number or weight of papayas corresponding to the size immediately above and/or below that indicated on the package, with a minimum of 190 g for those papayas packed in the smallest size range.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package (or lot for produce presented in bulk) must be uniform and contain only papayas of the same origin, variety and/or commercial type, quality and size. For "Extra" Class, colour and ripeness should be uniform. The visible part of the contents of the package (or lot for produce presented in bulk) must be representative of the entire contents.

5.2 Packaging

Papayas must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[2], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Papayas shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

5.2.1 Description of containers

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the papayas. Packages (or lot for produce presented in bulk) must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 Nature of produce

If the produce is not visible from the outside, each package shall be labelled as to the name of the produce and may be labelled as to name of the variety and/or commercial type.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment. For produce transported in bulk, these particulars must appear on a document accompanying the goods.

[2] For the purposes of this Standard, this includes recycled material of food-grade quality.

6.2.1 **Identification**
Name and address of exporter, packer and/or dispatcher. Identification code (optional).[3]

6.2.2 **Nature of produce**
Name of the produce if the contents are not visible from the outside. Name of the variety and/or commercial type.

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 Commercial identification
- Class;
- Size (size code or average weight in grams);
- Number of units (optional);
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals
Papayas shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues
Papayas shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

[3] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

CODEX STANDARD FOR PINEAPPLES

CODEX STAN 182-1993, Rev. 1-1999, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial varieties of pineapples grown from *Ananas comosus* (L.) Merr., of the *Bromeliaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Pineapples for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the pineapples must be:

- whole, with or without the crown;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of damage caused by pests;
- practically free of pests affecting the general appearance of the produce;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste.
- fresh in appearance, including the crown, when present, which should be free of dead or dried leaves;
- free of damage caused by low and/or high temperatures;
- free of internal browning;
- free of pronounced blemishes.

When a peduncle is present, it shall be no longer than 2.0 cm, and the cut must be transversal, straight and clean. The fruit must be physiologically ripe, i.e., without evidence of unripeness (opaque, flavourless, exceedingly porous[1] flesh) or overripeness (exceedingly translucent or fermented flesh).

2.1.1 The pineapples must have been carefully picked and have reached an appropriate degree of development and ripeness in accordance with criteria proper to the variety and/or commercial type and the area in which they are grown.

The development and condition of the pineapples must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

[1] Except in certain varieties such as those of the Queen Group.

2.1.2 **Maturity requirements**

The total soluble solids content in the fruit flesh should be at least 12°Brix (twelve Brix degrees). For the determination of Brix degrees a representative sample of the juice of all the fruit shall be taken.

2.2 Classification

Pineapples are classified in three classes defined below:

2.2.1 **"Extra" Class**

Pineapples in this class must be of superior quality. They must be characteristic of the variety and/or commercial type. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

The crown, if present, shall be simple and straight with no sprouts, and shall be between 50 and 150% of the length of the fruit for pineapples with untrimmed[2] crowns.

2.2.2 **Class I**

Pineapples in this class must be of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape;
- slight defects in colouring, including sun spots;
- slight skin defects (i.e., scratches, scars, scrapes and blemishes) not exceeding 4% of the total surface area.

The defects must not, in any case, affect the pulp of the fruit.

The crown, if present, shall be simple and straight or slightly curved with no sprouts, and shall be between 50 and 150% of the length of the fruit for pineapples with trimmed or untrimmed[3] crowns.

2.2.3 **Class II**

This class includes pineapples which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the pineapples retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape;
- defects in colouring, including sun spots;
- skin defects (i.e., scratches, scars, scrapes, bruises and blemishes), not exceeding 8% of the total surface area.

The defects must not, in any case, affect the pulp of the fruit.

[2] Trimming consists in tearing some leaves off the top of the crown.

The crown, if present, shall be simple or double and straight or slightly curved, with no sprouts.

3. PROVISIONS CONCERNING SIZING

Size is determined by the average weight of the fruit with a minimum weight of 700 g, except for small size varieties[3], which can have a minimum weight of 250 g, in accordance with the following table:

Size code	Average weight (+/–12%) *(in grams)*	
	With crown	Without crown
A	2 750	2 280
B	2 300	1 910
C	1 900	1 580
D	1 600	1 330
E	1 400	1 160
F	1 200	1 000
G	1 000	830
H	800	660

Significant volumes of pineapples in international trade are packaged and sold by count per box. Boxes are packed to minimum weight expectations e.g. 10 kg, 20 lbs, 40 lbs, appropriate for the various markets. Fruit are segregated for packaging by weights which approximate the above size codes, but may not consistently fall within a single size code, but would retain the uniformity required by the code.

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each inspection lot for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of pineapples not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

[3] such as Victoria and Queen.

4.1.2 **Class I**

Ten percent by number or weight of pineapples not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of pineapples satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For all classes, 10% by number or weight of pineapples corresponding to the size immediately above or below that indicated on the package.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform and contain only pineapples of the same origin, variety and/or commercial type, quality and size. For "Extra" Class, colour and ripeness should be uniform. The visible part of the contents of the package must be representative of the entire contents.

5.2 Packaging

Pineapples must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[4], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Pineapples shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

5.2.1 **Description of containers**

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the pineapples. Packages must be free of all foreign matter and smell.

[4] For the purposes of this Standard, this includes recycled material of food-grade quality.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 **Nature of produce**

If the produce is not visible from the outside, each package should be labelled as to the name of the produce and may be labelled as to name of the variety and/or commercial type. The absence of the crown should be indicated.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment.

6.2.1 **Identification**

Name and address of exporter, packer and/or dispatcher. Identification code (optional)[5].

6.2.2 **Nature of produce**

Name of the produce if the contents are not visible from the outside. Name of the variety or commercial type (optional). The absence of the crown should be indicated.

6.2.3 **Origin of produce**

Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**

- Class;
- Size (size code or average weight in grams);
- Number of units (optional);
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals

Pineapples shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

[5] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

7.2 Pesticide residues

Pineapples shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev.

CODEX STANDARD FOR PITAHAYAS

CODEX STAN 237-2003, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial species and varieties of pitahayas grown from the genera *Selenicereus* and *Hylocereus*, of the *Cactaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Pitahayas for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the pitahayas must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean and free of any visible foreign matter;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;[1]
- firm;
- fresh in appearance;
- free of cracks in the skin;
- with a peduncle or stem between 15 and 25 mm in length;
- without thorns.

2.1.1 The pitahayas must have been carefully picked and have reached an appropriate degree of development and ripeness[2] account being taken of the characteristics of the variety and/or commercial type and the area in which they are grown.

[1] This provision allows for smell caused by conservation agents used in compliance with corresponding regulations.

[2] The maturity of the yellow pitahayas can be gauged visually from its external colouring and confirmed by examining flesh content and using the iodine test.

The development and condition of the pitahayas must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

2.2 Classification

Pitahayas are classified in three classes defined below:

2.2.1 "Extra" Class

Pitahayas in this class must be of superior quality. They must be characteristic of the variety and/or commercial type. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 Class I

Pitahayas in this class must be of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape;
- slight defects of the skin not exceeding 1 cm^2 of the total surface area of the fruit.

The defects must not, in any case, affect the pulp of the fruit.

2.2.3 Class II

This class includes pitahayas which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the pitahayas retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape;
- defects of the skin not exceeding 2 cm^2 of the total surface area of the fruit.

The defects must not, in any case, affect the pulp of the fruit.

3. PROVISIONS CONCERNING SIZING

Size is determined by the weight of the fruit, in accordance with the following table[3]:

Size code	Unit weight *(in grams)*	
	Yellow	Red/White
A	110 – 150	110 – 150
B	151 – 200	151 – 200
C	201 – 260	201 – 250
D	261 – 360	251 – 300
E	> 361	301 – 400
F	–	401 – 500
G	–	501 – 600
H	–	601 – 700
I	–	> 701

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of pitahayas not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of pitahayas not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of pitahayas satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

[3] In the case of yellow pitahayas, the number of units per package may be used.

4.2 Size tolerances

For all classes, 10% by number or weight of pitahayas corresponding to the size immediately above and/or below that indicated on the package.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform and contain only pitahayas of the same origin, variety and/or commercial type, quality, colour and size. The visible part of the contents of the package must be representative of the entire contents.

5.2 Packaging

Pitahayas must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[4], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Pitahayas shall be packed in each container in compliance with the Recommended *International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

5.2.1 Description of containers

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the pitahayas. Packages must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 Nature of produce

If the produce is not visible from the outside, each package shall be labelled as to the name of the produce and may be labelled as to the name of the variety and/or commercial type.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment.

[4] For the purposes of this Standard, this includes recycled material of food-grade quality.

6.2.1 **Identification**
Name and address of exporter, packer and/or dispatcher. Identification code (optional).[5]

6.2.2 **Nature of produce**
Name of the produce if the contents are not visible from the outside. Commercial type defined by colour of skin[6] (yellow, red or white).

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Class;
- Size (size code or weight range in grams);
- Number of units (optional);
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals
Pitahayas shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues
Pitahayas shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

[5] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

[6] In some regions, this may also be defined by the colour of the pulp.

CODEX STANDARD FOR PRICKLY PEAR

CODEX STAN 186-1993, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to the fruit of commercial varieties of prickly pears grown from *Opuntia ficus indica, O. streptachanthae,* and *O. lindheimeiri*, of the *Cactaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Prickly pears for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

In all classes, subject to the special provisions for each class and the tolerances allowed, the prickly pears must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;
- firm;
- fresh in appearance;
- free of damage caused by low temperatures;
- free of prickles;
- free of pronounced blemishes;
- sufficiently developed and display satisfactory ripeness, depending on the nature of the produce.

Depending on the prickly pear variety, the receptacle of the fruit will be flat or slightly hollow. The prickly pears must have a shape, colour, taste and smell characteristic of the species.

2.1.1 The development and condition of the prickly pears must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

2.2 Classification

Prickly pears are classified in three classes defined below:

2.2.1 **"Extra" Class**

Prickly pears in this class must be of superior quality. They must be characteristic of the variety and/or commercial type. They must be free of defects, with the exception of

very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 **Class I**

Prickly pears in this class must be of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape and colour;
- slight skin defects such as bruising, sunspots, crusting, blemishes or other superficial defects. The total area affected shall not exceed 4%.

The defects must not, in any case, affect the pulp of the fruit.

2.2.3 **Class II**

This class includes prickly pears which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. They must be characteristic of the variety and/or commercial type. The following defects, however, may be allowed, provided the prickly pears retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape and colour, as long as the produce has the characteristics common to prickly pears;
- skin defects due to bruising, scarring, crusting sunspots or other defects. The total area affected shall not exceed 8%.

The defects must not, in any case, affect the pulp of the fruit.

3. PROVISIONS CONCERNING SIZING

Size is determined by the weight of the prickly pear, in accordance with the following table:

Size Code	Weight *(in grams)*
A	90 – 105
B	105 – 140
C	140 – 190
D	190 – 270
E	> 270

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of prickly pears not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of prickly pears not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of prickly pears satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting, pronounced irregularities or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For "Extra" Class, 5%; and for Class I or Class II, 10%; by number or weight of prickly pears not satisfying the requirements as regards sizing, but falling within the class immediately above or below or those indicated in Section 3.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package (or lot for produce presented in bulk) must be uniform and contain only prickly pears of the same origin, variety, quality and size. For "Extra" Class, colour and ripeness should be uniform. The visible part of the contents of the package (or lot for produce presented in bulk) must be representative of the entire contents.

5.2 Packaging

Prickly pears must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[1], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

[1] For the purposes of this Standard, this includes recycled material of food-grade quality.

Prickly pears shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

5.2.1 **Description of containers**

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the prickly pears. Packages (or lot for produce presented in bulk) must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 **Nature of produce**

If the produce is not visible from the outside, each package shall be labelled as to the name of the produce and may be labelled as to name of the variety.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment. For produce transported in bulk these particulars must appear on a document accompanying the goods.

6.2.1 **Identification**

Name and address of exporter, packer and/or dispatcher. Identification code (optional).[2]

6.2.2 **Nature of produce**

Name of the produce if the contents are not visible from the outside. Name of the variety or commercial type (optional).

6.2.3 **Origin of produce**

Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**

- Class;
- Size (size code or weight range in grams);

[2] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

– Number of units (optional);
– Net weight (optional).

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals

Prickly pears shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues

Prickly pears shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR PUMMELOS

CODEX STAN 214-1999, Amd. 2-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial varieties of pummelos grown from *Citrus grandis* (L.) Osbeck (syn. *C. maxima* Merr.), of the *Rutaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Pummelos for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the pummelos must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;
- firm;
- free of damage caused by low temperatures;
- practically free of bruising.

2.1.1 The pummelos must have been carefully picked and have reached an appropriate degree of development and ripeness in accordance with criteria proper to the variety and/or commercial type and to the area in which they are grown.

The development and condition of the pummelos must be such as to enable them:

- to withstand transport and handling, and
- to arrive in satisfactory condition at the place of destination.

2.1.2 **Maturity requirements and colouring**

Minimum total soluble solids content should not be less than 8%.

Colouring must be typical of the variety and/or commercial type on at least two-thirds of the surface of the fruit, account being taken of the variety and/or commercial type and of the time of picking.

2.2 Classification

Pummelos are classified in three classes defined below:

2.2.1 "Extra" Class

Pummelos in this class must be of superior quality. They must be characteristic of the variety and/or commercial type. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 Class I

Pummelos in this class must be of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape;
- slight defects in colouring;
- slight skin defects inherent in the formation of the fruit;
- slight healed defects due to mechanical causes.

The total area affected shall not exceed 10%.

The defects must not, in any case, affect the pulp of the fruit.

2.2.3 Class II

This class includes pummelos which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the pummelos retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape;
- defects in colouring;
- healed skin defects.

The total area affected should not exceed 15%.

The defects must not, in any case, affect the pulp of the fruit.

3. PROVISIONS CONCERNING SIZING

Size is determined by the weight or maximum diameter of the equatorial section of the fruit, in accordance with the following table:

Size code	Weight *(in grams)*	Diameter *(in millimetres)*
0	> 1900	> 170
1	1701 – 1900	156 – 170
2	1501 – 1700	148 – 162
3	1301 – 1500	140 – 154
4	1101 – 1300	132 – 146
5	901 – 1100	123 – 138
6	701 – 900	116 – 129
7	400 – 700	100 – 118

Pummelos may be packed by count. In this case, provided the size uniformity required by the standard is retained, the size range in the package may fall outside a single size code, but within two adjacent codes.

Pummelos of a weight less than 400 g or of a diameter below 100 mm are excluded.

Uniformity in size is achieved by the above mentioned size scales, except in the case of fruit in bulk bins and fruit in individual non-rigid (nets, bags) packages for direct sale to the consumer, for which the maximum size difference between the smallest and the largest fruit in the same lot or package must not exceed the range obtained by grouping three consecutive sizes in the size scale.

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package (or in each lot for produce presented in bulk) for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of pummelos not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of pummelos not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of pummelos satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For all classes, 10% by number or weight of pummelos corresponding to the size immediately above or below that indicated on the package.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package (or lot for produce presented in bulk) must be uniform and contain only pummelos of the same origin, variety and/or commercial type, quality, size and colour. The visible part of the contents of the package (or lot for produce presented in bulk) must be representative of the entire contents.

5.2 Packaging

Pummelos must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[1], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Pummelos shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

5.2.1 **Description of containers**

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the pummelos. Packages (or lot for produce presented in bulk) must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex General *Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

[1] For the purposes of this Standard, this includes recycled material of food-grade quality.

6.1.1 **Nature of produce**
If the produce is not visible from the outside, each package (or lot for produce presented in bulk) should be labelled as to the name of the produce and may be labelled as to name of the variety and/or commercial type.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment. For produce transported in bulk, these particulars must appear on a document accompanying the goods.

6.2.1 **Identification**
Name and address of exporter, packer and/or dispatcher. Identification code (optional)[2].

6.2.2 **Nature of produce**
Name of the produce if the contents are not visible from the outside. Name of the variety or commercial type (optional).

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Class;
- Size (size code or minimum and maximum weight or diameter in grams or millimetres, respectively);
- Net weight (optional);
- Size code (or, when fruit packed by count fall under two adjacent codes, size codes or minimum and maximum diameter in mm) and number of fruit, in the case of fruit arranged in layers in the package.

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals

Pummelos shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

[2] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

7.2 Pesticide residues

Pummelos shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR RAMBUTAN

CODEX STAN 246-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial varieties and/or commercial types of rambutans grown from *Nephelium lappaceum* L., of the *Sapindaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Rambutans for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the rambutans must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of pests and damage caused by them affecting the general appearance of the produce;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;
- fresh in appearance;
- free of damage caused by low and/or high temperatures.

2.1.1 The rambutans must have been carefully picked and have reached an appropriate degree of development and ripeness in accordance with criteria proper to the variety and/or commercial type and to the area in which they are grown.

The development and condition of the rambutans must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

2.2 Classification

Rambutans are classified in three classes defined below:

2.2.1 **"Extra" Class**

Rambutans in this class must be of superior quality. They must be characteristic of the variety and/or commercial type. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 **Class I**

Rambutans in this class must be of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- a slight defect in shape;
- slight skin defects not exceeding 5% of the total surface area, excluding defects on spinterns.

The defects must not, in any case, affect the flesh of the produce.

2.2.3 **Class II**

This class includes rambutans which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the rambutans retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape;
- skin defects not exceeding 10% of the total surface area, excluding defects on spinterns.

The defects must not, in any case, affect the flesh of the produce.

3. PROVISIONS CONCERNING SIZING

Size is determined by the number of fruits per kilogram. There are two forms of presentation: in single fruit and in bunches; the size specification is as follows:

TABLE 1

Size specifications of rambutans presented as single fruit

Size code	Weight per fruit	Number of fruits *(per kg)*
1	> 43	< 23
2	38 – 43	23 – 26
3	33 – 37	27 – 30
4	29 – 32	31 – 34
5	25 – 28	35 – 40
6	18 – 24	41 – 50

TABLE 2
Size specifications of rambutans presented in bunches

Size code	Number of fruits *(per kg)*
1	< 29
2	29 – 34
3	35 – 40
4	41 – 45

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of rambutans not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

In addition to the above, 10% by number or weight of detached fruits is allowed in each package containing rambutan in bunches.

4.1.2 **Class I**

Ten percent by number or weight of rambutans not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

In addition to the above, 10% by number or weight of detached fruits is allowed in each package containing rambutan in bunches.

4.1.3 **Class II**

Ten percent by number or weight of rambutans satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

In addition to the above, 10% by number or weight of detached fruits is allowed in each package containing rambutan in bunches.

4.2 Size tolerances

For all classes or forms of presentation, 10% by number or weight of rambutans corresponding to the size immediately above and/or below that indicated on the package.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform and contain only rambutans of the same origin, variety and/or commercial type, quality, size and colour. The visible part of the contents of the package must be representative of the entire contents.

5.2 Packaging

Rambutans must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[1], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Rambutans shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

5.2.1 Description of containers

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the rambutans. Packages must be free of all foreign matter and smell.

5.3 Presentation

The rambutans may be presented under one of the following forms:

5.3.1 Individually

In this case the pedicel must be detached at first knot and the maximum length must not extend more than 5 mm beyond the top of the fruit.

5.3.2 In bunches

Each bunch must be free of leaves and have a number of clusters, each cluster with a minimum of two rambutans. The stem of each bunch must not exceed 20 cm in length measured from the attachment of the highest fruit.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

[1] For the purposes of this Standard, this includes recycled material of food-grade quality.

6.1.1 **Nature of produce**
If the produce is not visible from the outside, each package shall be labelled as to the name of the produce "Rambutan" and may be labelled as to name of the variety and/or commercial type, including specified characteristic of "individually" or "in bunches".

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment.

6.2.1 **Identification**
Name and address of exporter, packer and/or dispatcher. Identification code (optional)[2].

6.2.2 **Nature of produce**
Name of the produce "Rambutan" if the contents are not visible from the outside. Name of the variety and/or commercial type (optional).

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Class;
- Size; and
- Net weight.

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Pesticide residues

Rambutans shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

7.2 Other contaminants

Rambutans shall comply with those maximum levels for contaminants established by the Codex Alimentarius Commission for this commodity.

[2] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR SWEET CASSAVA[1]

CODEX STAN 238-2003, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to commercial sweet[2] varieties of cassava roots grown from *Manihot esculenta Crantz*, of the *Euphorbiaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Cassava for industrial processing is excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the cassava must be:

- whole;
- sound, produce affected by rotting, mould or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter, except permitted substances used to prolong its shelf life;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;[3]
- firm;
- practically free of mechanical damage and bruising;
- free of loss of colour in the flesh.

The cut at the distal (narrow) end of the cassava should not exceed 2 cm in diameter.

The stalk end of the root should have a clean cut between 1 cm and 2.5 cm in length.

2.1.1 The cassava must have been carefully harvested and have reached an appropriate degree of physiological development account being taken of the characteristics of the variety and the area in which they are grown.

The development and condition of the cassava must be such as to enable it:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

[1] Commonly known in certain regions by: manioc, mandioca, tapioca, aipim, yucca, etc.

[2] Sweet varieties of cassava are those that contain less than 50 mg/kg hydrogen cyanide (fresh weight basis). In any case, cassava must be peeled and fully cooked before being consumed.

[3] This provision allows for smell caused by conservation agents used in compliance with corresponding regulations.

2.2 Classification

Cassava is classified in three classes defined below:

2.2.1 "Extra" Class

Cassava in this class must be of superior quality. It must be characteristic of the variety and/or commercial type. It must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 Class I

Cassava in this class must be of good quality. It must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape;
- scarring or healed damage, not exceeding 5% of the surface area;
- scraped areas, not exceeding 10% of the surface area.

The defects must not, in any case, affect the pulp of the produce.

2.2.3 Class II

This class includes cassava which does not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the cassava retains its essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape;
- scarring or healed damage, not exceeding 10% of the surface area;
- scraped areas, not exceeding 20% of the surface area.

The defects must not, in any case, affect the pulp of the produce.

3. PROVISIONS CONCERNING SIZING

Size is determined by the diameter at thickest cross-section of the produce, in accordance with the following table:

Size code	Diameter *(in centimetres)*
A	3.5 – 6.0
B	6.1 – 8.0
C	> 8.0

In all cases, cassava must not be less than 300 g in weight nor less than 20 cm in length.

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" class**

Five percent by number or weight of cassava not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of cassava not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of cassava satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For all classes, 10% by number or weight of cassava corresponding to the size immediately above and/or below that indicated on the package.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform in shape and contain only cassava of the same origin, variety and/or commercial type, quality and size. The visible part of the contents of the package must be representative of the entire contents.

5.2 Packaging

Cassava must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[4], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Cassava shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

[4] For the purposes of this Standard, this includes recycled material of food-grade quality.

5.2.1 **Description of containers**
The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the cassava. Packages must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 **Nature of produce**
Each package shall be labelled as to the name of the produce and type (sweet) and may be labelled as to the name of the variety.

6.1.2 **Preparation instructions**
A statement indicating that cassava should be peeled and fully cooked before being consumed is required.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment.

6.2.1 **Identification**
Name and address of exporter, packer and/or dispatcher. Identification code (optional).[5]

6.2.2 **Nature of produce**
Name of the produce and type (sweet) if the contents are not visible from the outside. Name of the variety (optional).

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Class;
- Size (size code or minimum and maximum diameter in centimetres);
- Net weight;
- Preparation instructions (see Section 6.1.2).

[5] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Heavy metals

Cassava shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues

Cassava shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR TABLE GRAPES

CODEX STAN 255-2007

1. DEFINITION OF PRODUCE

This Standard applies to commercial varieties (cultivars) of table grapes grown from *Vitis vinifera* L., of the *Vitaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Grapes for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the bunches and berries must be:

- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of pests and damage caused by them affecting the general appearance of the produce;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;
- practically free of damage caused by low and/or high temperatures.

In addition, the berries must be:

- whole;
- well formed;
- normally developed.

Pigmentation due to sun is not a defect so long as this only affects the skin of the berries.

2.1.1 The bunches must have been carefully picked.

The development and condition of the table grapes must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

2.1.2 **Maturity requirements**

Table grapes must be sufficiently developed and display satisfactory ripeness.

In order to satisfy this requirement, the fruit must have obtained a refractometric index of at least 16° Brix.

Fruit with a lower refractometric index are accepted provided the sugar/acid ratio is at least equal to:

(a) 20:1 if the Brix level is greater than or equal to 12.5° and less than 14° Brix,

(b) 18:1 if the Brix level is greater than or equal to 14° and less than 16° Brix.

2.2 Classification

Table Grapes are classified in three classes defined below:

2.2.1 "Extra" Class

Table grapes in this class must be of superior quality.

The bunches be characteristic of the variety in shape, development and colouring, allowing for the district in which they are grown.

The berries must be firm, firmly attached to the stalk, evenly spaced along the stalk and have their bloom virtually intact.

They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 Class I

Table grapes in this class must be of good quality.

The bunches must be characteristic of the variety in shape, development and colouring, allowing for the district in which they are grown.

The berries must be firm, firmly attached to the stalk and, as far as possible, have their bloom intact. They may, however, be less evenly spaced along the stalk than in the "Extra" Class.

The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- a slight defect in shape;
- a slight defect in colouring;
- very slight sun scorch affecting the skin only.

2.2.3 Class II

This class includes table grapes which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above.

The bunches may show slight defects in shape, development and colouring, provided these do not impair the essential characteristics of the variety, allowing for the district in which they are grown.

The berries must be sufficiently firm and sufficiently attached to the stalk. They may be less evenly spaced along the stalk than in Class I.

The following defects, however, may be allowed, provided the table grapes retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape;
- defects in colouring;

- slight sun scorch affecting the skin only;
- slight bruising;
- slight skin defects.

3. PROVISIONS CONCERNING SIZING

Size is determined by the weight of the bunch.

3.1 Minimum bunch weight

The minimum bunch weight shall be 75 gr. This provision does not apply to packages intended for single servings.

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by weight of bunches not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by weight of bunches not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by weight of bunches satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

Ten percent by weight of bunches not satisfying the size requirements as specified in Section 3.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform and contain only bunches of the same origin, variety, quality and degree of ripeness. In the "Extra" Class, the bunches must be of more or less identical size and colouring. In the case of Class I, the bunches may have slight variation in size.

However, consumer packages of a net weight not exceeding 1 kg may contain mixtures of table grapes of different varieties, provided they are uniform in quality, degree of ripeness and, for each variety concerned, in origin.

The visible part of the contents of the package must be representative of the entire contents.

5.2 Packaging

Table grapes must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[1], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Table grapes shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995).

In the case of the "Extra" Class, the bunches must be packed in a single layer.

5.2.1 Description of containers

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the table grapes. Packages must be free of all foreign matter and smell.[2]

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985), the following specific provisions apply:

6.1.1 Nature of produce

If the produce is not visible from the outside, each package shall be labelled as to the name of the produce and may be labelled as to name of the variety.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment.

6.2.1 Identification

Name and address of exporter, packer and/or dispatcher. Identification code (optional).[3]

[1] For the purposes of this Standard, this includes recycled material of food-grade quality.

[2] A fragment of vine shoot no more than 5 cm in length may be left on the stem of the bunch as a form of special presentation without prejudice to the applicable plant protection rules.

[3] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

6.2.2 **Nature of produce**
Name of the produce "Table Grapes" if the contents are not visible from the outside. Name of the variety or, where applicable, names of varieties.

6.2.3 **Origin of produce**
Country of origin or, where applicable, countries of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Class;
- Net weight (optional);
- "Bunches below 75 gr. intended for single servings", if appropriate.

6.2.5 **Official inspection mark (optional)**

7. CONTAMINANTS

7.1 Pesticide residues
Table grapes shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

7.2 Other contaminants
Table grapes shall comply with those maximum levels for contaminants established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

CODEX STANDARD FOR TANNIA[1]

CODEX STAN 224-2001, Amd. 1-2005

1. DEFINITION OF PRODUCE

This Standard applies to the tubercles of commercial varieties of lilac tannia grown from *Xanthosoma violaceum* Schott and white tannia grown from *Xanthosoma sagittifolium* (L.) Schott, of the *Araceae* family, to be supplied fresh to the consumer, after preparation and packaging. Tannias for industrial processing are excluded.

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the tannias must be:

- whole;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter, except permitted substances used to prolong their shelf life;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;[2]
- firm;
- practically free of mechanical damage and bruising;
- practically free of signs of sprouting.

2.1.1 The tannias must have been carefully harvested and have reached an appropriate degree of physiological development, account being taken of the characteristics of the variety and/or commercial type and the area in which they are grown.

The development and condition of the tannias must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

[1] Commonly known in certain regions by: tania, yautia, new cocoyam, tanier, chou Caraïbes, taioba, mangareto, mangarito, mangarás, yautía, malanga, macal, quiscamote, tiquisque, otó, okumo, uncucha, gualuza, malangay, queiquexque, taniera, macabo, etc.

[2] This provision allows for smell caused by conservation agents used in compliance with corresponding regulations.

2.2 Classification

Tannias are classified in three classes defined below:

2.2.1 "Extra" Class

Tannias in this class must be of superior quality. They must be characteristic of the variety. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

2.2.2 Class I

Tannias in this class must be of good quality. They must be characteristic of the variety. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape;
- scarring, provided this does not cover more than 20% of the surface area;
- scraped areas, provided these do not exceed 20% of the surface area.

The defects must not, in any case, affect the flesh of the produce.

2.2.3 Class II

This class includes tannias which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the tannias retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape;
- scarring, provided this does not cover more than 30% of the surface area;
- scraped areas, provided these do not exceed 30% of the surface area.

The defects must not, in any case, affect the flesh of the produce.

3. PROVISIONS CONCERNING SIZING

Size is determined by the weight of the tannia, in accordance with the following table:

Size code	Weight *(in grams)*	Length	Diameter
A	150 – 249	Between 100 and 300 mm (measured at the convex part of root)	45 to 70 mm (measured at the widest cross section)
B	250 – 349		
C	350 – 450		

4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

4.1 Quality tolerances

4.1.1 **"Extra" Class**

Five percent by number or weight of tannias not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

4.1.2 **Class I**

Ten percent by number or weight of tannias not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

4.1.3 **Class II**

Ten percent by number or weight of tannias satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For all classes, 10% by number or weight of tannias corresponding to the size immediately above and/or below that indicated on the package.

5. PROVISIONS CONCERNING PRESENTATION

5.1 Uniformity

The contents of each package must be uniform and contain only tannias of the same origin, variety and/or commercial type, quality and size. The visible part of the contents of the package must be representative of the entire contents.

5.2 Packaging

Tannias must be packed in such a way as to protect the produce properly. The materials used inside the package must be new[3], clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Tannias shall be packed in each container in compliance with the *Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44-1995, Amd. 1-2004).

[3] For the purposes of this Standard, this includes recycled material of food-grade quality.

5.2.1 **Description of containers**
The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the tannias. Packages must be free of all foreign matter and smell.

6. MARKING OR LABELLING

6.1 Consumer packages

In addition to the requirements of the Codex *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

6.1.1 **Nature of produce**
If the produce is not visible from the outside, each package shall be labelled as to the name of the produce and may be labelled as to name of the variety and/or commercial type.

6.2 Non-retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment.

6.2.1 **Identification**
Name and address of exporter, packer and/or dispatcher. Identification code (optional).[4]

6.2.2 **Nature of produce**
Name of the produce if the contents are not visible from the outside. Name of the variety and/or commercial type (optional).

6.2.3 **Origin of produce**
Country of origin and, optionally, district where grown or national, regional or local place name.

6.2.4 **Commercial identification**
- Type (white or lilac);
- Class;
- Size (size code or minimum and maximum weight in grams);
- Net weight (optional).

6.2.5 **Official inspection mark (optional)**

[4] The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

7. CONTAMINANTS

7.1 Heavy metals

Tannias shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity.

7.2 Pesticide residues

Tannias shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8. HYGIENE

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 4-2003), *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 produce should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

RECOMMENDED INTERNATIONAL CODE OF PRACTICE FOR PACKAGING AND TRANSPORT OF FRESH FRUIT AND VEGETABLES

CAC/RCP 44-1995, Amd. 1-2004

SECTION I – SCOPE

1.1 This code recommends proper packaging and transport of fresh fruit and vegetables in order to maintain produce quality during transportation and marketing.

SECTION II – DESIGN, CONDITION AND LOADING METHOD OF TRANSPORT EQUIPMENT

2.1 Mode of transportation and type of equipment

Factors include:

- destination;
- value of the produce;
- degree of produce perishability;
- amount of produce to be transported;
- recommended storage temperature and relative humidity;
- outside temperature conditions at origin and destination points;
- time in transit to reach destination by air, land, or ocean transport;
- freight rates negotiated with the carriers;
- quality of transportation service.

2.2 **Reliability and quality of transportation service provided by different carriers must be carefully considered along with the rates charged.** Services and schedules are established or modified weekly. Sometimes service is abruptly withdrawn. Shippers should contact air and ocean port authorities at their origin and destination locations to receive the most current information on available services. Local trade publications also are excellent sources of information, as many carriers and their agents advertise their schedules and destinations.

2.3 **When available refrigerated trailers and van containers are recommended for most high volume produce with transit and storage lives of a week or more.** After transit, there must be enough remaining produce life for marketing. Carriers utilizing trailers and containers can offer a door-to-door service. This reduces handling, exposure, damage, and theft of the produce.

2.4 **Air cargo containers also can be used to provide a door-to-door service.** Produce transported by air is generally high-value and highly perishable. Freight costs are higher by air. Transit times, however, are in terms of hours instead of days.

2.5 **Many produce is shipped in unrefrigerated air containers or on air cargo pallets.** This requires close coordination at the origin and destination airports to protect the produce when flights are delayed. Temperature-controlled storage facilities at airports are needed to ensure produce quality. Refrigerated air containers are available and should be used when possible. Use of insulated thermal blankets is an option.

2.6 **Produce which can be shipped in refrigerated trailers and van containers are sometimes shipped by air to take advantage of brief market opportunities, such as the beginning of a season when prices are high and supply is limited.** A robust and accurate system for monitoring or displaying temperature and relative humidity during transport in integral containers needs to be considered.

2.7 **Long distance transportation through tropical and frigid climates requires rugged well-designed equipment to withstand the transit environment and protect the produce.** Desirable features in refrigerated trailers up to 14.6 m (48 ft) long and van containers up to 12 m (40 ft) long include for example:

- 42 000 kJ/h (40 000 BTU/h) refrigeration capacity at 38°C (100°F) ambient, 2°C (36°F) return air temperature.
- a continuously operating high capacity evaporator blower for more even produce temperatures and higher relative humidities;
- a solid return air bulkhead at the front of the trailer to ensure air circulation throughout the load;
- vertical ribs on the rear door to assist in air circulation;
- adequate insulation and provisions for heating, when used in regions where weather conditions so demand due to the nature of the produce;
- deep floor grooves or channels, from 50 to 75 mm (2 to 3 mm) in depth to provide an adequate cross-sectional area for air circulation under loads placed directly on the floor;
- supply-air temperature sensing of the operation of the refrigeration unit to reduce produce chilling and freezing injury;
- provisions for ventilation to prevent ethylene or carbon dioxide buildup;
- air-ride suspension to reduce the amount of shock and vibration transferred to the shipping containers and the produce inside.
- modern containers in which cold air leaves the front part of the container, but the air flow circulates from below (close to the floor) toward the back, then rising to the upper part of the container.

2.8 **Most carriers check their transport equipment before presenting it to the shipper for loading.** The condition of the equipment is critical to maintaining the quality of the produce. Therefore, the shipper also should check the equipment to ensure it is in good working order and meets the needs of the produce. Carriers provide guidance on checking and operating the refrigeration systems.

2.9 All transportation equipment should be checked for:

- cleanliness – the load compartment should be regularly cleaned for example by steam cleaning;

- damage to walls, floors, doors, ceilings should be in good condition;
- temperature control – refrigerated units should be recently calibrated and supply continuous air circulation for uniform produce temperatures.

2.10 Shippers should insist on clean equipment. A load of produce can be ruined by:
- smell from previous deliveries or incompatible loads;
- toxic chemical residues;
- insects nesting in the equipment;
- decaying remains of agricultural produce;
- debris blocking drain openings or air circulation channels along the floor.

2.11 Shippers should insist on well maintained equipment and check for the following:
- damage to walls, ceilings, or floors which can let in the outside heat, cold, moisture, dirt, and insects;
- operation and condition of doors, ventilation openings, and seals;
- provisions for load locking and bracing.

2.12 For refrigerated trailers and van containers, the following additional checks are important:
- with the doors closed, have someone inside the cargo area check for light – door gaskets must seal. A smoke generator also can be used to detect leaks;
- the refrigeration unit should cycle from high to low speed when the desired temperature is reached and then back to high speed;
- determine the location of the sensing element which controls the discharge air temperature. If it measures return air temperature, the thermostat may have to be set- higher to avoid chilling injury or freezing injury of the produce;
- a solid return air bulkhead should be installed at the front of the trailer;
- a heating device should be available for transportation in areas with extreme cold weather;
- equipment with a top air delivery system should have a fabric air chute or metal ceiling duct in good condition.

2.13 **Produce requiring refrigeration should be thoroughly precooled, if necessary, prior to loading into transportation equipment.** Produce temperatures should be taken with an appropriate thermometer and recorded on the bill of lading for future reference. The load compartment in the equipment also should be precooled to the recommended transport or storage temperature for the produce. It is advisable that the loading area should be enclosed and if available, the loading dock doorway area should be equipped with doorway air seals.

2.14 **Proper loading practices are critical to maintaining temperature and relative humidity, protecting the produce from impact and vibration forces in transit, and preventing insects from entering the load.** Special care must be taken when shipping mixed loads. The produce must be compatible.

2.15 Basic loading methods include:
- bulk loading, by machine or hand, of unpackaged commodities;
- hand loading individual shipping containers, with or without pallets;
- unit loading of palletized or slipsheet loads of containers with pallet jacks or forklifts.

2.16 **Inadequate provisions for air circulation will ruin a load, even in well designed transportation equipment.** When possible, shipping containers should be kept off shallow floors and away from flat sidewalls by using pallets, racks, and dunnage. Adequate head space between the upper row of cartons and the top of the container should be allowed; this may be done by taping or gluing the upper row of cartons or by using appropriately designed packages for this purpose. Room for air circulation must be provided under, around and through the load to protect the produce from:
- heat gain from the outside air during hot weather;
- heat generated by the produce through respiration;
- accumulation of ethylene from ripening of the produce;
- heat loss to the outside air during extreme cold weather;
- chilling injury or freezing injury during operation of the refrigeration unit.

2.17 **Shippers using refrigerated transport equipment should follow the carrier's recommendations on loading of the equipment's load compartment to avoid chilling injury or freezing injury to the produce.** Discharge air may be colder than the set-point temperature if the refrigeration system operates on return air temperature sensing.

2.18 Loads should be secured with one or more of the following materials to prevent the effects of vibrations and impact damage in transport and handling:
- aluminum or wood load locks;
- paperboard or fibreboard honeycomb fillers;
- wood blocking and nailing strips;
- inflatable kraft paper air bags;
- cargo nets and straps;
- wood load gates constructed of 25 mm × 100 mm (1 × 4 in) material.

2.19 **If available all loads should have a small air temperature recorder placed between packages in the area where the warmest temperatures occur.** Recorder companies recommend placement on top of the load, near a side wall, one-third of the way in from the rear doors, away from any direct discharge of refrigerated air. Rail cars should have two or three recorders. In loads with top-ice or humidity above 95 percent, the recorders should be waterproof or enclosed in a plastic bag.

2.19.1 Shippers and receivers must follow the temperature recorder companies instructions on documenting the load, starting the recorder, reading the results, and returning it for calibration and certification if necessary. These steps are essential for settling claims over temperature management during transportation.

2.20 **Similar sized shipping containers should be loaded together in mixed loads for increased stability.** Heavier shipping containers of produce should be loaded first, distributed evenly across the floor of the trailer or container. Lighter shipping containers can then be placed against or on top of the heavier produce. Load lock and secure stacks of different sized shipping containers. To facilitate inspection of mixed loads at ports of entry, a representative sample of each commodity should be available near the door. This can minimize the unloading of cargo for examination.

2.21 **Never load fruit, vegetables, or other food products with cargoes that provide any risk of contamination through transfer of odour or toxic chemical residues.** The longer the transit time, the higher the risks in transporting mixed loads of agricultural produce. Therefore it is essential that guidelines be followed as much as possible to maintain quality in distant markets.

2.22 **Modified atmospheres of reduced oxygen and elevated carbon dioxide and nitrogen are provided to trailers and containers after loading is completed.** The trailers and containers must be equipped with channels at the doorway for a plastic film curtain and gas ports for the application of the treatment.

2.23 **The refrigeration unit, walls, ceiling, floor, and doors must adequately seal the inside of the cargo area from outside air.** Otherwise the modified atmosphere will quickly dissipate. Warning labels must be applied to the equipment to warn that the atmosphere is not life supporting and that the cargo area must be properly ventilated before personnel enter to unload the cargo.

SECTION III – PACKAGING TO MAINTAIN PRODUCE QUALITY DURING TRANSPORTATION AND MARKETING

3.1 Packaging must withstand:
- rough handling during loading and unloading;
- compression from the overhead weight of other containers;
- impact and vibration during transportation;
- high humidity during precooling, transit, and storage.

3.2 **Packaging materials are chosen on the basis of needs of the produce, packing method, precooling method, strength, cost, availability, buyer specifications, and freight rates.** Importers, buyers, and packaging manufacturers provide valuable recommendations. Materials used include:
- paperboard or fibreboard bins, boxes (glued, stapled, interlocking), lugs, trays, flats, dividers or partitions, and slipsheets;
- wood bins, crates (wirebound, nailed), baskets, trays, lugs, pallets;
- paper bags, sleeves, wraps, liners, pads, excelsior, and labels;
- plastic bins, boxes, trays, bags (mesh, solid), containers, sleeves, film wraps, liners, dividers, and slipsheets;
- foam boxes, trays, lugs, sleeves, liners, dividers, and pads.

3.3 **Bins, boxes, crates, trays, lugs, baskets, and bags are considered shipping containers.** Baskets, however, are difficult to handle in mixed loads of rectangular boxes. Bags provide limited produce protection. The fibreboard type box is a widely used container. Styles include for example:

- one-piece slotted box with glued, stapled, or self-locking flaps;
- two-piece half slotted box with a cover;
- two-piece half slotted box with a full telescoping cover, providing strong walls and corners;
- three-piece Bliss-style box featuring stapled or glued ends providing strong corners;
- one-piece box with full telescoping cover;
- two-piece, die-cut style box with full telescoping cover;
- one-piece box with wire or fibreboard tabs or hardboard end inserts and plastic end caps, providing stacking strength and alignment.

3.3.1 **Fibreboard boxes for produce which are packed wet or with ice must be wax-impregnated or coated with water resistant material.** The compression strength of untreated fibreboard can be reduced more than one half in conditions of 90 percent relative humidity. In addition to maintaining box strength, wax helps to reduce the loss of moisture from the produce to the fibreboard. All glued boxes should be made with a water resistant adhesive.

3.3.2 The majority of fibreboard boxes and wood crates are designed to be stacked top to bottom. Compression strength and produce protection are sacrificed when boxes or crates are stacked on their ends or sides. Misaligned boxes can lose up to 50 percent of their top to bottom compression strength.

3.4 **Various materials are added to shipping containers to provide additional strength and produce protection.** Dividers or partitions and double or triple thickness sides and ends in fibreboard boxes provide additional compression strength and reduce produce damage.

3.4.1 Pads, wraps, and sleeves and excelsior also reduce bruising. Pads also are used to provide moisture as with asparagus; provide chemical treatment to reduce decay as with sulphur dioxide pads for grapes; and absorb ethylene as with potassium permanganate pads in boxes of bananas and flowers.

3.4.2 Plastic film liners or bags are used to retain moisture. Perforated plastic is used for most produce to allow exchange of gases and avoid excessive humidity. Solid plastic is used to seal the produce and provide for modified atmosphere by reducing the amount of oxygen available for respiration and ripening. For example, this is done for bananas, strawberries, tomatoes and citrus fruits.

3.5 Packing methods include:

- field packing – produce is placed in fibreboard boxes, plastic crates or wood crates during harvesting. Some produce is wrapped. The filled containers

are then taken to a precooling facility to have the field heat removed where possible;
- shed packing – produce is processed or packed indoors or under cover at a central location. The produce is brought from the field to the packing shed in bulk in field crates, bins, or trucks. If available, the produce should be precooled either before or after they are placed in shipping containers according to the nature of the produce;
- repacking – produce is taken out of one container, regraded, and placed in another. This is often done to make smaller containers for the retailer or consumer packages.

3.5.1 Types of packs include:
- volume fill – produce is placed by hand or machine into the container until the desired capacity, weight, or count is reached;
- tray or cell pack – produce is placed in moulded trays or cells which provide separation and reduced bruising;
- place pack – produce is carefully placed in the container. This provides reduced bruising and a pleasing appearance;
- consumer pack or prepack – relatively small amounts of produce are packaged, weighted, and labelled for retail sale;
- film or shrink wrap – each fruit or vegetable is individually wrapped and sealed in film to reduce moisture loss and decay. The film may be treated with authorized fungicides or other chemicals;
- modified atmosphere – individual consumer packs, shipping containers, or pallet loads of containers are sealed with plastic film or bags. The oxygen level is reduced and the carbon dioxide level is increased. This reduces produce respiration and slows the ripening process.

3.6 **Shipping containers must be sized and filled correctly.** Containers which are very wide and weight more than 23 kg (50 lb), for example, encourage rougher handling, produce damage, and container failure. Overfilling causes produce bruising and excessive bulging of the sides of the container, which leads to decreased compression strength and container failure. Under-filling also causes produce damage. The produce is bruised as it moves around inside the shipping container during transport and handling.

3.6.1 Due to large number of different container sizes in use, box standards are desirable. **Standardized containers:**
- utilize, with other containers, the maximum surface of the pallet with no overhang and little underhang;
- provide unit loads and stable mixed pallet loads;
- reduce transportation and marketing costs.

3.7 **A large number of shippers have switched from handling individual shipping containers to unit loads on pallets.** Most distribution centres are set up to store palletized loads in three tier racks.

3.7.1 Unit loads provide for:
- reduced handling of individual shipping containers;
- less damage to the containers and the produce inside;
- faster loading and unloading of transportation equipment;
- more efficient distribution centre operations.

3.7.2 Unit loads may include, for example, some of the following features:
- standard wood pallets or slipsheets such as; 1200 × 1000 mm (48 × 40in), 800 × 1000 mm, 800 × 1200 mm, 1000 × 1200 mm;
- fibreboard, plastic or wire vertical interlocking tabs between boxes;
- boxes with holes for air circulation, which align when the boxes are stacked squarely on top of one another, corner to corner;
- glue between boxes to resist horizontal slipping;
- plastic netting around the pallet load of boxes;
- fibreboard, plastic, or metal cornerboards;
- plastic or metal strapping around the cornerboards and boxes.

3.8 **Wood pallets must be strong enough to allow storage under load.** Provisions for forklift and pallet jack handling are necessary. The design of the bottom of the pallet should not block air circulation.

3.8.1 Pallets must have an adequate number of top deck boards to support fibreboard boxes. Otherwise the boxes may collapse between deck boards from the overhead weight of the other containers, crush the produce, and cause the entire load to lean or fall off the pallet. A sheet of fibreboard with holes for air circulation can be used to distribute air across the pallet.

3.8.2 Boxes must not overhang the edges of the pallets. Overhang can reduce the strength of fibreboard boxes by one-third. This condition also can lead to collapse of the entire load, crushing of the produce, and make loading, unloading, and storage in racks difficult. On the other hand, boxes which utilize less than 90 percent of the pallet surface and do not align with the pallet edge can shift in transit.

3.8.3 Pallet loads of shipping containers which are not strapped or netted should have at least the top three layers of containers cross-stacked to provide stability. Some shippers use film wrap, tape, or glue on the top layers in addition to cross-stacking. The containers must be strong enough to be cross-stacked without collapsing. Film wrap should not be used on shipping containers of produce that need ventilation.

3.9 **Slipsheets are used by some shippers because they cost less than pallets.** They also eliminate the cost of transporting and returning pallets. A special forklift is needed to transfer slipsheet loads to and from the pallets at the shipper's and receiver's distribution centre. If a receiver does not have the proper handling equipment, the packages are unloaded by hand onto pallets for placement in storage. Shipping containers on slipsheets are cross-stacked, film wrapped, or otherwise unitized with cornerboards and strapping.

3.9.1 Slipsheets made of fibreboard or plastic must be strong enough to be clamped and pulled onto the forklift tines or plate for lifting while fully loaded. Fibreboard slipsheets should be wax impregnated when used in wet conditions. Slipsheets used in transportation equipment should have holes for air circulation under the load. The use of slipsheets in refrigerated transportation equipment with shallow floor channels is not recommended due to the need for adequate air circulation under the load.

SECTION IV – PRECOOLING PRACTICES

4.1 If available, the removal of field heat by the process of precooling to a recommended storage temperature and relative humidity is suggested to maintain the quality of fruits, and vegetables. The quality of most produce will rapidly deteriorate if field heat is not removed before loading into transportation equipment.

4.2 Refrigerated transportation equipment is designed to maintain temperature and should not be used to remove field heat from produce packed in shipping containers. The refrigeration units also are not capable of raising or controlling the relative humidity.

4.3 Precooling extends produce life by reducing:
- field heat;
- the rate of respiration and heat generated by the produce;
- the rate of ripening;
- the loss of moisture (shrivelling and wilting);
- the production of ethylene (ripening gas generated by the produce);
- the spread of decay.

4.4 The success of precooling is dependent on:
- time between harvest and precooling;
- type of shipping container if produce is packed beforehand;
- initial produce temperature;
- velocity or amount of cold air, water, or ice provided;
- final produce temperature;
- sanitation of the precooling air or water to reduce decay organisms.
- maintenance of the recommended temperature after precooling.

4.5 Precooling, where it is used, should occur as soon as possible after harvest. For most produce, harvesting should be done in early morning hours to minimize field heat and the refrigeration load on precooling equipment. Harvested produce should be protected from the sun with covering until they are placed in the precooling facility.

4.6 Many products are field or shed packed and then precooled. Wirebound wood or nailed crates or wax impregnated fibreboard boxes are used for packed produce that are precooled with water or ice after packing. Precooling of produce packed in shipping containers and stacked in unitized pallet loads is especially important as air

circulation around and through the packaging may be limited during transportation and storage.

4.7 The choice of precooling method depends on the nature, value, and quality of the produce as well as the cost of labour, equipment, and materials. Precooling methods include:

- room cooling – stacking containers of produce in a refrigerated room. Some produce is misted or sprayed with water during room cooling;
- forced air cooling or wet pressure cooling-drawing air through stacks of containers of produce in a refrigerated room. For some produce, water is added to the air;
- hydrocooling – flushing produce in bulk tanks, bins, or shipping containers with a large quantity of ice water;
- vacuum cooling – removing heat from produce packed in shipping containers by drawing a vacuum in a chamber;
- hydrovacuum cooling – adding moisture to produce packed in shipping containers before or during the vacuum process, to speed the removal of heat;
- package-icing – injecting slush or crushed ice into each shipping container of produce. Some operations use bulk containers.

4.8 Since most produce is sensitive to chilling injury, care must be taken not to precool or store the produce below the recommended temperature. Often the visible effects of chilling injury are delayed until the produce is offered for retail sale. These effects include failure to ripen properly, pitting, decay, watery breakdown, and discoloration in fruits and vegetables.

4.9 All produce is sensitive to decay. Precooling equipment and water should be sanitized continuously, for example, with a hypochlorite solution to eliminate decay producing organisms. Care also must be taken not to allow produce to warm up after precooling. Condensation on cool produce surfaces at higher air temperatures also spreads decay.

4.10 The method of transportation, condition of the transport equipment, loading method, and transit and storage practices affect the success of precooling. If the recommended temperature and relative humidity are not maintained after precooling, produce quality will deteriorate.

CODE OF HYGIENIC PRACTICE FOR FRESH FRUITS AND VEGETABLES

CAC/RCP 53-2003

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INTRODUCTION

Scientific research over the last decades has shown that a diet rich in fruits and vegetables is protective against many cancers and lowers the occurrence of coronary heart disease. This recognition of the importance of routine consumption of fresh fruits and vegetables, together with a marked increase in the year-round availability of fresh fruits and vegetables from a global market, has contributed to the substantial increase in consumption of fresh fruits and vegetables over the past two decades. However, the recent increase in reports of food borne illness associated with fresh fruits and vegetables has raised concerns from public health agencies and consumers about the safety of these products.

1. OBJECTIVES OF THE CODE

This code addresses Good Agricultural Practices (GAPs) and Good Manufacturing Practices (GMPs) that will help control microbial, chemical and physical hazards associated with all stages of the production of fresh fruits and vegetables from primary production to packing. Particular attention is given to minimizing microbial hazards. The code provides a general framework of recommendations to allow uniform adoption by this sector rather than providing detailed recommendations for specific agricultural practices, operations or commodities. The fresh fruit and vegetable industry is very complex. Fresh fruits and vegetables are produced and packed under diverse environmental conditions. It is recognized that some of the provisions in this code may be difficult to implement in areas where primary production is conducted in small holdings, in both developed and developing countries and also in areas where traditional farming is practised. Therefore, the code is, of necessity, a flexible one to allow for different systems of control and prevention of contamination for different groups of commodities.

2. SCOPE, USE AND DEFINITIONS

2.1 Scope

This code of practice covers general hygienic practices for the primary production and packing of fresh fruits and vegetables cultivated for human consumption in order to produce a safe and wholesome product: particularly for those intended to be consumed raw. Specifically, this code is applicable to fresh fruits and vegetables grown in the field (with or without cover) or in protected facilities (hydroponic systems, greenhouses). It concentrates on microbial hazards and addresses physical and chemical hazards only in so far as these relate to GAPs and GMPs.

The *Annex for Ready-to-Eat Fresh Pre-cut Fruits and Vegetables* (Annex I) and the *Annex for Sprout Production* (Annex II) are supplements to this code and include additional recommendations to cover, respectively, the hygienic practices for the processing of ready-to-eat fresh pre-cut fruits and vegetables, and the hygienic practices that are specific for the primary production of seeds for sprouting and the production of sprouts for human consumption.

The code does not provide recommendations for handling practices to maintain the safety of fresh fruits and vegetables at wholesale, retail, food services or in the home. It excludes food products for which there is a specific Codex Alimentarius Code of Hygienic Practices.

2.2 Use

This code follows the format of the Codex *Recommended International Code of Practice – General Principles of Food Hygiene* – CAC/RCP 1-1969, Rev 3 (1997) and should be used in conjunction with it. This code focuses upon hygienic issues that are specific to the primary production and packing of fresh fruits and vegetables. The major issues are covered in Section 3. In other sections, the *General Principles of Food Hygiene* have been expanded where there are issues specific to primary production and packing. The *Annex for Ready-to-Eat Fresh Pre-Cut Fruits and Vegetables* provides additional recommendations specific for the processing of ready-to-eat fresh pre-cut fruits and vegetables and the *Annex for Sprout Production* provides additional recommendations specific for the primary production of seeds for sprouting and the production of sprouts for human consumption.

2.3 Definitions

Definitions of general expressions are included in the *General Principles of Food Hygiene*. For the purpose of this code, the following terms have the definition stated:

Agricultural inputs – any incoming material (e.g. seeds, fertilizers, water, agricultural chemicals, plant support, etc.) used for the primary production of fresh fruits and vegetables.

Agricultural worker – any person that undertakes one or more of the following: cultivation, harvesting and packing of fresh fruits and vegetables.

Antimicrobial agents – any substance of natural, synthetic or semi-synthetic origin which at low concentrations kills or inhibits the growth of micro-organisms but causes little or no host damage.

Biological control – the use of competing biologicals (such as insects, micro-organisms and/or microbial metabolites) for the control of mites, pests, plant pathogens and spoilage organisms.

Biosolids – Sludge and other residue deposits obtained from sewage treatment plants and from treatment applied to urban and industrial wastes (food industries or other types of industry).

Composting – a managed process in which organic materials are digested aerobically or anaerobically by microbial action.

Cultivation **–** any agricultural action or practise used by growers to allow and improve the growing conditions of fresh fruits or vegetables grown in the field (with of without cover) or in protected facilities (hydroponic systems, greenhouses).

Farm – any premise or establishment in which fresh fruits and/or vegetables are grown and harvested and the surroundings under the control of the same management.

Grower – the person responsible for the management of the primary production of fresh fruits and vegetables.

Harvester **–** the person responsible for the management of the harvesting of fresh fruits and vegetables.

Hazard – a biological, chemical or physical agent in, or condition of, food with the potential to cause an adverse health effect.

Hazardous material **–** any compound which, at specific levels, has the potential to cause adverse health effects.

Hydroponics – a general term for the production of plants without soil in a water medium.

Manure **–** Animal excrement which may be mixed with litter or other material, and which may be fermented or otherwise treated.

Micro-organisms – include yeasts, moulds, bacteria, viruses and parasites. When used as an adjective, the term "microbial" is used.

Packer **–** the person responsible for the management of post-harvest processing and packing of fresh fruits and vegetables.

Packing – the action of putting fresh fruits and vegetables in a package. This may take place in a field or in an establishment.

Packing establishment **–** any indoor establishment in which fresh fruits and vegetables receive post-harvest treatment and are packaged.

Primary production – those steps involved in the growing and harvesting of fresh fruits and vegetables such as planting, irrigation, application of fertilizers, application of agricultural chemicals, etc.

Types of water:

Clean water – water that does not compromise food safety in the circumstances of its use.

Potable water **–** water which meets the quality standards of drinking water such as described in the WHO Guidelines for Drinking Water Quality.

3. PRIMARY PRODUCTION

Fresh fruits and vegetables are grown and harvested under a wide range of climatic and diverse geographical conditions, using various agricultural inputs and technologies, and on farms of varying sizes. Biological, chemical and physical hazards may therefore vary significantly from one type of production to another. In each primary production area, it is necessary to consider the particular agricultural practices that promote the production of safe fresh fruits and vegetables, taking into account the conditions specific to the primary production area, type of products, and methods used. Procedures associated with primary production should be conducted under good hygienic conditions and should minimize potential hazards to health due to the contamination of fresh fruits and vegetables.

3.1 Environmental hygiene

Where possible, potential sources of contamination from the environment should be identified. In particular, primary production should not be carried out in areas where the presence of potentially harmful substances would lead to an unacceptable level of such substances in or on fresh fruits and vegetables after harvest.

Where possible, growers should evaluate the previous uses of the sites (indoor and outdoor) as well as adjoining sites in order to identify potential microbial, chemical and physical hazards. The potential for other types of contamination (e.g., from agricultural chemicals, hazardous wastes, etc.) should also be considered. The evaluation process should include the following:

- Previous and present usage of the primary production area and the adjoining sites (e.g. crop grown, feed lot, animal production, hazardous waste site, sewage treatment site, mining extraction site) to identify potential microbial hazards including faecal contamination and contamination by organic waste and potential environmental hazards that could be carried to the growing site.
- The access of farm and wild animals to the site and to water sources used in primary production to identify potential faecal contamination of the soils and water and the likelihood of contaminating crop. Existing practices should be reviewed to assess the prevalence and likelihood of uncontrolled deposits of animal faeces coming into contact with crops. Considering this potential source of contamination, efforts should be made to protect fresh produce growing areas from animals. As far as possible, domestic and wild animal should be excluded from the area.
- Potential for contaminating produce fields from leaking, leaching or overflowing manure storage sites and flooding from polluted surface waters.

If previous uses cannot be identified, or the examination of the growing or adjoining sites leads to the conclusion that potential hazards exist, the sites should be analysed for contaminants of concern. If the contaminants are at excessive levels and corrective or preventative actions have not been taken to minimize potential hazards, the sites should not be used until correction/control measures are applied.

3.2 Hygienic primary production of fresh fruits and vegetables

3.2.1 Agricultural input requirements

Agricultural inputs should not contain microbial or chemical contaminants (as defined under the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev 3 (1997) at levels that may adversely affect the safety of fresh fruits and vegetables and taking into consideration the WHO guidelines on the safe use of wastewater and excreta in agriculture and aquaculture as appropriate.

3.2.1.1 Water for primary production

- Growers should identify the sources of water used on the farm (municipality, re-used irrigation water, well, open canal, reservoir, rivers, lakes, farm ponds etc.). They should assess its microbial and chemical quality, and its suitability for intended use, and identify corrective actions to prevent or minimize contamination (e.g. from livestock, sewage treatment, human habitation).

- Where necessary, growers should have the water they use tested for microbial and chemical contaminants. The frequency of testing will depend on the water source and the risks of environmental contamination including intermittent or temporary contamination (e.g. heavy rain, flooding, etc.). If the water source is found to be contaminated corrective actions should be taken to ensure that the water is suitable for its intended use.

3.2.1.1.1 ***Water for irrigation and harvesting***

Water used for agricultural purposes should be of suitable quality for its intended use. Special attention to water quality should be considered for the following situations:

- Irrigation by water delivery techniques that expose the edible portion of fresh fruits and vegetables directly to water (e.g. sprayers) especially close to harvest time.
- Irrigation of fruits and vegetables that have physical characteristics such as leaves and rough surfaces which can trap water.
- Irrigation of fruits and vegetables that will receive little or no post-harvest wash treatments prior to packing, such as field-packed produce.

3.2.1.1.2 ***Water for fertilizers, pest control and other agricultural chemicals***

Water used for the application of water-soluble fertilizers and agricultural chemicals in the field and indoors should not contain microbial contaminants at levels that may adversely affect the safety of fresh fruits and vegetables. Special attention to the water quality should be considered when using fertilizer and agricultural chemical delivery techniques (e.g. sprayers) that expose the edible portion of fresh fruits and vegetables directly to water especially close to harvest time.

3.2.1.1.3 ***Hydroponic water***

Plants grown in hydroponic systems absorb nutrients and water at varying rates, constantly changing the composition of the re-circulated nutrient solution. Because of this:

- Water used in hydroponic culture should be changed frequently, or if recycled, should be treated to minimize microbial and chemical contamination.
- Water delivery systems should be maintained and cleaned, as appropriate, to prevent microbial contamination of water.

3.2.1.2 **Manure, biosolids and other natural fertilizers**

The use of manure, biosolids and other natural fertilizers in the production of fresh fruits and vegetables should be managed to limit the potential for microbial, chemical and physical contamination. Manure, biosolids and other natural fertilizers contaminated with heavy metals or other chemicals at levels that may affect the safety of fresh fruits and vegetables should not be used. Where necessary, in order to minimize microbial contamination the following practices should be considered:

- Adopt proper treatment procedures (e.g. composting, pasteurization, heat drying, UV irradiation, alkali digestion, sun drying or combinations of these) that are designed to reduce or eliminate pathogens in manure, biosolids and other natural fertilizers. The level of pathogen reduction achieved by different

treatments should be taken into account when considering suitability for different applications.

- Manure, biosolids and other natural fertilizers which are untreated or partially treated may be used only if appropriate corrective actions are being adopted to reduce microbial contaminants such as maximizing the time between application and harvest of fresh fruits and vegetables.
- Growers who are purchasing manure, biosolids and other natural fertilizers that have been treated to reduce microbial or chemical contaminants, should, where possible, obtain documentation from the supplier that identifies the origin, treatment used, tests performed and the results thereof.
- Minimize direct or indirect contact between manure, biosolids and other natural fertilizers, and fresh fruits and vegetables, especially close to harvest.
- Minimize contamination by manure, biosolids and other natural fertilizers from adjoining fields. If the potential for contamination from the adjoining fields is identified, preventative actions (e.g. care during application and run-off controls) should be implemented to minimize the risk.
- Avoid locating treatment or storage sites in proximity to fresh fruit and vegetable production areas. Prevent cross-contamination from runoff or leaching by securing areas where manure, biosolids and other natural fertilizers are treated and stored.

3.2.1.3 **Soil**

Soils should be evaluated for hazards. If the evaluation concludes that such hazards are at levels that may compromise the safety of crops, control measures should be implemented to reduce hazards to acceptable levels. If this cannot be achieved by available control measures, growers should not use these soils for primary production.

3.2.1.4 **Agricultural chemicals**

- Growers should use only agricultural chemicals which are authorized for the cultivation of the specific fruit or vegetable and should use them according to the manufacturer's instructions for the intended purpose. Residues should not exceed levels as established by the Codex Alimentarius Commission.
- In order to minimize and contain the emergence of microbial resistance:
- the use of antimicrobial agents significant to human and animal therapy should be avoided.
- Antimicrobial agents not significant to human and animal therapy should be used only when unavoidable and in accordance with good agricultural practices and in a manner that achieves this objective.
- Agricultural workers who apply agricultural chemicals should be trained in proper application procedures.
- Growers should keep records of agricultural chemical applications. Records should include information on the date of application, the chemical used, the crop sprayed, the pest or disease against which it was used, the concentration, method and frequency of application, and records on harvesting to verify that the time between application and harvesting is appropriate.

- Agricultural chemical sprayers should be calibrated, as necessary, to control the accuracy of the rate of application.
- The mixing of agricultural chemicals should be carried out in such a way as to avoid contamination of water and land in the surrounding areas and to protect employees involved in this activity from potential hazards.
- Sprayers and mixing containers should be thoroughly washed after use, especially when used with different agricultural chemicals on different crops, to avoid contaminating fruits and vegetables.
- Agricultural chemicals should be kept in their original containers, labelled with the name of the chemical and the instructions for application. Agricultural chemicals should be stored in a safe, well ventilated place, away from production areas, living areas and harvested fruits or vegetables, and disposed of in a manner that does not pose a risk of contaminating crops, the inhabitants of the area, or the environment of the primary production.
- Empty containers should be disposed of as indicated by the manufacturer. They should not be used for other food-related purposes.

3.2.1.5 **Biological control**

Environmental and consumer safety should be considered when using competing biological organisms and/or their metabolites applied for the control of pests, mites, plant pathogens and spoilage organisms in fresh fruits and vegetables.

Growers should use only biological controls which are authorized for the cultivation of the specific fruit or vegetable and should use them according to the manufacturer's instructions for the intended purpose.

3.2.2 **Indoor facilities associated with growing and harvesting**

For operations where fresh fruits and vegetables are grown indoors (greenhouses, hydroponic culture, etc.) suitable premises should be used.

3.2.2.1 **Location, design and layout**

- Premises and structures should be located, designed and constructed to avoid contaminating fresh fruits and vegetables and harbouring pests such as insects, rodents and birds.
- Where appropriate, the internal design and layout should permit compliance with good hygienic practices for the primary production of fresh fruits and vegetables indoors, including protection against cross-contamination between and during operations. Each establishment should be evaluated individually in order to identify specific hygienic requirements for each product.

3.2.2.2 **Water supply**

Where appropriate an adequate supply of potable or clean water with appropriate facilities for its storage and distribution should be available in indoor primary production facilities. Non-potable water should have a separate system. Non-potable water systems should be identified and should not connect with, or allow reflux into, potable water systems.

- Avoid contaminating potable and clean water supplies by exposure to agricultural inputs used for growing fresh produce.
- Clean and disinfect potable and clean water storage facilities on a regular basis.
- Control the quality of the water supply.

3.2.2.3 **Drainage and waste disposal**

Adequate drainage and waste disposal systems and facilities should be provided. These systems should be designed and constructed so that the potential for contamination of fresh fruits and vegetables, agricultural inputs or the potable water supply is avoided.

3.2.3 **Personnel health, hygiene and sanitary facilities**

Hygiene and health requirements should be followed to ensure that personnel who come directly into contact with fresh fruits and vegetables during or after harvesting are not likely to contaminate them. Visitors should, where appropriate, wear protective clothing and adhere to the other personal hygiene provisions in this section.

3.2.3.1 **Personnel hygiene and sanitary facilities**

Hygienic and sanitary facilities should be available to ensure that an appropriate degree of personal hygiene can be maintained. As far as possible, such facilities should:

- Be located in close proximity to the fields and indoor premises, and in sufficient number to accommodate personnel.
- Be of appropriate design to ensure hygienic removal of wastes and avoid contamination of growing sites, fresh fruits and vegetables or agricultural inputs.
- Have adequate means of hygienically washing and drying hands.
- Be maintained under sanitary conditions and good repair.

3.2.3.2 **Health status**

People known, or suspected, to be suffering from, or to be a carrier of a disease or illness likely to be transmitted through fresh fruits and vegetables, should not be allowed to enter any food handling area if there is a likelihood of their contaminating fresh fruits and vegetables. Any person so affected should immediately report illness or symptoms of illness to the management.

3.2.3.3 **Personal cleanliness**

Agricultural workers who have direct contact with fresh fruits and vegetables should maintain a high degree of personal cleanliness and, where appropriate, wear suitable protective clothing and footwear. Cuts and wounds should be covered by suitable waterproof dressings when personnel are permitted to continue working.

Personnel should wash their hands when handling fresh fruits and vegetables or other material that comes in contact with them. Personnel should wash their hands before starting work involving the handling of fruits and vegetables, each time they return to handling areas after a break, immediately after using the toilet or after handling any contaminated material where this could result in contamination of fresh fruits and vegetables.

3.2.3.4 **Personal behaviour**

Agricultural workers should refrain from behaviour which could result in the contamination of food, for example: smoking, spitting, chewing gum or eating, or sneezing or coughing over unprotected fresh fruits and vegetables.

Personal effects such as jewellery, watches, or other items should not be worn or brought into fresh fruit and vegetable production areas if they pose a threat to the safety and suitability of the food.

3.2.4 **Equipment associated with growing and harvesting**

As required, growers and harvesters should follow the technical specifications recommended by the equipment manufacturers for their proper usage and maintenance. Growers and harvesters should adopt the following sanitary practices:

- Equipment and containers coming into contact with fresh fruits and vegetables should be made of materials that are non-toxic. They should be designed and constructed to ensure that, when necessary, they can be cleaned, disinfected and maintained to avoid the contamination of fresh fruit and vegetables. Specific hygienic and maintenance requirements should be identified for each piece of equipment that is used and the type of fruit or vegetable associated with it.
- Containers for waste, by-products and inedible or dangerous substances, should be specifically identifiable, suitably constructed and, where appropriate, made of impervious material. Where appropriate, such containers should be lockable to prevent malicious or accidental contamination of fresh fruits and vegetables or agricultural inputs. Such containers should be segregated or otherwise identified to prevent their use as harvesting containers.
- Containers that can no longer be kept in a hygienic condition should be discarded.
- Equipment and tools should function according to the use for which they are designed without damaging the produce. Such equipment should be maintained in good order.

3.3 Handling, storage and transport

3.3.1 **Prevention of cross-contamination**

During the primary production and post-harvest activities, effective measures should be taken to prevent cross-contamination of fresh fruits and vegetables from agricultural inputs or personnel who come directly or indirectly into contact with fresh fruits and vegetables. To prevent the potential of cross-contaminating fresh fruits and vegetables, growers, harvesters and their employees should adhere to the recommendations presented elsewhere in section 3 of this code and the following:

- At the time of harvest, consideration should be given to the need for additional management action where any local factor, for example adverse weather conditions, may increase the opportunity for contamination of the crop.
- Fresh fruits and vegetables unfit for human consumption should be segregated during harvesting. Those which cannot be made safe by further processing should be disposed of properly to avoid contamination of fresh fruits and vegetables or agricultural inputs.

- Agricultural workers should not use harvesting containers for carrying materials (e.g. lunches, tools, fuel, etc.) other than harvested fruits and vegetables.
- Equipment and containers previously used for potentially hazardous materials (e.g. garbage, manure, etc.) should not be used for holding fresh fruits or vegetables or have contact with packaging material that is used for fresh fruits and vegetables without adequate cleaning and disinfecting.
- Care must be taken when packing fresh fruits and vegetables in the field to avoid contaminating containers or bins by exposure to, manure or animal/human faeces.

3.3.2 Storage and transport from the field to the packing facility

Fresh fruits and vegetables should be stored and transported under conditions which will minimize the potential for microbial, chemical or physical contamination. The following practices should be adopted:

- Storage facilities and vehicles for transporting the harvested crops should be built in a manner to minimize damage to fresh fruits and vegetables and to avoid access by pests. They should be made of non-toxic materials that permit easy and thorough cleaning. They should be constructed in a manner to reduce the opportunity for potential contamination from physical objects such as glass, wood, plastic, etc.
- Fresh fruits and vegetables unfit for human consumption should be segregated before storage or transport. Those which cannot be made safe by further processing should be disposed of properly to avoid contamination of fresh fruits and vegetables or agricultural inputs.
- Agricultural workers should remove as much soil as possible from fresh fruits and vegetables before they are stored or transported. Care should be taken to minimize physical damage to crop during this process.
- Transport vehicles should not be used for the transport of hazardous substances unless they are adequately cleaned, and where necessary disinfected, to avoid cross-contamination.

3.4 Cleaning, maintenance and sanitation

Premises and harvesting equipment should be kept in an appropriate state of repair and condition to facilitate cleaning and disinfection. Equipment should function as intended to prevent contamination of fresh fruits and vegetables. Cleaning materials and hazardous substances such as agricultural chemicals should be specifically identifiable and kept or stored separately in secure storage facilities. Cleaning materials and agricultural chemicals should be used according to manufacturer's instructions for their intended purpose.

3.4.1 Cleaning programmes

Cleaning and disinfection programmes should be in place to ensure that any necessary cleaning and maintenance is carried out effectively and appropriately. Cleaning and disinfection systems should be monitored for effectiveness and should be regularly reviewed and adapted to reflect changing circumstances. Specific recommendations are as follows:

- Harvesting equipment and re-usable containers that come in contact with fresh fruits and vegetables should be cleaned, and, where appropriate, disinfected on a regular basis.
- Harvesting equipment and re-usable containers used for fresh fruits and vegetables that are not washed prior to packing should be cleaned and disinfected as necessary.

3.4.2 **Cleaning procedures and methods**

The appropriate cleaning methods and materials will depend on the type of equipment and the nature of the fruit or vegetable. The following procedure should be adopted:

- Cleaning procedures should include the removal of debris from equipment surfaces, application of a detergent solution, rinsing with water, and, where appropriate, disinfection.

3.4.3 **Pest control systems**

When primary production is carried out in indoor establishments (e.g. greenhouses), the recommendations of the *General Principles of Food Hygiene*, section 6.3 should be followed with respect to pest control.

3.4.4 **Waste management**

Suitable provision must be made for the storage and removal of waste. Waste must not be allowed to accumulate in fresh fruit and vegetable handling and storage areas or the adjoining environment. Storage areas for waste should be kept clean.

4. PACKING ESTABLISHMENT: DESIGN AND FACILITIES

Refer to the *General Principles of Food Hygiene*.

5. CONTROL OF OPERATION

5.1 Control of food hazards

Refer to the *General Principles of Food Hygiene*.

5.2 Key aspects of hygiene control systems

5.2.1 **Time and temperature control**

Refer to the *General Principles of Food Hygiene*.

5.2.2 **Specific process steps**

5.2.2.1 **Post-harvest water use**

Water quality management will vary throughout all operations. Packers should follow GMPs to prevent or minimize the potential for the introduction or spread of pathogens in processing water. The quality of water used should be dependent on the stage of the operation. For example, clean water could be used for initial washing stages, whereas water used for final rinses should be of potable quality.

- Post-harvest systems that use water should be designed in a manner to minimize places where product lodges and dirt builds up.
- Antimicrobial agents should only be used where absolutely necessary to minimize cross-contamination during post-harvest and where their use is in line with good hygienic practices. The antimicrobial agents levels should be monitored and controlled to ensure that they are maintained at effective concentrations. Application of antimicrobial agents, followed by a wash as necessary, should be done to ensure that chemical residues do not exceed levels as recommended by the Codex Alimentarius Commission.
- Where appropriate, the temperature of the post-harvest water should be controlled and monitored.
- Recycled water should be treated and maintained in conditions that do not constitute a risk to the safety of fresh fruits and vegetables. The treatment process should be effectively monitored and controlled.
- Recycled water may be used with no further treatment provided its use does not constitute a risk to the safety of fresh fruits and vegetables (e.g. use of water recovered from the final wash for the first wash).
- Ice should be made from potable water. Ice should be produced, handled and stored to protect it from contamination.

5.2.2.2 **Chemical treatments**

- Packers should only use chemicals for post-harvest treatments (e.g. waxes, fungicides) in accordance with the *General Standards on Food Additives* or with the Codex Pesticide Guidelines. These treatments should be carried out in accordance with the manufacturer's instructions for the intended purpose.
- Sprayers for post-harvest treatments should be calibrated regularly to control the accuracy of the rate of application. They should be thoroughly washed in safe areas when used with different chemicals and on different fruits or vegetables to avoid contaminating the produce.

5.2.2.3 **Cooling of fresh fruits and vegetables**

- Condensate and defrost water from evaporator type cooling systems (e.g. vacuum cooling, cold rooms) should not drip onto fresh fruits and vegetables. The inside of the cooling systems should be maintained clean.
- Potable water should be used in cooling systems where water or ice is in direct contact with fresh fruits and vegetables (e.g. hydro cooling, ice cooling). The water quality in these systems should be controlled and maintained.
- Forced-air cooling is the use of rapid movement of refrigerated air over fresh fruits and vegetables in cold rooms. Air cooling systems should be appropriately designed and maintained to avoid contaminating fresh produce.

5.2.2.4 **Cold storage**

- When appropriate, fresh fruits and vegetables should be maintained at low temperatures after cooling to minimize microbial growth. The temperature of the cold storage should be controlled and monitored.

- Condensate and defrost water from the cooling system in cold storage areas should not drip on to fresh fruits and vegetables. The inside of the cooling systems should be maintained in a clean and sanitary condition.

5.2.3 **Microbiological and other specifications**
Refer to the *General Principles of Food Hygiene*.

5.2.4 **Microbial cross-contamination**
Refer to the *General Principles of Food Hygiene*.

5.2.5 **Physical and chemical contamination**
Refer to the *General Principles of Food Hygiene*.

5.3 Incoming material requirements

Refer to the *General Principles of Food Hygiene*.

5.4 Packing

Refer to the *General Principles of Food Hygiene*.

5.5 Water used in the packing establishment

Refer to the *General Principles of Food Hygiene*.

5.6 Management and supervision

Refer to the *General Principles of Food Hygiene*.

5.7 Documentation and records

Where appropriate, records of processing, production and distribution should be kept long enough to facilitate a recall and food borne illness investigation, if required. This period could be much longer than the shelf life of fresh fruits and vegetables. Documentation can enhance the credibility and effectiveness of the food safety control system.

- Growers should keep current all relevant information on agricultural activities such as the site of production, suppliers' information on agricultural inputs, lot numbers of agricultural inputs, irrigation practices, use of agricultural chemicals, water quality data, pest control and cleaning schedules for indoor establishments, premises, facilities, equipment and containers.
- Packers should keep current all information concerning each lot such as information on incoming materials (e.g. information from growers, lot numbers), data on the quality of processing water, pest control programmes, cooling and storage temperatures, chemicals used in post-harvest treatments, and cleaning schedules for premises, facilities, equipment and containers, etc.

5.8 Recall procedures

Refer to the *General Principles of Food Hygiene.*

In addition, where appropriate:

- Growers and packers should have programmes to ensure effective lot identification. These programmes should be able to trace the sites and agricultural inputs involved in primary production and the origin of incoming material at the packing establishment in case of suspected contamination.
- Growers' information should be linked with packers' information so that the system can trace products from the distributor to the field. Information that should be included are the date of harvest, farm identification, and, where possible, the persons who handled the fresh fruits or vegetables from the primary production site to the packing establishment.

6. PACKING ESTABLISHMENT: MAINTENANCE AND SANITATION

Refer to the *General Principles of Food Hygiene*.

7. PACKING ESTABLISHMENT: PERSONAL HYGIENE

Refer to the *General Principles of Food Hygiene*.

8. TRANSPORTATION

Refer to the *General Principles of Food Hygiene* and to the *Code of Hygienic Practice for the Transport of Food in Bulk and Semi-Packed Food*.

9. PRODUCT INFORMATION AND CONSUMER AWARENESS

Refer to the *General Principles of Food Hygiene*.

10. TRAINING

Refer to the *General Principles of Food Hygiene* except for section 10.1 and 10.2.

10.1 Awareness and responsibilities

Personnel associated with growing and harvesting should be aware of GAPs, good hygienic practices and their role and responsibility in protecting fresh fruits and vegetables from contamination or deterioration. Agricultural workers should have the necessary knowledge and skills to enable them to carry out agricultural activities and to handle fresh fruits and vegetables and agricultural inputs hygienically.

Personnel associated with packing should be aware of GMPs, good hygienic practices and their role and responsibility in protecting fresh fruits and vegetables from contamination or deterioration. Packers should have the necessary knowledge and skills to enable them to perform packing operations and to handle fresh fruits and vegetables in a way that minimizes the potential for microbial, chemical, or physical contamination.

All personnel who handle cleaning chemicals or other potentially hazardous chemicals should be instructed in safe handling techniques. They should be aware of their role and responsibility in protecting fresh fruit and vegetables from contamination during cleaning and maintenance.

10.2 Training programmes

Factors to take into account in assessing the level of training required in growing, harvesting and packing activities include:

- The nature of the fruit or vegetable, in particular its ability to sustain growth of pathogenic micro-organisms.
- The agricultural techniques and the agricultural inputs used in the primary production including the probability of microbial, chemical and physical contamination.
- The task the employee is likely to perform and the hazards and controls associated with those tasks.
- The manner in which fresh fruits and vegetables are processed and packaged including the probability of contamination or microbial growth.
- The conditions under which fresh fruits and vegetables will be stored.
- The extent and nature of processing or further preparation by the consumer before final consumption.

Topics to be considered for training programmes include, but are not limited to, the following:

- The importance of good health and hygiene for personal health and food safety.
- The importance of hand washing for food safety and the importance of proper hand washing techniques.
- The importance of using sanitary facilities to reduce the potential for contaminating fields, produce, other workers, and water supplies.
- Techniques for hygienic handling and storage of fresh fruits and vegetables by transporters, distributors, storage handlers and consumer.

ANNEX I

ANNEX FOR READY-TO-EAT FRESH PRE-CUT FRUITS AND VEGETABLES

INTRODUCTION

The health benefits associated with fresh fruits and vegetables combined with the on–going consumer interest in the availability of a variety of ready-to-eat foods have contributed to a substantial increase in the popularity of pre-cut fruits and vegetables. Because of the increased convenience and consumption of pre-cut fruits and vegetables in and away from the home, the preparation of these products has moved from the point of consumption to the food processor or retailer. The processing of fresh produce without proper sanitation procedures in place in the manufacturing environment may enhance the potential for contamination by microbiological pathogens. The potential for pathogens to survive or grow may be enhanced by the high moisture and nutrient content of fresh-cut fruits and vegetables, the absence of a lethal process to eliminate them, and the potential for temperature abuse during processing, storage, transport, and retail display.

Some of the microbiological pathogens associated with fresh fruits and vegetables include *Salmonella* spp., *Shigella* spp., pathogenic strains of *Escherichia coli*, *Listeria monocytogenes*, Norwalk-like virus and hepatitis A virus and parasites such as Cyclospora. Some of these pathogens are associated with the agricultural environment, whereas others are associated with infected workers or contaminated water. Because of the ability for pathogens to survive and grow on fresh produce, it is important for the pre-cut industry to follow good hygienic practices to ensure the microbiological safety of its products.

1. OBJECTIVE

Hygienic recommendations for the primary production of fresh fruits and vegetables are covered under the *Code of Practice for Fresh Fruits and Vegetables*. This Annex recommends the application of Good Manufacturing Practices (GMPs) for all stages involved in the production of ready-to-eat fresh pre-cut fruits and vegetables, from receipt of raw materials to distribution of finished products.

The primary objective of this Annex is to identify GMPs that will help control microbiological, physical, and chemical hazards associated with the processing of fresh pre-cut fruits and vegetables. Particular attention is given to minimizing microbiological hazards. This Annex provides elements that should be taken into account in the production, processing and distribution of these foods.

2. SCOPE, USE AND DEFINITIONS

2.1 Scope

This Annex specifically applies to ready-to-eat fresh fruit and vegetables that have been peeled, cut or otherwise physically altered from their original form but remain in the fresh state and particularly those that are intended to be consumed raw. This Annex applies irrespective of where the operations take place (e.g. in the field, at the farm, at the retailer, at the wholesaler, at the processing establishment, etc.).

For some establishments that process fresh pre-cut fruit and vegetables, this Annex will cover all operations from receipt of raw material to the distribution of the final product. For other establishments, (e.g. those that use ready-to-eat pre-cut fresh fruit and vegetables in combination with other products, such as sauces, meat, cheese, etc.) only the specific sections that relate to the processing of the fresh pre-cut fruit and vegetable components will apply.

This Annex does not directly apply to fresh fruit and vegetables that have been trimmed leaving the food intact. Nor does it apply to other fresh fruit and vegetables that are pre-cut but are destined for further processing that would be expected to eliminate any pathogen that may be present (e.g. cooking, juice processing, fermentation) nor to fresh fruit or vegetable juices. However, some of the basic principles of the Annex could still be applicable to such products.

Packaging includes single serving containers (e.g., sealed pouches or plastic trays), larger consumer or institutional size packages and bulk containers. This Annex concentrates on microbial hazards and addresses physical and chemical hazards only in so far as these relate to GMPs.

2.2 Use

This document follows the format of the *Recommended International Code of Practice – General Principles of Food Hygiene* CAC/RCP 1-1969, Rev 3 (1997) and should be used in conjunction with the *General Principles of Food Hygiene* and the *Code of Hygienic Practice for Fresh Fruits and Vegetables*.

2.3 Definitions

Processor – the person responsible for the management of the activities associated with the production of ready-to-eat fresh pre-cut fruits and vegetables.

3. PRIMARY PRODUCTION

Refer to the *Code of Hygienic Practice for Fresh Fruits and Vegetables*.

4. ESTABLISHMENT: DESIGN AND FACILITIES

Refer to the *General Principles of Food Hygiene*. In addition:

4.4 Facilities

4.4.2 **Drainage and waste disposal**

The processing of products covered by this Annex generates a large quantity of waste that can serve as food and shelter for pests. It is therefore very important to plan an effective waste disposal system. This system should always be maintained in good condition so it does not become a source of product contamination.

5. CONTROL OF OPERATIONS

Refer to the *Code of Hygienic Practice for Fresh Fruits and Vegetables*. In addition:

5.1 Control of food hazards

For the products covered by this Annex it should be recognized that while processing may reduce the level of contamination initially present on the raw materials, it will not be able to guarantee elimination of such contamination. Consequently, the processor should ensure that steps are taken by their suppliers (growers, harvesters, packers and distributors) to minimize contamination of the raw materials during primary production. It is recommended that processors ensure that their suppliers have adopted the principles outlined in the *Code of Hygienic Practice for Fresh Fruits and Vegetables*.

There are certain pathogens, *Listeria monocytogenes* and *Clostridium botulinum*, which present specific concern in relation to ready to eat fresh pre-cut vegetables packaged in a modified atmosphere. Processors should ensure that they have addressed all relevant safety issues relating to the use of such packaging.

5.2 Key aspects of control systems

5.2.2 **Specific process steps**

5.2.2.1 **Receipt and inspection of raw materials**

During unloading of raw material, verify the cleanliness of the food transportation unit and raw materials for evidence of contamination and deterioration

5.2.2.2 **Preparation of raw material before processing**

Physical hazards (such as the presence of animal and plant debris, metal, and other foreign material) should be removed through manual sorting or the use of detectors, such as metal detectors. Raw materials should be trimmed to remove any damaged, rotten or mouldy material.

5.2.2.3 **Washing and microbiological decontamination**

Refer to section 5.2.2.1 of the *Code of Hygienic Practice for Fresh Fruits and Vegetables*. In addition:

- Water used for final rinses should be of potable quality, particularly for these products as they are not likely to be washed before consumption.

5.2.2.4 **Pre-cooling fresh fruits and vegetables**

Refer to section 5.2.2.3 of the *Code of Hygienic Practice for Fresh Fruits and Vegetables*.

5.2.2.5 **Cutting, slicing, shredding, and similar pre-cut processes**

Procedures should be in place to minimize contamination with physical (e.g. metal) and microbiological contaminants during cutting, slicing, shredding or similar pre-cut processes.

5.2.2.6 **Washing after cutting, slicing, shredding, and similar pre-cut processes**

Washing cut produce with potable water may reduce microbiological contamination. In addition, it removes some of the cellular fluids that were released during the cutting process thereby reducing the level of available nutrients for microbiological growth. The following should be considered:

- Water should be replaced at sufficient frequency to prevent the build-up of organic material and prevent cross-contamination.
- Antimicrobial agents should be used, where necessary, to minimize cross-contamination during washing and where their use is in line with good hygienic practices. The antimicrobial agents levels should be monitored and controlled to ensure that they are maintained at effective concentrations. Application of antimicrobial agents, followed by a wash as necessary, should be done to ensure that chemical residues do not exceed levels as recommended by the Codex Alimentarius Commission.
- Drying or draining to remove water after washing is important to minimize microbiological growth.

5.2.2.7 **Cold storage**

Refer to section 5.2.2.4 of the *Code of Hygienic Practice for Fresh Fruits and Vegetables*. In addition:

- Pre-cut fresh fruits and vegetables should be maintained at low temperatures at all stages, from cutting through distribution to minimize microbiological growth.

5.7 Documentation and records

Where appropriate, records should be maintained to adequately reflect product information, such as product formulations or specifications and operational controls. Maintaining adequate documentation and records of processing operations is important in the event of recall of with fresh pre-cut fruits and vegetables. Records should be kept long enough to facilitate recalls and foodborne illness investigations, if required. This period will likely be much longer than the shelf life of the product. Some examples of records to keep are the following:

- Fresh fruit and vegetable supplier records
- Water quality and supply records
- Equipment monitoring and maintenance records
- Equipment calibration records
- Sanitation records
- Product processing records

- Pest control records
- Distribution records

5.8 Recall procedures

Refer to the *General Principles of Food Hygiene*.

6. ESTABLISHMENT: MAINTENANCE AND SANITATION

Refer to the *General Principles of Food Hygiene*.

7. ESTABLISHMENT: PERSONAL HYGIENE

Refer to the *General Principles of Food Hygiene*.

8. TRANSPORTATION

Refer to the *General Principles of Food Hygiene* and the *Code of Hygienic Practice for Fresh Fruits and Vegetables*.

9. PRODUCT INFORMATION AND CONSUMER AWARENESS

Refer to the *General Principles of Food Hygiene*.

10. TRAINING

Refer to the *General Principles of Food Hygiene* and the *Code of Hygienic Practice for Fresh Fruits and Vegetables*. In addition:

10.2 Training programmes

To evaluate the level of training required of persons responsible for the production of fresh pre-cut fruits and vegetables, the additional following factors should be taken into account:

- the packaging systems used for fresh pre-cut fruits and vegetables, including the risks of contamination or microbiological growth involved in this method;
- the importance of temperature control and GMPs.

ANNEX II

ANNEX FOR SPROUT PRODUCTION

INTRODUCTION

In recent years the popularity of sprouted seeds has increased dramatically and are favoured by many for their nutritional value. However, the recent increase in reports of food borne illness associated with raw sprouts has raised concerns from public health agencies and consumers about the safety of these products.

The microbial pathogens associated with sprouted seeds are for example *Salmonella* spp, pathogenic *E. coli*, *Listeria monocytogenes*, and *Shigella* spp. Outbreak investigations have indicated that micro-organisms found on sprouts most likely originate from the seeds. Most seeds supplied to sprout producers are produced primarily for forage or animal grazing where the Good Agricultural Practices (GAPs) necessary to prevent microbial contamination of seeds intended for sprouting are not followed, especially through the misuse of natural fertilizers or contaminated irrigation water. As a result, the seeds may be contaminated in the field or during harvesting, storage or transportation. Typically, the germination process in sprout production involves keeping seeds warm and moist for two to ten days. In these conditions, if low levels of microbial contaminants are present on seeds, they can quickly reach levels high enough to cause illness.

The scientific literature proposes microbiological decontamination of seeds treatments which can achieve different levels of pathogen reduction. There is currently no treatment available that can guarantee pathogen free seeds. Research is in progress to find efficient microbiological decontamination treatments which would provide sufficient pathogen reduction on seeds especially if pathogens are internalized.

1. OBJECTIVES

This annex recommends control measures to occur in two areas: during seed production and during sprout production. During seed production, conditioning and storage, the application of Good Agricultural Practices (GAPs) and Good Hygienic Practices (GHPs) are aimed at preventing microbial pathogen contamination of seeds. During sprout production, the microbiological decontamination of seeds step is aimed at reducing potential contaminants and the good hygienic practices at preventing the introduction of microbial pathogens and minimizing their potential growth. The degree of control in these two areas has a significant impact on the safety of sprouts.

2. SCOPE, USE AND DEFINITIONS

2.1 Scope

This annex covers the hygienic practices that are specific for the primary production of seeds for sprouting and the production of sprouts for human consumption in order to produce a safe and wholesome product.

2.2 Use

This annex follows the format of the *Recommended International Code of Practice – General Principles of Food Hygiene* CAC/RCP 1-1969, Rev 3 (1997) and should be used in conjunction with the *General Principles of Food Hygiene* and the *Code of Hygienic Practice for Fresh Fruit and Vegetables*.

2.3 Definitions

Seed producer – any person responsible for the management of activities associated with the primary production of seeds including post-harvest practices.

Seed distributor – any person responsible for the distribution of seeds (handling, storage and transportation) to sprout producers. Seed distributors may deal with single or multiple seed producers and can be producers themselves.

Sprout producer – any person responsible for the management of the activities associated with the production of sprouted seeds.

Spent irrigation water – water that has been in contact with sprouts during the sprouting process.

3. PRIMARY PRODUCTION OF SEEDS

Refer to the *Code of Hygienic Practice for Fresh Fruits and Vegetables*. In addition:

3.2 Hygienic production of seeds

3.2.1.2 **Manure and biosolids**

When seeds are destined for the production of sprouts for human consumption, wild or domestic animals should not be allowed to graze in the fields where seeds are grown (e.g., employing sheep for spring clip back of alfalfa).

It is particularly important to prevent microbial contamination during the production of seeds which will be used to produce sprouts for human consumption because of the potential for pathogens to grow during the sprouting process. Consequently, manure, biosolids and other natural fertilizers should only be used when they have undergone treatments which achieve a high level of pathogen reduction.

3.2.1.4 **Agricultural chemicals**

Seed producers should only use chemicals (e.g., pesticides, desiccants) which are acceptable for seeds intended for the production of sprouts for human consumption.

3.2.4 **Equipment associated with growing and harvesting**

Prior to harvest, harvesting equipment should be adjusted to minimize soil intake and seed damage and should be cleaned from any debris or earth. Diseased or damaged seeds, which could be susceptible to microbial contamination, should not be used for the production of sprouts for human consumption.

3.3 Handling, storage and transport

Seeds produced for the production of sprouts for human consumption should be segregated from product to be seeded or planted for animal feed (e.g., for forage or animal grazing) and clearly labelled.

Recognizing that seeds are vulnerable to microbial pathogens during thrashing and drying, adequate care is needed to maintain sanitation in drying yards, and exposure of seeds to mist, high humidity and fog should be avoided.

3.4 Analyses

Seed producers, distributors, and sprout producers should test lots of seeds for microbial pathogens using internationally accepted analytical methods. Sprouting seeds before testing increases the possibility of finding pathogens that may be present. If lots of seeds are found to be contaminated, they should not be sold or used for the production of sprouts for human consumption. Because of the limitations associated with sampling methods and analytical tests, failure to find contamination does not guarantee that the seeds are pathogen free. However, if contamination is found at this stage, it allows seeds to be diverted or destroyed before entering sprout production for human consumption. Seed producers, distributors and sprout producers should refer to the *Principles for the Establishment and Application of Microbiological Criteria for Foods,* CAC/GL 21-1977, for guidance on establishing a sampling plan.

3.5 Recall procedures

Seed producers for the production of sprouts for human consumption should ensure that records and recall procedures are in place to effectively respond to health risk situations. Procedures should enable the complete and rapid recall of any implicated seed. The procedures should also assist in providing detailed information for the identification and investigation of any contaminated seeds and sprouts. The following should be adopted:

- Seed production and distribution practices should be in place to minimize the quantity of seed identified as a single lot and avoid the mixing of multiple lots that would complicate recalls and provide greater opportunity for cross-contamination. Seed producers and distributors and sprout producers should maintain records for each lot. The lot number, producer and country of origin should be indicated on each container.
- Seed producers should have a system to: effectively identify lots, trace the production sites and agricultural inputs associated with the lots, and allow physical retrieval of the seeds in case of a suspected hazard.
- Where a lot has been recalled because of a health hazard, other lots that were produced under similar conditions (e.g., on the same production sites or with the same agricultural inputs) and which may present a similar hazard should be evaluated for safety. Any lot presenting a similar risk should be recalled. Blends containing potentially contaminated seeds must also be recalled.
- Seeds which may present a hazard must be held and detained until they are disposed of properly.

4. ESTABLISHMENT FOR SPROUT PRODUCTION

Refer to the *General Principles of Food Hygiene*. In addition:

4.2.1 **Design and layout**

Where appropriate, the internal design and layout of sprout establishments should permit Good Hygiene Practices, including protection against cross-contamination between and during operations. Storage, seed rinsing and microbiological decontamination, germination and packaging areas should be physically separated from each other.

5. CONTROL OF OPERATION

Refer to the *General Principles of Food Hygiene*. In addition:

5.2.2 **Specific process steps in sprout production**

5.2.2.1 **Water use during sprout production**

Water quality management will vary throughout all operations. Sprout producers should follow GMPs to minimize the potential for the introduction or spread of pathogens in processing water. The quality of water used should be dependent on the stage of the operation. Because of the potential for pathogen proliferation during the sprouting process, clean water could be used for initial washing stages, whereas water used later in the sprout production process (i.e., for the rinse following the microbiological decontamination of seed, and subsequent operations) should be preferably of potable quality or at least clean water.

5.2.2.2 **Initial rinse**

The seeds should be rinsed thoroughly before the microbiological decontamination treatment to remove dirt and increase the efficiency of this treatment.

- Seeds should be rinsed and thoroughly agitated in large volumes of clean water, in such a way to maximize surface contact. The process should be repeated until most of the dirt is removed and rinse water remains clear.

5.2.2.3 **Microbiological decontamination of seeds**

Due to the difficulty of obtaining seeds which can be guaranteed as pathogen free, it is recommended that seeds be treated prior to the sprouting process. Although there are other options like the use of lactic acid bacteria, liquid microbiological decontamination treatment is generally used. During this treatment sprout producers should adhere to the following:

- All containers used for microbiological decontamination of seeds should be cleaned and disinfected prior to use.
- Seeds should be well agitated in large volumes of antimicrobial agent to maximize surface contact.
- The duration of treatment and the concentration of antimicrobial agent used should be accurately measured and recorded.

- Strict measures should be in place to prevent re-contamination of seeds after the microbiological decontamination treatment.
- Antimicrobial agent should be used according to manufacturer's instructions for their intended use.

5.2.2.4 **Rinse after seed treatment**

As appropriate, seeds should be thoroughly rinsed after the microbiological decontamination treatment with potable water or at least clean water. Rinsing should be repeated sufficiently to eliminate antimicrobial agent.

5.2.2.5 **Pre-germination soak**

Soaking is often necessary to improve germination. When soaking, the sprout producer should adhere to the following:

- All containers used for soaking should be cleaned and disinfected prior to use.
- Seeds should be soaked in cleaned water for the shortest possible time to minimize microbial growth.
- This step may also employ antimicrobial agents.
- After soaking, seeds should be rinsed thoroughly with potable water or at least clean water.

5.2.2.6 **Germination**

During germination, keep the environment and equipment clean to avoid potential contamination. All equipment should be cleaned and disinfected before each new batch.

- Only potable water should be used.
- Where necessary and when used, soils or other matrices should be treated (e.g., pasteurized) to achieve a high degree of microbial reduction.

5.2.2.7 **Harvesting**

All equipment should be cleaned and disinfected before each new batch. Harvesting should be done with cleaned and disinfected tools dedicated for this use.

5.2.2.8 **Final rinse and cooling**

A final water rinse will remove hulls, cool product, and may reduce microbial contamination on sprouts. The following should be adopted:

- As appropriate, sprouts should be rinsed in cold potable water to lower sprout temperature and slow down microbial growth.
- Water should be changed, as needed (e.g., between batches), to prevent cross-contamination.
- Sprouts should be drained using appropriate equipment (e.g. food grade centrifugal dryer) that is clean and disinfected prior to use.
- If additional cooling time is necessary, steps should be taken to facilitate rapid cooling (e.g., placed in smaller containers with adequate air flow between containers).

5.2.2.9 **Storage of finished product**

- Where appropriate, sprouts should be kept under cold temperature (e.g. 5^{0}C) that will minimize microbial growth for the intended shelf life of the product. Regular and effective monitoring of temperature of storage areas and transport vehicles should be carried out.

5.2.3 **Microbiological and other specifications**

It is recommended that seed and sprouts or spent irrigation water be tested for the presence of pathogens.

5.2.3.1 **Testing of seed lots before entering production**

It is recommended that each new lot of seeds received at the sprouting facility is tested before entering production (i.e. before the microbiological decontamination of seeds).

- The seed sample selected for testing should be sprouted prior to analysis to increase the potential to detect pathogens if present. Analysis may be performed on the sprouted seeds or the water used to sprout the sample.
- Seed samples for microbial analysis should not be subject to any microbiological decontamination treatment at the sprouting facility.

5.2.3.2 **Testing of sprouts and/or spent irrigation water**

Current seed treatments cannot guarantee total elimination of pathogens. Further, if even a few pathogens survive the microbiological decontamination treatment, they can grow to high numbers during sprouting. Therefore, producers should have in place a sampling/testing plan to regularly monitor for pathogens at one or more stages after the start of germination.

- Analyses can be performed during the germination process (e.g., spent irrigation water or sprouts) and/or finished product may be analysed after harvest.
- Testing spent irrigation water is a good indicator of microbial conditions of sprouts. It is homogeneous and is simpler to analyse. Further, sampling spent irrigation water (or sprouts) during germination allows earlier results compared to testing finished product.
- Because of the sporadic nature of seed contamination, it is recommended that producers test every production lot.

5.2.4 **Microbiological cross-contamination**

Sprout producers should adhere to the following:

- The traffic pattern of employees should prevent cross-contamination of sprouts. For example: the employees should avoid going back and forth to various areas of production. The employees should not go from a potentially contaminated area to the germination and/or packaging area unless they have washed their hands and changed to clean protective clothing.

5.3 Incoming material requirements

5.3.1 Specifications for incoming seeds

- Sprout producers should recommend that seed producers adopt good agricultural practices and provide evidence that the product was grown according to section 3 of this Annex and the Code of Hygienic Practice for Fresh Fruits and Vegetables.
- Seed and sprout producers should obtain assurance from seed producers or distributors that chemical residues of each incoming lot are within the limits established by the Codex Alimentarius Commission and, where appropriate, they should obtain certificates of analysis for microbial pathogens of concern.

5.3.2 Control of incoming seeds

Seed containers should be examined at their arrival to minimize the potential for introducing obvious contaminants in the establishment.

- Seed containers should be examined for physical damage (e.g., holes from rodents) and signs of contamination (e.g., stains, rodent, insects, faeces, urine, foreign material, etc.). If found to be damaged, contaminated or potentially contaminated, its contents should not be used for the production of sprouts for human consumption.
- If seed lots are analysed for the presence of microbial pathogens of concern, these should not be used until results of analysis are available.

5.3.3 Seed storage

Seeds should be handled and stored in a manner that will prevent damage and contamination.

- Seeds should be stored off the floor, away from walls and in proper storage conditions to prevent mould and bacterial growth and facilitate pest control inspection.
- Open containers should be stored in such a way that they are protected from pests and other sources of contamination.

5.7 Documentation and records

Refer to the *Code of Hygienic Practice for Fresh Fruits and Vegetables*. In addition: Written records that accurately reflect product information and operational controls should be available to demonstrate the adequacy of the production activities.

- Upon receipt of seeds, records should be maintained of the seed supplier, the lot number and the country of origin to facilitate recall procedures.
- Records should be legible, permanent and accurate. Records should include written procedures, controls, limits, monitoring results and subsequent follow-up documents. Records must include: seed sources and lot numbers, water analysis results, sanitation checks, pest control monitoring, sprout lot codes, analysis results, production volumes, storage temperature monitoring, product distribution and consumer complaints.
- Records should be kept long enough to facilitate recalls and food borne illness investigation, if required. This period will likely be much longer than the shelf life of the product.

6. ESTABLISHMENT: MAINTENANCE AND SANITATION

Refer to the *General Principles of Food Hygiene*.

7. ESTABLISHMENT: PERSONAL HYGIENE

Refer to the *General Principles of Food Hygiene*.

8. TRANSPORTATION

Refer to the *General Principles of Food Hygiene*.

9. PRODUCT INFORMATION AND CONSUMER AWARENESS

Refer to the *General Principles of Food Hygiene*.

10. TRAINING

Refer to the *General Principles of Food Hygiene*. In addition:

10.1 Awareness and responsibilities

Refer to the *Code of Hygienic Practice for Fresh Fruits and Vegetables*. In addition:

- The producer should have a written training programme that is routinely reviewed and updated. Systems should be in place to ensure that food handlers remain aware of all procedures necessary to maintain the safety of sprouts.

For further information on the activities of the Codex Alimentarius Commission, please contact:

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Fresh Fruits and Vegetables

Codex standards for fresh fruits and vegetables and related texts such as the *Code of Hygienic Practice for Fresh Fruits and Vegetables* are published in this compact format to allow their wide use and understanding by governments, regulatory authorities, food industries and retailers, and consumers. This first edition includes texts adopted by the Codex Alimentarius Commission up to 2007.

The Codex Alimentarius Commission is an intergovernmental body with over 170 members, within the framework of the Joint FAO/WHO Food Standards Programme established by the Food and Agriculture Organization (FAO) of the United Nations and the World Health Organization (WHO). The main result of the Commissions' work is the *Codex Alimentarius,* a collection of internationally adopted food standards, guidelines, codes of practice and other recommendations, with the objective of protecting the health of consumers and ensuring fair practices in the food trade.

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