



JOINT FAO/WHO FOOD STANDARDS PROGRAMME
CODEX COMMITTEE ON FRESH FRUITS AND VEGETABLES

Twenty-second Session

**DISCUSSION PAPER ON GLOSSARY OF TERMS USED IN THE LAYOUT FOR CODEX STANDARDS
FOR FRESH FRUITS AND VEGETABLES
(RENAMED AS DEFINITION OF TERMS FOR APPLICATION IN THE LAYOUT FOR CODEX STANDARDS
FOR FRESH FRUITS AND VEGETABLES)**

Prepared by the Prepared by the United States of America and Ghana

Codex members and observers wishing to submit comments on this draft should do so as instructed in CL 2022/11-FFV available on the Codex webpage/Circular letters 2022:
<http://www.fao.org/fao-who-codexalimentarius/circular-letters/en/>

BACKGROUND

1. The 19th Session of the Codex Committee on Fresh Fruits and Vegetables¹ (CCFFV19, Ixtapa, Zihuatanejo Guerrero, Mexico - October 2015) established an electronic working group (EWG), led by Mexico, working in English and Spanish to prepare a draft Glossary of Terms for use in the CCFFV Standard Layout for consideration at its next session. The stated objective of the Glossary of Terms was to facilitate uniform understanding of terminology, provisions of and uniform application/interpretation of CCFFV standards.
2. CCFFV20² (Kampala, Uganda, October 2017), discussed the draft Glossary of Terms (CX/FFV 17/20/11) and resulting from that discussion accepted an offer by the United States of America to further develop the Glossary of Terms as a discussion paper rather than in a working group to expedite its completion. The United States of America was requested to take into consideration the CCFFV standard layout, other terms used in Codex CCFFV standards, terms used in trade, other pre-existing glossary of terms from other intergovernmental standardization organizations and the comments made during plenary and working group discussions at CCFFV20.
3. Due to time constraints, CCFFV21³ agreed to consider the Item at its next session.
4. Ghana offered to collaborate with the United States in preparation of the discussion paper.

ANALYSIS OF COMMENTS RECEIVED AT CCFFV21

5. Comments were made at CCFFV21 concerning the correct nomenclature of this document because it was not presented in alphabetical order as glossaries are, but in the sequential order of the CCFFV Standard Layout. Considering the original intent of the discussion paper – to facilitate uniform understanding of terminology, provisions of and uniform application/interpretation of CCFFV standards, it is recommended to rename this discussion paper “Definition of Terms for Application in the Layout for Codex Standards for Fresh Fruits and Vegetables”. This name change permits this document to be written in the sequential order of the CCFFV Standard layout for better cross referencing. This format also permits the definitions of terms that describe the stages of progression of some broader terms used such as freshness, maturity and ripeness that facilitate uniform standard application.

¹ REP16/FFV, paras 102-103

² REP18/FFV, paras 94-95

³ REP20/FFV, para 99

6. This discussion paper is divided in two parts, Part 1 is the “Definition of Terms Used in CCFFV Standards” in the sequence of the CCFFV Standard Layout. Part 2 is “Additional Terms” that are often part of the standard development and application process but not found in the standard (Appendix I).

RECOMMENDATION

7. CCFFV22 is invited to consider the Definition of Terms for Application in the Layout for Codex Standards for Fresh Fruits and Vegetables (Appendix I).

DEFINITION OF TERMS FOR APPLICATION IN THE LAYOUT FOR CODEX STANDARDS FOR FRESH FRUITS AND VEGETABLES

Part 1: Definition of terms used in CCFV standards

The Terms and Definitions in this section, follows the sequence of the CCFV Standards.

1. SCOPE: This indicates the general name of the fresh fruit and vegetables (FFV) being standardized and the point of application of the standard.

Fresh Fruit and Vegetable⁴: Fruits and vegetables physical and textural characteristics that have not been changed or processed in any manner including by salting, drying, freezing, cooking, juicing, sugaring or drying. They may undergo post-harvest practices to maintain freshness, shelf life and to facilitate transportation, storage and handling without affecting their raw nature as when harvested.

Fruit: The seed-bearing structure developed from the ovary of a flowering plant. In some plants it is the edible part, the mesocarp (flesh or pulp layer) located between the exocarp (peel/skin) and the endocarp (the seed/s). Fruits are divided into the following two groups.

Climacteric fruits: Fruits having a ripening process that is accompanied by increased ethylene production due to increased respiration.

Non-climacteric fruits: Fruits having a ripening process that is not accompanied by increased ethylene production due to increased respiration

Vegetable: The edible non-fruit portions of plants such as bulbs, flowers, leaves, roots, stems and tubers.

Point of Application: The physical locations where the standard is applied; namely – shipping point, en-route and destination.

Shipping Point: Physical location from where the FFV is shipped into the trade channel, it can be a field, packhouse or warehouse.

En-route: Any point in-transit i.e., between the shipping point and the final destination of the FFV (both are indicated on the shipping documents).

Destination: The final point of arrival of the product (indicated on the shipping documents) usually for international FFV trade, this is the foreign port of arrival or importer's warehouse.

2. DEFINITION OF PRODUCE: This section of the standard identifies the part of the plant being standardized (fruit, leaves, rhizome, root, stem, tuber etc.), along with the species, sub-species/variety and/or cultivar.

Species: A group of living organisms consisting of similar individuals capable of exchanging genes or interbreeding. A biological classification ranking immediately below the genus or subgenus, comprising related organisms or populations.

Variety: A naturally occurring variation of individual plants within a species that can reproduce.

Cultivar: Cultivated varieties

Hybrids: FFV developed from crosses between two species, varieties or cultivars, or developed from a series of crosses between parents.

Commercial Type: Produce with similar characteristics including appearance, but which may belong to different varieties.

Industrial Processing: The process of transforming the physical and textural characteristics of raw FFV into a new product through chemical or physical means. Industrial processing includes juice extraction, pulp/puree creation, canning, preserving, freezing or drying/dehydrating.

⁴ In some cases, the definition of fruit and vegetable is based on their traditional use versus botanical nomenclature. E.g., watermelon and cantaloupe are considered as fruits while cucumbers and pumpkins are considered as vegetables; tomato is a fruit but is traditionally considered as a vegetable. Therefore, consideration should also be given to each product's traditional use and not solely botanical definition/nomenclature.

3. PROVISIONS CONCERNING QUALITY

3.1 MINIMUM REQUIREMENTS

Minimum Requirements are the lowest organoleptic prerequisites that FFV must meet to be traded, thereby meeting consumer performance expectations and food safety criteria. These requirements change based on individual FFV physiological characteristics, trade practices and food safety concerns. Deviations/exceptions from these prerequisites are permissible and are referred to as an “allowance”, and collectively as “Tolerances for defects allowed”.

Intact/whole: The fruit or vegetable has no physical parts/pieces missing. However, depending on the characteristics of the FFV (roots, rhizomes and tubers such as yams, ginger, taro) may be trimmed and still be considered as whole/intact.

Sound: The fruit or vegetable is free from physical and chemical defects (injury and diseases) affecting its eating and/or keeping quality. The produce is free from disease, rot, damage caused by physical means and the presence of live or dead insects including insect larvae.

Clean: Free from visible extraneous and foreign objectionable matter on the FFV surface, including soil, dirt and residues of agricultural production inputs, evident to the naked eye or with adjusted corrected vision lenses. Permissible post-harvest treatments such as waxes, shredded paper used for cushioning and other wrapping materials are allowed, their minute particles are not considered as making the product unclean.

Extraneous Matter: Vegetal matter associated with the part of the plant the FFV was harvested from, Examples for fruits are leaves, twigs and loose stems/peduncles.

Foreign Matter: Vegetal and non-vegetal matter not associated with the part of the plant the FFV was harvested from, such as stones, pieces of bark, sticks, twigs, metal, plastic, and glass.

Firm: The textural level of turgidity/compactness in the part of the plant being traded, with flesh that is acceptable as part of the FFV characteristics. Firmness is interpreted differently based on the section in which it appears and the innate physical characteristics of the FFV being standardized.

Terms describing firmness in FFV

Fresh Fruits: In some fresh fruits, firmness is measured using pressure test (penetrometer). The penetrometer’s result is also used to describe levels of flesh development and maturation/ripeness in some fruits such as apples, pear, apricot, peaches and nectarines.

The degree of firmness is described progressively as:

Hard: the fruit’s flesh is tenacious and not yielding to moderate hand pressure

Firm: the flesh yields very slightly to moderate hand pressure

Firm ripe: the flesh yields slightly to moderate hand pressure

Ripe: the flesh yields readily to moderate hand pressure

Over-ripe: the flesh has softened and has signs of breakdown, yields readily to hand pressure, deterioration is quickening, and the produce is unacceptable for wholesale trade.

Roots, Rhizomes and Tubers: Firm means these vegetables are turgid, solid, tenacious and do not yield readily to hand pressure.

Leafy Vegetables: Firm means these vegetables are crisp, not wilted or flabby and can be readily snapped/torn by hand.

Fresh in appearance: The FFV having its original external skin and condition or as close as possible to when harvested. Portraying the desired unimpaired quality except in some fruits, a change of color that may occur due to the ripening process.

Terms Describing Degrees of Freshness

Fresh: Normal succulence, brightness and firmness shown like when harvested. This is important as any impairment of original fresh quality reduces the product’s value.

Firm: Compact, solid, substantial and yields very slightly to moderate pressure. Indicative of normal development and good condition. Very important in root crops, cucurbits, eggplant, etc.

Crisp: Turgid, brittle and breaks readily. This denotes a fresh condition that is desirable, e.g., in celery, rhubarb, and spinach.

Tender: Succulent and of delicate texture. This is a desirable condition in vegetables, e.g., asparagus, artichokes, spinach, and beans.

Flabby: Soft, limp, pliable, and lacking firmness. Flabbiness is often due to loss of stored nutrients and water on account of improper storage conditions, sprouting or old age, such as in sprouted potatoes or aged carrots.

Pithy: Open texture with air spaces in pith or central portion that is usually the result of very rapid growth. This condition is especially applicable to celery, radishes, turnips and carrots.

Shriveled: Shrunken, drawn, or wrinkled resulting in a marked change in form and often in size. This is an extreme condition resulting from excessive transpiration or old age.

Spongy: Easily compressed and of loose open texture. This is usually the result of very rapid or irregular growth in commodities such as poorly headed cabbage or lettuce and immature or sprouted onions.

Pests: Animals, insects or micro-organisms whose presence or actions are detrimental to FFV quality, keeping quality/storage and/or safety.

Foreign smell and/or taste: Smell or taste not associated natural with individual FFV including smells resulting from unapproved post-harvest practices.

Damage caused by low and/or high temperature: Damage caused to the FFV after harvest due to exposure to non-ambient temperatures such as freezer burn, frozen flesh, certain types of sunburn and skin discoloration.

Abnormal external moisture: Moisture from sources not associated with condensation after refrigerated storage and/or transportation.

Defect: These are progressive and non-progressive flaws in the FFV resulting from deterioration, physical injury and/or physiological factors affecting the appearance or market utility of the produce.

Progressive/Condition defects: Defects having impact on the FFV that worsen over time such as unhealed bruises, skin breaks, flesh damage decay, mold. Such defects will eventually result in the FFV losing its utility. These factors vary depending on the specific characteristics of each FFV

Non-progressive/Quality defects: These are defects that do not worsen overtime, such as misshapen, healed cuts, undersize, immaturity, russets, some skin marks and residues of sap or wax from the plant. These factors vary depending on the specific characteristics of each FFV.

Some common FFV defects include:

Pest Damage: Physical injury to, or that detracts from the appearance of the FFV caused by pest (insects, mammals, birds etc.)- feeding/gnawing, living on or in. This definition also includes the presence of dead pest or pests at any stage of their development.

Insect Injury: Various injuries due to insects at any stage of their development, their current or past presence in the FFV including nest/frass, excreta or dead insect fragments.

Bruise: A physical injury that ruptures the outer surface/skin of the FFV without penetrating through the underlying tissue.

Sunburn: Discoloration of the FFV's surface due to direct exposure to sun's rays. Depending on the FFV, the affected area may be thickened, tough or leathery with underlying discoloured flesh.

Sunscald: Discoloration of the FFV's surface due to direct and intense exposure to sun's rays. Depending on the FFV, the affected area may appear whitish grey, dry paper-like, blistered and/or flattened. The underlying flesh may be dry and discoloured.

Frostbite: Damage to the FFV resulting from non-ambient low temperatures in the field before harvest. This may manifest as the following defects in the FFV- skin discoloration, soft or flabby tissue, external and/or internal flesh darkening.

Limb rub: Injuries to the fruit caused by friction between the fruits surface and the tree's limb and/or branch during the fruit's growth.

Decay: Deterioration and/or decomposition induced by fungi, bacteria resulting from injury (physical damage), pest damage, diseases and or senescence; or an aerobic decomposition of the FFV by bacteria as a natural process of change/senescence

Rot: To decompose due to biological action. Depending on individual FFV physical characteristics and trade practices other descriptors such as “soft rot” or “decay” is used instead of rot

Mould: A fungus that grows on damp or decaying organic matter.

Immature/not sufficiently developed: FFV that have not attained the physiological and biochemical stage of development at which they possess the desired characteristics/pre-requisites to provide the minimum accepted level of utility to the consumer (not sufficiently developed to meet commercial utility requirements).

Translucent: water-soaked condition resulting in the FFV having a glassy appearance

Misshapen: The physical shape of the FFV does not fully conform to the established/normal shape characteristics and therefore its appearance is affected.

Badly misshapen: The FFV's shape is so decidedly deformed that it does not conform to the established/normal shape characteristics and therefore its appearance is seriously affected.

Damage: Any specific defect or an equally objectionable variation of defects or a combination of defects, which materially detracts from the appearance, edibility, utility or shipping quality of the FFV. Damage may be caused by physical means, insects, pests and unfavorable environmental factors such as wind, hail and frost.

3.1.1 Minimum Maturity Requirements (fruit only): Horticultural/market maturity.

Maturity⁵: The fruit has attained a physiological and biochemical stage of development at which it possesses the desired characteristics/pre-requisites to provide the minimum accepted level of utility to the consumer (normal taste/odor, flavor, and texture).

Maturity measurements most commonly used for fruits at inspection points include: sugar content (brix degrees – brix), sugar-acid ratio, shape, juice content, ground color changes and pressure testing of the flesh using a penetrometer.

Sufficiently developed (vegetables, roots, rhizomes, tubers): measured by ground color, skin texture, flavor, leaf texture, shape, firmness/compactness. The following terms firm, tender, flabby, pithy, shriveled, woody, translucent are used to indicate stages of Sufficient Development and together with the general quality or condition of vegetables, used to describe maturity.

3.2 Classification: The placing of FFV into groups/classes based on physical and physiochemical characteristics/parameters (shape, color, taste/maturity and the presence or absence of defects).

3.2.1 “Extra” Class: Selection of FFV of superior quality. The produce shall have the characteristics typical of the variety or commercial type and shall fulfil the minimum requirements. The produce may have slight superficial defects only, unless otherwise indicated in the standard. The slight superficial defects should affect only very small areas of the produce and should hardly contrast with the typical coloring, nature of the skin or typical shape.

3.2.2 Class I: Selection of fruit or vegetables of good quality. The produce shall have the characteristics typical of the variety or commercial type and shall fulfil the minimum requirements. The produce may have slight defects only in shape, development, coloring and skin, unless otherwise indicated in the standard. The slight defects should affect only small areas of the produce and should only slightly contrast with the typical coloring, nature of the skin or typical shape.

3.2.2 Class II: Selection of fruit or vegetables of marketable quality. The produce may have defects regarding shape, development, coloring and skin as well as the minimum requirements, unless otherwise indicated in the standard. The produce shall not have serious defects affecting the internal quality.

4. PROVISION CONCERNING SIZING

⁵In some non-English languages maturity and ripe are the same word and have the same meaning.

Horticultural or Market maturity/Sufficiently developed: The fruit has attained a minimal level of physiological development (organoleptic characteristics) at which it can be traded and/or consumed.

Physiological maturity/ Fully developed: the fruit has attained a biological stage of development that results in the fruit being able to continue development (ripening) even it is detached from the plant.

Size: The physical dimension or mass of the FFV measured by one of, or a combination of the following:

Count: the number of FFV units per package or in an agreed container volume.

Length: the longitudinal axis of the FFV measured from the stem end/peduncle to the blossom /growth end/apex excluding the peduncle except in a few cases.

Diameter: the greatest dimension of the FFV measured at right angles to a line from the stem to the blossom end; or determined by the FFV passing through a round opening in any position. Diameter is measured either by the maximum or minimum diameter of the equatorial section of each FFV or a diameter range per package.

Weight: the individual weight of each FFV or a weight range per package

Minimum size: the absolute smallest acceptable size or size range in the standard.

Maximum size: the absolute largest acceptable individual size or size range in the standard.

Undersize: the FFV size is lower than the size that is indicated on the package or the minimum size allowed.

Oversize: the FFV size is larger than the size that is indicated on the package or the maximum size allowed.

Uniformity in size: A size or size range that is defined to guarantee uniform appearance of the FFV in the package with respect to the physical dimensions. It may be expressed by a fixed size, minimum and maximum size, or a minimum/maximum number of units in the package.

5. PROVISIONS CONCERNING TOLERANCES

Tolerances: The sum of all the allowances/deviations that are permitted within a lot of FFV or a class, from the requirements of the standard. Tolerances are assessed on samples taken from the lot in accordance with a pre-set ratio and/or based on recognized internationally agreed methods of sampling (such as OECD or Codex rules for conformity checks).

5.1.1 Quality tolerances: The collective maximum deviation allowed for produce not meeting the quality requirements, expressed in percentage, by number or weight.

Allowance: The amount of a factor/defect (e.g., staining) deviation permitted by a minimum requirement in a lot of produce. The allowance can be part of the tolerance or separate/independent.

5.2 Size tolerances: Maximum deviation allowed for produce not meeting the indicated size i.e., larger or smaller. This deviation is expressed as a percentage, by number or weight.

6. PROVISIONS CONCERNING PRESENTATION

6.1 Uniformity: Terms used to indicate that the FFV in a package and/or a lot are similar in variety, shape, size and/or size range, color and/or a color range.

Lot: A quantity of produce presented for inspection as one unit, having similar characteristics regarding type and or variety and origin:

Sublot: the result of dividing a very large volumes of FFV such as a car lot (rail carload) or boat load into smaller ones for inspection purposes.

6.2 Packaging

Package: Individual containers of produce that individually or collectively facilitate safe handling, storage, transportation and sale of the produce. Packages vary in size and function based on the produce characteristics and its trade practices. Types of packages are:

Sales package: Individual containers in which produce is offered for sale. Its main function is to contain, protect and preserve the product. These may be small, containing a few grams of products such as fresh herbs or as large as pallet-bins holding 200 Kg of watermelons or pumpkins.

Consumer Packages: Sales packages/ units intended for direct sale to the consumer. These can vary in size due to the intended/targeted consumer.

Pre-package/Primary package: Sales packages having product enclosed completely or only partially, but in such a way that the contents cannot be altered without opening or changing the packaging.

Bulk Containers: Large receptacles or packages such as pallet bins or bags, rail cars and other large shipping packages and/or containers in which the FFV may be in direct contact with the transportation unit and/or the atmosphere. Some bulk containers such as pallet bins are sometimes used as sales packages

In all cases, packages/receptacles in which the FFV is packaged must be of such quality and strength as to protect the FFV during transportation and handling. Recycled and re-usable packages meeting the requirements in this section are acceptable.

The materials used inside the package must be 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. Stickers individually affixed to the produce shall be such that, when removed, they neither leave visible traces of glue nor lead to skin defects.

6.2.1 Description of Containers: The type containers in which the FFV is placed in such as or multilayer, consumer sales package and bulk containers.

7. PROVISIONS CONCERNING MARKING OR LABELLING

7.1 Consumer Packages: See previous Section 6.2.

7.1.1 Name of produce: The common name or the trade name under which the product is traded.

Trade Name: A name or denomination developed or selected by a trader or specific industry for which no legal protection has been sought or obtained in any country. Example: The name of pear variety is Forelle, a special colour grading is named "Vermont Beauty", the latter being a trade name connected to the variety.

Trademark Name: A name or denomination developed or selected by a trader or specific industry for which legal protection has been sought and granted or obtained in any country. Example: Thompson Seedless (table grapes). Trademark named produce often require special organoleptic requirements such as prescribed maturity, color and/or size requirements.

7.1.2 Origin of produce: The country in which the product was grown and harvested. Optionally, this may include addition of the name of the geographical physical location within the country.

7.2. Non-retail Containers: Packages/containers whose sole purpose is for transportation, storage and wholesale trade of the produce.

7.2.1 Identification: The name and physical address of the exporter, packer/dispatcher and the receiver/importer

7.2.4 Commercial Specifications: This include stating the:

Class or grade: A rank of quality expressed in accordance with Section 3.2 Classification

Size: If sized, should be expressed in accordance with Section 4. Provision Concerning Sizing

7.2.5 Official Control Mark: Stamp, adhesive sticker or signage on the package reflecting the inspection status of the lot.

Part 2: Additional terms

These additional terms are often used in FFV standardization discussions

Color Variation: Differences in color occurring with the same variety of FFV

Conformity check: Inspection carried out by an inspector to check that FFV conform to the requirements laid down in a standard

Senescence: The gradual aging/deterioration of FFV due to physio-biochemical changes which naturally occur. It may be accompanied by either flesh softening, changes in color, structure and other organoleptic characteristics. Its progression at a point renders the FFV unsuitable for consumption.

Well-formed/Well shaped: The FFV have the shape characteristic of the variety.

Stalk/Peduncle: A stalk bearing a flower or flower cluster or a fructification which attaches the stem-end of the fruit to the plant.

Blossom/Growth End/Apex: The part of FFV opposite the stalk/peduncle at which growth occurs.