
**Fresh lettuces, curled - leaved endives
and broad - leaved (batavian) endives –
Specification and grading**

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Foreword

This Ethiopian Standard has been prepared under the direction of the Technical committee for fruit and vegetable (TC 13) and published by Ethiopian Standard Agency (ESA).

In preparation of this standard references have been made to the following:

CD/K/059:2010, Fresh lettuces, curled-leaved endives and broad-leaved (batavian) endives - Specification and grading, East African Standard.

Codex Stan 193, Codex general standard for contaminants and toxins in food.

Acknowledgement is made for the use information from the above publications.

Fresh lettuces, curled - leaved endives and broad - leaved (batavian) endives - Specification and grading

1 Scope

This standard applies to

- lettuces of varieties (cultivars) grown from:
 - *Lactuca sativa* L. var. *capitata* L. (head (cabbage) lettuces including crisphead and "Iceberg" type lettuces),
 - *Lactuca sativa* L. var. *longifolia* Lam. (cos or romaine lettuces),
 - *Lactuca sativa* L. var. *crispa* L. (leaf lettuces),
 - Crosses of these varieties and
- curled-leaved endives of varieties (cultivars) grown from *Cichorium endivia* L. var. *crispa* Lam.; and
- broad-leaved (Batavian) endives (escaroles) of varieties (cultivars) grown from *Cichorium endivia* L. var. *latifolium* Lam. to be supplied fresh to the consumer.

The leaf lettuces comprise a big group of varieties that are harvested as a complete "head", e. g. "Salad bowl", "Red salad bowl", "Oak leaf", "Lollo rossa", "Lollo bionda", "Raisa", "Novita".

This standard does not apply to produce for industrial processing, produce presented as individual leaves, lettuces with root ball or lettuces in pots.

2 Normative references

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

CES 73, *General standard for pre-packaged foods labeling*.

ES 577, *Recommended code of practice. General principles of Food hygiene*.

ES 929, *Code of practice - food hygiene management*.

ES 1246, *Code of practice for packaging and transport of fruits and vegetable*.

ES ISO 4833, *Microbiology of food and animal feeding stuffs- Horizontal method for the enumeration of microorganisms- Colony- count technique at 30 °C*.

3 Terms and definitions

For the purpose of this standard the following definitions shall apply.

3.1

similar varietal characteristics

the heads in any container have the same characteristic leaf growth. For example, lettuce of the Iceberg and Big Boston types shall not be mixed.

3.2

fresh

the head as a whole has normal succulence and the wrapper leaves and the outermost head leaves are not more than slightly wilted.

3.3

green

one-half or more of the exterior surface of the head, exclusive of the wrapper leaves, has at least a light green color.

3.4

burst

the head is split or broken open.

3.5

doubles

two heads on the same stem.

3.6

fairly well trimmed

the butt is trimmed off closely below the point of attachment of the outer leaves, and that on a head of Iceberg type lettuce, wrapper leaves do not exceed 7 in number.

3.7

closely trimmed

the butt is trimmed off closely below the point of attachment of the outer leaves, and that on a head of Iceberg type lettuce, wrapper leaves do not exceed 3 in number.

3.8

reasonably trimmed

the butt is trimmed off closely below the point of attachment of the outer leaves, and that on a head of Iceberg type lettuce, wrapper leaves do not exceed 12 in number.

3.9

cap leaf

the first head leaf. This is the outermost leaf which fairly closely enfolds the compact portion of the head, some portion of which extends to the top of the crown. The tip of the leaf may be separated from the head, provided that the separation does not extend more than (31.8 mm) in height from the compact portion of the head.

- a) All leaves outside of the cap leaf are wrapper leaves.
- b) On elongated or pointed heads the inner leaves that closely enfold the head three-fourths of their length are head leaves.

3.10

crown

the upper half of the head.

3.11

injury

any specific defect or any combination of defects, which noticeably detracts from the appearance, or the edible or marketing quality of the lettuce.

3.12

damage

any specific defect or any combination of defects, which materially detracts from the appearance, or the edible or marketing quality of the lettuce.

3.13

serious damage

any specific defect any other defect, or any combination of defects, which seriously detracts from the appearance, or the edible or marketing quality of the lettuce.

3.14

permanent defects

defects which are not subject to change during shipment or storage, including but not limited to soft, burst, open or poorly trimmed heads, seedstems or dirt.

3.15

condition defects

defects which are subject to change during shipment or storage, including but not limited to decay, tipburn, russet spotting, pink rib, rib discoloration, and freezing injury.

4 Provisions concerning quality

4.1 General requirements

The purpose of the standard is to define the quality requirements for produce at the export control stage, after preparation and packaging.

However, if applied at stages following export, products may show in relation to the requirements of the standard:

- a slight lack of freshness and turgidity,
- a slight deterioration due to their development and their tendency to perish.

The holder/seller of products may not display such products or offer them for sale, or deliver or market them in any manner other than in conformity with this standard. The holder shall be responsible for observing such conformity.

4.2 Minimum requirements

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

4.2.1intact: The produce must not have any mutilation or injury spoiling the integrity of the produce. The entire edible part must be intact and the produce must have a sufficient number of outer leaves in order to be properly protected, with the exception of produce individually wrapped in film or packed in plastic bags. Slight damage caused during harvesting and preparation is allowed.

However, in the particular case of curled-leaved endives, the ends of leaves may be removed provided this does not affect the appearance and the keeping of quality.

4.2.2sound; produce affected by rotting or deterioration such as to make it unfit for consumption is excluded: The lettuces must be free from disease or serious deterioration which appreciably affects their appearance, edibility or market value. In particular, this excludes produce affected by rotting, even if the signs are very slight but liable to make the produce unfit for consumption upon arrival at their destination. Lettuces showing the following defects are therefore excluded:

4.2.3clean and trimmed, i.e. practically free from all earth or other growing medium and practically free of any visible foreign matter: Lettuces must be practically free of visible soil, dust, chemical residue or other visible foreign matter. However, produce with visible chemical residue is excluded. Only slight traces of soil on the outer leaves and the bottom side of the produce are allowed.

Outer leaves that are soiled, faded, discoloured, torn, broken or seriously damaged in any other way, and all leaves that are badly joined to the heart must be removed.

4.2.4fresh in appearance: Wilting is not allowed. Lettuces should be packed as soon as possible after harvesting. Pre-cooling of the produce is recommended. During preparation and loading the produce must not show any signs of wilting.

4.2.5practically free from pests: Lettuces must be practically free of insects or other pests. The presence of pests can detract from the commercial presentation and acceptance of the produce. Lettuces infested with pests

must be excluded during preparation and packing. However, isolated aphids on a restricted part of the produce should not lead to rejection of the lot.

4.2.6 practically free from damage caused by pests: Pest damage can detract from the general appearance, keeping quality and edibility of the produce.

Lettuces with injuries occurring in the centre should be excluded. However, isolated slight injuries (e.g. bites) on the outer leaves are allowed.

4.2.7 turgescence

4.2.8 not running to seed: The development should not have progressed to an extent that the beginnings of the floral stem can be perceived or found on examination or have caused the heart to change its shape.

4.2.9 free of abnormal external moisture: This provision applies to excessive moisture, for example, free water lying inside the package but does not include condensation on produce following release from cool storage or refrigerated vehicle. However, a certain amount of external moisture may be necessary for quality preservation and is allowed.

4.2.10 free of any foreign smell and/or taste: This refers particularly to produce which have been stored on badly kept premises or have travelled in a badly maintained vehicle, especially produce which have acquired a strong smell from other produce stored on the same premises or travelling in the same vehicle. Therefore, care should be taken to use only non-smelling materials as protection in packaging.

In the case of lettuce, a reddish discolouration, caused by low temperature during growth, is allowed, unless it seriously affects the appearance of the lettuce.

A reddish discolouration of lettuce may be typical of the variety or may be caused by low temperature during growth and does not represent a defect, provided the other characteristics of the variety are present. However, the deviation in colour must not have been caused by a disease.

The roots must be cut close to the base of the outer leaves and the cut must be neat. The roots must be cut neatly, virtually perpendicular to the base of the outer leaves and the cut must be neat. The length of the root should not exceed 1 cm. The leaves must remain firmly attached.

The produce must be of normal development. The development and condition of the produce must be such as to enable it:

- a) to withstand transportation and handling,
- b) to arrive in a satisfactory condition at the place of destination.

The requirements regarding development are established in the chapter on quality classes and the chapter on sizing, in accordance with the individual growing conditions for each type of lettuce. Compliance with the minimum weight does not alone fulfill the requirements for normal development.

As for the condition of produce, freshness is most important. It is preferable that lettuces should be pre-cooled and transported in refrigerated means of transport, if necessary.

4.3 Classification

The produce is classified in two classes, as defined below:

4.3.1 Class I

Produce in this class must be of good quality. It must be characteristic of the variety or commercial type, especially the colour.

Lettuces in this class must be carefully selected and presented. The produce must also be:

- **well formed:** The produce must have the shape typical of the variety;

– **firm, taking into account the cultivation methods and the type of produce:** Lettuces grown under protection and leaf lettuces may be less firm. The produce is considered to be “grown under protection” when grown in an area under a structure covered with glass, plastic or other protective material for the entire production period.

– **free from damage or deterioration impairing edibility:** Defects such as small brown spots, slight bruises, slight injuries on some of the outer leaves are permitted. However, the centre part must not have any defects.

Slight defects are allowed which do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

– **free from frost damage.**

Head lettuces must have a single well-formed heart. However, in the case of head lettuces grown under protection, the heart may be small. The head lettuces should have a heart formation corresponding to their weight and the method of cultivation. They must have a sufficient number of outer leaves, provided they are not individually wrapped. In the case of “Iceberg” type lettuces (crisphead) the heart formation can only be judged by lightly pressing with the fingers and/or by making a longitudinal cut.

Cos lettuces must have a heart, which may be small. In the case of cos lettuces, the inner leaves may form a loose heart and there should also be a few protective outer leaves. The heart formation can only be judged by lightly pressing with the fingers and/or by making a longitudinal cut.

Leaf lettuces, curled-leaved endives and broad-leaved (Batavian) endives should show good rosetting. The centre of curled-leaved endives and broad-leaved (Batavian) endives must be yellow in colour.

4.3.2 Class II

This class includes produce which do not qualify for inclusion in Class I, but satisfy the minimum requirements specified above.

Lettuces in this class must be of marketable quality, suitably presented and suitable for human consumption. The produce must be:

– **reasonably well-formed:** Defects in the shape of the heart or the rosette are allowed, provided there is no excessive deformation and the deviation is not the result of the development of a floral stem. Some of the outer leaves may be missing.

– **free from damage and deterioration which may seriously impair edibility.** Damage of the outer leaves is allowed, provided this does not affect the general appearance of the produce. The margins of some of the outer leaves may show bruises, cracks or hail damage; up to two outer leaves may have a broken midrib. The outer leaves may show the first signs of wilting or traces of frost damage. However, these defects are not allowed on the centre part of the produce.

The following defects may be allowed provided the produce retains its essential characteristics as regards the quality, the keeping quality and presentation:

– **slight discolouration:** The produce may show a slight deviation from the colour characteristic of the variety or commercial type, provided this is not caused by disease and the general appearance of the produce is not impaired.

– **slight damage caused by pests.** Such damage is allowed on the outer leaves only, provided the general appearance is not impaired.

Head lettuces must have a heart, which may be small. However, in the case of head lettuces grown under protection, absence of heart is permissible.

Cos lettuces may show no heart.

5 Provisions concerning sizing

Size is determined by the weight of one unit.

5.1 Minimum weight

The minimum weight for Classes I and II is:

Classes	Open grown	Grown under protection
Head lettuces (excluding crisphead and "Iceberg" type lettuces) and Cos or romaine lettuces (excluding "Little gem" type lettuces)	150 g	100 g
Crisphead and "Iceberg" type lettuces	300 g	200 g
Leaf lettuces and "Little gem" type lettuces	100 g	100 g
Curled-leaved endives and broad-leaved endives	200 g	150 g

In both classes the produce must at least attain the minimum weight. However, if a higher minimum size is stated on the package, the produce must attain at least this weight. To determine if this weight is met, each unit in the package must be weighed separately, and the weight thus established is to be rounded up to the next whole 10 g.

5.2 Uniformity

5.2.1 Lettuces

In all classes, the difference between the lightest and heaviest units in each package must not exceed:

- 40 g when the lightest unit weighs less than 150 g per unit
- 100 g when the lightest unit weighs between 150 g and 300 g per unit
- 150 g when the lightest unit weighs between 300 g and 450 g per unit
- 300 g when the lightest unit weighs more than 450 g per unit.

Irrespective of the minimum weight, a specific size range (uniformity of size) must be met. When calculating the size range the minimum size stated must not always be considered to be the lowest size packed. Starting out from the individual weight established, the actual size range packed must be calculated to ensure the highest possible number of lettuce fall within this range.

Example:

24 units of lettuce per package with a given minimum size of 130 g.

- Weights measured in g:

140	140	150	150	150	160
160	160	160	160	170	170
170	170	170	170	180	180
190	190	200	210	210	210

- Size ranges (uniformity of size):
- 1st possibility: 130 - 170g (8 units do not comply with the size range)
- 2nd possibility: 140 - 180g (6 units do not comply with the size range)
- 3rd possibility: 150 - 250g (2 units do not comply with the size range)

The inspector checking the size range should choose a range that includes the maximum number of units. Therefore, the 3rd possibility is the appropriate one.

5.2.2 Curled-leaved and broad-leaved (Batavian) endives

In all classes, the difference between the lightest and heaviest units in each package must not exceed 300g.

6 Provisions concerning tolerances

At all marketing stages, tolerances in respect of quality and sizes shall be allowed in each lot for produce not satisfying the requirements of the class indicated. Tolerances are provided to allow for human error during the grading and packing process. During grading and sizing it is not permitted to deliberately include out of grade produce, i.e. to exploit the tolerances deliberately.

The tolerances are determined by examining each sample package and taking the average of all samples examined. The tolerances are stated in terms of percentage by number of units (heads) in the total sample not conforming to the class or to the size indicated on the package.

6.1 Quality tolerances

6.1.1 Class I

A total tolerance of 10 per cent, by number, of produce not satisfying the requirements of the class, but meeting those of Class II is allowed. Within this tolerance not more than 1 per cent in total may consist of produce satisfying neither the requirements of Class II quality nor the minimum requirements, or of produce affected by decay.

6.1.2 Class II

A total tolerance of 10 per cent, by number, of produce satisfying neither the requirements of the class nor the minimum requirements is allowed. With this tolerance not more than 2 per cent in total may consist of produce affected by decay.

The tolerance for Class II covers produce with diseases on the edible part, serious pest infestations, wilting, pronounced damage caused by frost or visible residues of chemical substances is excluded.

6.2 Size tolerances

For all classes: a total tolerance of 10 per cent, by number, of produce not satisfying the requirements as regards sizing, but weighing no more than 10 per cent over or under the size in question, is allowed.

Deviation from the size range: 10 per cent by number of units may be allowed up to 10 per cent above or below the established size range. However, if the tolerance is already used due to produce being below the minimum weight, no further allowances are permitted. In relation to the example given in the explanatory text concerning sizing, this means no produce weighs less than the stated 130 g.

Thus 10 per cent of units may deviate from the established size range up to 10 per cent, i.e. these 10 per cent may weigh up to 15 g less than 150 g or up to 25 g more than 250 g. Two units are weighing 10 g less than 150 g, i.e. the size tolerance is complied with.

7 Provisions concerning presentation

7.1 Uniformity

The contents of each package must be uniform and contain only produce of the same origin, variety or commercial type, quality and size.

A special effort should be made to suppress camouflage, i.e. concealing in the lower layers of the package produce inferior in quality and size to that displayed and marked.

However, a mixture of produce of distinctly different colours, varieties and/or commercial types may be packed together in a sales unit¹, provided they are uniform in quality and, for each colour, variety and/or commercial type concerned, in origin.

The visible part of the contents of the package must be representative of the entire contents. Similarly prohibited is any packaging method or practice intended to give a deceptively superior appearance to the top layer of the

¹The sales unit should be designed to be purchased in its entirety.

consignment.

7.2 Packaging

The produce must be packed in such a way as to protect it properly. It must be reasonably packed having regard to the size and type of packaging, without empty spaces or crushing.

Packages must be of a quality, strength and characteristic to protect the produce during transport and handling. 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 paper or stamps bearing trade specifications is allowed provided the printing or labelling has been done with non-toxic ink or glue.

This provision is designed to ensure suitable protection of the produce by means of materials inside the package which are new and clean and also to prevent foreign bodies such as leaves, sand or soil from spoiling its good presentation.

Packages must be free of all foreign matter. A visible lack of cleanliness in several packages could result in the goods being rejected.

7.3 Presentation

Produce presented in more than one layer may be packed base-to-heart provided the layers or heads are suitably protected or separated.

Lettuces may be packed in one, two or three layers. When packed in two (or three) layers, lettuces and curled-leaved endives must be placed heart-to-heart (in two of them), unless separated by suitable protective material e.g. a sheet of paper or the heads are wrapped or packed separately. Broad-leaved (Batavian) endives and cos lettuces may also be packed flat.

8 Marking and labeling

8.1 Consumer packages

In addition to the requirements of CES 73, the following specific provisions apply:

8.1.1 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.

8.2 Non-retail containers

Each package² must bear the following particulars in letters grouped on the same side, legibly and indelibly marked, and visible from the outside. All particulars must be grouped on the same side of the package, either on a label attached to or printed on the package with water-insoluble ink.

In the case of reused packages, all previous labels must be carefully removed and previous indications deleted.

8.2.1 Identification

The exporter, packer and/or dispatcher shall be identified by name and physical address (e.g. street/ city/region/ postal code and, if different from the country of origin, the country) or a code mark officially recognized by the national authority.

8.2.2 Nature of produce

- "Lettuces", "butterhead lettuces", "batavia", "crisphead lettuces (Iceberg)", "cos lettuces", "leaf lettuce" (or, for example and if appropriate, "Oak leaf", "Lollo bionda", "Lollo rossa"), "curled-leaved endives" or "broad-leaved (Batavian) endives", or other synonyms if the contents are not visible from the outside

²Package units of produce prepacked for direct sale to the consumer shall not be subject to these marking provisions but shall conform to the national requirements. However, the markings referred to shall in any event be shown on the transport packaging containing such package units.

- “Little gem” where appropriate or other synonyms
- An indication "grown under protection", or other appropriate indication, where appropriate. When the produce has been grown under protection, this must be stated.
- Name of the variety (optional)
- “Mixture of salads”, or equivalent denomination in the case of packages and/or sales units containing a mixture of produce of distinctly different colours, varieties and/or commercial types. If the produce is not visible from the outside, the colours, varieties or commercial types must be indicated.

8.2.3 Origin of produce

- Country of origin and, optionally, district where grown, or national, regional or local place name.
- In the case of sales units containing a mixture of distinctly different colours, varieties and/or commercial types of produce of different origins, the indication of each country of origin shall appear next to the name of the colour, variety and/or commercial type concerned.

8.2.4 Commercial specifications

- Class
- Size, expressed by the minimum weight per unit, or number of units
- Net weight (optional).

8.2.5 Official control mark (optional)

9 Contaminants

Lettuces and endives shall comply with those maximum levels for heavy metals and pesticide residue established by the Codex Alimentarius Commission (Codex Stan 193) for this commodity respectively.

10 Hygiene

10.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of ES 577, ES 929, and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

10.2 The produce should comply with any microbiological criteria established in accordance with ES ISO 4833.

Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010. ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1998.

ESA's objectives are:-

- ❖ Develop Ethiopian standards and establish a system that enable to check whether goods and services are in compliance with the required standards,
- ❖ Facilitate the country's technology transfer through the use of standards,
- ❖ Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational Institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes. Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed from our website.

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International Involvement

ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the International Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM). It is a founding member of the African Regional Organization for standardization (ARSO).

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