
**Fresh spinach –
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 Ethiopian Standard, references have been made to the following:

CD/K/067:2010, Fresh spinach — 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 spinach — Specification and grading

1 Scope

This standard applies to spinach of varieties (cultivars) grown from *Spinacia oleracea* L. to be supplied fresh to the consumer, spinach for industrial processing being excluded.

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 definition shall apply.

3.1

bunched

3.1.1 similar varietal characteristics

the spinach shall be of one type, such as crinkly leaf type or flat leaf type. No mixture of types shall be permitted which materially affects the appearance of the bunch.

3.1.2 same form

bunches and containers shall contain either plants or leaves with no more than a 15 percent by weight mixture of the other in either the bunch or the container.

3.1.3 well grown

not stunted or poorly developed.

3.1.4 fairly clean

generally free from dirt, sand or other adhering foreign matter and the appearance of the bunch is not materially affected.

3.1.5 reasonably clean

mostly free from dirt, sand or other adhering foreign matter and that the appearance of the bunch is not seriously affected.

3.1.6 well trimmed

for plants that the roots are no longer than 25 mm below the common point of attachment of the leafstems, and for leaves that not more than 15 percent of the leaves in the bunch have leafstems longer than the length of the attached leaf.

3.1.7 fairly well trimmed

for plants the roots are no longer than 50 mm below the common point of attachment of the leafstems, and for leaves that not more than 15 percent of the leaves in the bunch have leafstems longer than one and one-half times the length of the attached leaf.

3.1.8fresh

not more than slightly wilted.

3.1.9damage

any specific defect described in this section or an equally objectionable variation of any one of these defects, or any other defect or any combination of defects which materially detracts from the appearance or edible or marketing quality. The following specific defects shall be considered as damage:

- a) Seedstems when more than one-fourth the length of the longest leaf in the bunch.
- b) Flower buds when mostly opening in the bunch.
- c) Insects when scattered or concentrated or when insect feeding materially affects the appearance of the bunch.
- d) Discoloration when affecting an aggregate area of more than 10 percent of the total surface area of the leaves in the bunch.
- e) Mechanical damage when more than 25 % of the leaves in the bunch are crushed, torn or broken.

3.1.10 serious damage

any specific defect described in this clause or an equally objectionable variation of any one of these defects, or any other defects or any combination of defects which seriously detracts from the appearance or the edible or marketing quality. The following specific defects shall be considered as serious damage.

- a) Seedstems when more than one-half the length of the longest leaf in the bunch.
- b) Flower buds when generally open in the bunch.
- c) Insects when very concentrated or when the insect feeding seriously affects the appearance of the bunch.
- d) Discoloration when affecting an aggregate area of more than 25 percent of the total surface area of the leaves in the bunch.
- e) Mechanical damage when more than 50 percent of the leaves in the bunch are crushed, torn or broken.

3.2

plants

3.2.1

similar varietal characteristics

the spinach shall be of one type, such as crinkly leaf type or flat leaf type. No mixture of types shall be permitted which materially affects the appearance of the spinach in the container.

3.2.2

well grown

the plants are not stunted or poorly developed

3.2.3

fresh

the spinach is not more than slightly wilted

3.2.4

fairly clean

the individual spinach plant is reasonably free from dirt or other adhering foreign matter, and that the general appearance of the spinach plants in the container is not materially affected

3.2.5

well trimmed

the spinach plant is cut at the crown of the root, or cut so that the root is not longer than 25 mm

3.2.6

damage

any defect which materially affects the appearance, or the edible or shipping quality of the individual plant, or the general appearance of the spinach in the container. Any one of the following defects, or any combination of defects the seriousness of which exceeds the maximum allowed for any one defect, shall be considered as damage:

- a) Coarse central stalks or seedstems when causing more than 10 percent waste of the individual plant; or when the flower buds are plainly visible;
- b) Discoloration when materially affecting the general appearance of the plant, except that heart leaves which are yellow or partially blanched shall not be considered as damaging the plant; and
- c) Foreign material when materially affecting the edible quality, or the general appearance of the spinach in the container. Foreign material means weeds, grass, or any loose material other than spinach.

3.2.7

serious damage

any defect which seriously affects the appearance, or the edible or shipping quality of the individual plant, or the general appearance of the spinach in the container.

Any one of the following defects, or any combination of defects the seriousness of which exceeds the maximum allowed for any one defect, shall be considered as serious damage:

- a) Discoloration when the plants are badly discolored;
- b) Insects when the plant is noticeably infested, or when it is seriously damaged by them;
- c) Mildew, white rust or similar diseases when seriously affecting the edible quality or appearance of the plant; and,
- d) Decay.

3.3

leaves

3.3.1

similar varietal characteristics

the spinach shall be generally of one type, as crinkly leaf type, or flat leaf type. No mixture of varieties shall be permitted which materially affects the appearance of the lot.

3.3.2

well trimmed

the leafstems or petioles are not excessively long in relation to the size of the leafblades.

3.3.3

damage

any defect which materially affects the appearance, or the edible or shipping quality of the individual leaves or of the lot as a whole.

4 Provisions concerning quality

4.1 General requirements

The purpose of the standard is to define the quality requirements of spinach in leaf or in heads at the export control stage, after preparation and packaging.

4.2 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the spinach 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
- fresh in appearance
- practically free from pests
- practically free from damage caused by pests
- free of floral spikes
- free of any foreign smell and/or taste.

The washed spinach must be sufficiently drained.

In the case of spinach heads, the portion comprising the root must be cut close to the base of the outer leaves.

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

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

4.3 Classification

Spinach is classified in two classes defined below:

4.3.1 Class I

Spinach in this class must be of good quality. The leaves must be:

- normal in colour and appearance for the variety and time of picking
- free of damage caused by frost affecting appearance or edibility.

In the case of leaf spinach, the leaf stalk must not exceed 10 cm in length.

4.3.2 Class II

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

5 Provisions concerning sizing

Sizing is not compulsory for spinach.

6 Provisions concerning tolerances

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

6.1 Quality tolerances

6.1.1 Class I

10 per cent by weight of spinach not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

6.1.2 Class II

10 per cent by weight of spinach not satisfying 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, in the case of spinach heads, a tolerance of 10 per cent by weight of heads, the length of root attached to which may not exceed 1 cm from the base of the outer leaves, shall be allowed.

7 Provisions concerning presentation

7.1 Uniformity

The contents of each package must be uniform and contain only leaf spinach or spinach heads of the same origin, variety and quality.

The visible part of the contents of the package must be representative of the entire contents.

7.2 Packaging

The spinach must be packed in such a way as to protect the produce properly.

The materials used inside the package must be new, 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.

8 Marking and labeling

8.1 Consumer packages

The labeling shall comply with the requirements of CES 73, and shall be legibly and indelibly marked with the following:

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 package¹ must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside:

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 authority².

8.2.2 Nature of produce

- "Leaf spinach" or "Spinach heads" if the contents of the package are not visible from the outside.

8.2.3 Origin of produce

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

8.2.4 Commercial specifications

- Class.

8.2.5 Official control mark (optional)

9 Contaminants

Spinach 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.

¹Package 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.

²The 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, and the code mark should be preceded by the ES ISO 3166 (alpha) country/area code of the recognizing country, if not the country of origin.

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).

More Information?

Contact us at the following address.

The Head Office of ESA is at Addis Ababa.

☎ 011- 646 06 85, 011- 646 05 65

☎ 011-646 08 80

✉ 2310 Addis Ababa, Ethiopia

E-mail: info@ethiostandards.org,

Website: www.ethiostandards.org



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