



DRAFT TANZANIA STANDARD

Leafy vegetables – Specification

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TANZANIA BUREAU OF STANDARD

0. Foreword

Leafy vegetables are plants that the main used parts are the leaves. They provide a powerful source of vitamins, minerals and phytonutrients. Most importantly they are rich in fibres and low in fats, carbohydrates and proteins.

This Tanzania Standard was prepared in order to provide guidance to producers and traders of leafy vegetables as well as regulators and to act as a means for ensuring the safety and quality of the produces.

In the preparation of this Tanzania Standard considerable assistance was derived from:

UNECE STANDARD FFV-58:2010, *Marketing and commercial quality control of leafy vegetables*.

In reporting the results of a test or analysis made in accordance with this standard, if the final value observed or calculated is to be rounded off, it shall be done in accordance with TZS 4 (see clause 2).

1. Scope

This standard specifies requirements, methods of sampling and test of leafy vegetables to be supplied fresh to the consumers; leafy vegetables for industrial processing being excluded.

The following is the representative list of the common leafy vegetable varieties;

- a) Night shade (*Solanum vilosum/ nigrum*) - Mnavu/ mnafu
- b) Ethiopian Mustard (*Brasica carinata*) - Figiri/Loshuu/saro
- c) Collard greens (*Brassica oleracea var. viridis*) - Sukuma wiki
- d) Kale (*Brassica oleracea L. var.sabellica*) - sukuma wiki
- e) Swiss chard (*Beta vulgaris forma cicla*) - Chards
- f) Amaranth- (*Amaranthus spp.*) - Mchicha
- g) Sweet potato leaves (*Ipomea batata*) - Matembele
- h) Cassava leaves (*Manihot esculentum*) - Kisamvu
- i) Pumpkin leaves (*Cucurbit pepo*) - Majani ya maboga
- j) Jute Mallow (*Corchorus spp*) - Mlenda
- k) Spider Plant (*Gynandropsis gynandra*) - Mgagani

- l) Cowpea leaves (*Vigna unguiculata*) - Majani ya kunde
- m) Chinese cabbage (*Brassica chinensis*) - Chainizi
- n) Blackjack (*Biddens pilosa*, *B. biternata*); - Shona nguo/nata nata
- o) Lamb's quarter (*Chenopodium album* L.); - Muosha fedha
- p) Tackweed (*Tribulus terrestris*); - Mbigili
- q) African spinach (*Basella alba* L.) - Mlelema

2. Normative references

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

- a) TZS 4, *Rounding off numerical values*
- b) TZS 109, *General principles of food hygiene -Code of practice*
- c) TZS 122, *Foodstuffs - Microbial examination for Salmonella spp*
- d) TZS 552, *Code of Hygienic Practice for Fresh Fruits and Vegetables*
- e) TZS 538, *Pre -packaged food labeling - general requirements*
- f) TZS 729, *Microbiology of food and animal feeding stuffs -Horizontal method for the enumeration of coliforms - Colony count technique*
- g) TZS 730-2, *Microbiology of food and animal feeding stuffs - Horizontal method for the enumeration of b-glucuronidase-positive Escheria coli - Part 2 - Colony-count technique at 44 0C using 5-bromo-4-chloro-3-indolyl-b-D-glucuronide*
- h) TZS 852-1, *Microbiology of food and animal feeding stuffs - Horizontal method for the detection and enumeration of Listeria monocytogenes - Part 1 - Detection method*
- i) TZS 1002, *Fresh fruits and vegetables – Sampling*
- j) TZS 1003, *Guide to the prepacking of fruits and vegetables*
- k) *Codex stan, 193 General Standard for Contaminants and Toxins in Food and Feed*
- l) *Codex pesticide residues in food online data base*

3 Terms and definitions

For the purposes of this standard, the following terms and definitions apply;

3.1 similar varietal characteristics

the leafy vegetables shall be of one type, such as crinkly leaf type or flat leaf type.

3.2 well grown

not stunted or poorly developed

3.3 well-trimmed bunch

for plants that the roots are not longer than 25mm below the common point of attachment of the leafstems, and for leaves that not more than 15 per cent of the leaves in the bunch have leafstems longer than the length of the attached leaf.

3.4 well-trimmed plants

the leafy vegetables plant is cut at the root collar or cut so that the root is no longer than 25 mm

3.5 well-trimmed leaves

the leaf stems or petioles are not excessively long in relation to the size of the leaf blades

3.6 fairly well trimmed bunch

for plants the roots are not longer than 50mm below the common point of attachment of the leafstems and for leaves that not more than 15 per cent of the leaves in the bunch have leafstems longer than one and one-half times the length of the attached leaf

3.7 fresh

crispy or turgid

3.8 damage

any defect which materially affects the appearance, edible or shipping quality of the individual plant, storage of the leafy vegetables.

3.9 serious damage

any damage which extremely affects the appearance, edible or shipping quality of the leafy vegetables.

The following specific defects shall be considered as serious damage:

- a) discoloration; when the plants are badly discoloured;
- b) pests damage; when seriously affecting the edible quality or appearance of the plant

- c) decay; when the plant change from a state of soundness or perfection due to rotting or decomposition

3.10 rosettes

A circular arrangement of leaves at a similar height of a stem.

3.11 sound

produce not affected by rotting or deterioration such as to make it unfit for consumption

3.12 clean

practically free of any visible foreign matter, (however unwashed leafy vegetables (if indicated) may have traces of soil or other growing media)

3.13 tender

young, soft or delicate leaf of the plant that is typically consumed raw or lightly cooked

3.14 abnormal external moisture

excess water on the surface of fruits caused by a natural agent (for example rain) or due to an artificial treatment (for example washing)

3.15 turgescient

crisp and not wilted

4 Requirements

4.1 General requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the leafy vegetables shall meet the following general requirements:

- intact; leafy vegetables may be presented as single leaves or as rosettes; when presented as rosettes the outer leaves and roots may be removed
- sound;
- tender
- clean;
- well grown;
- practically free from pests and damage caused by them;
- fresh in appearance and turgescient;
- free from abnormal external moisture;
- free from any foreign smell and/or taste.

4.1.2 The development and condition of the leafy vegetables shall be such as to enable them to:

- a) withstand transportation and handling pressure.

- b) arrive in satisfactory condition at the place of destination.

4.2 Specific requirements

4.2.1 Classification

Fresh leafy vegetables are classified in two classes, Class I and II as defined below.

4.2.1.1 Class I

Fresh leafy vegetables in this class shall be of good quality. They shall be characteristic of the variety and/or commercial type. Leafy vegetables presented in rosettes shall be well trimmed. The roots shall be cut underneath the rosette. The produce shall be free from root tufts.

The following slight defects, however, may be allowed provided that these do not affect the general appearance of the produce, quality, keeping quality and presentation in the package:

- a) slightly damaged leaves, such as cracks, holes or tears; and
- b) slight defects in colouring.

4.2.1.2 Class II

This class includes leafy vegetables that do not qualify for inclusion in Class I but satisfy the general requirements specified in clause 4.1.

Fresh leafy vegetables presented in rosettes may be fairly well trimmed or untrimmed.

The following defects may be allowed provided that the leafy vegetables retain their essential characteristics as regards quality, the keeping quality and presentation:

- a) damaged leaves, such as cracks, bruises, holes or tears;
- b) defects in colouring;
- c) slight lack of freshness;
- d) small root tufts; and
- e) slight ribbiness.

4.2.2 Size requirements

There is no sizing requirement for fresh leafy vegetables.

5 Tolerances

At all marketing stages, tolerances in respect of quality shall be allowed in each lot for produce not satisfying the requirements of the class indicated.

5.1 Quality tolerances

5.1.1 Class I

A total tolerance of 10 percent by weight of leafy vegetables not satisfying the requirements of the class but meeting those of Class II is allowed. Within this tolerance not more than 1 percent in total may consist of produce satisfying neither the requirements of Class II quality nor the general requirements, or of produce affected by decay. In addition, 10 percent by weight of single leaves are allowed when presented as rosettes.

5.1.2 Class II

A total tolerance of 10 percent by weight of leafy vegetables satisfying neither the requirements of the class nor the general requirements is allowed. Within this tolerance not more than 2 percent in total may consist of produce affected by decay. In addition, 20 percent by weight of single leaves is allowed when presented as rosettes.

6 Presentation

6.1 The contents of each package shall be uniform and contain only leafy vegetables of the same origin, variety or commercial type and quality.

6.2 In Class I, leafy vegetables shall be uniform in shape and colour. However, a mixture of leafy vegetables of distinctly different species may be packed together in a sales package, provided they are uniform in quality and, for each species concerned, in origin.

6.3 The visible part of the contents of the package shall be representative of the entire contents.

7 Contaminants

7.1 Heavy metal contaminants

Leafy vegetables shall comply with those maximum metal contaminants established by the Codex Stan 193.

7.2 Pesticide residues

Leafy vegetables shall comply with those maximum residue limits established in the Codex pesticide residues in food online data base.

8 Hygiene

8.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with TZS 109 and TZS 552 (see clause 2).

8.2 Fresh Leafy vegetables shall be free from worms or their eggs.

8.3 Fresh Leafy vegetables shall also comply with the microbial requirements prescribed in Table 1.

Table 1 Microbiological requirements for fresh leafy vegetables

Characteristic	Requirement	Test method
Coliforms, cfu/g	10 ²	TZS 729
<i>Escherichia coli</i> , cfu/g	Absent	TZS 730 -2
<i>Salmonella</i> spp, /25 g	Absent	TZS 122
<i>Listeria monocytogenes</i> , /25g	Absent	TZS 852-1

9. Sampling and Tests

9.1 Sampling

Representative samples of the fresh leafy vegetables shall be drawn as prescribed in TZS 1002 (see clause 2).

9.2 Tests

Tests shall be done in accordance with the methods prescribed in this standard.

10 Packaging, marking and labelling

10.1 Packaging

10.1.1. Fresh leafy vegetables shall be packed in such a way as to protect the produce properly. The materials used shall be of food grade, 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 nontoxic ink or glue. Packages shall be free of all foreign matter.

10.1.2 The bulk/shipping containers shall meet the quality, hygiene, ventilation and resistance characteristics that shall ensure suitable handling, shipping and preserving

fresh leafy vegetables. Packages shall be free of foreign matter and objectionable smell.

10.1.3 The use of any substance tending to modify the natural characteristics of the produce, especially form, texture and taste shall be prohibited.

10.1.4 In addition to the provisions covered by this standard, fresh leafy vegetables shall also be packed in accordance with TZS 538 and TZS 1003 (See clause 2).

10.2 Marking and labelling

10.2.1 Each package shall legibly and indelibly bear the following information:

- a) Name, physical and postal address of the packer and/ or dispatcher;
- b) Name of the produce by common name, eg. amaranths, spinach;
- c) Name of the variety/cultivar;
- d) Country of origin;
- e) Commercial specifications i.e. class;
- f) Statement to indicate whether washed or unwashed (where appropriate);
- g) Net weight or number of bundles followed by the unit weight;
- h) Brand or trade mark, if any;
- i) Storage condition;
- j) Pack date

10.2.2 Certification mark – Each container may also be marked with TBS certification mark.

NOTE: The use of TBS certification mark is governed by provisions of the Standards Act, 2009. Details of the conditions under which a license for the use of TBS certification mark may be granted to manufacturers or producers, may be obtained from TBS.