



CD/K/034:2010
ICS 67.220.20

EAST AFRICAN STANDARD

Fresh ginger — Specification and grading



EAST AFRICAN COMMUNITY

HS 0910.10.000

Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in East Africa. It is envisaged that through harmonized standardization, trade barriers which are encountered when goods and services are exchanged within the Community will be removed.

In order to meet the above objectives, the EAC Partner States have enacted an East African Standardization, Quality Assurance, Metrology and Test Act, 2006 (EAC SQMT Act, 2006) to make provisions for ensuring standardization, quality assurance, metrology and testing of products produced or originating in a third country and traded in the Community in order to facilitate industrial development and trade as well as helping to protect the health and safety of society and the environment in the Community.

East African Standards are formulated in accordance with the procedures established by the East African Standards Committee. The East African Standards Committee is established under the provisions of Article 4 of the EAC SQMT Act, 2006. The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the procedures of the Community.

Article 15(1) of the EAC SQMT Act, 2006 provides that "Within six months of the declaration of an East African Standard, the Partner States shall adopt, without deviation from the approved text of the standard, the East African Standard as a national standard and withdraw any existing national standard with similar scope and purpose".

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

© East African Community 2010 — All rights reserved*

East African Community

P O Box 1096

Arusha

Tanzania

Tel: 255 27 2504253/8

Fax: 255-27-2504481/2504255

E-Mail: eac@eachq.org

Web: www.each.int

* © 2010 EAC — All rights of exploitation in any form and by any means reserved worldwide for EAC Partner States' NSBs.

Introduction

In the preparation of this East African Standard, the following sources was consulted extensively:

ISO 1003:2008, *Spices — Ginger (Zingiber officinale Roscoe) — Specification*

CODEX STAN 218:1999 (Rev. 2005), *Standard for Ginger*

CODEX STAN 193:1995 (Rev.5:2009), *General Standard for Contaminants and Toxins in Foods*

CODEX STAN 228:2001 (Rev.1:2004), *General methods of analysis for contaminants*

Codex Alimentarius website: http://www.codexalimentarius.net/mrls/pestdes/jsp/pest_q-e.jsp

USDA Foreign Agricultural Service website: <http://www.mrlatabase.com>

USDA Agricultural Marketing Service website: <http://www.ams.usda.gov/AMSV1.0/Standards>

USDA Plant Inspectorate Service website: http://www.aphis.usda.gov/import_export/plants

European Union: http://ec.europa.eu/sanco_pesticides/public

Assistance derived from these sources and others inadvertently not mentioned is hereby acknowledged.

This standard has been developed to take into account:

- the needs of the market for the product;
- the need to facilitate fair domestic, regional and international trade and prevent technical barriers to trade by establishing a common trading language for buyers and sellers.
- the structure of the CODEX, UNECE, USA, ISO and other internationally significant standards;
- the needs of the producers in gaining knowledge of market standards, conformity assessment, commercial cultivars and crop production process;
- the need to transport the product in a manner that ensures keeping of quality until it reaches the consumer;
- the need for the plant protection authority to certify, through a simplified form, that the product is fit for crossborder and international trade without carrying plant disease vectors;
- the need to promote good agricultural practices that will enhance wider market access, involvement of small-scale traders and hence making fruit and vegetable production a viable means of wealth creation; and
- the need to keep unsatisfactory produce from the market by allowing the removal of unsatisfactory produce from the markets and to discourage unfair trade practices e.g. trying to sell immature produce at the beginning of the season when high profits can be made. Immature produce leads to dissatisfaction of customers and influences their choices negatively, which disadvantages those traders who have waited until the produce is mature.

Contents

1	Scope	1
2	Normative references.....	1
3	Description	1
3.1	Form and appearance.....	1
3.2	Odour and taste	2
4	Provisions concerning quality	2
4.1	General	2
4.2	Minimum requirements	2
4.3	Chemical requirements	3
4.4	Classification.....	3
4.5	Sampling	4
4.6	Test methods	4
5	Provisions concerning sizing	4
6	Provisions concerning tolerances.....	4
6.1	Quality tolerances	4
6.2	Size tolerances	5
7	Provisions concerning presentation.....	5
7.1	Uniformity.....	5
7.2	Packaging	5
8	Marking or labelling.....	5
8.1	Consumer packages.....	5
8.2	Non-retail containers.....	5
9	Contaminants.....	6
9.1	Heavy metals	6
9.2	Pesticide residues.....	6
10	Hygiene.....	6
	Annex A (normative) Determination of calcium.....	10
	Annex B (informative) Recommendations relating to storage and transport of ginger.....	13
	Annex C (informative) Model certificate of conformity with standards for fresh fruits and vegetables	14
	Annex D (informative) Ginger (<i>Zingiber officinale</i>) — Fact sheet	15
	Annex E (informative) Ginger (<i>Zingiber officinale</i>) — Codex, EU and USA pesticide residue limits... 16	

Fresh ginger — Specification and grading

1 Scope

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.

Annex A specifies a method for the determination of calcium. Recommendations for storage and transport conditions are given in Annex B.

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.

CAC/GL 21, *Principles for the Establishment and Application of Microbiological Criteria for Foods*

CAC/RCP 1, *Recommended International Code of Practice — General Principles of Food Hygiene*

CAC/RCP 44, *Recommended International Code of Practice for the Packaging and Transport of Tropical Fresh Fruit and Vegetables*

CAC/RCP 53, *Code of Hygienic Practice for Fresh Fruits and Vegetables*

EAS 38, *Labelling of prepackaged foods — Specification*

CD/K/378:2010, *Horticultural industry — Code of practice*

ISO 565, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings*

ISO 927, *Spices and condiments — Determination of extraneous matter and foreign matter content*

ISO 928, *Spices and condiments — Determination of total ash*

ISO 930, *Spices and condiments — Determination of acid-insoluble ash*

ISO 939, *Spices and condiments — Determination of moisture content — Entrainment method*

ISO 948, *Spices and condiments — Sampling*

ISO 1208, *Spices and condiments — Determination of filth*

ISO 6571, *Spices, condiments and herbs — Determination of volatile oil content (hydrodistillation method)*

3 Description

3.1 Form and appearance

Ginger is the dried, peeled or unpeeled rhizome of *Zingiber officinale* Roscoe, in irregular pieces not less than in length, in slices, in small cut pieces or ground. The ginger shall be yellowish-white in colour. It can be peeled or scraped, then washed and dried. The ginger may be lime bleached. Ginger may be graded on the basis of place of production, type of processing or colour.

3.2 Odour and taste

The odour and taste of ginger shall be characteristic: slightly sharp, pungent, fresh, and lemony. The material shall not have a musty odour or a rancid or bitter taste.

4 Provisions concerning quality

4.1 General

The purpose of the standard is to define the quality requirements of ginger at the market control stage, after preparation and packaging.

The spice shall conform to international, regional and national food safety and consumer protection regulations relating to adulteration (including colouring with natural or synthetic colours), contaminants (such as heavy metals and mycotoxins), pesticides, and hygienic practices.

Treatments, such as methylbromide, aluminium phosphide¹, ethylene oxide or irradiation as well as processing aids and chemical bleaching agents, may only be applied after agreement between buyer and seller.

4.2 Minimum requirements

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

- (a) whole;
- (b) sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- (c) free from living insects and shall be practically free from visible dead insects or insect fragments. In the case of ground ginger, the contamination shall be determined by the method specified in ISO 1208.
- (d) clean and practically free of any visible extraneous matter. The proportion of extraneous matter in ginger shall be not more than 1 % mass fraction and foreign matter shall be not more than 0.5 % mass fraction when determined by the method specified in ISO 927.
- (e) practically free of damage caused by pests affecting the general appearance of the produce;
- (f) free from coarse particles. Ground ginger shall be free from coarse particles and fibres. The fineness shall be agreed between the buyer and the seller.
- (g) free of abnormal external moisture, and properly dried if washed, excluding condensation following removal from cold storage
- (h) free of any foreign smell and/or taste;
- (i) firm;
- (j) free of abrasions, provided light abrasions which have been dried properly are not regarded as a defect;
- (k) sufficiently dry for the intended use; skin, stems and cuts due to harvesting must be fully dried.

¹ Phostoxin is an example of a commercially available product. This information is given for the convenience of users of this Standard, and does not constitute an endorsement of this product.

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

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

4.3 Chemical requirements

Ginger shall comply with the requirements specified in Table 1.

Sulfur dioxide shall only be used for bleaching ginger after explicit agreement between buyer and seller. The content of sulfur dioxide, e.g. as a mass fraction, shall comply with national or international legislation in force in the destination country.

Table 1 — Chemical requirements for ginger

Characteristic	Requirement	Test method
Moisture content on dry basis:		
a) whole/pieces, max. % mass fraction	12.0	ISO 939
b) ground, max. % mass fraction	11.0	
Total ash on dry basis, max. % mass fraction	8.0	ISO 928
Acid-insoluble ash on dry basis, max. % mass fraction	1.5	ISO 930
Volatile oil content on dry basis:		
a) whole/pieces, min. % mass fraction	1.5	ISO 6571
b) ground, min. % mass fraction	1.0	
Calcium (as oxide) on dry basis:		
a) unbleached, max. % mass fraction	1.1	Annex A
b) bleached (optional) ^a , max. % mass fraction	2.5	
^a On agreement between buyer and seller.		

4.4 Classification

Ginger is classified in three classes defined below:

4.4.1 “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.

4.4.2 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%.

4.4.3 Class II

This class includes ginger which does not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in 4.2. 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.

4.5 Sampling

4.5.1 The ginger shall be sampled using the method specified in ISO 948.

4.5.2 Samples of ginger, whole or in pieces, shall be ground so that the whole of the material passes through a sieve of nominal size of openings 1 mm, complying with ISO 565. The material thus ground shall be used for determining the characteristics specified in Table 1.

4.6 Test methods

The samples of ginger shall be tested for conformity with the requirements of this International Standard using the test methods indicated in Table 1.

For the determination of total ash, incineration shall be carried out at $600\text{ °C} \pm 25\text{ °C}$ (instead of $550\text{ °C} \pm 25\text{ °C}$ as specified in ISO 928).

5 Provisions concerning sizing

Size is determined by the weight of the ginger.

Size Code	Weight (grams)
A	300
B	200
C	150

6 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.

6.1 Quality tolerances

6.1.1 "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.

6.1.2 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.

6.1.3 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.

6.2 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.

7 Provisions concerning presentation

7.1 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.

7.2 Packaging

Ginger must be packed in such a way as to protect the produce properly. The materials used inside the package must be new², sound, clean, sealed packaging made of material which cannot affect the product quality or safety but which protects it from the ingress of moisture, loss of volatile matter or colour. 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 CAC/RCP 44.

7.2.1 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.

8 Marking or labelling

8.1 Consumer packages

In addition to the requirements of EAS 38, 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 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.

8.2.1 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.

CD/K/034:2010

8.2.2 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).

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 Identification

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

8.2.5 Official inspection mark (optional)

9 Contaminants

9.1 Heavy metals

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

9.2 Pesticide residues

Ginger shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity. The limits listed below were current as of the dates indicated. The table below provides current MRLs while Annex E provides current MRLs for the USA, EU and Codex markets.

Maximum pesticide residue limits and extraneous maximum residue limits in ginger (current as at 2009-06-09)

Type	Unit symbol	Limit	Method of test	Notes
CLETHODIM	MRL (mg/kg)	0.5		
DIFENOCONAZOLE	MRL (mg/kg) (*)	0.02		
DIMETHENAMID-P	MRL (undef) (*)	0.01		
DITHIOCARBAMATES	MRL (undef)	0.5		Source of data: mancozeb
MALEIC HYDRAZIDE	MRL (mg/kg)	15		
PIRIMICARB	MRL (undef)	0.1		
PYRACLOSTROBIN	MRL (undef) (*)	0.05		

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 CAC/RCP 1, CAC/RCP 53, 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 CAC/GL21.



Ginger concept plant



Fresh ginger roots



Ginger plant



Ginger roots

Draft for comment



Ginger plant



Ginger root



Ginger



Draft for comments



Ginger packed in boxes

Draft for comments only — Not for publication

Annex A
(normative)**Determination of calcium****A.1 Terms and definitions**

For the purposes of this annex, the following terms and definitions apply.

A.1.1 calcium content

mass fraction of substances determined under the conditions specified in this Standard

NOTE The calcium content is expressed as a percentage mass fraction of calcium oxide.

A.2 Principle

A test portion is incinerated to give the total ash. The ash is treated with hydrochloric acid to precipitate the calcium as calcium oxalate, which is then titrated against potassium permanganate.

A.3 Reagents

Unless otherwise stated, use only reagents of recognized analytical grade, and only distilled or deionized water or water of at least equivalent purity.

A.3.1 Acetic acid.

A.3.2 Concentrated hydrochloric acid, $\rho_{20}(\text{HCl}) = 1.16 \text{ g/ml}$.

A.3.3 Dilute hydrochloric acid.

Dilute 2 volumes of concentrated hydrochloric acid (A.3.2) with 5 volumes of water.

A.3.4 Ammonium hydroxide solution, $\rho_{20}(\text{NH}_4\text{OH}) = 0.90 \text{ g/ml}$.

A.3.5 Ammonium oxalate, saturated solution.

A.3.6 Sulfuric acid, 20 % mass fraction solution.

Dilute 1 volume of concentrated sulfuric acid, $\rho_{20}(\text{H}_2\text{SO}_4) = 1.84 \text{ g/ml}$, with 4 volumes of water.

A.3.7 Potassium permanganate, $c(\text{KMnO}_4) = 0.05 \text{ mol/l}$ standard volumetric solution.

A.3.8 Bromocresol green indicator, 0.4 g/l solution.

Weigh (A.4.6), to the nearest 0.001 g, 0.1 g of bromocresol green and grind it with 14.3 ml of 0.01 mol/l sodium hydroxide solution in an agate mortar (A.4.8). Transfer the contents of the mortar quantitatively to a 250 ml one mark volumetric flask (A.4.7) and make up to the mark with water. This solution has a pH range of 3.8 to 5.4. It turns yellow in an acid medium and blue in an alkaline medium.

A.4 Apparatus

Usual laboratory equipment, and in particular the following.

A.4.1 Incineration dish.

A.4.2 Filter paper, ashless.

A.4.3 Beaker, of capacity 250 ml.

A.4.4 Steam bath.

A.4.5 Water bath.

A.4.6 Analytical balance.

A.4.7 Volumetric flasks.

A.4.8 Agate mortar.

A.5 Procedure

A.5.1 Test portion

Weigh (A.4.6), to the nearest 0.001 g, 2 g to 4 g of the product.

A.5.2 Determination

Incinerate the test portion by the method specified in ISO 928. Digest the ash in the dish (A.4.1) with the dilute hydrochloric acid (A.3.3). Evaporate to dryness on the steam bath (A.4.4). Digest the dry residue again with the dilute hydrochloric acid and again evaporate to dryness. Treat the residue with 5 ml to 10 ml of the concentrated hydrochloric acid (A.3.2), then add about 50 ml of water. Allow to stand on the water bath for a few minutes, and filter into the 250 ml beaker. Wash the insoluble residue with hot water, collecting the washings in the same beaker. Add to the beaker 8 drops to 10 drops of the bromocresol green (A.3.8) and add the ammonium hydroxide solution (A.3.4) until the colour of the solution is distinctly blue (pH 4.8 to pH 5.0). Add acetic acid (A.3.1) drop by drop to change the colour to distinct green, i.e., until the pH is changed to between 4.4 and 4.6.

Filter the solution quantitatively, collecting the filtrate and washings in the beaker. Boil the solution and add the ammonium oxalate solution (A.3.5) dropwise until a precipitate forms and then add an excess. Heat to boiling. Allow to stand for at least 3 h. Decant the clear solution through the filter paper (A.4.2). Pour 13 ml to 20 ml of hot water on to the precipitate and again decant the clear solution.

Dissolve any precipitate and again decant the clear solution. Dissolve any precipitate remaining on the filter paper by washing with hot dilute hydrochloric acid (A.3.3) into the original beaker. Wash the filter paper thoroughly with hot water. Then reprecipitate while boiling hot, by adding sufficient ammonium hydroxide solution (A.3.4) and a little ammonium oxalate solution (A.3.5). Allow to stand for at least 3 h, as before, then filter through the same filter and wash with hot water until the filtrate is chloride free.

Perforate the apex of the filter cone. Wash the precipitate into the beaker used for precipitation. Then wash the filter paper with hot sulfuric acid (A.3.6) and titrate the solution at a temperature not lower than 70 °C against the potassium permanganate solution (A.3.7) until the appearance of a persistent pink coloration.

A.6 Expression of results

The calcium content, ω_{CaO} , expressed as a percentage mass fraction of calcium oxide, is given by Equation (A.1):

CD/K/034:2010

$$\omega_{\text{CaO}} = \frac{0.028 \times V \times 100}{m} \quad (\text{A.1})$$

where

m is the mass, in grams, of the test portion (A.5.1);

V is the volume, in millilitres, of the potassium permanganate solution (A.3.7) required for the titration.

If the concentration of the potassium permanganate solution differs from 0.05 mol/l, apply an appropriate correction factor.

Draft for comments only — Not to be cited as East African Standard

**Annex B
(informative)**

Recommendations relating to storage and transport of ginger

B.1 The containers of ginger should be stored in covered premises, well protected from sun, rain and excessive heat.

B.2 The store room should be dry, free from objectionable odours, and proofed against entry of insects and vermin. The ventilation should be controlled so as to give good ventilation under dry conditions and to be fully closed under damp conditions. In a storage warehouse, suitable facilities should be available for fumigation.

B.3 The containers should be so handled and transported that they are protected from rain, from the sun or other source of excessive heat, from objectionable odours and from cross-infestation, especially in the holds of ships.

Draft for comments only — Not to be cited as East African Standard

Annex D
(informative)

Ginger (*Zingiber officinale*) — Fact sheet

Zingiber officinale



Authority	Rosc.
Family	Liliopsida:Zingiberidae:Zingiberales:Zingiberaceae
Synonyms	Amomon zingiber L., Zingiber blancoi Massk.
Common names	ginger, true ginger, stem ginger, Canton ginger, gingembre, gember, ingwer, zenzero, gengibre, beladi, mangarataia, jengibre, ingefaera, ingefær, zanjabil, imbir', shoga, chiang, kopakai (Cook I), cagolaya ni vavalagi, poloi (Niue), 'ava pui, papasa (Simbo), pasapasa (Roviana), zingibil, dendabil
Editor	
Ecocrop code	2177

Description

A slender, erect herbaceous plant, 30-100 cm high, with a robust branched rhizome borne horizontally near the soil surface, bearing leafy shoots close together. The fleshy sympodial rhizome is hard, thick and usually pale yellow within.

Uses

The underground stem is used as a spice for culinary purposes and for ginger beer, ginger ale and ginger wine. An essential oil is used in flavouring essences and perfumery. It also has medicinal properties. Mentioned as a useful agroforestry species.

Growing period

Perennial, usually grown as an annual. In India, the crop is usually planted in May, and in Queensland in September. The plant can be harvested after 270-365 days, when the stalks begin to wither.

Common names

Ginger, Gingembre, Jengibre, Ingwer, Zingibel, Zinjibil, Zanzai, Then-schibel, Gingebela, Zenjibil, Dendabil, Kundi, Zanjabeel, Sankanjabir, Citaraho, Jinja, Tangawizi, Ata-le, Jinja.

Further information

Scientific synonyms: *Z. zingiber*, *Z. blancoi*, *Z. majus*, *Amomum zingiber*. Ginger is mainly cultivated in the tropics from sea level to 1500 m and it thrives in hot, moist conditions, but can be grown over more diverse conditions than most other spices. Ginger originated in South East Asia, but is nowhere known in a wild state. When grown on slopes the production may result in severe erosion unless adequate soil-conservation methods have been employed. Low temperatures will induce dormancy. The expected yield of dried ginger may be 1.5-7.5 t/ha. The dried ginger constitutes about 25% of the raw rhizome's weight. Yields of green ginger can be up to 38 t/ha.

Annex E (informative)

Ginger (*Zingiber officinale*) — Codex, EU and USA pesticide residue limits

Users are advised that international regulations and permissible Maximum Residue Levels (MRL) frequently change. Although this International MRL Database is updated frequently, the information in it may not be completely up-to-date or error free. Additionally, commodity nomenclature and residue definitions vary between countries, and country policies regarding deferral to international standards are not always transparent. This database is intended to be an initial reference source only, and users must verify any information obtained from it with knowledgeable parties in the market of interest prior to the sale or shipment of any products. The developers of this database are not liable for any damages, in whole or in part, caused by or arising in any way from user's use of the database.

Results Key

MRL values in *(Italics)* are more restrictive than US

--- indicates no MRL value is established.

Cod, EU, etc. indicates the source of the MRL and EXP means the market defers to the exporting market.

All numeric values listed are in parts per million (ppm), unless otherwise noted

	US 1	Cod	EU 2
2,4-D	0.1	---	0.1
	1. United States does not maintain a specific MRL for the 2,4-D/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Vegetable, Root and Tuber, Group 1" group.		
	2. European Union does not maintain a specific MRL for the 2,4-D/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		
	US 3	Cod	EU 4
Acetamiprid	0.01	---	0.1
	3. United States does not maintain a specific MRL for the Acetamiprid/Ginger combination, but does maintain an MRL of 0.01 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	4. European Union does not maintain a specific MRL for the Acetamiprid/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		
	US 5	Cod	EU 6
Azoxystrobin	0.03	---	0.1
	5. United States does not maintain a specific MRL for the Azoxystrobin/Ginger combination, but does maintain an MRL of 0.03 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	6. European Union does not maintain a specific MRL for the Azoxystrobin/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		
	US 7	Cod	EU
Beta-cyfluthrin	0.01	---	---
	7. United States does not maintain a specific MRL for the Beta-cyfluthrin/Ginger combination, but does maintain an MRL of 0.01 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	US	Cod	EU
Bifenazate	0.1	---	---
	US 8	Cod	EU 9
Bifenthrin	0.05	---	0.1
	8. United States does not maintain a specific MRL for the Bifenthrin/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	9. European Union does not maintain a specific MRL for the Bifenthrin/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		
	US 10	Cod	EU 11
Boscalid	0.05	---	0.5
	10. United States does not maintain a specific MRL for the Boscalid/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	11. European Union does not maintain a specific MRL for the Boscalid/Ginger combination, but does maintain an MRL of 0.5 PPM for its "Spices" group.		
	US 12	Cod	EU 13
Captan	0.05	---	0.05
	12. United States does not maintain a specific MRL for the Captan/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Vegetable, Root and Tuber, Group 1" group.		
	13. European Union does not maintain a specific MRL for the Captan/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Spices" group.		

	US 14	Cod	EU 15
Carbaryl	2	---	{0.1}
	14. United States does not maintain a specific MRL for the Carbaryl/Ginger combination, but does maintain an MRL of 2 PPM for its "Vegetable, Root and Tuber, Group 1" group.		
	15. European Union does not maintain a specific MRL for the Carbaryl/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		
	US 16	Cod	EU 17
Carfentrazone-ethyl	0.1	---	{0.02}
	16. United States does not maintain a specific MRL for the Carfentrazone-ethyl/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Vegetable, Root and Tuber, Group 1" group.		
	17. European Union does not maintain a specific MRL for the Carfentrazone-ethyl/Ginger combination, but does maintain an MRL of 0.02 PPM for its "Spices" group.		
	US	Cod	EU 18
Clethodim	1	---	{0.1}
	18. European Union does not maintain a specific MRL for the Clethodim/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		
	US 19	Cod	EU 20
Clomazone	0.05	---	{0.02}
	19. United States does not maintain a specific MRL for the Clomazone/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Vegetable, Tuberos and Corm, Except Potato, Subgroup 1D" group.		
	20. European Union does not maintain a specific MRL for the Clomazone/Ginger combination, but does maintain an MRL of 0.02 PPM for its "Spices" group.		
	US 21	Cod	EU 22
Cyfluthrin	0.01	---	0.1
	21. United States does not maintain a specific MRL for the Cyfluthrin/Ginger combination, but does maintain an MRL of 0.01 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	22. European Union does not maintain a specific MRL for the Cyfluthrin/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		
	US	Cod	EU 23
Deltamethrin	0.04	---	0.05
	23. European Union does not maintain a specific MRL for the Deltamethrin/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Spices" group.		
	US	Cod	EU 24
Difenoconazole	0.01	---	0.3
	24. European Union does not maintain a specific MRL for the Difenoconazole/Ginger combination, but does maintain an MRL of 0.3 PPM for its "Spices" group.		
	US 25	Cod	EU 26
Dimethenamid	0.01	---	0.02
	25. United States does not maintain a specific MRL for the Dimethenamid/Ginger combination, but does maintain an MRL of 0.01 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	26. European Union does not maintain a specific MRL for the Dimethenamid/Ginger combination, but does maintain an MRL of 0.02 PPM for its "Spices" group.		
	US 27	Cod	EU 28
Fenamidone	0.02	---	0.05
	27. United States does not maintain a specific MRL for the Fenamidone/Ginger combination, but does maintain an MRL of 0.02 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	28. European Union does not maintain a specific MRL for the Fenamidone/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Spices" group.		
	US 29	Cod	EU 30
Flonicamid	0.2	---	{0.05}
	29. United States does not maintain a specific MRL for the Flonicamid/Ginger combination, but does maintain an MRL of 0.2 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	30. European Union does not maintain a specific MRL for the Flonicamid/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Spices" group.		
	US 31	Cod	EU 32
Fludioxonil	3.5	---	{0.05}
	31. United States does not maintain a specific MRL for the Fludioxonil/Ginger combination, but does maintain an MRL of 3.5 PPM for its "Vegetable, Tuberos and Corm, Except Potato, Subgroup 1D" group.		

	32. European Union does not maintain a specific MRL for the Fludioxonil/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Spices" group.		
	US	Cod	EU 33
Flumioxazin	0.02	---	0.1
	33. European Union does not maintain a specific MRL for the Flumioxazin/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		
	US 34	Cod	EU 35
Fluopicolide	0.02	---	0.02
	34. United States does not maintain a specific MRL for the Fluopicolide/Ginger combination, but does maintain an MRL of 0.02 PPM for its "Vegetable, Tuberos and Corm, Except Potato, Subgroup 1D" group.		
	35. European Union does not maintain a specific MRL for the Fluopicolide/Ginger combination, but does maintain an MRL of 0.02 PPM for its "Spices" group.		
	US	Cod	EU 36
Fluoride	70	---	{5}
	36. European Union does not maintain a specific MRL for the Fluoride/Ginger combination, but does maintain an MRL of 5 PPM for its "Spices" group.		
	US	Cod	EU 37
Fluoxastrobin	0.01	---	0.1
	37. European Union does not maintain a specific MRL for the Fluoxastrobin/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		
	US 38	Cod	EU 39
Glyphosate	0.2	---	{0.1}
	38. United States does not maintain a specific MRL for the Glyphosate/Ginger combination, but does maintain an MRL of 0.2 PPM for its "Vegetable, Root and Tuber, Group 1" group.		
	39. European Union does not maintain a specific MRL for the Glyphosate/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		
	US 40	Cod	EU 41
Imidacloprid	0.4	---	{0.05}
	40. United States does not maintain a specific MRL for the Imidacloprid/Ginger combination, but does maintain an MRL of 0.4 PPM for its "Vegetable, Root and Tuber, Group 1" group.		
	41. European Union does not maintain a specific MRL for the Imidacloprid/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Spices" group.		
	US	Cod	EU 42
Indoxacarb	0.01	---	0.05
	42. European Union does not maintain a specific MRL for the Indoxacarb/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Spices" group.		
	US	Cod 43	EU 44
	100	400	400
Inorganic bromide resulting from fumigation	43. Codex does not maintain a specific MRL for the Inorganic bromide resulting from fumigation/Ginger combination, but does maintain an MRL of 400 PPM for its "Spices" group.		
	44. European Union does not maintain a specific MRL for the Inorganic bromide resulting from fumigation/Ginger combination, but does maintain an MRL of 400 PPM for its "Spices" group.		
	US 45	Cod	EU 46
Lambda Cyhalothrin	0.02	---	0.05
	45. United States does not maintain a specific MRL for the Lambda Cyhalothrin/Ginger combination, but does maintain an MRL of 0.02 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	46. European Union does not maintain a specific MRL for the Lambda Cyhalothrin/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Spices" group.		
	US 47	Cod	EU 48
Mandipropamid	0.01	---	0.02
	47. United States does not maintain a specific MRL for the Mandipropamid/Ginger combination, but does maintain an MRL of 0.01 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	48. European Union does not maintain a specific MRL for the Mandipropamid/Ginger combination, but does maintain an MRL of 0.02 PPM for its "Spices" group.		
	US 49	Cod	EU 50
Metalaxyl	0.5	---	{0.1}
	49. United States does not maintain a specific MRL for the Metalaxyl/Ginger combination, but does maintain an MRL of 0.5 PPM for its "Vegetable, Root and Tuber, Group 1" group.		
	50. European Union does not maintain a specific MRL for the Metalaxyl/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		

	US 51	Cod	EU 52
Methoxyfenozide	0.02	---	0.05
	51. United States does not maintain a specific MRL for the Methoxyfenozide/Ginger combination, but does maintain an MRL of 0.02 PPM for its "Vegetable, Tuberos and Corm, Except Potato, Subgroup 1D" group.		
	52. European Union does not maintain a specific MRL for the Methoxyfenozide/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Spices" group.		
	US 53	Cod	EU 54
Novaluron	0.05	---	{0.01}
	53. United States does not maintain a specific MRL for the Novaluron/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	54. European Union does not maintain a specific MRL for the Novaluron/Ginger combination, but does maintain an MRL of 0.01 PPM for its "Spices" group.		
	US 55	Cod	EU 56
Oxamyl	0.1	---	{0.02}
	55. United States does not maintain a specific MRL for the Oxamyl/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	56. European Union does not maintain a specific MRL for the Oxamyl/Ginger combination, but does maintain an MRL of 0.02 PPM for its "Spices" group.		
	US	Cod	EU 57
Paraquat dichloride	0.1	---	{0.05}
	57. European Union does not maintain a specific MRL for the Paraquat dichloride/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Spices" group.		
	US 58	Cod	EU 59
Pymetrozine	0.02	---	0.1
	58. United States does not maintain a specific MRL for the Pymetrozine/Ginger combination, but does maintain an MRL of 0.02 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	59. European Union does not maintain a specific MRL for the Pymetrozine/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		
	US 60	Cod	EU 61
Pyraclostrobin	0.04	---	0.05
	60. United States does not maintain a specific MRL for the Pyraclostrobin/Ginger combination, but does maintain an MRL of 0.04 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	61. European Union does not maintain a specific MRL for the Pyraclostrobin/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Spices" group.		
	US 62	Cod	EU 63
Pyrimethanil	0.05	---	0.1
	62. United States does not maintain a specific MRL for the Pyrimethanil/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	63. European Union does not maintain a specific MRL for the Pyrimethanil/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		
	US 64	Cod	EU 65
Pyriproxyfen	0.15	---	{0.05}
	64. United States does not maintain a specific MRL for the Pyriproxyfen/Ginger combination, but does maintain an MRL of 0.15 PPM for its "Vegetable, Root and Tuber, Group 1" group.		
	65. European Union does not maintain a specific MRL for the Pyriproxyfen/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Spices" group.		
	US 66	Cod	EU 67
S-metolachlor	0.2	---	{0.1}
	66. United States does not maintain a specific MRL for the S-metolachlor/Ginger combination, but does maintain an MRL of 0.2 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	67. European Union does not maintain a specific MRL for the S-metolachlor/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		
	US 68	Cod	EU 69
Sethoxydim	4	---	{0.1}
	68. United States does not maintain a specific MRL for the Sethoxydim/Ginger combination, but does maintain an MRL of 4 PPM for its "Vegetable, Root and Tuber, Group 1" group.		
	69. European Union does not maintain a specific MRL for the Sethoxydim/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		

	US 70	Cod	EU 71
Spinetoram	0.1	---	0.1
	70. United States does not maintain a specific MRL for the Spinetoram/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Vegetable, Root and Tuber, Group 1" group.		
	71. European Union does not maintain a specific MRL for the Spinetoram/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		
	US 72	Cod	EU 73
Spinosad	0.1	---	{0.02}
	72. United States does not maintain a specific MRL for the Spinosad/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Vegetable, Root and Tuber, Group 1" group.		
	73. European Union does not maintain a specific MRL for the Spinosad/Ginger combination, but does maintain an MRL of 0.02 PPM for its "Roots or rhizome" group.		
	US 74	Cod	EU 75
Spiromesifen	0.02	---	0.02
	74. United States does not maintain a specific MRL for the Spiromesifen/Ginger combination, but does maintain an MRL of 0.02 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	75. European Union does not maintain a specific MRL for the Spiromesifen/Ginger combination, but does maintain an MRL of 0.02 PPM for its "Roots or rhizome" group.		
	US 76	Cod	EU 77
Spirotetramat	0.6	---	{0.1}
	76. United States does not maintain a specific MRL for the Spirotetramat/Ginger combination, but does maintain an MRL of 0.6 PPM for its "Vegetable, Tuberos and Corm, Subgroup 1C" group.		
	77. European Union does not maintain a specific MRL for the Spirotetramat/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		
	US	Cod	EU 78
Sulfuryl fluoride	0.5	---	{0.02}
	78. European Union does not maintain a specific MRL for the Sulfuryl fluoride/Ginger combination, but does maintain an MRL of 0.02 PPM for its "Spices" group.		
	US 79	Cod	EU 80
Tebufenozide	0.015	---	1
	79. United States does not maintain a specific MRL for the Tebufenozide/Ginger combination, but does maintain an MRL of 0.015 PPM for its "Vegetable, Tuberos and Corm, Except Potato, Subgroup 1D" group.		
	80. European Union does not maintain a specific MRL for the Tebufenozide/Ginger combination, but does maintain an MRL of 1 PPM for its "Spices" group.		
	US 81	Cod	EU 82
Thiamethoxam	0.02	---	0.05
	81. United States does not maintain a specific MRL for the Thiamethoxam/Ginger combination, but does maintain an MRL of 0.02 PPM for its "Vegetable, Tuberos and Corm, Except Potato, Subgroup 1D" group.		
	82. European Union does not maintain a specific MRL for the Thiamethoxam/Ginger combination, but does maintain an MRL of 0.05 PPM for its "Spices" group.		
	US	Cod	EU 83
Trifluralin	0.05	---	0.1
	83. European Union does not maintain a specific MRL for the Trifluralin/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Spices" group.		
	US 84	Cod	EU 85
Zeta-Cypermethrin	0.1	---	0.2
	84. United States does not maintain a specific MRL for the Zeta-Cypermethrin/Ginger combination, but does maintain an MRL of 0.1 PPM for its "Vegetable, Root and Tuber, Group 1" group.		
	85. European Union does not maintain a specific MRL for the Zeta-Cypermethrin/Ginger combination, but does maintain an MRL of 0.2 PPM for its "Roots or rhizome" group.		

Draft for comments only — Not to be cited as East African Standard