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DRAFT EAST AFRICAN STANDARD

Processed edible cultivated edible mushrooms — Specification

EAST AFRICAN COMMUNITY

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Contents

Page

| | |
|------------------------------------|----|
| Foreword | iv |
| 1 Scope | 1 |
| 2 Normative references | 1 |
| 3 Terms and definitions | 1 |
| 4 Requirements | 3 |
| 4.1 General requirements | 3 |
| 4.1.1 Raw materials | 4 |
| 4.1.5 Mushrooms Styles | 4 |
| 4.1.6 Other mushrooms styles | 4 |
| 4.1.7 Composition | 4 |
| 4.2 Specific requirements | 4 |
| 5 Food additives | 6 |
| 6 Hygiene | 6 |
| 7 Contaminants | 6 |
| 7.1 Pesticide residues | 6 |
| 7.2 Heavy metals | 6 |
| 7.3 Mycotoxins | 6 |
| 8 Sampling | 7 |
| 9 Packaging | 7 |
| 10 Labelling | 7 |
| Bibliography | 8 |

Foreword

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

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. 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 Principles and procedures for development of East African Standards.

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.

The committee responsible for this document is Technical Committee EASC/TC 016/02, *Processed and fruits and vegetable products*.

Attention is drawn to the possibility that some of the elements of this document may be subject of patent rights. EAC shall not be held responsible for identifying any or all such patent rights.

Processed cultivated edible mushrooms — Specification

1 Scope

This draft East Africa Standard specifies the requirements, sampling and test methods for processed cultivated edible mushrooms intended for human consumption or for other use in the food industry.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

CODEX STAN 192, *Food — Permitted food additives — Schedule*

EAS 38, *Labelling of pre-packaged foods — General requirements*

ISO 948, *Spices and condiments — Sampling*

ISO 2447, *Fruit and vegetable products — Determination of tin*

ISO 4833-1, *Microbiology of the food chain — Horizontal method for the enumeration of microorganisms — Part 1: Colony count at 30 degrees C by the pour plate technique*

ISO 4833-2, *Microbiology of the food chain — Horizontal method for the enumeration of microorganisms — Part 2: Colony count at 30 degrees C by the surface plating technique*

ISO 6633, *Fruits, vegetables and derived products — Determination of lead content — Flameless atomic absorption spectrometric method*

ISO 6579, *Microbiology of food and animal feeding stuffs — Horizontal methods for the detection of Salmonella spp.*

ISO 16649-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of beta-glucuronidase-positive Escherichia coli — Part 2: Colony-count technique at 44 degrees C using 5-bromo-4-chloro-3-indolyl beta-D-glucuronide*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1 cultivated edible mushrooms
Fruit bodies of the fungi group which are domesticated as opposed to those which grow naturally and are suitable for use as human food.

3.2 processed mushrooms
mushrooms (3.1) processed in several forms i.e. Dried, salted, fermented, mushrooms in plant oils(preserve), quick frozen, canned, mushroom extracts, mushroom concentrate, smoked

3.3 freeze dried mushrooms
Mushrooms obtained by low temperature dehydration that involve freezing the product and lowering the pressure and removing the ice by sublimation under vacuum

3.4 dried mushrooms
mushrooms obtained by drying of edible mushrooms of one species, either whole or sliced

3.5 mushroom grits
coarsely ground dried edible mushrooms of one species

3.6 mushroom powder
dried edible mushroom of one species ground so finely as to allow the powder to pass through a sieve having a 200-micron mesh.

3.7 salted mushrooms
fresh edible mushrooms of one species, either whole or sliced, preserved in brine after previous cleaning, washing and blanching

3.8 fermented mushrooms
fresh edible mushrooms of one species preserved by salt and by lactic acid fermentation

3.9 quick frozen mushrooms
fresh edible mushrooms of one species which, after cleaning, washing and blanching are subjected to a freezing process in appropriate equipment and comply with the conditions laid down hereafter in this section and in clause 4.9.4 of this Tanzania Standard. This freezing operation shall be carried out in such a way that the range of temperature of maximum crystallization is passed quickly. The quick-freezing process shall not be regarded as complete unless and until the product temperature has reached -18 °C (0°F) at the thermal centre after thermal stabilization.

3.10 mushroom extract/concentrate
products concentrated from fresh or dried edible mushroom juice of one or more mushroom species with the addition of salt and which is concentrated to 7 % of salt less extract

3.11 dried mushroom concentrate
the dried product obtained from mushroom extract or mushroom concentrate.

3.12**sterilized mushroom**

edible mushroom, fresh, salted or frozen, of one or more species, whole or sliced, packed in air tight containers in water and salt, and heat treated to a degree guaranteeing the resistance of the product to spoilage.

3.13**mushroom in olive oil and other plant oils**

Edible mushrooms either fresh or previously salted, of one species, whole or sliced, packed in airtight containers in olive oil or other plant oil and heat treated to a degree guaranteeing the resistance of the product to spoilage.

3.14**whole dried mushroom**

the product obtained from whole cleaned and dried edible mushrooms

3.15**Whole caps without stems**

The product obtained from whole caps with their stems having been removed

3.16**cut dried mushrooms**

mushrooms obtained from whole edible mushrooms sliced and dried; the thickness of the individual slices being 1-4 mm

3.17**damaged mushroom**

mushroom with more than quarter of the cap missing

3.18**carbonized mushrooms**

whole or dried mushrooms with traces of carbonization on their surface

3.19**maggot damaged mushrooms**

mushrooms having holes caused by maggots

3.20**organic impurities**

admixture of other edible mushrooms, parts of plants such as leaves and other tree stalks.

3.21**insect damaged mushrooms**

mushroom that have holes caused by insects.

3.22**spoiled mushrooms**

mushrooms which are brownish or rotten as a result of attack by mould and other micro-organisms

4 Requirements

4.1 General requirements

Processed mushrooms shall include a wide range of products specified under sub clause 3.2; and their form being described as provided under their definition in clause 3

4.1.1 Raw materials

Only fresh edible mushrooms which have been treated or processed immediately after they have been picked before deterioration sets in shall be used in the preparation of processed mushrooms. Both the raw and preserved mushroom shall be healthy clean, undamaged, free as practicable of maggots and other insect damages and shall possess the flavour and taste characteristic to the species.

4.1.2 The only permitted ingredient in mushroom extract, mushroom concentrate and dried mushroom concentrate is salt as sodium chloride. Other mushroom products may contain salt (sodium chloride), vinegar, spices and herbs, sugars, refined edible plant oil, butter, milk, milk powder, cream water and wine.

4.1.3 All processed edible mushrooms shall be safe and of good quality but not limited to the following species:

- a) White mushrooms or common mushrooms and brown mushrooms (*Portabellas and criminis*) of the *Agaricus spp*)
- b) Shiitake mushrooms (*Lentinula edodes*)
- c) Oyster mushrooms (*Pleurotus ostreatus*)
- d) Enoki mushrooms (*Flammulina velutipes*)
- e) Maitake mushrooms (*Grifola frondosa*)
- f) Beech mushrooms (*Hypsizygyus tesellatus*)

4.1.4 For all categories of mushrooms described in 4.1, shall in all cases be free from toxic ingredients; and shall not be a mixture of more than one species, unless clearly labelled as specified in clause 9.2.1(a).

4.1.5 Mushrooms Styles

Processed mushrooms may be presented in various styles, e.g. whole with stalks, whole caps (buttons) without stalks, slices, pieces and stalks, grits, powder or concentrate.

4.1.6 Other mushrooms styles

Any other presentation of the product shall be permitted provided that the product is sufficiently distinctive from other forms of presentations described in this standard and meet the requirements of this standard. Also such product shall be adequately described on the label to avoid confusing or misleading the consumer.

4.1.7 Composition

Except in the case processed mushrooms consisting entirely of caps or where the addition of stalks is stated on the label as provided under 9.2.a (i) the number of stalks shall not exceed the number of caps.

4.2 Specific requirements

Dried mushrooms shall conform to the requirements set in table 1 below when tested with the test method specified therein.

Table 1 — Chemical and physical requirements for processed edible mushrooms

| Type of processed mushroom | Requirements | | | | |
|--|------------------------------------|----------------------|--------------------------------|---------------------------------|---|
| | Salt (sodium chloride) % m/m, max. | Moisture % m/m, max. | Acid insoluble ash,% m/m, max. | Organic impurities,% m/m, max.* | Maggot and other pest damaged mushroom % m/m, max.* |
| Dried (other than freeze dried) | N/A | 12 | 0.2 | 0.02 | 1.0 |
| Freeze dried | N/A | 6 | 0.2 | 0.02 | 1.0 |
| Dried Shiitake (other than freeze dried) | N/A | 13 | 0.2 | 1.0 | 1.0 |
| Mushroom grits | N/A | 13 | - | - | N/A |
| Mushroom powder | - | 9 | 0.2 | - | N/A |
| Fermented mushrooms | 3 - 6 | N/A | 0.2 | 0.1 | - |
| Quick frozen | - | - | 0.2 | 0.02 | 2.0 |
| Mushroom in olive oil and other plant oils | 1.0 | - | 0.1 | 0.02 | 2.0 |
| Salted mushrooms | 15-18 | - | 0.3 | 0.03 | - |
| Canned mushrooms | ≤ 2 | - | 0.2 | 0.02 | 1.0 |
| Mushroom extract and mushroom concentrate | 20.0 | N/A | - | NIL | N/A |
| Dried mushroom concentrate | 5.0 | - | NIL | NIL | 9.0 |
| Test method | AOAC 971.27 | ISO 1026 | ISO 763 | | |
| * Organic impurities, maggot and other pest damaged mushrooms shall be determined by normal count under normal vision of a naked eye or by magnifying lense of X10, if necessary | | | | | |

5 Food additives

Food additives when used in processed edible mushrooms shall be in accordance with CODEX STAN 192.

6 Hygiene

6.1 Processed mushrooms shall be produced, prepared and handled under hygienic conditions in accordance with EAS 39.

6.2 Processed mushrooms shall comply with microbiological limits given in table 2 when tested in accordance with the methods specified therein.

Table 2 — Microbiological limits

| S/No. | Type of microorganisms | Limits | Test method |
|-------|---|-----------------|-------------|
| i) | Total plate count, cfu/g max | 1×10^3 | ISO 4833 |
| ii) | Coliforms, Cfu/g | <10 | ISO 4832 |
| iii) | <i>Staphylococcus aureus</i> , cfu/ g max | 1×10^1 | ISO 6888-1 |
| iv) | Salmonella, 25 g | Absent | ISO 6579 |
| v) | <i>E-coli</i> , cfu/ g | Absent | ISO 16649-2 |

7 Contaminants

7.1 Pesticide residues

Processed mushrooms shall comply with the pesticide residue limits prescribed by the Codex Alimentarius Commission of the respective commodity.

7.2 Heavy metals

Processed mushrooms shall not contain heavy metal contaminants in excess of the limits specified in Table 3 when tested in accordance with the methods specified therein.

7.3 Mycotoxins

Processed mushrooms shall not contain mycotoxins exceeding 5 ppb for aflatoxin B1 and 10 ppb for total aflatoxins (B1, B2, G1, and G2) when tested in accordance with ISO 16050.

Table 3 – Limits for metal contaminants

| S/N | Heavy metal | Maximum limit mg/kg | Test method |
|-----|-------------|------------------------|-------------|
| i. | Tin (Sn) | 250 | ISO 2447 |
| ii. | Lead (Pb) | 0.1 | ISO 6633 |

8 Sampling

Sampling shall be done in accordance with ISO 948.

9 Packaging

Processed mushroom shall be packaged in food grade material that ensures the integrity and safety of the product.

10 Labelling

In addition to the requirements of EAS 38, the following specific labelling requirements shall apply and shall be legibly and indelibly marked:

- a) The name of the product
 - i) The name of the product shall comply with the definitions and other requirements of this Standard with a designation that shall indicate the true nature. The genus such as *Agaricus* shall be provided including its scientific name of the species. The method of processing to which the product has been subjected shall be included e.g. “dried, sterilized, salted, and fermented”.
 - ii) In the case of processed mushrooms consisting of more than one species, such fact as “mixed” shall form part of the designation; including the style as per clause 4.1.5 and 4.1.6.
- b) List of ingredients in descending order of proportion except for the dried mushrooms.
- c) Name, physical and postal address of the producer/packer or distributor.
- d) Country of origin, district and region
- e) Net mass in SI units
- f) Batch number in code or in clear
- g) Brand or trade mark, if any.
- h) Storage condition
- i) Instruction for use
- j) Date of production and expiry

Bibliography

- [1] ISO #####-#, *General title — Part #: Title of part*
- [2] ISO #####-##:20##, *General title — Part ##: Title of part*

