

KENYA STANDARD

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ICS 67.120

First Edition

Edible insects — Specification

Part 1:

Edible insects' products

TECHNICAL COMMITTEE REPRESENTATION

The following organizations were represented on the Technical Committee:

Aga Khan University Hospital, Nairobi
Egerton University — Department of Human Nutrition
Government Chemist's Department
International Centre of Insect Physiology and Ecology
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Kensalt Ltd.
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Ministry of Health — Division of Food Safety and Quality
Ministry of Health — Division of Nutrition and Dietetics
National Public Health Laboratory
Nestle Kenya Ltd.
Total Lifestyle Change Ltd.
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Kenya Bureau of Standards — Secretariat

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Foreword

This Kenya Standard was prepared by the Nutrition and Foods for Special Dietary Uses Technical Committee under the guidance of the Standards Projects Committee, and it is in accordance with the procedures of the Kenya Bureau of Standards

There is increased demand to seek alternative sources of nutritious products to supplement existing traditional sources of nutrients such as meat, fruits, cereals and legumes. This is mainly due to decreased agricultural output of this products, increase of population, reduced agricultural land, rural-urban migration among other reasons. Recent scientific evidences are pointing at the great unexploited potential that edible insects possess in contributing to the overall food security and nutrition. There is a lot of innovation currently going on to introduce edible insects as alternative nutrient enhancing ingredients to existing food products. It is against this emerging trend that this standard was developed to particularly provide a basis of assuring the general safety and quality of edible insects' products. The standards address itself to parameters that are directly related to safety and quality of the products such as moisture contents which has an effect on keeping quality of the products, heavy metal and microbiological contaminations owing to susceptibility of the insects to contaminations as well as offering guidance to packaging and labelling.

During the preparation of this standard reference was made to the following documents:

FAO 2013: Edible insects future prospects for food and feed security, FAO, Rome.

IPIFF Guide on Good Hygiene Practices for European Union of insects as food and feed.

US 2146:2019 Edible insects – Specification.

Rumpold, Birgit & Schlüter, Oliver (2015), Insect-based protein sources and their potential for human consumption: Nutritional composition and processing, Animal Frontiers. 5. 20-24. 10.2527/af.2015-0015.

Acknowledgement is hereby made for the assistance derived from these sources.

Edible insects — Specification — Part 1: Edible insects' products

1 Scope

This Kenya Standard specifies the requirements, sampling and test methods for edible insects' products intended for human consumption.

2 Normative references

The following referenced 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.

KS 2921, *Primary production of insects for food and feed — Code of practice*

KS CODEX STAN 192, *Codex General standard for food additives*

KS EAS 38, *Labelling of prepackaged foods — General requirements*

KS EAS 39, *Hygiene in the food and drink manufacturing industry — Code of practice*

KS EAS 804, *Claims on food — General requirements*

KS EAS 805, *Use of nutrition and health claims — Requirements*

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

KS ISO 5983-1, *Animal feeding stuffs — Determination of nitrogen content and calculation of crude protein content — Part 1: Kjeldahl method*

KS ISO 5985, *Animal feeding stuffs — Determination of ash insoluble in hydrochloric acid*

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

KS ISO 6496, *Animal feeding stuffs — Determination of moisture and other volatile matter content*

KS ISO 6579-1, *Microbiology of the food chain — Horizontal method for the detection, enumeration and serotyping of Salmonella — Part 1: Detection of Salmonella spp*

KS ISO 6888-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (staphylococcus Aureus and other species) — Part 1: Technique using baird-pac*

KS ISO 10272-1, *Microbiology of the food chain-Horizontal method for detection and enumeration of Campylobacter spp.— Part 1:Detection method*

KS ISO 11290-2, *Microbiology of the food chain — Horizontal method for the detection and enumeration of Listeria monocytogenes and of Listeria spp. — Part 2: Enumeration method*

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KS ISO 16649-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of B-glucuronidase-positive Escherichia coli — Part 1: Colony-count technique at 44 using membranes and 5-bromo-4*

KS ISO 13547-2, *Copper, lead, zinc and nickel sulphide concentrates — Determination of arsenic Part 2: Acid digestion and inductively coupled plasma atomic emission spectrometric method*

KS ISO 21527-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of yeasts and moulds — Part 2: Colony count technique in products with water activity less than or equal to 0,95*

KS ISO 22964, *Microbiology of the food chain — Horizontal method for the detection of Cronobacter spp.*

KS ISO 27085, *Animal feeding stuffs — Determination of calcium, sodium, phosphorus, magnesium, potassium, iron, zinc, copper, manganese, cobalt, molybdenum, arsenic, lead and cadmium by ICP-AES*

3 Terms and definitions

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

3.1 edible insect product
product that has been processed from edible insects harvested either from domesticated farms or from the wild. the product may be presented in the form of whole insect, milled, paste, liquid/aqueous or in powder form

3.2 whole insect product
an edible insect product either whole or where some inedible parts of the insects such as wings, gut hair have been removed during or after drying

3.3 powdered insect product
particulate product of dried insects that is achieved by milling or grinding dry whole insect product

4 Requirements

4.1 General requirements

4.1.1 Edible insects intended to be processed into dried edible insect products shall be to the minimum harvested and processed in accordance with KS 2921. Where the insects are farmed, they shall comply fully to KS 2921.

4.1.2 Edible insects' products shall be:

- a) presented in either whole or granulated or powder form and either fried or dried;
- b) free from adulterants, extraneous material and objectionable odour; and
- c) free from infestation and contamination from pests.

4.2 Specific requirements

Edible insects' products shall comply with the specific requirements given in Table 1, when tested in accordance with the test methods given therein.

Table 1 — Requirements for edible insects' products

S/N	Parameter	Limit	Test method
i.	Moisture content, % m/m, max.	12	KS ISO 6496
ii.	Protein content % m/m, min.	15	KS ISO 5983-1
iii.	Acid insoluble ash, % m/m, max.	1	KS ISO 5985

5 Optional ingredients

Edible insect products may contain other approved food ingredients to enhance flavour and palatability such as edible salt, seasonings and herbs complying with relevant Kenya Standards.

6 Food additives

Only permitted food additives in accordance with KS CODEX STAN 192 for similar products may be used.

7 Hygiene

7.1 The edible insects' products shall be prepared and packaged in premises built and maintained under hygienic conditions in accordance with the Public Health Act, Cap. 242, the Food Drugs and Chemicals Substances Act, Cap. 254 of the Laws of Kenya and KS EAS 39.

7.2 Edible insects' products shall be free from any pathogenic microorganism and shall in particular comply with the microbiological requirements indicated in Table 2, when tested in accordance with the test methods specified therein.

Table 2 — Microbiological limits for edible insect' products

S/N	Type of micro-organism	Maximum number of counts	Test method
i.	Total Aerobic Counts at 30 °C, CFU/g	10 ⁵	KS ISO 4833-1
ii.	<i>Salmonella</i> in 25 g	Shall be absent	KS ISO 6579-1
iii.	<i>E. Coli</i> , CFU/g	Less than 10 ^a	KS ISO 16649-2
iv.	<i>Coagulase positive Staphylococci aureas</i> CFU/g	Less than 10	KS ISO 6888-1
v.	<i>Listeria monocytogenes</i> , CFU/25 g	Absent	KS ISO 11290-2
vi.	<i>Cronobacter spp. (Enterobacter sakazakii)</i> CFU/10 g	Absent	KS ISO 22964
vii.	<i>Campylobacter</i> , CFU/25 g	Absent	KS ISO 10272-1
viii.	Yeast and moulds, CFU/g	10 ²	KS ISO 21527-2

^a For ready to use. Products that will require further processing before consumption as per the direction of use a maximum of 10² shall apply.

8 Contaminants

8.1 Heavy metal contaminants

Edible insect' products shall not contain heavy metal contaminants in amounts established under WHO or FAO to cause adverse effect to health and in particular, shall comply with the limits indicated in Table 3, when tested in accordance with the test methods specified therein.

Table 3 — Limits for heavy metal contaminants for edible insects' products

S/N	Contaminant	Max. limit, mg/kg	Test method
i.	Lead (Pb)	0.5	KS ISO 6633
ii.	Arsenic (Ar)	0.1	KS ISO 13547-2
iii.	Cadmium	0.4	KS ISO 27085

8.2 Mycotoxins

Edible insects' products shall have a maximum of 10 µg/kg of total aflatoxin and a maximum of 5 µg/ kg of Aflatoxin B₁.

9 Packaging

9.1 The edible insects' products shall be packaged in food grade materials that shall ensure the safety and integrity of the product throughout the shelf life.

9.2 The fill of the container shall be in accordance with the Weights and Measures Act, Cap. 513 of the Laws of Kenya.

10 Labelling

10.1 In addition to the labelling requirements of KS EAS 38, the label shall include the following information:

- a) name of the product shall be either 'Dried whole insect' or 'Dried powdered insects' or 'Dried milled insects' or 'Fried insect products' or 'Grinded/ground insect products';
- b) declare the insect by common name and biological name in brackets;
- c) direction for use of the product; and
- d) storage instructions.

10.2 Any health and/or nutrition claim on edible insect' products shall comply with the provisions of KS EAS 804 and KS EAS 805.

Annex A (informative)

Potential species for production of edible insect products

As a guide, the latest publication of *the list of edible insects of the world* as compiled and published by Wageningen University web portal (<https://www.wur.nl/en/Research-Results/Chair-groups/Plant-Sciences/Laboratory-of-Entomology/Edible-insects/Worldwide-species-list.htm>) may be used to guide on the potential species. Compendium (s) developed, validated and published by national research centres and local universities may also be used as a reference. Where a local list has been developed it shall be preferred.

