

# DRAFT UGANDA STANDARD

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## Dried insect products for compounding animal feeds — Specification

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## Foreword

Uganda National Bureau of Standards (UNBS) is a parastatal under the Ministry of Trade, Industry and Cooperatives established under Cap 327, of the Laws of Uganda, as amended. UNBS is mandated to coordinate the elaboration of standards and is

- (a) a member of International Organisation for Standardisation (ISO) and
- (b) a contact point for the WHO/FAO Codex Alimentarius Commission on Food Standards, and
- (c) the National Enquiry Point on TBT Agreement of the World Trade Organisation (WTO).

The work of preparing Uganda Standards is carried out through Technical Committees. A Technical Committee is established to deliberate on standards in a given field or area and consists of key stakeholders including government, academia, consumer groups, private sector and other interested parties.

Draft Uganda Standards adopted by the Technical Committee are widely circulated to stakeholders and the general public for comments. The committee reviews the comments before recommending the draft standards for approval and declaration as Uganda Standards by the National Standards Council.

The committee responsible for this document is Technical Committee UNBS/TC2, *[Food and Agriculture]*, Subcommittee SC 9, *[animal feed and feeding stuff]*.

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# Dried insect products for compounding animal feeds — Specification

## 1 Scope

This Uganda Standard specifies the requirements, sampling and test methods for dried insect products for compounding animal feeds.

## 2 Normative references

The following referenced documents 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.

CAC/RCP 54, Code of practice for good animal feeding

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

US ISO 5984, *Animal feeding stuffs — Determination of crude ash*

US ISO 6492, *Animal feeding stuffs — Determination of fat content*

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

US ISO 6497, *Animal feeding stuffs — Sampling*

US ISO 6498, *Animal feeding stuffs — Preparation of test samples*

US ISO 6869, *Animal feeding stuffs — Determination of the contents of calcium, copper, iron, magnesium, manganese, potassium, sodium and zinc — Method using atomic absorption spectrometry*

US ISO 6888-3:2003, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 3: Detection and MPN technique for low numbers*

ISO 17375, *Animal feeding stuffs — Determination of aflatoxin B1*

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

US ISO 6865, *Animal feeding stuffs -- Determination of crude fibre content -- Method with intermediate filtration*

US ISO 5984, *Animal feeding stuffs -- Determination of crude ash*

US ISO 5985, *Animal feeding stuffs -- Determination of ash insoluble in hydrochloric acid*

US ISO 6490-1, *Animal feeding stuffs -- Determination of calcium content -- Part 1: Titrimetric method*

US ISO 6491, *Animal feeding stuffs -- Determination of phosphorus content -- Spectrometric method*

US ISO 5510, *Animal feeding stuffs -- Determination of available lysine*

ISO 13903, *Animal feeding stuffs -- Determination of amino acids content*

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 4831, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of coliforms —part 2 most probable number technique*

ISO 7251:2005, *Microbiology of food and animal feeding stuffs -- Horizontal method for the detection and enumeration of presumptive Escherichia coli -- Most probable number technique*

ISO 6579, *Microbiology of food and animal feeding stuffs — Part 6: Horizontal method for the detection of Salmonellaspp.*

ISO 16654, *Microbiology of food and animal feeding stuffs -- Horizontal method for the detection of Escherichia coli O157*

### 3 Terms and definitions

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

**3.1 Dried insect products —**  
include nymphal, larval, pupal stages and/or adult insects or processed insect material for use as an animal feed ingredient.

**3.1.1 Whole insects**  
insect material presented in their natural form after primary processing to minimize microbiological contamination and moisture.

**3.1.2 Ground insect product—**  
insect material presented as meal, pellets or crumbs after primary processing to minimize microbiological contamination and moisture.

**3.1.3 Defatted insect product**  
insect material presented as whole insect, meal, pellets or crumbs that has undergone additional processing to remove a portion of the fat content

## 4 Requirements

### 4.1 GENERAL REQUIREMENTS

Insect products shall be

- a) free from toxic substances.
- b) free from adulterants, extraneous material and objectionable odour.

- c) free from infestation and contamination from pests

## 4.2 Specific requirements

Insect products shall conform to the specific requirements specified in Table 1.

**Table 1: Specific requirements for dried insect products**

Parameters (%DM)				Test method
	Whole or ground insects protein (Low)	Whole or ground insects protein (High)	Defatted insect meal	
Energy, K Cal/100g, min.	284.2	284.2		
Moisture Content, % max.	13	13	13	US ISO 6496
Crude protein min.	25	40	45	US ISO 5983-1
Fat, max.	40	30	12	US ISO 6492
Fibre, max.	17	17	20	US ISO 6865
Total ash, max.	15	15	20	US ISO 5984
Acid insoluble ash, max.	4	4	4	US ISO 5985
Calcium max	5	5	5	US ISO 6490-1
Phosphorous min	0.6	0.6	0.6	US ISO 6491
Lysine (min)	1.0	2.4	1.0	US ISO 5510
Methionine (min)	0.4	0.7	0.4	ISO 13903
Zinc, max	0.02	0.02	0.02	US ISO 6869
Manganese, max	0.01	0.01	0.01	US ISO 6869

## 5 Contaminants

### 5.1 Pesticide and veterinary drug residues

Dried insect products shall comply with those maximum pesticide and veterinary drug residue limits established by Codex Alimentarius Commission for similar commodities.

### 5.2 Heavy metals

Dried insect products shall comply with those maximum metal contaminants residue limits established by Codex Alimentarius Commission for similar commodities.

### 5.3 Aflatoxins

The maximum content of aflatoxins in dried insect products when determined in accordance the method described in ISO 17375 shall not exceed 20 µg/kg for total aflatoxins

## 6 Hygiene

6.1 Dried insect products shall be produced and handled in accordance with CAC/RCP 54.

6.2 Dried insect products shall comply with microbiological requirements in Table 2

**Table 2 – Microbiological limits for dried insect products**

Microorganism	Max. limit (CFU/ml)	Test method
<i>Escherichia coli</i> O157:H7	Absent	ISO 16654
<i>Salmonellae sp</i>	Absent	US ISO 6579

## 7 Packaging

Dried insect products shall be packaged in materials that will safeguard the hygienic, nutritional and organoleptic qualities of the product .

## 8 Labelling

The following specific labelling requirements shall apply and shall be legibly and indelibly marked

- a) Name of product as “ Dried insect product” with the species name of insect used in close proximity;
- b) Net Weight in metric units;
- c) The;
- d) Batch/lot number;
- e) Name and physical address of the manufacturer/producer/processor;
- f) Date of manufacture
- g) expiry date;
- h) Nutrient declaration (on dry matter basis):- Crude protein (%), Crude Fat (%)and ;
- i) Instructions for storage and handling

## 11 Sampling

Sampling of dried insect products shall be in accordance to US ISO 6497



## **Annex A** (informative)

### **Potential species for production of insect products**

#### **A.1** Insect products may be produced from

- (i) Black Soldier Fly larvae and pupae (*Hermetia illucens*);
- (ii) Crickets adults and nymphs (Family Gryllidae);
- (iii) Blowfly/Housefly larvae and pupae (Calliphoridae/Muscidae);
- (iv) Grasshopper adults and nymphs (Sub-order Caelifera);
- (v) Silkworm pupae (*Bombyx* spp.);
- (vi) mealworm larvae and pupae (*Tenebrio* spp);
- (vii) Termite adults (Termitidae);
- (viii) Lakefly adult larvae and pupae (Chironomidae, Chaoboridae, Ephemeroptera),
- (ix) Blue/green Calliphora fly (adults and larvae)
- (x) cockroach adult and nymph (Blattellidae) among others.

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## Bibliography

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