



DRAFT TANZANIA STANDARD

**Dried insect products for compounding animal feeds –
Specification**

DRAFT STANDARD FOR PUBLIC COMMENTS

0 FOREWORD

Dried insects have recently been used for feeding animals and fish. To encourage the use of dried insects in formulation of animal feeds as a protein source, it is necessary to develop a standard. This Tanzania standard lays down specifications aiming at ensuring the safety and quality of dried insect products produced or traded in the country for manufacturing of animal feeds.

In the preparation of this Tanzania Standard substantial assistance was drawn from Uganda standard, US 1712 – 2017 Dried insect products for compounding animal feeds – Specification.

In reporting the results of a test or analysis made in accordance with this Tanzania 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).

1.0 SCOPE

This Tanzania Standard prescribes the requirements, methods of sampling and test for dried insect products as ingredients for compounding animal feed.

2.0 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 standard (including any amendments) applies.

TZS 4 – Rounding off numerical values.

TZS 76 – General method for determination of Arsenic silver diethyldithiocarbamate photometric method.

TZS 109 – Food Processing units – code of hygiene – General.

TZS 122-1 – Microbiology of food and animal feeding stuffs – Horizontal method for the detection of *Salmonella spp.*

TZS 268 – General atomic absorption spectrophotometric method for determination of lead in food stuffs

TZS 538 – Labelling of pre-packaged foods — General requirements

TZS 730-1 – Microbiology of food and animal feeding stuffs – Horizontal method for the detection of *Escherichia coli*

TZS 799 – Food stuffs – Determination of aflatoxin B1 and the total content

TZS 821 – Animal feeding stuffs – Preparation of test samples

TZS 2044 – Animal feeding stuffs – Determination of ash insoluble in hydrochloric acid

TZS 2470 – Animal feeding stuffs - Determination of lysine, methionine and threonine in commercial amino acid products and premixtures

TZS 2472 – Animal feeding stuffs – Determination of acid detergent fibre (ADF) and acid detergent lignin (ADL) Contents

TZS 2473, Animal feeding stuffs - Determination of crude ash

TZS 2476 – Animal feeding stuffs -Determination of fat content

TZS 2478 – Animal feeding stuffs – Determination of moisture and other volatile matter content

TZS 2480 – Animal feeding stuffs - Determination of nitrogen content and calculation of crude protein content - Part 1: Kjeldahl method

TZS 2482 – Animal feeding stuffs, animal products, and faeces or urine - Determination of gross calorific value - Bomb calorimeter method

TZS 2487 – Animal feeding stuffs - Determination of the contents of calcium, copper, iron, magnesium, manganese, potassium, sodium and zinc - Method using atomic absorption spectrometry

TZS 2488 – Animal feeding stuffs – Sampling

3.0 TERMS AND DEFINITIONS

For the purpose of this Tanzania standard, the following terms and definitions shall apply:

3.1 dried insect products

Include processed nymphal, larval, pupal stages and/ or adult insects, for use as an animal feed ingredient

3.2 whole insects

insect material presented in their natural form after primary processing to minimize microbiological contamination and moisture

3.3 ground insect product

insect material presented as meal, pellets or crumbs after primary processing to minimize microbiological contamination and moisture.

3.4 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.

4.0 REQUIREMENTS

4.1 General requirements

Insect products shall be free from

- Toxic substances
- Adulterants, extraneous material and objectionable matter
- Infestation and contamination.

4.2 Specific requirements

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

Table 1: Specific requirements for dried insect products for animal feed

S/No	Parameters (DM)	Requirements			Methods of test (See clause 2)
		Whole or ground insects (Low protein)	Whole or ground insects (High protein)	Defatted insect meal	
1)	Energy, (DE) Kcal/kg, min	2842	2842		TZS 2482
2)	Moisture content, %, m/m, Max	13	13	13	TZS 2478
3)	Crude protein, %, m/m, min	25	40	45	TZS 2480
4)	Crude fat, %, m/m, max	40	30	12	TZS 2476
5)	Crude fibre, %, m/m, max	17	17	20	TZS 2472
6)	Total ash, %, m/m, max	15	15	20	TZS 2473
7)	Acid insoluble ash, %, m/m, max	4	4	4	TZS 2044
8)	Calcium, %, m/m, max	5	5	5	TZS 2487
9)	Phosphorus, %, m/m, min	0.6	0.6	0.6	ICP/AAS
10)	Lysine, %, m/m, min	1.0	2.4	1.0	TZS 2470
11)	Methionine, %, m/m, min	0.4	0.7	0.4	TZS 2470
12)	Zinc, %, m/m, max	0.02	0.02	0.02	TZS 2487
13)	Manganese, %, m/m, max	0.01	0.01	0.01	TZS 2487

5 HYGIENE

5.1 Dried insect products shall be prepared under strict hygienic conditions according to TZS 109 (see clause 2).

5.2 Dried insect products shall comply with microbiological limits as shown in Table 2;

Table 2: Status for microbiological tolerance in animal feeds

S/No.	Microorganism	Status	Test methods (see clause 2)
1.	<i>Salmonella spp/25g</i>	Absent	TZS 122-1
2.	<i>Escherichia coli, cfu/g</i>	Absent	TZS 730-1

6.0 CONTAMINANTS

6.1 Pesticide residues

Dried insect products shall comply with pesticide residues limits as prescribed in the Codex Alimentarius Commission.

6.2 Aflatoxins

Total aflatoxins content maximum limit in dried insect products shall be 20 ppb when tested in accordance with TZS 799.

6.3 Heavy metals

Maximum limits for heavy metals shall be as specified in Table 3.

Table 3: Heavy metal

S/No.	Heavy metal	Maximum limits (mg/kg, max)	Method of test
1)	Mercury (Hg)	0.1	ICP/AAS
2)	Lead (Pb)	15	TZS 268
3)	Arsenic (As)	10	TZS 76
4)	Cadmium (Cd)	10	ICP/AAS

7.0 SAMPLING AND TESTS

7.1 Sampling

Sampling of dried insect products for animal feeding shall be done according to TZS 2488 and TZS 821 (see clause 2).

7.2 Tests

Testing of dried insect products for animal feeding shall be done according to test methods prescribed in Tables 1, 2 and 3.

8.0 PACKING, MARKING AND LABELLING

8.1 Packing

Dried insect products for animal feeding shall be packed in clean and sound containers capable of protecting the product from moisture ingress, contamination and spillage during normal handling and transportation. The containers shall be sealed/stitched in a manner that the product will be effectively protected.

8.2 Marking and labelling

8.2.1 Dried insect products containers shall be marked and labelled in accordance with TZS 538 (see clause 2). In addition, each container shall be legibly and indelibly marked with the following information:

- Name of the product as Dried insect product; with the species names of insects used in close proximity;
- Name and address of the manufacturer;
- Batch or code number;
- Date of production;

- e) Net mass;
- f) Expiry date;
- g) Country of origin;
- h) Instructions for storage and handling;
- i) Guaranteed analysis

8.3 The container may also be marked with TBS Certification Mark.

NOTE – The TBS Standards Mark of Quality may be used by the manufacturers only under license from TBS. Particulars of conditions under which the licenses are granted may be obtained from TBS.

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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.