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**Teff flour — Specification**

African Standard under Review



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This African Standard was prepared by the *ARSO Technical Committee on Cereals, Pulsses and Derived Products* (ARSO/TC 12).

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ARSO Central Secretariat  
International House 3rd Floor  
P. O. Box 57363 — 00200 City Square  
NAIROBI, KENYA

Tel. +254-20-2224561, +254-20-311641, +254-20-311608

Fax: +254-20-218792

E-mail: [arso@arso-oran.org](mailto:arso@arso-oran.org)

Web: [www.arso-oran.org](http://www.arso-oran.org)

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ARSO Central Secretariat  
International House 3rd Floor  
P.O. Box 57363 — 00200 City Square  
NAIROBI, KENYA

Tel: +254-20-2224561, +254-20-311641, +254-20-311608  
Fax: +254-20-218792

E-mail: [arso@arso-oran.org](mailto:arso@arso-oran.org)  
Web: [www.arso-oran.org](http://www.arso-oran.org)

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## Teff flour — Specification

### 1 Scope

This African standard specifies the requirements and methods of sampling and test for teff flour prepared from teff grains (*Eragrostis tef*) that include all the classifications magna (very white), nech (white), quey (brown) and sergegna (mixed) for human consumption

### 2 Normative references

The following referenced documents are indispensable for the application of this African standard. Only the latest edition of the documents (including any amendments) shall be applicable.

ARS 56, *Prepackaged foods — Labelling*

ARS 1349, *Teff—Specification*

CXS 192, *General standard for food additives*

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

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*

ARS 53, *General principles of food hygiene — Code of practice*

ISO 711, *Cereals and cereals products determination of moisture content (Basic reference method)*

ISO 712, *Cereals and cereals products determination of moisture content (Routine reference method)*

EN ISO 2171, *Cereals, pulses and by-products - Determination of ash yield by incineration*

ISO 20483 *Cereals and pulses - Determination of the nitrogen content and calculation of the crude protein content - Kjeldahl method*

ISO 6579-1, *Microbiology of food and animal feed — Horizontal method for the detection, enumeration and serotyping of salmonella — Part 1: 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*

ISO 5223, *Test sieves for cereals*

ISO 24333, *Cereals and cereal products-Sampling*

ISO 5498, *Agricultural and food products - Determination of crude fiber content (General method).*

ISO 16050, *Foodstuffs - Determination of aflatoxin B1, and the total content of aflatoxins B1, B2, G1 and G2 in cereals, nuts and derived products - High-performance liquid chromatographic method*

ISO 6541, *Agricultural food products - Determination of crude fiber content - General method content (milled grain and whole grain.)*

ISO 6579-2, *Microbiology of food and animal feed — Horizontal method for the detection, enumeration and serotyping of salmonella — Part 2. Enumeration by a miniaturized most probable number technique*

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

ISO 2152 7-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of yeasts and moulds — Part 1. Colony count technique in products with water activity greater than 0.95*

AOAC 920. *Determination of Total crude fiber*

AOAC 920.87, *Determination of Protein*

AOAC 923. 03. *Determination of Total ash*

AOAC 925.10, *Determination of Moisture*

AOAC 920.39, *Determination of Fat,*

AOAC 966. 24, *Determination of Coliform and E. coli*

AOAC 977. 02. *Determination of Mould and yeast*

AOAC 967. 25, *Determination of Salmonella*

# DARS 1350:2023(E)

## 3 Terms and definitions

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

### 3.1

#### **teff**

dry grains obtained from family of *Poaceae*, sub family *Eragostoidea*, genus *Eragrostis* and species *Eragrostis tef* which is harvested for grain and milled into flour

### 3.2

#### **teff flour**

flour which is obtained by milling teff grain

### 3.3

#### **magna /very white teff flour**

flour which is obtained by milling very white /magna/ teff grain

### 3.4

#### **nech /white teff flour**

flour which is obtained by milling white /nech/ teff grain

### 3.5

#### **quey /red teff flour**

flour which is obtained by milling red /quey/ teff grain

### 3.6

#### **sergegna /mixed/ teff flour**

flour which is obtained by milling mixed /sergegna/ teff grain

## 4 Requirements

### 4.1 General requirements

Teff flour shall:

- a) be free from any harmful ingredients, substances, injurious to health or any foreign matter;
- b) be free from any added artificial colouring matter,
- c) have the characteristic teff flour appearance,
- d) be free from rancidity,
- e) be free from insect and rodent contamination.
- f) not be fermented and be free from fungal infestation musts. or objectionable odours and adulterants.

### 4.2 Specific requirements

Teff flour shall comply with the specific requirements specified in Table 1.

Table 1- Specific requirements for teff flour

S/No.	Characteristic	Requirement				Test methods
		Magna (Very white)	Nech (White)	Quey(Red)	Sergegna (mixed)	
4.2.2	Total crude fiber, % m/m, max	3.2	3.2	3.2	3.2	ISO 5498, ISO 6541, AOAC 920
4.2.5	Protein, % m/m, min	8.0	8.0	8.0	8.0	ISO1871, ISO 20483 AOAC 920.87
4.2.6	Total ash, % m/m, max	3.0	30	4.0	3.0	ISO 2171, AOAC 923.03
4.2.7	Acid insoluble ash, % m/m	0.25	0.25	0.33	0.25	ISO 5985
4.2.9	Moisture, % m/m, max	12.5	12.5	12.5	12.5	ISO 6540, ISO 711, ISO 712 AOAC 925.10
4.2.10	Fat, % m/m, max.	6.0	6.0	6.0	6.0	AOAC 920.39
4.2.11	Phytate, mg/100g, max	1500	1500	1500	1500	By difference
4.2.12	Particle size, Passed through 250µm	54.0-90.0	54.0-90.0	54.0 – 90.0	54.0-90.0	ISO 5223

## 5 Food additives

Teff flour shall contain only permitted additives complying with CODEX STAN 192.

## 6 Contaminants

### 6.1 Heavy metals

Teff flour shall not contain heavy metals at levels exceeding the limits indicated in Table 2.

Table 2 – Heavy metals limits for teff flour

S/No.	Heavy metal	Limit (mg/kg, max.)	Test method
6.1.1	Arsenic (as As)	0.1	ISO 27085
6.1.2	Lead (as Pb)	0.2	ISO 27085
6.1.3	Cadmium	0.1	ISO 27085

### 6.2 Aflatoxin limits

Teff flour shall comply with levels for aflatoxins given in Table 3 when tested in accordance with the test methods specified therein.

**Table 3 — Mycotoxin limits for Teff flour**

S/N	Aflatoxin	Maximum limit (µg/kg)	Test method
i.	Total aflatoxins (AFB1+AFB2+AFG1 +AFG2)	10	ISO 16050
ii.	Aflatoxin B1	5	

## 7 Hygiene

Teff flour shall be produced and handled under hygienic conditions in accordance with ARS 53 and shall comply with the microbial limits given in Table 3 when tested in accordance with the test methods prescribed therein.

**Table 4 – Microbiological limit for teff flour**

S/N o.	Microorganism	Maximum limit	Test method
i.	<i>E. coli</i> , cfu per g, max.	Absent	ISO 7251, ISO 16649-2 AOAC 966.24
ii.	Mold and yeast, cfu per g, max.	10.0x10 <sup>3</sup>	ISO 21527-1, AOAC 977.02
iii.	Salmonella, cfu per g, max.	Absent	ISO 6579-1 ISO 6579-2, AOAC 967.25

## 8 Packaging

Teff flour shall be packed in food grade packaging material, which will safeguard the hygienic, nutritional and organoleptic qualities of the products.

## 9 Labelling

In addition to ARS 56, the following specific labelling requirements shall apply and shall be legibly and indelibly marked (labelled) with the following information:

- a) Country of origin
- b) Name and physical and postal address of manufacturer
- c) Name of the product as "Teff flour": including its classification.
- d) Net weight in kg
- e) Date of manufacture and batch number;
- f) Best before date;
- g) Storage instruction;
- h) List of ingredients
- i) Nutritional value content (protein, fat, carbohydrate and calorie value etc).

## 10 Sampling

Sampling of teff flour shall be done in accordance with ISO 24333.