

---

**Dry soybeans — Specification**



**Table of contents**

1	Scope .....	1
2	Normative references .....	1
3	Terms and definitions .....	2
4	Requirements .....	2
4.1	General requirements .....	2
4.2	Specific requirements .....	3
4.2.1	Grading .....	3
5	Contaminants .....	4
5.1	Heavy metals .....	4
5.2	Pesticide residues .....	4
6	Hygiene .....	4
7	Packaging .....	5
8	Labelling .....	5
9	Sampling .....	6
	Bibliography .....	7

## Foreword

The African Organization for Standardization (ARSO) is an African intergovernmental organization established by the United Nations Economic Commission for Africa (UNECA) and the Organization of African Unity (AU) in 1977. One of the fundamental mandates of ARSO is to develop and harmonize African Standards (ARS) for the purpose of enhancing Africa's internal trading capacity, increase Africa's product and service competitiveness globally and uplift the welfare of African communities. The work of preparing African Standards is normally carried out through ARSO technical committees. Each Member State interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, Regional Economic Communities (RECs), governmental and non-governmental organizations, in liaison with ARSO, also take part in the work.

ARSO Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare ARSO Standards. Draft ARSO Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an ARSO Standard requires approval by at least 75 % of the member bodies casting a vote.

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

This African Standard was prepared by the ARSO Technical Committee on Cereals, pulses and derived products (ARSO/TC 12).

© African Organisation for Standardisation 2023 — All rights reserved\*

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

Tel. +254-20-2224561, +254-20-3311641, +254-20-3311608

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

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

---

\* © 2023 ARSO — All rights of exploitation reserved worldwide for African Member States' NSBs.

**Copyright notice**

This ARSO document is copyright-protected by ARSO. While the reproduction of this document by participants in the ARSO standards development process is permitted without prior permission from ARSO, neither this document nor any extract from it may be reproduced, stored or transmitted in any form for any other purpose without prior written permission from ARSO.

Requests for permission to reproduce this document for the purpose of selling it should be addressed as shown below or to ARSO's member body in the country of the requester:

© African Organisation for Standardisation 2023 — All rights reserved

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

Tel: +254-20-2224561, +254-20-3311641, +254-20-3311608

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

Reproduction for sales purposes may be subject to royalty payments or a licensing agreement. Violators may be prosecuted.

## Introduction

Soybeans contain significant amounts of all the amino acids essential for humans. In the recent past, the range of soyfoods has expanded to include (i) fresh beans and sprouts, (ii) dairy substitutes such as soy milk, cheese etc., (iii) grain products such as soybread, pasta and flour, (iv) meat substitutes, and (v) soy spreads and pastes. Although, in recent years, soyfoods have been introduced in many more countries in the developed and developing world, the share of domestic soybean supplies intended for direct consumption - as opposed to crushing - remains below 10% at the global level.

Soy-foods are generally considered to be nutritious and healthy based on their nutrient composition which includes protein, fat, carbohydrates, dietary fibres as well as minerals and phytoestrogens (or isoflavones). With regard to the latter, recent scientific studies associate the consumption of phytoestrogen-rich diets with a lower risk of coronary heart diseases, osteoporosis, hormone-dependent forms of cancer and menopausal symptoms. The health-benefits of isoflavones contained in soyfoods have been explained by their structural resemblance to endogenous oestrogen, showing oestrogenic and anti-oestrogenic properties as well as anti-oxidative, anti-proliferative and anti-angiogenic properties which are non-hormonally dependent.

Based on the above and considering the economic and technical limitations prevailing in tropical developing countries, the direct consumption of soybeans as a nutritious food that is economically accessible for large parts of the population appears to be appealing.

Soya beans are part of the strategic food commodity basket recognized by the declaration of the African Union Food Security Summit held in December 2006 in Abuja, Nigeria. This standard was harmonized as part of the response by the resolution of the AU Food Security Summit to harmonize standards and grades for strategic food commodities as a means of promoting and facilitating intra-African food trade. Such facilitation would lead to free movement of food commodities from areas of surplus to areas of deficit, leading to overall achievement of food and nutrition security, food self-sufficiency and socioeconomic development of the African continent.



## Dry soybeans — Specification

### 1 Scope

This Draft African Standard specifies the requirements, sampling and test methods for dry whole soybeans of varieties (cultivars) grown from *Glycine max* (L.) intended for human consumption.

### 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.

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

ARS 56, *Prepackaged foods — Labelling*

AOAC Official Method 999.10:1999, *Determination of lead, cadmium, copper, iron and zinc in foods — Atomic absorption spectrophotometry after microwave digestion*

AOAC Official Method 999.11:1999, *Determination of lead, cadmium, copper, iron and zinc in foods — Atomic absorption spectrophotometry after dry ashing*

AOAC Official Method 2001.04, *Determination of Fumonisin B<sub>1</sub> and B<sub>2</sub> in corn and corn flakes — Liquid chromatography with immunoaffinity column cleanup*

ISO 520, *Cereals and pulses — Determination of the mass of 1000 grains*

ISO 605, *Pulses — Determination of impurities, size, foreign odours, insects, and species and variety — Test methods*

ISO 659, *Oilseeds — Determination of oil content (Reference method)*

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

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-Parker agar medium*

ISO 6888-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 2: Technique using rabbit plasma fibrinogen agar medium*

ISO 16050, *Foodstuffs — Determination of aflatoxin B<sub>1</sub>, and the total content of aflatoxin B<sub>1</sub>, B<sub>2</sub>, G<sub>1</sub> and G<sub>2</sub> in cereals, nuts and derived products — High performance liquid chromatographic method*

ISO/TS 16634-2, *Food products — Determination of the total nitrogen content by combustion according to the Dumas principle and calculation of the crude protein content — Part 2: Cereals, pulses and milled cereal products*

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 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*

ISO 24333, *Cereals and cereal products — Sampling*

ISO 24557, *Pulses — Determination of moisture content — Air-oven method*

## 3 Terms and definitions

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

### 3.1

#### **soybeans**

whole mature dry grains of varieties (*Glycine max* (L.))

### 3.2

#### **damaged/defective beans**

soybeans and pieces of soybeans that are badly ground-damaged, badly weather-damaged, diseased, frost-damaged, germ-damaged, heat-damaged, insect-bored, mould-damaged, sprout-damaged, stinkbug-stung, or otherwise materially damaged. Stinkbug-stung kernels are considered damaged beans at the rate of one-fourth of the actual percentage of the stung kernels.

### 3.3

#### **foreign matter**

all organic and inorganic material other than dry soybeans or broken soybeans and other edible grains

#### 3.3.1

##### **inorganic matter**

stones, glass, pieces of soil and other mineral matter

#### 3.3.2

##### **organic matter**

any animal or plant matter (seed coats, straws, weeds) other than dry green grams, broken dry green grams, inorganic extraneous matter and harmful/toxic seeds

### 3.4

#### **immature**

immature damaged soybeans are characterized by a green exterior appearance in conjunction with green discolouration penetrating the cotyledon

### 3.5

#### **poisonous, toxic and/or harmful seeds**

any seed which if present in quantities above permissible limit may have damaging or dangerous effect on health, organoleptic properties or technological performance such as Jimson weed — *Datura* (*D. fastuosa* L. and *D. stramonium* L.) corn cockle (*Agrostemma githago* L., *Machai Lallium remulenum* L.) Akra (*Vicia* species), *Argemone mexicana*, Khesari and other seeds that are commonly recognized as harmful to health

### 3.6

#### **splits**

broken/spilts soybean seeds that are less than three-quarters of the whole seed, and cotyledons that are loosely held together by the seed coat

### 3.7

#### **food grade packaging material**

packaging material, made of substances which are safe and suitable for their intended use and which will not impart any toxic substance or undesirable odour or flavour to the product

## 4 Requirements

### 4.1 General requirements



Dry soybeans shall be

- a) whole mature dry beans of varieties (*Glycine max* (L.)) that will not pass through a 3.175 mm round-hole sieve;
- b) soybeans may be yellow, green, brown or black;
- c) free from substances which render them unfit for human consumption;
- d) free from abnormal flavours, musty, sour or other undesirable odour, obnoxious smell and discolouration;
- e) free of pests, live animals, fungus infestation, added colouring matter, moulds, impurities of plant and animal origin including insects, rodent hair and excreta and shall meet any other sanitary and phytosanitary requirements; and
- f) be free from toxic or noxious seeds that are commonly recognized as harmful to health.

## **4.2 Specific requirements**

### **4.2.1 Grading**

Dry soybeans shall be graded into three grades on the basis of the tolerable limits established in Table 1 when tested in accordance with the test methods specified therein which shall be additional to the general requirements set out in this standard.

Table 1 — Specific requirements for dry soybeans

S/N	Characteristic	Limit			Test method
		Grade 1	Grade 2	Grade 3	
i.	Moisture, % m/m, max.	13	13	13	ISO 24557
ii.	Oil content, on dry matter basis, % min.	20	18	15	ISO 659
iii.	Acid value of oil, mg KOH/g fat or oil, max.	3	4	6	ISO 660
iv.	Protein, on dry matter basis, % min. (Applicable to culinary varieties only. Not applicable to flour milling or oil crushing or animal feed varieties.)	40	40	40	ISO/TS 16634-2
v.	Test weight, kg/h (g/0.5 L) min.	70(357)	68(347)	66(337)	ISO 520
vi.	Foreign matter, % m/m, max	1	2	3	ISO 605
vii.	Inorganic matter, % m/m, max	0.1	0.3	0.5	
viii.	Broken/split grains, % m/m, max.	1	2.5	5	
ix.	Pest damaged grains, % m/m, max.	0.3	0.8	1.5	
x.	Rotten and diseased grains, % m/m, max.	0.2	0.5	1.0	
xi.	Heat damaged grains, % m/m, max.	0.1	0.2	0.5	
xii.	Contrasting colours, % m/m, max.	2	3	5	
xiii.	Immature/shrivelled beans, % m/m, max.	0.1	0.2	0.5	
xiv.	Filth, % m/m, max.	0.1	0.1	0.1	
xv.	Total defective grains, % m/m max.	2	3	5	
xvi.	Other edible pulses	0.1	0.2	0.5	
xvii.	Total aflatoxin (AFB <sub>1</sub> +AFB <sub>2</sub> +AFG <sub>1</sub> +AFG <sub>2</sub> ), ppb, max.	10			ISO 16050
xviii.	Aflatoxin B <sub>1</sub> only, ppb, max.	5			
xix.	Fumonisin, ppm, max.	2			AOAC 2001.04
NOTE The parameter, total defective beans is not the sum total of the individual defects. It is limited to 70% of the sum total of individual defects.					

## 5 Contaminants

### 5.1 Heavy metals

Dry soybeans shall comply with those maximum limits for metal contaminants limits established by the Codex Alimentarius Commission for this commodity.

### 5.2 Pesticide residues

Dry soybeans shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

## 6 Hygiene

**6.1** Dry soybeans shall be produced, prepared and handled in accordance with the provisions of appropriate sections of ARS 53.

**6.2** When tested by appropriate methods in the standards listed in Clause 2, the product:

- a) shall be free from microorganisms in amounts which may represent a hazard to health and shall not exceed the limits stipulated in Table 3 when tested in accordance with the test methods specified therein;
- b) shall not contain any substance originating from microorganisms in amounts which may represent a hazard to health.

**Table 3 — Microbiological limits for dry soybeans**

S/N	Micro-organism	Limit	Test method
i.	Yeasts and moulds, max. per g	10 <sup>5</sup>	ISO 21527-2
ii.	<i>Staphylococcus aureus</i> , cfu per g, max.	Absent	ISO 6888-1 ISO 6888-2
iii.	<i>E. coli</i> , per g	Absent	ISO 16649-2
iv.	<i>Salmonella</i> , per 25 g	Absent	ISO 6579-1

## 7 Packaging

**7.1** Dry soybeans shall be packed in suitable food grade packaging materials which shall be clean, sound, free from insect, fungal infestation and the packing material shall be of food grade quality and shall be securely closed and sealed.

**7.2** Dry soybeans shall be packed in containers which will safeguard the hygienic, nutritional, and organoleptic qualities of the products.

**7.3** Each package shall contain dry beans of the same variety and of the same grade designation.

## 8 Labelling

### 8.1 Labelling of retail packages

In addition to the requirements in ARS 56, each package shall be legibly and indelibly marked with the following:

- a) product name as "Dry Soybeans";
- b) variety;
- c) grade;
- d) name, address and physical location of the producer/ packer/importer;
- e) lot/batch/code number;
- f) net weight, in SI units;
- g) the declaration "Food for Human Consumption";
- h) storage instruction as "Store in a cool dry place away from any contaminants";
- i) crop year;
- j) packing date;

- k) instructions on disposal of used package;
- l) country of origin; and
- m) a declaration on whether the soybeans were genetically modified or not.

### 8.2 Labelling of non-retail containers

Information detailed in 8.1 shall be given either on the container or in accompanying documents, except that the name of the product, lot identification and the name and address of the processor or packer as well as storage instructions, shall appear on the container.

For products purchased for use by the buyer/retailer, at least the name of producer, lot number and/or 'crop year' shall be indicated on the container.

Lot identification and the name and address of the processor or packer may be replaced by an identification mark provided that such a mark is clearly identifiable with the accompanying documents.

## 9 Sampling

Sampling shall be done in accordance with ISO 24333.

**Bibliography**

- [1] EAS 762:2012, *Dry soybeans — Specification*
- [2] Malawi Standard, MBS 244:1991, *Soya bean — Specification*
- [3] United States Standards for Soybeans, Effective September, 2007
- [4] Soybeans, Official Grain Grading Guide, August 1, 2012, Canadian Grain Commission
- [5] *Australian Oilseeds Federation — Soybean Marketing and Trading Specifications — CS07:2012/2013: Edible Culinary Grade Soybean*

Draft for comments only — Not to be cited as African Standard



Draft for comments only — Not to be cited as African Standard