CODEX ALIMENTARIUS
INTERNATIONAL FOOD STANDARDS

Food and Agriculture Organization of the United Nations
World Health Organization

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STANDARD FOR SORGHUM GRAINS

CXS 172-1989

Adopted in 1989. Revised in 1995. Amended in 2019, 2023.

2023 Amendments

Following decisions taken at the Forty-sixth Session of the Codex Alimentarius Commission in December 2023, amendments were made in the Annex.

2023 editorial correction

An editorial correction was made to Section 3.2.3 to read Crotalaria (*Crotalaria* spp.) instead of Crotolaria (Crotalaria spp.) and footnote 1 was added in the Annex.

1. SCOPE

This standard applies to sorghum grains as defined in Section 2, for human consumption; i.e. ready for its intended use as human food, presented in packaged form or sold loose from the package directly to the consumer. It does not apply to other products derived from sorghum grains.

2. DESCRIPTION

2.1 Definition of the product

Sorghum grains are whole or decorticated grains obtained from species of *Sorghum bicolor* (L.) Moench. They may be suitably dried if necessary.

2.1.1 *Whole sorghum grains*

These are sorghum grains obtained as such after a complete threshing without any further treatment.

2.1.2 *Decorticated sorghum grains*

These are sorghum grains from which the external casings and whole or parts of the germ have been removed in an appropriate manner, using mechanical treatment.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Quality factors – general

3.1.1 Sorghum grains shall be safe and suitable for human consumption.

3.1.2 Sorghum grains shall be free from abnormal flavours, odours, and living insects.

3.1.3 Sorghum grains shall be free from filth (impurities of animal origin, including dead insects) in amounts which may represent a hazard to human health.

3.2 Quality factors – specific

3.2.1 ***Moisture content*** 14.5 percent m/m max

Lower moisture limits should be required for certain destinations in relation to the climate, duration of transport and storage.

3.2.2 ***Definition of defects***

The product shall have not more than 8 percent total defects including extraneous matter, inorganic extraneous matter, and filth as contained in the standards and blemished grains, diseased grains, broken kernels, and other grains as contained in the Annex.

3.2.2.1 **Extraneous matter** is all organic and inorganic material other than sorghum, broken kernels, other grains and filth. Extraneous matter includes loose sorghum seedcoats. Sorghum grains shall have not more than 2 percent extraneous matter of which not more than 0.5 percent shall be extraneous inorganic matter.

3.2.2.2 **Filth** is impurities of animal origin including dead insects (0.1 percent m/m max).

3.2.3 ***Toxic or noxious seeds***

The products covered by the provisions of this standard shall be free from the following toxic or noxious seeds in amounts which may represent a hazard to human health.

– Crotalaria (*Crotalaria* spp.), corn cockle (*Agrostemma githago* L.), castor bean (*Ricinus communis* L.), Jimson weed (*Datura* spp.), and other seeds that are commonly recognized as harmful to health.

3.2.4 ***Tannin content***

(a) For whole sorghum grains, the tannin content shall not exceed 0.5 percent on a dry matter basis.

(b) For decorticated sorghum grains, the tannin content shall not exceed 0.3 percent on a dry matter basis.

4. CONTAMINANTS

4.1 Heavy metals

Sorghum grains shall be free from heavy metals in amounts which may represent a hazard to human health.

4.2 Pesticide residues

Sorghum grains shall comply with those maximum residue limits established by the Codex Alimentarius Commission (CAC) for this commodity.

4.3 Mycotoxins

Sorghum grains shall comply with those maximum mycotoxin limits established by the CAC for this commodity.

5. HYGIENE

5.1 It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *General principles of food hygiene* (CXC 1-1969)[1] and other codes of practice recommended by the CAC which are relevant to this product.

5.2 To the extent possible in good manufacturing practice, the product shall be free from objectionable matter.

5.3 When tested by appropriate methods of sampling and examination, the product:

- shall be free from microorganisms in amounts which may represent a hazard to health;
- shall be free from parasites which may represent a hazard to health; and
- shall not contain any substance originating from microorganisms in amounts which may represent a hazard to health.

6. PACKAGING

6.1 Sorghum grains shall be packaged in containers which will safeguard the hygienic, nutritional, technological, and organoleptic qualities of the product.

6.2 The containers, including packaging material, shall be made of substances which are safe and suitable for their intended use. They should not impart any toxic substance or undesirable odour or flavour to the product.

6.3 When the product is packaged in sacks, these must be clean, sturdy and strongly sewn or sealed.

7. LABELLING

In addition to the requirements of the *General standard for the labelling of pre-packaged foods* (CXS 1-1985),[2] the following specific provisions apply:

7.1 Name of the product

The name of the product to be shown on the label shall be “sorghum grains”.

7.2 Labelling of non-retail containers

Information for non-retail containers shall either be given on the container or in accompanying documents, except that the name of the product, lot identification and the name and address of the manufacturer or packer shall appear on the container. However, lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

8. METHODS OF ANALYSIS AND SAMPLING

For checking the compliance with this standard, the methods of analysis and sampling contained in the *Recommended methods of analysis and sampling* (CXS 234-1999)[3] relevant to the provisions in this standard shall be used.

ANNEX

In those instances where more than one factor limit and/or method of analysis is given, we strongly recommend that users specify the appropriate limit and method of analysis.

Factor/Description	Limit	Method of analysis
COLOUR ▪ white, pink, red, brown, orange, yellow, or any mixture of these colours	Buyer preference	Visual examination
▪ abnormal colour. Grains whole natural colour has been modified by bad weather conditions, contact with the ground, heat, and excessive respiration. These grains may be dull, shrivelled, swollen, puffed, or bloated in appearance		
ASH ▪ decorticated sorghum grains	Max: 1.5% on a dry matter basis	Refer to Section 8
PROTEIN (N x 6.25)	Min: 7.0% on a dry matter basis	Refer to Section 8
FAT	Max: 4.0% on a dry matter basis	Refer to Section 8
CRUDE FIBRE	Buyer preference	ICC 113 Determination of crude fibre value (Type I) – or – ISO 6541 (1981) Agricultural food products determination of crude fibre content-modified Scharrer method
DEFECTS (Total)		Visual examination
▪ blemished grains. Grains which are insect of vermin damaged, of abnormal colour, sprouted, diseased, or otherwise materially damaged	Max: (Total) 8%[i]	
▪ diseased grains. Grains made unsafe for human consumption due to decay, moulding, or bacterial decomposition, or other causes that may be noticed without having to cut the grains open to	Max: 3% of which diseased grains must not exceed 0.5%	

[i] The maximum amount of defects includes those from this Annex and Section 3.2.2 of the standard.

Factor/Description	Limit	Method of analysis
examine them		
▪ insect or vermin damaged grains. Kernels with obvious weevil-bored holes or which have evidence of boring or tunnelling, indicating the presence of insects, insect webbing or insect refuse, or degermed grains, chewed in one or more than one part of the kernel which exhibit evident traces of an attack by vermin		
▪ grains having an abnormal colour. Grains whose natural colour has been modified by bad weather conditions, contact with the ground, heat, and excessive respiration. These grains may be dull, shrivelled, swollen, puffed, or bloated in appearance		
▪ sprouted grains. Grains exhibiting obvious signs of sprouting	Max: 5.0%	
▪ frost-damaged grains. Grains which are damaged by frost and may appear bleached or blistered and the seed coat may be peeling. Germs may appear dead or discoloured	Max: 1.0%	
▪ broken kernels. Sorghum and pieces of sorghum which pass through a 1.8 mm round-hole sieve		
▪ other grains which are edible grains, whole or identifiable brokens, other than sorghum (i.e. legumes, pulses and other edible cereals)		

NOTES

[1] FAO and WHO. 1969. *General principles of food hygiene*. Codex Alimentarius Code of Practice, No. CXC 1-1969. Codex Alimentarius Commission. Rome.
[2] FAO and WHO. 1985. *General standard for the labelling of pre-packaged foods*. Codex Alimentarius Standard, No. CXS 1-1985. Codex Alimentarius Commission. Rome.
[3] FAO and WHO. 1999. *Recommended methods of analysis and sampling*. Codex Alimentarius Standard, No. CXS 234-1999. Codex Alimentarius Commission. Rome.