AFRICAN STANDARD

DARS 865

Second Edition 2023

Dry green grams — Specification

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ICS 67.060

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Foreword

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

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Introduction

The green gram (*Vigna radiata* (L.)) is a leguminous pulse crop, prized for its seeds, which are high in protein, easily digested, and consumed as food. Green grams are high in vitamins A, B_1, B_2 and C and niacin.

Green grams protein is comparatively rich in lysine, an amino acid deficient in cereal grains, and deficient in methiomine, cystine, and cysteine, amino acids found abundantly in cereal grains. A diet combining green gram mungbeans and cereal grains compensates for the deficiencies in protein quality found in either grain alone and provides a balanced amino acid content.

Green grams 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 green grams — Specification

1 Scope

This Draft African Standard specifies requirements, sampling and test methods for the dry green grams of the cultivar *Vigna radiata* (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 Fumonisins B_1 and B_2 in corn and corn flakes — Liquid chromatography with immunoaffinity column cleanup*

CODEX STAN 193, *Codex general standard for contaminants and toxins in food and feed*

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

ISO 6579, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of Salmonella spp*.

ISO 6888 (all parts), *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species)*

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

3.1
green grams
dry whole grains of *Vigna radiata* (L.)

3.2
damaged grains
grains which are distinctly identified as having been visibly affected by insects, fungi, heat, water, disease or any other causative agent. These include grains that are damaged or split in the process of handling or those that are off colour.

3.3
immature grains
grains which are not fully developed, normally smaller in size than the mature grains, shrivelled and off colour

3.4
objectionable odours
odours which are entirely foreign to green grams and which, because of their presence, render green grams unfit for human consumption

3.5
pest infestation
presence of live insects or other organisms, either in adult or other development stages

3.6
food grade packaging material
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

3.7
foreign matter
all organic and inorganic material other than dry green grams or broken green grams and other edible grains

3.7.1
inorganic foreign matter
stones, glass, pieces of soil and other mineral matter

3.7.2
organic foreign 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

3.8
contrasting varieties
other varieties that are of a different colour, size, or shape from the grains of the designated variety

3.9
total defective/damaged grains
pest damaged, discouloured, diseased, germinated, mouldy, immature and shrivelled grains, or otherwise materially damaged, which specifically do not include broken grains

3.10
filth
impurities of animal origin including dead insects, rodent hair and excreta

3.11
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

4 Requirements

4.1 General requirements

Dry green grams shall be:

a) the dried mature grains of pulse green gram *Vigna radiata* (L.)*;*

b) well-filled, smooth, hard, clean, wholesome, uniform in size, shape, colour;

c) free from substances which render them unfit for human consumption;

d) free of pests, live animals, fungus infestation, added colouring matter, weevils, obnoxious substances, glass, metal, coal, dung, discoloration and all other impurities that represent a hazard to human health;

e) free from abnormal flavours, musty, sour or other undesirable odour, obnoxious smell and discoloration; and

f) free from toxic or noxious seeds that are commonly recognized as harmful to health.

4.2 Specific requirements

4.2.1 Grading

Green grams 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 green grams

S/N	Characteristic	Limit			Test method
		Grade 1	Grade 2	Grade 3	
i.	Moisture, % m/m, max.	14.0	14.0	14.0	ISO 24557
ii.	Total defective grains, % m/m, max.	3.5	6.3	9.1	ISO 605
iii.	Immature grain % m/m, max.	2.0%	3.0	4.0	
iv.	Contrasting varieties, % m/m, max.	0.5	1.0	2.0	
v.	Foreign material% m/m, max.	0.65 [0.5]	0.65 [0.8]	0.65 [1]	
vi.	Inorganic material	0.3	0.3	0.3	
vii.	Filth	0.1	0.1	0.1	
viii.	Other edible grains % m/m, max. Any edible grains or oilseeds other than green grams	0.1	0.5	3.0	ISO 605
ix.	Insect /pest damaged % m/m, max. Grains per cent by count clean-cut weevil bored	1	2	3	ISO 605
NOTE The parameter, total defective grains 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 green grams shall comply with those maximum limits for metal contaminants specified in CODEX STAN 193.

5.2 Pesticide residues

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

6 Hygiene

6.1 Dry green grams 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; and

b) shall not contain any substance originating from microorganisms in amounts which may represent a hazard to health.

Table 3 — Microbiological limits for dry green grams

S/N	Type of micro-organism	Limit	Test method
i.	Yeasts and moulds, max. per g	10^5	ISO 21527-2
ii.	*Staphylococcus aureus* cfu per g, max	Absent	ISO 6888
iii.	*E. coli*, per g	Absent	ISO 7251
iv.	*Salmonella,* per 25 g	Absent	ISO 6579

7 Packaging

7.1 Dry green grams 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 green grams shall be packed in containers which will safeguard the hygienic, nutritional, technological and organoleptic qualities of the product.

7.3 Each package shall contain dry green grams 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 green grams”;

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 green grams were genetically modified or not.

8.2 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 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 the ISO 24333.

Annex A
(informative)

Illustration of green grams

Bibliography

[1] EAS 331:2012, *Green grams — Specification*

[2] *Pulses Grading and Marking Rules*, 2003, Schedule V, *Grade designation and definition of quality of Moong (whole)*, Ministry of Agriculture, India, 7th April 2004

[3] CODEX STAN 171:1989 (Rev. 1:1995), *Standard for Certain Pulses*

[4] Australian Pulse Standards, 2012/2013: *Mungbeans minimum export standards*

