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Iron bio-fortified dry beans — Specification



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Foreword

Rwanda Standards are prepared by Technical Committees and approved by Rwanda Standards Board (RSB) Board of Directors in accordance with the procedures of RSB, in compliance with Annex 3 of the WTO/TBT agreement on the preparation, adoption and application of standards.

The main task of technical committees is to prepare national standards. Final Draft Rwanda Standards adopted by Technical committees are ratified by members of RSB Board of Directors for publication and gazettment as Rwanda Standards.

DRS350 was prepared by Technical Committee RSB/TC 003, *Cereals, Pulses and Cereal Products*.

In the preparation of this standard, reference was made to the following standard:

RS EAS 46: 2017, *Dry beans – Specification*

The assistance derived from the above source is hereby acknowledged with thanks.

Committee membership

The following organizations were represented on the Technical Committee on Cereals, pulses and cereals products (RSB/TC 003) in the preparation of this standard.

Paragraph of participants

Rwanda Standards Board (RSB) – Secretariat

Iron bio-fortified beans — Specification

1 Scope

This Draft Standard specifies requirements and methods of sampling and test for iron bio-fortified dry common beans (*Phaseolus vulgaris* 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.

RS CAC/RCP 1,

RS EAS 38, *Labelling of pre-packaged foods — Requirements*

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

RS ISO 24333, *Cereals and cereal products — Sampling*

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

AOAC 972.25, *Lead in food — Atomic absorption spectrophotometric method*

AOAC 973.34, *Cadmium in food — Atomic absorption spectrophotometric method*

3 Terms and definitions

For the purposes of this standard, the following terms and definitions apply.

3.1

iron bio-fortified dry beans

dry beans produced from varieties that have higher level of iron

3.2

bio-fortification

practice of deliberately increasing the content of an essential micronutrient, i.e. vitamins and minerals (including trace elements) in a food, through agronomic practices, conventional plant breeding

3.3

conventional plant breeding

natural crop variety development techniques

3.4

dry beans

dry threshed field and garden beans of the variety *Phaseolus vulgaris* L.

3.5

defective beans

that are slightly or seriously defective

3.5.1

slightly defective beans

that are immature, slightly stained, wrinkled or broken

3.5.1.1

immature beans

which are light, not fully filled and thin due to under development

3.5.1.2

slightly stained beans

with extensive seed coat staining, without the cotyledon being affected

3.5.1.3

wrinkled

in which there is pronounced folding of the seed coat

3.5.1.4

broken beans

in which the cotyledons are separated or one or both cotyledons have been broken

3.5.2

seriously defective beans

that are pest damaged, mouldy, rotten, Seriously Stained beans, Germinated and heat damaged

3.5.2.1

pest damaged beans

which show damage owing to attack by rodents, insects, mites or other pests

3.5.2.2

Mouldy beans

with visible mycelia/fungal growth on their surface

3.5.2.3

rotten/decay beans

which are discoloured, swollen and soft as a result of decomposition by fungi or bacteria

3.5.2.4

seriously stained beans

with cotyledon staining

3.5.2.5

germinated beans

which have sprouted

3.5.2.6

heat-damaged beans

that are materially discoloured and damaged by heat due to the exposure to severe heat during storage

3.6

foreign/extraneous matter

fraction consisting of inorganic extraneous matter and organic extraneous matter other than filth

3.6.1

inorganic foreign/extraneous matter

stones, glass, pieces of soil and other mineral matter

3.6.2

organic foreign/extraneous matter

plant matter (twigs, seed coats, straws, weeds) other than grains of beans, damaged bean grains, other edible grains

3.7

filth

impurities of animal origin such as dead insects, fragments or remains of insects

3.8

food grade 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

3.9

contrasting varieties

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

3.10

other edible grains

other than common bean (*phaseolis vulgaris*), whole or broken such as maize, sorghum, wheat, etc that are naturally comestible

3.11

harmful and toxic seeds

seeds which, if present in quantities above a certain limit, can have a damaging or dangerous effect on health, sensory properties or technological performance i.e *Crotalaria* (*Crotalaria* spp.), Corn cockle (*Agrostemma githago* L.), Castor bean (*Ricinus communis* L.), Jimson weed (*Datura* spp.)

4 Quality requirements

4.1 General requirements

Iron bio-fortified dry beans shall be:

- a) dried and mature;
- b) well-filled;
- c) uniform in size, colour and shape and produced from one variety;
- d) free from off flavours and musty or other undesirable odour.

4.2 Specific requirements

Iron bio-fortified dry beans shall be categorised into three grades on the basis of the tolerable limits established in Table 1.

Table 1 — Specific requirements

S/N	Characteristics	Maximum limits, %, m/m			Method of test
		Grade 1	Grade 2	Grade 3	
i)	Moisture	14			RS ISO 24557
ii)	Foreign/extraneous matter	0.5	0.75	1	RS ISO 605
iii)	Inorganic foreign matter	0.1	0.2	0.3	
iv)	Filth	0.1			
v)	Other edible grains	0.1	0.2	0.5	
vi)	Contrasting varieties	0.5	1	1.5	
vii)	Slightly defective beans ^a	1	3	7	
viii)	Seriously defective beans	0.2	0.4	1	
ix)	Total defective	0.8	2.4	5.6	
x)	Harmful/noxious seeds	0.05			
^a broken bean shall not exceed 3.0 % of the slightly defective beans					

4.3 Iron content requirements

Iron bio-fortified beans shall be classified and have iron content limits as per the Table 2.

Table 2 — Iron bio-fortification requirements

S/N	Class	Iron content mg/kg	Method of test
i)	Class I	≥ 90	AOAC 999.10
ii)	Class II	≥ 80 and < 90	
iii)	Class III	≥ 60 and < 70	

5 Contaminants

5.1 Pesticide residues

Iron bio-fortified dry beans shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity

5.2 Other contaminants

5.2.1 Heavy metals

Iron bio-fortified dry beans shall comply with those maximum limits for heavy metals stated in Table 2

Table 3-Heavy metals limits for beans

Heavy metal	Maximum limit, mg/kg	Method of Test
Lead	0.2	AOAC 972.25
Cadmium	0.1	AOAC 973.34

6 Hygiene

Iron bio-fortified dry beans shall be produced, prepared and handled in accordance with RS CAC/RCP 1.

7 Packaging

7.1 Iron bio-fortified dry beans shall be packed in food grade containers which will safeguard the hygienic, nutritional, and organoleptic qualities of the products.

7.2 Each package shall be securely closed and sealed.

8 Weights and measures

The weight of the package of the product shall comply with Weights and Measures regulations of the importing Partner State.

9 Labelling

In addition to the requirements in EAS 38, each package shall be legibly and indelibly labelled with the following:

- a) product name as “Iron bio-fortified dry beans”;
- b) grade as per the Table 1;
- c) class as per Table 2;
- d) name, address and physical location of the producer/packer/importer;
- e) batch number;
- f) net weight, in kilograms;
- g) storage instruction as “Store in a cool dry place away from any contaminants”;
- h) crop year;
- i) instructions on disposal of used package;
- j) country of origin; and
- k) declaration on whether the dry beans were genetically modified or not.

10 Sampling methods

Sampling shall be done in accordance with the RS ISO 24333.

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