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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.

RS 350 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.

CIAT/Harvest Plus

FARMFRESH Ltd

Rwanda Agriculture Board (RAB)

SHEKINA Enterprise

University of Rwanda – College of Agriculture, Animal sciences and Veterinary Medicine (UR-CAVM)

Rwanda Standards Board (RSB) – Secretariat

# Iron bio-fortified beans — Specification

## 1 Scope

This Rwanda Standard specifies requirements, sampling and test methods 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.

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

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

AOAC 999.10, *Lead, Cadmium, Zinc, Copper, and Iron in Foods. Atomic Absorption Spectrophotometry*

RS CAC/RCP 1, *Code of Practice — General principles of food hygiene*

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*

## 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

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### 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

#### **dry beans**

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

### 3.4

#### **defective beans**

slightly or seriously defective

#### **3.4.1**

##### **slightly defective beans**

immature, slightly stained, wrinkled or broken

##### **3.4.1.1**

##### **immature beans**

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

##### **3.4.1.2**

##### **broken beans**

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

#### **3.4.2**

##### **seriously defective beans**

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

### 3.5

#### **foreign/extraneous matter**

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

**3.6****inorganic foreign/extraneous matter**

stones, glass, pieces of soil and other mineral matter

**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/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 Grading 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 — Grading requirements**

S/N	Characteristics	Maximum limits, %, m/m			Test method
		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 <sup>a</sup>	1	3	7	
viii)	Seriously defective beans	0.2	0.4	1	
x)	Total defective	0.8	2.4	5.6	
x)	Harmful/toxic seeds	0.05			

<sup>a</sup> 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 — Levels of iron in bio-fortified beans**

S/N	Class	Iron content mg/kg	Test method
i)	Class I	≥ 90	AOAC 999.10
ii)	Class II	≥ 80 - < 90	
iii)	Class III	≥ 60 - < 80	



## 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 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	Test method
<i>Lead</i>	0.2	AOAC 972.25
<i>Cadmium</i>	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 RS EAS 38, each package shall be legibly and indelibly labelled with the following:

- a) product name as “Iron bio-fortified dry beans”;
- b) grade;
- c) class;

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- 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

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

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