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**Pumpkin seeds — 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.

DRS 508 was prepared by Technical Committee RSB/TC 003, Cereals, pulses, legume and cereal products

### **Committee membership**

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

Ace global depository Rwanda Ltd

Rwanda Consumer's Rights Protection Organization (ADECOR)

International Consultant in food processing companies

MANOSALWA FOOD INDUSTRIES LTD

Mount Meru Soyco Ltd

National Industrial Research and Development Agency (NIRDA)

Nyarutarama Business Incubation Center

One Acre Fund

Rwanda Food and Drugs Authority (RFDA)

SOSOMA Industries

SPIC Ltd

UR-CAVM

ZIMA HEALTHY GROUP (ZHG) Ltd

Rwanda Standards Board (RSB) – Secretariat

# Pumpkin seeds — Specification

## 1 Scope

This Draft Rwanda Standards specifies the requirements, sampling and test methods for pumpkin seeds from the varieties (*Cucurbita pepo* L., *Cucurbita maxima*) intended for human consumption.

This standard applies to raw pumpkin seeds and roasted pumpkin seeds.

## 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 2001.13, *Vitamin A(Retionol) in Foods. Liquid Chromatography*

AOAC 999.11, *Determination of Lead, Cadmium, Copper, Iron, and Zinc in Foods— Atomic Absorption Spectrophotometry*

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

RS CODEX STAN 192, *General standard for food additives*

RS CODEX STAN 193, *General standard for contaminants and toxins in food and feed*

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

RS ISO 16050, *Foodstuffs — Determination of aflatoxin B1, and the total content of aflatoxins B1, B2, G1 and G2 in cereals, nuts and derived products — High-performance liquid chromatographic method*

RS 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*

RS ISO 20483, *Cereals and pulses — Determination of the nitrogen content and calculation of the crude protein content — Kjeldahl method*

RS 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*

RS ISO 2171, *Cereals, pulses and by-products — Determination of ash yield by incineration*

RS ISO 4833-1, *Microbiology of the food chain — Horizontal method for the enumeration of microorganisms — Part 1: Colony count at 30 degrees C by the pour plate technique*

RS ISO 542, *Oilseeds — Sampling*

RS ISO 5498, *Agricultural food products — Determination of crude fibre content — General method*

RS ISO 5985, *Animal feeding stuffs — Determination of ash insoluble in hydrochloric acid*

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

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

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

RS ISO 6634, *Fruits, vegetables and derived products — Determination of arsenic content — Silver diethyldithiocarbamate spectrophotometric method*

RS ISO 665, *Oilseeds — Determination of moisture and volatile matter content*

RS ISO 6888-1, *Microbiology of the food chain — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 1: Method using Baird-Parker agar medium*

RS ISO 729, *Oilseeds — Determination of acidity of oils*

### **3 Terms and definitions**

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

#### **3.1**

##### **pumpkin**

thick rind and roundish fruit of the *Cucurbitaceae* family that usually comes in a bright orange color or also green and yellow or white depending on how mature it is and mostly used as vegetable

#### **3.2**

##### **pumpkin seeds**

edible seeds of pumpkin from *Cucurbitaceae* family

### 3.3

#### **raw pumpkin seeds**

edible seeds of a pumpkin that have not been subjected to any form of processing other than drying, cleaning and/or sorting/grading

### 3.3

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

material which will safeguard the hygienic, nutritional, technological, and organoleptic qualities of the product

### 3.4

#### **roasted pumpkin seeds**

pumpkin seeds which have been subjected to dry heat and to which salt (in form of powder or brine) and/or spices may have been added

### 3.5

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

organic or inorganic materials other than the pumpkin seeds

### 3.6

#### **organic matter**

any animal or plant matter other than pumpkin seed

### 3.7

#### **inorganic matter**

stones, glass, pieces of soil and other mineral matter

### 3.8

#### **filth**

impurities of animal origin, including dead insects

### 3.9

#### **defective/damaged seeds**

pest damaged, discoloured, stained, rotten and diseased and broken seeds

### 3.10

#### shrivelled/immature pumpkin seeds

seeds which are underdeveloped, thin and papery in appearance

### 3.11

#### fried pumpkin seeds

pumpkin with or without seed coats which have been subjected to deep frying in edible oil and to which salt (in form of powder or brine) and/or spices may have been added

### 3.12

#### oil content

amount of oil in the seed expressed as percentage mass by mass

### 3.13

#### acid value

number of milligrams of potassium hydroxide required to neutralize the free fatty acids present in 1 g of fat.

## 4 Grading

Raw pumpkin seeds shall be classified as grade 1, grade 2 and grade 3 according to Table 1 when tested in accordance with test method specified therein

Table 1— Grading for raw pumpkin seeds

S/N	Characteristic	Maximum limits			Test method
		Grade 1	Grade 2	Grade 3	
1.	Filth, % m/m, max.	0.1	0.1	0.1	RS ISO 605
2.	Extraneous/foreign matter % m/m max	0.01	0.03	0.05	
3.	Damaged seeds % m/m max	1.0	2.0	3.0	
4.	Shrivelled and immature seeds, % m/m max. max	1.0	3.0	5.0	

## 5 Requirements

### 5.1 General requirements

5.1.1 Pumpkin seeds shall be practically free from foreign flavours and odours, moulds, live pests, fungal infestation, toxic or noxious weed seeds, other edible grains and other injurious contaminants.

5.1.2 Pumpkin seeds shall:



- a) be clean;
- b) be wholesome;
- c) have a colour characteristic of the variety;
- d) be dry and uniform in size, flat and oval in shape; and
- e) be free from decayed and mould seeds.

## 5.2 Specific requirements

Raw and roasted pumpkin seeds shall comply with the specific requirements given in Table 2 when tested in accordance with test methods specified therein.

**Table 2 — Specific requirements for raw and roasted pumpkin seeds**

S/N	Characteristic		Requirements	Test method
1.	Moisture content, % m/m, max.	Raw	8.0	RS ISO 665
		Roasted/Fried	5.0	
2.	Crude protein on dry matter basis, % m/m, min		15 [19]	RS ISO 20483
3.	Acid insoluble ash, % m/m, max.		0.4	RS ISO 5985
4.	Total ash% max.		6.0	RS ISO 2171
5.	Free fatty acids % m/m, max		2.0	RS ISO 729
6.	Sodium chloride (when used) % max		2.0	-
7.	Oil content on moisture free basis, %, (m/m), min	Raw	30	RS ISO 659
		Roasted/Fried	[45]	
	Vitamin A (µg/100 g) min		262	AOAC 2001.13
	Crude fiber, % m/m, max		4.5	RS ISO 5498
8.	[Phytic acids % max]		[1.8]	

## 6 Food additives

Food additives which may be used shall comply with RS CODEX STAN 192.

## 7 Hygiene

Pumpkin seeds shall be produced and handled under hygienic conditions in accordance with RS CAC/RCP 1.

## 8 Microbiological limits

Pumpkin seeds shall not exceed the microbiological limits in Table 5 when tested in accordance with test methods specified therein

**Table 5 — Microbiological limits for Pumpkin seeds**

S/N	Microorganisms	Maximum Limit	Test method
1.	Total Plate Count cfu/g,	10 <sup>3</sup>	RS ISO 4833-1
2.	<i>Escherichia coli</i> , cfu/ g	Absent	RS ISO 16649-2
3.	<i>Salmonella spp</i> in 25 g	Absent	RS ISO 6579-1
4.	<i>Staphylococcus aureus</i> , cfu/ g	Absent	RS ISO 6888-1
5.	Yeasts and moulds, cfu/g	10 <sup>2</sup>	RS ISO 21527-2

## 9 Contaminants

### 9.1 Pesticide residues

Pumpkin seeds shall comply with the maximum residue limits for pesticides established by the Codex Alimentarius Commission.

### 9.2 Heavy metals

Pumpkin seeds shall comply with the heavy metal contaminants given in Table 3 when tested in accordance with the test methods specified therein.

**Table 3 — Limits for heavy metal contaminants in pumpkin seeds**

S/N	Heavy metal	Maximum limit (mg/kg)	Test method
1.	Lead (Pb)	0.05	AOAC 999.11
2.	Cadmium (Cd)	0.05	
3.	Arsenic (As)	0.1	RS ISO 6634

### 9.3 Mycotoxins

Pumpkin seeds shall not exceed aflatoxin limits in Table 4 when tested in accordance with test methods specified therein.

**Table 4 — Mycotoxin limits for pumpkin seeds**

S/N	Type of mycotoxin	Maximum limit (µg/kg)	Test method
1.	Total aflatoxins	10	RS ISO 16050
2.	Aflatoxin B <sub>1</sub>	5	

## 10 Packaging

Pumpkin seeds shall be packaged in food grade packaging materials that ensure the integrity and safety of the product.

## 11 Labelling

In addition to the requirements of RS EAS 38, each pack of pumpkin seeds shall be legibly and indelibly marked with the following:

- a) product name as "Raw pumpkin seeds" or "Roasted pumpkin seeds"; or "Fried pumpkin seeds"
- b) grade for raw pumpkin seeds;
- c) The name and address of the manufacturer, packer, distributor, importer, exporter or vendor
- d) list of ingredients in descending order
- e) net weight;
- f) country of origin;
- g) lot/batch number;
- h) statement, "Food for Human Consumption" shall appear on the package;
- i) storage instructions
- j) instructions on disposal of used package;
- k) date of manufacture
- l) date of expiry

## 12 Sampling

Sampling of pumpkin seeds shall be done in accordance with RS ISO 542

## Bibliography

[1]<https://www.sciencedirect.com/science/article/abs/pii/S0963996921006918#:~:text=Roasting%20is%20widely%20applied%20in,from%20oilseed%20during%20subsequent%20extraction.>

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