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Roasted macadamia— Specification

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In order to match with technological development and to keep continuous progress in industries, standards are subject to periodic review. Users shall ascertain that they are in possession of the latest edition

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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 171 was prepared by Technical Committee RSB/TC 038, *Processed fruits and vegetables.*

This second edition cancels and replaces the first edition (RS 171:2012), which has been technically revised.

Committee membership

The following organizations were represented on the Technical Committee on Processed fruits and vegetables (RSB/TC 038) in the preparation of this standard.

Enterprise Urwibutso

FRESHCO

National Agricultural Export Development Board (NAEB)

NORELGA Macadamia

PEBEC Ltd

Rwanda Nuts Company

SORWATOM

Rwanda Standards Board (RSB) – Secretariat

Roasted macadamia— Specification

1 Scope

This Draft Rwanda Standard specifies the requirements, sampling and test methods for roasted macadamia of varieties (cultivars) grown from *Macadamia integrifolia*, *Macadamia ternifolia*, *Macadamia tetraphylla*, and their hybrids 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 999.10, *Lead, Cadmium, Copper, Iron, and Zinc in foods, Atomic Absorption Spectrophotometry after microwave digestion*

RS CAC/RCP 1*, Code of practice — General Principle for food Hygiene*

RS CODEX STAN 192, *Codex general standard for food additives*

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 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 3960, *Animal and vegetable fats and oils — Determination of peroxide value — Iodometric (visual) endpoint determination*

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

3 Terms and definitions

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

3.1

roasted macadamia

kernels which have been subjected to heat by dry or wet roasting and to which salt, sugar, honey or other permitted food additives may have been added

3.2

whole kernel

kernel that is not split or separated into halves. The kernel contour is not more than materially affected by a missing portion or portions. Not more than ¼ of the kernel is chipped off or missing

3.3

half kernel/split

approximately half of a whole kernel, with not more than 1/8 of its mass chipped off or missing

3.4

piece

unit of a kernel which is less than half a kernel

3.5

clean kernel

kernel which is practically free from dirt or other foreign material, or the general appearance of the lot is not more than appreciably affected by dirt or other foreign or extraneous substance

3.6

foreign matter

organic and inorganic material other than roasted macadamia

3.7

defective kernels

defective kernels shall mean any or all of the following:

a) kernels with adhering of foreign matter;

b) insect damaged kernels;

c) excessively soft kernels;

d) rancid kernels;

e) immature kernels;

f) weather-damaged kernels.

3.8

off flavour

odour or flavour which is not characteristic of macadamia kernels and which appreciably affect the eating quality of the kernel

4 Requirements

4.1 General requirements

Roasted macadamia shall:

a) be of the characteristic colour;

b) be free from objectionable odour;

c) be free from dust;

d) be free from decayed or mould damaged kernels; and

e) be free from live insects, insect fragments and mites.

4.2 Specific requirements

Roasted Macadamia shall comply with the specific requirements stipulated in Table 1 when tested in accordance with test methods specified therein.

Table 1 — Specific requirements for roasted macadamia

S/N	Characteristic	Limits	Test method
i.	Moisture content, %, m/m, max.	1.5	Annex A
ii.	Oil content on dry weight basis, %, m/m, min.	85	Annex B
iii.	Free fatty acid, calculated as Oleic acid %, m/m, max.	0.5	Annex C

iv.	Total ash (roasted and salted), % m/m, max.	4	RS ISO 2171
v.	Peroxide value, meq/kg, max.	3	RS ISO 3960

4.3 Grading

Roasted Macadamia shall be graded in compliance with the stipulations in Table 2 when tested in accordance with test methods specified therein.

Table 2 — Grades for roasted macadamia

S/N	Grade	Description	Whole kernel percentage	Size range (m/m)
i.	Premium	Whole kernels	100[a]	25 to 15
ii.	Popular	Wholes and halves	50 min.	17 to 10
iii.	Cocktail	Wholes and halves	11 to 49	17 to 10
iv.	Medium	Halves and pieces	10 Max.	12 to 4
v.	Chips	Pieces and bits	None	5 to 0.5
[a.] Tolerance — Up to 5 % by mass of the next lower grade.				

5 Food additives

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

6 Contaminants

6.1 Pesticide residues

Roasted macadamia shall comply with those maximum residue limits for pesticide residues established by Codex Alimentarius Commission for this commodity.

6.2 Heavy metals

Roasted macadamia shall not contain heavy metals in amounts which can represent a hazard to human health and shall comply with the limits in Table 3. when tested in accordance with test methods specified therein.

Table 3 —Heavy metals contaminant limits

S/N	Heavy metal	Maximum limit mg/kg	Test method
	Lead (Pb),	0.10	AOAC 999.10
	Cadmium (Cd),	0.02	

7 Hygiene

7.1 Roasted macadamia shall be handled in hygienic manner in accordance with RS CAC/RCP 1.

7.2 Roasted macadamia shall comply with the microbiological limits given in Table 4 when tested in accordance with test methods specified therein.

Table 4 — Microbiological limits for Roasted macadamia

S/N	Microorganism	Maximum limit	Test method
i.	Total plate count, CFU/g	10^3	RS ISO 4833-1
ii.	*Escherichia coli,* CFU/g	<1	RS ISO 16649-2
iii.	*Salmonella spp* in 25g	absent	RS ISO 6579-1
iv.	Yeasts and Moulds CFU in g	10	RS ISO 21527-2

8 Mycotoxin limits

Total aflatoxin levels in roasted macadamia kernels for human consumption shall not exceed 10 µg/kg and aflatoxin B1 shall not exceed 5 µg/kg when tested in accordance with RS ISO 16050.

9 Packaging

9.1 Roasted macadamia shall be packaged in food grade materials that will safeguard the hygienic, nutritional, technological and organoleptic qualities of the product. They shall be packaged in such a way to protect the product from mechanical, heat and frost damage.

9.2 The packaging materials shall conform to the environmental legislation of the destination country.

10 Weights and measures

Roasted Macadamia shall be packaged in accordance with the national weights and measurement regulations. and environmental requirements in the destination country.be in accordance with.

11 Labelling

In addition to the requirements of RS EAS 38, the following information shall be legibly and indelibly marked:

f) name of the product shall be “Roasted macadamia”

g) name and location address of the exporter and/or packer;

h) country of origin;

i) net weight;

j) lot identification (batch number);

k) declaration of preservatives, if used;

l) date of manufacture;

m) expiry date;

n) grading; and

o) storage conditions.

11.2 When labelling non-retail packages, information for non-retail packages shall either be given on the packages or in accompanying documents, except that the name of the produce, lot identification and the name and address of the manufacturer or packer shall appear on the package.

12 Sampling

Sampling shall be done in accordance to RS ISO 24333.

Annex A
(normative)

Determination of moisture content for Roasted macadamia

A.1 Procedure

A.1.1 Weigh accurately about 10 g of the material in a suitable moisture dish previously dried in an electric oven and weighed. Place the dish in a vacuum oven at 95 ^{0}C to 100 ^{0}C under pressure 100 mm/Hg. Cool the dish in a desiccator and weigh with the lid on. Repeat the process of heating, cooling and weighing at halfhour intervals until the loss in weight between two successive weighings is less than 1 mg. Record the lowest weight obtained.

A.1.2 Calculation and expression of results, moisture % by mass

$$\frac{(m_1 - m_2) \times 100}{m_1 - m_3}$$

where:

m_1 is the mass in g of the dish and sample before drying;

m_2 is the mass in g of the dish and sample after drying; and

m_3 is the mass in g of the dish only.

Annex B
(normative)

Determination of oil content

B.1 Reagents

B.1.1 Petroleum ether of boiling range of 40 ^{0}C to 60 ^{0}C.

B.1.2 Hezane of food grade.

B.2 Procedure

B.2.1 Weigh accurately about 2.5 g of the sample, dried as described under A.1.1, and extract with petroleum ether or hexane, food grade, in a Soxhlet or other suitable extractor. The extraction period may vary from 4 h at a condensation rate of 5.6 drops per second. Dry the extract on a steam bath for 30 min., cool in a desiccator and weigh. Continue at 30 min. intervals this alternative drying and weighing until the difference between two successive weighings is less than 1 mg.

B.2.2 Note the lowest mass.

B.3 Calculation and expression of results

Crude fat (on moisture-free basis), % by mass

$$100\,\frac{(m_1 - m_2)}{m_3}$$

where,

m_1 is the mass in g of the extraction flask with dried extract;

m_2 is the mass in g of extraction flask; and

m_3 is the mass in g of the dried sample for the test.

Annex C
(normative)

Determination of free fatty acid

C.1 Apparatus

Soxhlet fat extraction apparatus.

C.2 Reagents

C.2.1 Petroleum, ether, distilling below 65 ^{0}C, or ethyl ether.

C.2.2 Alcohol potassium hydroxide, 0.1N (use absolute or alcohol denatured with MeOH).

C.2.3 Alcohol-ether mixture, equal volumes of 96 % alcohol and ethyl ether.

C.2.4 Phenolphthalein solution, one % in alcohol ether and add alcoholic KOH solution to a faint pink.

C.3 Procedure

C.3.1 Extract 10.00 g ± 0.01 g of the sample taken in a thimble with petroleum ether for about 16 h in a Soxhlet extraction apparatus. Completely evaporate the solvent from extraction flask (weighed previously) on a steam bath, cool and weigh the Soxhlet flask with the residue and from the difference of the mass of fat obtained from the material. Dissolve the residue in the extraction flask with 50 ml of the alcohol-ether phenolphthalein solution. Titrate the dissolved extract, with standard potassium hydroxide solution to a faint pink colour which persists for 10 s. If emulsion is formed during titration, dispel by adding second 50 ml portion of the alcohol-ether phenolphthalein solution.

C.3.2 Make a blank titration on 50 ml of the alcohol-ether phenolphthalein solution and subtract this value from the titration value of the sample. If the additional 50 ml portion of the alcohol-ether phenolphthalein solution is added, double the blank titration

Annex D
(normative)

Determination of salt

D.1 Reagents

D.1.1 Acetone.

D.1.2 10 % calcium acetate solution.

D.1.3 HNO3.

D.1.4 0,1 N AgNO3.

D.1.5 Fe Alum indicator.

D.1.6 0.1 N NH4SCN.

D.2 Procedure

D.2.1 Weight 2 g of thoroughly mixed sample into a platinum or silica dish.

D.2.2 Disperse sample with 10 ml of acetone.

D.2.3 Remove acetone at room temperature, with air current.

D.2.4 Add, and thoroughly mix, 10 ml of 10 % calcium acetate.

D.2.5 Carefully dry on a steam bath.

D.2.6 Ash in a muffle oven at 550 0C (1022^{0}F) (complete ashing is not necessary).

D.2.7 Place ash in a beaker and dissolve ash in 25 ml HNO3 (1 + 3).

D.2.8 Add at least 2 - 4 ml of 0.1 N AgNO3 that is just enough to precipitate all chloride present.

D.2.9 Add at least 5 ml of 0.1 N AgNO3 in excess, to 8.

D.2.10 Heat to boil, cool, then add 5 ml Fe Alum indicator.

D.2.11 Titrate excess Ag with 0.1 N NH4SCN (which has been standardized to equalize normalities) to a permanent light brown end point.

D.2.12 Subtract the amount of NH4 SCN used (D.2.11) from the total AgNO3 used in D.2.8 and D.2.9. The resulting difference is the ml of 0.1 N AgNO3 used in the calculation of salt (D.2.13).

D.2.13 Calculate as % NaCl=

$$\frac{(mLof\,0.1NAgNO3(0.05845)(100)}{(gramsofsample)}$$

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ICS 67.080