The African Organisation for Standardisation

EDICT OF GOVERNMENT

ARS SHEA-K (2011) (English): African standard for shea kernel

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AFRICAN STANDARD FOR SHEA KERNEL

FOREWORD

The African Regional Organization for Standardization (ARSO) is a continental organization which harmonizes the standards developed by member countries and it's regional blocks. After the harmonization process member countries are then to publish the standards.
The African Regional Organization for Standardization is a member of the International Organization for Standardization (ISO).

The elaboration of this Africa Standard was carried out through a Regional Technical Committee drawn from the National Standards Bodies from the shea zone. Draft standards in the producer countries were widely circulated for public review and consultations (with direct involvement of the private sector and industry) both national and international, in order to assess and record the perspectives of a wide variety of stakeholders. The harmonisation process was done based on the African harmonisation model.The results of national consultation work was presented, reviewed and finalized at a regional inter-governmental consultation before recommending the standard to ARSO for declaration as Africa Standard.

This standard has been elaborated with a view to serve as a reference for professionals of the sector, consumers and institutions engaged in research, analysis and enforcement, in the framework of application of quality requirements to facilitate national, regional and international trade in shea kernel.

Reference to national and international publications as well as work of private sector and industries are hereby acknowledged.

Information on a grading system based on fat content , stearic - oleic – stearic (SOS) content and unsaponofiables for confectionary cocoa butter improver (CBI) and cosmetic products is included in an annex.

Users should note that this standard undergoes revision from time to time and any reference to it statutorily implies its latest edition.

1.0 Scope

This standard specifies the quality requirements, methods of sampling and testing for shea kernel originating from fruits of the tree *Vitellaria paradoxa* Cf Gaertn of the family Sapotaceae which is processed into fat/oil and other products destined for human use.

2.0 Normative References

The following references contain provisions applicable to this Standard. At the time of publication, the editions indicated were valid.
All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the recent editions of the standards indicated below.

ISO 542 : 1990 oil seeds – Sampling

ISO 659 : 1998 Oil seeds – Determination of oil content (Reference method)

ISO 660 : 1996 Animal and vegetable fats and oils - Determination of acid value and acidity.

ISO 665 : 2000 Oil seeds – Determination of moisture and volatile matter content

ISO 3960 : 2001 Animal and vegetable fats and oils - Determination of peroxide value.

ISO 8294 : 1994 Animal and vegetable fats and oils - Determination of copper, iron , and nickel content.

ISO 12193 : 2004 Animal and vegetable fats and oils - Determination of lead by direct graphite furnace atomic absorption spectroscopy.

AOAC 952.13 (1999) Determination of arsenic content

CAC/GL 50: 2004 General Guidelines on sampling

CODEX CAC/RCP 6 (1972) Recommended International code of hygienic practice for tree nuts

CODEX CAC/RCP 59 (2005) Code of practice for the prevention and reduction of Aflatoxin contamination in tree nuts.

CODEX STANDARD 228 (2001, revised 2004) General methods of Analysis for contaminants

CODEX STANDARD 193 -1995 (rev 2 - 2006) General standard for contaminants and toxins in foods

CODEX STANDARD 229 (1993, revised 2003) Analysis of pesticide residues – Recommended methods

CODEX STAN 1-1985 (Rev. 1-1991) Codex General Standard for the Labelling of Prepackaged Foods

3.0 Terminology

For the purposes of this Standard, the following terminologies shall apply:

3.1 Shea nut
Depulped Fruits of the tree *Vitellaria paradoxa* Cf Gaertn.

3.2 Shea kernel
The decorticated (shelled) nut of the tree *Vitellaria paradoxa* Cf Gaertn.

3.3 Damaged nuts/kernels
Nuts/kernels which are damaged mechanically, or by mould or weevils, or those showing internal discoloration of kernels which affects the quality. Characteristics of damaged kernels include mildewed, germinated and hardened (blackened).

3.4 Mouldy/decayed kernels
Kernels with evidence of mould particularly mould filaments and showing visible significant decomposition.

3.5 Empty nuts
Nuts in which there are no kernels.

3.6 Shrivelled nuts/kernels
Nuts/kernels which are imperfectly developed and shrunken.

3.7 Broken kernels
Kernels from which more than a quarter has been broken off.

3.8 Skinned kernels
Kernels from which the complete skin (integument) has been removed.

3.9 Split kernels
Kernels which have been split into halves.

3.10 Impurities

All matter other than whole sheanuts/kernels. Impurities includes: sand, stones, pebbles, dirt, lumps of earth, clay, mud, glass, metallic and plastic pieces, other vegetative materials such as grass, wood, bits of dry sheanuts/kernels or other seeds and filth.

3.10.1 Filth

Filth includes impurities of animal origin, including dead insects.

3.11 Insect infestation

Presence of live insects, or their eggs and / or other developmental stages.

4.0 Quality Requirements

4.1 General

4.1.1 Shea Nuts

Sheanuts shall have the appearance and colour characteristic of the variety. They shall be clean and reasonably uniform in size. Shea nuts shall be free from insect infestation.

4.1.2 Shea Kernels

Shea kernels shall be obtained by shelling the nuts and they shall have the appearance and colour characteristic of the variety. They shall be clean and reasonably uniform in size. Shea kernels shall be safe and suitable for processing for human use and shall be free from rancid odours and mustiness. shea kernels shall be free from insect infestation.

4.2 Specific requirements

For a given lot, the kernels shall all come from the same harvest.

4.2.1 Organoleptic Characteristics

Color: deep tan (chestnut) , characteristic of having undergone heat treatment
Light tan characheristic of non heat treatment

4.2.2 Fat Content

Total fat content of sheakernel shall not be less than 35% m/m

4.2.3 Specific quality requirements

Shea kernel shall conform to the Specific quality requirements as in Table 1

Table 1 - Specific quality requirements for shea kernel

Parameters	Grade I	Grade II	Grade III
Free Fatty Acid (FFA) % m/m	**2 max.**	**>2 - 4**	**>4 - 5**
Peroxide Value (meq/kg)	**5 max.**	**>5 - 9**	**>9 - 15**
Moisture Content % m/m	**5 max.**	**>5 - <7**	**7 - 8**
Impurities % m/m	**0.5 max**	**>0.5 - 0.8%**	**>0.8 - 1**

4.3 Physical defects

Physical defects of shea nut/kernel shall not exceed the value specified in Table 2.

Table 2 - Requirements for physical defects in shea nuts/kernels

Characteristic	Shea nut	Shea Kernel
Damaged nuts/kernels, % (m/m) max.	0.5	0.5
Shrivelled nuts/kernels, % (m/m) max.	3	3
Mouldy/decayed kernels% (m/m) max.	2	2
Skinned kernels, % (m/m) max.	-	0.5
Broken and split kernels, % (m/m) max.	-	2
Empty nuts, % (m/m)max.	2	-
Admixtures of other varieties, % (m/m) max.	1	1

5.0 Contaminants

5.1 Heavy metals

Shea kernel shall not contain heavy metals in amounts that may present a hazard to human health and shall not exceed the limits specified as follows :

Element	Maximum Limit
Lead (Pb)	0.1 mg/kg
Arsenic (As)	0.1 mg/kg
Iron (Fe)	5.0 mg/kg
Copper (Cu)	0.4 mg/kg

5.2 Chemical contaminants

The Aflatoxin content of shea kernel shall not be more than 4µg/kg.

5.3 Pesticide Residues

Pesticide residues in sheanuts/kernels shall be in accordance with CAC/MRL 1 Maximum Residue Limits (MRL's) for pesticides : 2001

6.0 General hygiene requirements

It is recommended that the product covered by the provisions of this standard be picked, handled, and packed in accordance with Good Agricultural Practices, CODEX CAC/RCP 6 (1972), Recommended International code of hygienic practice for tree nuts, and CODEX CAC/RCP 59 (2005), Code of practice for the prevention and reduction of Aflatoxin contamination in tree nuts.

7.0 Microbiological Requirements

When tested by appropriate methods shea kernel shall not contain any substances originating from micro-organisms in amounts which may present a health hazard and shall

- contain no more than 1 X 10^3 cfu/g for total viable count (TVC).
- contain no more than 1 X 10^2 cfu/g for yeast and mould count.

8.0 Packaging and Labelling

8.1 Packaging

The jute bags (food grade or hydrocarbon free bags) used for packaging of shea kernel shall be clean, sound, intact, free of insects, sufficiently strong and properly sewn. The bags shall preserve the hygienic, nutritional, technical and organoleptic qualities of the product.

For shipment new jute bags shall be used.

8.2 Labelling

The product shall be labeled according to the provisions of Codex General Standard for Lablling of Prepackaged Foods - CODEX STAN 1 1985, Rev. 2001. In addition, each bag shall be legibly and indelibly marked with the following information.

- Name of produce
- Name and address of the producer or exporter and registered trade mark of producer / packer if any
- Net weight (kg)
- Product category
- Batch code (for traceability)
- Country of production
- Year and month of harvest
- Storage conditions

For bulk packages, shipment shall be accompanied by documents specifying the labelling requirements.

9.0 Sampling

Sampling shall be done in accordance with the provisions of ISO 542 : 1995 Oil seeds – Sampling and Oilseeds ISO 664 -1995 Reduction of laboratory sample to test sample.

10.0 Testing

The samples drawn in accordance with clause 9 shall be tested for compliance with the requirements of this specification according to the appropriate methods of test as indicated below.

Moisture content
Determination of moisture content to be undertaken according to the method described in ISO 665 : 2000.

Acidity
Determination of Free Fatty Acid content to be undertaken according to the method described in ISO 660 : 1996.

Fat content
Determination of fat content to be undertaken according to the method described in ISO 659 : 1998 (Reference method).

Level of impurities
Determination of the level of impurities to be undertaken according to the method described in ISO 658 : 2002.

Peroxide value
Determination of Peroxide value to be undertaken according to the method described in ISO 3960 : 2001 Animal and vegetable fats and oils - Determination of peroxide value

Heavy metals
Determination of heavy metals to be undertaken according to the methods described in :
ISO 8294 : 1994 Animal and vegetable fats and oils - Determination of copper, iron , and nickel content.

ISO 12193 :2004 Animal and vegetable fats and oils - Determination of lead content.

AOAC 952.13 (1999) Determination of arsenic content

11.0 Criteria for conformity

A lot shall be declared as conforming to this specification if the final sample satisfies all the requirements given in this standard.

Annex A

Grading Shea Kernels for Confectionery Cocoa Butter Improver (CBI)

Total Fat Content (%) range 51.5-35.1

Grade 'A'	Grade 'B'	Grade 'C'
>45	45 - >40	40 - 35

SOS Content (% Total) range 45.9-24.4

Grade 'A'	Grade 'B'	Grade 'C'
>40	40 – >35	35 – 30

Grading Shea Kernels for Cosmetic / Pharmaceutical

Unsaponifiables: range 13.3 – 3.2

Grade 'A'	Grade 'B'	Grade 'C'
>8	8 - >5	5 - 3