

DRAFT UGANDA STANDARD

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Groundnuts for oil extraction — Specification

PUBLIC REVIEW DRAFT



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DUS DEAS 889: 2016

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This Draft Uganda Standard, DUS DEAS 889: 2016, *Groundnuts for oil extraction — Specification*, is identical with and has been reproduced from a Draft East African Standard, DEAS 889: 2016, *Groundnuts for oil extraction — Specification*, and is being proposed for adoption as a Uganda Standard.

This standard was developed by the Food and agriculture Standards Technical Committee (UNBS/TC 2).

Wherever the words, "East African Standard" appear, they should be replaced by "Uganda Standard."



DEAS 889:2016

ICS 67.080

DRAFT EAST AFRICAN STANDARD

Groundnuts for oil extraction — Specification

EAST AFRICAN COMMUNITY

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Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

In order to achieve this objective, the Community established an East African Standards Committee mandated to develop and issue East African Standards.

The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the procedures of the Community.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

DEAS 889 was prepared by Technical Committee EASC/ TC/015, *Oil Seeds, Edible Fats and Oils*.

Groundnuts for oil extraction — Specification

1 Scope

This Draft East Africa Standard specifies the requirements, methods of sampling and test for shelled groundnuts of the fruit of the plant *Arachis hypogaea* intended for oil extraction.

2 Normative references

2 Terms and definitions

For the purposes of this standard, the following definitions shall apply:

3.1

groundnut/peanut

the fruit of the plant *Arachis hypogaea*

3.2

shelled groundnut kernels

raw groundnuts with their shells removed, and which have not been subjected to roasting and/or various forms of chemical treatment

3.3

unshelled groundnuts

groundnuts with part or all of the hull (shell) attached

3.4

Mature pod

kernels which are firm and developed

3.6

damage/defects

kernel that is rancid, mouldy, pest infested, dirty and/ or decayed

3.7

Other defects

the groundnut kernel that have skin discolouration, flesh discolouration and / or sprouted kernels

3 Requirements

3.1 General requirements

- 3.1.1 Groundnuts shall be free from dead or living insects, insect fragments and mites.
- 3.1.2 The kernels shall be free from foreign matter such as stones, dirt or any contamination.
- 3.1.3 The kernels shall be free from extraneous matter
- 3.1.4 The kernels shall be free from foreign odours and undesirable flavour and/or taste.
- 3.1.5 groundnuts shall be free from decayed and mould-damaged kernels.
- 3.1.6 groundnuts shall be free from small shrivelled and immature kernels or hard kernels.

3.2 Specific requirements

Groundnuts intended for oil extraction shall comply with the requirements stipulated in Table 1.

Table 1 — Specific Requirements

Sl. No.	Characteristic	Requirements	Method of test
i)	Moisture content, % m/m max.	8.0	Annex A
ii)	oil content, dry weight, %, m/m, min	40	Annex B
iii)	Free fatty acids, %, m/m, max	6.0	ISO 660
iv)	Total ash on dry weight basis % m/m max.	2.0	EAS 60

3.3 Grading

Groundnuts intended for oil extraction may be classified as Grade 1, Grade 2 or Grade 3 according Table 2, where applicable.

Table 2 — Grade requirements for groundnut kernels for oil extraction

Sl. No.	Factor	Requirement			Method of test
		Grade 1	Grade 2	Grade 3	
i)	Oil content of the kernel (on moisture free basis), % by mass, min.	48.0	45.0	42.0	Annex B
ii)	FFA content, % max.	2.0	4.0	6.0	Annex B
iii)	Broken, defective and damaged kernels, % by mass, max.	3.0	5.0	7.0	Annex A

iv)	Foreign matter, % by mass, max.	0.1	0.2	0.3	
v)	Total tolerance for factors (iii) and (iv)	0.1	5.0	7.0	

4 Hygiene requirements

Groundnuts for oil extraction shall be produced, processed, handled and stored in accordance with EAS 39.

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Table 2 — Microbiological limits for roasted groundnuts

Sl. No.	Micro-organism	Limits	Method of test
i)	Moulds (max.)	10 ⁴ /g	ISO 7698
ii)	E. Coli	Shall be absent	ISO 16654
iii)	Salmonellae	Shall be absent	ISO 6579

4.3 Total Aflatoxin shall not exceed 10 ppb while aflatoxin B1 shall not exceed 5 Pbb when tested in accordance with ISO 16050.

5 Packaging

Groundnuts for oil extraction shall be packaged in food grade containers and sealed in manner to ensure the safety and quality requirements specified in this standard are maintained throughout the shelf life of the product.

6 Labelling

Labelling shall be done in accordance with EAS 38.

8 Sampling

Sampling of groundnuts for oil extraction shall be done in accordance with ISO 542.

Annex A (normative) **Determination of moisture**

A.1 Grinding

A.1.1 General requirements

The grinding mill should grind evenly and should not be operated at such a high speed that the ground material is heated.

Air currents that might cause loss of moisture shall be reduced to a minimum.

A.1.2 Particle size

The mill-setting shall be such that at least 50 per cent of the ground material passes through a sieve with meshes of 3.4 mm.

A.1.3 Drying

Two stages of drying shall be applied when moisture content of bean grains is higher than 20 per cent.

A.2 Determination

A.2.1 Preferred method

The air-oven 130 °C method shall be used.

A.2.2 Equipment

A.2.2.1 Dishes of non-corrosive metal (thickness approximately 0.5 mm) with side rounded at base and flat bottom, fitted with covers which seat so snugly that loss of moisture is reduced to a minimum.

The dimensions of the materials is applied per cm², to ensure close fitting of the cover, the rim of the dish should be levelled by rubbing with an abrasive.

A.2.2.2 An electrically-heated oven with adequate ventilation and thermostatic control which permits the temperature to be maintained at 130 °C.

The heating capacity of the oven must be such that after pre-heating capacity to temperature 130 °C, followed by opening and loading with dishes, the oven will again reach 130 °C within 45 minutes (preferably within 30 minutes).

A.2.2.3 A desiccator (with a suitable desiccant), preferably fitted with a thick metal plate to promote rapid cooling of the dishes.

A.2.2.4 A balance on which accurate weighings can be made in grams to 3 decimal places.

A.2.3 Procedure

Weigh the dish with its cover. Weigh out 4 g to 5 g of the sample previously mixed. Place the working sample in the dish, distributing it evenly over the bottom surface. Put the cover on the dish and weigh again. Place the dish on top of its cover in an oven heated before-hand to 130 °C. In order to limit the loss of heat, the dishes must be placed in the oven rapidly. From the time that the oven again reaches 130 °C, the drying period

should be 60 min at this temperature. After termination of the drying period, cover the dishes immediately and place them in a desiccator to cool for 30 min to 45 min. Weigh the dishes with their contents and covers. All weighings should be made to an accuracy of 0.001;

$$\text{Moisture} = (M_2 - M_3) \times \frac{100}{M_2 - M_1}$$

where

M_1 is the weight in g of the dish and its cover,

M_2 is the weight in g of the dish, its cover and its contents; and

M_3 is the weight in g of the dish, covers the contents after drying, then moisture content calculated on wet basis and expressed in percentage is:

The determination must be made in duplicate. The results of duplicate determinations must not differ by more than 0.2 %. Should the difference be greater than this, the determination must be repeated in duplicate.

A.2.4 Two-stage drying

Weigh out approximately 50 g of the sample. Then transfer this working sample to a suitable weighed container and place in an air-oven at a temperature of 130 °C for 5 min to 10 min. The length of this preliminary drying period will depend on the amount of moisture. It may be necessary to remove the sample from the oven, the objective being to reduce the moisture content to 12 % to 15 %. Spread the partly-dried seeds in an open tray and leave exposed in the laboratory for 2 hours. Transfer the material to the container in which it was oven dried, and weigh. Calculate the loss of moisture as stated in A.2.3.

The determination must be made in duplicate, with the weighings being made to an accuracy of 10 mg. Grind separately the two partly-dried working samples, and on the ground material from each, make a single moisture determination as stated above, and calculate the loss of moisture. From the results obtained in the first and second stages of the procedure, calculate the moisture content of the sample if S_1 is the moisture lost in stage 1 and S_2 is the moisture lost in stage 2, each expressed as a percentage, then the original moisture content of the sample, calculated on the wet basis and expressed as percentage, is:

$$S_1 + S_2 - \frac{(S_1 \times S_2)}{100}$$

Annex B
(normative)
Determination of fat

B.1 Reagents

B.1.1 Petroleum ether, of boiling range 40 °C to 60 °C.

B.1.2 Hezane, food grade.

B.2 Procedure

Weigh accurately about 2.5 g of the dried sample and extract with petroleum ether or hexane, food grade, in a Soxhlet or other suitable extractor. The extraction period may vary from 4 hours 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 one-milligram.

Note the lowest mass.

B.3 Calculation and expression of results

Crude fat (on moisture-free basis), per cent by mass = $\frac{m_1 - m_2}{m_3}$

where;

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

m_2 is the mass in grams of extraction flask;

m_3 is the mass in grams of the dried sample taken for the test.

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