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PROJET DE NORME CAMEROUNAISE PNC 3153 : 2026 - CT 48

2026

CASSAVA WHEAT COMPOSITE FLOUR – SPECIFICATION

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PROJET DE NORME CAMEROUNAISE

ENQUETE PUBLIQUE N° : 19

Durée de l'enquête Du 21/09/2026 Au 19/10/2026

Edition et diffusion par l'Agence des Normes et de la Qualité
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DN-R2/PR-01/ENR-02
16/12/2015

Cassava wheat composite flour — Specification



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Introduction

Cassava is cultivated in many parts of Africa. The farmers have a number of varieties both indigenous and improved. Cassava roots have a short shelf-life and are either consumed immediately after harvest or have to be processed into shelf stable products.

Cassava roots are processed at household and cottage levels in the rural areas. Processing at these levels involves mainly the production of cassava chips and flour from fermented or unfermented roots.

The processing of cassava roots into flour is done by traditional methods. The process for production of flour involves peeling, cutting into pieces, sun drying, milling, sieving and packaging for unfermented flour. For fermented cassava flour, the cassava pieces are fermented before sun drying.

Wheat and its flours imports represent a major burden on the economy of importing countries including trade imbalance, overdependence on foreign foods, loss of foreign exchange, food insecurity, as well as displacement of local food, with detrimental effects on the agricultural and technological development of these regions (Ohimain, 2014). The need for strategic development and use of local resources for producing low cost foods, such as bread and baked foods has been recognized by organizations such as the Food and Agriculture Organization of the United Nations (FAO), the International Center for Tropical Agriculture (CIAT) and the International Institute of Tropical Agriculture (IITA). The utilization of composite flours in the baking industry promotes local food crops and agriculture and reduces the negative balance of trade in developing countries. Cassava, as an important staple food crop in tropical regions, has been studied extensively in relation to the production of composite flour. Inclusion of cassava flour as composite for production of foods such as noodles, breakfast cereals, cookies, breads, cakes, pastries, muffins and doughnuts among others could reduce costs and increase the production of these products locally (Sanni *et al.*, 2006). Measures to promote the use of cassava flour in tropical countries, particularly cereals importing countries, remain active. The implementation of these measures can be enhanced by ensuring that cassava flour meets relevant standards which improve the quality of composite flours in order to produce palatable recipes.

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Cassava wheat composite flour — Specification

1 Scope

This African Standard specifies requirements, the methods of sampling and test for cassava-wheat composite flour. This standard does not apply to other composite flours from non-wheat sources which may be used in different products.

2 Normative references

The following referenced documents are indispensable for the application 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.

ARS 53, *General principles of food hygiene — Code of practice*

ARS 56, *Prepackaged foods — Labelling*

ARS 470, *Wheat flour — Specification*

ARS 838, *Cassava flour — Specification*

ARS 839, *Dried cassava chips — Specification*

ARS 844, *Cassava and cassava products — Determination of total cyanogens — Enzymatic assay method*

CODEX Stan 192, *General standard for food additives*

CODEX STAN 193, *Codex general standard for contaminants and toxins in food and feed*

ISO 712, *Cereals and cereal products — Determination of moisture content — Reference method*

ISO 1871, *Food and feed products — General guidelines for the determination of nitrogen by the Kjeldahl method*

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

ISO 3094, *Fruit and vegetable products — Determination of copper*

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

ISO 5986, *Animal feeding stuffs — Determination of diethyl ether extract*

ISO 6579, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of *Salmonella* spp.*

ISO 6633, *Fruit and vegetable products — Determination of lead content — Flameless atomic absorption spectrometric method*

ISO 6634, *Fruit and vegetable products — Determination of arsenic content — Silver diethyldithiocarbamate spectrophotometric method*

ISO 6637, *Fruit and vegetable products — Determination of mercury content — Flameless atomic absorption method*

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

ISO 6888-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 2: Technique using rabbit plasma fibrinogen agar medium*

ISO 6888-3, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 3: Detection and MPN technique for low numbers*

ISO 7251, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of presumptive Escherichia coli — Most probable number technique*

ISO 7305, *Milled cereal products — Determination of fat acidity*

ISO 15141-1, *Foodstuffs — Determination of ochratoxin A in cereals and cereal products — Part 1: High performance liquid chromatographic method with silica gel clean up*

ISO 15141-2, *Foodstuffs — Determination of ochratoxin A in cereals and cereal products — Part 2: High performance liquid chromatographic method with bicarbonate clean up*

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

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*

ISO 24333, *Cereals and cereal products — Sampling*

3 Terms and definitions

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

3.1

cassava-wheat composite flour

combination of cassava flour and wheat flour

3.2.

filth

impurities of animal origin (including dead insects)

3.3

food grade material

one that will not transfer non-food chemicals into the food and contains no chemicals which would be hazardous to human health

3.4

foreign matter

all organic and inorganic materials (such as sand, soil, glass)

3.5

flour

finely ground content of wheat grains or dried peeled cassava roots

4 Quality requirements

4.1 General requirements

The general requirements for cassava wheat composite flour shall be as follows;

- (a) homogenous in size and colour;
- (b) practically free of filth and foreign matter;
- (c) free from rancid, objectionable odours or flavours.

4.2 Ingredients

The cassava flour used in the manufacture of composite flour shall conform to ARS 838. The wheat flour shall conform to ARS 470.

4.3 Particle size

Testing for particle size shall be done in accordance with ISO 3588. Not less than 90 % shall pass through a 0.25 mm sieve for fine flour.

4.4 Specific requirements

Composite cassava wheat flour shall conform to the requirements in Table 1.

Table 1 — Compositional requirements for cassava wheat composite flour

Characteristic	Requirement	Method of test
Protein content, percent by mass, min. (N x 6.25)	8.0	ISO 1871
Crude fat content, % by mass on a dry weight basis, min.	2.0	ISO 5986
Crude fibre content, % by mass on dry matter basis, max.	1.25	ISO 5498
Acid value, mg/kg	50	ISO 7305
Acid insoluble ash, % by mass, max.	0.35	Annex A
Moisture content, %, by mass, max.	13.5	ISO 712
Hydrocyanic acid content, mg/kg, max	10	ARS 844
Total Aflatoxin (AFB ₁ +AFB ₂ +AFG ₁ +AFG ₂), µg/kg, max	10	ISO 16050
Aflatoxin B ₁ only, µg/kg, max	5	
Ochratoxin A, µg/kg, max	5	ISO 15141-1, -2
NOTE For baby foods and young children and dietary foods for special purposes intended for infants, both the Aflatoxin B ₁ and Ochratoxin A are restricted to 0.50 µg/kg, max.		

5 Food additives

Food additives may be used in the preparation of composite flour in accordance with Codex Stan 192.

6 Contaminants

6.1 Pesticide residues

Cassava wheat composite flour shall conform to maximum residue limits for pesticide residues established by the Codex Alimentarius Commission for this commodity.

6.2 Other contaminants

6.2.1 Cassava wheat composite flour shall comply with the maximum levels of the Codex General Standard for Contaminants and Toxins in Food and Feed (Codex Stan 193).

6.2.2 The product shall be free from microorganism which represent a hazard to health (Table 2).

7 Hygiene

7.1 The product covered by the provisions of this standard shall be prepared and handled in accordance with ARS 53 and shall conform to microbiological limits specified in Table 2.

Table 2 — Microbiological limits for cassava wheat composite flour

S/N	Micro-organism(s)	Requirements	Method of test
1	<i>Escherichia coli</i> , cfu/g,	absent	ISO 7251
2	<i>Salmonella</i> , 25g,	absent	ISO 6579
3	Yeasts and moulds, cfu/g, max.	10 ⁴	ISO 21527-2
4	<i>Staphylococcus aureus</i> cfu/g max	10 ²	ISO 6888-1, -2, -3

7.2 During handling, storage and transportation, effective measures shall be taken to prevent cross contamination with chemicals, microbial or physical contaminants.

8 Packaging

8.1 Cassava wheat composite flour shall be packaged in food grade material which will safeguard the hygienic, physical, nutritional and organoleptic qualities of the product.

8.2 The net weight of the packages for cassava wheat composite flour may be required to meet the relevant regulations of the destination country.

9 Marking and labelling

9.1 In addition to the requirements of ARS 56, the following specific labelling requirements shall apply and shall be legibly and indelibly marked:

- (a) Common name of the product "Cassava wheat composite flour";
- (b) Percentage composition of cassava wheat flour shall be declared.
- (c) Name, and physical address of the manufacturer/ distributor and /or trade name/ brand name;
- (d) List of ingredients in descending order;
- (e) Date of manufacture;
- (f) Storage instructions;
- (g) Lot / batch identification in code or clear;

- (h) Expiry date;
- (i) Country of origin;
- (j) The net weight in metric units; and
- (k) Instructions on disposal of used package.

9.2 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 product, lot identification and the name and address of the manufacturer or packer shall appear on the packages.

10 Sampling

Sampling shall be done in accordance with ISO 24333.

Annex A
(normative)

Determination of acid insoluble ash

A.1 Reagent

A.1.1 Dilute Hydrochloric Acid — 1:1, prepared from concentrated hydrochloric acid.

A.2 Procedure

A.2.1 Weigh accurately about 2 g of the dried material in a tared porcelain, silica or platinum dish. Ignite with a meker burner for about 1 hour. Complete the Ignition by keeping in a muffle furnace at 500 °C to 570 °C until grey ash results.

Cool and filter through whatman filter paper No. 42 or its equivalent. Wash the residue with hot water until the washings are free from chlorides as tested with silver nitrate solution and return the filter paper and residue to the dish. Keep it in an electric air oven maintained at 135 ± 2 °C for about 3 hrs. Ignite the dish again for about 30 minutes, cool and weigh. Repeat this process till the difference between two successive weighings is less than 1 mg. Note the lowest weight.

A.3 Calculation

A.3.1 Acid insoluble ash, per cent by weight

$$= \frac{100(M_2 - M)}{M_1 - M}$$

where,

M_2 = the lowest weight, in g, of the dish with the acid insoluble ash;

M = weight, in g, of the empty dish; and

M_1 = weight, in g, of the dish with the dried product taken for the test.

Bibliography

EAS 741:2010, *Cassava composite wheat flour — Specification*

Acknowledgment and appreciation

This African Standard was harmonized under the project titled:

Harmonization of African Standards for Agriculture and Food Products
June 2015 — August 2018

financed by the **African Development Bank (AfDB)** through the **African Trade Fund (AfTra)** Programme. ARSO acknowledges and appreciates this support on behalf of its Member States.

ENQUÊTE PUBLIQUE N° 19

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