
STANDARD FOR FORTIFIED WHEAT FLOUR

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STANDARD FOR FORTIFIED WHEAT FLOUR

1. SCOPE

This standard applies to wheat flour for direct human consumption prepared from common wheat, *Triticum aestivum* L., or club wheat, *Triticum compactum* Host., or mixture thereof, which is fortified and prepackaged ready for sale to the consumer or destined for use in other food products.

It does not apply:

- to any product prepared from durum wheat, *Triticum durum* Desf., singly or in combination other wheat;
- to whole meal, whole-wheat flour or semolina, farina milled from common wheat, *Triticum aestivum* L., or club wheat, *Triticum compactum* Host., or mixtures thereof;
- to wheat flour destined for use as a brewing adjunct or for the manufacture of starch and/or gluten;
- to wheat flour for non-food industrial use;
- flours whose protein content have been reduced or which have been submitted after the milling process to a special treatment other than drying or bleaching and/or to which have been added other ingredients than those mentioned under Sections 3.2.2 and 4.

2.0 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.

- GAMS CODEX CAC/RCP 1 – 1969, *General principles of food hygiene*
- GAMS CODEX STAN, 1 - 1985 *Labelling of Prepackaged foods* —
- ISO 2171, *Cereals, pulses and by-products -- Determination of ash yield by incineration*
- ISO 7305, *Milled cereal products — Determination of fat acidity*
- ISO 24333, *Cereals and cereal products — Sampling*
- ISO 1871:2009, *Food and feed products -- General guidelines for the determination of nitrogen by the Kjeldahl method*

3 DEFINITION

3.1 wheat flour

wheat flour is the product prepared from grain of common wheat, *Triticum aestivum* L., or club wheat, *Triticum compactum* Host., or mixtures thereof, by grinding or milling processes in which the bran and germ are partly removed and the remainder is comminuted to a suitable degree of fineness.

3.2 Fortification

practice of deliberately adding essential micronutrients in a food to improve the nutritional quality of the food and to provide a public health benefit with minimal risk to health

3.3 diluent

a suitable, inert, edible food-grade carrier for micronutrients

3.4 premix

a blend of fortificants and diluents formulated to provide specified and determinable amounts of micronutrients.

3.5 fortified wheat flour

wheat flour to which micronutrients have been added in accordance with this standard.

3.6 fortificant

a compound which contains the specified micronutrient intended to be added to a food

4 ESSENTIAL COMPOSITION AND QUALITY FACTORS

4.1 Quality factors – general

4.1.1 Fortified wheat flour and any added ingredients shall be safe and suitable for human consumption.

4.1.2 Fortified wheat flour shall have the characteristic colour and shall be free from any objectionable flavours

4.1.3 The flour shall be free from insects, worms, fungal infestation, rodent contaminations and foreign matter.

4.2 Quality factors – specific

4.2.1 **Moisture content** 13 % m/m max

4.3 Optional ingredients

The following ingredients may be added to wheat flour in amounts necessary for technological purposes:

- malted products with enzymatic activity made from wheat, rye or barley;
- vital wheat gluten;
- soybean flour and legume flour.

5 FOOD ADDITIVES

5.1 Enzymes

Fungal amylase from *Aspergillus*

5.1.1 *niger*

GMP

5.1.2 Fungal amylase from *Aspergillus*

5.1.2 *oryzae*

GMP

Maximum level in finished product

5.1.3	Proteolytic enzyme from <i>Bacillus subtilis</i>	GMP
5.1.4	Proteolytic enzyme from <i>Aspergillus oryzae</i>	GMP

5.2 Flour treatment agents **Maximum level in finished product**

5.2.1	L-ascorbic acid and its sodium and potassium salts	300 mg/kg
5.2.2	L-cysteine hydrochloride	90 mg/kg
5.2.3	Sulphur dioxide (in flours for biscuit and pastry manufacture only)	200 mg/kg
5.2.4	Mono-calcium phosphate	2 500 mg/kg
5.2.5	Lecithin	2 000 mg/kg
5.2.6	Chlorine in high ratio cakes	2 500 mg/kg
5.2.7	Chlorine dioxide for yeast raised bakery products	30 mg/kg
5.2.8	Benzoyl peroxide	60 mg/kg
5.2.9	Azodicarbonamide for leavened bread	45 mg/kg

5.3 Fortification

Wheat flour shall be fortified with folic acid and iron as specified in Table 1:

Table 1 – Levels of iron and folic acid fortification of wheat flour

Fortificant	Quantity (mg/kg)	Tolerance
Folic Acid	2.6	±10% (2.34 – 2.86 mg/kg)
Iron	55 – 65	±10%
Fe fumerate	(60)	(54 – 66 mg/kg)
EDTA Fe	(40)	(36 – 44 mg/kg)
Fe Sulfate	(60)	(54 – 66 mg/kg)

6 CONTAMINANTS

6.1 Heavy metals

Wheat flour shall be free from heavy metals in amounts which may represent a hazard to human health.

6.2 Pesticide residues

Wheat flour shall comply with those maximum residue limits established by the Codex Alimentarius Commission for this commodity.

6.3 Mycotoxins

Wheat flour shall comply with those maximum mycotoxin limits established by the Codex Alimentarius Commission for this commodity.

7 HYGIENE

- 7.1 It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *ECOWAS General principles of food hygiene — Code of practice* (ECOSTAND 052) and other Codes of Practice recommended by the Codex Alimentarius Commission which are relevant to this product.
- 7.2 To the extent possible in good manufacturing practice, the product shall be free from objectionable matter.
- 7.3 When tested by appropriate methods of sampling and examination, the product:
- shall be free from micro-organisms in amounts which may represent a hazard to health;
 - shall be free from parasites which may represent a hazard to health; and
 - shall not contain any substance originating from micro-organisms in amounts which may represent a hazard to health.

8 PACKAGING AND LABELLING

8.1 PACKAGING

- 8.1.1 Fortified Wheat flour shall be packaged in containers which will safeguard the hygienic, nutritional, technological, and organoleptic qualities of the product.
- 8.1.2 The containers, including packaging material, shall be made of substances which are safe and suitable for their intended use. They should not impart any toxic substance or undesirable odour or flavour to the product.
- 8.1.3 When the product is packaged in sacks, these must be clean, sturdy and strongly sewn or sealed.

8.2 LABELLING

In addition to the requirements of the *Gambian standard for Labelling of Prepackaged foods (GAMSCODEX STAN 1 – 1985)* — the following specific provisions apply:

8.2.1 Name of the product

The name of the product to be shown on the label shall be “fortified wheat flour.”

8.2.2 Labelling of non-retail containers

Information for non-retail containers shall either be given on the container 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 container. However, lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

9. METHODS OF ANALYSIS AND SAMPLING

Sampling shall be done in accordance with ISO 24333. Testing shall be done in accordance with the methods indicated against each requirement or other equivalent methods.

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ANNEX

In those instances where more than one factor limit and/or method of analysis is given we strongly recommend that users specify the appropriate limit and method of analysis.

Factor/Description	Limit	Method of analysis
ASH	Buyer Preference	AOAC 923.03 ISO 2171:1980 ICC Method No. 104/1 (1990)
FAT ACIDITY	MAX: 70 mg per 100 g flour on a dry matter basis expressed as sulphuric acid – or – Not more than 50 mg of potassium hydroxide shall be required to neutralize the free fatty acids in 100 grammes flour on a dry matter basis	ISO 7305:1986 – or – AOAC 939.05
PROTEIN (N 5.7)	MIN: 7.0% on a dry weight basis	ICC 105/I Method for the Determination of Crude Protein in Cereals and Cereal Products for Food and for Feed (Type I Method) Selenium/Copper catalyst. – or – ISO 1871:1975
NUTRIENTS		None Defined
Vitamins A	2.0 mg/kg (±10%)	
Thiamin	8.4 mg/kg (±10%)	
Riboflavin	4.5 mg/kg (±10%)	
Niacin	59.0 mg/kg (±10%)	
Vitamin B12	0.01mg/kg (±10%)	
Zinc	28.3 mg/kg (±10%)	
Iron 55 – 60 mg/kg (±10%)	Folic Acid 2.6 mg/kg (±10%)	
PARTICLE SIZE (GRANULARITY)	98% or more of flour shall pass through a 212 micron (No. 70 sieve)	AOAC 965.22

Note: Vitamin A for Wheat flour fortification is a dry, encapsulated form of Vitamin A palmitate containing (75,000 g RE/g). The most common commercial Premix used contains a blend of Vitamin A palmitate, other vitamins and minerals