



Technical Specifications for

FORTIFIED WHEAT FLOUR – YEMEN

Commodity code: **Fortified Wheat Flour - Yemen**

Version: **1, adopted 2019**

Replacing: **This is first version for Yemen**

Date of **OSCQ** issue: **29.03.2019**

The key notes are:

1. Fortification requirements as per YSMO Standard for Wheat Flour (YSMO GSO 51/2005)

1. SCOPE

This specification applies to **Fortified Wheat Flour** (hereafter called the product) prepared from common wheat, *triticum aestivum* L., or club wheat, *triticum compactum* Host., or mixture of thereof, fortified with essential micronutrients for human consumption.

2. REFERENCES

Unless otherwise specified in, the product must comply with the following guidelines or standards (latest versions):

- Recommended International Code of Practice: General Principles of Food Hygiene CAC/RCP 1-1969, Rev. 4 - 2003 including Annex "Hazard Analysis and Critical Control Point (HACCP) System and Guidelines for its application".
- General principles for addition of essential nutrients to foods: CAC/GL 09-1987
- General standard for contaminants and toxins in food and feed: CODEX STAN 193- 1995.
- Codex Standard for Wheat Flour: Codex Stand 152-1985, amendment: 2016
- Yemen Standard for Wheat Flour: YSMO GSO 51/2005

3. RAW MATERIALS

3.1 Wheat

The product prepared from wheat of good quality, free from foreign materials, substances hazardous to health, excessive moisture, insect damage and fungal contamination and shall comply with all relevant national food laws and standards. Specific requirements for the Fortified Wheat Flour are:

- Conform to Codex STAN 152-1985.
- Be obtained from non-genetically modified varieties (*if required by the contract*).

Wheat grains must be stored under dry, ventilated and hygienic conditions. Only authorized insecticides (e.g. phosphine) may be used for fumigation control. Where needed, fumigation must be performed by certified operators.

3.2 Vitamins and minerals

Complete micronutrient premixes (vitamins and minerals) must be purchased from GAIN Premix Facility or any of the GAIN approved suppliers. A complete list is available at the following link: <http://gpf.gainhealth.org/suppliers/current-suppliers>

Micronutrient premixes must be delivered to the processor of the product with a complete Certificate of Analysis as well as with a Proof of purchase of premixes. The two documents must be presented with other documents for payment.

Micronutrient premixes must be stored in a dry, cool and clean place. Follow storage recommendations from the supplier of micronutrient premix in case labelled on shipped boxes and/or bags.

3.3 Homogeneity of micronutrients

Theoretical calculations indicate that a mixing system with a Coefficient of Variation of 10% using iron as the indicator element, will enable product to meet the above variation target on 95%, provided that all conditions of mixing are rigorously applied. The guidelines for this calculation is shown at <http://foodqualityandsafety.wfp.org>.

4. PRODUCT SPECIFICATIONS

4.1 General requirements

4.1.1 *Wheat flour characteristics*

Following shall be met in Fortified Wheat Flour:

- Shall be produced from fully mature, sound wheat grains, clean and free from impurities
- Shall be free from insects, its parts or its wiggler, parasites and rodents' excreta
- Shall be clean free from any foreign materials and substances hazardous to health
- Shall retain its natural properties and free from rancidity an unacceptable odour or taste
- Shall be homogeneous in colour and free from agglomeration

4.1.2 *Contaminants*

Heavy metals

The product shall be free from heavy metals in amounts which may represent a hazard to health. Follow National regulations in case of maximum permissible values of heavy metals.

Pesticide residues

The limits of pesticide residues shall not exceed the limit stated in YSMO Standard for "maximum limits for pesticide residues in agricultural food products". The product shall comply with those maximum residue limits established by the Codex Alimentarius Commission for this commodity.

Mycotoxins

Aflatoxin limits shall not exceed the limits stated in YSMO Standard for "maximum limits of aflatoxins permitted in food and animal feeds aflatoxins". The product shall comply with those maximum mycotoxin limits established by the Codex Alimentarius Commission for this commodity.

4.1.3 *Hygiene*

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 Recommended International Code of Practice – *General Principles of Food Hygiene (CAC/RCP 1-1969)*, and other Codes of Practice recommended by the Codex Alimentarius Commission which are relevant to these products.

The production shall be carried out according to the YSMO Standard for “the general regulations for food hygiene affairs”. Microbiological criteria shall not exceed the limits stated in YSMO Standard for “microbiology criteria for foodstuff-part-1”.

To the extent possible in good manufacturing practice, the product shall be free from objectionable matter.

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.

4.1.4 Food Additives

Any food additive (if used) shall comply with Codex Standard on Food additives Codex stan 192-1995 and Yemen Standard for Wheat Flour: YSMO GSO 51/2005.

4.1.5 Fit for human consumption guarantee

Suppliers shall have to check the quality of their products and guarantee that the product covered by the provision of this specification is ‘fit for human consumption’.

4.2 Specific requirements

4.2.1 Fortification

The minimum levels of micronutrients for the fortification of wheat flour are indicated in below table 1, specified in Yemen Standard for Wheat Flour: YSMO GSO 51/2005

The micronutrients levels shall conform with Legislation of the Country in which the product is distributed.

Table 1: Micronutrient rate and chemical form

Micronutrient	Minimum (mg/kg of flour)	Chemical form
Vitamin A	1.0	Dry vitamin A palmitate 250 CWS
Thiamine (vitamin B1)	4.4	Thiamine mononitrate
Riboflavin (vitamin B2)	2.6	Riboflavin
Niacin (Vitamin B3)	35	Nicotinamide
Folic Acid	1.5	Folic acid
Vitamin B12	0.008	Cyanocobalamin
Iron	60	Elemental/electrolytic Iron
Zinc	30	Zinc Oxide

Note: The incorporate rate is 250g micronutrient premix per ton of flour.

4.2.2 Shelf life

The product covered by the provision of this specification shall retain above qualities for at least one year from date of manufacture when stored dry at ambient temperatures prevalent in the country of destination.

5. PACKAGING

5.1 General requirements

The product covered by the provision of this specification must be packed in appropriate packaging which safeguard the hygienic, nutritional, technological, and organoleptic qualities of the product. The packaging shall be made of substances which are safe and suitable for their intended use (food grade). The packaging should not impart any toxic substance or undesirable odour or flavour to the product.

5.2 Product net weight

- 50 kg net weight
- Average net weight of the batch should not be less than specified net weight
- Maximum allowed deviation of individual package is not more than +/- 1% of the net weight

5.3 Packaging requirements

The product must be packed in new polypropylene (PP) woven bags:

- Clean, sound and free from insect, fungal infestation,
- They should not impart any toxic substance or undesirable odour or flavour to the product,
- Bags must be new, uniform, strong, fit for export and multiple handling,
- Construction of fabric must be solid to sustain harsh handling,
- Compliance : Compliant with food grade regulation of the country of production with regards to material intended to be in contact with food

Note: Packaging requirement can also be agreed as per contractual requirements.

Bag specifications:

Outer bag:

- Virgin woven polypropylene (PP) (no recycled material or colorant allowed)
- Anti-slip woven polypropylene material,
- Capacity : fit to contain 50kg of product - typical size 60 x 100 cm,
- Minimum grammage of 110 gsm – typical weight 130 gr or as per contract requirement
- Minimum meshing 10 x 10,
- Minimum Denier 1000,
- Heat cut to prevent fibrillation,
- Sewn with a double folded bottom with a minimum 4 dots per inch.

5.4 Compliance Tests:

The bags of finished product must pass the drop test (after each drop, there shall be no rupture or loss of contents) following the principles of the drop test standard (EN 277, ISO 7965-2 or equivalent) with following sequence (each bag should go through the butt dropping and flat dropping):

- Butt dropping: Bag is dropped from a height of 1.20m on the bottom and the top of the bag.
- Flat dropping: Bag is dropped from a height of 1.60m twice on one flat face and twice on the opposite flat face.

Unless otherwise specified in the contract, two percent marked bags (included in the price) must be sent with the lot.

6. MARKING

The labelling of the product covered by the provision of this specification shall comply with CODEX STAN 1-1985 and YSMO Standard for “expiration dates for food products part-1. The following information should be available on bags:

- Name of Product
- Net content
- Name and address of the supplier (including country of origin)
- Batch number (or SI)
- Production date
- Best Before End: mm/yyyy

Additional marking is as per contractual agreement and conforms with Legislations of the Country in which the product is distributed.

7. STORING

The product covered by the provision this specification must be stored under dry, ventilated and hygienic conditions and far from all sources of contamination.

8. ANALYTICAL REQUIREMENTS

Table 2: List of compulsory tests and reference methods

No	Tests	Requirements	Reference methods (or equivalent validated methods)
1.	Organoleptic	Pleasant smell; typical taste and color	
2.	Moisture content	MAX. 14.0 %, w/w	ISO 711/ICC no. 110
3.	Total Ash	MAX. 0.65 % of dry matter	AOAC 923.03 ISO 2171 / ICC method 104/1
4.	Protein	MIN. 11.0 % of dry matter	ISO 1871:1975/ ICC 105/I
5.	Zeleny index	MIN. 30 ml	ICC 116 & 118 ISO 5529
6.	Delayed sedimentation	MIN. Zeleny value + 5 ml	
7.	Hagberg Falling Number (HFN)	MIN. 230 seconds (incl. 60 sec preparation)	ICC 107 ISO 3093
8.	Wet gluten	MIN: 28 %	AACC 38-12A ICC No 155 ISO 21415-1
9.	Gluten index	MIN: 85 %	ICC 155 AACC 38-12
10.	Fat acidity	MAX. 50 mg KOH per 100 gram dry matter	ISO 7305 AOAC 939.05
11.	Iron	MIN 60 mg/kg of flour	AOAC 944.02 AACC 40-41B
12.	Zinc	MIN 30 mg/kg of flour	AOAC 999.10 AACC 40-75
13.	Particle size	MIN 90% shall pass through a sieve of 250 micrometer. Or As per contractual requirement	AOAC 965.22