



## Technical Specifications for FORTIFIED WHEAT FLOUR - SYRIA

Version: 1

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The key adjustments are:

- These specifications represent the first version developed for Fortified Wheat Flour **local procurement** in Syria.

### 1. SCOPE

This specification applies to **local procurement of 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, 2019
- Syrian National Standard for Wheat Flour SNS 192-2019 and any applicable Syrian Standards and regulations.

### 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 wheat grains are:

- Conform to Codex STAN 199-1995
- 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.

Wheat grains shall be free from the following toxic or noxious seeds in amounts which may represent a hazard to human health and shall comply with all WFP spec requirements for Wheat – Syria, particularly with lists A1 and A2 for individual limits of toxic and noxious seeds.

### **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/coefficient-of-variation-calculator>.

## **4. PRODUCT SPECIFICATIONS**

### **4.1 General requirements**

#### **4.1.1 Wheat flour characteristics**

Following shall be met in Fortified Wheat Flour:

- Shall be milled from fully mature, sound wheat grains, free from filth and 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 and unacceptable odour or taste
- Shall be homogeneous in colour and free from agglomeration
- Shall be suitable for bread making

#### **4.1.2 Contaminants**

##### **Heavy metals**

The product shall be free from heavy metals in amounts which may represent a hazard to health.

##### **Pesticide residues**

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

##### **Mycotoxins**

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

##### **Other contaminants**

The product shall be free from other contaminants in amounts which may represent a hazard to health.

#### **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.

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.

In case fumigation is required:

- It shall be done as specified in the GAFTA Standard for Fumigation<sup>1</sup>.
- Only phosphine gas can be employed during fumigation

#### **4.1.4 Food Additives**

Any food additive (if used) shall comply with Codex Standard on Food additives Codex stan 192-1995 and Codex Stand 152-1985 and applicable Syrian National Standards

#### **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 added for the fortification are indicated in below table 1. The incorporation rate is 250g micronutrient premix per ton of flour.

*Table 1: Micronutrient rate and chemical form*

<b>Micronutrient</b>	<b>Target</b>	<b>Chemical form</b>
Vitamin A	1.0 mg/kg	Dry vitamin A palmitate 250 CWS
Thiamine (vitamin B1)	4.4 mg/kg	Thiamine mononitrate
Riboflavin (vitamin B2)	2.6 mg/kg	Riboflavin
Niacin (Vitamin B3)	35 mg/kg	Nicotinamide
Folic Acid	1.0 mg/kg	Folic acid
Vitamin B12	0.008 mg/kg	Cyanocobalamin
Iron	15 mg/kg	NaFeEDTA
Zinc	30 mg/kg	Zinc Oxide

*Note: Variable levels of micronutrients (i.e iron, zinc, etc.) naturally present in wheat may lead to variable amount of micronutrients in finished product.*

#### **4.2.2 Shelf life**

The product covered by the provision of this specification shall retain the above qualities for 9 months from date of manufacture when stored dry at ambient temperatures prevalent in the Syrian Arab Republic.

<sup>1</sup>[https://www.gafta.com/write/MediaUploads/Trade%20Assurance/Gafta\\_Standard\\_for\\_Fumigation\\_WEB.PDF](https://www.gafta.com/write/MediaUploads/Trade%20Assurance/Gafta_Standard_for_Fumigation_WEB.PDF)

Shelf life of the product shall comply with the latest Syrian National Standards for “Shelf Life of Foodstuffs SNS 1781”.

**Products shall have a minimum of 80% of shelf-life remaining when presented to WFP for inspection, unless otherwise authorized by WFP.**

## **5. PACKAGING**

Food shall be packed in a suitable container complying with the packaging and marking requirements separately available under “4.5 to 90 kg PP woven bag specification with or without PE inner liner” on <http://foodqualityandsafety.wfp.org/specifications>. The applicable packaging is bag without PE inner liner.

Weight and quantity tolerance must meet The International Organization of Legal Metrology International Recommendation OIML R 87<sup>2</sup>.

WFP shall be informed and consulted before making any modification to the current primary, secondary and tertiary packaging (e.g., the composition of the packaging material(s), ink or any other parameters) that could impact the integrity of the packaging and food or storage and transport conditions.

## **6. MARKING**

The labelling of the product covered by the provision of this specification shall comply with CODEX STAN 1-1985 and the latest Syrian National Standards for “Shelf Life of Foodstuffs SNS 1781”.

The following information should be available on bags in both English and Arabic languages:

- Name of Product: Fortified Wheat Flour
- Net content
- Batch/Lot number
- Production date: MM/YYYY
- Best Before End: MM/YYYY
- For traceability, Production date in DD/MM/YYYY format shall be stamped/ink jetted on a label that is stitched to the bag.
- Name and address of the mill
- Country of Origin
- PO number
- “Not For Sale”
- WFP Logo

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.

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<sup>2</sup> OIML R 87 Quantity of commodity in prepackages [https://www.oiml.org/en/files/pdf\\_r/r087-e04.pdf](https://www.oiml.org/en/files/pdf_r/r087-e04.pdf) (latest edition)

## 8. ANALYTICAL REQUIREMENTS

As per contractual agreement, WFP will appoint an inspection company that will check that the food matches requirements specified in Tables 2 & 3. Additional tests may be defined in case further quality assessment is required. The following analytical plans are currently utilized by WFP and shared only for suppliers' information. Suppliers should follow their own food safety and quality management plan. Additionally, WFP reserves the rights to change these plans at any time.

### A. Releasing Criteria

Table 2: List of compulsory tests and reference methods

No	Tests	Requirements	Reference methods (or equivalent validated methods)
1.	Organoleptic	Natural color, odor and taste. Free of rancidity, any odd odor, lumps, bitterness and moulding. Harmonized color.	Sensory evaluation
2.	Moisture content	Max. 14.0 %, w/w	ISO 712/ICC no. 110 /1
3.	Total Ash (on DM)	Max. 0.65 % of dry matter	AOAC 923.03 ISO 2171 / ICC method 104/1
4.	Acid Insoluble Ash (on DM)	Max. 0.1 % of dry matter	AOAC 941.12 C
5.	Protein (on DM)	Min. 11.0 % of dry matter	ISO 20483/ICC 105/1 O
6.	Wet gluten	Min. 26 %	AACC 38-12A / ICC No 155 ISO 21415-1
7.	Acidity (on DM)	Max. 4% as Lactic Acid	AACC 02-31.01
8.	Vitamin A	Min. 1.0 -2.0mg/kg of flour	AOAC 992.04 AACC 86-03.01
9.	Iron	Min. 15 - 40 mg/kg of flour	AOAC 944.02 AACC 40-41.03

**Note:** Other micronutrient tracers can be analysed instead of Vitamin A-Retinol and Iron, as per the minimum requirements stated in Table 3 for some exceptional cases.

### B. Indicative Criteria for Compliance

Table 3: List of compliance tests and reference methods

No	Tests	Requirements	Reference methods (or equivalent validated methods)
10.	Zeleny index	Min. 30 ml	ICC 116 & 118 ISO 5529
11.	Delayed sedimentation	Min. Zeleny value + 5 ml	
12.	Hagberg Falling Number (HFN)	Min. 230 seconds (incl. 60 sec preparation)	ICC 107 ISO 3093
13.	Gluten index	Min. 85 %	ICC 155 AACC 38-12
14.	Bacillus cereus	n:5; c:1; m:10 <sup>3</sup> ; M:10 <sup>5</sup> cfu/g	ISO 7932
15.	Clostridium perfringens	n:5; c:1; m:10; M:10 <sup>2</sup> cfu/g	ISO 7937
16.	Yeast & Molds	n:5; c:2; m:10 <sup>3</sup> ; M:10 <sup>4</sup> cfu/g	ISO 21527-2
17.	Lead (Pb)	Max 0.2 mg/kg	AOAC 986.15

18.	Cadmium (Cd)	Max 0.2 mg/kg	AOAC 986.15
19.	Mercury (Hg)	Max 0.05 mg/kg	AOAC 971.20
20.	Arsenic (As)	Max 1.0 mg/kg	AOAC 986.15
21.	Total aflatoxins (B+G)	Max 4.0 ppb	SNS 3353
22.	Aflatoxin B1	Max 2.0 ppb	SNS 3353
23.	Ochratoxin A	Max 3.0 ppb	ISO 15141/98 1-2
24.	Deoxynivalenol	Max 1000ppb	EN 15891:2010