



## Technical Specifications of:

### HIGH ENERGY BISCUITS (HEB)

Specification reference: **MIXHEB000**

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*This version replaces the version 14.0, issued on 13 June, 2014.*

*The main adjustments are:*

- 1. Reducing shelf life from 24 months to 12 months*
- 2. Updating packaging requirements*
- 3. Addition of request for desiccant*
- 4. Removing Melamine and Updating GMO test*
- 5. Updating layout*

#### 1. SCOPE

This specification applies to High Energy Biscuits purchased and/or distributed by WFP.

WFP High Energy Biscuits (hereafter called the product) are biscuits (small baked breads or cakes) that are high in protein and supplemented with vitamins and minerals. They are intended for general food distribution and school feeding.

#### 2. REFERENCES

The following main references are referred in this specification. Other specific standards and regulations are cited in paragraphs of the specification. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- Recommended International Code of Practice: General Principles of Food Hygiene CAC/RCP 1-1969, including Annex “Hazard Analysis and Critical Control Point (HACCP) System and Guidelines for its application”.
- General standard for contaminants and toxins in food and feed: CODEX STAN 193- 1995.
- General principles for addition of essential nutrients to foods: CAC/GL 09-1987.

#### 3. RAW MATERIALS

##### 3.1 Main ingredients

The product must be manufactured from fresh and good quality, free from foreign materials, substances hazardous to health, excessive moisture, insect damage and fungal contamination and must comply with all relevant national food laws and standards.

Requirements for the main ingredients are:

**Wheat flour** must conform to Codex STAN 152-1985.

**Sugar** must conform to Codex STAN 212-1999.

**Shortening** must be prepared from oil that conform to Codex STAN 210-1999, must be free from trans fatty acids and must contain only antioxidants that comply with Codex and relevant regulations.

**Skimmed milk** powder must conform to Codex STAN 207-1999.

- It must be accompanied by a 'melamine-free' certificate.
- Maximum level aflatoxin M1: < 0.5 mcg/kg milk (recommended methods ISO 14501/IDF 171:2007<sup>1</sup> or ISO 14674/IDF 190:2005<sup>2</sup>).

**Other raw materials** and **additives** (if used) must comply with Codex or relevant regulations.

Raw materials must be stored under dry, ventilated and hygienic conditions. Only safe insecticides (i.e. phosphine) may be used for fumigation control. Where needed, fumigation must be performed by certified operators.

### 3.2 Vitamins and minerals

Complete micronutrient premix must be purchased from GAIN Premix Facility or any of the GAIN approved suppliers. A complete list of suppliers is available at the following link:

<http://gpf.gainhealth.org/suppliers/current-suppliers>

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

Micronutrient premix must be stored in a dry, cool and clean place.

## 4. PROCESSING

### 4.1 Formula

The product formulation shall be based on supplier experience and must include:

- Dry Skimmed Milk: Min. 4 g/100g of biscuit
- Sugar: 10-19 g/100g of biscuit.

*Note:* soybean and soybean derivatives are not authorized.

### 4.2 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 guide for this calculations is showed at <http://foodqualityandsafety.wfp.org>

### 4.3 Food safety and risk assessment at manufacturing premises

For compliance with Codex standards the processor must be able to demonstrate by principle and practice the adoption, implementation and recording of:

- Good Manufacturing Practices
- Hazard Analysis Critical Control Point program

In this context an appointed WFP Inspector / Quality Surveyor is entitled to visit the factory without prior notice during any period when WFP product is being manufactured to check

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<sup>1</sup> Milk and milk powder: determination of aflatoxin M1 content, clean up by immunoaffinity chromatography and determination by HPLC.

<sup>2</sup> Milk and milk powder: determination of aflatoxin M1 content, clean up by immunoaffinity chromatography and determination by Thin Layer Chromatography.

that the GMP and HACCP systems are in place. The Inspector / Quality Surveyor may request to see:

- **Records** (i.e. names of people in charge of the process and quality control, temperatures of the process, mixing times / quantity, cleaning schedules, etc).
- **Procedures** (e.g. cleaning, personnel hygiene, HACCP, sampling and analysis).
- **Instructions** (e.g. process instructions, cleaning instructions).
- The **quality manual** for the process or factory.

The manufacturer must be **registered under national food law** as a processor of foods for human consumption.

## 5. PRODUCT SPECIFICATIONS

### 5.1 General requirements

#### 5.1.1 Contaminants

##### 5.1.1.1 Heavy metals

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

##### 5.1.1.2 Pesticide residues

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

The product shall be prepared with special care under good manufacturing practices, so that residues of those pesticides which may be required in the production, storage or processing of the raw materials or the finished food ingredient do not remain, or, if technically unavoidable, are reduced to the maximum extent possible.

These measures shall take into account the specific nature of the products concerned and the specific population group for which they are intended.

##### 5.1.1.3 Mycotoxins

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

The maximum level of aflatoxin M1 is less than 0.5 ppb.

##### 5.1.1.4 Other contaminants

The product shall be free from residues of hormones, antibiotics as determined by means of agreed methods of analysis and practically free from other contaminants, especially pharmacologically active substances.

#### 5.1.2 Hygiene

5.1.2.1 It is recommended that the products 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.

5.1.2.2 The product should comply with any microbiological criteria established in accordance with the Principles for the Establishment and application of microbiological Criteria for Foods (CAC/GL 21-1997)

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

5.1.2.4 When tested by appropriate methods of sampling and examination, the products:

- 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.

### **5.1.3 Fit for human consumption guarantee**

Suppliers shall have to check the quality of their products and guarantee that the product is 'fit for human consumption'.

## **5.2 Specific requirements**

### **5.2.1 Fortification**

The product must be fortified to provide the following net micro nutrient supplement per 100g of biscuit (table 1).

*Table 1: Micronutrient rate and chemical form*

	<b>Target</b>	<b>Chemical form</b>
Vitamin A-Retinol	250 µg	Palmitate 250 CWS
Vitamin B1	0.5 mg	Thiamine mononitrate
Vitamin B2	0.7 mg	Riboflavin
Niacin	6 mg	Nicotinamide
Pantothenic acid	3 mg	Calcium d-pantothenate
Vitamin B6	1 mg	Pyridoxin hydrochloride
Folic acid	80 µg	Folic acid
Vitamin B12	2 µg	Vitamin B12 – 1% in manitol
Vitamin C	20 mg	Ascorbic acid coated
Vitamin D	1.9 µg	Vit D3 100 CWS
Vitamin E	5 mg	Vit E 50 CWS
Calcium	250 mg	Calcium carbonate
Magnesium	150 mg	As magnesium oxide
Iron	11 mg	Ferrous fumarate
Iodine	75 µg	Potassium iodate

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

### **5.2.2 Biscuit characteristic**

The product must be free of insect (all stages, dead or live). Unless otherwise specified in the contract, one biscuit should weigh between 5 g and 10g.

The product must also comply with other requirements specified in table 2.

### **5.2.3 Shelf life**

Unless stated otherwise in the contractual agreement, the product must have minimum 12 months shelf life when stored up to 30°C.

## **6. PACKAGING**

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 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.

### **6.1 Primary package**

Unless otherwise specified in the contract, the product must be packed in new uniform strong package, fit for export and multiple handling and must be hermetically heat-sealed. Unless otherwise specified in the contract, each package must contain 50 grams, 75 grams, 100 grams or 250 grams biscuits (as per specified in the contract). The package must comply with below requirements:

- It must be based on supplier experience and comply with relevant regulations.
- It must be food grade, have good sealing properties and be printed as per requirement.
- It must include a metalized layer to reduce permeability to Oxygen and Vapor.
- It must be stored under dry, ventilated and hygienic conditions.

Typically a laminated composed of BOPP + VMCPP (20 and 25 microns respectively) or equivalent or stronger can be used.

### **6.2 Secondary package**

Individual packages must be stuffed in strong cardboard cartons suitable for multiple handling and must contain as per contractual agreement from 10 kg to 15 kg Net biscuits.

The cartons used to pack the primary packaging of the products shall be fit for export and multiple-harsh handling. The cartons for 15kg of products (including primary packaging) should meet the following requirements:

- Number of ply: 5
- Total grammage: MIN. 870 gsm
- Edge Crush Test: MIN. 12 kN/m

Carton must be fully filled and glued. Secondary packaging (i.e. cartons with full product) must pass the drop test as per ISTA 2A standard (after each drop, there shall be no rupture or loss of contents).

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

Unless fully shrink wrapped pallets are used, dunnage (of strong sheets such as carton, plywood...) should be placed inside each container at every three layers of cartons to provide the required stacking strength. In addition protecting material like air bag, carton, polystyrene, can be used.

*Note: For shipping containers, unless fully shrink wrapped pallet are used, and unless otherwise specified in the contract, kraft paper must be adhered to all internal sides, door, and floor of container. Kraft paper also need to be placed on the top of packaging. Desiccant needs*

*to be placed/laid in container at appropriate location in order to absorb moisture. Supplier needs to use high quality desiccant and calculate the quantity of desiccant based on:*

- *Efficiency of desiccant*
- *Length of time in transit in container*
- *Container capacity*

*Supplier needs to provide in the offer the type of desiccant and quantity to be used for the consignment. If silica gel is used, 15 bags of at least 1 kg each must be placed in each 20 feet container.*

## **7. MARKING**

The labelling of the product covered by the provision of this specification shall comply with CODEX STAN 1-1985.

Primary packages (of 50 grams, 75 grams, 100 grams or 250 grams biscuits) must be printed with the following information in a visible way:

- Product name : “ High Energy Biscuits”
- World Food Programme + WFP logo
- Donor marking as per contractual agreement
- Ingredient list
- Nutritional information per 100 g
- “This product contains no lard”
- “Not for sale”
- Net weight
- Best before end : month + year
- Production lot
- Country of origin
- Name and address of the vendor

Additional marking is as per contractual agreement.

Cartons must be printed with the following information in a visible way:

- Product name: “ High Energy Biscuits”
- World Food Programme (in letters of 5 cm) + WFP logo
- Donor marking as per contractual agreement
- Net weight (total net weight of all primary packages in the carton)
- Best before end : month + year
- Production lot
- Country of origin
- Name and address of the vendor

Additional marking is as per contractual agreement.

## **8. STORING**

The product must be stored under dry, ventilated and hygienic conditions and far from all source of contaminations. Ideally, the product should be stored up to 30°C.

## **9. ANALYTICAL REQUIREMENTS**

Unless otherwise decided by WFP, the principal tests in table 1 are performed by WFP appointed inspection company/ laboratory and the results of the tests shall be used for lot

release decision. If the laboratory results indicate at least a parameter doesn't comply with WFP specification, only WFP can decide whether or not the lot can be accepted. Additional tests may be defined in case of further quality assessment is required. Supplier/processor should also conduct internal tests to make sure that the quality of the product meets WFP requirements.

*Table 2: List of compulsory tests and reference method*

<b>No</b>	<b>Tests</b>	<b>Requirements</b>	<b>Reference method (or equivalent, latest version)</b>
1	Moisture content	Max 4.5 %	AOAC 925.10, 2002
2	Organoleptic (smell, taste, color)	Typical color, Pleasant smell and palatable taste.	Sensory
3	Broken biscuits	Max. 5.0 % broken (by weight)	Visual inspection
4	Protein	Min. 9 g/100g	AOAC 981.10
5	Fat	Min. 15.0 g/100g	AOAC 963.15, 2000
6	Sugar (total)	10.0-19.0 g/100g	AOAC 920.189
7	Crude fibre	Max. 2.3 g/100g	AOAC 962.09
8	Ash (total)	Max. 3.5 g/100g	ISO 2171.2000
9	Aflatoxin M1	< 0.5 ppb	AACC 45-16
10	Peroxide value	Max. 10 meq/kg fat	AOAC 965.33
11	Vitamin A-Retinol	Min. 250 mcg/100g	AOAC 960.45
12	Iron	Min. 11 mg/100g	AOAC 945.40
13	Aerobic mesophilic bacteria	Max. 10,000 cfu/g	ICC No 125 AACC 42-11
14	Coliforms	Max. 10 cfu/g	AOAC 2005.03
15	Escherichia coli	Absent in 10 g	AOAC 991.14
16	Salmonella	Absent in 25 g	AACC 42-25B
17	Staphylococcus aureus	<10 cfu/g	AACC 42-30B
18	Bacillus cereus	Max. 10 cfu/g	AOAC 980.31
19	Yeasts and moulds	Max. 100 cfu/g	ICC No 146
20	GMO cereal (Only if required)	< 0.9 % of GMO material in total cereal DNA	Quantitative PCR ISO 21570