



**World Food
Programme**

Technical Specifications for FORTIFIED DATE-BARS

Commodity code: **MIXHEB010**

Version: **1, adopted 2019**

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The adjustments are:

-Harmonizing micronutrient requirements for general food distribution and school feeding

-Updating packaging requirements

1. INTRODUCTION

This specification applies to Fortified Date-Bars purchased and/or distributed by WFP.

Fortified Date-Bars (hereafter called the product) are date-filled biscuits that are supplemented with premix of vitamins and minerals. The product is culturally well-accepted by the beneficiaries in Middle-East and North Africa and intended for school feeding and general food distribution.

2. REFERENCES

The product shall comply with the following guidelines and/or standards of the Codex Alimentarius.

- 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".
- CODEX General principles for addition of essential nutrients to foods: CAC/GL 09-1987
- CODEX STAN 193-1995, Codex general standard for contaminants and toxins in food and feed.
- CODEX STAN 192-1995, Codex general standard for food additives.
- CODEX STAN 1-1985: General standard for the labelling of pre-packaged foods.

3. RAW MATERIALS

3.1 Main ingredients

The product shall be manufactured from fresh and good quality raw materials free from foreign materials, substances hazardous to health (including any contamination from toxic or noxious seeds), excessive moisture, insect damage and fungal contamination and shall comply with all relevant food safety and quality laws, regulations and standards for each material (if used) as followings:

- **Wheat flour** must conform to Codex STAN 152-1985.
- **Dates** must conform to Codex STAN 143-1985.
- **Date-Paste** must conform to Codex Regional STAN for Date-Paste (Near East) 314R-2013.
- **Sugar** must conform to Codex STAN 212-1999.
- **Salt** must be food grade salt and conform to Codex STAN 150-1985.
- **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; in case of using palm oil, must conform to Codex STAN 074-1981 and in case using butter, must conform to CODEX STAN for Butter 279-1971 (Revision 1999 and amendment 2003, 2006)

- **Skimmed milk powder** must conform to Codex STAN 207-1999.
 - Maximum level aflatoxin M1: < 0.5 mcg/kg milk (recommended methods ISO 14501/IDF 171:20071 or ISO 14674/IDF 190:20052). Melamine Max. 2.5 mg/kg.

3.2 Food Additives

- **Lecithin** shall be in proportion as specified in the Codex STAN 074-1981.
- **Raising agent** (i.e. SODA) must be added as specified in the codex STAN 074-1981, the maximal value is determined by the principles of GMP.
- **Flavouring** only permitted flavours which are agreeable with WFP shall be used. Supplier may use ethyl vanillin and vanillin: 7mg/100g as specified in the Codex STAN 074-1981.
- **Other additives and ingredients** (if used) must conform to relevant Codex standards and/or international standards.

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

3.3 Vitamins and minerals

Fortified Date-Bars shall include a premix consisting of the vitamins and minerals described in Table 1. Suppliers should implement an effective food safety and quality management system for the premix, including supplier performance/evaluation and premix quality control.

Additionally, the premix shall:

- Be purchased from any of the GAIN approved suppliers, as per the list available at the following link: <http://gpf.gainhealth.org/suppliers/current-suppliers>.
- Be delivered to the processor of **Fortified Date-bars** with a complete Certificate of Analysis and proof for the purchase of premixes. These documents. This document shall be presented to WFP with other documents for payment.
- Be stored in a dry, cool (Below 25 °C), and clean place. According to the storing instructions declared by manufacturer.

For use of premix, the supplier will have to share the supporting data that show that the combination of raw materials, prescribed premix and specific processing steps results in a product of which the specific nutrient content is consistently complying with the labelling declaration

4. PROCESSING

4.1 Formula

The product formulation shall be based on supplier experience. A clear and full recipe including all ingredients and additives should be shared with WFP and shall comply with the following constraints:

- **Date paste:** should be fresh produced date paste with minimum 25.0 % (250 kg date paste per 1 MT date-bars) and maximum 30% (300 kg date paste per 1 MT date-bars). The supplier needs to apply appropriate control measures for the quality and safety of date paste e.g. water activity, pH, heat treatment. Date-paste shall be free from any form of insect infestation (egg, larvae, live or dead insect) and mould growth during all stages of date-paste handling including sourcing, incoming, processing, utilization and storage. Date-paste shall be free from any foreign matter and hard particles coming from date pits.
- **Dry Skimmed Milk powder:** The mandatory minimum content is 4.0 % (40 kg dry skimmed milk per 1 MT date-bars) to ensure addition of quality protein
- **Added Sugar:** the allowed percentage is 8.0 to 12.0 % (80.0-120.0 kg sugar per 1 MT date-bars)
- **Soybean and soybean derivatives** are prohibited to be used as ingredient for production of date-bar, except soya lecithin and therefore must be clearly declared on the label of the final product.
- **Energy:** The formula should provide 430 kcal minimum per 100g Fortified Date-Bars

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

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

- **Micronutrient premix:** As per table 1
- Micronutrient premix could be added to the date paste or to the dough or in both based on available equipment, tools, technology and process is validated. The supplier should develop the appropriate mixing procedures to ensure a good homogeneity of micronutrient in the Date-bars and it is the supplier's responsibility to ensure that:
 - The product contains the labelled nutrients throughout the shelf life;
 - Process losses are minimised during mixing, baking and processing of dough and paste;
 - Premix does not impact taste in the final product;
- **Rework of finished date-bars** is not permitted.

4.2 Homogeneity of micronutrients

Theoretical calculations indicate that a mixing system with a Coefficient of Variation of 10% using iron/vitamin A 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 these calculations is showed at <http://foodqualityandsafety.wfp.org/coefficient-of-variation-calculator>

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 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

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

Other contaminants

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

The supplier should be aware of Acrylamide³ concern in bakery products which is chemical that can form in some foods during high-temperature cooking processes, such as frying, roasting, and baking. Acrylamide in food forms from sugars and an amino acid that are naturally present in food; it does not come from food packaging or the environment.

³ https://www.fooddrinkurope.eu/uploads/publications_documents/FoodDrinkEurope_Acrylamide_Toolbox_2019.pdf

5.1.2 Hygiene

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.

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)

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

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 Additional requirements

The product should meet any additional food safety and quality requirements as per contract.

5.2 Specific requirements

5.2.1 Fortification

The product must be fortified using the following micronutrient requirements per 100g of Fortified date-bars (FDB). Premix shall always be used (dosage) as per recommendation from the premix supplier. The approximately addition rate for premix is 7.0 kg/MT of finished product.

Table 1: Premix requirement and chemical forms

Micronutrient	Unit	Chemical Form	Premix to be added per 100g product	Micronutrients at all points of time (Minimum per 100g)
Vitamin A	mcg	Dry Vitamin A Palmitate Cold Water Dispersible Stabilized Beadlet as alternatives options	824.6	500
Thiamine (B1)	mg	Thiamine Mononitrate	1	0.9
Riboflavin (B2)	mg	Riboflavin	1.2	0.9
Niacin (B3)	mg	Niacin amide (= Nicotinamide)	5.9	8
Pantothenic acid	mg	Calcium D-Pantothenate	4.9	4
Pyridoxine (B6)	mg	Pyridoxin hydrochloride	1.1	1
Folic acid (B9)	mcg	Folic acid	243.6	180
Vitamin B12	mcg	Vitamin B12 0.1% or 1% Spray dried	2.2	1.8
Biotin (B7)	mcg	Biotin 1%	20.7	20
Vitamin D	mcg	Dry Vitamin D3 100 Water dispersible stabilized (Beadlet can also be used)	10	5
Vitamin E	aTE mg	Dry Vitamin E acetate 50% Water dispersible	7.4	7
Calcium	mg	Calcium Carbonate; Calcium Phosphate (check P level if the latter is used)	174.1	250
Iron mg (5% bioavailability)	mg	5.6g from Ferric pyrophosphate and 3g from Sodium EDTA	8.6	10
Zinc	mg	Zinc sulphate	5.7	8
Iodine	mcg	Potassium iodate	147.7	120
Phosphorus	mg	Calcium Phosphate	46.9	167

Note: Variable levels of micronutrients (i.e. iron, zinc, calcium, Phosphorus etc.) naturally present in raw materials may also contribute lead variable of micronutrients in finished product. The product shall meet WFP's specification for all parameters through-out the shelf-life.

5.2.2 Product characteristic

- Organoleptic: The products covered by this specification shall have a typical colour, nice texture, pleasant smell and palatable taste to meet the beneficiary's expectations and acceptance.
- Broken: The percentage of broken Fortified Date-Bars must not be more than 5.0% (by weight).
- Weight: Each individual Fortified Date-bar shall have a corresponding net weight (20 or 40 gm) based on contractual requirements and shall be declared on the label of each pack.
- Different shapes of date-bar units are accepted; including round, bar and rectangular shape.
- The product must also comply with other requirements specified in Table-4.

5.2.3 Shelf life

Unless stated otherwise in the contract, the product must have a minimum 12-month shelf-life. The supplier should conduct their own shelf life studies to confirm shelf-life claims for the labelling. The shelf life studies should comply with WFP requirements.

5.2.4 Fit for human consumption guarantee

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

6. PACKAGING

6.1 Primary package

The product shall be packaged in food-grade flexible sachets, hermetically sealed and robust enough to withstand multiple handling & transport and protect the product throughout its shelf life.

Each package must contain 40g, 50g, 80g, 100 grams of Fortified Date-Bars as per specified in the contract. Weight and quantity tolerance must meet The International Organization of Legal Metrology International Recommendation OIML R 87⁴.

It is the responsibility of the manufacturers to select a packaging material that will protect the product from moisture as well as from vitamin and fat degradation during the required 12-months of shelf life.

Sachets shall be:

- Food grade materials compliant with the last amendments of national regulations in the country of production (If not existing: compliance with EU or FDA legislations required)
- Optimized shape to avoid space loss in the sachets and cartons
- Properly sealed (test example: ASTM F2338 – 09, ASTM D3078 – 02 or equivalent)
 - Longitudinal seal strength (N/m) = 330 (=5N/15mm)
 - Transversal seal strength (N/m) = 330 (=5N/15mm)
- The sachets must be placed in an appropriate way in the carton box during the packing process to avoid packaging & product damage
- The laminate must include a high barrier layer to highly reduce permeability of oxygen and water vapour. The minimum requirements⁵ are:
 - WVTR <1 g/m².day (38°C/90% RH) (ASTM F1249-06 or equivalent)
 - OTR < 150 cc/m².day (23°C/50% RH) (ASTM D-3985 or equivalent)
- Reverse printing is mandatory

Typically, a laminated film composed of PP* + metallized PP** (20 and 25 microns respectively) or equivalent or stronger can be used.

*PP can be either bi-oriented (BOPP) or oriented (OPP)

** PP can be either oriented (OPP) or only cast PP (CPP)

⁴ OIML R 78 Quantity of commodity in prepackages https://www.oiml.org/en/files/pdf_r/r087-e04.pdf, latest edition to be followed

⁵ Suppliers must submit packaging Certificate of Analysis indicating WVTR and OTR compliance to WFP for technical review.

6.2 Secondary package

The product shall be packed in cartons suitable for the humanitarian supply chain and must contain 160 individual packages, unless otherwise specified in the contract.

It is under supplier responsibility to select a packaging material that will resist to multiple handling and up to 2 meters stacking.

Cartons shall be:

- New, manufactured from well-constructed double wall corrugated board
- With an edge crush resistance of 60ECT = 60 lbs/in eq 11 kN/m (ISO 3037) and a specific weight of 700 to 1000 grams per square meter
- fully filled for maximum strength and dimensions adjusted to the load
- The fluting must be vertical, supporting the load
- The carton should be plain brown
- No stapling will be accepted
- firmly closed (top and bottom)

Unless otherwise specified in the contract, two percent (2%) empty, marked cartons (included in the price) must be sent with the lot.

6.3 Tertiary packaging

If pallets are used inside containers: it is highly recommended to have 3 first bottom layers placed as column stacking, the rest can be interlocked (cross-stacking) for load stability. Pallet must be wrapped in a suitable manner (locked to the pallet, enough containment force) and the cartons should be banded when necessary. The cartons must be secured to pallets in order to prevent any damage to the contents or packaging during shipment. Pallet used should be strong enough to support the charge during transportation. Pallets shall be stackable (minimum double stock) without damage to the cartons during shipment.

If no pallets are used inside container: 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. Also, 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.

For shipping containers, unless fully shrink-wrapped pallets are used, and unless otherwise specified in the contract, it is highly recommended to place desiccant 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.

Table 2: Guideline on the quantity to be used for calcium chloride-based desiccants:

Estimated days in container	20 ft container	40 ft container
15-59 days	9.00 kg	17.50 kg
60-89 days	11.25 kg	22.50 kg
90-120 days	13.50 kg	25.00 kg

Better alternative material can be used upon agreement with WFP.

Empty containers/vehicles shall be clean, pest free and free of damage, odours and previous cargo remains.

7. MARKING

The labelling of the product covered by the provision of this specification shall comply with CODEX STAN 1-1985. Labels of package and carton must be approved by WFP.

Unless otherwise specified in the contract, information in table 4 must be printed on the packaging of the product.

Table 3: Generic marking requirements

	Individual package	Carton
Product name	Fortified Date-bars	
Net weight	80g (or as per contract)	160 x 80g: 12.8kg
Nutrients content	XX ⁶	-
Ingredient list	XX; (including allergens ⁷)	-
Storage instruction	"Store under dry, ventilated and hygienic conditions and away from direct sunlight"	
Manufacturer name	Produced by: XX	
Manufacturer address	XXX, including country of origin	
Manufacturer batch/lot number	XX	
Production date (dd/mm/yyyy)	XX	
Best Before End (mm/yyyy)	XX	
Other	"not for sale or exchange" "Contains no ingredients of animal origin besides dairy products"	
Donor and WFP logo	as per contractual requirement	
Additional marking	as per contractual requirement	

Note: Nutrient content that will be printed on the package shall be based on analytical reports from accredited laboratory. Values will depend on the premix formula and ingredients of Fortified Date-bars.

Templates for artwork available on: <https://foodqualityandsafety.wfp.org/specifications>

8. STORING

The product must be stored under dry, ventilated and hygienic conditions and away from direct sunlight.

⁶ All XX must be filled by manufacturer.

⁷ Allergen labelling guidelines: All ingredients considered allergens as per EU Regulation 1169/2011 – Annex II -shall be labelled in bold letters in the ingredient list. The supplier is responsible for creating and maintaining an updated list of allergens present in the manufacturing facility. All products manufactured in that facility must be labelled with the entire list of allergens identified in that facility, either as ingredients or as cross-contamination.

For cross contamination labelling, the following terms should be used: "May contain traces of" The addition of new allergens to a facility needs to be evaluated and communicate beforehand, as an update of packaging artwork will be necessary.

9. ANALYTICAL REQUIREMENTS



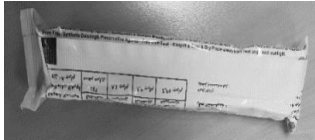

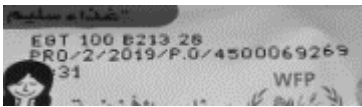
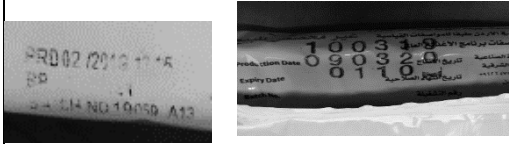


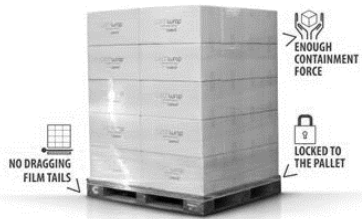

As per contractual agreement, WFP can appoint an inspection company that will check that the food matches requirements of the specification. Analytical tests in Table 4. are usually utilized, additional test might be performed. Suppliers should follow its own food safety and quality management plan. WFP reserves the rights to change these plans at any time.

Table 4: List of compulsory tests and reference method

No	Tests	Requirements	Reference method (or equivalent, latest version)
1	Moisture content	Max 12.0 %	AACC 44-15.02 ISO 712:2009 AOAC 925.10
2	Organoleptic (smell, taste, colour)	Free from abnormal, harmful material. Typical and pleasant colour, smell. Soft and pleasant texture.	Sensory evaluation
3	Broken Date-Bars	Max. 5.0 % broken (by weight)	Visual inspection
4	Total Protein	Min. 6.0g/100g	AOAC 992.23 EN ISO 16634-2:2016
5	Total Fat	12.0-20.0 g/100g	ISO 11085:2015
6	Crude fibre	Max. 2.0 g/100g	AOAC 962.09
7	Peroxide value	Max. 10 meq/kg fat	AOAC 965.33
8	Vitamin A-Retinol	500 – 850 mcg/100g	AOAC 2012.10 2014 UNI EN 12823
9	Iron	10-17 mg/100g	AOAC 2015.06 EN 15763:2010
10	Aerobic mesophilic bacteria	Max. 10,000 cfu/g	ISO 4833-1:2013 ICC No 125 AACC 42-11.01
11	Coliforms	Max. 10 cfu/g	ISO 4832:2006 AOAC 2005.03 AACC 45-15.02
12	Escherichia coli	Absent in 10 g	ISO 16649-2:2001 AOAC 991.14
13	Salmonella	Absent in 25 g	ISO6579-1:2017 AACC 42-25.03
14	Staphylococcus aureus	<10 cfu/g	EN ISO 6888-2:2004 AACC 42-30.04
15	Bacillus cereus	Max. 10 cfu/g	ISO 7932:2004 AOAC 980.31
16	Yeasts and moulds	Max. 100 cfu/g	ISO 21527-2:2008 ICC No 146 AACC 42-50.02

Note: Other micronutrient tracers can be analysed instead of Vitamin A-Retinol and Iron, as per the minimum requirements stated in Table 4 for some exceptional cases.

Annex-1: Visual Inspection for packaging quality control*:

	Description	IN 	OUT 
PRIMARY PACKAGING	Sealing quality (transversal and longitudinal)	<ul style="list-style-type: none"> No wrinkles (=no open channels) No burnt material Well aligned film 	<ul style="list-style-type: none"> Wrinkles Burnt material Weak sealing 
	Printing	<ul style="list-style-type: none"> All mandatory markings written (ref to specification) 	<ul style="list-style-type: none"> Missing information (ref. to specification)
	Printing of batch code and expiring date	<ul style="list-style-type: none"> Good readability Not printed on pre-printed text 	<ul style="list-style-type: none"> Ink is partially / totally erased Printed on pre-printed text 
SECONDARY PACKAGING	Sachet in the carton	<ul style="list-style-type: none"> Sachets are perfectly placed flat in the carton 	<ul style="list-style-type: none"> Sachets are in disorder in the carton  <p><i>Picture non-contractual</i></p>
TERTIARY PACKAGING	Palletization	<ul style="list-style-type: none"> Load in lock on the pallet, suitable containment force 	<ul style="list-style-type: none"> Over-hang, cartons are not aligned, stretch wrap isn't locked on pallet 

*Non-exhaustive list. The supplier must create his own defect list based on process capability
 It is highly not recommended to print any information on sealing area
 If the supplier does not have a leak test detection machine (e.g. vacuum test), it is highly recommended to check the sealing by diving date-bar sachets in water bath for 5 minutes and check if date-bars are wet.