*Fighting Hunger Worldwide*

# Technical Specifications for:

# FORTIFIED REFINED CANOLA OIL

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Replacing: n/a
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*Key update:*
This document represents the first version of Fortified Canola Oil – WFP generic specification.

## 1. Introduction

Product name (hereafter called the product): Fortified Refined Canola Oil.

General description: Canola oil (low erucic acid rapeseed oil; low erucic acid turnip rape oil; low erucic acid colza oil) is the oil produced by extraction of low erucic acid oil-bearing seeds of varieties derived from the *Brassica napus* L., *Brassica rapa* L. and *Brassica juncea* L., species. Refined Canola Oil distributed by WFP is fortified with vitamin A and vitamin D in proportions described in this product specification.

## 2. Standards

Except when specified otherwise in the contract, the manufacture, testing, packaging and labelling, of the product shall be in strict compliance with the specifications set forth herein, and with the latest edition of the following standards/guidelines (whichever is stricter). Supplier shall not deviate in any way from the specifications without WFP's prior written consent.
Codex Texts can be found in the following webpages:
Standards: https://www.fao.org/fao-who-codexalimentarius/codex-texts/list-standards/tr/;
Codes of practice: https://www.fao.org/fao-who-codexalimentarius/codex-texts/codes-of-practice/en/;
Guidelines: https://www.fao.org/fao-who-codexalimentarius/codex-texts/guidelines/tr/;
Guidelines of International Commission on Microbiological Specifications for Foods: https://www.icmsf.org/publications/books/
Maximum Residue Limits of pesticide and veterinary drug: https://www.fao.org/fao-who-codexalimentarius/codex-texts/maximum-residue-limits/tr/;

- CODEX GENERAL STANDARD FOR CONTAMINANTS AND TOXINS IN FOOD AND FEED (CXS 193-1995)
- CODEX GENERAL PRINCIPLES OF FOOD HYGIENE (CXC 1-1969)
- CODEX PRINCIPLES AND GUIDELINES FOR THE CONDUCT OF MICROBIOLOGICAL RISK MANAGEMENT (CXG 63-2007)
- CODEX GUIDELINES FOR THE VALIDATION OF FOOD SAFETY CONTROL MEASURES (CXG 69-2008)
- CODEX PRINCIPLES FOR THE ESTABLISHMENT AND APPLICATION OF MICROBIOLOGICAL CRITERIA FOR FOODS (CAC/GL 21-1997)

- RECOMMENDED METHODS OF SAMPLING FOR THE DETERMINATION OF PESTICIDE RESIDUES FOR COMPLIANCE WITH MRLS (CXG 33-1999)
- CODEX GENERAL STANDARD FOR FOOD ADDITIVES (CXS 192-1995)
- CODE OF PRACTICE ON FOOD ALLERGEN MANAGEMENT FOR FOOD BUSINESS OPERATORS (CXC 80-2020)
- CODEX GENERAL GUIDELINES ON CLAIMS (CXG 1-1979)
- CODEX GENERAL STANDARD FOR THE LABELLING OF PREPACKAGED FOODS (CXS 1-1985)
- CODEX GUIDELINE ON NUTRITION LABELLING (CXG2-1985)
- CODEX GENERAL PRINCIPLES FOR ADDITION OF ESSENTIAL NUTRIENTS TO FOODS (CXG 9-1987)
- GENERAL STANDARD FOR THE LABELLING OF AND CLAIMS FOR PRE-PACKAGED FOODS FOR SPECIAL DIETARY USES (CXS 146-1985)
- CODE OF PRACTICE FOR THE PREVENTION AND REDUCTION OF DIOXIN, DIOXINS-LIKE PCBS AND NON-DIOXIN-LIKE PCBS IN FOOD AND FEED (CXC 62-2006)
- CODE OF PRACTICE FOR THE REDUCTION OF 3-MONOCHLOROPROPANE-1,2- DIOL ESTERS (3-MCPDES) AND GLYCIDYL ESTERS (GES) IN REFINED OILS AND FOOD PRODUCTS MADE WITH REFINED OILS (CXC 79-2019)
- CODEX STANDARD FOR NAMED VEGETABLE OILS (CXS 210-1999)

**3. Raw Materials**

All ingredients shall be of good quality, comply with the latest version of Codex Alimentarius and applicable food laws and regulation in the food originating countries (which-ever is stricter). Where there is no standard available, JECFA and EFSA evaluations shall be considered for guidance limits.

Suppliers shall conduct risk assessment on raw materials to ensure quality of raw materials is adequate to meet final product specifications.

**Micronutrients**

The product shall be fortified with a premix containing Vitamin A (retinol palmitate) and Vitamin D (D3 as cholecalciferol). Suppliers are responsible of applying sufficient overage to ensure that the final product meets all requirements stated in this document.

Suppliers shall implement an effective food safety and quality management system for the premix, including supplier approval and premix quality control.

Additionally, the premix shall:

- Conform to all relevant quality standards, including food chemical Codex
- Be suitable for vegetarian. The definition of the terms "Food suitable for vegetarians" can be found here: https://www.fooddrinkeurope.eu/wp-content/uploads/2021/09/Joint-statement-on-vegan-vegetarian-definitions.pdf (Annex I).
- Be purchased from WFP or GAIN approved suppliers (http://gpf.gainhealth.org)
- Be delivered to the manufacture with a Certificate of Analysis (CoA) showing levels of all micronutrients included in the premix. This CoA shall be submitted to WFP along with other documents for payment.
- Micronutrient premixes shall be stored as recommended by premix manufacturer (e.g., under 25 $^{o}$C).

**Additives**

The product shall contain antioxidants, within admissible level stated in Codex, such as:

| Antioxidants | Maximum use level (mg/kg) |
|---|---|
| Butylated Hydroxyanisole (BHA) | 175 |
| Butylated Hydroxytoluene (BHT) | 75 |
| Tertiary Butyl Hydroquinone (TBHQ)[1] | 120 |
| Any combination of gallates, BHA, BHT, or TBHQ | 200 within individual limit. |

Note: The manufacturers shall conform use & labelling of other additives i.e. synergists and antifoaming agents as per Codex STAN 210-1999.

## 4. Processing

### Food safety and quality management at manufacturing premises

The manufacturer shall be able to demonstrate by principle and practice the adoption, implementation and recording of:

- Good Manufacturing Practices (GMPs)
- Good Hygiene Practices (GHPs)
- Hazard Analysis Critical Control Point program (HACCP)
- Global Food Safety Initiative (GFSI) scheme principles

In this context an appointed WFP staff/ Quantity &Quality Inspector / Surveyor/Auditor is entitled to visit the factory without prior notice during any period when WFP product is being manufactured to check that production is done as per WFP contract specifications.

The WFP staff/Inspector/Surveyor/Auditors may examine any aspect of Supplier's manufacturing premises and its documentation relating to any products or services provided to WFP, including but not limited to production facilities, procedures, records, certifications, or practices.

Food suppliers shall notify WFP immediately of lots (pre-delivery and post-delivery) that fail to meet contract requirements. Any testing on food safety parameters for foods (and/or the associated raw materials) delivered to WFP shall be pre-agreed with WFP.

### Homogeneity of micronutrients

Maximum Coefficient of Variation (CV) is: 10%.

The associated indicator element is: Vitamin A and/or Vitamin D.

The guidelines for calculating CV: https://foodqualityandsafety.wfp.org/food-fortification-and-coefficient-of-variation-cv-calculation.

## 5. Product Specifications

### General requirements

- The product's organoleptic characteristics shall be characteristics of the designated product.
- The product shall meet the testing requirements stated in this document.

| Parameters | Requirements |
|---|---|
| Moisture and volatile matter at $105^0$C | 0.2% maximum (m/m) |

[1] TBHQ is recommended.

| | |
|---|---|
| Insoluble impurities | 0.05% maximum (m/m) |
| Soap content | 0.005% maximum |
| Unsaponifiable matter | ≤ 20 g/kg |
| Refractive index (ND 40ºC) | 1.465 - 1.467 |
| Relative density (20ºC /water at 20°C) | 0.914 - 0.920 |
| Iodine value | 105 – 126 |
| Peroxide value (throughout shelf life) | 10 meq/kg fat (as $O_2$) |
| Crismer value | 67 - 70 |
| Concentration of brassicasterol (as % of total sterols) | 5% minimum |
| Erucic acid (as % of total fatty acid) | 2% maximum |

**Nutritional requirements**

The product shall contain the following nutritional values throughout the shelf life.

| Nutrients | Unit | Minimum | Label* Nutrient content /100 g | Maximum |
|---|---|---|---|---|
| Energy | kcal | 900 | x | |
| Energy | kj | 3700 | x | |
| Fat | g | 100 | x | |
| of which saturates | g | | x | |
| Carbohydrate** | g | 0 | x | |
| of which sugars | g | 0 | x | |
| Protein | g | 0 | x | |
| Sodium | mg | 0 | x | |
| Vitamin D*** | µg | 23[2] | 23 | 69 |
| Vitamin A**** | µg RE | 2000[3] | 2000 | 4000 |

***** Unless otherwise specified in the contract, suppliers shall follow the labelling specification, including the number & order of nutrients. All nutrients shall be labelled on the primary packaging even if the values are zero (it should be marked as "= 0"). "X" values shall be declared by suppliers based on products. Prescribed labelling values are given as an example, and suppliers shall revise the values where needed to match the actual products.

****** Carbohydrates = Available Carbohydrates = sugars + starches. The theoretical calculation can be made based on food composition database such as: https://fdc.nal.usda.gov/

*** The minimum Vitamin D at the end of shelf life shall be 23 µg=920IU; 69 µg=2760 IU;

**** The minimum Vitamin A at the end of shelf life shall be 2000 µg RE= 6666IU RE; 4000 µg RE = 13,332IU RE.

**Product Safety**

[2] The minimum Vitamin D at the end of shelf life shall be 23 µg=920IU; 69 µg=2760 IU;
[3] The minimum Vitamin A at the end of shelf life shall be 2000 µg RE= 6666IU RE; 4000 µg RE = 13,332IU RE.

- The product shall not contain any harmful substances including, but not limited to, micro-organisms, heavy metals, pesticides, mycotoxin, foreign matter or anti-nutritional factors, in amounts that may represent a hazard to health. Where Codex standard is absent, JECFA and EFSA evaluations shall be considered for guidance limits.
- Fit for human consumption guarantee: Suppliers shall manage the quality of their product and guarantee that the product is 'fit for human consumption' and in line with TIC Council/IFIA Guidelines*.
- The product shall comply strictly with Codex General Standard for Contaminants and Toxins in Food and Feed (CXS 193-1995) and Codex Maximum Residue Limits for Pesticide Residues.
- Additionally, the product shall meet the following requirements:

| Contaminant | Requirements (maximum limits) |
|---|---|
| Arsenic | 0.1 ppm |
| Lead | 0.08 ppm |
| Iron | 1.5 ppm |
| Copper | 0.1 ppm |
| PAH Total (sum of benzo(a)pyrene, benz(a)anthracene, benzo(b)fluoranthene and chrysene | 10 ppb |
| Benzo(a)pyrene | 2 ppb |
| Glycidyl fatty acid esters, expressed as glycidol | 1000 µg/kg |
| Sum of 3-monochloropropanediol (3-MCPD) and 3-MCPD fatty acid esters, expressed as 3-MCPD | 1250 µg/kg |

Links of references mentioned above:
*http://www.ifia-federation.org/content/wp-content/uploads/Fit_for_Human_Consumption_Bulletin_Rev_4.pdf

**Shelf life**

The shelf-life shall be minimum 12 months when stored in ambient temperature, dry place and hygienic conditions, away from direct sunlight. Or reduced shelf life as per contract.

Products shall meet this specification, remain stable & suitable for human consumption throughout the shelf-life. Suppliers should conduct shelf-life studies following WFP shelf-life study requirements (available at https://docs.wfp.org/api/documents/WFP-0000118387/download/) to support the shelf-life claim.

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

**6. Packaging and Marking**

Food shall be packed in a suitable container complying with the packaging and marking requirements separately available under "Vegetable oil packaging technical specification".

Specification can be found here: https://docs.wfp.org/api/documents/WFP-0000108986/download/.

Templates for packaging artwork are available in the packaging specification. The actual content of marking shall be based on the actual foods provided and correspond to the relevant food specifications.

The additional labelling requirements shall be as per contract. If local requirements need to be stated, new information shall supersede requirements of the specifications mentioned above.

**7. Additional technical document requirements**

Suppliers shall submit the following documents to WFP along with other documents for payment.

- a Certificate of Analysis (CoA) showing levels of all micronutrients added
- a CoA of the final product
- the specifications of antioxidants used in the oil

Additionally, suppliers shall provide other technical documents upon request from WFP.

**8. Analytical Requirements**

Suppliers shall follow their own food safety and quality management plan. WFP can conduct tests on products as per the Table below. Additionally, WFP reserves the rights to change this testing plan at any time.

Any products taken for the purpose of weight check and lab testing (including retention samples) shall be replenished by the suppliers. The shipment quantity shall not be less than the purchased quantity. When non-destructive inspection is done, suppliers shall close the package or replace it.

In addition to the pre-delivery Q&Q inspection, WFP can also perform prior-assessment (e.g., documentation check, production monitoring, audits, assessment of raw materials, etc).

Suppliers acknowledge that any prior-assessment by WFP or its designated inspection agents does not constitute a determination whether the specifications for the foods set out in this document or any purchase order (including mandatory technical requirements) have been met. Suppliers will be required to comply with their warranty and other contractual obligations whether or not WFP carries out such prior-assessment.

The prior-assessment undertaken by WFP or its designated inspection agents will not substitute for the pre-delivery Q&Q inspection and testing of the goods upon delivery to WFP.

Table: Analytical Requirements and testing methods

- Quantitative tests:

| **No** | **Tests** | **Unit** | **Minimum** | **Maximum** | **Reference methods (latest versions)** or equivalent validated methods* |
|---|---|---|---|---|---|
| **1** | Acid value | mg KOH/g oil | n/a | 0.6 | ISO 660:2009; AOCS Cd 3d-63 |

| | | | | | |
|---|---|---|---|---|---|
| **2** | Peroxide value (at time of purchase) | meq/kg fat (as $O_2$) | n/a | 2 | ISO 3960:2017 BS 684-2.14:2001 AOCS Cd 8b-90 AOAC 965.33; IUPAC 2.501 |
| **3** | Saponification | mg KOH/g oil | 182 | 193 | ISO 3657:2013; AOCS Cd 3-25 |
| **4** | Vitamin A** | µg RE/100g | 2600 | 4000 | EN 12823-1:2014 |
| **5** | Vitamin D*** | µg/100g | 30 | 69 | EN 12821:2009 |

*Meets the requirements of EN ISO 16140-2.

** 8665 -13,332 IU RE/100g at the time of purchase or as per contract.

*** 1200-2760 IU/100g at the time of purchase or as per contract.

- Qualitative tests:

| **No** | **Tests** | **Requirements** | **Reference methods (latest versions)** or equivalent validated methods* |
|---|---|---|---|
| **1** | Organoleptic | The color, odor and taste of product shall be characteristics of the designated product. It shall be free from foreign and rancid odor and taste. | Organoleptic evaluation |

*Meets the requirements of EN ISO 16140-2