



Technical Specifications for the manufacture of:

Fortified Vegetable Ghee for Nepal

Specification reference: **Vegetable Ghee for Nepal**

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1. INTRODUCTION

1.1 Product type

Vegetable ghee is made from mixture of good quality oils together with annatto flavourings and permitted antioxidant. Vegetable ghee distributed by WFP is fortified with vitamin A and vitamin D in proportions described in product specifications.

1.2 Standards and recommendations

Vegetable ghee shall be manufactured in accordance with: “Recommended International Code of Practice: General Principles of Food Hygiene”, CAC/RCP 1-1969 Rev 3 1997 Amended (1999) including Annex “Hazard Analysis and Critical Control Point (HACCP) System and Guidelines for its application”.

2. RAW MATERIALS

2.1 Vegetable oil

Several types of oils can be used, e.g. palm oil and its products, soybean, rapeseed and cottonseed oils are the most commonly used oils for vegetable ghee.

Vegetable Ghee must contain at least 7% sesame oil.

2.2 Vitamins

Fortified vitamins (vitamin A and D) shall conform to Codex Standard CAC/GL 09-1987- General principles for the addition of essential nutrients to foods.

Vitamin premix should be purchased from a WFP approved suppliers: BASF (Stern Vitamin), DSM, Fortitech, Nicholas Piramal, Hexagon Nutrition or their authorized dealers and GAIN premix facility. Addresses of premix suppliers are on <http://foodquality.wfp.org>

Vitamin premix must be stored in a dry, cool and clean place where the temperature is a maximum of 25°C.

3. PROCESSING

Hydrogenation is not recommended. WFP recommends the use of formulations that are free from trans fatty acids. Either direct blending or inter-esterification of oils and fats using palm oil and its products as the major components will achieve this.

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

- Good Manufacturing Practice
- 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 producer must be *registered under national food law* as a processor of foods for human consumption. In addition, the producer must have a *legal authorization* to produce this commodity in the country where the factory is located.

4. PRODUCT SPECIFICATIONS

4.1. Main requirements

Specification	Recommended value
Taste	Neutral/bland taste; absence of foreign odours and flavours
Moisture and volatile matter	0.1% maximum
Free fatty acid	0.1 % maximum expressed as palmitic acid
Color	5 ¼ Lovibond 3 red, 30 yellow max
Peroxide value	3 milliequivalents maximum of active oxygen per kg of oil
Iodine value (Wijs)	50 - 55 g per 100g
Slipping point	39°C maximum
Saponification	190 - 209 mg KOH per g
Unsaponifiable matter	1.3% maximum
Vitamin A	24,000– 36,000 IU per kg
Vitamin D	2,400 – 3,600 IU per kg

4.2 Additional Requirements

Vegetable Ghee shall meet the following additional requirements:

- The product must be free from solvents which used through extraction.
- The product must be free from butter oil or fats & from animal fat sources.
- Antioxidant agents can be added as soon as types and quantities are in accordance with the Codex Alimentarius STAN 19-1981 and Good Manufacturing Practices.
- The supplied goods must be of homogenized structure according to the contractual specifications other wise goods will be rejected.

Shelf life: it 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

Safety: it shall be free from objectionable matter; not contain any substances originating from micro-organisms or any other poisonous or deleterious substances such as anti-nutritional factors, heavy metals or pesticide residues, in amounts which may represent a hazard to health.

- Heavy metals
 - Lead (Pb) Max 0.1 ppm
 - Arsenic (As) Max 0.1 ppm
 - Iron (Fe) Max 1.5 ppm
 - Cooper (Cu) Max 0.1 ppm
- Polycyclic Adromatic Hydrocarbures (PAH)
 - PAH heavy Max 5 ppb
 - PAH total Max 25 ppb
 - Benzo(a)pyrene Max 2 ppb
- Free from radioactivity

5. PACKAGING

Vegetable Ghee shall be packed in new good quality plastic jerry cans (each weighing 300 grammes) with strong and good quality cap and proper inner lid sealing by aluminum foil with handle, each can should contain 5 (five) kilogrammes net ghee, and the gross weight of each jerry can should not be less than 5.3 kilogrammes.

The cans shall be packed in good/strong quality card-board boxes (ie, 4 jerry cans in one box).

6. MARKING

6.1 On jerry cans

The following information should be available on cans

- Name of the product
- Net content
- Name and address of the supplier (including country of origin)
- Batch number (or SI)
- Production date
- Additional marking as per contractual agreement

6.2 On card-boxes

The following information should be available on each card-box:

- Name of the product
- Number of unit per carton
- Name and address of the supplier (including country of origin)
- Production date
- Additional marking as per contractual agreement

7. STORING

Vegetable Ghee must be stored under dry, ventilated and hygienic conditions.

8. ANALYTICAL REQUIREMENTS

Table 1: List of compulsory tests and reference methods

No	Specification	Recommended value	Reference methods
1	Taste	Neutral/bland taste; absence of foreign odours and flavours	
1	Moisture and volatile matter	0.1% maximum	ISO 662:1998 AOCS Ca 2c-25 IUPAC 2.601
2	Free fatty acid	0.1 % maximum expressed as palmitic acid	ISO 18395:2005 AOCS Ca 5a-40 AOAC 940.28
3	Color	5 ¼ Lovibond 3 red, 30 yellow max	AOCS Cc 13b-45 BS 684-1.14:1998
5	Peroxide value	3 milliequivalents maximum of active oxygen per kg of oil	ISO 3960:2007 BS 684-2.14:2001 AOCS Cd 8-53 AOAC 965.33 IUPAC 2.501
6	Iodine value (Wijs)	50 - 55 g per 100g	ISO 3961:2009 AOAC 993.20 IUPAC 2.205
7	Slipping point	39°C maximum	AOAC 920.156 ISO 6321:2002
8	Saponification	190 - 209 mg KOH per g	ISO 3657:2002 AOCS Cd 3-25
9	Unsaponifiable matter	1.3% maximum	ISO 18609:2000 ISO 3596:2000 AOCS Ca 6a – 40 IUPAC 2.401
10	Vitamin A	24,000– 36,000 IU per kg	
11	Vitamin D	2,400 – 3,600 IU per kg	