



Technical Specifications for
- Lipid-based Nutrient Supplement - Medium Quantity -
- LNS-MQ -

Specification reference: **LNS category**

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1. INTRODUCTION

1.1 Product purpose

LNS-MQ is a ready to use supplementary food for children aged 6 months and above, intended to **prevent Moderate Acute Malnutrition (MAM)**.

Product is consumed directly from the package with no necessary dilution, mixing or cooking.

1.2 Product type

LNS-MQ is a fortified, energy-dense, lipid-based supplementary food that is packed in individually resistant package. Each package must be of the same nutritional value.

LNS-MQ is generally made with oil seeds, pulses, cereals, sugar, milk powder, vegetable oils, vitamins and minerals.

*Products such as Plumpy'Doz (Nutraset), eeZeeCup (Compact) and Wawamum (WFP Pakistan) belong to **LNS-MQ** group. This list is not an exhaustive list and additional product(s) may be included after being validated by WFP.*

1.3 Standards and recommendations

LNS-MQ must conform, in terms of food safety, to the following guidelines or standards of Codex Alimentarius and ISO

- Guidelines on Formulated Supplementary Foods for Older Infants and Young Children, CAC/GL 08-1991 of the Codex Alimentarius (Except nutrients requirements in the annex of the guidelines)
- General principles for addition of essential nutrients to foods: CAC/GL 09-1987 (amended 1991), of the Codex Alimentarius.
- Recommended International Code of Practice. General Principles of Food Hygiene CAC/RCP 1-1969, Rev. 4-2003
- ISO 22000:2005: Food safety management systems – Requirements for any organization in the food chain
- ISO/TS 22004 – Guidance on the application of ISO 22000:2005
- ISO 9001:2008 – Quality management systems – Requirements

2. RAW MATERIALS

2.1 Main ingredients

LNS-MQ must be manufactured from ingredients that are fresh, of good quality, free from foreign materials, substances hazardous to health and must comply with all relevant national food laws and standards.

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

Raw Peanut or peanut paste (for peanut-based LNS-MQ)

- Must conform to Codex Stan 200-1995

Chick pea (for chick pea based LNS-MQ)

- Must conform to Codex Stan 171-1989

Other agricultural products

- Must conform to Guidelines on Formulated Supplementary Foods for Older Infants and Young Children, CAC/GL 08-1991 of the Codex Alimentarius
- Must conform to other Codex standards or/and relevant food laws.

Oil

- Must conform to Codex Stan 210-1999
- Must not contain antioxidants which are not permitted for infant foods such as Butylhydroxyanisol (BHA) and Butylated hydroxytoluene (BHT).

Sugar

- Sugar must be conform to Codex Stan 212-1999.

Dairy Source

- Milk powder if used must conform to Codex Stan 207-1999 - Standard for Milk Powders and Cream Powder
- Whey powder if used must conform to Codex Stan 289-1995 – Standard for Whey Powders
- Both materials if used must be provided with a certificate of analysis confirming absence of melamine.

Other raw materials

- Must comply with Codex or relevant regulations.
- Honey is prohibited due to a safety hazard.

2.2 Vitamins and Minerals

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

LNS-MQ producer can be requested to provide full Certificate of Analysis for every lot of vitamins and minerals premix used.

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

2.3 Additives

Flavouring:

- Must Conform to Codex Stan 73-1981 – Codex standard for canned baby foods

Antioxidant:

- Must Conform to Codex Stan 73-1981 – Codex standard for canned baby foods

Other additives

- Must comply with Codex or relevant regulations.

3. PROCESSING

The **LNS-MQ** Supplier must implement a HACCP plan specific to the type of product and specific to the environment of production and the process (including Critical Control Points – CCP's, critical limits, and corrective actions).

Appropriate treatment shall be applied to reduce the amount of fiber, anti-nutrient compounds (e.g. tannins, trypsin inhibitors), toxins (e.g. cyanogens, alkaloids) or other potentially poisonous or deleterious substances in agricultural raw materials.

4. PRODUCT SPECIFICATION

4.1 General requirements

- Protein: 10.9-13.3 g/100g
- Fat: 30-38 g/100g
- Energy: 520-587 Kcal/100g

LNS-MQ must be smooth, homogeneous, and free from lumps and must constitute a uniform paste. There must be no more than slight oil separation throughout the shelf life of the product.

4.2 Micronutrient

LNS-MQ must be fortified to contain the following micro nutrients per 100g of finished product:

Table 1: Micronutrient rate

Micronutrient	Unit	Per 100 gram
Vitamin A	mcg	819-1050
Vitamin B1 (Thiamine)	mg	1.1-2.6
Vitamin B2 (Riboflavin)	mg	1.1-1.6
Vitamin B3 (Niacin)	mg	12.9-18.6
Vitamin B5 (Pantothenic Acid)	mg	4.2-6.8
Vitamin B6 (Pyridoxine)	mg	1.1-1.6
Vitamin B7 (Biotin)	mcg	2-4.02
Vitamin B9 (Folic Acid)	mcg	350-500
Vitamin B12 (Cobalamine)	mcg	1.9-2.7
Vitamin C (Ascorbic acid)	mg	60-180
Vitamin D (Cholecalciferol)	mcg	3.5-5.8
Vitamin E (Tocopheryl acetate)	mg	12.9-20.2
Vitamin K (Phytomenadione)	mcg	15-30
Calcium (Ca)	mg	800-980
Copper (Cu)	mg	0.5-0.7
Iodine (I)	mcg	150-250
Iron (Fe)	mg	17.5-21.5
Magnesium (Mg)	mg	115-140
Manganese (Mn)	mg	0.3-1.03
Phosphorus (P)	mg	530-660
Potassium (K)	mg	660-870
Selenium (Se)	mcg	7.91-50
Sodium (Na)	mg	<111.5
Zinc (Zn)	mg	17.5-21.5

4.3 Microbiology

LNS-MQ must meet requirements for children aged 6 months and above to prevent Moderate Acute Malnutrition.

LNS-MQ must not contain any microorganism in amounts which may represent a hazard to health of beneficiaries.

4.4 Contaminants and Toxins

LNS-MQ must 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.

- Permitted level of total Aflatoxin: 10 ppb (B1, B2, G1, G2).
- Heavy metals: as per Codex Stan 193-1995.
- Pesticides: as per Codex.
- Melamine: free.

4.5 Fit for human consumption guarantee

LNS-MQ suppliers must guarantee that their product is ‘**fit for human consumption and for intended purpose**’.

5. PACKAGING AND MARKING

The commercial name of the **product** must be kept simple and must not reflect any medical purpose.

LNS-MQ labeling must conform to:

- Codex Stan 146-1985 - General standard for the labelling of and claims for pre-packaged foods for special dietary uses.
- Codex Stan 1-1985 - General standard for the labelling of pre-packaged foods

Detail requirements for packaging and marking will be presented in the purchase contract. Some general requirements for information to be printed out on the primary package and on the carton are:

- Net content
- Production date
- Best before date
- Production lot
- Country of origin
- The name and address of the vendor of the food shall be declared

6. STORING

LNS-MQ must be stored under dry, ventilated and hygienic conditions.

7. SAMPLING AND ANALYTICAL REQUIREMENTS

7.1 Sampling plan

Sampling frequency (lot size) will be defined based on the daily production of the producer.

- For producers with daily production equal or greater than 100MT, the inspection lot size will be one day production.
- For producers with daily production less than 100MT, the inspection lot size will be one week production.

The following number of samples representative of the inspection lot needs to be sent to the laboratory:

1. One composite set of samples for analysis 1-7 in table 3
2. Twenty five samples for Salmonella analysis
3. Ten samples for Enterobacteriaceae analysis

7.2 List of analysis

LNS-MQ must meet following requirements as specified in Table 2 and Table 3.

Table 2: List of compulsory tests

No	Parameters	Limit	Method of analysis
1	Protein	10.9-13.3 g/100g	
2	Lipid	30.0-38.0 g/100g	
4	Vitamin A	819-1050 mcg/100g	
5	Iron (Fe)	17.5-21.5 mg/100g	
6	Total Aflatoxin	Max 10 ppb	
7	Melamine	Free	
8	Salmonella	As per table 3	ISO 6579*
9	Enterobacteriaceae	As per table 3	ISO 21528-2**

* 25 g analytical unit, samples may be pooled if lab method has been validated. The total analytical unit should be 625g

** 10 g analytical unit, no pooling

Table 3: Microbiological criteria

Microorganisms	n	c	m	M	p-class
Salmonella	25	0	Absent in 25 g	n/a	2
Enterobacteriaceae	10	2	≤10 cfu/g	≤100 cfu/g	3

Where

- n: number of sample units;

- c: the maximum allowable number of defective sample units in a 2-class plan or marginally acceptable sample units in a 3-class plan;

- m: a microbiological limit which, in a 2-class plan, separates good quality from defective quality or, in a 3-class plan, separates good quality from marginally acceptable quality;

- M: a microbiological limit which, in a 3-class plan, separates marginally acceptable quality from defective quality;

- p: 2 or 3 class plan

WFP will appoint an inspection company in order to proceed to the sampling and product analysis as specified above.