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PAKISTAN STANDARD SPECIFICATION
FOR

MILK POWDER (2ND REVISION)

PAKISTAN STANDARDS AND QUALITY CONTROL AUTHORITY
Standards Development Centre,
PSQCA complex, Standardization Wing II, 1st Floor, Plot - ST-7/A, Block-3,
Scheme No.36, Gulistan-e-Jauher, Karachi

PAKISTAN STANDARDS & QUALITY CONTROL AUTHORITY

(STANDARDS DEVELOPMENT CENTRE)

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PAKISTAN STANDARD SPECIFICATION
FOR
MILK POWDER (2ND REVISION)

0.0 **FOREWORD:**

0.1 This Pakistan Standard Specification was adopted by the Pakistan Standards & Quality Control Authority; Standards Development Centre, on **28-07-2011** after the draft finalized by the Milk & Diary Products Technical Committee had been approved by the National Standards Committee for Agricultural & Food Products.

0.2 The bulk of the milk powder at present available in the market is prepared by two well-known commercially established processes, known as the Roller 'Drying Process' and the 'Spray Drying Process'.

0.3 This standard was established in 1963 and first revised in 1982 as it was felt necessary to include additional requirements like flavour and odour, and coli form count. Besides, the limit for moisture content had been increased in view of practical considerations. This standard incorporates partly skimmed milk powder as the third type along with the requirements.

0.4 In the preparation of this standard, the views of the suppliers, consumers, technologists and testing authorities have been taken into consideration.

0.5 The assistant derived from codex standard is acknowledged with thanks.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with (PS: 103) for Methods of Rounding off Numerical Values the number of significant places retained in the rounded off value shall be the same as that of the specified value in the standard.

0.7 This standard is intended chiefly to cover the technical provisions relating to the supply of the material and it does not include all the necessary provisions of a contract.

0.8 All the ingredients preparation, processing, packaging storage and for transportation shall be according to PS: 3733 for Halaal Food Management System Requirement for any Organization in the Food Chain.

1. **SCOPE:**

This Standard prescribes the requirements and sampling for milk powders (made from the milk of cow, buffalo or a mixture thereof), intended for direct consumption or further processing, in conformity with the description in Clause 2 of this Standard.

2. **DESCRIPTION**

Milk powders are milk products which can be obtained by the partial removal of water from milk. The fat and/or protein content of the milk may have been adjusted, only to comply with the compositional requirements in TABLE-I of this Standard, by the addition and/or withdrawal of milk constituents in such a way as not to alter the whey protein to casein ratio of the milk being adjusted*.

* The following milk products are allowed for protein adjustment purposes:
– Milk retentate Milk retentate is the product obtained by concentrating milk protein by ultrafiltration of milk, partly skimmed milk, or skimmed milk;
– Milk permeate Milk permeate is the product obtained by removing milk proteins and milkfat from milk,partly skimmed milk, or skimmed milk by ultrafiltration; and
– Lactose (For specification, see relevant PS or Codex standard).

TABLE – I

S. No.	Description	REQUIREMENTS FOR MILK POWDERS			
		WHOLE MILK/FULL CREAM MILK POWDER	PARTLY SKIMMED MILK POWDER	SEMI-SKIMMED MILK POWDER	SKIMMED/ LOW FAT MILK POWDER
(i)	Flavour and Odour	Characteristic	Characteristic	Characteristic	Characteristic
(ii)	*Moisture % by mass	Not more than 5.0%	Not more than 5.0%	Not more than 5.0%	Not more than 5.0%
(iii)	Total solids (Milk solids and added solids) % by mass.	Not less than 95.0%	Not less than 95.0%	Not less than 95.0%	Not less than 95.0%
(iv)	Solubility Index : (a)Roller-dried	Not less than 85.0%	Not less than 85.0%	Not less than 85%	Not less than 85.0%
	(b)Spray-dried	Not less than 98.0%	Not less than 98.0%	Not less than 98%	Not less than 98.0%
(v)	Total Ash (on dry basis)% by mass	Not more than 7.0%	Not more than 8.0%	Not more than 8.0%	Not more than 9.0%
(vi)	Milk fat, % by mass	Not less than 26.0%	1.5% - 26.0%	14.0% - 16.0%	Not more than 1. 5%
(vii)	Titratable acidity (as lactic acid)% by mass	1.0%	1.0%	1.0%	1.0%
(viii)	Milk Protein m/m Min.	30%-34%	30%-34%	30%-34%	30%-34%
(ix)	Melamine in foods mg/Kg	2.5	2.5	2.5	2.5
(x)	Aflatoxin	Not more than 10 ppb	Not more than 10 ppb	Not more than 10 ppb	Not more than 10 ppb

*The water content does not include water of crystallization of the lactose; the milk solids-not-fat content includes water of crystallization of the lactose.

3. **FOOD ADDITIVES:** The additive shall be used and only within the limits permitted/specified in Pakistan Standard for Food Additives (PS: 2022), *OR* General Standard for Food Additives (CODEX STAN 192-1995).

4. **HYGIENIC REQUIREMENTS:** In accordance with PS:1825 for Good Manufacturing Practice in processing, packing, or holding human food. The product shall be processed, packed, stored and distributed under hygienic conditions. Contamination should be avoided.

The products shall comply with any rational microbiological criteria established in accordance with the Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods (CAC/GL 21-1997).

TABLE – II

MICROBIOLOGICAL LIMITS FOR MILK POWDER

S.No	Description	MILK POWDERS			
	MICRO-ORGANISM	WHOLE MILK/ FULL CREAM	PARTLY SKIMMED	SEMI-SKIMMED	SKIMMED/ LOW FAT
(i)	Total Bacterial count per gram	not more than 50,000 cfu	not more than 50,000 cfu	not more than 50,000 cfu	not more than 50,000 cfu
(ii)	Salmonella in cfu/25 gram	Absent	Absent	Absent	Absent
(iii)	Staphylococcus aeures (CFU per g)	<100	<100	<100	<100

4.1 CONTAMINANTS: The milk used in the manufacture of the products covered by this Standard shall comply with the Maximum Levels for contaminants and toxins specified for milk by the *General Standard for Contaminants and Toxins in Food and Feed* (CODEX STAN 193-1995) and with the maximum residue limits for veterinary drug residues and pesticides established for milk by the CAC.

5. MARKING: The following particulars shall be marked or labelled on each container:

(1) Name and type of the product,
(2) Name and address of the manufacturer,
(3) List of ingredients in descending order
(4) Batch or code numbers,
(5) Net weight in kilograms/gram,
(6) Process of manufacture (spray-dried or roller-dried),
(7) Date of manufacturer and expiry,
(8) Exact milk fat & Protein contents shall be declared,
(9) Pakistan Standard Number, PS: Mark, and licence number,
(10) "equivalent of (x)… liters of milk" OR similar statement
(11) declaration of allergen(s) including soya lecithin is/are mandatory

5.1 LABELLING: In accordance with PS: 1485 for Labelling of pre-packaged foods.

6. SAMPLING:
The method of drawing representative samples of the material and the criteria for conformity shall be as prescribed in Appendix- A.

7. METHOD OF TEST:

The relevant Testing Method of ISO, CAC and of other internationally recognized standard methods may be taken into account for analysis purpose.

APPENDIX - A
(Clause 5.1)
SAMPLING OF MILK POWDER
(WHOLE, PARTLY SKIMMED, SEMI SKIMMED & SKIMMED)

A-1 **GENERAL REQUIREMENTS:**

A-1.1 In drawing, preparing, storing and handling sampling the following precautions and directions shall be observed.

A-1.2 Samples shall be taken in protected place not exposed to damp air, dust or soot.

A-1.3 The sampling instrument shall be clean and dry when used. When taking samples for bacteriological examination, it shall be sterile.

A-1.4 Precautions shall be taken to protect the samples, the material being samples, the sampling instrument and the containers for samples from adventitious contamination.

A-1.5 The samples shall be placed in clean and dry glass containers. The sample containers shall be of such a size that they are almost completely filled by sample. The sample containers shall in addition be sterile when they are used for samples for bacteriological examination.

A-1.6 Each container shall be sealed air-tight after filling and marked with full details of sampling, batch or code number, name of the manufacturer and other important particular of the consignment.

A-1.7 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the temperature.

A-2 **Scale of Sampling:**

A-2.1 **Lot** All the containers in a single consignment of one type of material drawn from a single batch of manufacture shall constitute a lot. If the consignment is declared to consist of different batches of manufacturer, the batches shall be marked separately and the group of containers in each batch shall constitute separate lots.

A-2.1.1 Samples shall be tested from each lot for ascertaining its conformity to the requirements of this standard.

A-2.2 The number of containers to be selected from the lot shall depend on the size of the lot and shall be as given in Table III.

TABLE - III
NUMBER OF CONTAINERS TO BE SELECTED FOR SAMPLING
(Clause A-2.2 & A-2.3)

LOTE SIZE	SAMPLE SIZE (FOR TEST OTHER THAN MICROBIOLOGICAL)	SUB-SAMPLE SIZE (FOR MICROBIOLOGICAL TESTS)
(1)	(2)	(3)
22 to 25	2	1
26 to 100	3	1
101 to 300	5	2
301 to 500	7	3
501 and above	9	4

A-2.3 The containers shall be chosen at random from the lot and for this purpose as agreed to between the purchaser and the supplier shall be used. If such Table is not available, the following procedure shall be adopted.

Starting from any container in one order, count them as 1,2,3, etc. up to or and so on in a systematic manner and withdraw the r^{th} container; r being the integral part of N/n where N is the total number of containers and n the number of containers to be selected according to col. 2 of Table 2.

A-3 **TEST SAMPLES AND REFEREE SAMPLES:**

A-3.1 **Preparation of individual Sample**: Draw with suitable sampling instrument approximately equal quantities of the material from different parts of the container till about 500gram of the material is obtained. From this take about 150gram of the material & divide it into three equal parts. Each part so obtained shall constitute individual sample representing the container and shall be transferred immediately to
thoroughly clean and dry container sealed air-tight with particulars given under A-1.5. The individual sample so obtained shall be divided into three sets in such a way that each set has a sample, representing each selected container. One of these shall be marked for the purchaser, another for the vendor and the third for the referee.

A-3.2 **Preparation of Composite Sample:** From the material from each selected container remaining after the individual sample has been taken, approximately equally quantities of the material shall be taken and mixed together so as to form a composite sample
weighing about 600gram. This composite sample shall be divided into three equal parts and transferred to clean and dry containers, sealed air-tight and labelled with the particulars given in A-1.5. One of these Composite samples shall be for the purchaser, another for the vendor and the third for the referee.

A-3.3 **Preparation of Samples for Microbiological Examination:** From the selected containers select a sub-sample according to column 3 of Table-III. Draw with a suitable sampling instrument, which is sterile, at least 100g of the material and mix thoroughly under aseptic conditions to form a sample of container for microbiological examination. Divide sample (taking care not to bring in microbiological contamination in the material) into three equal parts. Each part so obtained shall constitute a sample representing the container and shall be transferred to sterile glass containers, sealed air-tight & labelled with particulars given A-1.5. They shall be marked, in addition, with the words, 'For Microbiological Examination'. The samples so obtained shall be divided into three sets in such a way that each set has a sample representing each selected container. One of these sets shall be marked for the purchaser, another for the vendor and the third for the referee.

A-3.4 **Referee Samples:** Referee samples consist of a set of individual samples (A-3.1) and a composite sample (A-3.2) and a set of samples for microbiological examination (A-3.3) marked for this purpose & shall bear the seals of the purchaser and the vendor. These shall be kept at a place as agreed to between the two.

A-4 **NUMBER OF TESTS:**

A-4.1 Test for determination of moisture, total solids, and solubility, fat and total ash shall be conducted on each of the samples constituting a set of individual samples.

A-4.2 Tests for flavour and odour, and titratable acidity shall be conducted on the composite sample.

A-4.3 Test for bacterial count and coli form count shall be conducted on each for the samples constituting a set of test samples labelled with the words 'For Microbiological Examination'.

A-5 **CRITERIA FOR CONFORMITY:**

A-5.1 The lot shall be declared as conforming to all the requirements of this specification when A-5.1.1 to A-5.1.2 is satisfied.

A-5.1.1 The test results in each of the individual samples for determination of moisture, total solids, solubility, total ash and fat shall satisfy the corresponding requirements as given in Table-I.

A-5.1.2 The test results for bacterial count and coli form count shall satisfy the corresponding requirements as given in Table -II.
