বাংলাদেশ স্ট্যান্ডার্ডস এন্ড টেস্টিং ইন্সটিটিউশন

শিল্প মন্ত্রণালয়

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার

সূত্র নং ৩৬.০৫.০০০০.০০২.১২.৫০৩.১৯

তারিখ: ২৯-০৯-২০১৯ খ্রিঃ

বিষয়: পাস্তুরাইজড মিল্ক পণ্যের বাংলাদেশ মান (BDS 1702:2002) রিভিশনের জন্য টেকনিয়াল কমিটি কর্তৃক প্রাথমিকভাবে অনুমোদিত খসড়া মানটির উপর মতামত আহ্বান প্রসঙ্গে।

উপর্যুক্ত বিষয়ে আদিষ্ট হয়ে জানানো যাচ্ছে যে, গত ১৬ সেপ্টেম্বর ২০১৯ খ্রিঃ তারিখে অনুষ্ঠিত মিল্ক এন্ড মিল্ক প্রোডাক্টস শাখা কমিটির একাধিক সভায় বিস্তারিত আলোচনান্তে ও বিভিন্ন দেশের রেফারেন্স পর্যালোচনান্তে BDS 1702:2002 Pasteurized milk মানটি রিভিশনের জন্য একটি খসড়া মান কমিটি কর্তৃক প্রাথমিকভাবে অনুমোদিত হয়।

২। প্রাথমিকভাবে অনুমোদিত মানটি নিয়মানুযায়ী কৃষি ও খাদ্য বিভাগীয় কমিটি কর্তৃক চূড়ান্তভাবে অনুমোদনের পূর্বে আপনার/আপনার প্রতিষ্ঠানের মতামত আহ্বান করা যাচ্ছে। বিবেচ্য মানটির উপর কোনরূপ মতামত যদি থাকে, তবে তা যৌক্তিকতা উল্লেখপূর্বক প্রদানের নিমিত্ত খসড়া মানটির ১ (এক) কপি এতদ্সঙ্গে প্রেরণ করা হলো।

৩। এমতাবস্থায়, রিভিশনের জন্য প্রস্তাবিত খসড়া মানটির উপর কোন সুচিন্তিত মতামত (যদি থাকে) আগামী ২৫ অক্টোবর ২০১৯ খ্রিঃ তারিখের মধ্যে নিম্নস্বাক্ষরকারী বরাবর প্রেরণের জন্য অনুরোধ করা হলো। নির্ধারিত সময়ের মধ্যে কোনরূপ মতামত না পাওয়া গেলে প্রস্তাবিত খসড়া মানটির সাথে সম্মত রয়েছেন মর্মে পরবর্তী কার্যক্রম গ্রহণ করা হবে।

৪। জাতীয় মান প্রণয়নে সকলের সহযোগিতা একান্তভাবে কাম্য।

(গোলাম মোঃ সরওয়ার)
উপ-পরিচালক (কৃষি ও খাদ্য)
মোবাঃ ০১৭১৮৪৬৩৬৬২
ইমেইল: kbdsarwarbsti@gmail.com

সংযুক্তি: বর্ণনামতে।

বিতরণ প্রয়োজনীয় কার্যার্থে (জেষ্ঠ্যতার ক্রমানুসারে নয়):

১। সংশ্লিষ্ট সকল স্টেকহোল্ডার ও কমিটির সদস্যবৃন্দ।
২। চেয়ারম্যান, বাংলাদেশ নিরাপদ খাদ্য কর্তৃপক্ষ, প্রবাসী কল্যাণ ভবন, ৭১-৭২ ইস্কাটন গার্ডেন রোড, ঢাকা।
৩। মহাপরিচালক, জাতীয় ভোক্তা অধিকার সংরক্ষণ অধিদপ্তর, টিসিবি ভবন, ১ কাওরান বাজার, ঢাকা।
৪। সভাপতি, এফবিসিসিআই, ৬০ মতিঝিল বাণিজ্যিক এলাকা, ঢাকা।
৫। সভাপতি, ক্যাব, ৮/৬ সেগুনবাগিচা, ঢাকা।
৬। পরিচালক (সিএম), বিএসটিআই, ঢাকা।
৭। পরিচালক (রসায়ন), বিএসটিআই, ঢাকা।
৮। প্রোগ্রামার, আইসিটি সেল, বিএসটিআই, ঢাকা (বিএসটিআই'র ওয়েবসাইটে দেয়ার জন্য)।

অনুলিপি (সদয় অবগতির জন্য):

১। পরিচালক (মান) বিএসটিআই, ঢাকা।
২। পিএ টু মহাপরিচালক, বিএসটিআই, ঢাকা।

FOREWORD

This Bangladesh Standard was adopted by the Bangladesh Standards and Testing Institution on ..... after the draft finalized by the Milk and Milk Products Sectional Committee had been approved by the Agricultural and Food Products Divisional Committee.

Milk is one of the most important commodities that is required in every household as an article of food and normally marketed in the form of pasteurized milk. The basic public health requires that consumers should be supplied with pure milk.

Pasteurization of milk has been accepted as a satisfactory method of destroying all pathogenic organisms in milk and reducing the number likely to affect the keeping quality of milk. The chemical composition and nutritive value of milk are not affected to any significant extent by this purpose. Pasteurization is intended to ensure delivery of milk in a wholesome free from all pathogenic bacteria. The process must be carried out with the prescribed heat treatment so as to permit maximum retention of macro and micro nutrients as well as natural flavour of raw milk. It should below in the total bacterial content, since heat destruction of microorganism is a logarithmic function. Milk with high microbial lead will yield product of inferior quality. Milk should be free from additives, neutralizers and foreign bodies not normal to milk.

To regulate the quality of pasteurized milk, this standard was initially published in 2002. Keeping in view the existing trade practices in the industry, the committee felt that this standard should be revised. This Bangladesh Standard is the first revision of BDS 1702:2002. Major modifications in this revision are as follows:

a) introduce flash pasteurization and change pasteurization time and temperature;
b) the scope of the standard has been extended;
c) specify the product in terminology;
d) the parameter for ash has been removed;
e) limit for total plate count has been changed;
f) new safety parameters for lead and phosphatase test have been included; and
h) the labeling requirements have been revised according to the current legislation.

The Sectional Committee responsible for the preparation of this standard has taken into consideration the views of producers, consumers and technologists and has related the standard of the manufacturing and trade practices following in the country in this field.

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 BDS 103. The number of significant places retained in the rounded off value should be the same as that of the specified value in the standard.

This standard cancels and replaces BDS 1702:2002 Specification for pasteurized milk which has been technically revised.

Bangladesh Standard
SPECIFICATION FOR
PASTEURIZED MILK
(Draft for First Revision)

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for pasteurized whole milk/full cream milk of cow, buffalo sheep, or goat.

1.2 This standard does not cover low fat milk, toned milk, double toned milk, skimmed milk, recombined milk or any other standardize milk.

2. REFERENCES

2.1 The Bangladesh Standards listed in Annex E is necessary adjuncts to this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

3. TERMINOLOGY

3.1 For the purpose of the specification the following definitions shall apply:

3.2 Milk — Milk is the normal lacteal secretion derived from complete milking of healthy animal without either addition of thereto or extraction therefrom. It shall be free from colostrum and obtained by the complete milking of one or more healthy animals (cow, buffalo sheep, or goat).

3.3 Whole milk/Full cream milk — Whole milk/Full cream milk means any of the milk mentioned under 3.2 which fat and milk solids-not-fat percentage minimum at 3.5 and 8.0 respectively. It shall be pasteurized.

3.4 Pasteurization

It shall refer to:

a) the process of heating every particle of milk at a specified temperature;
b) holding the milk at such temperature continuously for a specified period in standard and properly operate of equipment, and
c) immediate cooling in the same equipment after heating.

3.4.1 Holding or Batch method — Milk is heated to at least 65 ^{0}C and held continuously at that temperature for at least 30 minutes and then immediately cooled in the same equipment to 4.4 ^{0}C or less but not 0 ^{0}C or less to prevent the growth of the suring organism (largely protiolytic sporeformers).

3.4.2 High Temperature Short Time (HTST) Method — In this method milk is heated at least 75 ^{0}C and held continuously at that temperature for at least 16 seconds and then immediately cooled in this equipment to 4.4 ^{0}C or less but not 0 ^{0}C or less.

3.4.3 Flash pasteurization — The temperature of milk shall be raised to not less than 80 °C and retained at this temperature for at least 10 s and immediately and rapidly cooled to 10 °C or less but not 0 ^{0}C or less.

4. REQUIREMENTS

Physical and Chemical requirements of pasteurized milk.

4.1 Description — The material shall have white yellowish opaque colour with fresh sweetish characteristic odour of milk. It shall be free from visible dirt and extraneous matter. Milk shall not contain added water, preservatives or any other added substances. It shall be free from foreign fat and free from skimmed milk powder (see Annex A) or any other milk solids.

4.2 Hygienic condition – The material shall be prepared in the premises maintained in accordance with BDS 822.

4.3 Legal Requirement

The product shall also comply in all other aspects with the requirements of the legislations enforced in the country.

4.4 Pesticides, veterinary drug residues and Aflatoxin M_1

The products covered by this standard shall comply when tested periodically with the maximum residue limits established by the Bangladesh Food Safety Authority and the Codex Alimentarius Commission.

4.5 The material shall also comply with the requirements given in table 1

TABLE 1 REQUIREMENT FOR PASTEURIZED MILK

Sl No.	Characteristic	Requirement	Method of Test
(1)	(2)	(3)	(4)
i)	Fat, percent by mass, Min.	3.5	AOAC 905.02/ISO 2446
ii)	Solids Non Fat (SNF), percent by mass, Min.	8.0	ISO 6731
iii)	Density, g/ml at 20^0C	1.028-1.034	See note-1
iv)	Lactose, percent by mass, Min.	4.4	ISO 5548
v)	Protein, percent by mass, Min.	3.3	ISO 8968-1
vi)	Titrable acidity (as Lactic acid per 100 ml of milk), Max.	0.18	ISO TS 22113:2012
vii)	Total count, per ml, Max.	30,000 cfu	ISO 4833-1
viii)	Total coliform count, per ml	Less than 10	Annex B
ix)	Phosphatase test	Negative	Annex C
x)	Alcohol test	Negative	Annex D
xi)	Lead, Max.	0.02 ppm	ISO TS 6733
Note -1: Density of normal milk may be determined by hydrometer (lacto-meter)			

5. Packing and Marking

5.1 Packing – The pasteurized milk shall be filled in clean, sound and sanitary containers made of glass or food grade polyethylene pouches, plastic containers, cans or any other suitable materials or dispensing units. The product when marketed shall be packaged in well-sealed containers in order to prevent spoilage or contamination of the product.

5.1.1 All containers shall be clear and free from chips, cracks and any other defects. Bottles shall be hermetically sealed with new and clean closures and cans shall be sealed with new and clean can closures. The plastic container shall be heat sealed along one or more edges and shall not leak after it is filled with the products. All containers shall be subjected to cleansing and sanitising process before filling.

5.2 Labeling - The following information shall appear legibly on each container or label. Labels if used shall be clear and pasted securely.

a) Name of the product `Pasteurized whole milk/full cream milk' with brand name;
b) Fat -------- percent;
c) Batch or code number;
d) Name and address or the manufacturer and or distributor;
e) Volume of the contents in litres or milliliters;
f) Date of packing;
g) Date of expiry;
h) Storage temperature below 4.0 ^{o}C but not 0 ^{o}C or less; and
i) Maximum Retail Price (MRP).

5.2.1 The container or label shall be marked with the BSTI Certification mark

NOTE: The use or BSTI Certification Mark is governed by the provisions of the Bangladesh Standards and Testing Institution Act, 2018 and the Rules and Regulations made there under. Details of conditions under which a licence for the use of BSTI Certification Mark may be granted to manufacturers or processors may be obtained from the Bangladesh Standards and Testing Institution.

6. SAMPLING

6.1 The method of drawing representative samples of the material and the criteria for conformity shall be as prescribed in BDS 1009.

7. TESTS

7.1.1 Tests shall be carried out as prescribed by the methods specified in column 4 of Table 1.

7.2 Quality of regents - Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (see BDS 833) shall be used where the use of water as a reagent is intended.

NOTE : `Pure chemicals' shall mean chemicals that do not contain impurities, which affect the result of analysis.

Annex A
[Clause 4.1]
Test for Presence of Skimmed milk Powder in Natural milk (Cow, buffalo, goat, sheep)

A-1 General

A-1.1 This method is based on the fact that the coagulum obtained from reconstituted skimmed milk powder by addition of acetic acid, gives intense blue colour on boiling with phosphomolybdic acid due to cause reduction of molybdenum blue resulting in formation of blue colour.

A-2 Reagents

A-2.1 Acetic acid: 4%

A-2.2 Phosphomolybdic acid: 1% solution in water

A-3 Procedure

A-3.1 Take 50 ml of milk in a 60 ml centrifuge tube. Place the tube in the centrifuge and balance it properly. Centrifuge at 5000 rpm for 15 minutes. Decant the supernatant creamy layer carefully. Add 0.5 ml of 4% acetic acid to skim milk portion for coagulation of protein. Centrifuge the tubes at 5000 rpm for 5 minutes. Decant the supernatant and wash the precipitate with distilled water twice. Discard the washings. Then, add 2 ml of 1% phosphomolybdic acid to the washed precipitates. Mixed the content thoroughly and heat in a water bath at boiling temperature for 15 minutes and then cool. The curd obtained from pure milk shall be greenish in colour whereas the curd of sample containing skimmed milk powder shall be bluish in colour. The intensity of bluish colour depends on the amount of the skim milk powder present in the sample.

ANNEX B
[Table 1, item (viii)]
DETERMINATION OF COLIFORM COUNT

B-1 GENERAL

B-1.1 Coli form Bacteria – Coliform bacteria include all aerobic and facultative anaerobic gram negative non-spore forming bacteria which ferment lactose with the production of acid and gas. A positive presumptive test is indicated by formation of acid and gas within 48 hours at 35 ^{0}C to 37 ^{0}C in a fermentation tube containing lactose bile salt broth. Alternatively, the development of dark red colonies at least 0.5 mm in diameter in a solid medium (violet red bile agar) within 20 to 24 hours at 35 ^{0}C to 37 ^{0}C may be considered as a positive evidence of the presence of coliform bacteria. Violet red bile agar is one of the standard media used for determination of general types of coliform organisms including those of faecal origin in water, milk and other materials or sanitary importance.

B-2 APPARTUS

B-2.1 Weighing scoop sterile - with counter mass (weight)

B-2.2 Bacteriological transfer pipettes sterile – accurately graduated, with cotton plug in the upper orifice.

B-2.3 Dilution bottles, sterile - made of heat-resistance glass (preferably silicate glass) closed with rubber stoppers (preferably screw cap) with new friction-fit liners for making them leak-proff and of the following capacities:

a) 150 ml with mark at 99 ml level; and
b) 25 ml with mark at 9 ml level.

B-2.4 Petri dishes - with outside dish diameter 100 mm, inside dish diameter 91 mm and depth 15 mm. The exterior and interior surfaces of the bottom should be flat and free from bubbles scratches or other defects which would interfere with counting of colonies.

B-2.5 Bacteriological tubes sterile - 25 ml capacity with a mark at the 10 ml level, with cotton plugs.

B-2.6 Tubes having inverted vials - Durham tubes.

B-3 REAGENT

B-3.1 Dilution water - Dissolve 34 g of potassium dihydrogen phoshate (KH_2PO_4) in 500 ml of distilled water, adjust with 1 N sodium hydroxide solution and make up to one litre with distilled water. Dilute 1.25 ml of this stock phoshpate buffer solution with distilled water to one litre to obtain dilution water.

B-3.2 Medium - Violet red bile agar of following composition and pH shall be used as the medium:

Yeast extract	3.0 g
Peptone	7.0 g
Sodium taurocholate	1.5 g
Lactose	10.0 g
Sodium chloride	5.0 g
Agar-agar	20.0 g
Indicator	
Neutral red	0.03 g
Crystal violet	0.002 g
Water	100 ml
Final pH	7.4 ± 0.1

B-3.2.1 Preparation and sterilization of medium - Soak the materials (B-3.20) for 3 to 5 minutes in cold water, then bring the mixture into complete solution with minimum delay by boiling above asbestos centered wire gauze, over a flame. Stir continuously and efficiently to avoid charring. Adjust the solution to pH 7.4 ± 0.1 at 5 ^{0}C with sodium hydroxide solution. Filler through cotton pad till clear filtrate is obtained. Fill into bacteriological tubes to 10 ml mark. Sterilize in an autoclave 121^{0}C for 15 minutes.

B-4 PROCEDURE

B-4.1 Dilution - Weigh 11 g of the material from the samples for bacteriological examination using a sterile spatula and suspend in 99 ml of dilution water at 45 ^{0}C. Agitate mildly, soak for one to three minutes and then agitate vigorously to avoid churming out the fat. Prepare dilutions of this and add on millilitre of suitable dilutions in triplicate to the sterile petri dishes.

B-4.2 Pouring plates - Melt the medium (see B-3.2.1) in bacteriological tubes and keep at 48 ^{0}C to 50 ^{0}C. Introduced this medium aseptically at 42 ^{0}C to 44 ^{0}C into the petri dishes and mix by rotating and tilting dishes without spreading over the edges, spread the mixture evenly over the bottom of the plate. Allow to solidify, after solidification of medium in plate, add cover layer of the medium.

B-4.3 Incubation - Invert plates and incubate at 35 ^{0}C to 37 ^{0}C for 24 hours.

B-4.4 Counting - Count the dark red colonies which have a diameter of 0.5 mm or over.

B-4.5 Computation - Compute the coliform count per gram from the dilutions used (see B-4.1).

NOTE - 1: In case of doubt regarding the colonies developed on violet red bile agar representative colonies are picked and transferred to lactose bile salt broth in tubes having inverted vials. Production of acid and gas in confirmatory for coliform organisms.

NOTE - 2: All precautions shall be observed to prevent microbiological contamination throughout the test.

Annex C
[Table 1, Item (ix)]
Phosphatase Test

C-1 Alkaline phosphatase is an indigenous milk enzyme. The enzyme activity is destroyed at pasteurization temperature and has been adopted as an index of the efficiency of pasteurization. Since milk is a proven vector for a number of pathogenic bacteria, including Salmonella, Campylobactor and Listeria, the test is very great significance to the dairy industry as a means of policing the thoroughness of heat treatments or the addition of raw milk to heated or unheated products. In the following method, a solution of disodium p-nitrophenyl phosphate in a buffer of pH 10.2 is used as substrate. The compound, colourless in solution, is hydrolyzed by alkaline phosphatase of milk to liberate *p*-nitrophenol, which under alkaline condition gives an intense yellow colouration to the solution. The liberated *p*-nitrophenol is measured by direct comparison with standard colour discs in a Lovobond comparator. The test does not apply to sour milk and milk preserved with chemical preservatives.

C-2 Reagents/Apparatus – All reagents should be of analytical grade.

C-2.1 Buffer solution – 1.5 g of sodium bicarbonate and 3.5 g of anhydrous sodium carbonate dissolved in water and made up to one litre. Store in a refrigerator and discard after 1 month.

C-2.2 Disdium p-nitrophenylphosphate – The solid substrate must be kept in the refrigerator.

C-2.3 Buffer-substrate solution – Weigh accurately 0.15 g of subtrate (disodium p-nitrophenyl phosphate) into a 100 ml measuring cylinder and make up to 100 ml with buffer solution. The solution should be stored in refrigerator and protected from light. The solutiuon should give a reading of less than the standards marked 10 on comparator disc APTW or APTW 7 when viewed through a 25 mm cell (distilled water is used as blank). The solution must be discarded after one week.

C-2.4 A lovibond comparator with stand for work in reflected light.

C-2.5 A lovibond comparator disc APTW or APTW 7.

C-2.6 Two fused glass cells of 25 mm depth.

C-2.7 A water bath or incubator capable of being maintained at 37.5 ºC ± 0.5 ºC.

C-2.8 One ml pipette and 5 ml pipette.

C-2.9 One litre graduated flask.

C-2.10 100 ml measuring cylinder.

C-2.11 Test tubes, nominal size 150/16 mm with rubber stoppers.

C-3 Procedure – Into a test tube pipette 5 ml of buffer substrate solution, stopper and bring the temperature to 37 ºC. Add 1 ml of test milk to it shake and replace stopper, incubate at 37 ºC for 2 hours. Incubate one blank prepared from boiled milk of the same type as that undergoing the test with each series of sample. Remove the tubes after 2 hours and the content should be well mixed. Place the boiled milk blank on left hand side of the comparator stand and test sample on the right. Take reading in reflected light by revolving the disc until the test sample is matched. Record readings failing between two standards by affixing a plus or minus sign to the figure for the nearest standard.

C-4 Interpretation – The test is considered satisfactory if it gives a reading of 10 µg or less of p-nitrophenyl per ml of milk. Properly pasteurized milk gives no discernible colour.

Precautions Note-1: All glassware must be cleaned before use. Cleaning should be done by soaking in Chromic acid solution prepared by slowly adding 4 volumes of concentrated H_2SO_4 to 5 volumes of 8 % potassium dichromate. After cleaning in chromic acid glassware must be rinsed in warm water and distilled water and finally dried. Glassware used for the test must not be used for any other purpose and must be kept apart from other apparatus in the laboratory.

Precautions Note-2: A fresh pipette must be used for each sample of milk. Pipettes must not be contaminated with saliva.

Precautions Note-3: The sample of milk should be examined as soon as possible after arrival at the laboratory. If not examined immediately it must be kept at a temperature between 3 ºC and 5 ºC until examined. The sample must be brought to room temperature immediately before being tested.

Annex D
Table -1, Item (x)
Alcohol test

D-1 Alcohol Test

The test is quick and simple. It is based on instability of the proteins when the levels of acid and/or rennet are increased and acted upon by the alcohol. Also increased levels of albumen (colostrum milk) and salt concentrates (mastitis) results in a positive test.

D-2 Procedure

The test is done by mixing equal amounts of milk and 68% of ethanol solution in a small bottle or test tube. 68 % Ethanol solution is prepared from 68 ml 96% (absolute) alcohol and 28 ml distilled water. If the tested milk is of good quality, there will be no coagulation, clotting or precipitation, but it is necessary to look for small lumps. The first clotting due to acid development can first be seen at 0.21 - 0.23 % Lactic acid. For routine testing 2 ml milk is mixed with 2 ml 68 % alcohol.

Annex E
(Clause 2)
List of Relevant Standards

BDS and ISO No.	Title
BDS 103	Methods of rounding off numerical value
BDS 822	Code of hygienic conditions for food processing units
BDS 833	Water for laboratory use
ISO 2446:2008	Milk – Determination of milk fat content
ISO 4833-1:2013	Microbiology of the food chain — Horizontal method for the enumeration of microorganisms — Part 1: Colony count at 30 degrees C by the pour plate technique
ISO 5548:2004	Caseins and caseinates – Determination of lactose content – Photometric method
ISO 6731:2010	Milk, cream and evaporated milk – Determination of total solids content (Reference method)
ISO 8968-1	Milk and milk products - Determination of nitrogen content - Part 1: Kjeldahl principle and crude protein calculation
ISO 14501:2007	Milk and milk powder – Determination of aflatoxin M1 content Clean-up by immunoaffinity chromatography and determination by high-performance liquid chromatography
ISO TS 6733:2006	Milk and milk products — Determination of lead content — Graphite furnace atomic absorption spectrometric method
ISO TS 22113:2012	Milk and milk products — Determination of the titratable acidity of milk fat