GB

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食品安全国家标准

食品微生物学检验乳与乳制品检验

National food safety standard

Food microbiological examination:Milk and milk products

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Forward

This standard cancels and replaces GB/T 4789.18-2003: Microbiological examination in foods-examination of milk and milk products.

Main modifications in this standard comparing to GB/T 4789.18-2003 are as follows:

— Chinese and English names of this standard are revised.

— ‘Scope’ and ‘Normative references’ are revised;

— ‘Sampling method’ and treatment of all kinds of milk products are revised.

Replaced previous published standards:

——GB 4789.18-1984、GB/T 4789.18-1994、GB/T 4789.18-2003。

National food safety standard

Food microbiological examination:Milk and milk products

1 Scope

This General Standard applies to microbiological examination of milk and milk products.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

3 Apparatus and materials

3.1 Sampling equipment

All surfaces of sampling equipment should be smooth and free from crevices. All corners should be rounded. The equipment should be cleaned, sterilized and dry prior to use. Sampling equipment include stirrers, sampling spoons, cutting wires, knives (lancet or spatula), cheese triers, etc.

3.2 Sampling containers

Sampling containers and closures should be of material (such as, glass, stainless steel, plastic, etc.) and construction that adequately protect the sample. The containers and closures should be clean, sterile and dry. The capacity of the container should be adequate allow proper mixing of the contents before analysis. Sampling containers include sampling bags, sampling tubes, sampling bottles, etc.

3.3 Other materials

Other materials include thermometers, aluminum foil, parafilm, marker pens, sampling record forms, etc.

3.4 materials for examination in lab

3.4.1 Materials for general examination refer to GB 4789.1

3.4.2 Examination of indicator microorganisms refers to GB4789.1, GB4789.3 and GB 4789.15, respectively.

3.4.3 Examination of pathogens refers to GB 4789.4, GB 4789.10, GB 4789.30, GB 4789.37, GB 4789.40, respectively.

3.4.4 Examination of Bifidobacteria and lactic acid bacteria refers to GB 4789.34 and GB 4789.35, respectively.

4 Sampling method

Samples should be truly representative. Samples should be taken using aseptic techniques. The precise method of sampling and the mass or volume of product to be taken varies according to the nature of milk and milk products and related standard requirements. During storage and transport, where necessary, precautions should be taken to prevent change of the initial load of microorganisms in the sample and to remain the initial status of the sample.

4.1 Sampling of raw milk

4.1.1 Thoroughly mix the product and take the sample immediately after mixing. A number of samples should be taken using aseptic techniques and sterilized equipments from the same batch products (special for single milk tank or road tank). The sample size should meet the requirements of microbiological examination.

4.1.2 For subdivided milk storage equipment, a representative quantity should be taken from each container. Mix portions of each representative quantity in amounts which are proportional to the quantity of the container from which they are taken. Samples from the aggregate sample thus obtained should be taken after mixing.

4.2 Sampling of liquid milk products

The instruction applies to pasteurized milk, fermented milk, sterilized milk, etc. Take a number of samples of each batch with smallest original package.

4.3 Sampling of semi-solid milk products

4.3.1 Sampling of condensed milk

Apply to the evaporated milk, sweetened condensed milk and recombined condensed milk etc.

4.3.1.1 Products with original package less than or equal to 500 g (mL): a number of products with the smallest original retail package should be taken from each batch. Sample size should be no less than 5 times of examination unit.

4.3.1.2 Products with original package over 500 g (mL)(processed products, imports and exports): the product should be mixed by plunging or stirring by mechanical agitation until sufficient homogeneity is ensured before sampling. If the product is difficult to obtain sufficient homogeneity, samples should be taken from different portions of the product container to obtain a representative sample. Sample size should be no less than 5 times of examination unit.

4.3.2 Sampling of butter and butter products

Apply to cream, butter and Anhydrous Milk Fat etc.

4.3.2.1 Products with original package less than or equal to 1000 g (mL): samples with smallest original package should be taken from the same batch. Sample size should be no less than 5 times of examination unit.

4.3.2.2 Products with original package over 1000 g (mL): the product should be mixed by plunging or stirring by mechanical agitation until sufficient homogeneity is ensured before sampling. For solid products, the aseptic spatula should be used to remove the surface layer of the product from the sampling area to a depth of not less than 5 mm. A clean and dry butter trier should be passed through the product with a steady speed to the bottom. The trier should be rotated through a half turn and be withdrawn. The sample on the trier should be removed and collected into the sampling container. Sample size should be no less than 5 times of examination unit.

4.4 Sampling of solid milk products

Apply to cheese, processed cheese, milk powder, whey powder, lactose and butter milk powder etc.

4.4.1 Sampling of cheese and processed cheese

4.4.1.1 Products with original package less than or equal to 500 g: samples with smallest original package should be taken from the same batch. Sample size should be no less than 5 times of examination unit.

4.4.1.2 Products with original package over 500 g (mL): sampling should be performed, depending upon the shape and type, by following methods: (1) a cheese trier should be inserted from the surface (at least 10 cm from the edge) diagonally. This procedure should be done once or repeated several times. (2) a cheese trier should be inserted from one surface vertically through the core to opposite surface. (3) a cheese trier should be inserted horizontally between the two surfaces into the core of the cheese. (4) for sampling block-shaped cheese or cheese packaged in barrel bulk, box or other big container, a trier should be inserted from the top of the container diagonally into the bottom. Sample size should be no less than 5 times of examination unit.

4.4.2 Sampling of milk powder, whey powder and lactose and buttermilk powder

Apply to milk powder, whey powder, lactose and buttermilk powder etc.

4.4.2.1 Products with original package less than or equal to 500 g: samples with smallest original package should be taken from the same batch. Sample size should be no less than 5 times of examination unit.

4.4.2.2 Products with original package over 500 g: a clean and dry Borer should be passed into the product with a even rate of penetration until the borer reaches the center of the container. The trier should be rotated through a half turn and be withdrawn. The sample on the borer should be removed and collected into the sampling container. Sample size should be no less than 5 times of examination unit.

5 Treatment of test samples

5.1 Treatment of milk and liquid milk products

Open the package aseptically after the test sample has been shaken for homogenization. For plastic or carton package, sanitize the opening of the package by 75% ethanol and cut by aseptic scissors to open; for glass package, aseptically remove the cover or cap and sanitize the opening by flame. Aseptically pipette 25 mL (homogenize the liquid milk which containing solids) test sample into a conical flask containing 225 mL sterilized physiological saline and shake thoroughly.

5.2 Treatment of semisolid milk products

5.2.1 Condensed milk

Clean and sanitize the surface of the bottle or can by burning ethanol tampon and open it by sterilized can opener. Aseptically weight 25 g test sample into a conical flask containing 225 mL sterilized physiological saline (or other enriched solution) which has been preheated to 45℃ and shake thoroughly.

5.2.2 Cream, butter and AMF

Aseptically open the package and weight 25 g test sample into a conical flask containing 225 mL sterilized physiological saline (or other enriched solution) which has been preheated to 45℃ and shake thoroughly. It should not exceed 30 min from thawing the test sample to inoculation.

5.3 Treatment of solid milk products

5.3.1 Cheese and cheese products

Aseptically open the outer packing. Remove parts of the sealing wax on the surface by sterile knife if the cheese is coated or aseptically carve the cheese directly using sterile knife if the cheese is not coated. Take appropriate representative samples from the surface and core part by sterile knife (spoon), respectively, and mix them and smash evenly. Weight 25 g homogenized sample into a conical flask containing 225 mL sterilized physiological saline (or other diluent) which has been preheated to 45℃. Shake the above sample thoroughly (1 to 3 min) to make the samples distributed evenly. The temperature of the diluent during the operation should not exceed 40℃ and foam should be avoid as much as possible.

5.3.2 Milk powder, whey powder, lactose, buttermilk powder

Blend the product to mix thoroughly before sampling. The sampling method and treatment of canned milk powder is the same as condensed milk. For bag-packaged milk powder, sanitize the bag opening using 75% alcohol and aseptically open the bag. Weigh 25g sample into a conical flask containing 225 mL sterilized physiological saline which has been preheated to 45℃(glass beads can be used for dissolving). Shake the flask thoroughly to dissolve and mix the samples completely.

For acid whey powder, use dipotassium hydrogen phosphate solution at pH8.4±0.2. For special milk powder containing high level starch, use α-amylase or double the diluent to reduce the viscosity of the solution.

5.3.2 Casein and caseinate

Aseptically weight 25 g of the test sample into a conical flask containing 225 mL of the appropriate diluent, as follows. When decimal diluting viscous sample, rinse the pipette with diluent by aspirating several times to transfer the samples adhered to the pipette inner wall as much as possible.

5.3.3.1 for acid and lactic casein, use as diluent dipotassium hydrogen phosphate solution with antifoam agent at pH8.4±0.2.

5.3.3.2 for rennet casein, use as diluent dipotassium hydrogen phosphate solution with antifoam agent at pH7.5±0.2. Mix well and allow standing for 15 min at room temperature. Homogenize for 2 min in sterile peristaltic blender bags and allow standing for 5 min.

5.3.3.3 for caseinate, use as diluent dipotassium hydrogen phosphate solution at pH7.5±0.2.

6 Determination methods

6.1 Aerobic plate count: refer to GB 4789.2;

6.2 C*oliform*: refer to GB 4789.3;

6.3 *Salmonella*: refer to GB 4789.4;

6.4 Examination of *Staphylococcus aureus*: refer to GB 4789.10;

6.5 Molds and yeasts: refer to GB 4789.15;

6.6 *Listeria monocytogenes*: refer to GB 4789.30

6.7 Bifidobacteria: refer to GB/T 4789.34;

6.8 Lactic acid bacteria: refer to GB/T 4789.35

6.9 *Enterobacter sakazakii*: refer to GB 4789.40.;