



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 5413.3-2010

**National food safety standard -- Determination of fat in foods
for infants and young children, milk and milk products
(English Translation)**

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Preface

This standard replaces the determination of fat in GB/T 5009.46-2003 "Method of analysis of hygienic standard of milk and milk products"; the determination of fat in GB/T 5409-85 "Analytical method for milk"; the determination of fat in GB/T 5416-85 "Analytical method for butter"; and GB/T 5413.3-1997 "Milk powder and formula foods for infant and young children - Determination of fat".

Appendix A is informative.

The previous editions to be replaced by this standard are.

- GB/T 5409-85;
- GB/T 5413.3-1997;

- GB/T 5416-85;
- GB/T 5009.46-1985, GB/T 5009.46-1996, and GB/T 5009.46-2003.

National food safety standard

Determination of fat in foods for infant and young
children, milk and milk products

1 Scope

This standard specifies the determination of fat in pasteurized milk, sterilized milk, raw milk, fermented milk, modulation milk, milk powder, condensed milk, butter, diluted butter, cheese, and infant formula foods.

Method 1 in this standard is applicable to determination of fat in pasteurized milk, sterilized milk, raw milk, fermented milk, modulation milk, milk powder, condensed milk, butter, diluted butter, cheese, and infant formula foods. Method 2 in this standard is applicable to determination of fat in pasteurized milk, sterilized milk, and raw milk.

2 Normative documents

The normative documents are indispensable to this Standard. For dated references, only the dated references apply to this Standard. For undated references, the latest editions of the normative documents (including all corrigendum) to apply to this Standard.

Method 1

3 Principle

Use ethyl ether and petroleum ether to extract the alkaline hydrolyzate of the sample. Distil or evaporate to remove the solvent. Determine the extract's mass that is dissolved in the solvent.

4 Reagents and materials

Unless otherwise specified, all reagents are analytically pure. Water is the Grade 3 specified in GB/T 6682.

4.2 Ammonia (NH₄OH). Mass fraction is about 25%.

Note: Higher concentration of ammonia may be used.

4.4 Ethyl ether (C₄H₁₀O). Does not contain peroxide or antioxidant; and meet the test

requirements.

4.6 Mixed-solvent. Mix ethyl ether (4.4) with same-volume's petroleum ether (4.5).

Prepare before using.

4.8 Congo-red solution (C₃₂H₂₂N₆Na₂O₆S₂). Dissolve 1g of Congo-red into water; dilute

to 100ml.

Note: It may be selectively used. Congo-red can make the interface of solvent and water-phase to be clear. Other solutions can also be used if it can colorize the water-phase and do not affect the test result.

4.9 Hydrochloric acid (6 mol/L). Pipette 50 mL of hydrochloric acid to slowly pour into 40

mL of water. Fix the volume to 100 mL. Mix well.

5.2 Centrifuge. It can be used for placement of liposuction bottle or tube. Rotating

speed is 500-600 r/min. It can generate 80-90g gravity field at the outer end of liposuction bottle.

5.5 Liposuction bottle. With high quality cork stopper or other stoppers (e.g. silica gel

or polytetrafluoroethylene) which do not affect the solvent use. Firstly immerse the cork stopper in ethyl ether; then put into the water with temperature of 60°C or above for minimum 15min. Cool down before using. Immerse the cork stopper in water when it is not in use. Change the immersing water daily.

Note: It may also liposuction tube (or bottle) with siphon. However, the operational steps are

different, see Appendix A. The lower-end of the internal long branch-pipe of the joint can be a spoon-shaped.

6.1 Preparation of the fat-collection container (fat-collection bottle)

Put a few grains of zeolites in a dried fat-collection bottle. Place it a drying oven to dry for 1 hour. Cool the fat-collection bottle to room temperature. Weigh to precision of 0.1 mg.

Note: The fat-collection bottle may be selected according to actual needs.

6.2 Blank test

Avoid splashing the solvent outside of the bottle. Place the fat-collection bottle into drying oven at $102^{\circ}\text{C} \pm 2^{\circ}\text{C}$. Heat for 1 hour. Operate according to 6.3.1.12 and 6.3.1.13.

6.3.1.16 The difference between the mass from 6.3.1.13 AND mass from 6.3.1.15 is the content of fat.

Note: Follow the description in Appendix A when selecting liposuction tube with a siphon or wash-bottle accessory.

6.3.2 Milk powder and milk-based infant food

Weigh the well-mixed sample. High-fat milk powder, full cream milk powder, full cream milk powder with sugar, and milk-based infant food. ~ 1 g (accurate to 0.0001 g); skimmed milk powder, whey powder, and buttermilk powder. ~ 1.5 g (accurate to

6.3.2.1 Sample without starch

Add 10mL of water at temperature $65 \pm 5^{\circ}\text{C}$. Wash the sample into the small ball in the liposuction bottle. Mix thoroughly till the sample is fully dispersed. Place it in running water to cool down.

6.3.2.2 Sample with starch

Put the sample into liposuction bottle. Add 0.1g of amylase (4.1) and a magnetic stirring rod . After mixing well, add 8 mL - 10mL distilled water at 45°C . The solution