NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

GB 5009.9-2023

National food safety standard - Determination of starch in foods

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Table of Contents

Foreword

This Standard replaces GB 5009.9-2016 "National food safety standard - Determination of starch in food". Compared with GB 5009.9-2016, the main changes in this Standard are as follows.

- MODIFY the scope;

- ADD the microsugar test method to remove soluble sugar in the sample;

- ADD a washing step for samples containing maltodextrin.

National food safety standard - Determination of starch in

foods

1 Scope

This Standard specifies the methods for the determination of starch in food.

Method I and method II of this Standard apply to the determination of starch in food (except meat products); method III applies to the determination of starch in meat products. This Standard does not apply to the determination of starch in foods with added substances that produce reducing sugars upon hydrolysis (except maltodextrin and soluble sugars).

Method I. Enzymatic hydrolysis method

2 Principle

After the fat and soluble sugars are removed from the sample, the starch is hydrolyzed into glucose by amylase and hydrochloric acid in sequence. Determine the glucose content and convert it into the starch content in the sample.

3 Reagents and materials

Unless otherwise stated, the reagents used in this method are of analytical regent, and the water is Grade 3 water specified in GB/T 6682.

3.3 Reference material

D-anhydrous glucose (C6H12O6, CAS number. 50-99-7). purity >= 98 %, or a reference material certified by the country and awarded a reference material certificate.

3.4 Preparation of standard solution

Glucose standard solution (1.00 mg/mL). Accurately weigh 1 g (accurate to 0.001 g) of D-anhydrous glucose that has been dried at 98 degrees C ~ 100 degrees C for 2 hours, add water to

dissolve, then add 5 mL of hydrochloric acid, and dilute to 1000 mL with water.

4 Instruments and equipment

4.1 40 mesh sieve. the aperture is 0.425 mm.

5.1 Preparation of samples

Take the edible part of the sample and grind it, pass it through a 40 mesh sieve, and weigh 2 g ~ 5 g (accurate to 0.001g) of it. If the sample is not easy to grind, add an appropriate amount of water accurately and record the mass; after homogenization, weigh a sample equivalent to 2 g ~ 5 g of the original sample.

5.2 Microsugar test method

Take 2 mL of the washing liquid in a small test tube, add 4 drops of alpha-naphthol ethanol solution (10 g/L), and slowly add 1 mL of concentrated sulfuric acid along the tube wall.

5.3.1 Calibration of alkaline copper tartrate solution

Pipette 5.00 mL of alkaline copper tartrate solution A and 5.00 mL of alkaline copper tartrate solution B, place them in a 150 mL Erlenmeyer flask;

5.3.4 Determination of reagent blank

At the same time, measure 20.00 mL of water and the same amount of amylase solution as when processing the sample solution, and carry out a reagent blank test according to the back titration method. That is, use the glucose standard solution to titrate the reagent blank solution to the end point, and record the mass of glucose contained in 10 mL of the sample solution, which is equivalent to the difference between the volume consumed and the volume of the glucose standard solution consumed during calibration. Calculate the glucose content in the reagent blank according to formula (5) and formula (6).

6.1 The mass of glucose, which is equivalent to the alkaline copper tartrate solution

used for calibration.

6.3 When the starch concentration in the sample is too low, the glucose content is

calculated according to formula (3) and formula (4).

7 Precision

The absolute difference between two independent determination results obtained under repeatability conditions shall not exceed 10% of the arithmetic mean.

8 Principle

After the fat and soluble sugar are removed from the sample, the starch is hydrolyzed into glucose by hydrochloric acid. The glucose content is measured, and converted into the starch content in the sample.

9 Reagents and materials

Unless otherwise stated, the reagents used in this method are of analytical regent, and the water is Grade 3 water specified in GB/T 6682.

9.2.1 Methyl red indicator solution (2 g/L). Weigh 0.20 g of methyl red, dissolve in 95 %

ethanol and dilute to 100 mL.

9.2.2 Sodium hydroxide solution (400 g/L). Weigh 40 g of sodium hydroxide, add water

to dissolve and dilute to 100 mL.

9.2.6 Ethanol solution (85 %, volume fraction). Take 85 ml of absolute ethanol, add

water to dilute to 100 mL and mix well. It can also be prepared with 95 % ethanol.

9.2.7 Ethanol solution (40 %, volume fraction). Take 40 ml of absolute ethanol, add

water to dilute to 100 mL and mix well. It can also be prepared with 95 % ethanol.

9.3 Reference material

Same as 3.3.

9.4 Preparation of standard solution

Same as 3.4.