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

GB/T 21126-2026

Replacing GB/T 21126-2007

**Determination of sodium formaldehyde sulfoxylate in wheat
flour, rice flour and their products**

小麦粉与大米粉及其制品中甲醛次硫酸氢钠含量的测定

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents". Drafting. This document supersedes GB/T 21126-2007 "Determination of formaldehyde and sodium bisulfite content in wheat flour, rice flour and their products". Compared with GB/T 21126-2007, apart from structural adjustments and editorial changes, the main technical changes are as follows:

- a) Added terms and definitions (see Chapter 3);
- b) The requirements for water used in solution preparation have been changed (see Chapter 5, Chapter 4 of the 2007 edition);
- c) The preparation and storage requirements for formaldehyde standard intermediate solutions have been revised (see 5.4.1, 4.2 of the 2007 edition);
- d) The types of instruments have been changed (see 6.2, 6.3, 6.5, 6.6, 6.7, 6.9, 6.12 and 6.13, and 5.2, 5.3,

5.9 in the.2007 edition);

e) A sample preparation method has been added (see 7.1);

f) The extraction and separation method for formaldehyde derivatives was modified (see 7.2,

6.3 in the.2007 edition);

g) Added reference conditions for column packing particle size, column temperature, and injection volume (see 7.3.1, 7.3.2, and 7.3.6);

h) The detection wavelength has been changed (see 7.3.5,

1 Scope

GB/T 21126-2026 is the Chinese national standard covering detecting rongalite in flour - an industrial bleaching and reducing agent that is banned in food and that has been used illegally to whiten flour and noodles. It replaces GB/T 21126-2007 and has been in force since 1 October 2026, with the benzoyl peroxide method GB/T 18415-2026. It was issued on 31 March 2026 and takes effect on 1 October 2026, replacing GB/T 21126-2007. The document is under the responsibility of the National Food and Strategic Reserves Administration. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document describes a high-performance liquid chromatography (HPLC) method for the determination of sodium formaldehyde bisulfite content in wheat flour, rice flour, and their products. This document applies to residues found in wheat flour, rice flour, steamed buns, dried noodle products, fresh wet noodle products, fermented noodle products, and rice noodle products. Determination of formaldehyde and sodium formaldehyde sulfoxylate content.

4.Principles In acidic solution, sodium formaldehyde sulfoxylate decomposes to release formaldehyde. After extraction with water, the formaldehyde reacts with 2,4-dinitrophenylhydrazine to produce a yellow... The colored 2,4-dinitrophenylhydrazone was extracted with n-hexane, separated by high-performance liquid chromatography, and detected under ultraviolet light. Qualitative analysis was based on retention time. Quantitative analysis using the external standard method.

5.Reagents and Materials Unless otherwise stated, all reagents used in this method are of analytical grade, and the water is Grade I water conforming to GB/T 6682.

5.1 Reagents

5.1.1 n-Hexane (C₆H₁₄). chromatographic grade.

5.1.2 Acetonitrile ($\text{C}_2\text{H}_3\text{N}$). chromatographic grade.

5.1.3 Phosphoric acid (H_3PO_4).

5.1.4 Disodium hydrogen phosphate dodecahydrate ($\text{Na}_2\text{HPO}_4 \cdot 12\text{H}_2\text{O}$). 5.1.5 2,4-Dinitrophenylhydrazine ($\text{C}_6\text{H}_6\text{N}_4\text{O}_4$).

5.1.6 Sodium chloride (NaCl).

5.1.7 Hydrochloric acid (HCl).

5.1.8 Anhydrous ethanol ($\text{C}_2\text{H}_6\text{O}$).

5.2 Reagent Preparation

5.2.1 Hydrochloric acid-sodium chloride solution [6% (volume fraction) hydrochloric acid; 20 g/L sodium chloride]. Weigh 20 g of sodium chloride into a 1000 mL volumetric flask. Dissolve in a small amount of water, add 60 mL of hydrochloric acid, and then add water to the mark.

5.2.2 Disodium hydrogen phosphate solution (0.5mol/L). Weigh 18g of disodium hydrogen phosphate dodecahydrate, dissolve in water and bring the volume to 100mL.

5.2.3 Purification of 2,4-dinitrophenylhydrazine. Weigh approximately 20 g of 2,4-dinitrophenylhydrazine into a beaker, add 167 mL of acetonitrile and 500 mL of water, and mix thoroughly. Stir to dissolve, filter out insoluble impurities using qualitative filter paper, and let the filtrate stand overnight. Filter the crystals through qualitative filter paper, and react with water and anhydrous ethanol respectively. After washing 5 to 6 times, place in a dryer for later use.

5.2.4 Derivatization solution (2 g/L). Weigh 200 mg of 2,4-dinitrophenylhydrazine prepared in 5.2.3, dissolve it in acetonitrile and bring the volume to 100 mL. Incubate at room temperature. Store away from light.

5.3 Standard Products Formaldehyde (CH_2O , CAS No.. 50-00-0) standard solution. 1000 mg/L, or other nationally certified and certified standard samples. Standard reference materials.

Note. Formaldehyde standard solution can also be prepared and calibrated using 36%~38% formaldehyde solution. For specific procedures, please refer to Appendix A of GB 5009.307-2025.

5.4 Preparation of Standard Solutions

5.4.1 Formaldehyde standard intermediate solution (100 $\mu\text{g/mL}$). Accurately pipette 1 mL of 1000 mg/L formaldehyde standard solution, dilute with water and bring to a final volume. Prepare a 10 mL solution of formaldehyde standard intermediate with a mass concentration of 100 $\mu\text{g/mL}$. Store at 2°C ~ 8°C away from light. Shelf life is 3 months.

5.4.2 Formaldehyde Standard Working Solution. Accurately measure a certain amount of formaldehyde standard intermediate solution and dilute it with water to prepare a 2 μ g/mL formaldehyde standard working solution. Prepare as needed.

5.5 Materials

5.5.1 Centrifuge tubes. 20mL, 50mL.

5.5.2 Organic filter head. 0.45 μ m pore size.

6 Instruments and Equipment

6.1 Erlenmeyer flasks with stoppers. 150mL, 250mL.

6.2 Volumetric flasks. 1000mL, 500mL, 100mL.

6.3 Pipettes. 50mL, 5mL, 2mL, 1mL.

6.4 Analytical balance. sensitivity is 0.01g and 0.1mg.

6.5 Knife-type grinder.

6.6 Reciprocating oscillator. oscillation frequency $\geq$ 200 times/min.

6.7 High-speed tissue homogenizer. rotation speed $\geq$ 2000 r/min.

6.8 Vortex Oscillator.

6.9 High-speed centrifuge. speed $\geq$ 10000r/min.

6.10 Constant temperature water bath. includes a 50°C temperature control point, with a temperature control accuracy of $\pm 1^\circ\text{C}$.

6.11 High-performance liquid chromatograph. equipped with a UV-Vis wavelength detector or a diode array detector.

7.1 Sample Preparation

7.1.1 Preparation of powdered samples. For wheat flour and rice flour samples, take no less than 500g of representative sample from all samples and directly pack it into a clean container. Store in a clean, sealed container for later use.

7.1.2 Preparation of dried samples. For dried noodles and dried rice noodles, take a representative sample of no less than 500g from all samples, and cut or chop it. Use a knife grinder (6.5) to grind the particles to a size of less than 1 mm, mix them well, put them into a clean container, seal and store for later use.

7.1.3 Preparation of wet samples. For steamed buns, fresh noodles or rice noodles, wet rice noodles, and fresh rice sheets, take no less than 500g from the total sample.

Representative samples were chopped into particles no larger than 5 mm, mixed