

ICS 67.200.20

CCS B 33



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

GB/T 30390-2026

Replacing GB/T 30390-2013

**Determination of fructose, glucose, sucrose, stachyose and
raffinose in oilseeds**

油料种籽中果糖、葡萄糖、蔗糖、水苏糖和棉子糖含量的测定

Issued on: March 31, 2026

Implemented on: October 1, 2026

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

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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 replaces GB/T 30390-2013 "Determination of Fructose, Glucose and Sucrose Content in Oilseeds by High Performance Liquid Chromatography". Compared with GB/T 30390-2013, apart from structural adjustments and editorial changes, the main technical changes are as follows:

- a) The range has been changed to include stachyose and raffinose (see Chapter 1, Chapter 1 of the 2013 edition);
- b) Ion chromatography has been added (see Chapter 5);
- c) The reagents and materials have been changed, and standard samples/reference materials of stachyose and raffinose have been added (see 5.2.3, 4.5 of the 2013 edition);
- d) Some equipment was modified, replacing the magnetic stirrer with a vortex mixer (see 5.3.4, 2013 version 5.4);
- e) The experimental procedures have been changed (see 5.5, Chapter 7 of the 2013 edition);
- f) The formulas and the way calculation results are retained have been changed (see 5.7, Chapter 9 of the 2013 edition). Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed and is under the jurisdiction of the Ministry of Agriculture and Rural Affairs of the People's Republic of China. This document was drafted by: Oil Crops Research Institute, Chinese Academy of Agricultural Sciences; Agricultural Products Processing Institute, Chinese Academy of Agricultural Sciences; and the Chinese Academy of Agricultural Sciences. Institute of Crop Science, Chinese Academy of Sciences; Chongqing Zhongyi Seed Industry Co., Ltd. The main drafters of this document are: Li Peiwu, Hu Xiaofeng, Wang Qiang, Ma Fei, Sun Lijuan, Zhang Wen, Li Juan, Ma Xiaojie, Li Jingmei, Gu Fengying, and Zhang Liangxiao. Ding Xiaoxia, Zhou Haiyan, and Hu Chengwei. The release history of this document and the document it replaces is as follows:

---First published in 2013 as GB/T 30390-2013;

---This is the first revision. Oilseeds contain fructose, glucose, sucrose, stachyose, and Determination of raffinose content

1 Scope

GB/T 30390-2026 is the Chinese national standard covering the sugars in an oilseed - the sucrose that indicates maturity and the stachyose and raffinose that make soybean meal less digestible to a young animal, which is why a feed formulator wants them measured. It replaces GB/T 30390-2013 and has been in force since 1 October 2026. It was issued on 31 March 2026 and takes effect on 1 October 2026, replacing GB/T 30390-2013. The document is under the responsibility of the Ministry of Agriculture and Rural Affairs. 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 and ion exchange method for determining the content of fructose, glucose, sucrose, stachyose, and raffinose in oilseeds. Chromatography. This document applies to the determination of fructose, glucose, sucrose, stachyose, and raffinose content in oilseeds.

4 High Performance Liquid Chromatography

4.1 Principle After extraction of fats and precipitation of proteins, the sample was filtered, and the filtrate was separated by an amino chromatography column and detected by a differential refractive index detector or evaporative light scattering detector. Instrument detection, external standard method for quantification.

4.2 Reagents and Materials Unless otherwise specified, all reagents are of analytical grade and the water is grade II water as specified in GB/T 6682.

4.2.1 Reagents

4.2.1.1 Acetonitrile (CH_3CN). chromatographic grade.

4.2.1.2 Acetic acid (CH_3COOH).

4.2.1.3 Petroleum ether. boiling range $30^\circ\text{C}\sim 60^\circ\text{C}$.

4.2.1.4 Zinc acetate dihydrate [$\text{Zn}(\text{CH}_3\text{COO})_2\cdot 2\text{H}_2\text{O}$].

4.2.1.5 Potassium ferrocyanide trihydrate [$\text{K}_4\text{Fe}(\text{CN})_6\cdot 3\text{H}_2\text{O}$].

4.2.2.1 Zinc acetate solution (1 mol/L). Weigh

21.9 g of zinc acetate dihydrate (4.2.1.4), add 3 mL of acetic acid (4.2.1.2), and dissolve in water. Make up to 100 mL.

4.2.2.2 Potassium ferrocyanide solution (1 mol/L). Weigh

10.6 g of potassium ferrocyanide trihydrate (4.2.1.5), add water to dissolve and make up to 100 mL.

4.2.3 Standard Samples/Standard Substances

4.2.3.1 Fructose (C₆H₁₂O₆, CAS No.. 57-48-7). Purity ≥ 99%.

4.2.3.2 Glucose (C₆H₁₂O₆, CAS No.. 50-99-7). Purity ≥ 99%.

4.2.3.3 Sucrose (C₁₂H₂₂O₁₂, CAS No.. 57-50-1). Purity ≥ 99%.

4.2.3.4 Stachyose (C₂₄H₄₂O₂₁, CAS No.. 54261-98-2). Purity ≥ 98%.

4.2.3.5 Raffinose (C₁₈H₃₂O₁₆, CAS No.. 512-69-6). Purity ≥ 99%.

4.2.4.1 Standard stock solution (20 mg/mL). Weigh 1 g (accurate to

0.1 mg) of fructose (4.2.3.1), glucose (4.2.3.2), and sucrose respectively. (4.2.3.3), stachyose (4.2.3.4) and raffinose (4.2.3.5) standard samples/standard substances were dissolved in water and diluted to volume in a 50 mL volumetric flask. The solution should be stored at 4°C away from light and has a shelf life of 1 month.

4.2.4.2 Standard working solutions. Measure

0.05 mL,

0.25 mL,

0.50 mL,

5.00 mL of standard stock solution, respectively. (4.2.4.1) Dilute to volume in a 10 mL volumetric flask to prepare a mixed standard working solution. The mixed standard working solution contains fructose, glucose, sucrose, and... The mass concentrations of stachyose and raffinose were

0.1 mg/mL,

0.5 mg/mL,

5.0 mg/mL, respectively.

10.0 mg/mL. Prepare fresh before use.

4.2.5 Materials

4.2.5.1 Aqueous filter membrane needle filter. 0.22μm.

4.2.5.2 Qualitative rapid filter paper.

4.3 Instruments and Equipment

4.3.1 High-performance liquid chromatograph. equipped with a differential refractive index detector or an evaporative light scattering detector.