



National Standard of the People's Republic of China

GB 1352—2023
Replace GB 1352—2009

Soya bean

大豆

(English Translation)

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Foreword

National Food and Strategic Reserves Administration is in charge of this English translation. In case of any doubt about the contents of English translation, the Chinese original shall be considered authoritative.

All technical contents of this document are mandatory.

This document is drafted in accordance with the rules given in the GB/T 1.1-2020 *Directives for standardization — Part 1: The structure and drafting of standards*.

This document replaces the GB 1352-2009 *Soybean* in whole.

The following technical deviations have been made with respect to the GB 1352—2009:

- modification for the scope of the standard application;
- modification for the definitions of “sound kernel” , “ high oil soybean” and “high protein soybean”;
- modification for the requirement for the rate of damaged kernels;
- modification for the quality index of high protein soybean;
- Supplementation of new term “off-grade soybean”.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The issuing body of this document shall not be held responsible for identifying any or all such patent rights.

This document was proposed and prepared by National Food and Strategic Reserves Administration.

The previous editions of this document are as follows:

—GB 1352—1978, GB 1352—1986, GB 1352—2009.

Soya bean

1 Scope

This document specifies the terms and definitions, classification, quality requirements, test methods, inspection rules, and the labeling, packaging, storage and transportation requirements for soya bean.

This document is applicable to the purchase, storage, transportation, processing and sale of commercial soya bean.

2 Normative reference

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

GB/T 191 *Packaging—Pictorial marking for handling of goods*

GB 5009.3 *National standard for food safety—Determination of moisture in foods*

GB 5009.5 *National standard for food safety—Determination of protein in foods*

GB 5009.6-2016 *National Food Safety Standard—Determination of Fat in Foods*

GB/T 5490 *Inspection of grain and oils — General rules*

GB/T 5491 *Inspection of Grain and Oilseeds—Methods for sampling and sample reduction*

GB/T 5492 *Inspection of grain and oils — Identification of colour, odour and taste of grain and oilseeds*

GB/T 5493 *Inspection of grain and oils — Determination of type purity and their mixture*

GB/T 5494 *Inspection of grain and oils — Determination of foreign matter and unsound kernels of grain and oilseeds*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

sound kernel

soya bean with natural colour and intact kernel

3.2

immature kernel

soya bean significantly different from normal kernels with 50% or more hollow and the shrunken part of the grain surface or 50% or more green part of cotyledons (except green kernel soya bean) of the cotyledons

3.3

broken kernel

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splits

soya bean with broken cotyledon more than one-quarter of the whole bean

3.4

damaged kernel

soya bean damaged by insect, bacteria, moldy, sprouted, frost, heat, or otherwise unsound.

3.4.1

insect-bored kernel

weeviled kernel

soya bean corroded by worm to damaged cotyledons

3.4.2

diseased kernel

mottled kernel

soya bean with stained and mottled on the surface to damaged cotyledons

3.4.3

mouldy kernel

soya bean with mould

3.4.4

sprouted kernel

soya bean that bud or young root breaks through seed coats, or with unrecovered kernel in swelling by absorbing moisture

3.4.5

frost-damaged kernel

soya bean with frozen damaged, transparent or stiff dark green cotyledon

3.4.6

heat-damaged kernel

soya bean with significant discoloration and damage of cotyledon caused by heat

3.5

Impurities

useless material

non-soy substance that remains in the sample after the sieve layer is specified and sifted

Note 1 to entry: It includes screenings, inorganic impurities and organic impurities.

3.5.1

Screenings

finer

substance passing through a round-hole sieve with diameter 3.0 mm

3.5.2

inorganic impurities

impurities such as soil, sand, stone, brick and/or tile pieces and other inorganic substances

3.5.3

organic impurities

impurities such as valueless soya bean, other crop kernels and other organic substances

3.6

percent of sound kernel

the mass fraction of sound kernels (3.1) in total samples

3.7**percent of damaged kernel**

the mass fraction of damaged kernels in total samples

3.8**percent of heat-damaged kernel**

the mass fraction of heat-damaged kernels in total samples

3.9**high-oil soya bean**

soya bean with no less than 20.0% of fat content (on a dry basis)

3.10**high-protein soya bean**

soya bean with no less than 40.0% of protein content (on a dry basis)

4 Classification

Soya bean is classified by the colour of the seed coat as follows:

- a) yellow soya bean, containing no less than 95% of kernels with yellow or light-yellow seed coat and yellow brown, light brown or dark brown hilum.
- b) green soya bean, containing no less than 95% of kernels with green seed coat. It can be classified into two types based on the colour of the cotyledon: soya bean with green seed coat and green cotyledon, soya bean with green seed coat and yellow cotyledon.
- c) black soya bean, containing no less than 95% of kernels with black seed coat. It can be classified into two types based on the colour of the cotyledon: soya bean with black seed coat and green cotyledon, soya bean with black seed coat and yellow cotyledon.
- d) other soya bean, containing no less than 95% of kernels with a uniform colour, such as brown, red seed coat and double colours (soya bean containing two seed coat colours, one of them is brown or black, covering 50% or more of the surface area of the soybean).
- e) mixed soya bean, no conforming to the requirements of a), b), c) or d).

Soya bean are classified into high-oil soybean and high-protein soybean according to the content of composition.

5 Quality requirements

5.1 Soya bean quality indexes for grading shall conform to the grade requirements in Table 1.

Table 1 — Quality indexes of soya bean

Grade	Percentage of sound kernel %	Percentage of damaged kernel %		Impurities content %	Moisture content %	Colour and odour
		Total	Percentage of heat-damaged kernel			

1	≥95.0	≤4.0	≤0.2	≤1.0	≤13.0	Normal
2	≥90.0	≤6.0	≤0.2			
3	≥85.0	≤8.0	≤0.5			
4	≥80.0	≤10.0	≤1.0			
5	≥75.0	≤12.0	≤3.0			
Substandard	<75.0	—	—			
Note: "—" is N/A.						

5.2 High-oil soya bean quality indexes for grading shall conform to the grade requirements in Table 2.

Table 2 — Quality indexes of high-oil soya bean

Grade	Fat content %	Percentage of sound kernel %	Percentage of damaged kernel %		Impurities content %	Moisture content %	Colour and odour
			Total	Percentage of heat-damaged kernel			
1	≥22.0	≥85.0	≤8.0	≤0.5	≤1.0	≤13.0	Normal
2	≥21.0						
3	≥20.0						

5.3 High-protein soya bean quality indexes for grading shall conform to the grade requirements in Table 3.

Table 3 Quality indexes of high-protein soya bean

Grade	Protein content %	Percentage of sound kerne %	Percentage of damaged kernel %		Impurities content %	Moisture content %	Colour and odour
			Total	Percentage of heat-damaged kernel			
1	≥44.0	≥85.0	≤8.0	≤0.5	≤1.0	≤13.0	Normal
2	≥42.0						
3	≥40.0						

6 Test methods

- 6.1 Sampling and sample reduction shall be in accordance with GB/T 5491.
- 6.2 Inspection of percentage of sound kernel shall be in accordance with Annex A.
- 6.3 Inspection of percentage of damaged kernel shall be in accordance with Annex A.
- 6.4 Inspection of percentage of heat-damaged kernel shall be in accordance with Annex A.
- 6.5 Inspection of foreign material shall be in accordance with GB/T 5494.
- 6.6 Moisture content determination shall be in accordance with GB 5009.3.

6.7 Inspection of colour and odour shall be in accordance with GB/T 5492.

6.8 Inspection of soya bean with other colours shall be in accordance with GB/T 5493.

6.9 Protein content determination shall be in accordance with GB 5009.5. The coefficient (F) for converting nitrogen into protein shall be as specified in GB 5009.5, 6.25. Protein content is calculated according to equation (1):

$$X_{p,drybasis} = \frac{X_p}{(100 - W)} \times 100 \dots\dots\dots (1)$$

where:

$X_{p,drybasis}$ is content of protein in test sample, expressed in grams per 100 grams (g/100g, on dry basis)

X_p is content of protein in test sample calculated in accordance with GB 5009.5, expressed in grams per 100 grams (g/100g)

W is content of moisture in test sample, expressed in grams per 100 grams (g/100g)

6.10 Fat content measurement shall be in accordance with the first method specified in GB 5009.6-2016. Fat content is calculated according to equation (2):

$$X_{o,drybasis} = \frac{X_o}{(100 - W)} \times 100 \dots\dots\dots (2)$$

where:

$X_{o,drybasis}$ is the content of fat in test sample, expressed in grams per 100 grams (g/100g, on dry basis)

X_o is the content of fat in test sample calculated in accordance with GB 5009.6, expressed in grams per 100 grams (g/100g)

W is the content of moisture in test sample, expressed in grams per 100 grams (g/100g)

7 Inspection Rules

7.1 General inspection rules shall be carried out in accordance with GB/T 5490.

7.2 Inspection lot shall be soya bean of the same category, place of origin, harvest year, transportation unit and storage unit.

7.3 Soya bean shall be graded based on percentage of sound kernel, and other indexes shall be in accordance with relevant national provisions.

7.4 High-oil soya bean shall be graded based on the fat content. If the fat content is lower than that of the minimum grade, it will not be considered as high-oil soybean. Other indexes shall be in accordance with relevant national provisions.

7.5 High-protein soya bean shall be graded based on the protein content. Soya bean with protein content lower than that of the minimum grade is not considered as high-protein soya bean. Other indexes shall be in accordance with relevant national provisions.

8 Labelling and marking

8.1 Name, type, grade, place of origin and harvest year of the products shall be indicated on the package or attached documents.

8.2 The labeling of prepackaged soya beans shall comply with the provisions of applicable

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national standards.

8.3 The packaging, storage and transportation marks of outside package shall comply with the

requirements of GB/T 191.

8.4 Genetically modified soya beans shall be labelled in accordance with relevant national provisions.

9 Packaging, storage and transport

9.1 Packaging

Packaging shall be clean, firm and undamaged, sealed tightly and strongly to avoid leakage, and is not allowed to pollute or bring abnormal odour to the products. Genetically modified soya bean shall be packaged separately.

9.2 Storage

Products shall be stored in warehouses which are clean, dry, rain-proof, damp-proof, insects-proof, rodents-proof and odour-free. No products shall be stored together with toxic or hazardous matters, or substances with relatively high moisture content.

9.3 Transportation

Products shall be transported by tools and containers that comply with hygienic requirements, and be rain-proof and pollution-free during transportation.

Annex A

(normative)

Inspection methods for the percentage of sound kernel, percentage of damaged kernel and percentage of heat-damaged kernel

A.1 Instruments and tools

A.1.1 Balance, 0.01 g readability.

A.1.2 Grain sieves.

A.1.3 Sample dividers

A.1.4 Analysis trays, small dishes, tweezers, etc.

A.2 Operation Method

According to GB/T 5491, a bulk sample with 500 g (m_1) is taken and screened twice using the method specified in GB/T 5494. Then the large impurities on the screen and substances under the sieves, are weighed together (m_2). From the sample with large impurities removed, a small test sample with 100 g (m_3) is taken and transferred to an analysis tray, and the impurities (m_4), damaged kernels (m_5), immature kernels and broken kernels (m_6) are picked out and weighed respectively. Among them, the heat-damaged kernels (if necessary, peel off the seed coat to observe whether cotyledons have undergone a colour change) are taken and weighed alone (m_7).

A.3 Calculation Results

A.3.1 The percentage of sound kernel is calculated by equation (1):

$$X_1 = \left(1 - \frac{m_2}{m_1}\right) \times \left(\frac{m_3 - m_4 - m_5 - m_6}{m_3}\right) \times 100 \dots \dots \dots (1)$$

where:

X_1 is the percentage of sound kernel, expressed in percent (%);

m_1 is the mass of bulk sample, expressed in grams (g);

m_2 is the mass of impurities in bulk sample, expressed in grams (g);

m_3 is the mass of small test sample, expressed in grams (g);

m_4 is the mass of impurities in small test sample, expressed in grams (g);

m_5 is the mass of damaged kernels, expressed in grams (g);

m_6 is the mass of immature kernels and broken kernels, expressed in grams (g).

The allowable difference between the double test results is not more than 1.0%, and the average value is the test result and displayed with one decimal place.

A.3.2 The percentage of damaged kernel is calculated by equation (2):

$$X_2 = \left(1 - \frac{m_2}{m_1}\right) \times \left(\frac{m_5}{m_3}\right) \times 100 \dots \dots \dots (2)$$

where:

X_2 is the percentage of damaged kernel, expressed in percent (%);

m_1 is the mass of bulk sample, expressed in grams (g);

m_2 is the mass of impurities in bulk sample, expressed in grams (g);

m_3 is the mass of small test sample, expressed in grams (g);

m_5 is the mass of damaged kernels, expressed in grams (g).

The allowable difference between the double test results is not more than 0.5%, and the average value is the test result and displayed with one decimal place.

A.3.3 The percentage of heat-damaged kernel is calculated by equation (3):

$$X_3 = \left(1 - \frac{m_2}{m_1}\right) \times \left(\frac{m_7}{m_3}\right) \times 100 \dots\dots\dots (3)$$

where:

X_3 is the percentage of heat-damaged kernel, expressed in percent (%);

m_1 is the mass of bulk sample, expressed in grams (g);

m_2 is the mass of impurities in bulk sample, expressed in grams (g);

m_3 is the mass of small test sample, expressed in grams (g);

m_7 is the mass of heat-damaged kernels, expressed in grams (g).

The allowable difference between the double test results is not more than 0.2%, and the average value is the test result and displayed with one decimal place.

《大豆》（GB 1352-2023）（英文版）征求意见稿翻译说明

1 任务来源及主要工作过程

1.1 任务来源

根据《国家标准化管理委员会关于下达〈便携式木折梯安全要求〉等 360 项国家标准外文版计划的通知》（国标委发〔2020〕36 号）要求，由全国粮油标准化技术委员会负责归口，翻译国家标准《大豆》（GB 1352-2023）英文版，外文版项目计划编号 W20201450，具体信息见下表。

序号	外文版项目计划编号	国家标准/计划编号	国家标准/计划名称	翻译语种	主管部门	归口单位	翻译承担单位	项目周期
6	W20201450	GB 1352/ 20062452-Q-449	大豆	英文	国家粮食和物资储备局	全国粮油标准化技术委员会	南京财经大学、国家粮食和物资储备局标准质量中心	中文标准发布后 90 天

1.2 主要工作过程

GB 1352-2023 英文版翻译起草工作是在 GB 1352 报批后进行，英文版在起草过程中参考国际标准和加拿大、美国等国家的大豆标准，进行对比分析，力求忠实原文、表述准确，符合英文语言的表达习惯。

《大豆》（GB 1352）英文版翻译起草工作的主要过程如下：

- 2020 年 12 月
- 成立起草工作组，工作组根据标准报批稿中文版，并按照《国家标准外文版管理办法》、GB/T 20000.10-2016 和 GB/T 20000.11-2016 的要求开展英文版的翻译起草工作；
- 2021 年 7 月
- 英文版翻译起草工作完成，将英文版初稿发有关单位，征求翻译意见；
- 2023 年 5 月
- 工作组根据标准发布稿中文版，对前言部分内容进行修改，完成送审稿；

以上内容仅为本文档的试下载部分，为可阅读页数的一半内容。

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