GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

ICS 67.060

CCS B 23

GB 1352-2023

Replacing GB 1352-2009

Soya bean

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Issued on: May 23, 2023 **Implemented on: December 01, 2023**

Issued by: State Administration for Market Regulation;
Standardization Administration of the People's Republic of China.

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Soya beans

1 Scope

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

This document applies to the acquisition, storage, transportation, processing, and sale of commercial soya beans.

2 Normative references

The following referenced documents are indispensable for the application 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 food safety standard - Determination of moisture in food

GB 5009.5 National food safety standard - Determination of protein in food

GB 5009.6-2016 National food safety standard - Determination of fat in food

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 purpose of this document, the following terms and definitions apply.

3.1

3.4.5

frost-damaged kernel

Kernels that have been damaged by freezing, have transparent kernels or stiff and dark green cotyledons.

3.4.6

heat-damaged kernel

Kernels of which the cotyledons have significant discoloration and damage due to heat.

3.5

impurities; useless material

Non-soya-bean materials that remain in the sample after passing through the specified sieve layer and sieving.

NOTE: Including screenings, inorganic impurities, and organic impurities.

3.5.1

screenings; fines

Materials that pass through a 3.0 mm diameter round-hole sieve.

3.5.2

inorganic impurities

Soil, sand, bricks, and other inorganic materials.

3.5.3

organic impurities

Soya bean kernels that have no use value, different types of grains, and other organic materials.

3.6

percent of sound kernel

The mass fraction of sound kernels in the sample.

3.7

percent of damaged kernel

The mass fraction of damaged kernels in the sample.

3.8

percent of heat-damaged kernel

The mass fraction of heat-damaged kernels in the sample.

3.9

high-oil soya bean

Soya beans of which the fat content is not less than 20.0 % (on a dry basis).

3.10

high-protein soya bean

Soya beans of which the protein content is not less than 40.0 % (on a dry basis).

4 Categories

Soya beans can be divided into the following categories according to the color of seed coat.

a) Yellow soya beans: soya beans of which the seed coat is yellow or light yellow, the hilum color is yellowish brown, light brown, or dark brown, and the kernel content is not less than 95 %.

b) Green soya beans: soya beans of which the seed coat is green and the kernel content is not less than 95 %. According to the color of its cotyledons, it is divided into two types: green-coat green-cotyledon soya beans and green-coat yellow-cotyledon soya beans.

c) Black soya beans: soya beans of which the seed coat is black and the kernel content is not less than 95 %. According to the color of its cotyledons, it is divided into two types: black-coat green-cotyledon soya beans and black-coat yellow-cotyledon soya beans.

d) Other soya beans: soya beans of which the seed coat is single-color such as dark brown, light brown, red, etc. or bi-color (the seed coat has two colors, one of which is light brown or black, and covers one-half or more of the kernel surface), and the kernel content is not less than 95 %.

e) Mixed soya beans: soya beans that do not meet the requirements of a), b), c), and d).

6.10 Determination of fat content: implement in accordance with the first method specified in GB 5009.6-2016. The test results are calculated according to formula (2):

$$X_{\text{o, dry basis}} = \frac{X_{\text{o}}}{(100 - W)} \times 100 \qquad \cdots\cdots(2)$$

where:

$X_{\text{o, dry basis}}$ - the fat content in the sample, in grams per hundred grams (g/100 g, on a dry basis);

X_{o} - the fat content in the sample, calculated according to GB 5009.6, in grams per hundred grams (g/100 g);

W - the moisture content in the sample, in grams per hundred grams (g/100 g).

7 Inspection rules

7.1 The general rules for inspection shall be implemented in accordance with GB/T 5490.

7.2 The inspection batch shall be soya beans of the same category, origin, harvest year, transportation unit and storage unit.

7.3 Soya beans are graded based on the percent of sound kernel. Other indicators are implemented in accordance with relevant national regulations.

7.4 High-oil soya beans are graded according to fat content. If the fat content is lower than the minimum grade, they are not classified as high-oil soya beans. Other indicators are implemented in accordance with relevant national regulations.

7.5 High-protein soya beans are graded according to protein content. If the protein content is lower than the minimum grade, they are not classified as high-protein soya beans. Other indicators are implemented in accordance with relevant national regulations.

8 Labeling

8.1 It shall indicate the name, category, grade, origin, and harvest year of the product on the packaging or accompanying documents.

8.2 The labeling of prepackaged soya beans shall comply with relevant national standards.

8.3 The packaging, storage, and transportation markings of the outer packaging shall comply with the requirements of GB/T 191.

Annex A

(normative)

Inspection methods for percent of sound kernel, percent of damaged kernel and percent of heat-damaged kernel

A.1 Instruments and apparatus

A.1.1 Balance, sensitivity 0.01 g.

A.1.2 Grain sieves.

A.1.3 Sample dividing machine and sample dividing plate.

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

A.2 Operation method

TAKE 500 g (m_1) of the sample according to GB/T 5491; SIEVE it twice according to the method specified in GB/T 5494; then PICK OUT the large impurities on the sieve and fines; WEIGH them together (m_2). From the sample that has been tested for large impurities, WEIGH 100 g (m_3) of the sample; POUR it into the analysis plate; PICK OUT the impurities (m_4), damaged kernels (m_5), immature kernels, and broken kernels (m_6); WEIGH them. PICK OUT the heat-damaged kernels individually (if necessary, peel off the coat and observe whether the color of the cotyledons has changed) and WEIGH (m_7).

A.3 Result calculation

A.3.1 The percent of sound kernel is calculated according to formula (A.1):

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

where:

X_1 - the percent of sound kernel, %;

m_2 - the mass of impurities in the large sample, in grams (g);

m_1 - the mass of large sample, in grams (g);

m_3 - the mass of small sample, in grams (g);

m_4 - the mass of impurities in the small sample, in grams (g);

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