

TCVN

NATIONAL STANDARDS

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First edition

RAW CASHEW NUT – TECHNICAL REQUIREMENTS

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Preface

TCVN 12380:2018 is developed by the Department for Processing and Market Development of Agricultural Products, Ministry of Agriculture and Rural Development proposed, Directorate for Standards and Quality approved, Ministry of Science and Technology published.

Raw cashew nut – Technical requirements

1 Scope

This standard specifies the technical requirements for raw cashew nut *Anacardium occidentale* Linnaeus with further processing for human consumption.

2 References

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.

TCVN 12386:2018 *Foodstuffs – General Guidelines on Sampling*.

3 Terms and definitions

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

3.1

Raw cashew nut

Cashew nut in shell, include cashew kernel and cashew testa.

REMARKS: Formal fruit of the cashew nut tree with pear shaped and red, orange, yellow colour.

3.2

Cashew shell

Outermost part covering kernel and testa

3.3

Cashew testa

The thin film between the hard shell and the kernel, with white, pink to light brown colour.

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3.4

Cashew kernel

The inside of cashew nut after eliminate the hard shell.

3.5

Defective cashew nut

Deformed nuts, nuts with undeveloped or underdeveloped kernel, or damaged by biological, chemical or physical causes such as follows, void, immature, moldy, damaged by pests, oily, rotten kernel, spotted kernel (black, yellow) and nuts passed the 17 mm diameter sieve.

3.6

Foreign matter

Everything which is not recognized as cashew nut such as stalk, soil, branch, leaf, metal, etc. mixed into the cargo.

3.7

Lots

A defined quantity of cashew nuts with same quality requirement, same marking, packing in the same package's type and delivered at the same time.

3.8

Outturn

Good kernel with testa remained after removing cashew shell.

4 Technical requirements

4.1 Grading

Raw cashew nuts are classified into 4 grades of size as in Table 1.

Table 1 – Grade size

Grade	Number of nuts/kg
A	≥ 150
B	from 151 to 180
C	from 181 to 200
D	from 201 to 250

4.2 Sensory requirements

Sensory requirements of raw cashew nuts are given in Table 2.

Table 2 – Sensory requirements

Item	Requirements
1. Shape	Nuts must have characteristic shape
2. Colour	Having uniform colours, may be, grey-white to pink-white, light gray to gray, light brown to specific brown for the nuts.
3. Odour	Have no foreign odour
4. Live insects	Do not have live insects

4.3 Physical properties

Physical properties of raw cashew nuts are given in Table 3.

Table 3 – Physical properties

Properties	Level
1. Moisture, % mass, not more than	10,0
2. Out turn, % mass, not less than	25,0
3. Defective cashew nut, % mass, not more than	10,0
4. Foreign matter, % mass, not more than	1,0

5 Food safety requirements

5.1 Mycotoxins

The maximum limit of mycotoxins for cashew nuts follows the current regulations.

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5.2 Pesticide residues: The maximum limit of pesticide residues for cashew nuts follow the current regulations.

6 Testing methods

6.1 Sampling, according to plan AQL 6.5 of TCVN 12386:2018 (CAC/GL50-2004).

6.2 Sample preparation

From the sample taken in 6.1, mix thoroughly and use a suitable sample dividers to obtain the required sample fraction and packing in air-tight bag, isolating the external environment.

6.3 Sensory examination

Spread the test portion into thin layer on a white background and observe with the naked eye under natural (non-direct) light or artificial light to evaluate the colour, nuts shape, harmful insects and contamination status.

6.4 Determination of moisture by distillation method

6.4.1 Reagents

6.4.1.1 Toluene, must be pure for testing.

Note: Other solvents may be used to determine the moisture if they have no affect on the results of the analysis.

6.4.1.2 Calcium chloride, must be pure for testing.

6.4.2 Apparatus

6.4.2.1 Distillation equipment

The following components are connected by means of grinding glass joints:

- Round bottom flask, minimum capacity of 500 ml.
- Reflux condenser.
- Distilling trap, placed between the flask and condenser.
- Electric stove with asbestos grid.

6.4.2.2 Analytical balances, accurate to the nearest 0,01 g.

6.4.2.3 Knife or scissors.

6.4.3 Procedure

6.4.3.1 Sample preparation

Take 200 g of the test portion (using analytical balances in 6.4.2.2), using a knife or scissors to cut the raw cashew nut sample into slices about 1.5 mm to 2.0 mm thick.

6.4.3.2 Determination

Weigh approximately 50 g of cutted sample into a round bottom flask that containing toluence, add enough toluene to cover the sample completely, and shake gently to mix. Assemble the apparatus, and fill the trap with toluene until it begins to flow into the flask. If necessary, insert a loose non-absorbing cotton plug into the top of condenser or attach to the top of condenser a small calcium chloride tube to prevent condensation of atmospheric moisture into the condenser. In order to control the reflux, wrap the flask and tube to the distilling trap by absestos fabric. Heat the flask to the rate of distillation is about 100 drops/min. When most of the water has been obtained, then increase the rate of distillation to about 200 drops / min and continue until the end. While distilling, occasionally clean the reflux condenser by using 5 ml of toluene to wash the droplets on the inner wall of the condenser tube. The water in the trap may be separated from toluene by occasionally using glass rods to make droplets that cling to the wall of the tube flowing down into condenser and trap; and make water settle to bottom of the trap in the meantime. Continuously reflux until the water level in the trap remains constant for 30 min and then turns off the power supply.

Fill the condenser with toluene as required, using the glass rod to brush the droplets on the inside wall of the tube to expel all the droplets into the trap.

Allow the trap to cool to ambient temperature for at least 15 min or until the toluene level is completely separated, then read the volume of the water.

6.4.3.3 Calculation

Moisture content, W (%), expressed by percent of mass, by using Equation (1):

$$W = \frac{V}{m} \times 100 \quad (1)$$

Where:

V is the volume of water collected, in mililit (ml);

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m is the mass of the test portion, in gram (g);

NOTE: The rapid moisture determination devices and instruments may be used, but must be calibrated with the method specified in this standard.

6.5 Determine the number of cashew nuts in 1 kg and out turn

6.5.1 Apparatus

6.5.1.1 **Analytical balances**, accurate to the nearest 0,1 g.

6.5.1.2 **Scissors (for shell cutting)**

6.5.1.3 **Peeling knife to remove cashew testa.**

6.5.2 Procedure

Using analytical balances (6.5.1.1) to weigh about 2,000 g of sample (m_1), accurate nearest to 0.1 g. Count the number of nuts in this sample.

Use a scissor (6.5.1.2) to split the cashew nut in half, to collect all the kernel and cashew testa. Use a peeling knife (6.5.1.3) to expose the kernel surface.

Weigh the kernel and cashew testa (m_2), without the defective cashew nuts.

6.5.3 Calculation

a) Number of nuts in 1 kg, N , is calculated by using Equation (2):

$$N = \frac{n}{m_1} \times 1000 \quad (2)$$

Where:

m_1 is the mass of the test portion, in gram (g);

n is the number of cashew nuts in the test portion;

1 000 is the conversion factor from gram to kilogram;

Express the results to whole number.

b) Outturn expressed by percentage, A , using Equation (3):

$$A = \frac{m_2}{m_1} \times 100 \quad (3)$$

Where:

m_1 is the mass of the test portion, in gram (g);

m_2 is a mass of good kernel and cashew testa from testing portion, in gram (g).

Express the results to the one decimal.

6.6 Determination of foreign matter and defect cashew nut

6.6.1 Apparatus

6.6.1.1 Analytical balances, accurate to the nearest 0,1 g.

6.6.1.2 Knife or scissors.

6.6.1.3 Peeling knife to remove cashew testa

6.6.2 Procedure

Using analytical balances (6.6.1.1) to weigh about 2 000 g of test portion (m_3), nearest to 0,1 g. Spread the test portion, separate foreign matter and weigh (m_4).

From the remained test portion above, separate the deformed nuts and split the nuts by using knife or scissors to determine all defects. Separate all the defective nuts and weigh (m_5).

6.6.3 Calculation

a) Foreign matter, in percent, B , is calculated by using Equation (4):

$$B = \frac{m_4}{m_3} \times 100 \quad (4)$$

Where:

m_3 is the mass of the test portion, in gram (g);

m_4 is the mass of the test portion obtained after removing foreign matter, in gram (g).

Express the results to the one decimal.

b) Defective nuts, in percent, C , is calculated by using Equation (5):

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$$C = \frac{m_5}{m_3} \times 100 \quad (5)$$

Where:

m_3 is the mass of the test portion, in gram (g);

m_5 is the mass of defective nuts separated from the test portion, in gram (g).

Express the results to the one decimal.

6.7 Determination of mold, see TCVN 7852:2008 or TCVN 8275-2:2010 (ISO 21527-2:2008).

6.8 Determination of aflatoxin B₁ and total aflatoxin contents, see TCVN 7596 (ISO 16050).

Bibliography

- [1] QCVN 8-1:2011/BYT *National technical regulations for mycotoxins contamination in foodstuffs*
 - [2] QCVN 8-3:2012/BYT *National technical standards for microbial contamination in foodstuffs*
 - [3] TCCS 2016 /HĐT/VINACAS *Base specifications for raw cashew nuts in shells (dried) by Vietnam Cashew Association*
 - [4] Some testing analysis results of raw cashew nuts.
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