

CODEX ALIMENTARIUS

INTERNATIONAL FOOD STANDARDS



Food and Agriculture
Organization of
the United Nations



World Health
Organization

E-mail: codex@fao.org - www.codexalimentarius.org

REGIONAL STANDARD FOR SOYBEAN PRODUCTS FERMENTED WITH *BACILLUS* SPECIES

Asia

CXS 354R-2023

Adopted in 2023

1. SCOPE

This standard applies to products, as defined in Section 2, for direct consumption, including for catering purposes, repacking or further processing if required. This standard does not apply to the product covered by the *Regional Standard for Fermented Soybean Paste* (CXS 298R-2009).¹

2. DESCRIPTION

2.1 Product definition

Soybeans fermented with *Bacillus* spp. (solely or together with other microorganisms), that normally retain the shape of soybeans and are not a type of paste, although some of the soybeans may be crushed during the manufacturing process. The final products may be sticky and can be further processed into various forms of products.

2.2 Classification

2.2.1 Natto

Soybeans (including crushed soybeans, hereinafter referred to as soybeans) are soaked in water or diluted salty water, then steamed and fermented with *Bacillus subtilis* var. *Natto*. No material or ingredients shall be added after fermentation.

Natto shall be sticky and filamentous, substance must be visible when a bean in *Natto* is picked up.

2.2.2 Cheonggukjang

Soybeans soaked in water are boiled, steamed or baked and then fermented with naturally-occurring or cultivated microorganisms (i.e. *Bacillus* spp. including *Bacillus subtilis*) for a few days. Optional ingredients described in Section 3.1.2.2, may be added only after fermentation. The final product, *Cheonggukjang*, which complies with the component requirement may be presented in the forms of powder, paste and spherical pellet.

2.2.3 Thua Nao

Soybeans are soaked in water, steamed or boiled, and wrapped in broad leaves such as banana leave. They are fermented with *Bacillus* spp. (solely or may contain other microorganisms). Optional ingredients described in Section 3.1.2.3, may be presented/added. The final product, *Thua Nao*, which complies with the component requirement may be presented in paste or dried forms, e.g. powder, sheet, and pellet.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Composition

3.1.1 Basic ingredients

- a) soybeans;
- b) potable water; and
- c) *Bacillus* spp. (naturally-occurring or cultivated microorganisms). These are not pathogenic and do not produce toxins.

3.1.2 Optional ingredients

3.1.2.1 Natto

- a) grains and/or flour (wheat, rice, barley, etc.);
- b) salt;
- c) seaweed and/or seaweed powder; and
- d) other ingredients as appropriate.

3.1.2.2 Cheonggukjang

- a) naturally-occurring or cultivated microorganisms (other than *Bacillus* spp.). These are not pathogenic and do not produce toxins;
- b) salt;
- c) garlic;
- d) red pepper powder; and
- e) other ingredients as appropriate.

3.1.2.3 *Thua Nao*

- a) other naturally occurring or cultivated microorganisms (other than *Bacillus* spp.). These are not pathogenic and do not produce toxins;
- b) salt; and
- c) other ingredients as appropriate

3.2 Quality criteria

The soybean products fermented with *Bacillus* spp. shall have the characteristic flavour, odour, colour, and texture of the product. There should be no visible foreign mattersⁱ in the products.

3.3 Component requirement

The soybean products fermented with *Bacillus* spp. should comply with the requirements listed in Table 1.

Table 1

Product name	Moisture content (% w/w)	Protein (% w/w)	Lipid (% w/w)
<i>Natto</i>	≥ 53.0	≥ 10.0	≥ 5.0
<i>Cheonggukjang</i>	≤ 58.0	≥ 12.5	≥ 4.0
<i>Thua Nao</i>	≥ 53.0 (in case of dried form ≤ 15.0)	≥ 10.0	—

(wet weight basis)

3.4 Classification of defectives

Any products that fail to meet the applicable quality requirements, as set out in Sections 3.2 and 3.3, should be considered defective.

3.5 Lot acceptance

A lot should be considered as meeting the applicable quality requirements referred to in Section 3.2, when the number of defectives, as defined in Section 3.4, does not exceed the acceptance number (c) of the appropriate sampling plans with an acceptable quality level (AQL) of 6.5.

4. FOOD ADDITIVES

None permitted.

5. CONTAMINANTS

The products covered by this standard shall comply with the maximum levels of the *General Standard for Contaminants and Toxins in Food and Feed* (CXS 193-1995).²

The products covered by this standard shall comply with the maximum residue limits (MRLs) for pesticides established by the Codex Alimentarius Commission.

6. HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *General Principles of Food Hygiene* (CXC 1-1969),³ and other relevant Codex texts, such as codes of hygienic practice and codes of practice.

The products should comply with any microbiological criteria established in accordance with the *Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods* (CXG 21-1997).⁴

7. WEIGHTS AND MEASURES

7.1 Net weight

The weight of the products covered by the provisions of this standard shall be indicated in accordance with the *General Standard for the Labelling of Pre-packaged Foods* (CXS 1-1985).⁵

ⁱ Any visible objectionable foreign detectable matter or material not usually associated with the raw material used.

7.2 Lot acceptance

The requirements for net weight should be deemed to be complied with when the average net weight of all containers examined is not less than the declared weight, provided that there is no unreasonable shortage in individual containers.

8 LABELLING

The products covered by the provisions of this standard shall be labelled in accordance with the *General Standard for the Labelling of Pre-packaged Foods* (CXS 1-1985).⁵

8.1 Name of the product

The products are soybean products fermented with *Bacillus* spp. The product should be designated with the appropriate term in Section 2.2. Other names may be used in accordance with the law and custom of the country of retail sale in the manner not to mislead consumers.

8.2 Labelling of non-retail containers

The labelling of non-retail containers should be in accordance with the *General Standard for the Labelling of Non-Retail Containers of Foods* (CXS 346-2021).⁶

9. METHODS OF ANALYSIS AND SAMPLING

For checking the compliance with this standard, the methods of analysis and sampling contained in the *Recommended Methods of Analysis and Sampling* (CXS 234-1999)⁷ relevant to the provisions in this standard, shall be used.

NOTES

¹ FAO and WHO. 2009. *Regional Standard for Fermented Soybean Paste*. Codex Alimentarius Standard, No. CXS 298R-2009. Codex Alimentarius Commission. Rome.

² FAO and WHO. 1995. *General Standard for Contaminants and Toxins in Food and Feed*. Codex Alimentarius Standard, No. CXS 193-1995. Codex Alimentarius Commission. Rome.

³ FAO and WHO. 1969. *General Principles of Food Hygiene*. Codex Alimentarius Code of Practice, No. CXC 1-1969. Codex Alimentarius Commission. Rome.

⁴ FAO and WHO. 1997. *Principles and Guidelines for the Establishment and Application of Microbiological Criteria related to Foods*. Codex Alimentarius Guideline, No. CXG 21-1997. Codex Alimentarius Commission. Rome.

⁵ FAO and WHO. 1985. *General Standard for the Labelling of Pre-packaged Foods*. Codex Alimentarius Standard, No. CXS 1-1985. Codex Alimentarius Commission. Rome.

⁶ FAO and WHO. 2021. *General Standard for the Labelling of Non-Retail Containers of Foods*. Codex Alimentarius Standard, No. CXS 346-2021. Codex Alimentarius Commission. Rome.

⁷ FAO and WHO. 1999. *Recommended Methods of Analysis and Sampling*. Codex Alimentarius Standard, No. CXS 234-1999. Codex Alimentarius Commission. Rome.

Members of the Codex Alimentarius Commission in the Region of Asia are indicated on the Codex website at <https://www.fao.org/fao-who-codexalimentarius>.