

# CODEX ALIMENTARIUS

INTERNATIONAL FOOD STANDARDS



Food and Agriculture  
Organization of the  
United Nations



World Health  
Organization

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## STANDARD FOR BLACK, WHITE AND GREEN PEPPERS

CXS 326-2017

Adopted in 2017. Amended in 2021, 2022.

### 2022 Amendment

The following amendments were made to the text of the standard following decisions taken at the forty-fifth session of the Codex Alimentarius Commission in December 2022.

Page	Location	Original text	Printed text
5	Section 8.3 Labelling of non-retail containers	Information for non-retail containers shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name and address of the manufacturer, packer, distributor or importer, as well as storage instructions, shall appear on the container. However, lot identification, and the name and address of the manufacturer, packer, distributor or importer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.	The labelling of non-retail containers should be in accordance with the <i>General Standard for the Labelling of Non-Retail Container of Foods</i> (CXS 346-2021).

## 1. SCOPE

This standard applies to black, white and green peppers (abbreviated as BWG) offered for direct consumption, as an ingredient in food processing or for repackaging if required. It excludes BWG peppers intended for industrial processing.

## 2. DESCRIPTION

### 2.1 Product definition

- (i) BWG peppers are the berries of *Piper nigrum* L. of the Piperaceae family having reached appropriate degree of development and/or maturity for the intended product purpose.
  - (a) Black pepper – obtained from dried berries having unbroken pericarp.
  - (b) White pepper – obtained from dried berries after removing the pericarp.
  - (c) Green pepper – obtained from green berries by removal of moisture under controlled conditions.
- (ii) Berries are treated in an appropriate manner to obtain the above products, by undergoing operations such as threshing, sieving and sifting, soaking, washing, blanching, drying or dehydrating, decorticating, grading, crushing and grinding.

### 2.2 Styles

BWG peppers may be offered in one of the following styles:

- (a) Whole.
- (b) Cracked/crushed – broken into two or more pieces.
- (c) Ground – processed into powders.

### 2.3 Varietal types

Any commercially cultivated variety (cultivar) of *Piper nigrum* L. suitable for processing.

## 3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

### 3.1 Composition

Product as defined in Section 2.

### 3.2 Quality factors

The quality factors for BWG peppers are determined based on the physical and chemical characteristics, as given below.

#### 3.2.1 Odour, flavour and colour

**Table 1A. Odour, flavour and colour**

Basic parameter	Black pepper	White pepper	Green pepper
Colour for all forms	Brownish to dark brownish, blackish colour. Free from added colouring.	Matt grey to brownish to pale ivory white. Free from added colouring.	Characteristic green, greenish or dark greenish Free from added colouring.
Sensory property for all forms	The flavour shall have a penetrating odour and hot, biting pungent taste characteristics of black pepper excluding mouldy and rancid odours.  The product shall be free from foreign odours, flavours and free from any other harmful substances.	The odour and flavour shall be characteristic of white pepper, slightly sharp and very aromatic, excluding mouldy and rancid odours.  The product shall be free from foreign odours, flavours and free from any other harmful substances.	Pungent odour and flavour characteristic of green pepper, free from rancidity, mustiness, bitter taste and extraneous flavour.  The product shall be free from foreign odours, flavours and free from any other harmful substances.

### 3.2.2 Physical characteristics

**Table 1B. Basic characteristics of BWG peppers**

Parameter	Black pepper	White pepper	Green pepper
General size for whole BWG peppers	Diameter 2.5–7.0 mm (approx.)	Diameter 2.0–6.0 mm (approx.)	Diameter 2.0–6.0 mm (approx.)
Shape for whole BWG peppers	Whole with globular shape and wrinkled pericarp.	Whole with globular shape with smooth surface, slightly flattened at one pole and a small protuberance at the other.	Whole with globular shape with or without wrinkled pericarp.

### 3.2.3 Classification

The following three classes/grades are applicable to BWG peppers:

- Class I/Grade I
- Class II/Grade II
- Class III/Grade III

**Table 2. Physical characteristics for BWG whole peppers**

Physical characteristics	Requirements								
	Black			White			Green		
	Class I/ Grade I	Class II/ Grade II	Class III/ Grade III	Class I/ Grade I	Class II/ Grade II	Class III/ Grade III	Class I/ Grade I	Class II/ Grade II	Class III/ Grade III
Bulk density, (g/l), min	550	500	400	600	600	550	NA	NA	NA
*a Light berries, % (m/m) max	2.0	5.0	10.0	1.0	2.0	2.0	NA	NA	NA
*b Extraneous vegetable matter, % (m/m), max	1.0	2.0	2.0	1.0	1.5	2.0	0.5	1.0	1.2
*c Foreign matter, % (m/m), max	0.1	0.5	0.5	0.1	0.5	0.5	0.1	0.5	0.5
Black berries/corns % (m/m), max	NA	NA	NA	5.0	7.5	10.0	Nil	Nil	5.0
Broken berries, % (m/m), max	NA	NA	NA	2.0	3.0	3.0	1.0	3.0	10.0
Mouldy berries % (m/m), max	1.0	2.0	3.0	1.0	2.0	3.0	Nil	1.0	2.0
Insect defiled berries /corns, % (m/m), max.	1.0	1.0	2.0	1.0	1.0	2.0	0.5	1.0	2.0
Mammalian or/and other excreta, (mg/kg), max	1.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0
*d Pinheads for black pepper, % (m/m), max	1.0	2.0	4.0	NA	NA	NA	NA	NA	NA
NA – NOT APPLICABLE									

Physical characteristics	Requirements								
	Black			White			Green		
	Class I/ Grade I	Class II/ Grade II	Class III/ Grade III	Class I/ Grade I	Class II/ Grade II	Class III/ Grade III	Class I/ Grade I	Class II/ Grade II	Class III/ Grade III
<p><sup>a</sup> <i>Light berries</i> (in black and white peppers only) – Generally immature berries without kernel with an apparent density lower than 0.30 g/ml or 300 g/l.</p> <p><sup>b</sup> <i>Extraneous vegetative matter</i> – Vegetative matter associated with the plant from which the product originates – but is not accepted as part of the final product. Light berries, pinheads or broken berries are not considered as extraneous matter.</p> <p><sup>c</sup> <i>Foreign matter</i> – Any visible objectionable foreign detectable matter or material not usually associated with the natural components of the spice plant; such as sticks, stones, burlap bagging, metal.</p> <p><sup>d</sup> <i>Pinheads</i> – Developed from unfertilized flowers, berries with a diameter of less than 2 mm with more angularity than normal berries, they have soft texture (collapse under heavy pressure) and have less odour and flavour than pepper berries.</p>									

### 3.2.4 Chemical characteristics

**Table 3. Chemical characteristics for BWG whole peppers**

Chemical characteristics	Requirements						
	Black			White			Green
	Class I/ Grade I	Class II/ Grade II	Class III/ Grade III	Class I/ Grade I	Class II/ Grade II	Class III/ Grade III	
Moisture content, % (m/m), max	12.0	12.0	13.0	12.0	12.0	13.0	12.0
Total ash, % (m/m), max, on dry basis	6.0	7.0	7.0	3.5	4.0	4.0	5.0
Nonvolatile ether extract, % (m/m) min, on dry basis	7.0	7.0	6.0	6.0	6.0	6.0	0.3
Volatile oils, <sup>i</sup> % (ml/100 g) min, on dry basis	2.0	1.5	1.0	1.5	1.5	1.0	1.0
Piperine content, % (m/m), min, on dry basis	3.5	3.0	2.0	4.0	3.5	3.0	NA*
Acid-insoluble ash, % (m/m) max, on dry basis	1.5	1.5	1.5	0.3	0.3	0.3	0.3

\*NA – NOT APPLICABLE

**Table 4. Chemical characteristics for BWG ground peppers**

Chemical characteristics	Requirements	
	*Ground black pepper	*Ground white pepper
Moisture content, % (m/m), max	12.0	13.0
Total ash by mass, % (m/m), on dry basis, max	6.0	3.5
Non-volatile ether extract, % (m/m), on dry basis, min	6.0	6.0
Volatile oil, <sup>ii</sup> % (ml/100 g), on dry basis, min	1.0	0.7
Crude fibre, insoluble index, % (m/m) on dry basis, max	17.5	6.5
Piperine, % (m/m), on dry basis, min	3.5	4.0
Acid insoluble ash, % (m/m) on dry basis, max	1.2	0.3

<sup>i</sup> The volatile oil content should be determined immediately after grinding.

<sup>ii</sup> See note i above.

Chemical characteristics	Requirements	
	*Ground black pepper	*Ground white pepper
*Ground peppers include all its forms as per 2.2(b).		

### 3.3 Classification of “defectives”

A container sample that fails to meet one or more of the applicable quality requirements, as set out in Section 3.2 (except those based on sample averages), should be considered as a “defective”.

### 3.4 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 3.3, does not exceed the acceptance number (c) of the appropriate sampling plan. For factors evaluated on a sample average, a lot will be considered acceptable if the average meets the specified tolerance, and no individual sample is excessively out of tolerance.

## 4. FOOD ADDITIVES

Preservatives used in accordance with Table 1 and Table 2 of the *General Standard for Food Additives* (CXS 192-1995)<sup>1</sup> in food category 12.2.1 (herbs and spices) are acceptable for use in green peppers only conforming to this standard.

## 5 CONTAMINANTS

5.1 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).<sup>2</sup>

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

## 6. FOOD HYGIENE

6.1 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 *Code of Hygienic Practice for Low Moisture Foods* (CXC 75- 2015, Annex III)<sup>3</sup> and other relevant Codex texts, such as codes of hygienic practice and codes of practice.

6.2 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).<sup>4</sup>

## 7. WEIGHTS AND MEASURES

Containers shall be as full as practicable without impairment of quality and shall be consistent with a proper declaration of contents for the product.

## 8. LABELLING

8.1 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).<sup>5</sup> In addition, the following specific provisions apply:

### 8.2 Name of the product

8.2.1 The name of the product shall be “black pepper” (pepper corn), “white pepper” or “green pepper”.

8.2.2 The nature of the product may include an indication of the style and grade as described in Section 2.2.

8.2.3 Country of origin (optional)

8.2.4 Commercial Identification

- Class/Grade
- Variety (optional)

8.2.5 Inspection mark (optional)

### 8.3 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 in Foods* (CXS 346-2021).<sup>6</sup>

## 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)<sup>7</sup> relevant to the provisions in this standard shall be used.

### NOTES

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<sup>1</sup> FAO and WHO. 1995. *General Standard for Food Additives*. Codex Standard, No. CXS 192-1995. Codex Alimentarius Commission. Rome.

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

<sup>3</sup> FAO and WHO. 2015. *Code of Hygienic Practice for Low Moisture Foods*. Codex Code of Practice, No. CXC 75-2015. Codex Alimentarius Commission. Rome.

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

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

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

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