

# PHILIPPINE NATIONAL STANDARD

PNS/BAFPS 79:2009  
ICS 65.020.20

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## Fresh vegetables – Radish – Grading and classification



**BUREAU OF PRODUCT STANDARDS**

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## **Foreword**

The development of the Philippine National Standard for Fresh vegetables – Radish – Grading and classification, PNS/BAFPS 79:2009 was undertaken by the Bureau of Agriculture and Fisheries Product Standards (BAFPS) in order to reflect the recent technology developments in the industry, and the need for its harmonization with ASEAN standards and Codex requirements in Heavy Metals, Pesticide Residues and Hygiene.

PNS/BAFPS 79:2009 cancels and replaces Standardization of Philippine Radish, Standards Administrative Order 128:1969 developed by the Philippine Trade Standards under the Department of Commerce and Industry.

A Technical Committee (TC) and Sub-Committee (SC) were organized by the Bureau of Agriculture and Fisheries Product Standards (BAFPS) through Special Orders No. 411, series of 2001 and No.169, series of 2007 to generate and update the data and formulate the PNS for Fresh Radish. BAFPS, in collaboration with the TC conducted technical reviews and public consultations in the three major islands of the country prior to the finalization of the standard.

PNS/BAFPS 79:2009 aims to provide common understanding on the scope, definitions, minimum requirements, types, classification, size classification, tolerances, sampling, packaging, and marking and labeling of radish.

## **1 Scope**

This standard establishes a system of grading and classifying commercial varieties of radish, *Raphanus sativus* L. produced in the Philippines to be supplied fresh to the consumers.

## **2 References**

The titles of the standard publications and other references of this standard are listed on the inside back cover.

## **3 Definitions**

### **3.1**

#### **badly misshapen**

the root is so badly curved, twisted or constricted which seriously affect its appearance

### **3.2**

#### **clean**

practically free from stains, dirt or any other foreign materials

### **3.3**

#### **decay**

the root is affected by damage caused by microorganisms

### **3.4**

#### **discoloration**

the root has slight deviation from the natural color of the variety

### **3.5**

#### **firm**

the root is crisp, not soft, flabby or shriveled

### **3.6**

#### **fairly well-formed**

the root is slightly curved or constricted and is not forked

### **3.7**

#### **growth cracks**

cracks due to physiological problems

### **3.8**

#### **overmature**

appearance of flowers, roots are fibrous and with different taste

**3.9**

**pest damage**

external and internal pest damage caused by insects, pathogens and rodents which affect slightly the appearance of the root

**3.10**

**pithiness**

distinct open spaces in the center of the flesh of radish which seriously affects its edible quality

**3.11**

**smooth**

fine skinned, not rough, pebbled or ridged without secondary rootlets

**3.12**

**sunburn**

discoloration due to sun exposure

**3.13**

**well-formed**

the root has good symmetry and with typical shape of the variety

**3.14**

**well-trimmed**

the tops of the radish must be 5 cm and no rootlets

**3.15**

**wilting**

the roots are very limp, shriveled and flaccid

**4 Minimum requirements**

In all classes subject to the special provisions for each class and tolerances allowed, radish must meet the following requirements:

- fresh, firm and clean;
- free from any damages caused by pests and diseases;
- well-formed, smooth and free from growth cracks;
- free from decay;
- uniform and has similar shape of the variety;
- not affected by discoloration, sunburn and pithiness;
- free of any foreign/undesirable smell and/or taste;
- free of physical damage (i.e., skin marks/blemishes);
- with petiole portion of the tops intact; and
- not overmature.

The development and condition of the radish must enable it to: (a) withstand transport and handling and (b) arrive in satisfactory condition at the place of destination.

## 5 Classification

Radish are classified into three classes as described below:

**5.1 Extra class** – Radish in this class must be of superior quality and have similar characteristics of the variety and/or commercial type. It must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

**5.2 Class I** – Radish must be of good quality and have similar characteristics of the variety and/or commercial type. The following slight defects, may be allowed, provided these do not affect the general appearance of the produce, the quality and presentation in the package: (a) slight defects in shape and color and (b) slight skin healed defect due to mechanical damage.

**5.3 Class II** – This class includes radish which do not qualify for inclusion in the higher classes but satisfy the minimum requirements specified in Clause 4.

## 6 Size classification

Size is determined by the length and diameter of the radish, in accordance with the following table:

**Table 1 – Size classification based on length (cm)**

Size classification	Length (cm)
Extra large	> 30.0
Large	21.0 - 30.0
Medium	15.0 - 20.0
Small	< 15.0
<b>NOTE</b> There are radish varieties that have more than 50.0 cm in length.	

**Table 2 – Size classification based on diameter (cm)**

Size classification	Diameter (cm)
Extra large	> 6.0
Large	5.0 – 6.0
Medium	4.1 – 4.9
Small	< 4.0

## **7 Tolerances**

### **7.1 Quality tolerances**

**7.1.1 Extra class** – Five percent by number or weight of radish not satisfying the requirements for the class, but conforming to those of class I or, exceptionally, coming within the tolerances of that class.

**7.1.2 Class I** – Ten percent by number or weight of radish not satisfying the requirements for the class, but conforming to those of class II or, exceptionally, coming within the tolerances of that class.

**7.1.3 Class II** – Ten percent by number or weight of radish not satisfying the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any deterioration rendering it unfit for consumption.

### **7.2 Size tolerances**

For all classes, ten percent by size of radish not corresponding to the size immediately above and/or below that is indicated on the package.

## **8 Sampling**

Sampling method to be used for ascertaining conformance shall be in accordance with PNS/ISO 874.

## **9 Packaging**

Radish shall be packed in suitable containers that will avoid any external and internal damage to the produce. The materials used inside the package must be new, clean and of good quality to ensure suitable handling and transport of radish.

## **10 Marking and Labeling**

Each container shall have a label using an indelible ink to provide the following information:

**10.1** Name of produce, variety or commercial type;

**10.2** Class and size;

**10.3** Net weight (kg);

**10.4** Name of producer, trader and exporter; and

**10.5** Product of the Philippines.

## **11 Contaminants**

### **11.1 Heavy metals**

Radish shall comply with the maximum residue levels for heavy metals established by the Codex Alimentarius Commission and/or authority for this commodity.

### **11.2 Pesticide residues**

Radish shall comply with the maximum residue limits established by the Codex Alimentarius Commission and/or authority for this commodity.

## **12 Hygiene**

**12.1** It is recommended that the produce covered by the provisions of this standard be prepared and handled in accordance with appropriate sections of the Recommended International Code of Practice – General Principles of Food Hygiene (CAC/RCP1 – 1969, Rev. 4 – 2003), Code of Hygienic Practice for Fresh Fruits and Vegetables (CAC/RCP 53-2003), and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

**12.2** The produce should comply with any microbiological criteria established in accordance with the Principles for the Establishment and Application of Microbiological Criteria for Foods (CAC/GL 21-1997).

## Annex A

### Types of radish

**1 White radish** – is characterized with a thin, smooth and white skin, white to translucent flesh and with deep green foliage. The shape is elongated, the flesh is crispy, juicy, with sharp peppery and slightly sweet flavor.

**2 Red/Purple/Brown radish** – is characterized with smooth, bright red, or deep purple, or brown skin, white to translucent flesh and with bright green foliage. The shape is approximately round and slightly elongated at the base. The flesh is crispy, juicy, and with sharp peppery flavor.



## Annex B

Table 3 – The composition of white skinned radish

Nutrient	Value per 100g
<b>Proximates</b>	
Energy	86 KJ
Moisture	92.9 g
Nitrogen	0.11 g
Protein	0.7 g
Fat	0.3 g
Ash	0.6 g
Fructose	1.3 g
Glucose	1.4 g
Sucrose	0.2 g
Maltose	0.0
Lactose	0.0
Sugars, total	2.9 g
Starch	0.0
Available Carbohydrate	2.9 g
Total Dietary Fibre	1.8 g
<b>Minerals</b>	
Calcium	30.0 mg
Iron	0.3 mg
Magnesium	13 mg
Phosphorus	23 mg
Potassium	210 mg
Sodium	28 mg
Zinc	0.5 mg
<b>Vitamins</b>	
Thiamin	0.03 mg
Riboflavin	0.01 mg
Niacin	0.8 mg
Niacin derived from Tryptophan of Protein	0.1 mg
Niacin Equivalents	0.9 mg
Folate	28 ug
Dietary Folate Equivalents	28 ug
Vitamin C	17 mg
Alpha Carotene	20 ug
Beta Carotene	30 ug
Cryptoxanthin	0.0
Beta Carotene Equivalents	40 ug
Retinol	0.0
Retinol Equivalents	7.0 ug
Cholecalciferol	0.0
Vitamin D3 Equivalents	0.0
Alpha Tocopherol	0.0
Vitamin E	0.0
<b>Lipids</b>	
Cholesterol	0.0
<b>Organic Acids</b>	
Citric Acid	0.0
Lactic Acid	0.0
Malic Acid	0.2 g
Oxalic Acid	0.0
Quinic Acid	0.0

Source: Food Standards Australia New Zealand

## References

**PNS/BAFPS 79:2009**

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.

Code of Hygienic Practice for Fresh Fruits and Vegetables. CAC/RCP 53-2003

General Principles of Food Hygiene. CAC/RCP 1 – 1969. Rev. 4–2003

<http://www.foodstandards.gov.au>

Principles for the Establishment and Application of Microbiological Criteria for Foods. CAC/GL 21-1997

Standards Administrative Order. 128:1969

Wills, R.B.H., J.S.K. Lim and H. Greenfield. 1987. Composition of Australian Foods. 38. Tuber, root and bulb vegetables. Food Technology in Australia. 39:384 – 386

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