

# PHILIPPINE NATIONAL STANDARD

PNS/BAFPS 53:2007  
ICS 65.020.20

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Fresh vegetables – Potatoes – Grading and classification



BUREAU OF PRODUCT STANDARDS

**Foreword**

The revision of the Philippine National Standard for Potatoes (PNS/BAFPS 53:2007) was undertaken in order to reflect the recent technology developments in the industry and the need for harmonization with Codex requirements in Heavy Metals, Pesticide Residues and Hygiene.

The Standard for Potatoes (1980) developed by the Food Terminal Incorporated (FTI), entitled 'Quality and Grade Specification for Potatoes' supersedes the existing standards developed by GMTFM Grade Standards for Potatoes.

A Technical Committee and Sub-Committee were organized by the Bureau of Agriculture and Fisheries Product Standards (BAFPS) through No. 411, series of 2001, and Special Order No. 169, series of 2007 to identify members and experts that shall be involved in the formulation of the PNS for Potatoes. BAFPS in collaboration with the TC conducted technical reviews and public consultations in the three major islands of the country for the finalization of the draft standard.

PNS/BAFPS 53:2007 aims to provide common understanding on the scope, definitions, varieties, minimum requirements, classification for both quality and size, tolerances, sampling, packaging, marking and labeling, contaminants and hygiene.

**Fresh vegetables – Potatoes – Grading and classification**

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**1 Scope**

This standard establishes a system of classifying and grading potatoes of the varieties grown from *Solanum tuberosum* L. of the Solanaceae family produced in the Philippines.

**2 References**

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

**3 Definitions**

For the purpose of this standard, the following definitions apply:

**3.1****clean**

it is practically free from dirt or stain or other foreign matter present in the tuber

**3.2****cracks**

break in the tuber occurring during growth or due to mechanical damage

**3.3****defect**

any injury or imperfection which materially detracts the appearance of the tubers

**3.4****diameter**

the greatest dimension at right angles to the longitudinal axis

**3.5****disease damage**

scab, bacterial wilt, Rhizoctonia, soft rot and dry rot

**3.6****firm**

the tuber is not shriveled or flabby and does not yield to moderate pressure

**3.7****greening**

appearance of green color on the tuber which indicates the presence of solanin caused by prolong exposure to sunlight

**3.8****insect damage**

presence of holes, tunnels and other damages caused by insects

**3.9**

**mature**

firmness of the skin, based on the number of days and variety

**3.10**

**misshapen**

the individual tuber is pointed, dumb bell-shaped or otherwise badly formed

**3.11**

**scab**

rough lesions on the surface of the tuber

**3.12**

**second growth**

which are developed to such an extent as to affect materially the appearance of the tuber

**3.13**

**shriveling**

which makes the appearance of the tuber flabby

**3.14**

**similar varietal characteristics**

the tubers are similar in shape and color

**3.15**

**skinning**

when a sizeable portion of the skin of the tuber is missing or feathered

**3.16**

**sprouting**

when sprouts become noticeable or signs of having being removed on the tuber

**3.17**

**well-shaped**

the shape is typical of the variety

**4 Varieties**

**4.1 NSIC 1994 Po 01 (‘Baraka’)** – Grows in highlands (Benguet and Mt. Province) and matures at 80 days - 90 days. The root characteristics are: dry matter content - 18.8 %; sugar content – 4.4 %; tuber shape is oval to flattened; skin color is pale yellow and the texture is smooth; flesh color is pale yellow and medium deep eyes. It is highly recommended for chips and for table use. This variety comes from BPI-Baguió National Crop Research and Development Center, Guisad, Baguió City.

**4.2 NSIC 1994 Po 02 (‘Agria’)** – Grows in highlands (Benguet and Mt. Province) and matures at 80 days - 90 days. The root characteristics are: dry matter content – 18.8 % (dry season) and 18.0 % for wet season; sugar content – 1.88 %; tuber shape is round to oval; skin texture is rough yellow; flesh color is deep yellow and shallow deep eyes. It is highly recommended for chips and for table use. This variety comes from BPI – Baguió National Crop Research and Development Center, Guisad, Baguió City.

**4.3 NSIC 1994 Po 03 ('Kennebec')** – Grows in highlands (Benguet and Mt. Province) and matures in 90 days - 100 days. The root characteristics are: dry matter content – 18.9 %; sugar content – 4.8 %; tuber shape is elliptical to oblong; skin color is yellowish and has smooth texture; flesh color is whitish and has shallow deep eyes. It has firm texture; fairly free from discoloration after cooking. It is highly recommended for French fries, chips and for table use. It comes from BPI – Baguio National Crop Research and Development Center, Guisad, Baguio City.

**4.4 NSIC 1997 Po 04 ('Igorota')** – Grows in highlands and mid-elevation areas of Mindanao. It matures at 100 days - 120 days. The root characteristics are: dry matter content – 18 % - 21 %; tuber shape is round to round oval; skin color is yellow; flesh color is pale yellow and has shallow deep eyes. It is highly recommended for processed chips. It comes from Northern Philippine Root Crops Research and Training Center, Benguet State University, La Trinidad, Benguet

**4.5 NSIC 1997 Po 05 ('Solibao')** – Grows well under highland conditions and matures at 100 days - 120 days. The root characteristics are: dry matter content – 18 % - 21 %; tuber shape is oblong oval; skin color is brownish; flesh color is cream and has shallow deep eyes. It is recommended for processing such as processed chips/ French fries. It comes from Northern Philippine Root Crops Research and Training Center, Benguet State University, La Trinidad, Benguet.

**4.6 NSIC 2000 Po 06 ('Raniag')** – Grows under lowland areas in the Philippines, specifically in Regions 1 and 2. It matures at 83 days. The root characteristics are: dry matter content is 18.04 %; skin color is brown; and flesh color is pale yellow. It has good eating and chipping quality and has good storability in the lowlands. It comes from Mariano Marcos State University, Batac, Ilocos Norte.

**4.7** Other varieties of potato grown under lowland and highland. (See Annex A).

## **5 Minimum requirements**

**5.1** Firm, clean and free from any visible foreign matter.

**5.2** Free from visible rots, dead and living insects, mold and other contaminants.

**5.3** Sound, free from greening and well-developed tubers.

**5.4** Normal appearance of the tubers to the variety.

## **6 Classification**

Tubers shall be classified according to its general appearance, quality and condition, as follows:

**6.1 Extra class** – Consists of tubers of similar varietal characteristics, firm, clean, mature, well-shaped and free from diseases such as scab, soft rot and wet breakdown, insect damage, sprouting, internal defects such as blackheart and free from other damages.

**6.2 Class 1** – Consists of tubers of similar varietal characteristics, firm, fairly clean, fairly well-shaped, free from soft rot and wet breakdown, blackheart, sprouting and free from other damages.

**6.3 Class II** – Consists of tubers of similar varietal characteristics, not seriously misshapen, free from blackheart, bacterial wilt, soft rot and wet breakdown and free from other damages.

## 7 Size classification

Tubers shall be classified according to size based on diameter and weight as follows:

Size	Diameter (cm)	Weight (g)
<b>Jumbo</b>	> 9.0	> 350
<b>Super</b>	8.1 - 9.0	301 - 350
<b>Extra Large</b>	7.1 - 8.0	251 - 300
<b>Large</b>	6.1 - 7.0	201 - 250
<b>Big</b>	5.1 - 6.0	151 - 200
<b>Medium</b>	4.1 - 5.0	101 - 150
<b>Small</b>	3.0 - 4.0	50 - 100
<b>Marble/ very small</b>	< 3.0	< 50

## 8 Tolerances

### 8.1 Quality tolerance

**8.1.1 Extra class** – Five percent by weight of the tubers may fail to meet the requirements of the class but meeting those of Class 1 including not more than 1 % for visible rots.

**8.1.2 Class 1** – Ten percent of the tubers by weight may fail to meet the requirements of the class but meeting those of Class 2 including not more than 2 % for visible rots.

**8.1.3 Class 2** – Ten percent of the tubers by weight satisfying the requirements of the class nor the general requirements, with the exception of produce affected by rotting.

### 8.2 Size tolerance

A total of 5 % by weight of the tubers may fail to meet the minimum size specified.

## **9 Sampling**

Sampling to be used for ascertaining for conformance to the requirement of this specification shall be in accordance with PNS/ISO 874.

## **10 Packaging**

Potatoes shall be packed in containers that will provide protection from normal hazards of transport and handling. The materials used inside the package must be new, clean and of quality to avoid causing any external or internal damage to the produce.

## **11 Marking and labeling**

Each container shall be properly labeled with the following information:

- 11.1 Name of produce and variety;
- 11.2 Class and size;
- 11.3 Net weight (kg);
- 11.4 Name and address of producer, trade and exporter; and
- 11.5 Product of the Philippines.

## **12 Contaminants**

### **12.1 Heavy metals**

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

### **12.2 Pesticide residues**

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

## **13 Hygiene**

13.1 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/RCP 1 – 1969, Rev. 4 – 2003), and other relevant Codex texts such as Code of Hygienic Practice and Code of Practice.

13.2 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

Table 1 – The characteristics of other varieties of potato.

Varieties for highland	Size	Shape	Skin color	Flesh	Storage quality
<b>Cosima</b>	small to medium	round-oval	yellowish	yellowish	good
<b>Red Pontiac</b>	medium	round , with deep-eyes	red-skinned	yellowish	short dormancy, poor storage quality
<b>Conchita</b>	medium	round-oval	yellowish-cream	yellow	medium dormancy, good storage quality
<b>Varieties for both lowland and highland</b>					
<b>Arka</b>	medium	long-oval, with shallow eyes	reddish salmon	light yellow	medium dormancy
<b>Siro</b>	large	long-oval with tapered hill end	light yellow	light yellow	medium dormancy, poor storage quality
<b>Kennebec</b>	large	elliptical to oblong, fairly shallow eyes	yellowish cream	creamy white	poor storage quality, has tendency to produce growth cracks
<b>Roslyn Gucha</b>	medium	round-oval	yellowish	yellowish	short dormancy, poor storage quality
<b>Up-to-Date</b>	medium	round-oval	yellowish-cream	yellowish	medium dormancy, good storage quality



## References

PNS/BAFPS 53:2007

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.

GMTFM Grade Standard for Potatoes.

Quality and Grade Specification for Potatoes. 1980. Food Terminal Inc.

Philippine Science Encyclopedia. 1984. Agriculture. Vol. 6. National Research Council of the Philippines

UN/ECE Standards Fresh Fruits and Vegetables. 1988.

United States Standards for Grades of Potatoes. 1991.

**B P S**

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The use of the PS Certification Mark is governed by the provisions of Department Administrative Order No. 01 series of 1997 – Revised Rules and Regulations Concerning the Philippine Standard (PS) Quality and / or Safety Certification Mark Scheme by the Bureau of Product Standards. This mark on a product/container is an assurance by the manufacturer/producer that the product conforms with the requirements of a Philippine standard. Details of conditions under which a license to use the PS Certification Mark may be granted can be obtained from the Bureau of Product Standards, Department of Trade and Industry, 361 Sen. Gil J. Puyat Avenue, Makati City.



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Bureau of Agriculture and Fisheries Product Standards**

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