PHILIPPINE NATIONAL STANDARD

PNS/BAFS 51:2021
ICS 67.080

Fresh vegetables – Garlic – Grading

BUREAU OF AGRICULTURE AND FISHERIES STANDARDS
BPI Compound Visayas Avenue, Diliman, Quezon City 1101 Philippines
Trunkline: **(632) 928-8741 to 64 loc. 3301-3319**
E-mail: **bafs@da.gov.ph**
Website: **www.bafs.da.gov.ph**

Foreword

At the 13th Task Force Meeting on the ASEAN Standards for Horticultural and Other Food Crops (TF-MASHP) in 2017, the ASEAN Member States (AMS) requested the Philippines to review and revise, if applicable, the PNS Fresh vegetables – Garlic – Grading and Classification (PNS/BAFPS 51:2007) to meet the quality and trade requirements for garlic in the ASEAN region. In 2018, the Bureau of Agriculture and Fisheries Standards (BAFS) initiated the amendment of PNS/BAFPS 51:2007 to align with the ASEAN Standard for Garlic (ASEAN Stan 13:2009). A Technical Working Group (TWG) was created through Special Order (SO) No. 1092, series of 2018 (Creation of Technical Committees and its TWGs for the Development of PNS for Agriculture and Fisheries Products, Machinery, Tools, and Equipment), SO No. 322, series of 2019 (Addendum to Special Order No. 1092 for the Creation of Technical Committees and its TWGs for the Development of PNS for Agriculture and Fisheries Products, Machinery, Tools, and Equipment), SO No. 442, series of 2020 (Creation of Technical Committees and its TWGs for the Development of PNS for Agriculture and Fisheries Products, Machinery, and Structures), and SO No. 81, series of 2021 (Creation of TWGs for the Development of PNS for Agriculture and Fishery Products, Machinery, and Equipment). The TWG was composed of representatives from the government agencies, academe, non-government organization, and private sector organization. The draft standard was presented to the relevant stakeholders during the initial and final consultations held on November 22, 2018 and May 20, 2021, respectively. It was subsequently finalized by the TWG and was endorsed to the DA Secretary for approval. This standard was eventually approved by the Secretary of the Department of Agriculture in June 2021.

This PNS/BAFS edition includes the following significant changes compared to the previous PNS/BAFPS 51:2007:

1. Inclusion of a normative reference;
2. Inclusion of the definitions for “bulb”, “clove”, “grading”, and “well-cured”;
3. Amendment of the definition for “compact”, “damage”, “diameter”, “length”, “well-cured”, and “tops”;
4. Harmonization of minimum requirements, classification, and tolerances with the provisions of the ASEAN Standard for Garlic (ASEAN Stan 13:2009);
5. Adoption of the size classification specified in the ASEAN Standard for Garlic (ASEAN Stan 13:2009); and
6. Inclusion of Annex A on Bureau of Plant Industry – National Seed Industry Council (BPI – NSIC) Registered Garlic Varieties in the Philippines.

In the amendment of this standard, the ASEAN Standard for Garlic (ASEAN Stan 13:2009) was generally adopted with modifications to suit the local conditions in the Philippines.

This Standard cancel and replaces PNS/BAFPS 51:2007 which has been technically amended. This document was drafted in accordance with the editorial rules of the BPS Directives Part 2.

Table of Contents

1 Scope

This standard establishes a system of grading commercial varieties of garlic (*Allium sativum* L.) produced in the Philippines to be supplied fresh[1] to consumers. Garlic for industrial processing is excluded.

2 Normative reference

The referenced document is indispensable for the application of this document. Only the edition cited applies.

International Organization for Standardization (ISO). (1980). *ISO 874-1980 (E) – Fresh fruits and vegetables — Sampling*. https://www.iso.org/standard/5259.html

3 Terms and definitions

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

3.1
bulb
underground structure comprised of thickened leaf bases

3.2
clove
individual segment that makes up one bulb of garlic

3.3
compact
cloves fit closely together (not spreading) the entire length of the individual clove

3.4
damage
any injury or defect, which materially affects the appearance and transport and eating qualities of the individual bulb and/or clove

3.5
diameter
greatest horizontal dimension of the bulb expressed in metric units (mm)

3.6
grading
process of classifying the produce into groups according to a set of criteria of quality and size recognized or accepted by the industry. Each group bears an accepted

[1] Garlic for fresh consumption means produce in which the pseudo stem, the other outer skin of the bulb, and the skin surrounding each clove are completely dry.

name and size grouping. Grades are the names of the groups under which the produce are classified e.g. Extra Class, Class I, and Class II

3.7
length
longest dimension straight from the basal plate to the neck expressed in metric units (mm)

3.8
mature
tops are soft, yellowing, and bent; bulbs are tight or closed neck; firm; and harvested from 100 days to 150 days after planting

3.9
tops
dried leaves from the neck of the bulb upwards

3.10
well-cured
sufficiently dried outer skin and skin enclosing each clove with a moisture content of 10% to 12%

4 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the garlic shall be:

- whole, covered with outer skin;
- whole bulb with dried outer skin in which the neck is not less than 20 mm in length;
- mature and well-cured;
- sound; produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free of any visible foreign matter;
- practically free of pests affecting the general appearance of the produce;
- practically free of damage caused by pests;
- practically free of mechanical and/or physiological damage;
- free of any foreign smell and/or taste;
- the shape, color, and taste characteristic of the variety; and
- free of visible sprouts.

4.1 The garlic shall have been carefully harvested and have reached an appropriate degree of development and in accordance with criteria characteristic to the variety and to the area in which they are grown.

The development and condition of the garlic shall be such as to enable them to:

- withstand transport and handling; and

- arrive in satisfactory condition at the place of destination.

5 Classification

Garlic is classified in three classes defined below:

5.1 Extra class – Garlic in this class shall be of superior quality. It shall be characteristic of the variety and/or commercial type. It shall be practically free of defects provided these do not affect the general appearance of the produce, quality, storability, and presentation in the package. The cloves shall be compact. The tops shall be at least 50 mm in length.

5.2 Class I – Garlic in this class shall be of good quality. It shall be characteristic of the variety and/or commercial type. Slight defects of shape, color, firmness, and damage in the outer skin of the bulb may be allowed provided these do not affect the general appearance of the produce, quality, storability, and presentation in the package. The tops shall be at least 50 mm in length.

5.3 Class II – This class includes garlic which does not qualify for inclusion in the higher classes but satisfies the minimum requirements specified in Section 4 above. Garlic in this class shall be of good quality. It shall be characteristic of the variety and/or commercial type. No more than two (2) missing cloves are allowed. Defects of shape, color, firmness, and damage in the outer skin of the bulb may be allowed provided these do not affect the general appearance of the produce, quality, storability, and presentation in the package.

6 Size classification

Garlic shall be classified according to size based on equatorial diameter as follows:

Table 1 – Size classification for garlic based on equatorial diameter

Size code	Equatorial diameter (mm)
Extra large	>35
Large	30 - <35
Medium	25 - <30
Small	15 - <25
Extra small	<15

7 Tolerances

Tolerances with respect to quality and size shall be allowed in each package (or in each lot for produce presented in bulk) for produce not satisfying the requirements of the class indicated.

7.1 Quality tolerances

7.1.1 Extra class – Five percent (5%) by number or weight of garlic is not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

7.1.2 Class I – Ten percent (10%) by number or weight of garlic is satisfying neither the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting or any other deterioration rendering it unfit for consumption.

7.1.3 Class II – Fifteen percent (15%) by number or weight of garlic is satisfying neither the requirements of the class nor the minimum requirements and without rotten bulb.

7.2 Size tolerances

For all classes, ten percent (10%) by number or weight of garlic not satisfying the requirements as regards to sizing but falling within the size immediately above or below those indicated in Section 6.

8 Sampling

Sampling method to ascertain conformity with the requirements of this specification shall be in accordance with *Fresh fruits and vegetables — Sampling (ISO 874 – 1980 (E)).*

9 Packaging

Garlic shall be packed in netted bags or any container with appropriate ventilation that will adequately protect the product from normal hazards of transportation and handling. Packages shall be clean and free of all foreign matter.

10 Marking or labeling

Each container shall be properly labeled with the following information:

10.1 Name of product, variety or commercial type;
10.2 Class and size;
10.3 Net weight (kg);

10.4 Date of harvest;
10.5 Name and address of producer or exporter; and
10.6 The words “Product of the Philippines”.

11 Contaminants

11.1 Heavy metals

Cloves of garlic shall comply with those maximum levels (MLs) for heavy metals established by the Codex Alimentarius Commission (CAC) and/or competent authority for this commodity.

11.2 Pesticide residues

Cloves of garlic shall comply with those maximum residue limits (MRLs) established by the Codex Committee on Pesticide Residues and/or competent authority for this commodity.

12 Hygiene

12.1 It is recommended that the product 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).

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

Annex
(informative)
Bureau of Plant Industry – National Seed Industry Council (BPI – NSIC) Registered Garlic Varieties in the Philippines

Table A.1 – List of BPI-NSIC Registered Garlic Varieties and their Varietal Characteristics

NSIC Registration Number	Year Approved	Variety Name	Owner/ Breeder	Varietal Characteristics													
				Yield (kg/ha)		Maturity (days after planting)	Size (75 days after planting)		No. of leaves	Laminar		Foliage		Shape of Bulbs		Color of skin		Bulb Structure
				Raised Bed	Minimum Tillage		HT (cm)	Stem (cm)		WD (cm)	LT (cm)	Color	Attitude	Dry	Mature	Clove	Outer	
BPI-NSIC-2017-Gr 01	2017	Ilocos White' (Balitok)	DA - RFO I	5550	4330	103	59.7	0.99	12	1.65	39.5	Green	Prostrate/ Spreading	Flat globe	Heart shape, basal plate retracted	Beige	White	Multi-shelled
BPI-NSIC-2017-Gr 02	2017	Batanes Red'	DA - RFO I	8440	6700	150	53	1.14	10	1.7	36.4	Dark green	Prostrate/ Spreading	Rhom-boid	Circular, basal plate prominent	Violet	Violet	Multi-shelled
BPI-NSIC-2017-Gr 03	2017	Ilocos Pink' (Gameng)	DA - RFO I	6450	5020	111	58.32	1	12	1.4	38.2	Green	Prostrate/ Spreading	Globe	Heart shape, basal plate retracted	Pink	White with brown stripes	Multi-shelled
BPI-NSIC-2017-Gr 04	2017	Mexican' (Sanikua)	DA - RFO I	8050	4980	111	61.18	0.97	13	1.55	38.5	Green	Prostrate/ Spreading	Globe	Heart shape, basal plate retracted	Beige	Cream	Multi-shelled
BPI-NSIC-2017-Gr 05	2017	Bang-ar'	DA - RFO I	3530		111	56.1	0.95	15	1.45	37.5	Green	Prostrate/ Spreading	Globe	Heart shape, basal plate retracted	Beige	White with yellow stripes	Multi-shelled
BPI-NSIC-2017-Gr 06	2017	Ilocos Tan Bolters	MMSU	3150		110	58.14 (60 DAP)		12	1.32	39.6	Green	Prostrate/ Spreading	Globe		Brown	White with brown stripes	Multi-shelled
BPI-NSIC-2017-Gr 07	2017	MMSU Gem	MMSU	3150		100	56.16 (60DAP)		11	1.31	39.62	Green	Prostrate/ Spreading	Flat globe		White with pink stripes	White with yellow stripes	Multi-shelled

NOTE HT - Height; WD - Width; LT - Length.

Table A.2 – List of BPI-NSIC Registered Garlic Varieties and their Reaction to Pests and Diseases; Agromatic, Seasonal, and Cultural Adaptations.

NSIC Registration Number	Year Approved	Variety Name	Owner/ Breeder	Reaction to Pests and Diseases						Agro-climatic, Seasonal and Cultural Adaptations
				Purple Blotch	Cercospera Leap Spot	Fusarium bulb rot	Thrips	Leaf Folder	Mites	
BPI-NSIC-2017-Gr 01	2017	Ilocos White' (Balitok)	DA - RFO I	MR	MR	MR	SI	SI	SI	Adaptable in Dry season - cool and windy climatee during entire growing period and high temperature for maturation.
BPI-NSIC-2017-Gr 02	2017	Batanes Red'	DA - RFO I	MR	MR	MR	SI	SI	SI	Adaptable in Dry season - cool and windy climatee during entire growing period and high temperature for maturation.
BPI-NSIC-2017-Gr 03	2017	Ilocos Pink' (Gameng)	DA - RFO I	MR	MR	MR	SI	SI	SI	Adaptable in Dry season - cool and windy climatee during entire growing period and high temperature for maturation.
BPI-NSIC-2017-Gr 04	2017	Mexican' (Sanikua)	DA - RFO I	MR	MR	MR	SI	SI	SI	Adaptable in Dry season - cool and windy climatee during entire growing period and high temperature for maturation.
BPI-NSIC-2017-Gr 05	2017	Bang-ar'	DA - RFO I	MR	MR	MR	SI	SI	SI	Adaptable in Dry season - cool and windy climatee during entire growing period and high temperature for maturation.
BPI-NSIC-2017-Gr 06	2017	Ilocos Tan Bolters	MMSU	MR	MR	MR	MR	MR	MR	Adaptable in Dry season.
BPI-NSIC-2017-Gr 07	2017	MMSU Gem	MMSU	MR	MR	MR	MR	MR	MR	Adaptable in Dry season.

NOTE MR - Moderately resistant; SI - Slight infestation; DAP - Days after planting.

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Department of Agriculture (DA)
Bureau of Agriculture and Fisheries Standards (BAFS)

Technical Working Group (TWG) for the Amendment of the Philippine National Standard (PNS) on the Grading of Garlic

Chairperson
Peter Magdaraog, Ph.D
Bureau of Plant Industry (BPI)
DA

Members

1 Bella Fe Carmona
2 Angelo Bugarin
Fertilizer and Pesticide Authority (FPA)
DA

4 Jocelyn Sales, Ph.D
5 Zoraida Manalastas
Food and Development Center (FDA)
DA

6 Elijah Davalos
7 Benny Roderos
Philippine Center for Postharvest Development and Mechanization (PhilMECH)
DA

8 Lilian Pateña
Institute of Plant Breeding (IPB)
University of the Philippines
Los Baños (UPLB)

9 Bonifacio Cayabyab, Ph.D
10 Gideon Aries Burgonio
National Crop Protection Center (NCPC)
UPLB

11 Perlita Nuevo, Ph.D
12 Leonisa Artes
Postharvest Horticulture Training and Research Center (PHTRC)
UPLB

13 Jonathan Galindez, Ph.D
Central Luzon State University (CLSU)

14 Noralyn Legaspi
15 Raymund Julius Rosales
Mariano Marcos State University (MMSU)

BAFS Management Team
Karen Kristine Roscom
Farlash Pancho
Kristel Alarice Aborido

Advisers
Vivencio Mamaril, Ph.D
Myer Mula, Ph.D

BUREAU OF AGRICULTURE AND FISHERIES STANDARDS

BPI Compound Visayas Avenue, Diliman, Quezon City 1101 Philippines
T/ (632) 928-8741 to 64 loc. 3301-3319
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Website: www.bafs.da.gov.ph