

**PHILIPPINE  
NATIONAL  
STANDARD**

**PNS/BAFS 410:2025  
ICS 67.020**

---

---

**Prevention and Reduction of Mycotoxins in Cassava  
and Cassava-based Products —  
Code of Practice (COP) — Hygienic Practices**



**BUREAU OF AGRICULTURE AND FISHERIES STANDARDS**

BPI Compound Visayas Avenue, Diliman, Quezon City 1101 Philippines

Trunkline: (632) 8928-8741 to 64 loc. 3301-3319

E-mail: [info.dabafs@gmail.com](mailto:info.dabafs@gmail.com)

Website: [www.bafs.da.gov.ph](http://www.bafs.da.gov.ph)

Prevention and Reduction of Mycotoxins in Cassava and Cassava-based Products  
— Code of Practice (COP) — Hygienic Practices  
PNS/BAFS 410:2025  
ICS 67.020

Copyright © 2025 by Bureau of Agriculture and Fisheries Standards

All rights reserved. The mention of specific organizations or products, does not mean endorsement or recommendation from the Bureau of Agriculture and Fisheries Standards (BAFS) in preference to others of similar nature that are not included. The BAFS encourages the reproduction and dissemination of the materials upon request. Applications for permissions to reproduce or disseminate these materials and all other queries should be addressed to the publisher.

Published by:  
Bureau of Agriculture and Fisheries Standards  
BAFS Building, BPI Compound, Visayas Avenue, Diliman, Quezon City  
info.dabafs@gmail.com | bafs@da.gov.ph  
(+632) 8928 8756 to 65 local 3301 – 3325

ISBN 978-621-455-604-5 (PDF downloadable)  
ISBN 978-621-455-603-8 (Softbound/Paperback)

[www.bafs.da.gov.ph](http://www.bafs.da.gov.ph)

## Foreword

In 2023, the Department of Agriculture (DA)-Bureau of Agriculture and Fisheries Standards (BAFS), through the Standards Development Division (SDD) conducted an inventory of Philippine National Standards (PNS) against Codex Standards to identify those that can be adopted as PNS. This initiative is aligned with the Philippines' commitment to the World Trade Organization (WTO) Sanitary and Phytosanitary (SPS) Agreement to base the country's SPS measures on international standards, guidelines, or recommendations, where they exist. With this, the Code of Practice (COP) for the Prevention and Reduction of Mycotoxins Contamination in Cassava and Cassava-based Products (CXC 82-2023) was identified for adoption and included in the priority list for CY 2025. The development of PNS COP for the prevention and reduction of mycotoxins in cassava and cassava-based products aims to establish recommended practices and guidelines that ensure food safety, enhance the efficiency of cassava production systems, and facilitate compliance with international food safety standards, thereby strengthening market access and trade opportunities.

Furthermore, a research study entitled "Comparative Evaluation of Practices for the Prevention and Reduction of Mycotoxins in Cassava (*Manihot esculenta* Crantz) in Bukidnon and Misamis Oriental against CXC 82-2023" was conducted in April 2024 by the DA-BAFS- Standards Research Division (SRD) to support the development of the PNS for the Prevention and Reduction of Mycotoxins in Cassava and Cassava-based Products. The study aimed to provide technical information on local cassava production practices compared with CXC-82-2023 across the pre-planting, planting, pre-harvest, harvest, storage, packaging, and transportation stages. The comparative evaluation focused on two major cassava-producing provinces, namely Bukidnon and Misamis Oriental. As a result of the study, it was recommended that all provisions of CXC 82:2023 be adopted, particularly for the pre-planting, planting, pre-harvest, harvest, storage, packaging, and transportation stages.

A Technical Working Group (TWG) was established through the Special Order No. 745, series of 2025 (Composition of the Technical Working Groups [TWG] and Project Management Team [PMT] for the Development of the PNS for Agricultural and Fishery Products and Machinery). The TWG was composed of relevant stakeholders from the government sector, academe/research institutions, private sector organizations, and Civil Society Organizations (CSO). The draft PNS underwent a series of TWG meetings and stakeholder consultations conducted via an online platform before its endorsement to the DA Secretary for approval.

This document was drafted in accordance with the editorial rules of the DA-BAFS-SDD Standardization Guide No. 1: Writing the PNS.

**Table of Contents**

Foreword .....	i
1 Scope.....	1
2 Normative References .....	1
3 Terms and Definitions .....	2
4 Recommended Practices Applicable to Pre-Planting Stage .....	4
4.1 Site selection .....	4
4.2 Farmland clearing and preparation .....	4
4.3 Cassava variety (cultivar) and seed pieces selection .....	4
5 Recommended Practices Applicable to Planting and Pre-Harvest Stage .....	4
5.1 Planting.....	4
5.2 Cropping system.....	5
5.3 Weed control.....	5
5.4 Pesticide use .....	5
5.5 Irrigation.....	6
6 Recommended Practices Applicable to Harvest Stage.....	6
6.1 Harvesting.....	6
6.2 Holding conditions .....	6
7 Recommended Practices Applicable to Post-Harvest.....	6
7.1 Cassava-based products.....	6
7.2 Washing.....	7
7.3 Peeling.....	7
7.4 Boiling/steaming .....	7
7.5 Size reduction: Grating, pulping, and slicing or chipping.....	7
7.6 Fermentation.....	8
7.7 Dewatering.....	8
7.8 Cake breaking.....	8
7.9 Drying .....	8
7.10 Milling.....	9
7.11 Sieving .....	9
8 Storage .....	9
9 Packaging .....	10
10 Transportation.....	10
11 Product Information and Consumer Awareness .....	11

## 1 Scope

This Standard covers recommended practices for the prevention and reduction of mycotoxin contamination in cassava (*Manihot esculenta* Crantz) and cassava-based products intended for human consumption. It aligns with the relevant provisions of Good Agricultural Practices (GAP), Good Manufacturing Practices (GMP), Good Storage Practices (GSP), and Good Distribution Practices (GDP). This Standard does not apply to cassava and cassava-based products intended for further industrial processing.

*These guidelines were adopted from CXC 82-2023 (Code of practice for the prevention and reduction of mycotoxin contamination in cassava and cassava-based products) with some modifications to consider the conditions in the Philippines. Any modifications from the original Codex document to consider the conditions in the Philippines are written in italicized text for distinction.*

## 2 Normative References

The following documents are referred to in the text in such a way that some or all their contents constitute the requirements of this document. The latest edition of the referenced documents (including any amendments) applies:

Bureau of Agriculture and Fisheries Standards (BAFS)-Department of Agriculture (DA). (2017a). Dried cassava chips and grates as food purposes (PNS/BAFPS29:2017).

<https://bafs.da.gov.ph/index.php/approved-philippine-national-standards/>

BAFS-DA. (2017b). Good Warehousing Practices (GWP) for bagged grains (PNS/BAFS 193:2017).

<https://bafs.da.gov.ph/index.php/approved-philippine-national-standards/>

BAFS-DA. (2020a). Code of practice for the reduction of hydrocyanic acid (HCN) in cassava and cassava products (PNS/BAFS 147:2020).

<https://bafs.da.gov.ph/index.php/approved-philippine-national-standards/>

BAFS-DA. (2020b). GAP for cassava (PNS/BAFS 150:2020).

<https://bafs.da.gov.ph/index.php/approved-philippine-national-standards/>

BAFS-DA. (2021). GAP for fresh fruits and vegetable farming (PNS-BAFS 49-2021).

<https://bafs.da.gov.ph/index.php/approved-philippine-national-standards/>

BAFS-DA. (2024). General labeling standard for packaged primary and postharvest foods (PNS/BAFS 384:2024).

<https://bafs.da.gov.ph/index.php/approved-philippine-national-standards/>

Codex Alimentarius Commission (CAC). (2013). Code of practice for the reduction of Hydrocyanic Acid (HCN) in cassava and cassava products (CAC/RCP 73-2013).

[https://www.fao.org/input/download/standards/13605/CXP\\_073e.pdf](https://www.fao.org/input/download/standards/13605/CXP_073e.pdf)

### 3 Terms and Definitions

For the purpose of this Standard, the following definitions below apply.

#### 3.1

##### **cassava**

woody perennial shrub of the genus *Manihot*, which grows from 1 m to 5 m in height (FAO, 2013)

#### 3.2

##### **cassava-based product**

derived from cassava roots processed into various fermented or non-fermented products (CAC, 2023)

#### 3.3

##### **cassava primary products**

cassava roots that undergo primary processing to produce chips, grates, flours, and starches as raw materials for industrial utilization (Chisenga, S. M. 2021, *modified*)

#### 3.4

##### **industrial processing**

transforming the physical, organoleptic, and textural characteristics of cassava into a new product through chemical, biological, or physical means. It includes juice extraction, pulp/puree creation, canning, preserving, freezing, or drying/dehydrating (CAC, 2022, *modified*)

#### 3.5

##### **Good Agricultural Practices (GAP)**

principles and methods that promote environmental, economic, and social sustainability of on-farm processes, and result in safe and quality food and non-food agricultural products (FAO, 2003, *modified*)

#### 3.6

##### **Good Distribution Practices (GDP)**

quality assurance that ensures that the quality of the product is maintained by means of adequate control of the numerous activities which occur during the

distribution process, as well as providing a tool to secure the distribution system from falsified, unapproved, illegally imported, stolen, substandard, adulterated, and/or misbranded products (WHO, 2019, *modified*)

### 3.7

#### **Good Storage Practices (GSP)**

quality assurance that ensures that the quality of products is maintained by means of adequate control throughout the storage thereof (WHO, 2019, *modified*)

### 3.8

#### **microbial contaminants**

include spoilage, pathogenic, and toxin-producing microorganisms (BAFS-DA, 2017)

### 3.9

#### **mycotoxins**

toxic secondary metabolites produced by many filamentous fungi belonging to the phylum Ascomycota, which contaminate agricultural products (FAO, 2024, *modified*)

### 3.10

#### **seed pieces**

planting materials for the propagation of new cassava plants with a length of 15 cm to 30 cm (DA, 2024)

### 3.11

#### **soaking**

submersion of cassava in the water to reduce the Hydrocyanic (HCN) content (Kakwu, 2018)

### 3.12

#### **sun drying**

method that reduces hydrocyanic acid (HCN) content of cassava through prolonged exposure to sunlight (Kakwu, 2018)

### 3.13

#### **wet cakes**

result of removing excess water from the wet cassava mash after root grating and/or fermentation (Shittu et al., 2016)

## **4 Recommended Practices Applicable to Pre-Planting Stage**

### **4.1 Site selection**

**4.1.1** Farmers shall avoid planting in areas with high risks of pooling water, flooding, and soil contaminants such as chemical residues, heavy metals, and fungal inocula.

**4.1.2** *Other considerations of the site shall be in conformance with Clause 4.1.1 (Location of production site) of the PNS/BAFS 150:2020 (Cassava — GAP).*

### **4.2 Farmland clearing and preparation**

**4.2.1** The planting site shall be practically free from plant residues and waste/s to avoid contamination of the cassava roots with inocula from infected weeds or other crops.

**4.2.2** Soil shall be loosened through tillage and *sanitized by solarization*.

### **4.3 Cassava variety (cultivar) and seed pieces selection**

**4.3.1** Cassava varieties that are healthy, mature, pest-free, and have low hydrocyanic acid (HCN) content as specified in Annex A of PNS/BAFS 150:2020 (Cassava — GAP), shall be selected and used for planting to ensure optimal crop establishment.

**4.3.2** Cassava variety selection shall consider resistance to fungi and other plant pathogens as a key criterion. Cuttings that are visibly free from fungal infection and other signs of disease shall be used for planting.

**4.3.3** *Other considerations of seed and planting materials shall be in conformance with Clause 4.2.2 (Source of planting material, the necessary seed treatments and related documents) of the PNS/BAFS 49:2021 (GAP for fruits and vegetable farming — COP) and/or Clause 4.2.2 (Planting material requirements) of the PNS/BAFS 150-2020 (Cassava — GAP).*

## **5 Recommended Practices Applicable to Planting and Pre-Harvest Stage**

### **5.1 Planting**

**5.1.1** Infected cassava stems, particularly those exhibiting rotting spots, shall not be used for planting to prevent fungal growth.

**5.1.2** Planting practices proven to prevent rot, including vertical/slanting planting position, shall be adopted to minimize the risk of rot, particularly during the rainy season.

- 5.1.3** Planting material (*seed pieces*) shall be dipped in a pesticide and nutrient solution as guided by label instructions to reduce soil-borne pathogens and shall be recommended for pre-planting treatment. The dipped *seed pieces* shall be allowed to dry and be placed in a shaded, well-ventilated area before field planting.
- 5.1.4** *When planting in ridges, the ridge should be 20 cm to 30 cm in height, and the distance between ridges should be 75 cm to 100 cm. There should be 1 cutting per hill at a distance of 50-75 cm between hills and 75-100 cm between rows.*
- 5.2 Cropping system**
- 5.2.1** Crop rotation shall be properly planned across successive growing seasons to minimize the buildup of inocula in the field and reduce the presence of post-harvest plant residues that may harbor toxigenic fungal spores.
- 5.2.2** Crop rotation plans should exclude highly susceptible crops to toxigenic fungi, such as but not limited to groundnuts (*Arachis hypogea*), maize (*Zea mays*), and sugarcane (*Saccharum officinarum*), to reduce the risk of cross-contamination from residual fungal inocula present in the field.
- 5.2.3** *Risk-based management and suitability of cassava production shall be in conformance with Clause 4.1.1 (Suitability of the agricultural site for food production and primary processing) of the PNS/BAFS 49:2021 (GAP for fruits and vegetable farming — COP).*
- 5.3 Weed control**
- 5.3.1** Weeds that harbor toxigenic fungi and compete for moisture, light, and nutrients shall be controlled using either manual or mechanical methods such as *off-barring*, *hilling-up*, and the use of approved and appropriate herbicides.
- 5.4 Pesticide use**
- 5.4.1** *Duly* registered pesticides/biocontrol products by the national competent authority/ies shall be used in the soil or around/on the crop to minimize insect damage and fungal infection.
- 5.4.2** *Weather patterns/ambient conditions* and pest situation should be used as bases in selecting the best pesticide product to be used and timing of application.
- 5.4.3** Users shall follow all label instructions, particularly the recommended rate of application, and only for their intended use to ensure the safe and proper use of the pesticide product.

## 5.5 Irrigation

- 5.5.1 *Surface* irrigation during root maturation shall be avoided to prevent favorable conditions for fungal infections created by excess precipitation during root maturation.

## 6 Recommended Practices Applicable to Harvest Stage

### 6.1 Harvesting

- 6.1.1 Harvesting shall be done to *attain the desired level of maturity (6-8 months after planting)* and quality for the intended users, and prevent crop wastage and possible rot. The quantity of roots to be harvested shall be determined based on market needs and demand.

- 6.1.2 Cassava roots shall be harvested when the soil is slightly soft and not overly saturated, to easily remove soil from the roots and avoid damage.

- 6.1.3 Necessary measures shall be taken to prevent or minimize damages during harvesting and to reduce the risks of fungal growth during postharvest handling and storage.

### 6.2 Holding conditions

- 6.2.1 Prior to the processing step and while being held for use, cassava roots should not be exposed to the sun or high temperatures, and shall be protected from mechanical damage or other conditions that could promote fungal contamination.

- 6.2.2 *Proper handling from harvest to final product shall be implemented to ensure that roots are not stored for extended periods. Without appropriate storage methods, the maximum allowable storage time shall not exceed 3 days.*

- 6.2.3 Cassava roots shall be stored in a suitable or appropriate storage area or facility.

- 6.2.4 When storage or export of large quantities of *fresh peeled* cassava roots is required, enhanced storage methods shall be applied. These methods include storing at low temperatures.

## 7 Recommended Practices Applicable to Post-Harvest

### 7.1 Cassava-based products

- 7.1.1 Cassava roots may be processed into various fermented or non-fermented cassava-based products.

- 7.1.2** Cassava-based products, which may be specific to certain regions and used for human consumption, shall be processed using methods appropriate to each product type. The processing steps shall be in conformance with the CXC 73-2013 (COP for the reduction of hydrocyanic acid in cassava and cassava products) and *Clause 7 (Specific processing steps) of the PNS/BAFS 150-2020 (Cassava — GAP)*.
- 7.1.3** Processing of cassava roots as raw materials shall be initiated *upon receipt, but not to exceed 3 days, provided that appropriate storage conditions are kept* to avoid spoilage.
- 7.2 Washing**
- 7.2.1** When cassava roots are to be processed immediately after harvest, they shall be washed thoroughly to remove surface dirt and soil, thereby reducing the inoculum of toxigenic fungal species.
- 7.2.2** *Water used for washing peeled cassava roots* shall be potable or treated appropriately to ensure it is safe and fit for its intended purpose, to prevent potential contamination.
- 7.3 Peeling**
- 7.3.1** Peeling cassava roots shall either be done manually or mechanically using clean, sanitized, *appropriate peeling tools and/or equipment*. Peeling shall be carried out in a *designated processing area* to avoid cross-contamination with other crops during storage.
- 7.4 Boiling/steaming**
- 7.4.1** Cassava roots should be boiled at an appropriate temperature or steamed for *at least 30 minutes* immediately after peeling and washing *to reduce the hydrocyanic content and inoculum of toxigenic fungal species*.
- 7.5 Size reduction: Grating, pulping, and slicing or chipping**
- 7.5.1** Where further processing of washed cassava roots includes size-reduction activities, regardless of the size of the roots to be further processed, cassava variety, *environment*, or type of available equipment, appropriate measures, including sanitation, shall be taken to ensure such unit processing does not lead to fungal and *other microbial and physical contamination*.
- 7.5.2** When cassava chips or slices are dried at the farm level or in a processing facility, the chips or slices shall be dried on clean, dry, raised platforms and at appropriate distance from probable sources of contamination, such as refuse dumps. When sun drying is carried out, it should be done on raised platforms *at least 1 m in height* that would ensure good hygienic practice.

- 7.5.3** When chips or slices are dried artificially, the dryer thermostat shall be optimally maintained to achieve the acceptable *maximum moisture content of 13%* of the cassava and cassava-based products at the right time to prevent mold growth.
- 7.6 Fermentation**
- 7.6.1** Fermentation of cassava roots shall be employed as a processing step primarily to facilitate further cyanide elimination, flavor development, and product stability.
- 7.6.2** All containers and equipment used in fermentation shall be cleaned and sanitized at all times to ensure they do not become a natural source of inoculum. Fermentation typically takes place over 2 to 5 days.
- 7.7 Dewatering**
- 7.7.1** Dewatering should involve removing water from grated cassava roots and is usually done by pressing to produce wet cakes. The process may last up to 2 days.
- 7.7.2** Dewatering should be done before or after fermentation. Water removal shall be optimal, and care shall be taken not to use contaminated processing materials, such as contaminated sacks, as they may become sources of fungal inocula and *other microbial contaminants*.
- 7.7.3** Food-grade sacks should be used. Adequate cleaning and sterilization of the sacks shall be done frequently.
- 7.8 Cake breaking**
- 7.8.1** *Wet cakes should be disintegrated using clean hands and sifted to remove lumps and to improve particle consistency.*
- 7.8.2** The sacks containing *disintegrated cake* shall not be placed on dirty surfaces. Clean and *sanitized* containers shall be used to hold the *disintegrated cake* to ensure the product is not contaminated.
- 7.9 Drying**
- 7.9.1** Cassava primary products shall be dried to a moisture content *not exceeding 13%* to prevent fungal growth and subsequent mycotoxin production.
- 7.9.2** *All surfaces and materials used for drying cassava products shall be cleaned and maintained in a hygienic condition to prevent microbial contamination.*
- 7.9.3** Chips shall be properly spread per square meter of drying surface and shall not be *overlayered* to allow for air circulation.

- 7.9.4** Platforms for sun drying shall be raised *at least 1 m and should be enclosed* to prevent contamination from dust, animals, and pests. Batches of chips, *flours, grates, and starches* not adequately dried shall be spread out in a ventilated room until the products are dried.
- 7.9.5** Drying surfaces and materials shall be clean and sanitized.
- 7.10 Milling**
- 7.10.1** *Milling operations* shall be monitored to prevent cross-contamination from dust.
- 7.10.2** Flour shall be stored in a clean, moisture-proof container, and the milling machine shall be cleaned and dried after use.
- 7.11 Sieving**
- 7.11.1** Sieves used in further processing shall be properly stored, cleaned with potable water, and thoroughly dried before each use.
- 8 Storage**
- 8.1** Storage facilities *shall conform with the relevant provisions of Clause 6.2 (Hygiene and sanitation requirements) of the PNS/BAFS 193:2017 (GWP for bagged grains)*.
- 8.2** Sheds, silos, bins, and other building materials intended for cassava and cassava-based product storage shall be dry and well ventilated.
- 8.3** Storage areas shall be designed and maintained to prevent contamination of commodities from groundwater, moisture condensation, rainwater *ingress*, rodents, and insect activity, all of which increase susceptibility to fungal infection.
- 8.4** Storage facilities shall minimize wide temperature fluctuations to maintain product quality.
- 8.5** Where feasible, temperature and humidity within storage areas shall be monitored and controlled to reduce the risk of fungal growth.
- 8.6** Packaged cassava and cassava-based products shall be stored under dry and cool conditions to preserve quality and prevent spoilage.
- 8.7** Direct contact between packaged products and floors or walls shall be avoided to minimize contamination and moisture transfer, *such as the use of plastic pallets and trays or stainless-steel racks*.

- 8.8 The product shall be dried to a suitable moisture level *not exceeding 13%* before storage to ensure product stability and prevent spoilage. Moisture content of each lot shall be determined prior to storage.
- 8.9 Fungal growth shall be controlled by maintaining water activity ( $a_w$ ) of the product below 0.60. Storage conditions shall be managed to ensure that  $a_w$  remains below this threshold throughout the storage period.
- 9 Packaging**
- 9.1 Moisture content of cassava-based products, mainly in the form of flour and chips, *shall not exceed 13%* and shall be monitored before packaging to avoid packing a product that will favor the growth of microorganisms.
- 9.2 Cassava-based products shall be packed in food-grade materials. Packaging shall be made of materials which should not absorb moisture when packed and sealed.
- 9.3 Where necessary, cassava roots may use packaging technologies such as vacuum and modified atmosphere packaging.
- 10 Transportation**
- 10.1 Transport containers and vehicles, including trucks, railway vessels, boats, and ships, shall be maintained in a dry condition and free from *residual* crop dust, visible fungal growth, musty odors, insects, and any other contaminants that may contribute to *elevated* mycotoxin levels in cassava and cassava-based products.
- 10.2 Transport containers shall be cleaned and disinfected before use and re-used and be suitable for the intended cargo. *Containers shall be cleaned appropriately after unloading to prevent contamination of subsequent loads.*
- 10.3 Shipments of cassava and cassava-based products shall be protected from additional moisture by using covered or airtight (*hermetically sealed*) containers or tarpaulins.
- 10.4 *Environmental conditions, such as temperature and relative humidity, shall be monitored to minimize fluctuations that may cause enhanced deterioration of cassava and cassava-based products during transport.*
- 10.5 Pest-proof containers should be used to avoid pest infestation during transport.

**11 Product Information and Consumer Awareness**

- 11.1** Specific storage instructions for cassava and cassava-based products shall be provided on the packaging to ensure protection from unfavorable conditions, which may promote fungi growth and contamination.
- 11.2** Storage instructions before (e.g., store in a cool, dry, well-ventilated area) and after the product is opened shall be legible and in clear language to maintain product quality.
- 11.3** *Date of harvest, quantity, variety, and destination for each consignment of cassava should be included to ensure traceability.*
- 11.4** *Labeling of cassava-based products shall be in conformance with the relevant provisions of Clause 6 (Mandatory information requirements on the label) of the PNS/BAFS 384:2024 (Packaged primary and postharvest foods — Product standard — General labeling standard).*

## References

- Bureau of Agriculture and Fisheries Standards (BAFS)-Department of Agriculture (DA). (2017a). Dried cassava chips and grates as food purposes (PNS BAFPS29:2017).  
<https://bafs.da.gov.ph/index.php/approved-philippine-national-standards/>
- Bureau of Agriculture and Fisheries Standards (BAFS)-Department of Agriculture (DA). (2017b). Good Warehousing Practices (GWP) for bagged grains (PNS/BAFS 193:2017).  
<https://bafs.da.gov.ph/index.php/approved-philippine-national-standards/>
- Bureau of Agriculture and Fisheries Standards (BAFS)-Department of Agriculture (DA). (2020a). Code of practice for the reduction of hydrocyanic acid (HCN) in cassava and cassava products (PNS/BAFS 147:2020).  
<https://bafs.da.gov.ph/index.php/approved-philippine-national-standards/>
- Bureau of Agriculture and Fisheries Standards (BAFS)-Department of Agriculture (DA). (2020b). Code of Good Agricultural Practices (GAP) for cassava (PNS/BAFS 150:2020).  
<https://bafs.da.gov.ph/index.php/approved-philippine-national-standards/>
- Bureau of Agriculture and Fisheries Standards (BAFS)-Department of Agriculture (DA). (2021). Fruits and Vegetable Farming – Code of Practice — Good Agricultural Practices (GAP) (PNS 49:2021).  
[https://drive.google.com/file/d/1iZJOPrh-fxk2h-xvLDy\\_NH4I0TD205zT/view](https://drive.google.com/file/d/1iZJOPrh-fxk2h-xvLDy_NH4I0TD205zT/view)
- Bourdoux, P., Segherd, P., Mafuta, M., Vanderpas, R.M., Delanga, F., and Ermans, A.M. (1982). Cassava products: HCN content and detoxification process. In: Delange, F., Iteke, F.B. and Ermans, A.M., Eds., Nutritional factors involved in the gfoitrogenic action of cassava, IDRC, Ottawa, 51-75.
- Chisenga, S. M. (2021). Primary quality control parameters of cassava raw materials. In Frediansyah, A (Ed.), Cassava - Biology, production, and use.  
<https://cdn.intechopen.com/pdfs/76939.pdf>
- Codex Alimentarius Commission (CAC). (2003). Code of practice for the prevention and reduction of mycotoxin contamination in cereals (CXC 51-2003).  
[https://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?Ink=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FStandards%252FCXC%2B51-2003%252FCXC\\_051e.pdf](https://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?Ink=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FStandards%252FCXC%2B51-2003%252FCXC_051e.pdf)
- Codex Alimentarius Commission (CAC). (2013). Code of practice for the reduction of hydrocyanic acid (HCN) in cassava and cassava products (CAC/RCP 73-2013).  
[https://www.fao.org/input/download/standards/13605/CXP\\_073e.pdf](https://www.fao.org/input/download/standards/13605/CXP_073e.pdf)

Codex Alimentarius Commission. (2023). Code of practice for the prevention and reduction of mycotoxin contamination in cassava and cassava-based products (CXC 82-2023).

[https://www.fao.org/fao-who-codexalimentarius/sh-proxy/ua/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252Fstandards%252FCXC%2B82-2023%252FCXC\\_082e.pdf](https://www.fao.org/fao-who-codexalimentarius/sh-proxy/ua/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252Fstandards%252FCXC%2B82-2023%252FCXC_082e.pdf)

Department of Agriculture (DA). (2024). Guidelines on the implementation of cassava seed system under the National Corn Program (Memorandum Circular No. 18, series of 2024).

[https://www.da.gov.ph/wp-content/uploads/2024/10/mc18\\_s2024.pdf](https://www.da.gov.ph/wp-content/uploads/2024/10/mc18_s2024.pdf)

Fertilizer and Pesticide Authority (FPA). Department of Agriculture (DA). (1977). Rules and regulations, No. 1, series 1977 Article II (Registration of pesticides), Section 1.

<https://fpa.da.gov.ph/wp-content/uploads/2024/05/IRR.pdf>

Food and Agriculture Organization (FAO). (2003). Committee on Agriculture, development of a framework for good agricultural practices, 17th session. Rome.

<https://www.fao.org/4/Y8704e/Y8704e.htm>

Food and Agriculture Organization (FAO). (2013). Cassava: A guide to sustainable farming intensification.

<https://openknowledge.fao.org/handle/20.500.14283/i3278e>

Food and Agriculture Organization (FAO). (2024). Food safety and quality: Mycotoxins.

[https://www.fao.org/food/food-safety-quality/a-z\\_index/mycotoxins/en/](https://www.fao.org/food/food-safety-quality/a-z_index/mycotoxins/en/)

Kakwu, C. K. (2018). Parboiling and soaking of cassava to reduce cyanide contents of crisps (Master's thesis, University of Nairobi). University of Nairobi Repository.

<https://erepository.uonbi.ac.ke/handle/11295/105235>

Shittu, T. A., Alimi, B. A., Wahab, B., Sanni, L. O., & Abass, A. B. (2016). Cassava flour and starch: Processing technology and utilization. In H. K. Sharma, N. Y., Njintang, R. S., Singhal, P., and Kaushal (Eds.), *Tropical roots and tubers: Production, processing and technology* (pp. 412–447). John Wiley & Sons.

<https://biblio.iita.org/documents/S16lnbkShittuCassavaNothomDev.pdf-235fd21d0084903cd2035e6936e78ada.pdf>

Stapleton, J.J., Wilen, C.A., Molinar, & R.H., (2019). UC IPM Pest notes: Soil solarization for gardens and landscapes. UC ANR Publication 74145.

[https://ipm.ucanr.edu/legacy\\_assets/PDF/PESTNOTES/pnsoilsolarization.pdf](https://ipm.ucanr.edu/legacy_assets/PDF/PESTNOTES/pnsoilsolarization.pdf)

World Health Organization (WHO). (2019). Good storage and distribution practices for medical products.

[https://cdn.who.int/media/docs/default-source/medicines/norms-and-standards/guidelines/distribution/trs1025-annex7-\(1\).pdf?sfvrsn=1f96888d\\_4&download=true](https://cdn.who.int/media/docs/default-source/medicines/norms-and-standards/guidelines/distribution/trs1025-annex7-(1).pdf?sfvrsn=1f96888d_4&download=true)

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

**Philippine National Standard (PNS) on Prevention and Reduction of  
Mycotoxins in Cassava and Cassava-based Products —  
Code of Practice — Hygienic Practices**

**Technical Working Group (TWG)**

**Chairperson**

Emnace, Ivy, PhD

Conde, Ladie Anne, PhD

**Philippine Root Crop Research and Training Center (PRCRTC)  
Visayas State University (VSU)-**

**Vice-Chairperson**

Serrano, Edralina, PhD

**Postharvest Horticulture Training and Research Center (PHTRC)  
University of the Philippines Los Baños (UPLB)-**

**Members**

- |   |  |
|---|--|
| 1. Sadural, Renelyn   | 10. Suello, Novie  |
| 2. Marcos, John Dembert<br><b>Bureau of Plant Industry (BPI)-DA</b>                                     | 11. Quiamco, Christine Jane<br><b>Regional Field Office (RFO)-DA<br/>Northern Mindanao</b> |
| 3. Oliveros, Jean Marjorie  |  |
| 4. Cuervo, Mark Joseph<br><b>Philippine Council for Agriculture<br/>and Fisheries (PCAF)-DA</b>         | 12. Mopera, Lotis, PhD   |
|   | 13. Mandap, Julie Aiza<br><b>College of Agriculture and Food<br/>Sciences (CAFS)-UPLB</b>  |
| 5. Elvira, Romualdo, Jr.<br><b>National Sectoral Committee<br/>(NSC) on Corn and Feeds,<br/>PCAF-DA</b> | 15. Garcia, Franz Marielle, PhD  |
|   | 16. Castro, Dan Fred<br><b>Central Luzon State University<br/>(CLSU)</b>                   |
| 6. Mendoza, Apolonia  |  |
| 7. Jonas, Mark Vheejay<br><b>Bureau of Agricultural<br/>Research (BAR)-DA</b>                           | 17. Ellasus, Rosalie<br><b>Philippine Maize Federation, Inc.</b>                           |
| 8. Gabriel, Jocelyn   |  |
| 9. Eugenio, Jasper Jory<br><b>Food Development Center<br/>(FDC)-DA</b>                                  | 18. Torno, Richard, DVM<br><b>Torno, AgriEnterprise</b>                                    |

**BAFS Management Team**

Lanuza, Alpha, DVM

Aborido, Kristel Alarice, RND

Monta, Jyles Louis, RAgri

**Adviser**

Mandigma, Mary Grace, PFT



## **BUREAU OF AGRICULTURE AND FISHERIES STANDARDS**

---

---

**BPI Compound Visayas Avenue, Diliman, Quezon City 1101 Philippines  
T/ (632) 8928-8741 to 64 loc. 3301-3319  
E-mail: [bafs@da.gov.ph](mailto:bafs@da.gov.ph)  
Website: [www.bafs.da.gov.ph](http://www.bafs.da.gov.ph)**