

# **PHILIPPINE NATIONAL STANDARD**

**PNS/BAFS 166:2015  
ICS 67.080.20**

---

---

## **Code of Hygienic Practice for Gabi Leaves**



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

BPI Compound Visayas Avenue, Diliman, Quezon City 1101 Philippines  
Phone (632) 920-6131; (632) 455-2856; (632) 467-9039; Telefax (632) 455-2858  
E-mail: [bafpsda@yahoo.com.ph](mailto:bafpsda@yahoo.com.ph)  
Website: [www.bafs.da.gov.ph](http://www.bafs.da.gov.ph)

## **FOREWORD**

The recently enacted Republic Act No. 10611 otherwise known as the Food Safety Act of the Philippines re-enforced the mandate of the Bureau of Agriculture and Fisheries Standards (BAFS) in developing food safety standards. Such standards, however, when established should be based on available scientific data.

In Bicol region, taro or gabi farming is considered as one of the champion commodities and farmers have been exporting the dried form of this commodity to several trading partners. The United States of America (USA) – one of our trading partners, imposes strict rules with regard to imported products. On this matter, the United States Department of Agriculture (USDA) released a report stating that food products being exported to the country should be produced in a condition where sanitation practices are equivalent to those being implemented in the country. Further, the report associated sanitation practices in food production with microbiological issues that are usually implicated in imported foods.

Given the food safety issues surrounding gabi leaves production, its trade and their impact to the small and micro-producers, this standard is therefore developed to ensure that gabi leaves produced in the Philippines comply with regulatory requirements, thus, are microbiologically safe. Congruent to this matter, the Bureau, in collaboration with the experts of the Technical Working Group (TWG), developed a Code of Hygienic Practice (COHP) for the Production of Gabi Leaves.

Special Order No199 series of 2013 established the TWG tasked to conduct field validation studies; sample products for the purposes of microbiological, heavy metal and pesticide residue analyses; and draft and finalize the COHP. The members of the TWG include identified experts from the Department of Agriculture Regional Field Office V (DA RFO V), and academic institutions such as Central Bicol State University (CBSUA) and Bicol University – College of Agriculture and Forestry (BUCAF).

During drafting, existing international guidelines were used as basis and these include the *Codex Code of Hygienic Practice for Fresh Fruits and Vegetables* (CAC/RCP 53:2003) and its Annex (Annex III on Fresh Leafy Vegetables), ASEAN Code of Good Agricultural Practices (GAP), and Philippine National Standard (PNS) Code of Good Agricultural Practices (GAP) for Fruits and Vegetables (PNS 49:2011).

This COHP addresses the essential principles of food safety applicable to primary production, postharvest, transport operations, primary processing (i.e. drying) and its subsequent storage. It encompasses Good Agricultural Practices (GAP), Good Hygienic Practices (GHP) and Good Manufacturing Practices (GMP) that will help minimize

microbiological hazards associated with all stages of production to primary processing of gabi leaves.

This Code provides general recommendations to allow flexible and uniform adoption even when production practices and environmental conditions are diverse. Therefore, this Code is also applicable to micro and small-scale producers.

## INTRODUCTION

Taro (*Colocasia esculenta* L.) or most commonly known as gabi is one of the agricultural commodities that is associated with Bicolanos. Gabi has many varieties but some of them are not used in food preparations due to the itchy reaction they cause. The commonly grown gabi varieties in the Bicol region are locally known as bahebahe, catigbi, duguan, panawon, ginalyang, prinsesita, binting dalaga, puting natong, prinsesa and balitaka. The leaves of gabi are sold either in fresh or dried form. As a dish, it is cooked with coconut milk to suit the discriminating taste of Filipinos. Laing and pinangat are the most popular dishes made from gabi leaves. Laing is described as cooking of shredded gabi leaves in coconut milk, while pinangat is described as either cooking of shredded gabi leaves or of grated coconut meat and shrimp wrapped in whole gabi leaves and held together by a tie. Both are cooked in coconut milk.

In Bicol, commercial gabi farms are commonly established in irrigated paddies, along irrigation canals, in creeks or in riverbanks. Bicolano farmers believe that better quality of leaves is produced in fields that are either flooded or with flowing water.

The presence of calcium oxalates in gabi results in acidity and can cause irritation on the lips, mouth or throat. Young gabi leaves contain significantly higher oxalate than old leaves. The soluble oxalate is affected by cooking but not the insoluble oxalate. Boiling can reduce the soluble oxalate content of the food if the cooking water is discarded. Baking the young and old gabi leaves with cow's milk can reduce calcium oxalate in cooked leaves (Oscarsson *et al*, 2006). In Bicol however, gabi is cooked with coconut milk and not with cow's milk. Selection of the known non-irritating gabi varieties is the farmers' way of addressing the problem on acidity. The farmers are careful in planting material selection because of varietal effect of the leaves on its marketability.

Aside from concerns pertaining to quality and palatability of gabi leaves, another major concern is the susceptibility of the produce to chemical and microbiological hazards. Factors affecting this include diversity in production sites and practices commencing from land preparation, cultural management, harvesting, post-harvest handling and primary processing.

Bicol farmers harvest gabi leaves either by using a sharp knife or separating the stalk together with the leaf from the entire plant by skillfully pulling it with a sudden stroke. Prior to point of sale, practices of farmers also vary. Gabi leaves are wiped with a piece of cloth, washed or sold as is.

Due to the absence of standard operating procedure that will ensure microbiological safety of gabi leaves, lack of knowledge on Good Agricultural Practices (GAP) among farmers therefore exists. The possibility of contamination, however, can be minimized or controlled by implementing environmental and personal hygienic standards along the supply chain.

## **SECTION 1 - OBJECTIVES**

The *Codex Code of Hygienic Practice for Fresh Fruits and Vegetables (CAC/RCP 53-2003)* and the *Philippine Code of Good Agricultural Practices for Fruits and Vegetables (GAP-FV) Farming (PNS/BAFPS 49:2007/2011)* provide the general hygienic recommendations for the primary production of gabi leaves. The objective of the Code therefore is to provide specific guidance on how to minimize microbiological hazards during primary production through packing, storage and distribution of fresh and/or dried gabi leaves.

Additional guidance for on-farm primary processing of gabi leaves (i.e. cutting and drying) without undergoing microbiocidal step ('no-washing step') takes into account, as far as practicable, the relevant of Good Manufacturing Practices (GMPs).

## **SECTION 2 - SCOPE, USE AND DEFINITIONS**

### **2.1 Scope**

This Code covers specific guidance related to all areas from primary production to on-farm primary processing of gabi leaves without undergoing microbiocidal step. This Code encompasses all edible varieties of gabi leaves (*Colocasia esculenta*) grown in the Philippines.

### **2.2 Use**

This Code adopts and follows the general format of the *Codex Code of Hygienic Practice for Fresh Fruits and Vegetables (CAC/RCP 53-2003)* and discusses specific sections which relate to the microbiological safety of fresh and/or dried gabi leaves. The Code should also be read in conjunction with that standard, the *Codex Recommended International Code of Practice-General Principles of Food Hygiene (CAC/RCP 1-1969, Rev 4:2003)* and other applicable codes.

This Code supplements the *Philippine Code of Good Agricultural Practices for Fruits and Vegetables (GAP-FV) Farming (PNS/BAFPS 49:2007/2011)*, which is the basis for granting the Good Agricultural Practices (PhilGAP) certification to fruit and vegetable farms.

### 2.3 Definitions

For the purpose of this Code, the following terms are operationally defined:

**Agricultural chemicals** – chemical farm inputs used in gabi production such as synthetic fertilizers and pesticides.

**Agricultural inputs** - any incoming material (e.g. seeds, fertilizers, water, agricultural chemicals, plant support, etc.) used for the primary production of fresh fruits and vegetables.

**Agricultural workers** - any person who undertakes one or more of the following: cultivation, harvesting and packing of fresh fruits and vegetables.

**Documentation** – a written food safety control plan that includes the description of hazards identified through environmental hygiene assessment as well as the corrective and preventive measures to be implemented by the business operating the primary production.

**Environmental hygiene** – sanitary condition in the gabi farm, handling, storage, transport, processing and postharvest operational areas.

**Farm** – any premise or establishment in which gabi are grown and harvested and the surroundings under the control of the same management.

**Grower** – the person responsible for the management of the primary production of gabi.

**Personnel hygiene** – sanitary practices of personnel as per Sanitation Code of the Philippines, such as washing of hands , before handling gabi leaves in order to prevent contamination with pathogenic microorganisms.

**Primary Production** – all steps which start from selection of farm site, selection of planting materials/seedlings and all other cultural practices prior to harvesting.

**Postharvest** – all operations including the separation of gabi from the mother plant drying, stripping or minimal processing, packaging and transport until the gabi reaches the table of the consumer.

**Primary processing** – refers to the physical alteration of gabi with or without the use of mechanical facilities/equipment prior to cooking

**Records** –serve as evidence of conformity to hygienic requirements in the operation of gabi leaves production and processing business.

### **SECTION 3 - PRIMARY PRODUCTION**

#### **3.1 Environmental Hygiene**

One of the key features of sustainable farming is the continuous integration of site-specific knowledge and practical experiences into future management planning and practices. This section is intended to ensure that the land, buildings and other facilities are properly managed to ensure the safe production and protection of the environment.

##### **3.1.1 Production Site**

Where possible, potential sources of contamination from the environment should be identified. In particular, primary production should not be carried out in areas where the presence of potentially harmful substances would lead to an unacceptable level of such substances in or on gabi leaves after harvest.

Considering the wide variation on the production site of gabi leaves (i.e. paddy, riverbanks, well-irrigated areas, rainfed areas), the following should be considered in the evaluation of location of production sites:

- Previous land use;
- Slope and potential for run-off from nearby fields;
- Proximity to high risk production sites (animal production facilities, hazardous waste sites and mining areas) potential microbial hazards including faecal contamination and contamination by organic waste and potential environmental hazards that could be carried to the growing site;
- The access of farm and stray animals to the site and to water sources used in primary production that will be then be used to identify potential faecal contamination of the soil and water and the likelihood of contaminating crop. Considering the potential source of contamination, efforts should be made to protect fresh gabi leaves production areas from animals. As far as possible, domestic and wild animal should be excluded from the area.

If previous uses cannot be identified, or the examination of the growing or adjoining sites leads to the conclusion that potential hazards exist, the sites should be analysed for

contaminants of concern. If the contaminants are at excessive levels and corrective or preventative actions have not been taken to minimize potential hazards, the sites should not be used until correction/control measures are applied.

Another consideration during production site evaluation is the soil. Soil should be evaluated and tested for hazards as a result of the preliminary evaluation and only when necessary. Soil samples may be taken and sent to laboratories (e.g. Bureau of Soils and Water Management) for analyses to check the level of heavy metal contamination or persistent chemical pesticides.

If the evaluation also gives the conclusion that such hazards are at levels that may compromise the safety of the gabi leaves, control measures should be implemented to reduce the hazards to its acceptable level. If this cannot be achieved by implementing available control measures, growers should not use the areas for primary production.

## **3.2 Hygienic Primary Production of Gabi Leaves**

### **3.2.1 Agricultural Input Requirement**

Agricultural inputs (water, fertilizer, agricultural chemicals, etc.) should not contain microbial or chemical contaminants as defined under the *General Principles of Food Hygiene (CAC/RCP 1-1969)* at levels that may adversely affect the safety of gabi leaves.

#### **3.2.1.1 Water for primary production**

Growers should identify the sources of water used in the farm (e.g. re-used irrigation water, run-off irrigation water, well, open canal, reservoir, rivers). They should assess its microbial and chemical quality, suitability for intended use, and identify corrective actions to prevent or minimize contamination (e.g. from livestock, sewage treatment, human habitation, activities of neighboring farm, upstream activities for gabi leaves planted in riverbanks). Mitigation measures i.e. catchment pond, may be established to minimize chemical contamination from the activities of neighboring farm, specifically in cases where the source of water is common irrigation system.

Depending highly on the intended use, growers should have the water tested for microbial and chemical use. The frequency of testing, however, will depend on the level of assessed risks. If found contaminated, corrective actions should be taken to ensure its suitability for use. The certificate of analysis results should be kept.

Reassessment of the potential for microbiological contamination is necessary when events or other conditions indicate that water quality may have changed.

### **3.2.1.2 Manure, biosolids and other natural fertilizers**

To effectively guide the farmers in deciding the appropriate kind of fertilizer or the amount needed to be applied, the results of soil analyses can be used as basis.

The use of treated manure and biosolids, and other natural fertilizers in the production of gabi leaves should be managed to limit the potential for microbial, chemical and physical contamination. Manure, biosolids and other natural fertilizers contaminated with heavy metals or other chemicals at levels that may affect the safety of gabi leaves should not be used. In most cases, such agricultural inputs are applied during land preparation as basal fertilizer.

Growers or agricultural workers must not use untreated solid nor liquid manure because foodborne pathogens can persist in soils for long periods of time. In cases where there are livestock (e.g. hog) raising in the upstream of the growing areas, proper mitigation measures should be instituted to ensure that there is no direct dispersal of fresh manure to the production area.

In cases when the farm produces its own organic inputs, proper treatment procedures should be adopted to reduce or eliminate the pathogens present in the raw material and to minimize the probability of contaminating the produce. The location of the composting site should also consider the slope and proximity to production areas in order to prevent cross contamination from runoff or leaching.

In order to minimize loss and contamination of the produce, correct application and proper storage procedures of manure, biosolids and natural fertilizers should be followed.

If organic inputs are procured from outside sources, documents should be kept.

Human manure and urine are not allowed.

### **3.2.1.3 Pest and disease control**

Integrated Pest Management (IPM) is an effective and environment-friendly approach to pest management to control and minimize pest damages. IPM combines the use of current and comprehensive information on the life cycles of pests; their interaction with the environment and the available pest control methods. In general, IPM focuses on the following factors:

- Use of resistant cultivars and varieties, and following recommended crop sequences for the prevention of pests and diseases;



- Regular monitoring and quantitative assessment of pest population and diseases, and beneficial organisms;
- Application of pest and disease forecasting techniques, and;
- Consideration of all possible methods of intervention and their short and long term effects on productivity and environmental implications in order to minimize the use of agrochemicals.

If the growers opt to use commercial agricultural chemicals (i.e. pesticides) to control pests and diseases, only FPA-registered & green-labeled agricultural chemicals should be used. These should be authorized for the cultivation of gabi leaves or fresh leafy vegetables and be used according to the label recommendations. Upon sampling and conduct of necessary analyses, residues should not exceed levels as established by the Codex Alimentarius Commission or the ASEAN or by the Philippine National Standard (PNS).

Growers should refer to the Section 7.2 to 7.5 of the PNS Code of Good Agricultural Practices for Fresh Fruits and Vegetables (PNS/BAFPS 49:2011) with regard to pesticide management.

Gabi growers may also use botanical-based pesticides to control pests and diseases.

### **3.2.2 Personnel Health, Hygiene and Sanitary Facilities**

All agricultural workers including contractors or visitors should act in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene (CAC/RCP 1 – 1969)* to maintain an appropriate degree of personal cleanliness; operate in a suitable manner and to ensure that those who have direct contact with fresh gabi leaves during or after harvesting will not likely to contaminate the produce. In particular, subcontractors and visitors should be made aware of relevant procedures on personal safety and hygiene (e.g. relevant instructions are in visible place where all visitors or subcontractors can read them).

In particular, attention should be given to availability of hand-washing facilities equipped with soap and clean running water during harvesting and post-harvest handling operations.

Training on personnel hygiene should be conducted annually. Evidence on the conduct of training should be kept. Moreover, the farm should keep track of evidence that hygiene instructions are followed.

Regular environmental and personnel hygiene assessment as well as sanitary inspection of facilities should be conducted to serve as basis for corrective and preventive actions.

### 3.2.3 Harvesting

Harvesting operations and methods should be conducted with consideration on the possible sources of contamination. Depending on the area and the intended end-use of the leaves (i.e. fresh or dried form), the number of days to harvest varies. For transplanted gabi leaves, the maturity index ranges from 30 days to 120 days after transplanting. Other factors affecting the harvest days include variety and the type of production system. Normally upland gabi matures earlier than lowland gabi.

The frequency of harvesting also varies from province to province with some harvesting leaves only when the need arises. On the average, suitable leaves (younger) can be harvested weekly. During harvesting, the leaves should be neatly picked, kept cool and moist and rolled into small bundles. For gabi leaves that will be sold fresh, it is advisable that harvesting be done during the cooler time of the day to prevent wilting.

A responsible person should be present during harvesting to assure that harvester follow proper hand washing techniques and do not harvest damaged leaves and those showing disease symptoms. Fresh gabi leaves that are placed in direct contact with the soil should be excluded and are not to be sold as fresh or used as raw material for primary processing (i.e. drying).

Hygienic practices pertaining to post-harvest operations should be considered. These include cleaning and sanitation of tools used during harvesting, cloth used for wiping the leaves, sanitary condition of the area where primary processing are conducted and personal hygiene of the workers handling the produce.

Since the appearance and intactness of the gabi leaves are commonly associated with quality and freshness, over handling of gabi leaves that are to be sold fresh should be avoided to prevent bruises.

#### 3.2.3.1 Equipment Associated with Growing and Harvesting

Harvesting tools, implements and equipment that have direct contact with the produce should be regularly cleaned, disinfected and maintained in good order.

Equipment and containers used for harvesting should be made from non-toxic materials (e.g. plastic crates). They should be designed and constructed to ensure that, when necessary, they can be cleaned, disinfected and maintained to avoid the contamination. When using reusable harvesting containers (e.g. plastic sacks) and tools (e.g. knife), a

cleaning and disinfection schedule is in place to prevent contamination. A record of cleaning should be available. Containers that are damaged and can no longer be kept in a hygienic condition should be discarded.

As far as practicable, containers used to store harvested produce should only be used for that particular purpose. If these containers are used for other purposes, these must be cleaned and disinfected as necessary prior to use. Never use containers of agrochemicals as containers of harvested gabi leaves.

## **SECTION 4 – HANDLING, STORAGE AND TRANSPORT**

Water loss through transpiration makes leaves dry faster after harvest. Giving due consideration to the final marketable form of gabi leaves (i.e. fresh or dried form), care should be given to ensure that quality is not significantly affected.

### **4.1 Prevention of Cross-Contamination**

Gabi leaves are susceptible to damage and contamination during harvesting and post-harvest handling operations. The following should be considered during manual harvesting and post-harvest handling of gabi leaves, prior to primary processing:

- Evaluate the field for the presence of hazards (e.g. high animal population in the neighboring paddy, rice-duck farming) or contamination prior to harvest to determine if harvesting operations are to be conducted;
- Practice good personal hygiene particularly during manual harvesting, drying and field packing operations;
- Clean and disinfect tools, implements and equipment to prevent cross-contamination from soil and water to the gabi leaves;
- Provide clean harvesting tool for gabi leaves;
- Avoid setting newly harvested gabi leaves directly on the soil after harvest and before loading into transport vehicle to avoid contaminating the gabi leaves with microbiological contaminants from the soil;
- Collect and dispose damaged gabi leaves so that they will not attract animals, microbes and insect pests;
- Growers/agricultural workers should continually reinforce the importance of good hygienic practices since this practice can significantly decrease the risk of contaminating gabi leaves

## **4.2 Field Packing**

Gabi leaves that will be sold fresh or in dried form to institutional buyers or exporters should ensure that field packing operations (i.e. bugkos) are carried out in such a way that contamination due to contact with soil and manure are minimized or prevented. Temporary harvesting containers (e.g. sacks) used and its holding or storage area prior to bulk loading should be clean.

Growers/ agricultural workers during this operation should ensure that containers are used and efforts towards ensuring that these containers do not come in contact with the soil and other sources of contaminants are done.

## **4.3 Storage and transport from the field to the packing/processing facility**

Freshly harvested gabi leaves or dried gabi leaves should be stored and transported under conditions, which will minimize the potential for microbial, chemical or physical contamination.

Prior to transportation of gabi leaves that will be sold fresh, produce are packed in the field in such a way that it can withstand rough handling during loading and unloading, compression from the weight of other containers, impact and vibration during transport and high humidity during transit.

Storage facilities and vehicles for transporting the harvested crops should be built in a manner that minimizes damage to gabi leaves and to avoid access of pests. They should be made of non-toxic materials that permit easy and thorough cleaning. They should be constructed in a manner to reduce the opportunity for potential contamination from physical objects such as glass, wood, plastic, etc.

Gabi leaves unfit for human consumption should be removed before storage or transport to avoid contamination of other harvested gabi leaves.

Prior to transporting harvested gabi leaves, vehicles should be adequately cleaned, and where necessary disinfected, to avoid cross-contamination. When not in use, clean harvest containers and transport trailers should be covered and kept in a protected location. Replace damaged containers or transport trailers.

In cases of transporting dried gabi leaves utilizing public transport system, attention with regard to segregation and proper packaging should be ensured to prevent chemical and microbial contamination.

## SECTION 5 - ESTABLISHMENT: DESIGN AND FACILITIES

Refer to the *General Principles of Food Hygiene (CAC/RCP 1-1969, Rev 4 2003)*.

The provisions below apply to packing and processing establishment (i.e. cutting and drying) of gabi leaves as indicated in the above Code:

### 5.1 Premises and Lay out

#### 5.1.1 Design and Layout

Harvesting and primary processing of gabi leaves is a year-round operation. However due to dependency of the drying operation to solar energy, processing and packing areas should be appropriately protected from pest infestations during lean months. The design of the processing and packing areas should allow thorough cleaning and disinfection of food contact surfaces (e.g. chopping board, tarpaulin, drying machinery) to ensure that foodborne pathogens do not grow in the facility or on the equipment.

Where feasible, raw material handling areas should be separated from processing/packing areas.

Within each of these areas, cleaning operations should be conducted separately to avoid cross-contamination between tools and utensils in each operation.

For products that are not immediately wrapped or packed (i.e. gabi leaves are exposed to contaminants from the environment), the rooms where final products are packed and stored should be designed and maintained to make it as dry as possible. The use of water or having a facility where moisture and humidity is high can enhance the growth and spread of foodborne pathogens.

## SECTION 6 - CONTROL OF OPERATIONS

### 6.1 Control of Food Hazards

Prevention of microbiological contamination is a key control point for all fresh produce operations, including primary processing. Establishment should carefully consider product flow and segregation of incoming soiled and/or damaged, and outgoing fresh and dried gabi leaves to avoid cross-contamination.

Care should be taken to ensure that fresh and dried gabi leaves are not contaminated during transport and handling. Prior to packing, fresh and dried gabi leaves should be inspected for presence of physical contaminants and are culled as necessary.

Culled fresh and dried gabi leaves should be removed from the field or packing facility and disposed in manner that will prevent contamination of other leaves. Culled leaves should be hygienically disposed of to avoid it from attracting pests.

## **6.2. Key Aspects of Hygiene Control Systems**

### **6.2.2 Specific Process Steps**

#### **6.2.2.1 Receipt and inspection of raw materials**

During unloading of raw material, the transportation vehicle should be verified for cleanliness and the raw materials for evidence of contamination and deterioration.

#### **6.2.2.2 Preparation of raw material before processing**

Physical hazards (such as presence of animal and plant debris, metal and other foreign material) should be removed through manual sorting. Raw materials showing signs of damage or rot should be removed from the lot.

#### **6.2.2.3 Cutting and Drying of Gabi Leaves**

The following should be considered:

- If wiping of fresh gabi leaves is practiced to remove dust, tiny insects and other particles, make sure to use clean cloth. Otherwise, running water should be used to wash the gabi leaves.
- Washed gabi leaves should be air dried.
- Before cutting, chopping boards are scrubbed with sanitizer or are applied with alternative surface decontamination such as hot water, steam or other treatments to further reduce microbiological contamination;
- Cutting knife blades, drying materials (i.e. tarpaulin) and equipment (i.e. drying machine) should be cleaned and disinfected on a regular basis to reduce the potential for cross-contaminating gabi leaves during the cutting processes. These tools, materials and equipment should be inspected regularly and discarded if found unfit for further use;
- Drying pavement and other similar drying structure when used should be cleaned and disinfected before and prior use;
- During the drying operations, drying pavement should be protected or enclosed to prevent entry of domestic animals such as dogs, cats, rats and chicken to avoid contamination and damage of crops;

- Knife blade disinfecting solutions (such as sodium hypochlorite solutions) should be monitored to ensure that the disinfectant is present at sufficient levels to achieve its intended purpose;
- Cleaning agents or disinfecting solutions when used, there should be documented evidence (i.e. specific label mention) authorizing use for the food industry which may come into contact with produce.
- Proper personal hygiene should be observed during primary processing of gabi leaves including wearing of proper protective clothing to protect the gabi leaves from contamination

### 6.7 Documentation and Records

Where appropriate, records should be maintained to adequately reflect product information. Maintaining adequate documentation and records of processing information is important in the event of recall of fresh and dried gabi leaves. Records should be kept long enough to facilitate recalls and foodborne illness investigations, if required.

Proper recording should be observed. First-in first-out (FIFO) should be practiced.

### 6.8 Recall Procedures

In the event of a foodborne illness outbreak associated with gabi leaves, maintaining appropriate records of production, processing, packaging and labeling, and distribution may help to identify the source of contamination in the gabi food chain and facilitate product recalls. Growers, processors and distributors should consider developing and maintaining a traceability/product tracing system. The traceability/ product tracing system should be designed and implemented according to the Codex Principles for Traceability/Product Tracing as a Tool within a Food Inspection and Certification System (CAC/GL 60-2006), especially to enable the withdrawal of the products, where necessary.

## SECTION 7 - ESTABLISHMENT: MAINTENANCE AND SANITATION

Refer to the *General Principles of Food Hygiene*. In general, establishments should be located away from areas prone to infestation of pest, pollution, flooding and other potential sources of contamination. Facilities such as water supply, toilet rooms and hand washing areas should be kept in sanitary condition.

## SECTION 8 - TRANSPORTATION

Refer to the *General Principles of Food Hygiene*.

**SECTION 9 - PRODUCT INFORMATION AND CONSUMER AWARENESS**

Pre-packaged fresh and/or dried gabi leaves should be labeled in accordance with the Current *FDA labeling requirements for Pre-packaged Food Products (Department of Health Administrative Order No. 2014-0030)* or its latest issuance. Labels must be printed legibly in accordance to the FDA labeling guidelines in order to assure their adherence to the product during storage and distribution.

**SECTION 10 - TRAINING**

Training should be conducted regularly and according to hygiene instructions. Moreover, the farm and/or the processing area should keep track of evidence that hygiene instructions are followed. Regular environmental and personnel hygiene assessment as well as sanitary inspection of facilities should be conducted to serve as basis for corrective and preventive actions.



**REFERENCES:**

Bureau of Agriculture and Fisheries Standards. 2015. Philippine National Standard (PNS) Code of Hygienic Practice (COHP) for Berries (PNS/BAFS 148: 2015)

Codex Alimentarius Commission. 1969. General Principles of Food Hygiene (CAC/RCP 1-1969, Revision 4-2003)

Codex Alimentarius Commission. 1995. Code of Practice for the Packaging and Transport of Fresh Fruits and Vegetables (CAC/RCP 44:1995)

Codex Alimentarius Commission. 2001. Code of Hygienic Practice for the Transport of Food in Bulk and Semi-Packed Food (CAC/RCP 47:2001)

Codex Alimentarius Commission. 2003. Code of Hygienic Practice for Fresh Fruits and Vegetables (CAC/RCP 53:2003).

Codex Alimentarius Commission. 2006. Principles for Traceability / Product Tracing as a Tool within Food Inspection and Certification System (CAC/GL 60:2006)

GLOBALG.A.P. 2012. localg.a.p. Foundation Level (All Farm Base | Crops Base | Fruit and Vegetables) Version 4.

Oscarsson KV and GP Savage (2006). Composition and availability of soluble and insoluble oxalates in raw and cooked taro (*Colocasia esculenta* var. Schott) leaves. Retrieved on May 23, 2014 from [www.elsevier.com/locate/foodchem](http://www.elsevier.com/locate/foodchem).

**TECHNICAL WORKING GROUP (TWG) FOR  
THE DEVELOPMENT OF THE PHILIPPINE NATIONAL STANDARD (PNS)  
CODE OF HYGIENIC PRACTICE (COHP) FOR GABI LEAVES**

**Chairperson:**

**Ms. Karen Kristine A. Roscom**  
OIC Executive Director  
Bureau of Agriculture and Fisheries Standards (BAFS)

**Vice-chairperson:**

**Ms. Luz R. Marcelino**  
Department of Agriculture  
Regional Field Office V

**Members:**

**Dr. Maria Dulce J. Mostoles**      Central Bicol State University (CBSUA)

**Dr. Lorena F. Hernandez**      Central Bicol State University (CBSUA)

**Dr. Marissa N. Estrella**      Bicol University College of Agriculture  
and Forestry (BUCAF)

**Dr. Lester M. Narvaez**      Bicol University College of Agriculture  
and Forestry (BUCAF)

**BAFS Secretariat:**

Ms. Mary Grace R. Mandigma / Ms. Lara V. Navarro  
Ms. Katrina L. Maminta / Ms. Farlash D. Pancho



**BUREAU OF AGRICULTURE AND FISHERIES STANDARDS**

---

---

**BPI Compound Visayas Avenue, Diliman, Quezon City 1101 Philippines**

**T/ (632) 920.6131 / 455.2856 / 467.9039**

**TF/ (632) 455.2858 / 456.6552**

**E-mail: [bafpsda@yahoo.com.ph](mailto:bafpsda@yahoo.com.ph)**

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