

Training on Food Safety and Good Manufacturing Practices

September 21-23, 2016

Day 1 – Hotel Lorenza, Tacloban City, Leyte

Day 2 and 3 – Brgy. Old Kawayan Multi-Purpose Hall, Tacloban City, Leyte



Date & Venue

September 21-23, 2016

Day 1 - Hotel Lorenza, Tacloban City

Day 2 and 3 - Brgy. Old Kawayan Multi-Purpose Hall, Tacloban City

Facilitator/Trainor

Imelda Picorro (DOST Research Specialist II)

Participants

There were five (5) associations present in the training program. These associations and/or organizations came from various areas or Barangays in Tacloban City. The Groups and Associations present are the following:

1. **Old Kawayan Women's Fish Processing Association (OKWFPA)**, from Brgy. Old Kawayan
2. **St. Vincent Women's Association (SVWA)**, also from Brgy. Old Kawayan
3. **Rural Improvement Club (RIC)**, from Brgy. Burayan, San Jose, Tacloban City
4. **Brgy. 102, Seaweed Farmers**, from Brgy. 102 Cabalawan, Tacloban City
5. **City Agriculture Office**

There were ten (10) members of Old Kawayan Women's Fish Processing Association who participated the training, namely;

1. Josefina Medina
2. Caroline Jane C. Bodaño
3. Cecilia L. Cinco
4. Analiza Behic
5. Edita Malate
6. Marilyn E. Chavez
7. Kareen Olario
8. Ana Fe Cadayong
9. Mary Joy Pla
10. Christine P. Opiniado

St. Vincent Women's Association was represented by its five (5) members:

1. Vevilyin C. Trazona
2. Charito S. Bodaño
3. Ilene M. Bonguet
4. Rebecca L. Bodaño
5. Maricar M. Cinco

The six (6) participants from Brgy. 102, Seaweed Farmers who attended the event were:

1. Rebecca P. Bodaño
2. Chona Navibante
3. Maritoni S. Lucañas
4. Vilma C. Padul
5. Charito L. Laure

6. Maritoni S. Lucañas

There were ten (10) participants from Rural Improvement Club led by their president, 1. Saleha U. Badidles. Other members present were;

2. Ma. Rowena S. Llego
3. Helen Beato
4. Corazon Go
5. Crisilda Padilla
6. Norma Avila
7. Mae Joy Corre
8. Sarah Dador
9. Zenaida Malate
10. Laila Esperas

Lastly, there were two (2) members from the City Agriculture Office:

1. Petrona S. Ayo
2. Wilma A. Balangatan

Overall, there were 33 participants (excluding the facilitator and organizers) who attended the said training.

Aims & Objectives of the Training

1. To boost the skills of the participants on food preparation and processing.
2. To impart the knowledge on how to properly manufacture food products.
3. To demonstrate or illustrate the methods of making different and innovative recipes of fish products specifically, Bangus.
4. To increase awareness on food safety and food hazards.
5. To teach the methods on how to minimize different kinds of contamination and cross-contamination on food that may cause diseases.

Agenda & Activities

Day 1

- Lecture/ Discussion on Food Safety and Food Hazards
- Classification of Food Hazards
- Lecture/ Discussion on the Essentials of Personal Hygiene
- Lecture/Discussion on how Cross-Contamination occurs
- Lecture/ Demonstration on Proper Handwashing Techniques
- Lecture/Discussion on GMP during Production process, how it should be done to eliminate product contamination

Day 2

- Demonstration on Safe Food Preparation
- Deboning of Bangus
- Marinating of Bangus

Day 3

- How to make “Rellenong Bangus” or stuffed Milkfish
- How to make fish burger using Bangus as the main ingredient

The Training Proper

Preliminaries

The training started at 9:40 A.M. on September 21, 2016 at Hotel Lorenza, Tacloban City. The resource persons and the participants were welcomed by the NFR staff, Ms. Hannah Hipe, who led the invocation and the singing of the national anthem and gave the opening remarks. This was followed with the introduction of the speaker/trainor, Imelda Picorro of DOST Leyte, who facilitated the entire training.

SESSION 1: Food Safety and Seminar

Trainor/Facilitator: Imelda Picorro

Lecture 1: Food Safety

Lessons, Key Messages & Concepts

- The lecture was mainly about food safety, food hazards, food contamination, cross- contamination and good manufacturing practices (GMP).
- Food Safety is the assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use.
- Food Safety is important in protecting the human health and the reputation of the country.

- Food Safety can benefit consumers in terms of reducing food-borne diseases, awareness of physical hygiene, increasing confidence in food supply and improving quality of life.
- Food Safety can also benefit the industry in terms of reducing insurance and production costs (reduce wastage of food), improving product consistency, decreasing business risk and increasing profitability.



The trainer, Imelda Picorro, discussed the importance of food safety and the benefits of food safety to consumers and to the industry. The participants listened thoroughly.

Lecture 2: Food Hazards

Lessons, Key Messages & Concepts

- Food hazards can be biological, chemical, allergen and physical.

- Biological hazards are caused by living things such as microorganisms (bacteria, virus, protozoa and fungi) and parasitic worms.
- Microorganisms can be good, bad and pathogenic.
- Good microorganisms are added to food or naturally present in food. Helps on preserving food and/or creating unique flavors and textures.
- Bad microorganisms cause food to spoil. Examples are discolored vegetables, sour milk and slimy, putrid meat.
- Pathogenic microorganisms cause diseases such as foods contaminated with Salmonella.
- Microbes are everywhere. In ideal conditions, bacteria doubles every 20 minutes.



The speaker informed the participants that microbes are everywhere. Microbes are in air, soil, water, in intestines of animals and humans, skins of fruits and vegetables, on raw meat, on insects and rodents, and even in the hands, skin, hair and clothing of people.

Table 2. Generation times for some common bacteria under optimal conditions of growth

Bacterium	Medium	Generation Time (minutes)
<i>Escherichia coli</i>	Glucose-salts	17
<i>Bacillus megaterium</i>	Sucrose-salts	25
<i>Streptococcus lactis</i>	Milk	26
<i>Streptococcus lactis</i>	Lactose broth	48
<i>Staphylococcus aureus</i>	Heart infusion broth	27-30
<i>Lactobacillus acidophilus</i>	Milk	66-87
<i>Rhizobium japonicum</i>	Mannitol-salts-yeast extract	344-461
<i>Mycobacterium tuberculosis</i>	Synthetic	792-932
<i>Treponema pallidum</i>	Rabbit testes	1980

http://textbookofbacteriology.net/growth_3.h

- Factors affecting the growth of bacteria are food, acidity, temperature, time, oxygen and moisture.

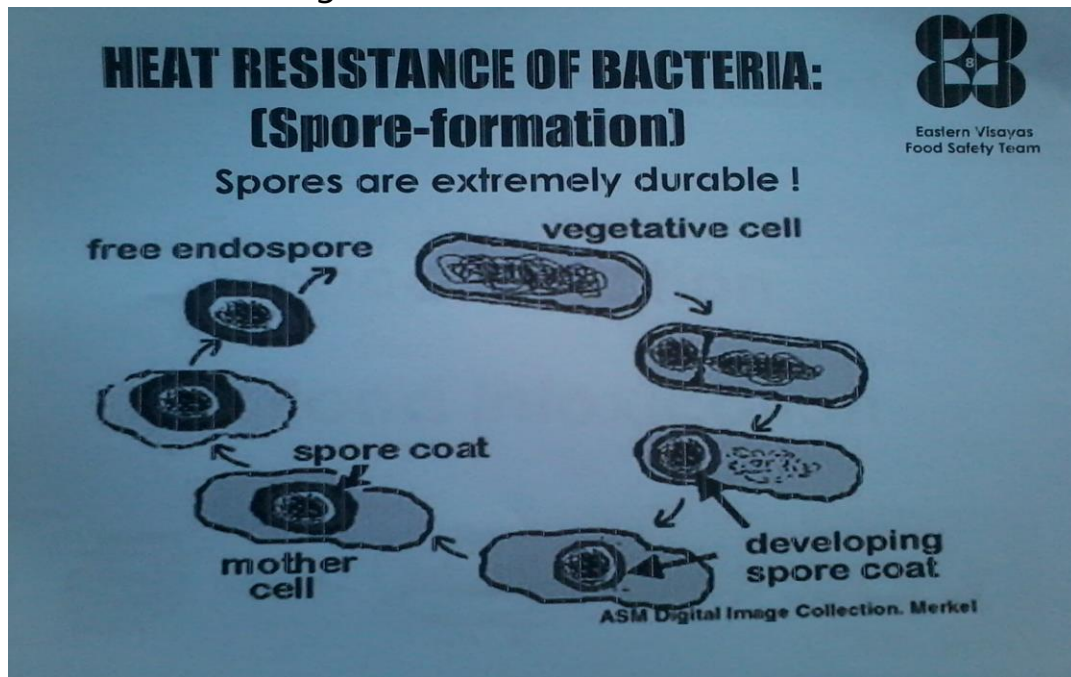
Growth Factors



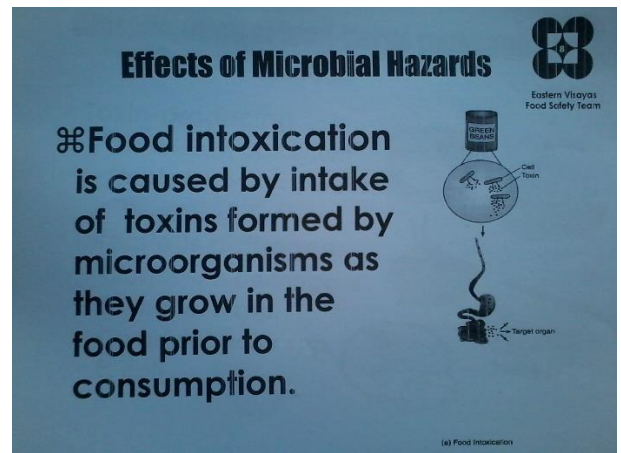
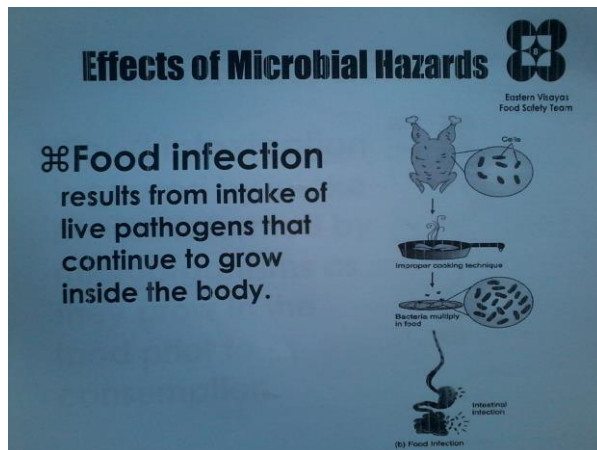
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- **Food** Nutrients, provided by most foods.
- **Acidity** Most bacteria grow best at near neutral conditions (**pH 6.5 – 7.5**)
- **Temperature** Temperature danger zone is **4 – 60°C**. Growth increases with temperature
- **Time** Growth to dangerous levels can occur **after 2 hours**
- **Oxygen** Some require oxygen to grow, some require little or no oxygen. Most grow with or without oxygen.
- **Moisture** Water requirements vary. Bacteria need the most. Yeasts and molds require less

- Bacteria cause the greatest number of food-borne diseases.




- The effects of microbial hazards are food infection and food intoxication.




- Food-borne pathogens are classified into toxin-producing and infectious pathogens.

Classification of food-borne pathogen (Effects)



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- **Toxin-producing**
 - *Clostridium botulinum*
 - *Staphylococcus aureus*
- **Infectious pathogens**
 - *Clostridium perfringens*
 - *Salmonella spp.*
 - *Campylobacter spp.*
 - *E. coli*



CLOSTRIDIUM BOTULINUM

(klo-strid'e-um boch'ōō-li-num)


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Foods Associated with Clostridium botulinum:

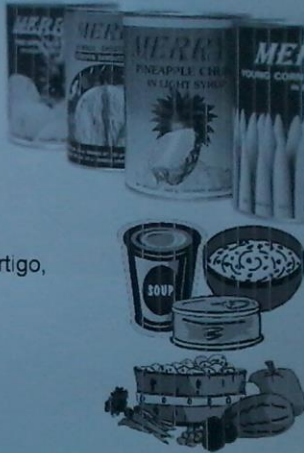
- Improperly processed home canned food.
- Improperly processed or damaged canned or aseptically processed food.

*Infant botulism may occur when infants ingest **honey containing C. botulinum spores** which then colonize and produce toxin in their intestines.*

Characteristics of Illness: Symptoms include double vision, vertigo, inability to swallow, speech difficulty and progressive respiratory paralysis.
Nausea may also be present initially.

Prevention of Illness:

- Follow appropriate techniques when home canning.
- Do not eat food from swollen, leaking or severely damaged cans.
- Keep foods which are supposed to be refrigerated below 4° C.
- Do not feed honey to infants under 1 year old.



E. COLI O157:H7

(esh'er-í'ke-ah cō lī)



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Foods Associated with E.coli O157:H7:

- a. Undercooked and raw ground beef
- b. Unpasteurized apple cider
- c. Raw milk and raw produce.



Characteristics of Illness: Severe cramping and diarrhea which is initially watery but becomes grossly bloody.

*Young children are especially susceptible and in some cases, complications which lead to **hemolytic uremic syndrome (HUS)** may occur. HUS may lead to permanent loss of kidney failure, or fatality occurs in up to 15% of HUS cases.*

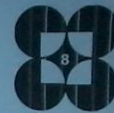


Prevention of Illness:

- a. Cook ground beef to an internal temperature of 72°C.
- b. Wash fresh fruits and vegetables thoroughly with running water.
- c. Do not drink unpasteurized milk.
- d. Do not drink unpasteurized apple cider unless it is well refrigerated.

STAPHYLOCOCCUS AUREUS

(staf í-lo-kok'us au'reus)



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Foods Associated with Staphylococcus aureus:

- a. meat and meat products
- e. sandwich fillings
- b. poultry and egg products
- f. milk and dairy products.
- c. salads such as egg, tuna, potato and macaroni
- d. cream-filled bakery products and pies

In general, Staph poisoning often occurs when a food has been handled a great deal (such as the chopping and handling involved in making a salad or sandwich) and is then left at temperatures above refrigeration which allow the bacteria to multiply and produce toxin.

Characteristics of Illness: Vomiting, diarrhea and abdominal cramps.

Prevention of Illness:

- a. Always wash hands well when preparing food.
- b. Keep food refrigerated.

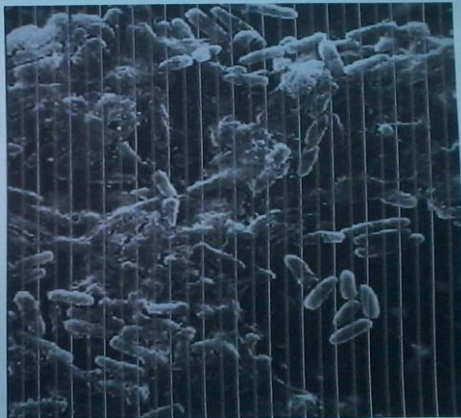


DOST Research Specialist II, Imelda Picorro, reminded the participants not to consume damaged canned foods and unpasteurized milk. She added, “Cold food, consume cold and hot food, consume hot”.

- Bacteria tend to form biofilms that prevent sanitizers from reaching the surface of bacteria. Biofilm is a complex aggregation of microorganisms growing on a solid substrate. Example is dental plaque.

Biofilms

Biofilms form when bacteria adhere to surfaces in aqueous environments and begin to excrete a slimy, glue-like substance that can anchor them to all kinds of material



<http://bacteriality.com/2008/05/26/biofilm/>

Examples of Biofilms



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- Teeth (dental plaque)
- Surfaces that are continuously wet (drains, floors, food processing equipment)



- Virus does not cause spoilage but infects living cells and reproduces inside the host cell. Transmission usually by fecal-oral route and related to poor personal hygiene and improper food handling. Viruses may cause Hepatitis A.

Example of disease caused by Virus:

HEPATITIS A

(hep'ah-ti'tis)



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Foods Associated with Hepatitis A:

- | | |
|----------------|---------------|
| a. Sandwiches | d. vegetables |
| b. Shellfish | e. water |
| c. Salads and. | |

*Transmission of this illness via foods is most often associated with contamination of food by **infected food handlers**.*

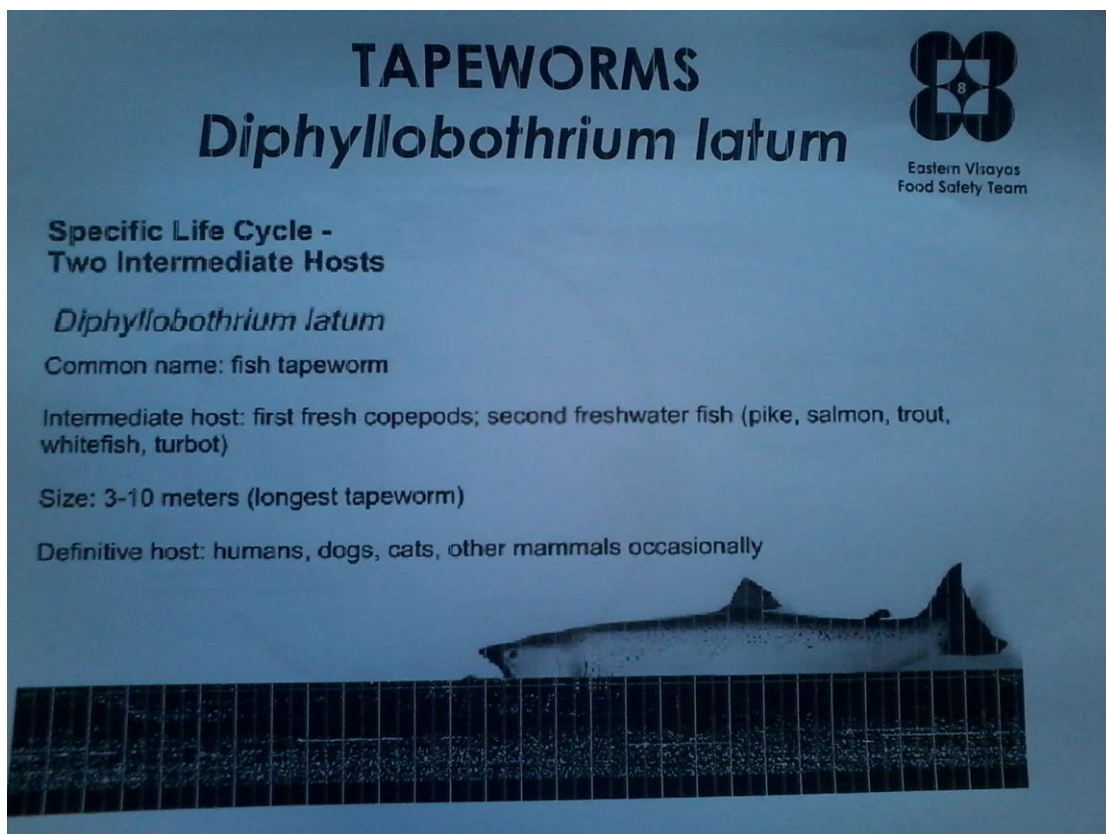
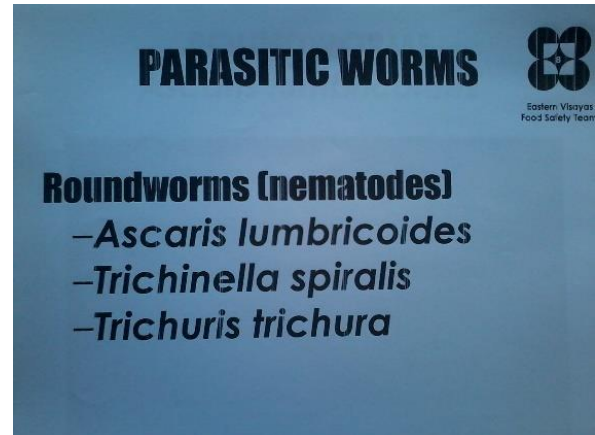
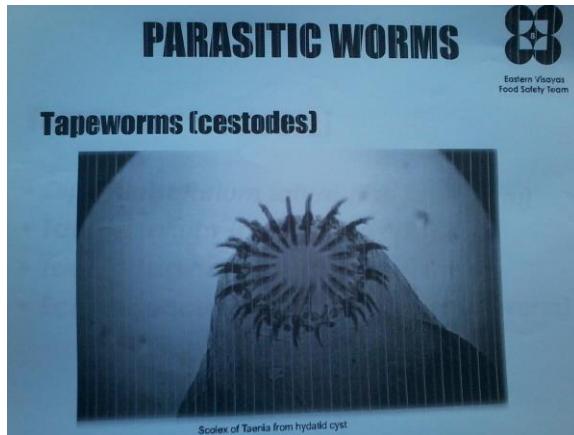
Characteristics of Illness: Sudden onset of fever, malaise, nausea and abdominal pain, followed by several days of jaundice.



Prevention of Illness:


- a. Always wash hands well when preparing foods.
- b. Wash fresh fruits and vegetables thoroughly under running water.
- c. Avoid eating raw shellfish.
- d. Do not let ill workers handle or prepare food.

- Only 100 types out of thousands existing parasites are known to infect people through food contamination (transmission through food and water). Examples of parasitic worms are flatworms, roundworms and tapeworms.



- Chemical hazards may be naturally occurring, intentionally added and incidentally or unintentionally added.
- Naturally occurring chemical hazard may come from mushrooms and "gaway".

NATURALLY OCCURRING CHEMICAL HAZARDS




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Mycotoxins


- Derived from the Greek words "MYKES" (fungus) and "TOKSIKON" (poison)
- Toxic products of microscopic fungi or molds that have serious adverse effects in humans and animals
- Toxic & carcinogenic metabolites

MOLDS: Mycotoxin Producing




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- Multicellular, visible mycelium and pigmented fruiting structures
- Growth not as dependent on temperature as bacteria
- Exist in dormant state as spores resistant to low moisture, high heat, high acidity, or freezing



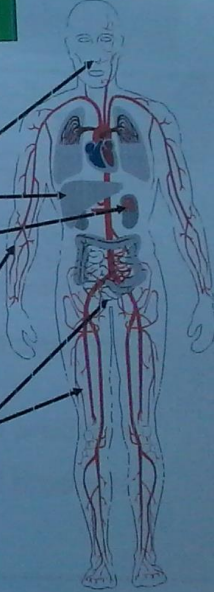
NATURALLY OCCURRING CHEMICAL HAZARDS



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Target Organs of MYCOTOXINS

Mycotoxin	Target
Aflatoxin	liver
Ochratoxin A	kidney
Trichothecenes	mucosa
Ergot alkaloids	peripheral vascular system
Zearalenone	uro-genital tract



NATURALLY OCCURRING CHEMICAL HAZARDS



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MYCOTOXINS IN THE PHILIPPINES

Mycotoxins	Fungi	Agricultural Crops/Products
Aflatoxins	<i>Aspergillus flavus</i> <i>Aspergillus parasiticus</i>	Corn, peanuts and other nuts, copra/copra meal, soybeans, milk and their products
Fumonisin	<i>Fusarium moniliforme</i> <i>Fusarium proliferatum</i>	Corn and products
Zearalenone	<i>Fusarium graminearum</i>	Corn and products
Trichothecenes (Nivalenol)	<i>Fusarium graminearum</i>	Corn and products

NATURALLY OCCURRING CHEMICAL HAZARDS



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AFLATOXINS

Cancer-causing substances
produced by molds:

- *Aspergillus flavus* &
- *Aspergillus parasiticus*



NATURALLY OCCURRING CHEMICAL HAZARDS



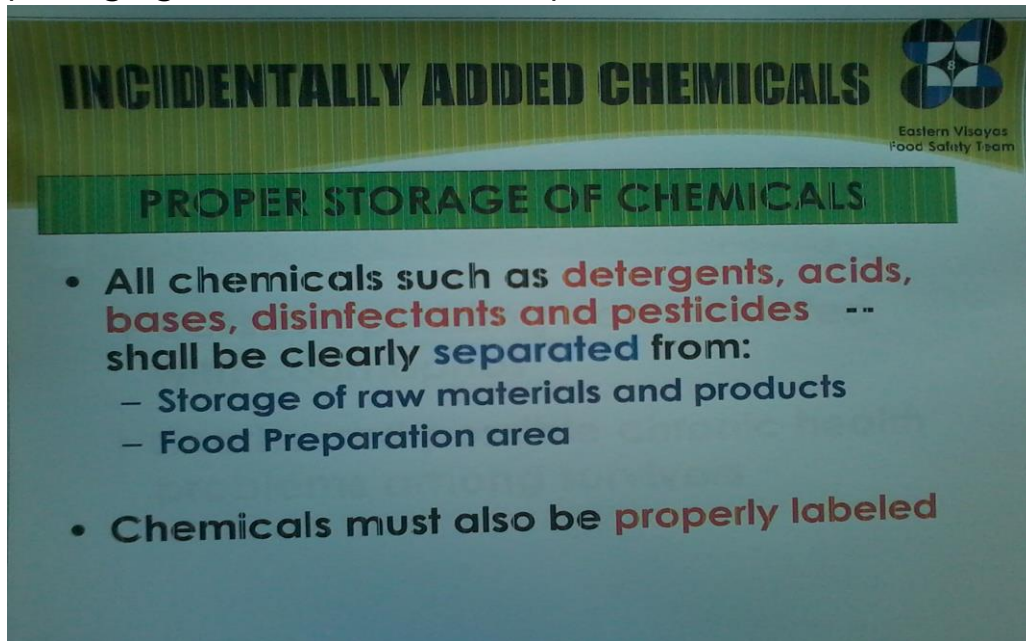
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CONTROL OF AFLATOXINS IN PEANUTS

- **Ensure freshness (max 3-9 months)**
- **No insect damage**
- **No evidence of moisture**
- **No rancid or musty smell**
- **No black (moldy) spots**
- **Stored in dry, cool and dark place**
- **Batch analysis**

- Intentionally added chemicals that may cause food hazards are preservatives, nutritional additives and color additives.
- The overuse of preservatives can cause damage to the body such as increase in blood pressure, mutation, chromosomal damage and damage to the brain.

- Incidentally added chemicals are pesticides and herbicides, environmental contaminants, cleaning chemicals, paints, and packaging residues and reaction products.

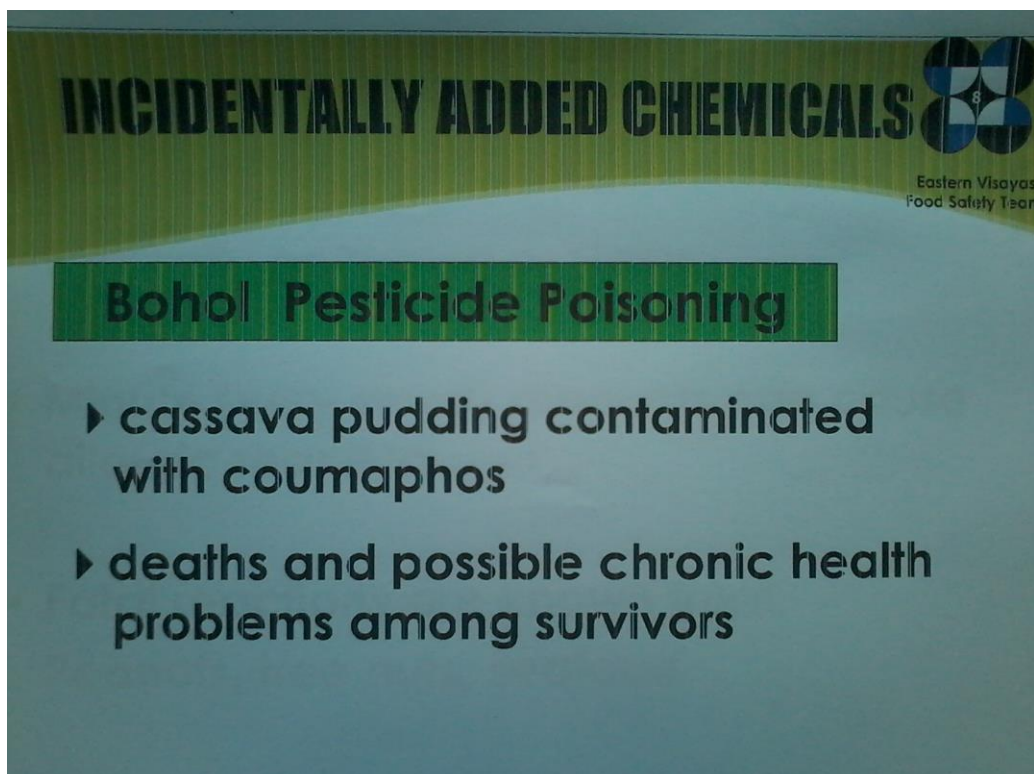


INCIDENTALLY ADDED CHEMICALS

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PROPER STORAGE OF CHEMICALS

- All chemicals such as **detergents, acids, bases, disinfectants and pesticides** -- shall be clearly **separated** from:
 - Storage of raw materials and products
 - Food Preparation area
- Chemicals must also be **properly labeled**



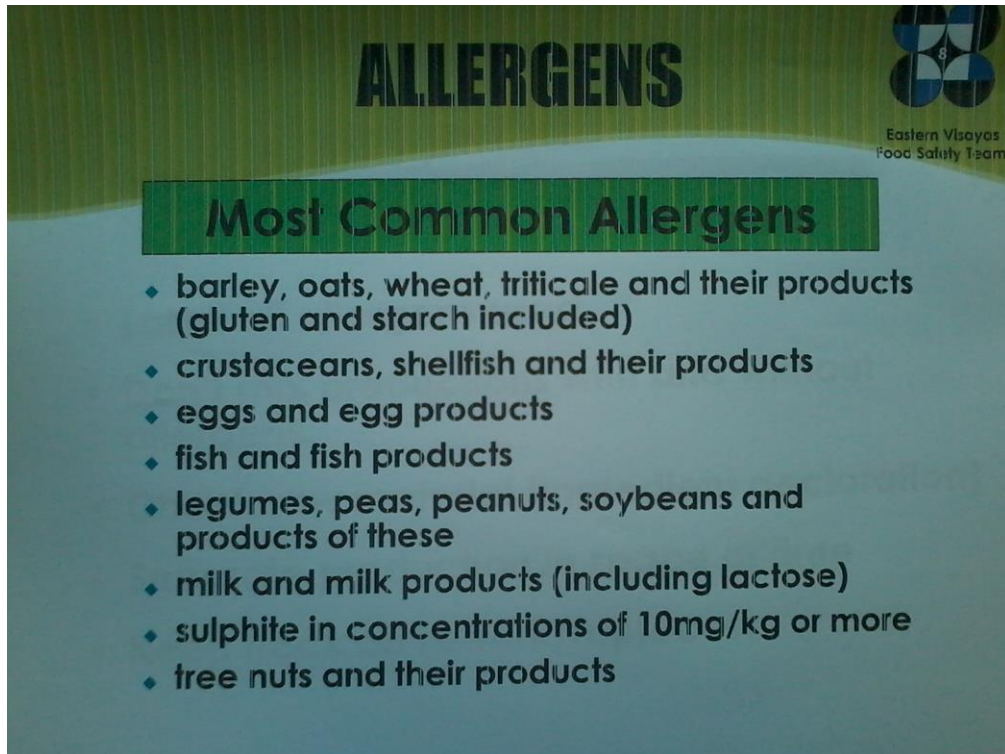
INCIDENTALLY ADDED CHEMICALS

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Bohol Pesticide Poisoning

- ▶ cassava pudding contaminated with coumaphos
- ▶ deaths and possible chronic health problems among survivors

- Allergens are naturally occurring proteins. Fatal reactions are known from peanuts, tree nuts and seafood.

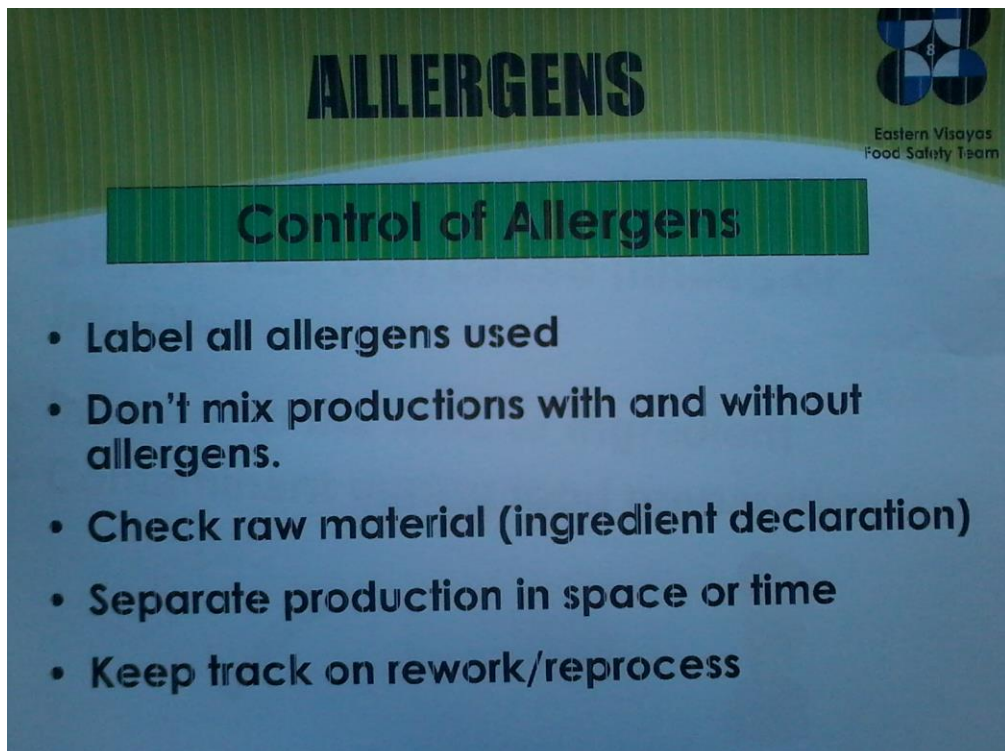


ALLERGENS

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Most Common Allergens

- ♦ barley, oats, wheat, triticale and their products (gluten and starch included)
- ♦ crustaceans, shellfish and their products
- ♦ eggs and egg products
- ♦ fish and fish products
- ♦ legumes, peas, peanuts, soybeans and products of these
- ♦ milk and milk products (including lactose)
- ♦ sulphite in concentrations of 10mg/kg or more
- ♦ tree nuts and their products



ALLERGENS

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Control of Allergens

- Label all allergens used
- Don't mix productions with and without allergens.
- Check raw material (ingredient declaration)
- Separate production in space or time
- Keep track on rework/reprocess

- Physical hazards: a hard foreign object that can cause illness or injury.



PHYSICAL HAZARDS

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Potential Physical Hazards

In the food or ingredients

- Bone fragments (ground beef)
- Feathers from animal carcass (turkey)

Contamination during processing

- Stones, rocks, dirt in vegetables
- Metal from processing equipment (ground beef)
- Jewelry, fingernails (food handler)

- Possible control measures: visual inspection, filters, metal detectors, magnets, separation by density and personnel precautions.

Lecture 3: Contamination and Cross-contamination, Essentials of Personal Hygiene, and Handwashing Basics

Lessons, Key Messages & Concepts

Contamination and Cross-contamination on Food

- Minimize Contamination and Cross-contamination by:
 - Don't prepare food when you are sick
 - Wash your hands
 - Separate ready to eat foods from raw foods
 - Separate different types of raw foods
 - Clean and sanitize/disinfect between different types of food
 - Use labels and color coding in segregating raw materials and utensils



The speaker discussed how to minimize contamination and cross-contamination on food, how to prevent it and how does contamination happen. The participants listened carefully.

What is Contamination?



The presence of substance or conditions in the food that can be harmful to humans.



What is Cross-contamination?



- The transfer of biological or chemical contaminants from foods (usually raw) to other foods.
 - The contaminants can be transferred directly when one food touches or drips onto another
 - Or indirectly from: hands, equipment, work surfaces (chopping boards), cloths or knives and other utensils.
- Cross-contamination is one of the major causes of food poisoning.

How does it happen?



- Storing raw and ready to eat food together
- Not washing hands after touching raw food
- Using the same chopping board or knife for raw and ready-to-eat food



How to prevent?



- Store raw and cooked food separately (be ware of dripping).
- Use different (or properly cleaned and sanitized) surfaces and utensils for raw and ready to eat food.
- Keep food in clean covered containers separate from chemicals.
- Always maintain good personal hygiene.

Minimize Bare Hand Contact



- Use utensils, food grade paper
- Use clean and/or disposable gloves
- Wash your hands before touching gloves
- Change gloves between tasks
 - when they are dirty or torn
 - when they are contaminated
 - anytime that a hand would need washing



How to prevent?



Separate raw (meat) from ready to eat food.



Keep highest hygiene level with ready to eat food

Essentials of Personal Hygiene

- Personal cleanliness of working personnel is important in preventing food hazards.
- Personnel with illness or injuries must refrain from working.
- No wearing of jewelries, watches and other accessories when working.
- Personal Behavior - no smoking, no chewing and eating while in food processing and no sneezing.

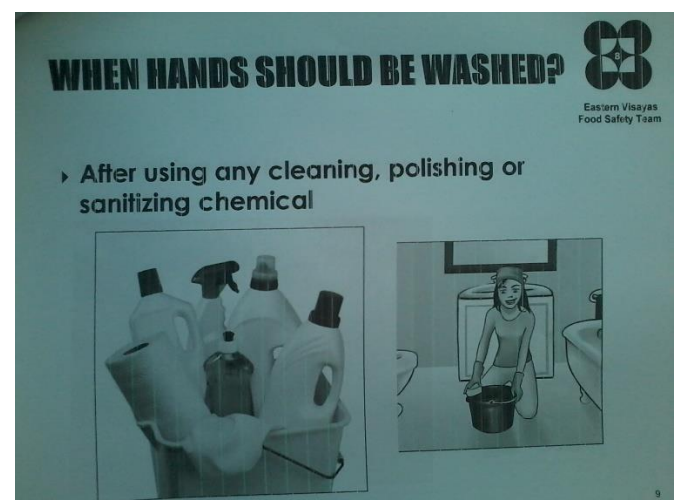
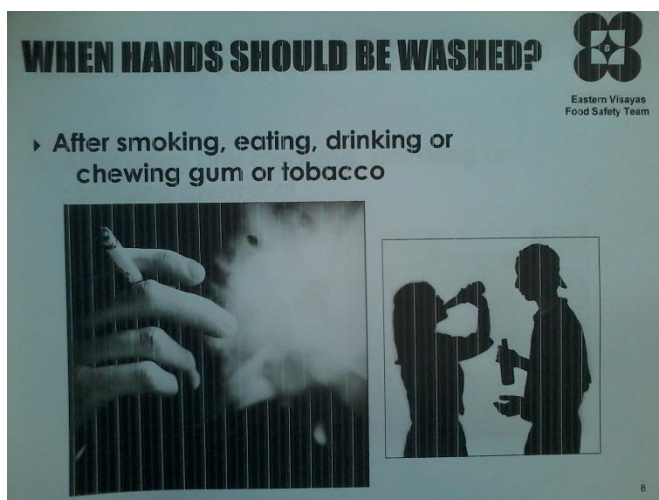
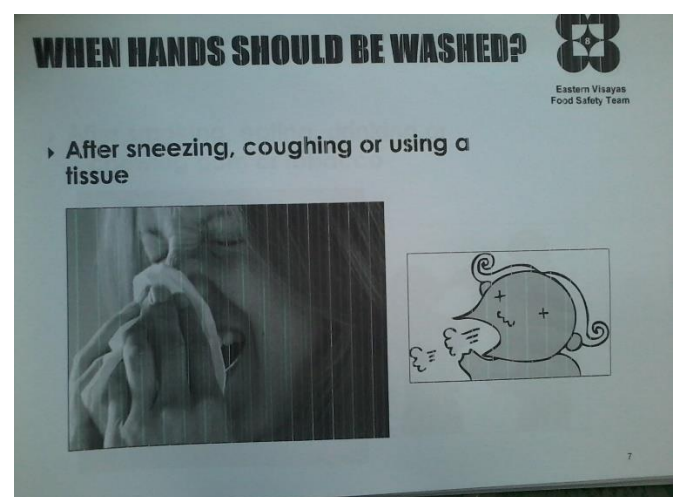
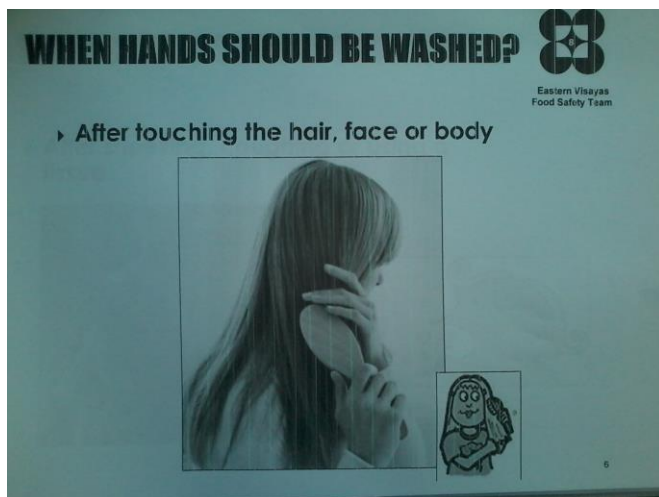
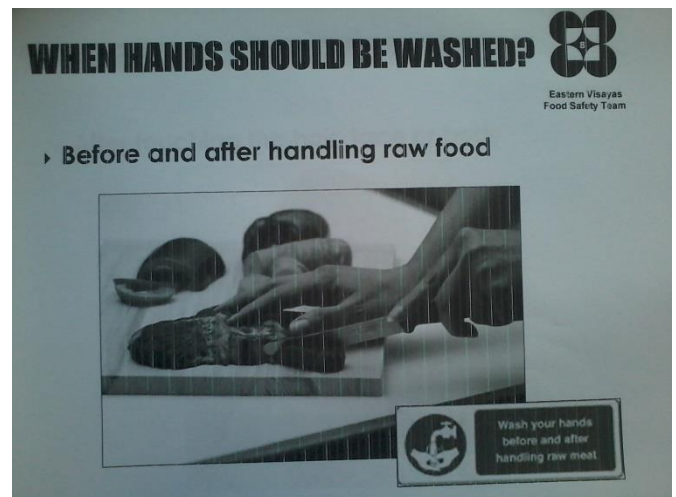


The speaker explained to the participants the importance of good personal behavior while in food processing.

Handwashing Basics

- Handwashing is important to prevent food contamination and to prevent the spread of food-borne illnesses.



- When should hands be washed:



WHEN HANDS SHOULD BE WASHED?

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- ▶ After taking out the garbage or trash





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WHEN HANDS SHOULD BE WASHED?

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- ▶ After cleaning tables or busing dirty dishes



WHEN HANDS SHOULD BE WASHED?

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- ▶ After touching soiled aprons or clothing



WHEN HANDS SHOULD BE WASHED?

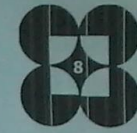
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- ▶ After touching anything else that may contaminate the hands, such as
 - unsanitized equipment,
 - work surfaces or
 - cleaning clothes




Demonstration of how to see bacteria present in the hands. Ultraviolet light was used to see the bacteria. There is no photo illustrating the use of UV light because of lighting issue.

MISSED AREAS DURING HANDWASHING



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- Areas most frequently missed during hand washing
- Less frequently missed
- Not missed

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HANDWASHING PROCEDURE



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STEP 1:

Wet hands with hot running potable water

- Use water as hot as the hands can comfortably stand.
- Approximately 43°C (110°F).



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HANDWASHING PROCEDURE

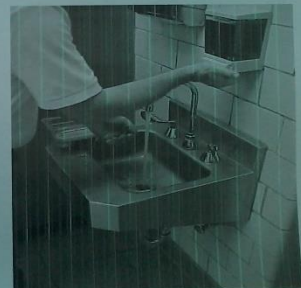


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STEP 2


Apply enough soap to build up a good lather.

- Soap may be liquid, powder or bar soap.




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HANDWASHING PROCEDURE


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STEP 3
Rub hands together for at least 20 seconds.

- One fun way to teach this is to have the employee sing "Happy Birthday" while lathering their hands




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HANDWASHING PROCEDURE


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STEP 4
Clean under fingernails and between fingers.

- A nail brush is recommended. But avoid splashing.




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HANDWASHING PROCEDURE



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STEP 5
Rinse hands thoroughly under running water.




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HANDWASHING PROCEDURE


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STEP 6
Dry hands.

- Hands should be dried with clean, single use, disposable paper towels or hot air blow dryer.



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- Handwashing station must be convenient and accessible by the employees. Should have warm potable running water (43° C water must be available).
- Liquid soap is preferred in handwashing.
- Hand sanitizer may be used after washing the hands and never be used to replace proper hand washing.
- Fingernails should be kept short and clean.
- Cuts and sores should be treated and kept covered with clean bandages.

Lecture 4: Good Manufacturing Practices (GMP)

Lessons, Key Messages & Concepts

- Quality ingredients and proper manufacturing steps are important.
- Sanitation Standard Operating Procedure (SSOP) is a specific written procedure in GMP.
- Must have good pre-operational and operational procedures.
- Good hygiene and appropriate practices are important.
- Food and drug administration and ASEAN integration help in regulating food products. RA 106011 is the food safety act of 2013.
- Good = quality; Manufacturing = hygienic, suitable requirements, production and preparation; Practices.
- GMP requires cleaning, pest control, operational methods, personnel practices and maintenance for food safety.



The speaker, Imelda Picorro, explained the necessary location/ environment for GMP. Areas must not be near the ocean, cemetery, poultry, sewage, and not near highways – 50 meters away.

- Waste collection areas must be far from working areas.
- Plant premises – grounds shall be constructed and maintained. Must have adequate maintenance of grounds.



Ma'am Imelda Picorro explained the importance of how building facilities should be constructed properly to avoid food contamination and strengthen food safety.

- Water supply and Good Hygienic Practices (GHP) are vital in GMP.
- Handwashing and disinfection, storage and waste facilities are important.

Day 1 ended at exactly 4:00 P.M. The lessons discussed were food safety and hazards, contamination, essentials of personal hygiene, handwashing basics and Good Manufacturing Practices (GMP). The training will resume at Brgy. Old Kawayan Multi-purpose Hall, Tacloban City on September 22, 2016. It is expected on Day 2 to have a Demonstration and training on Deboning of Bangus.

The second day of the training course started at 10:30 A.M.

SESSION 2: Demonstration on Food Preparation and Processing

Trainor/Facilitator: Imelda Picorro

Demonstration on food preparation (Deboning and Marinating of Bangus)

Key Messages & Concepts of the Session & Activity

- Deboning of Bangus (Milkfish) properly.
- When selling deboned Bangus, do not use the term "Boneless Bangus" because there is insufficient guarantee that the "Boneless Bangus" you sell is 100 percent no bone. Use the term "**Deboned Bangus**" for safer marketing of the product.

Activity 1: Deboning of Bangus

Raw Materials:

- Bangus (Milkfish)

Equipment:

- Forceps
- Cutting/Chopping board
- Sharp knife
- Utility tray
- Basin

Pre-preparation:

1. Washing. Wash fish upon arrival from the market. The fishes used were stored in a bucket with ice. Scales may or may not be removed.
2. Splitting. Split fish on the dorsal side starting from the tail to the head by running the edge of the knife along the backbone.



Demonstration of splitting of bangus properly. The participants watched carefully.



One participant splitted the Bangus accordingly to the trainor's instructions. Other participants observed.



Some participants in action: Splitting of Bangus.

3. Removal of internal organs. Lay fish open like a butterfly fillet. Remove gills and internal organs. The black membrane covering the belly cavity may or may not be removed depending upon the consumer's choice. Wash fish in running water.

Demonstration on how to remove the internal organs of Bangus properly. The black membrane was not removed.

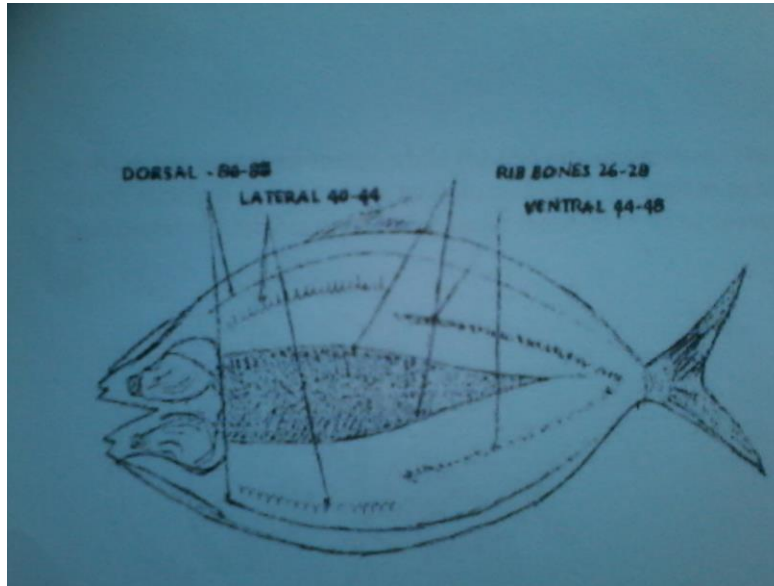


4. Removal of backbone dorsal fin. Remove backbone by laying fish flat on the cutting board with the skin down. Hold the knife in a horizontal/slanting position and cut in with the tip of the blade along the backbone from the head to tail. Trim off the dorsal fin.



A certain participant removed the backbone dorsal fin. The other participant observed.

Deboning Proper:



Note: It is important to know the exact location of the spines especially the intermuscular spines.



The trainer illustrated and explained the location of bones for the participants to know where to look when deboning.

Deboning:

1. Rib bones. The bones are located in the belly cavity. They are visible and superficially embedded thus easy to pull out.
 2. Dorsal intermuscular spines. Make a superficial slit from head to tail along the dent of the dorsal muscle. Pull out the embedded intermuscular spines one at a time. The spines on the head portion are the branched spines while the rest are unbranched. The spine on the tail portion are very much attached to the muscle tendon, making it difficult to remove. It is necessary to make a horizontal slit on this portion for easier removal of these spines.
 3. Lateral intermuscular spines. Area located in-between the dorsal and ventral muscles. Pull out first the large arch-shaped spines at the base of the operculum. Proceed pulling out the Y-shaped spines up the mid-portion of the body ending with 3 delicate spines.
 4. Ventral intermuscular spines. Make a shallow slit along the dent between the muscle segments of the ventral side and mid-portion of the body to the tip of the muscle in the tail. Pull out the first 2 very fine and delicate spines found in the mid-body which is the start of the spines located in this portion. Proceed to the tail region.
- These information are based on the hand-outs given by the trainor, Imelda Picorro, about how to make deboned Bangus.



Making of slit along the dent between the muscle segments of the ventral side and mid-portion of the body to the tip of the muscle tail for easier pulling of bones.



The participants watched and carefully observed the demonstration of the trainor in deboning of Bangus. Some participants recorded the demonstration.



One participant deboned the Bangus together with the trainor.

Participants in action:









After deboning, the participants put the deboned Bangus in plastic bags for sealing.



A certain participant and the NFR community organizer, Christine Cartalla, sealed the deboned Bangus.



A participant with her deboned Bangus.

- Some deboned Bangus were sealed and will be used on Day 3 (September 23, 2016) for making of Rellenong Bangus and Fish Patties.
- Some deboned Bangus were marinated. Soy sauce or "toyo" was not used for marinating because the meat of the Bangus turns black when fried or cooked.

Activity 2: Marinating of Bangus

Ingredients:

- Deboned Bangus
- Vinegar
- Garlic
- Salt
- Calamansi

Equipment:

- Sharp Knife
- Chopping Board
- Measuring cups
- Basin



The trainor, Imelda Picorro, prepared the ingredients for marinating. She minced the garlic into small cubes. The participants together with the community organizer watched.

Measuring of what amount of Vinegar to be used accordingly to how many pieces of deboned Bangus to be marinated.





Some of the participants observed and took notes about the procedures of marinating.

Marinated
Deboned
Bangus



Day 2 of the training course ended at 2:30 P.M. The activities completed were Deboning and Marinating of Bangus. Day 3 will be on Food Processing – Making of “Rellenong Bangus” or stuffed Bangus and making of Fish Burger.

SESSION 3: Food Processing – Rellenong Bangus and Fish Burger

Trainor/Facilitator: Imelda Picorro

Key Messages & Concepts of the Session & Activity

- There are many dishes using Bangus as the main ingredient.
- Fish patty can also be a good alternative for meat patty.
- The weight of each patty must be equal. In the activity, 50 grams was used as the basis for weighing the patties.

Activity 1: “Rellenong Bangus” or Stuffed Milkfish

Ingredients:

- Bangus (Milkfish)
- Onions, chopped finely
- Garlic, minced
- Carrots, small cubes
- Raisins
- Eggs
- Vetsin (monosodium glutamate)
- Salt
- Bell pepper, chopped finely
- Flour
- Oil for frying

Equipment:

- Sharp Knife
- Chopping board
- Utility tray

- Basin
- Needle, for stitching
- Measuring cups



The participants took notes and copied the ingredients on the board written by the trainer since no hand-outs were given.

Procedure:

1. Scrape fish scales. Clean. Gently pound fish to loosen meat from the skin. Use flat side of a knife for pounding.



Scraping of fish scales and cleaning of fish. After cleaning, pound fish gently to loosen fish. The participants observed.

2. Break the bone at the nape and on the tail. Insert the end of the handle of an aluminum kitchen turner (sandok) through the fish neck. In the activity, straighten bamboo was used.
3. Gently scrape down the handle between the meat and the skin. Scrape down to the tail, going around and on the other side of the fish.
4. If you feel the meat is entirely separated from the skin, remove the handle, squeeze and push out the meat (with the big bone), starting from the tail going out through the head. This way, you will be able to push out the whole meat without cutting an opening on the skin.



The trainer demonstrated how to remove the fish meat and innards of the Bangus. Separated the meat from the skin. The participants observed.



Two participants worked together in separating the fish meat from the skin of the Bangus.



While some participants removed the fish meat, other participants prepared the other ingredients for the mixture of what will be stuffed on the skin of the Bangus



The trainor, Imelda Picorro, with the participants prepared together the potatoes and carrots for the mixture.



The DOST S&T Director, Engr. John Glenn Ocana, visited and observed the training.



The participants checked and removed the bones from the fish meat.

5. Sauté garlic until brown. Add onion. Stir in fish meat, carrots, potatoes and pepper. Season with salt, vetsin, ground pepper. Add raisins.
6. Transfer cooked mixture to a plate. Cook, then, add raw egg and flour.



The trainor together with other participants cooked the mixture.



The cooked mixture for stuffing.

7. Fill in mixture in the Bangus skin. Stich the neck of the Bangus after filling.



The participants together with the trainor stuffed the cooked mixture to the skin of the Bangus.



Stitching of the neck to avoid leaking of the cooked mixture inside the Bangus.



The stuffed Bangus for cooking.



A certain participant cooked the stuffed Bangus.



Finished product: “Rellenong Bangus” or stuffed Bangus.

Activity 2: How to make Fish Burger

Ingredients:

- 2 kilos fish meat
- 6 teaspoon salt
- 4 tsp. black pepper
- 3 tsp. calamansi (lime) juice
- 2 cups onions, chopped
- 4 pcs. Fresh eggs
- 4 tablespoon hamburger seasoning
- 2-4 tbsp. flour
- Oil for frying

Additional ingredients for burger:

- Catsup
- Cheese spread
- Cucumber
- Bread buns

Equipment:

- Sharp knife
- Utility tray
- Bowl for mixing
- Forceps
- Weighing scale
- Measuring cups
- Plastic/Disposable gloves

Pre-preparation

1. The deboned Bangus on Day 2 was used for making the patties. The participants checked the deboned Bangus for possible remains of bones.



Two participants checked the deboned Bangus. Note: Even a tiny bit of bone remains in patties can cause food hazards.

2. After checking, weigh the fish meat according to the number of patties you want to produce.



The participants weighed the fish meat. In the activity, the proposed amount of meat was 2 kilos.

Making of Patties:

1. Chop the fish meat into bits and mash.



Some participants chopped the fish meat into flakes.

2. In a bowl or basin, combine all the ingredients and mix thoroughly.



The participants together with the trainor mixed all the ingredients.

3. Divide the mixture into serving pieces. Roll it into balls and flatten it.



Making of fish patties. In the activity, the mixture was divided and weighed into 50 grams each.



Bangus fish patties for frying.

Final stage: Making of fish burger

1. Cook the fish patties.
2. Prepare and add the additional ingredients. Serve with cucumber, catsup and cheese spread.



The making of Fish Burger. The trainor, Imelda Picorro prepared the food. Other participants helped.



Final product: Fish Burger

The training course ended at 4:10 P.M.

After the activities, there was a forum conducted and supervised by the NFR staff, Hannah Hipe, to talk about the feedbacks of the participants regarding the training.

FEEDBACKS OF THE PARTICIPANTS

FROM RURAL IMPROVEMENT CLUB (RIC):

1. "From the start, damo an nabaruan ha pagproseso tas pagluto" – From the start, there are many things learned in food processing and cooking.
2. "More knowledge an nabaruan o na-gain" – More knowledge gained.
3. "Klaro an katutdo" – Clear teaching or training.
4. "Nabaro dayon" – Learned quickly.
5. "Mayda gihap dre nasusunod nga proseso" – There were processes or procedures that have not been followed.
6. "Danay waray nasusunod o nangangalimtan pero OK an lecture ni Maam" – Sometimes, there were procedures left out. However, the lecture of the trainor, Imelda Picorro, was good.

Comments concerning the cooking:

1. "An karaha dre maupay o dre naangay lutu-an kay dire flat" – The frying pan used in cooking was not appropriate because it was not flat thus it was hard to cook.
2. "Kun magluluto, dapat prepared an ingredients" – When cooking, the ingredients must be prepared.
3. "An table dre dapat plastic (kay mahugaw), stainless dapat it table o pwede butangan liwat hin acetate it plastic table" – The table must not be plastic (because it's dirty). Stainless table should have been

used or maybe, the plastic table should have been covered with acetate.

FROM OLD KAWAYAN WOMEN'S FISH PROCESSING ASSOCIATION AND OTHER OLD KAWAYAN GROUPS:

1. "Damo an nabaruan nga recipe or ingredients para bangus" There were many recipes and ingredients learned using Bangus.
2. "An market value, dapat it pag-kwenta, kun ano la an im gingamit dire an nga tanan" – For the market value of the product, the counting of market value must be in relation to the ingredients used or the expenses for food processing rather than all the expenses.
3. "Dapat maghugas hit kamot, proper putting of hairnets, no jewelry or accessories, dapat waray samad gihap basta nagluluto" – The hands must be washed, proper putting of hair nets, no jewelries or accessories and must not have any wounds when cooking.
4. "Nag-enjoy, damo an nabaruan" – Enjoyed, many lessons learned.

APPENDIX

APPENDIX A

The Trainor/Facilitator

TRAINOR/ FACILITATOR	SESSIONS DISCUSSED	AGENCY/ ORGANIZATION & Designation
 <p>Imelda Picorro (Research Specialist II)</p>	<p>Lecture:</p> <ul style="list-style-type: none"> • Food Safety and Hazards • Contamination and Cross-contamination • Essentials of Personal Hygiene • Handwashing Basics • Good Manufacturing Practices <p>Food Preparation and Processing:</p> <ul style="list-style-type: none"> • Bangus Deboning • Rellenong Bangus or Stuffed Bangus • Fish Burger 	<p>DOST Leyte</p>

APPENDIX B

Photos of the Participating Representatives of Fisher folk Associations



RURAL IMPROVENT CLUB (RIC)

10 REPRESENTATIVES TOGETHER WITH MA'AM IMELDA PICORRO
SALEHA U. BADIDLES; MA. ROWENA S. LLEGO; HELEN BEATO; CORAZON GO; CRISILDA PADILLA;
NORMA AVILA; MAE JOY CORRE; SARAH DADOR; ZENaida MALATE; LAILA ESPERAS



BRGY. 102 SEAWEED FARMERS

6 REPRESENTATIVES

REBECCA P. BODAÑO; CHONA NAVIBANTE; MARITONI S. LUCAÑAS; VILMA C. PADUL; CHARITO L. LAURE

ST.VINCENT WOMEN'S ASSOCIATION

5 REPRESENTATIVES

VEVILYN C. TRAZONA; CHARITO S. BODAÑO; ILENE M. BONGUET; REBECCA L. BODAÑO; MARICAR M. CINCO

CITY AGRICULTURE OFFICE

2 REPRESENTATIVES

PETRONA S. AYO; WILMA A. BALANGATAN

NOTE: THE PERSONS IN THE PHOTO ARE THE ONES ONLY PRESENT ON DAY 1 IN HOTEL LORENZA



OLD KAWAYAN WOMEN'S FISH PROCESSING ASSOCIATION

10 REPRESENTATIVES

JOSEFINA MEDINA; CAROLINE JANE C. BODAÑO; CECILIA L. CINCO; ANALIZA BEHIC; EDITA MALATE;
MARILYN E. CHAVEZ; KAREEN OLARIO; ANA FE CADAYONG; MARY JOY PLA; CHRISTINE P. OPINIADO

NOTE: ONLY 5 REPRESENTATIVES (IN THE PHOTO) ARE PRESENT ON DAY 1

APPENDIX C

PHOTOS FROM THE SITE VISIT AND TRAINING DEMO











APPENDIX D

TRAINING DESIGN AND TRAINING MODULE

Day 1: September 21, 2016

Venue: Hotel Lorenza

- Lecture/ Discussion on Food Safety and Food Hazards
- Classification of Food Hazards
- Lecture/ Discussion on the Essentials of Personal Hygiene
- Lecture/Discussion on how Cross-Contamination occurs
- Lecture/ Demonstration on Proper Handwashing Techniques
- Lecture/Discussion on GMP during Production process, how it should be done to eliminate product contamination

Day 2: September 22, 2016

Venue: Brgy. Old Kawayan

- Demonstration on Safe Food Preparation
- Deboning of Bangus
- Marinating of Bangus

Day 3: September 23, 2016

Venue: Brgy. Old Kawayan

- "Rellenong Bangus" or Stuffed Milkfish
- Fish burger