



Republic of the Philippines

# DAVAO DEL NORTE STATE COLLEGE

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## EXTENSION ON-GOING

### A. BASIC INFORMATION

**TITLE** : Enhancement of Food Safety Practices in Panabo City Public Market

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**IMPLEMENTING AGENCY**: Davao del Norte State College

CEEMDO-LGU

a. Lead Agency: Davao del Norte State College

b. Project Site: Panabo City Public Market and DNSC Campus

**FUNDING AGENCY**: DNSC-REP, NAFES and CEEMDO-LGU

**DURATION**: 12 months

c. Date Started: November 2016

d. Date of Completion: May 2018

**PROJECT COST**: 57,370 Php

### B. TECHNICAL REPORT

#### I. INTRODUCTION

Food safety is a prerequisite for food security. Hence, the World Health Organization (WHO) is globally campaigning the theme “**Food Safety: From farm to plate, make food safe**” to spur governments to improve food safety through public awareness and encourage consumers to ensure that the food on their plate is safe. In the Philippines, the Republic Act 10611 also known as the Food Safety Act of 2013 was signed into law to support this program.

New threats to food safety are constantly emerging. Changes in food production, distribution and consumption (i.e. intensive agriculture, globalization of food trade, mass

catering and street food); changes to the environment; new and emerging bacteria and toxins; antimicrobial resistance—all increase the risk that food becomes contaminated (FAO.org, 2015).

In 2015, there are several food-poisoning incident that were reported including three persons who drank a contaminated beverage in a milk tea shop in Sampaloc, Manila, leaving two persons dead-ErgoCha owner William Abrigo and customer Suzaine Dagohoy-and sending another customer to the hospital. Toxicology tests showed oxalic acid was ingested by the victims. There were also more than 70 orphaned and homeless beneficiaries from the Manila Boystown Complex in Parang, Marikina City, ended up in the hospital on June 7, 2015. The boys, ages 7 to 17, were served hotdogs, hard-boiled eggs and rice during an outreach program. In Caraga region, close to 2,000 people, most of them students, complained of symptoms consistent with food poisoning after eating durian candies on July 10, 2015. Initial results of laboratory analysis indicated the bacteria *Staphylococcus aureus* as the cause of food poisoning.

Food safety indeed is a public health issue that if not given priority could threaten the health of thousands of people. Foodborne diseases due to microbial, biotoxin, chemical and physical hazards will not only affect people's health and well-being but also the economic concerns of each individual, families, communities and businesses. Food establishments should be responsible in keeping the food safe for the customers. All persons working in foodservice should have basic food safety training to reduce potential foodborne health hazards. The Davao del Norte State College is indeed willing to extend the knowledge in food safety and improve the food handling practices of the street food and *carenderia* vendors in Panabo City public market and within the vicinity of DNSC campus. Thus, this project was conducted.

## **OBJECTIVES**

The project aims to:

1. Assess the needs of the community;
2. Improve the handling practices of food handlers;
3. Evaluate the microbial load of the food served at the public market and at DNSC; and
4. Promote food safety through planning and management.

## **II. METHODOLOGY**

This project entails the following activities:

- Needs Assessment

The respondents included the street food and *carenderia* vendors, consumers in the Panabo City Public Market and inside the DNSC premises. Research findings conducted by DNSC students on food handling practices and microbial load evaluation of the street foods served were used as baseline information for this project. Needs assessment of food vendors and the

food safety regulators was also conducted to know their own problems on the implementation. Food safety regulators include the LGU-CEEMDO, CENRO and City Health Inspectors. Survey questionnaires were used to gather these information.

- Food Safety and Food Processing Seminar

Seminar on food safety was conducted in coordination with the Local Government Unit - City Economic Enterprise Management and Development Office. In this way, essential information needed to develop and maintain prerequisite programs in producing of quality and safe food was disseminated. Lecture, video presentation and open forum was done during the seminar. Brochures and leaflets was also distributed to the participants.

- Microbial and Analyses

The microbial load of street foods and viands sold at the night market and inside DNSC were analyzed through pour plate method with the aid of a sample-ready to use 3M Petrifilm. The gathered data were then evaluated whether the products passed the standard microbial load count.

- Food Safety Plan Recommendations

A meeting with the Food Safety Team, CEEMDO-LGU, CENRO, City Health Inspector and representatives of the food safety vendors was held before the conduct of the project. It was agreed that each concerned agencies will take part on promoting the food safety project. It was also discussed that penalties will be imposed upon violating the rules and regulations. To strongly implement the Food Safety Act, an ordinance will be proposed to the city government.

- Monitoring & Evaluation

The provision of safe and nutritious food was monitored by inspecting food handling practices of food vendors using the GMP monitoring form. The initial monitoring was done with the assistance of the city sanitary inspector to determine compliance with existing hygienic requirements. The monitoring was done every week and during random days.

- Food Safety Campaign

Adopting the World Health Day 2015 Food Safety Campaign “From farm to plate, make food safe,” the theme for this project campaign is “Food Safety First.” Information drive will be conducted through poster, leaflets, flyers and radio script. Letterhead of the theme will be used for all campaign correspondence.

The food safety related researches will be presented to the City Councilors-LGU for deliberation and possible intervention and ordinances. Signage about Good Manufacturing

Practices will soon be posted on the *Night Market*, Panabo City to remind the food vendors on the GMP rules and regulations. This will also inform the consumers that an extension activity was done in the area and to emphasize the importance of food safety in the country.

### III. RESULTS AND OUTPUT

#### IV. DISCUSSION

- Consultative Meeting and Presentation of Consolidated Research Findings Related to Food Safety

The food safety implementing agencies namely CEEMDO-LGU, CENRO, City sanitary health inspectors and representatives of food vendors were invited for a consultative meeting (Figure 1). During the meeting, the research findings anchored to food safety conducted by the DNSC students were presented. In this way, they were aware of the status of their respective areas in terms of food safety and contentedly accepted the results. Hence, they are willing to participate for the strong implementation of the Food Safety Act of 2013. The proposal indicating the timetable of activities were presented and it was agreed that each party will commit to their respective roles without hesitation.



Figure 1. Consultative meeting with the food safety team, CEEMDO-LGU, CENRO, City Sanitary Inspector, food vendors representatives and students

- Food Safety and Food Processing Seminars

Good Manufacturing Practices Awareness Seminar was conducted on November 16 and December 13, 2016 at the Brgy. Salvacion, Panabo city together with the City Health Sanitary Inspector (Figure 2). The seminar served as one of the requirements for business permit renewal. The food vendors from the *night market*, *food centrum*, Panabo city public market and within the DNSC premises attended the seminar. They have been very grateful for the opportunity to know about GMP and for others who have already attended seminars, were also reminded. However, there have been many issues raised during the open forum regarding the location of the different stalls, waste management disposal, penalties for those vendors who have violated the rules. They



were also complaining that comfort rooms and handwashing area were not visible on the area. Since CEEMDO-LGU officers and city sanitary health inspectors were present during the seminar, their complaints were immediately addressed to the respective agency.



Figure 2. Food Safety Seminars Conducted

- Microbial Analyses and GMP Monitoring

The analyses on the microbiological count of deep-fried coated eggs and Good Manufacturing Practices of the Food Stall Vendors in Panabo City Night Market were performed as the research component of the project. Deep-fried coated eggs were chosen as samples of interest since these are the most commonly purchased foods in the market.

Carried out by Rey S. Romano, a Food Technology student, the study revealed the following results presented in Tables 1, 2 and 3. For the microbiological assessment, two parameters were observed, namely: Aerobic Colony Count (ACC) and *E. coli* Count. Table 1 shows

the result of the Aerobic Colony Count investigation. All samples from all food stalls had ACC less than 250 cfu/g in all its replicates. Considering the nature of deep-fried coated eggs, Food Safety Authority of Ireland (2016) categorizes it under Category 2 (Food cooked immediately prior to consumption or sale). Based on the guidelines for the said category,  $<10^3$  CFU/g is considered Satisfactory.

ACC, otherwise known as standard plate count and total viable count is a crude method of identifying the number of microorganisms that can grow in a specific medium under aerobic conditions and moderate temperature. The data obtained from this test can be used to evaluate the shelf-life and the hygienic practices employed in producing a food. Based on the results in Table 1, the samples investigated are safe to consume.

However, it should be noted that deep-fried coated eggs are made using heat treatment. Most foods are prone to bacterial contamination and growth within the Temperature Danger Zone of 4°C to 60°C (USDA, 2013). Subjecting a food outside this range renders it safe from bacterial development. Heating placed the samples above the zone which may have led to the satisfactory results. Aside from the application of heat, these food products are also sold almost immediately after cooking. Hence, the benefit of the heat hurdle is still high considering that it doesn't last very long before it is consumed.

**Table 1. Aerobic Colony Count of Deep-Fried Coated Eggs from Food Stalls in Panabo City Night Market.**

| Food Stalls | Aerobic Colony Count (cfu/g) |             | Remarks      |
|-------------|------------------------------|-------------|--------------|
|             | Replicate 1                  | Replicate 2 |              |
| A           | <250                         | <250        | Satisfactory |
| B           | <250                         | <250        | Satisfactory |
| C           | <250                         | <250        | Satisfactory |
| D           | <250                         | <250        | Satisfactory |
| E           | <250                         | <250        | Satisfactory |

**Table 2. *Escherichia coli* Count of Deep-Fried Coated Eggs from Food Stalls in Panabo City Night Market.**

| Food Stall Vendors | E. coli Count (cfu/g) |             | Remarks        |
|--------------------|-----------------------|-------------|----------------|
|                    | Replicate 1           | Replicate 2 |                |
| A                  | <10                   | <10         | Unsatisfactory |
| B                  | <10                   | <10         | Unsatisfactory |
| C                  | <10                   | <10         | Unsatisfactory |
| D                  | <10                   | <10         | Unsatisfactory |
| E                  | <10                   | <10         | Unsatisfactory |

Table 2 on the other hand illustrates the *E. coli* count of the samples. According to the FDA guidelines, coliforms in the form of *E. coli* should be negative. Thus, the result (<10 CFU/g) falls within the Unsatisfactory level.

The GMP Monitoring, done through face to face interview is summarized in Table 3. It shows the overall result of the monitoring procedures performed. As observed, the rating of all food stall vendors, with the exception of Vendor A, dramatically increased as monitoring period progressed. Food Stall Vendor E obtained the highest average percentage, followed by Vendor D, then Vendor A. Vendors B and C ranked last. However, despite the difference in the rating, all respondents were not able to reach the passing rate of 75%. This means that all the vendors were not compliant to Good Manufacturing Practices in preparing deep-fried coated eggs. The samples may have passed the microbial assessment because of the heat treatment, nevertheless, its producers failed in their practices. The contrast in the results poses possible risks to the consumers. While their deep-fried coated eggs are safe to consume, other products that does not undergo heat treatment may be detrimental to one's health if the improper manufacturing practices persist.

Among the identified reasons for the noncompliance of the food stall vendors is the lack of GMP monitoring of the city government. In addition, the absence of a city ordinance for GMP on street vending, penalizing violators is also a possible concern.

**Table 3. GMP Monitoring Rating of Vendors Selling Deep-Fried Coated Eggs in Panabo City Night Market.**

| Food Stall Vendor | GMP Monitoring Rating (%)  |                            |                            | Average (%) | Remarks |
|-------------------|----------------------------|----------------------------|----------------------------|-------------|---------|
|                   | 1 <sup>st</sup> Monitoring | 2 <sup>nd</sup> Monitoring | 3 <sup>rd</sup> Monitoring |             |         |
| <b>A</b>          | 42.86                      | 40.66                      | 64.84                      | 49.45       | Failed  |
| <b>B</b>          | 31.87                      | 42.86                      | 61.54                      | 45.42       | Failed  |
| <b>C</b>          | 24.18                      | 48.35                      | 63.74                      | 45.42       | Failed  |
| <b>D</b>          | 28.57                      | 59.34                      | 64.84                      | 50.92       | Failed  |
| <b>E</b>          | 32.97                      | 60.44                      | 69.23                      | 54.21       | Failed  |

## V. CONCLUSIONS AND RECOMMENDATIONS

This project revealed the current status of the city of Panabo with regards to street food vending and food safety practices. Although the city government officials are willing to help, they don't have the necessary data to better visualize the status of the city and the need to strongly implement the Food Safety Act of 2013.

From the Food Safety Training, it was found out that several of the food stall vendors around the city are not aware or need to be reminded of the Good Manufacturing Practices and its impact to the community. Hence, there is a need to conduct regular Food Safety Trainings to capacitate the local food producers and to reach an increasing number of audiences.

From the research component of the project, it was found out that the most popular food product in Panabo City Night Market, which is deep-fried coated egg is not safe for consumption as seen in its unsatisfactory ratings for *E. coli* count. It can be vulnerable to post-process contamination considering the non-compliance of the vendors to many of the GMP requirements for street vending.

## **VI. REFERENCES**

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## **C. PROBLEMS ENCOUNTERED DURING THE CONDUCT OF EXTENSION**

### **I. PROBLEMS**

- Some vendors find it difficult to answer the survey during business hours.
- Some city government officials were not present during the consultative meeting.
- Constant monitoring of the area was not achieved due to time constraints and lack of manpower.
- Materials for microbial analyses were limited.



## II. RECOMMENDATIONS

- An ordinance must be made to strongly implement the food safety program.
- For the meantime, penalties must be imposed by CEEMDO to violators.
- Additional manpower for GMP monitoring in the area must be implemented.
- The project can be extended to another phase for future expansion to other recipients other than the Night Market where food safety is a concern.

### D. Budgetary Requirements

| Particulars                                        | Qty | Unit of Issue | Estimated Cost | Estimated Budget |
|----------------------------------------------------|-----|---------------|----------------|------------------|
| <b>Office Supplies</b>                             |     |               |                |                  |
| Bond paper                                         | 5   | Ream          | 150.00         | 750.00           |
| Ink Bottles                                        | 3   | Bottles       | 250.00         | 750.00           |
| Paperboards                                        | 5   | Packs         | 40.00          | 200.00           |
| Ballpen                                            | 20  | Pcs           | 5.00           | 100.00           |
| <b>Meeting/Representation Expense</b>              |     |               |                | 1,010.00         |
| <b>Seminar Expense</b>                             |     |               |                | 35,370.00        |
| <b>Travel Expense</b>                              |     |               |                | 1,000.00         |
| <b>Communication</b>                               |     |               |                | 1,000.00         |
| <b>Microbial and Chemical Analyses</b>             |     |               |                |                  |
| Glo-Germ Kit                                       | 1   | Case          | 3000.00        | 3,000.00         |
| Petrifilm Aerobic Count Plates                     | 1   | Box           | 4800.00        | 4800.00          |
| Petrifilm Coliform Count Plates                    | 1   | Box           | 2,900.00       | 2,900.00         |
| Buffered Peptone                                   | 1   | Bottle        | 3,600.00       | 3,600.00         |
| <b>Other supplies</b>                              |     |               |                | 617.00           |
| <b>Contingency (10% of the total project cost)</b> |     |               |                | 2,273.00         |
|                                                    |     |               | <b>Total</b>   | <b>57,370.00</b> |

## E. Work and Financial Plan

| Activities                                                                                                    | 2016-2017 |          |           |     |           |     |     |     |        |          |        |        |
|---------------------------------------------------------------------------------------------------------------|-----------|----------|-----------|-----|-----------|-----|-----|-----|--------|----------|--------|--------|
|                                                                                                               | Sep       | Oct      | Nov       | Dec | Jan       | Feb | Mar | Apr | May    | Jun      | Jul    | Aug    |
| 1.Needs Assessment                                                                                            | 500.00    |          |           |     |           |     |     |     |        |          |        |        |
| 2.Meeting and Planning with the CEEMDO-LGU officers, City Health Office, Legal Council, FDA, Licensing Office |           | 1,100.00 |           |     |           |     |     |     |        |          |        |        |
| 3.Food Safety Seminar (Public Market & DNSC Campus)                                                           |           |          |           |     | 37,170.00 |     |     |     |        |          |        |        |
| 4. Microbial and Chemical Analyses                                                                            |           |          | 14,300.00 |     |           |     |     |     |        |          |        |        |
| 5.Meeting with CEEMDO for the food safety plan recommendations                                                |           |          |           |     |           |     |     |     | 500.00 |          |        |        |
| 6.Meeting with DNSC-Planning Officer for the food safety plan recommendations                                 |           |          |           |     |           |     |     |     | 500.00 |          |        |        |
| 7.Monitoring and Evaluation                                                                                   |           |          |           |     |           |     |     |     |        | 1,300.00 |        |        |
| 8.Preparation of Report                                                                                       |           |          |           |     |           |     |     |     |        |          | 500.00 |        |
| 9.Presentation of Report                                                                                      |           |          |           |     |           |     |     |     |        |          |        | 500.00 |
| 10.Publication                                                                                                |           |          |           |     |           |     |     |     |        |          |        | 500.00 |

Prepared by:

  
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