

# TRAINING REGULATIONS



## FOOD PROCESSING NC II

**AGRICULTURE AND FISHERY, PROCESSED  
FOOD AND BEVERAGES SECTOR**

**TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY**

**East Service Road, South Superhighway, Taguig City, Metro Manila**

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## **TRAINING REGULATIONS FOR FOOD PROCESSING NC II**

### **Section 1 FOOD PROCESSING NC II QUALIFICATION**

The **Food Processing NC II** Qualification consists of competencies that a person must achieve to process foods by salting, curing and smoking; process food by fermentation and pickling; process food by sugar concentration and package finished / processed food products.

This Qualification is packaged from the competency map of the Agriculture and Fishery, Processed Food and Beverage Sector as shown in Annex A.

The units of competency comprising this qualification include the following:

<b>Code</b>	<b>BASIC COMPETENCIES</b>
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500311105	Participate in workplace communication
500311106	Work in a team environment
500311107	Practice career professionalism
500311108	Practice occupational health and safety procedures

<b>Code</b>	<b>COMMON COMPETENCIES</b>
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AGR741201	Apply Food Safety and Sanitation
AGR741202	Use Standard Measuring Devices / Instruments
AGR741203	Use Food Processing Tools, Equipment and Utensils
AGR741204	Perform Mathematical Computation
AGR741205	Implement Good Manufacturing Practice Procedure
AGR741206	Implement environmental policies and procedures

<b>Code</b>	<b>CORE COMPETENCIES</b>
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AGR741301	Process Food by Salting, Curing and Smoking
AGR741302	Process Food by Fermentation and Pickling
AGR741303	Process Food by Sugar Concentration
AGR741304	Package Finished / Processed Food Products

**A person who has achieved this Qualification is competent to be:**

- **Production Aide**
- **Packaging Aide**

## SECTION 2

## COMPETENCY STANDARDS

These guidelines are set to provide the Technical Vocational Education and Training (TVET) providers with information and other important requirements to consider when designing training programs for **FOOD PROCESSING NC II**. These units of competency are categorized into basic, common and core competencies.

### BASIC COMPETENCIES

**UNIT OF COMPETENCY :** PARTICIPATE IN WORKPLACE COMMUNICATION

**UNIT CODE :** 500311105

**UNIT DESCRIPTOR :** This unit covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized</i> terms are elaborated in the Range of Variables
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from <b><i>appropriate sources</i></b> 1.2 Effective questioning , active listening and speaking skills are used to gather and convey information 1.3 Appropriate <b><i>medium</i></b> is used to transfer information and ideas 1.4 Appropriate non- verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace procedures for the location and <b><i>storage</i></b> of information are used 1.7 Personal interaction is carried out clearly and concisely
2. Participate in workplace meetings and discussions	2.1 Team meetings are attended on time 2.2 Own opinions are clearly expressed and those of others are listened to without interruption 2.3 Meeting inputs are consistent with the meeting purpose and established <b><i>protocols</i></b> 2.4 <b><i>Workplace interactions</i></b> are conducted in a courteous manner 2.5 Questions about simple routine workplace procedures and matters concerning working conditions of employment are asked and responded 2.6 Meetings outcomes are interpreted and implemented

3. Complete relevant work related documents	3.1 Range of <b>forms</b> relating to conditions of employment are completed accurately and legibly 3.2 Workplace data is recorded on standard workplace forms and documents 3.3 Basic mathematical processes are used for routine calculations 3.4 Errors in recording information on forms/ documents are identified and properly acted upon 3.5 Reporting requirements to supervisor are completed according to organizational guidelines
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## RANGE OF VARIABLES

VARIABLE	RANGE
1. Appropriate sources	1.1. Team members 1.2. Suppliers 1.3. Trade personnel 1.4. Local government 1.5. Industry bodies
2. Medium	2.1. Memorandum 2.2. Circular 2.3. Notice 2.4. Information discussion 2.5. Follow-up or verbal instructions 2.6. Face to face communication
3. Storage	3.1. Manual filing system 3.2. Computer-based filing system
4. Forms	4.1. Personnel forms, telephone message forms, safety reports
5. Workplace interactions	5.1. Face to face 5.2. Telephone 5.3. Electronic and two way radio 5.4. Written including electronic, memos, instruction and forms, non-verbal including gestures, signals, signs and diagrams
6. Protocols	6.1. Observing meeting 6.2. Compliance with meeting decisions 6.3. Obeying meeting instructions

## EVIDENCE GUIDE

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1. Prepared written communication following standard format of the organization</li> <li>1.2. Accessed information using communication equipment</li> <li>1.3. Made use of relevant terms as an aid to transfer information effectively</li> <li>1.4. Conveyed information effectively adopting the formal or informal communication</li> </ul>
2. Underpinning Knowledge and Attitudes	<ul style="list-style-type: none"> <li>2.1. Effective communication</li> <li>2.2. Different modes of communication</li> <li>2.3. Written communication</li> <li>2.4. Organizational policies</li> <li>2.5. Communication procedures and systems</li> <li>2.6. Technology relevant to the enterprise and the individual's work responsibilities</li> </ul>
3. Underpinning Skills	<ul style="list-style-type: none"> <li>3.1. Follow simple spoken language</li> <li>3.2. Perform routine workplace duties following simple written notices</li> <li>3.3. Participate in workplace meetings and discussions</li> <li>3.4. Complete work related documents</li> <li>3.5. Estimate, calculate and record routine workplace measures</li> <li>3.6. Basic mathematical processes of addition, subtraction, division and multiplication</li> <li>3.7. Ability to relate to people of social range in the workplace</li> <li>3.8. Gather and provide information in response to workplace Requirements</li> </ul>
4. Resource Implications	<ul style="list-style-type: none"> <li>4.1. Fax machine</li> <li>4.2. Telephone</li> <li>4.3. Writing materials</li> <li>4.4. Internet</li> </ul>
5. Methods of Assessment	<ul style="list-style-type: none"> <li>5.1. Direct Observation</li> <li>5.2. Oral interview and written test</li> </ul>
6. Context of Assessment	<ul style="list-style-type: none"> <li>6.1. Competency may be assessed individually in the actual workplace or through accredited institution</li> </ul>

**UNIT OF COMPETENCY: WORK IN TEAM ENVIRONMENT****UNIT CODE : 500311106****UNIT DESCRIPTOR :** This unit covers the skills, knowledge and attitudes to identify role and responsibility as a member of a team.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized</i> terms are elaborated in the Range of Variables
1. Describe team role and scope	1.1. The <b><i>role and objective of the team</i></b> is identified from available <b><i>sources of information</i></b>  1.2. Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources
2. Identify own role and responsibility within team	2.1. Individual role and responsibilities within the team environment are identified  2.2. Roles and responsibility of other team members are identified and recognized  2.3. Reporting relationships within team and external to team are identified
3. Work as a team member	3.1. Effective and appropriate forms of communications used and interactions undertaken with team members who contribute to known team activities and objectives  3.2. Effective and appropriate contributions made to complement team activities and objectives, based on individual skills and competencies and <b><i>workplace context</i></b>  3.3. Observed protocols in reporting using standard operating procedures  3.4. Contribute to the development of team work plans based on an understanding of team's role and objectives and individual competencies of the members.



## RANGE OF VARIABLES

VARIABLE	RANGE
1. Role and objective of team	<ul style="list-style-type: none"><li>1.1. Work activities in a team environment with enterprise or specific sector</li><li>1.2. Limited discretion, initiative and judgement maybe demonstrated on the job, either individually or in a team environment</li></ul>
2. Sources of information	<ul style="list-style-type: none"><li>2.1. Standard operating and/or other workplace procedures</li><li>2.2. Job procedures</li><li>2.3. Machine/equipment manufacturer's specifications and instructions</li><li>2.4. Organizational or external personnel</li><li>2.5. Client/supplier instructions</li><li>2.6. Quality standards</li><li>2.7. OHS and environmental standards</li></ul>
3. Workplace context	<ul style="list-style-type: none"><li>3.1. Work procedures and practices</li><li>3.2. Conditions of work environments</li><li>3.3. Legislation and industrial agreements</li><li>3.4. Standard work practice including the storage, safe handling and disposal of chemicals</li><li>3.5. Safety, environmental, housekeeping and quality guidelines</li></ul>

## EVIDENCE GUIDE

1. Critical aspects of competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1. Operated in a team to complete workplace activity</li> <li>1.2. Worked effectively with others</li> <li>1.3. Conveyed information in written or oral form</li> <li>1.4. Selected and used appropriate workplace language</li> <li>1.5. Followed designated work plan for the job</li> <li>1.6. Reported outcomes</li> </ul>
2. Underpinning Knowledge and Attitude	<ul style="list-style-type: none"> <li>2.1. Communication process</li> <li>2.2. Team structure</li> <li>2.3. Team roles</li> <li>2.4. Group planning and decision making</li> </ul>
3. Underpinning Skills	<ul style="list-style-type: none"> <li>3.1. Communicate appropriately, consistent with the culture of the workplace</li> </ul>
4. Resource Implications	<p>The following resources <b>MUST</b> be provided:</p> <ul style="list-style-type: none"> <li>4.1. Access to relevant workplace or appropriately simulated environment where assessment can take place</li> <li>4.2. Materials relevant to the proposed activity or tasks</li> </ul>
5. Methods of Assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> <li>5.1. Observation of the individual member in relation to the work activities of the group</li> <li>5.2. Observation of simulation and or role play involving the participation of individual member to the attainment of organizational goal</li> <li>5.3. Case studies and scenarios as a basis for discussion of issues and strategies in teamwork</li> </ul>
6. Context for Assessment	<ul style="list-style-type: none"> <li>6.1. Competency may be assessed in workplace or in a simulated workplace setting</li> <li>6.2. Assessment shall be observed while task are being undertaken whether individually or in group</li> </ul>

**UNIT OF COMPETENCY: PRACTICE CAREER PROFESSIONALISM**

**UNIT CODE : 500311107**

**UNIT DESCRIPTOR :** This unit covers the knowledge, skills and attitudes in promoting career growth and advancement.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized</i> terms are elaborated in the Range of Variables
1. Integrate personal objectives with organizational goals	1.1 Personal growth and work plans are pursued towards improving the qualifications set for the profession 1.2 Intra- and interpersonal relationships is are maintained in the course of managing oneself based on performance <b>evaluation</b> 1.3 Commitment to the organization and its goal is demonstrated in the performance of duties
1. Set and meet work priorities	2.1 Competing demands are prioritized to achieve personal, team and organizational goals and objectives. 2.2 <b>Resources</b> are utilized efficiently and effectively to manage work priorities and commitments 2.3 Practices along economic use and maintenance of equipment and facilities are followed as per established procedures
2. Maintain professional growth and development	3.1 <b>Trainings and career opportunities</b> are identified and availed of based on job requirements 3.2 <b>Recognitions</b> are -sought/received and demonstrated as proof of career advancement 3.3 <b>Licenses and/or certifications</b> relevant to job and career are obtained and renewed

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Evaluation	1.1 Performance Appraisal 1.2 Psychological Profile 1.3 Aptitude Tests
2. Resources	2.1 Human 2.2 Financial 2.3 Technology 2.3.1 Hardware 2.3.2 Software
3. Trainings and career opportunities	3.1 Participation in training programs 3.1.1 Technical 3.1.2 Supervisory 3.1.3 Managerial 3.1.4 Continuing Education 3.2 Serving as Resource Persons in conferences and workshops
4. Recognitions	4.1 Recommendations 4.2 Citations 4.3 Certificate of Appreciations 4.4 Commendations 4.5 Awards 4.6 Tangible and Intangible Rewards
5. Licenses and/or certifications	5.1 National Certificates 5.2 Certificate of Competency 5.3 Support Level Licenses 5.4 Professional Licenses

## EVIDENCE GUIDE

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Attained job targets within key result areas (KRAs)</li> <li>1.2 Maintained intra - and interpersonal relationship in the course of managing oneself based on performance evaluation</li> <li>1.3 Completed training and career opportunities which are based on the requirements of the industries</li> <li>1.4 Acquired and maintained licenses and/or certifications according to the requirement of the qualification</li> </ul>
2. Underpinning Knowledge	<ul style="list-style-type: none"> <li>2.1 Work values and ethics (Code of Conduct, Code of Ethics, etc.)</li> <li>2.2 Company policies</li> <li>2.3 Company-operations, procedures and standards</li> <li>2.4 Fundamental rights at work including gender sensitivity</li> <li>2.5 Personal hygiene practices</li> </ul>
3. Underpinning Skills	<ul style="list-style-type: none"> <li>3.1 Appropriate practice of personal hygiene</li> <li>3.2 Intra and Interpersonal skills</li> <li>3.3 Communication skills</li> </ul>
4. Resource Implications	<p>The following resources <b>MUST</b> be provided:</p> <ul style="list-style-type: none"> <li>4.1 Workplace or assessment location</li> <li>4.2 Case studies/scenarios</li> </ul>
5. Methods of Assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> <li>5.1 Portfolio Assessment</li> <li>5.2 Interview</li> <li>5.3 Simulation/Role-plays</li> <li>5.4 Observation</li> <li>5.5 Third Party Reports</li> <li>5.6 Exams and Tests</li> </ul>
6. Context of Assessment	<ul style="list-style-type: none"> <li>6.1 Competency may be assessed in the work place or in a simulated work place setting</li> </ul>

**UNIT OF COMPETENCY :**     **PRACTICE OCCUPATIONAL HEALTH AND SAFETY PROCEDURES**

**UNIT CODE**                    **:**     **500311108**

**UNIT DESCRIPTOR**        **:**     This unit covers the outcomes required to comply with regulatory and organizational requirements for occupational health and safety.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized</i> terms are elaborated in the Range of Variables
1. Identify hazards and risks	1.1 <b><i>Safety regulations</i></b> and workplace safety and hazard control practices and procedures are clarified and explained based on organization procedures 1.2 <b><i>Hazards/risks</i></b> in the workplace and their corresponding indicators are identified to minimize or eliminate risk to co-workers, workplace and environment in accordance with organization procedures 1.3 <b><i>Contingency measures</i></b> during workplace accidents, fire and other emergencies are recognized and established in accordance with organization procedures
2. Evaluate hazards and risks	2.1 Terms of maximum tolerable limits which when exceeded will result in harm or damage are identified based on threshold limit values (TLV) 2.2 Effects of the hazards are determined 2.3 OHS issues and/or concerns and identified safety hazards are reported to designated personnel in accordance with workplace requirements and relevant workplace OHS legislation

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized</i> terms are elaborated in the Range of Variables
3. Control hazards and risks	<p>3.1 Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace are consistently followed</p> <p>3.2 Procedures for dealing with workplace accidents, fire and emergencies are followed in accordance with organization OHS policies</p> <p>3.3 <b><i>Personal protective equipment (PPE)</i></b> is correctly used in accordance with organization OHS procedures and practices</p> <p>3.4 Appropriate assistance is provided in the event of a workplace emergency in accordance with established organization protocol</p>
4. Maintain OHS awareness	<p>4.1 <b><i>Emergency-related drills and trainings</i></b> are participated in as per established organization guidelines and procedures</p> <p>4.2 <b><i>OHS personal records</i></b> are completed and updated in accordance with workplace requirements</p>

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Safety regulations	May include but are not limited to: 1.1 Clean Air Act 1.2 Building code 1.3 National Electrical and Fire Safety Codes 1.4 Waste management statutes and rules 1.5 Philippine Occupational Safety and Health Standards 1.6 DOLE regulations on safety legal requirements 1.7 ECC regulations
2. Hazards/Risks	May include but are not limited to: 2.1 Physical hazards – impact, illumination, pressure, noise, vibration, temperature, radiation 2.2 Biological hazards- bacteria, viruses, plants, parasites, mites, molds, fungi, insects 2.3 Chemical hazards – dusts, fibers, mists, fumes, smoke, gasses, vapors 2.4 Ergonomics 2.4.1. Psychological factors – over exertion/ excessive force, awkward/static positions, fatigue, direct pressure, varying metabolic cycles 2.4.2. Physiological factors – monotony, personal relationship, work out cycle
3. Contingency measures	May include but are not limited to: 3.1 Evacuation 3.2 Isolation 3.3 Decontamination 3.4 (Calling designed) emergency personnel
4. PPE	May include but are not limited to: 4.1 Mask 4.2 Gloves 4.3 Goggles 4.4 Hair Net/cap/bonnet 4.5 Face mask/shield 4.6 Ear muffs 4.7 Apron/Gown/coverall/jump suit 4.8 Anti-static suits



VARIABLE	RANGE
5. Emergency-related drills and training	5.1 Fire drill 5.2 Earthquake drill 5.3 Basic life support/CPR 5.4 First aid 5.5 Spillage control 5.6 Decontamination of chemical and toxic 5.7 Disaster preparedness/management
6. OHS personal records	6.1 Medical/Health records 6.2 Incident reports 6.3 Accident reports 6.4 OHS-related training completed

## EVIDENCE GUIDE

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Explained clearly established workplace safety and hazard control practices and procedures</li> <li>1.2 Identified hazards/risks in the workplace and its corresponding indicators in accordance with company procedures</li> <li>1.3 Recognized contingency measures during workplace accidents, fire and other emergencies</li> <li>1.4 Identified terms of maximum tolerable limits based on threshold limit value- TLV.</li> <li>1.5 Followed Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace</li> <li>1.6 Used Personal Protective Equipment (PPE) in accordance with company OHS procedures and practices</li> <li>1.7 Completed and updated OHS personal records in accordance with workplace requirements</li> </ul>
2. Underpinning Knowledge and Attitude	<ul style="list-style-type: none"> <li>2.1 OHS procedures and practices and regulations</li> <li>2.2 PPE types and uses</li> <li>2.3 Personal hygiene practices</li> <li>2.4 Hazards/risks identification and control</li> <li>2.5 Threshold Limit Value -TLV</li> <li>2.6 OHS indicators</li> <li>2.7 Organization safety and health protocol</li> <li>2.8 Safety consciousness</li> <li>2.9 Health consciousness</li> </ul>
3. Underpinning Skills	<ul style="list-style-type: none"> <li>3.1 Practice of personal hygiene</li> <li>3.2 Hazards/risks identification and control skills</li> <li>3.3 Interpersonal skills</li> <li>3.4 Communication skills</li> </ul>
3. Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> <li>4.1 Workplace or assessment location</li> <li>4.2 OHS personal records</li> <li>4.3 PPE</li> <li>4.4 Health records</li> </ul>
4. Methods of Assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> <li>5.1 Portfolio Assessment</li> <li>5.2 Interview</li> <li>5.3 Case Study/Situation</li> </ul>
5. Context for Assessment	<p>6.1 Competency may be assessed in the work place or in a simulated work place setting</p>

## COMMON COMPETENCIES

### UNIT OF COMPETENCY: APPLY FOOD SAFETY AND SANITATION

UNIT CODE : AGR741201

**UNIT DESCRIPTOR:** This unit deals with the skills, knowledge and attitudes required to apply food safety and sanitation in the workplace

ELEMENTS	PERFORMANCE CRITERIA <i>Italicized</i> terms are elaborated in the Range of Variables
1. Wear Personal Protective Equipment	<p>1.1 Personal protective equipment are checked according to <b><i>manufacturer's specifications</i></b></p> <p>1.2 <b><i>Personal protective equipment</i></b> are worn according to the job requirement</p>
2. Observe Personal Hygiene and Good Grooming	2.1 Personal hygiene and good grooming is practiced in line with <b><i>workplace health and safety requirements</i></b>
3. Implement Food Sanitation Practices	<p>3.1 Sanitary food handling practices are implemented in line with workplace sanitation regulations</p> <p>3.2 Safety measures are observed in line with workplace safety practices.</p>
4. Render Safety Measures and First Aid Procedures	<p>4.1 <b><i>Safety measures</i></b> are applied according to workplace rules and regulations</p> <p>4.2 <b><i>First aid procedures</i></b> are applied and coordinated with concerned personnel according to workplace standard operating procedures.</p>
5. Implement housekeeping activities	<p>5.1 Work area and surroundings are cleaned in accordance with workplace health and safety regulations</p> <p>5.2 Waste is disposed according to organization's waste disposal system</p> <p>5.3 <b><i>Hazards</i></b> in the work area are recognized and reported to designated personnel according to workplace procedures</p>

### RANGE OF VARIABLES

VARIABLES	RANGE
1. Manufacturer's Specifications	<p>Manufacturer's specifications may include but not limited to:</p> <ul style="list-style-type: none"> <li>1.1 Handling</li> <li>1.2 Operating</li> <li>1.3 Discharge Label</li> <li>1.4 Reporting</li> <li>1.5 Testing</li> <li>1.6 Positioning</li> <li>1.7 Refilling</li> </ul>
2. Personal Protective Equipment	<p>Personal Protective Equipment may include but not limited to:</p> <ul style="list-style-type: none"> <li>2.1 Apron/laboratory gown</li> <li>2.2 Mouth masks</li> <li>2.3 Gloves</li> <li>2.4 Rubber boots/safety shoes</li> <li>2.5 Head gears such as caps, hair nets, earl plug</li> </ul>
3. Workplace Health and Safety Requirements	<p>Workplace and Safety Requirements may include:</p> <ul style="list-style-type: none"> <li>3.1 Health/Medical Certificate</li> <li>3.2 DOLE requirements</li> <li>3.3 BFAD requirements</li> <li>3.4 Personal Hygiene and good grooming</li> <li>3.5 Plant Sanitation and waste management</li> </ul>
4. Safety Measures	<p>Safety measures may include but not limited to:</p> <ul style="list-style-type: none"> <li>4.1 Labeling of chemicals and other sanitizing agents</li> <li>4.2 Installation of fire fighting equipment in the work area</li> <li>4.3 Installation of safety signages and symbols</li> <li>4.4 Implementation of 5S in the work area</li> <li>4.5 Removal of combustible material in the work area</li> </ul>

5. First Aid Procedures	<p>First Aid Procedures may include but not limited to:</p> <ul style="list-style-type: none"> <li>5.1 Mouth to mouth resuscitation</li> <li>5.2 CPR</li> <li>5.3 Application of tourniquet</li> <li>5.4 Applying pressure to bleeding wounds or cuts</li> <li>5.5 First aid treatment for burned victims</li> </ul>
6. Hazards	<p>Hazards in the workplace may include but not limited to:</p> <ul style="list-style-type: none"> <li>6.1 Physical</li> <li>6.2 Biological</li> <li>6.3 Chemical</li> </ul>

## EVIDENCE GUIDE

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Cleaned, checked and sanitized personal protective equipment</li> <li>1.2 Practiced proper personal hygiene and good grooming</li> <li>1.3 Implemented workplace food safety practices</li> <li>1.4 Applied first aid measures to victims</li> <li>1.5 Implemented good housekeeping activities in the work area</li> </ul>
2. Underpinning Knowledge	<ul style="list-style-type: none"> <li>2.1 Safety Practices <ul style="list-style-type: none"> <li>2.1.1 Proper waste disposal</li> <li>2.1.2 Environmental protection and concerns</li> <li>2.1.3 Food safety principles and practices</li> <li>2.1.4 Good grooming and personal hygiene</li> </ul> </li> <li>2.2 Codes and Regulations <ul style="list-style-type: none"> <li>2.2.1 TQM and other food quality system principles</li> <li>2.2.2 ISO, HACCP, EMS, 5S</li> <li>2.2.3 Good Food Manufacturing Practices</li> </ul> </li> <li>2.3 Equipment: Uses and Specifications <ul style="list-style-type: none"> <li>2.3.1 Parts and functions of personal protective equipment</li> <li>2.3.2 First Aid Kit</li> <li>2.3.3 Sanitizing equipment</li> </ul> </li> </ul>
3. Underpinning Skills	<ul style="list-style-type: none"> <li>3.1 Sanitary food handling practices</li> <li>3.2 Implementing housekeeping activities</li> <li>3.3 Applying first aid treatment</li> <li>3.4 Coordination skills</li> </ul>
4. Methods of Assessment	<p>Competency in this unit must be assessed through:</p> <ul style="list-style-type: none"> <li>4.1 A combination of direct observation and questioning of a candidate processing foods.</li> </ul>
5. Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> <li>5.1 Work area/station</li> <li>5.2 First Aid kit</li> <li>5.3 PPE relevant to the activities</li> <li>5.4 Fire extinguisher</li> <li>5.5 Stretcher</li> <li>5.6 Materials, tools and equipment relevant to the unit of competency</li> </ul>
6. Context of Assessment	<ul style="list-style-type: none"> <li>6.1 Assessment should occur on the job or in a simulated workplace</li> </ul>

## UNIT OF COMPETENCY: USE STANDARD MEASURING DEVICES AND INSTRUMENTS

UNIT CODE : AGR741202

**UNIT DESCRIPTOR:** This unit deals with the knowledge, skills and attitudes required to use standard measuring devices, instruments in the workplace

ELEMENTS	PERFORMANCE CRITERIA Italicized terms are elaborated in the Range of Variables
1. Identify Standard Measuring Devices and Instruments	<p>1.1 <b><i>Standard measuring devices and instruments</i></b> are identified according to manufacturer's specifications</p> <p>1.2 Devices and instruments for measuring are properly checked, sanitized and calibrated prior to use</p>
2. Review the Procedures in Using Standard Measuring Devices and Instruments	<p>2.1 Procedures in using the <b><i>standard measuring devices</i></b> and instruments are recalled according to manufacturer's specifications</p> <p>2.2 Printed procedures/brochures/catalogues are consulted according to specified <b><i>food processing methods</i></b></p>
3. Follow Procedures of Using Measuring Devices and Instruments	<p>3.1 Methods/practices of using measuring devices and instruments are strictly observed according to manufacturer's specifications and workplace requirements</p> <p>3.2 Measuring devices and instruments are cleaned, wiped dry and stowed after use to ensure conformity with workplace requirements</p>

### **RANGE OF VARIABLES**

<b>VARIABLES</b>	<b>RANGE</b>
1. Standard Measuring Devices	Standard Measuring Devices may include but not limited to the following:  1.1 Weighing scales and balances of various capacities and sensitivities 1.2 Measuring cups of varying capacities for dry ingredients 1.3 Measuring cups of varying capacities for liquid ingredients
2. Standard Measuring Instruments	Standard Measuring Instruments may include but not limited to the following:  2.1 Salinometer 2.2 Thermometers of varying temperature range ( 0-300 C ) 2.3 Refractometer of varying range ( 0 – 90 B) 2.4 Glasswares like cylinders, beakers, flasks) of varying graduations
3. Food Processing Methods	Food Processing Methods include the following:  3.1 Process foods by Salting, Curing and Smoking 3.2 Process foods by Fermentation and Pickling 3.3 Process foods by Canning and Bottling 3.4 Process foods by Sugar Concentration 3.5 Process foods by Drying and Dehydration



## EVIDENCE GUIDE

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"><li>1.1 Identified, prepared and calibrated standard measuring devices and instruments</li><li>1.2 Followed correctly the procedures in using standard measuring devices and instruments</li><li>1.3 Followed proper cleaning and sanitizing and stowing procedures of measuring devices and equipment before and after use</li></ul>
2. Underpinning Knowledge	<ul style="list-style-type: none"><li>1.1 Safe handling of measuring devices and instruments</li><li>1.2 Specifications and functions of measuring devices and instruments</li><li>1.3 Defects and breakages of measuring devices and instruments</li><li>1.4 Procedures in cleaning, sanitizing and calibrating and stowing equipment and instruments</li></ul>
3. Underpinning Skills	<ul style="list-style-type: none"><li>3.1 Communication skills</li><li>3.2 Calibrating skills</li><li>3.3 Sanitary handling of devices and instruments</li><li>3.4 Measuring devices and instruments</li><li>3.5 Stowing measuring devices and instruments</li></ul>
4. Methods of Assessment	<p>Competency in this unit must be assessed through:</p> <ul style="list-style-type: none"><li>4.1 Direct observation and questioning of a candidate using measuring devices and instruments</li></ul>
5. Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"><li>5.1 Work area/station</li><li>5.2 Materials, tools and equipment relevant to the Unit of Competency</li></ul>
6. Context of Assessment	<ul style="list-style-type: none"><li>6.1 Assessment should occur on the job or in a simulated workplace</li></ul>

## UNIT OF COMPETENCY: USE FOOD PROCESSING TOOLS, EQUIPMENT AND UTENSILS

UNIT CODE : AGR741203

**UNIT DESCRIPTOR:** This unit deals with the skills, knowledge and attitudes required to operate food processing tools, equipment and instruments in the workplace.

ELEMENTS	PERFORMANCE CRITERIA <i>Italicized</i> terms are elaborated in the Range of Variables
1. Perform Pre- Operation Activities	1.1 Appropriate tools and equipment/utensils are assembled according to <b><i>food processing methods</i></b>  1.2 <b><i>Food processing tools and equipment/utensils</i></b> are inspected and checked according to manufacturer's specifications  1.3 Food processing equipment is set up, adjusted and readied according to job requirements
2. Operate Food processing Equipment	2.1 Food processing equipment is switched on according to <b><i>manufacturer's specifications</i></b>  2.2 Performance of food processing equipment is checked to ensure conformity with specified output  2.1 Operation of food processing equipment is managed to achieve planned outcomes  2.2 Minor trouble shooting on food processing tools, equipment and utensils is performed when necessary
3. Perform Post- Operation Activities	3.1 Food processing equipment is switched off and unplugged after operation in accordance with manufacturer's specifications  3.2 Food processing tools, equipment and instruments are cleaned, sanitized and stowed as required according to manufacturer's specifications and workplace policies and regulations

	<p>3.3 <b>Minor preventive maintenance</b> on equipment is performed in line with organization's maintenance system</p> <p>3.4 Main machine parts are inspected and checked in line with organization's policy</p> <p>3.5 <b>Condition of machine</b> is monitored to ensure serviceability in accordance with workplace rules and regulations</p>
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**RANGE OF VARIABLES**

<b>VARIABLES</b>	<b>RANGE</b>
1. Food Processing Methods	Food Processing Methods include:  1.1 Salting 1.2 Curing 1.3 Smoking 1.4 Fermentation 1.5 Pickling 1.6 Canning 1.7 Bottling 1.8 Sugar concentration 1.9 Drying 1.10 Dehydration
2. Food Processing Tools, Equipment and Utensils	Tools, Equipment and Utensils used for the following food processing methods:  2.1 Salting 2.2 Curing 2.3 Smoking 2.4 Fermentation 2.5 Pickling 2.6 Canning 2.7 Bottling 2.8 Sugar concentration 2.9 Drying 2.10 Dehydration
3. Manufacturer's Specifications	Manufacturer's specifications may include but not limited to:  3.1 Handling requirements 3.2 Operating requirements 3.3 Discharge Label 3.4 Reporting 3.5 Testing 3.6 Positioning 3.7 Refilling

4. Minor Preventive Machine Maintenance	<p>Minor Preventive Machine Maintenance may include but not limited to checking of the following:</p> <ul style="list-style-type: none"> <li>4.1 Machine temperature</li> <li>4.2 Hydraulic fluid</li> <li>4.3 Wear and surface condition</li> <li>4.4 Crack</li> <li>4.5 Leak detection</li> <li>4.6 Vibration</li> <li>4.7 Corrosion/erosion</li> <li>4.8 Electric insulation</li> </ul>
5. Condition of Machine	<ul style="list-style-type: none"> <li>5.1 Serviceable</li> <li>5.2 Repairable</li> <li>5.3 Defective</li> </ul>

## EVIDENCE GUIDE

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Assembled, inspected, checked and sanitized appropriate tools and equipment/instruments</li> <li>1.2 Set-up, adjusted and readied tools and equipment and instruments according to requirements</li> <li>1.3 Operated and monitored performance of equipment to ensure specified output</li> <li>1.4 Performed post operation activities</li> <li>1.5 Performed minor trouble shooting on food processing tools, equipment and utensils</li> </ul>
2. Underpinning Knowledge	<ul style="list-style-type: none"> <li>2.1 Equipment, tools and instruments: Uses and Specifications</li> <li>2.2 Equipment, tools and instruments: Parts and Functions</li> <li>2.3 Sanitizing agents: Uses and Specification</li> <li>2.4 Minor preventive maintenance</li> <li>2.5 Proper stowing of tools and equipment/instruments</li> <li>2.6 Minor trouble shooting</li> <li>2.5 Interpreting manufacturer's specifications</li> <li>2.6 Equipment/machine wear and tear process</li> </ul>
3. Underpinning Skills	<ul style="list-style-type: none"> <li>3.1 Equipment/machine parts tear down and assembly</li> <li>3.2 Inspecting and checking condition of equipment/machines before, during and after operation</li> <li>3.3 Performing minor trouble shooting</li> <li>3.4 Performing minor preventive maintenance</li> <li>3.5 Reporting equipment/machine, tools, instruments breakdown and recording same in standard forms</li> </ul>
4. Methods of Assessment	<p>Competency in this unit must be assessed through:</p> <ul style="list-style-type: none"> <li>4.1 Direct observation and questioning of a candidate operating food processing tools and equipment/instruments</li> <li>4.2 Submission of written report on the performance and condition of equipment/machine, tools, instruments used.</li> </ul>
5. Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> <li>5.1 Work area/station</li> <li>5.2 Materials, tools and equipment relevant to the Unit of Competency</li> </ul>
6. Context of Assessment	<ul style="list-style-type: none"> <li>6.1 Assessment should occur on the job or in a simulated workplace</li> </ul>

**UNIT OF COMPETENCY : PERFORM MATHEMATICAL COMPUTATIONS****UNIT CODE : AGR741204****UNIT DESCRIPTOR :** This unit covers the knowledge, skills and attitudes to perform mathematical computations in the workplace.

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized</i> terms are elaborated in the Range of Variables
1. Gather and Tabulate the Recorded Data	1.1 Records of <b><i>weights and measurements</i></b> of raw materials and ingredients are gathered and summarized according to workplace standard operating procedures  1.2 Records of weights and measurements of finished processed products are gathered and summarized according to workplace standard operating procedures  1.3 Summarized data are tabulated according to enterprise requirements
2. Review the Various Formulations	2.1 Raw materials and ingredients and percentage formulations are checked/counter checked according to approved specifications and enterprise requirements  2.2 Finished products and percentage formulations are reviewed according to approved specifications and enterprise requirements
3. Calculate Production Input and Output	3.1 Data on raw material consumption and corresponding percentage equivalent are calculated in line with enterprise requirements  3.2 Data on actual spoilage and rejects and corresponding percentage equivalents are calculated according to enterprise requirements  3.2 Data on actual yields and recoveries and corresponding percentage equivalents are calculated according to enterprise requirements  3.3 All calculated data are recorded according to enterprise requirements

4. Compute Production Cost	<p>4.1 <b><i>Costs of production</i></b> are computed according to organization's standard procedures</p> <p>4.2 Computed costs of production are reviewed and validated according to organization's production requirements</p>
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### RANGE OF VARIABLES

VARIABLES	RANGE
1. Weights and Measurements	Weights and Measurements may include:  1.1 Gravimetric 1.2 Volumetric 1.3 Lengths, diameters, widths 1.4 Seam measurements 1.5 Hotness/coldness ( temperature) 1.6 Concentrations of solutions
2. Costs of Production	Costs of production are computed using the following:  2.1 Ingredient formulation 2.2 Percentage formulation 2.3 Conversion 2.4 Ratios and proportion 2.7 Spoilage and rejects and corresponding percentages 2.8 Recoveries and yields and corresponding percentages

## EVIDENCE GUIDE

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Gathered the records of weights and measurements of raw materials/ingredients and finished processed products</li> <li>1.2 Summarized and tabulated all raw data gathered</li> <li>1.3 Calculated the production inputs and outputs</li> <li>1.4 Computed the costs of production</li> <li>1.5 Reviewed all formulations and concentrations of solutions according to specifications and standards of the enterprise</li> </ul>
2. Underpinning Knowledge	<ul style="list-style-type: none"> <li>2.1 Mensuration</li> <li>2.2 Percentage formulation</li> <li>2.3 Fraction, ratios and proportions</li> <li>2.3 Basic Mathematical Operations</li> <li>2.4 Conversion factors</li> </ul>
3. Underpinning Skills	<ul style="list-style-type: none"> <li>3.1 Basic Mathematical skills</li> <li>3.2 Basic Accounting skills</li> <li>3.3 Recording skills</li> <li>3.4 Data Gathering skills</li> </ul>
4. Methods of Assessment	<p>Competency in this unit must be assessed through:</p> <ul style="list-style-type: none"> <li>4.1 A combination of direct observation and questioning of a candidate computing costs of production</li> <li>4.2 Submission of a written report showing a record of production data including raw data</li> </ul>
5. Resource Implications	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>5.1 Work area/station</li> <li>5.2 Materials relevant to recording and documentation of production data</li> <li>5.3. Computer with printer and software</li> <li>5.4 Calculator</li> <li>5.5 Work table</li> </ul>
6. Context of Assessment	<ul style="list-style-type: none"> <li>6.1 Assessment should occur on the job or in a simulated workplace</li> </ul>

## UNIT OF COMPETENCY: IMPLEMENT GOOD MANUFACTURING PRACTICE AND PROCEDURES

UNIT CODE : AGR741205

**UNIT DESCRIPTOR:** This unit deals with the skills, knowledge and attitudes required to comply with relevant Good Manufacturing Practice (GMP) codes through the implementation of workplace GMP and quality procedures

ELEMENTS	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Identify requirements of GMP related to own work	1.1. Sources of information on GMP requirements are located 1.2. GMP requirements and responsibilities related to own work are identified
2. Observe personal hygiene and conduct to meet GMP requirements	2.1. Personal hygiene meets GMP requirements 2.2. Clothing is prepared, used, stored and disposed of according to GMP and workplace procedures 2.3. Personal movement around the workplace complies with area entry and exit procedures
3. Implement GMP requirements when carrying out work activities	3.1. GMP requirements are identified 3.2. <b>Work area</b> , materials, equipment and product are routinely monitored to ensure compliance with GMP requirements 3.3. Raw materials, packaging components and product are handled according to GMP and workplace procedures 3.4. Workplace procedures to control resource allocation and process are followed to meet GMP requirements 3.5. Common forms of contamination are identified and appropriate control measures are followed according to GMP requirements 3.6. The workplace is maintained in a clean and tidy order to meet GMP housekeeping standards

4. Participate in improving GMP	<p>4.1. Processes, practices or conditions which could result in non-compliance with GMP are identified and reported according to workplace reporting requirements</p> <p>4.2. Corrective action is implemented within level of responsibility</p> <p>4.3. GMP issues are raised with designated personnel</p>
5. Participate in validation processes	<p>5.1. Validation procedures are followed to GMP requirements</p> <p>5.2. Issues arising from validation are raised with designated personnel</p> <p>5.3. Validation procedures are documented to meet GMP requirements</p>
6. Complete workplace documentation to support GMP	<p>6.1. Documentation and recording requirements are identified</p> <p>6.2. Information is recorded according to <b>workplace reporting procedures</b> to meet GMP requirements</p>

## RANGE OF VARIABLES

VARIABLE	RANGE
1. OH&S requirements may include:	1.1. OH&S legal requirements 1.2. Enterprise OH&S policies, procedures and programs
2. Work in carried out in accordance with regulations. Regulatory requirements may include:	2.1. Relevant regulations regarding food processing and food safety regulations 2.2. Department of Health – Food Establishments – Code of Sanitation of the Philippines (P.D.856) 2.3. Environment Management Bureau regulations regarding emissions, waste treatment, noise and effluent treatment and control
3. Hygiene and sanitation requirements may include:	3.1. Department of Health – Food Establishments – Code of Sanitation of the Philippines (P.D.856) 3.2. Requirements set out by Bureau of Food and Drugs 3.3. Workplace requirements
4. Workplace requirements may include:	4.1. Work instructions 4.2. Standard operating procedures 4.3. OH&S requirements 4.4. Quality assurance requirements 4.5. Equipment manufacturers' advice 4.6. Material Safety Data Sheets 4.7. Codes of Practice and related advice
5. Products may include	5.1. Products, raw materials, packaging components and consumables, part-processed product, finished product and cleaning materials
6. Responsibility and reporting systems	6.1. Responsibility for applying Good Manufacturing Practice relates to the person's work area 6.2. Reporting systems may include electronic and manual data recording and storage systems

## EVIDENCE GUIDE

<p>1. Critical aspects of Competency</p>	<p>Assessment requires evidences that the candidate :</p> <ol style="list-style-type: none"> <li>1.1. Located and followed workplace information relating to GMP responsibilities</li> <li>1.2. Maintained personal hygiene consistent with GMP</li> <li>1.3. Followed workplace procedures when moving around the workplace and/or from one task to another to maintain GMP</li> <li>1.4. Used, stored and disposed of appropriate clothing/footwear as required by work tasks and consistent with GMP</li> <li>1.5. Identified and reported situations that do or could compromise GMP</li> <li>1.6. Applied appropriate control measures to control contamination</li> <li>1.7. Recorded results of monitoring, and maintain records as required by GMP</li> <li>1.8. Followed validation procedures within level of responsibility</li> <li>1.9. Identified and responded to out-of-specification or unacceptable raw materials, packaging components, final or part processed product within level of responsibility</li> <li>1.10. Followed procedures to isolate or quarantine non-conforming product</li> <li>1.11. Handled, cleaned and stored equipment, utensils, raw materials, packaging components and related items according to GMP and workplace procedures</li> <li>1.12. Maintained GMP for own work</li> <li>1.13. Handled and/or disposed of out-of-specification or contaminated materials, packaging components/consumables and product, waste and recyclable material according to GMP as required by work responsibilities</li> <li>1.14. Maintained the work area in a clean and tidy state</li> <li>1.15. Identified and reported signs of pest infestation</li> </ol>
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<p>2. Underpinning Knowledge and Attitudes</p>	<p>2.1. The role of GMP in preventing contamination, its relationship to legislative responsibilities and potential implications of non-compliance</p> <p>2.2. GMP arrangements in the workplace. This includes awareness of relevant GMP codes of practice and related workplace policies and procedures to implement these responsibilities</p> <p>2.3. The relationship between GMP and the quality system, personnel responsible for designing and managing GMP, personal role to maintain GMP, the role of internal and external auditors as appropriate</p> <p>2.4. Procedures followed to investigate contamination events and performance improvement processes</p> <p>2.5. Personal clothing and footwear requirements for working in and/or moving between work areas</p> <p>2.6. Personal clothing use, storage and disposal requirements</p> <p>2.7. Awareness of common micro biological, physical and chemical contaminants relevant to the work process. This includes the types of contamination likely to occur, the conditions under which they occur, possible consequences and control methods to prevent occurrence</p> <p>2.8. Basic concepts of quality assurance including quality specifications, operating parameters, validation procedures and control methods. This includes an understanding of related documentation including Standard Operating Procedures and/or batch instructions</p> <p>2.9. Control methods and procedures used in the work area to maintain GMP. This includes an understanding of the purpose of control, the consequences if not controlled and the method of control where relevant. It may include an understanding of methods used to monitor process control; purpose and requirements of validation procedures; and purpose of equipment calibration</p> <p>2.10. GMP responsibilities and requirements relating to work role</p> <p>2.11. Basic understanding of the properties, handling and storage requirements of raw materials,</p>
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	<p>packaging components and final product handled and used</p> <p>2.12. Standards for materials, equipment and utensils used in the work area</p> <p>2.13. Recall and traceability procedures relevant to work role</p> <p>2.14. Procedures for responding to out-of-specification or unacceptable performance/outcomes. This includes procedures for identifying or isolating materials or product of unacceptable quality</p> <p>2.15. Purpose of keeping records and the recording requirements of GMP. This includes an understanding of product and materials traceability procedures</p> <p>2.16. Housekeeping requirements and responsibilities relating to own work. Where relevant this includes use and storage of housekeeping/cleaning equipment</p> <p>2.17. Waste collection, recycling and handling procedures relevant to own work responsibilities</p> <p>2.18. Responsibilities for reporting and recording quality information</p>
3. Underpinning Skills	<p>3.1. Planning and organizing work (time management)</p> <p>3.2. Working with others and in teams</p>
4. Resource Implication	<p>The following resources should be provided:</p> <p>4.1. Workplace location and access to workplace policies</p> <p>4.2. Materials relevant to the proposed activity and tasks</p>
5. Methods of Assessment	<p>Competency in this unit must be assessed using at least two (2) of the following methods:</p> <p>5.1. A combination of direct observation and oral questioning</p> <p>5.2. Written report</p> <p>5.3. Written Test</p> <p>5.4. Portfolio</p>
6. Context of Assessment	<p>Assessment should occur on the job or in a simulated workplace</p>



## UNIT OF COMPETENCY: IMPLEMENT ENVIRONMENTAL POLICIES AND PROCEDURES

UNIT CODE : AGR741206

**UNIT DESCRIPTOR:** This unit deals with the skills, knowledge and attitudes required to implement environmental policies and procedures when carrying out work responsibilities

ELEMENTS	PERFORMANCE CRITERIA <i>Bold, italicized terms</i> are elaborated in the Range of Variables
1. Conduct work in accordance with environmental policies and procedures	<ul style="list-style-type: none"><li>1.1. Immediate work area is routinely checked to ensure compliance with environmental requirements</li><li>1.2. <b>Hazards</b> and unacceptable performance are identified, removed and/or reported to appropriate personnel according to workplace procedures</li><li>1.3. Workplace procedures and work instructions are followed</li><li>1.4. Where control requirements are not met, incidents are promptly reported and corrective action is taken</li><li>1.5. Measures used to minimize and handle waste are followed</li><li>1.6. Environmental data is recorded in required format according to workplace reporting requirements</li></ul>
2. Participate in improving environmental practices at work	<ul style="list-style-type: none"><li>2.1. Processes or conditions which could result in an unacceptable environmental outcome are identified and reported according to workplace reporting requirements</li><li>2.2. Corrective action is taken in accordance with the environmental management and emergency response plans as required</li><li>2.3. Contributions are made to a participative arrangements for managing environmental issues in the workplace within workplace procedures and level of responsibility</li></ul>

<p>3. Respond to an environmental emergency</p>	<p>3.1. Emergency situations are identified and reported according to workplace reporting requirements</p> <p>3.2. Emergency procedures are followed as appropriate to the nature of the emergency and according to workplace procedures</p>
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## RANGE OF VARIABLES

VARIABLE	RANGE
1. OH&S requirements may include:	1.1. OH&S legal requirements 1.2. Enterprise OH&S policies, procedures and programs
2. Work in carried out in accordance with regulations. Regulatory requirements may include:	2.1. Relevant regulations regarding food processing and food safety regulations 2.2. Department of Health – Food Establishments – Code of Sanitation of the Philippines (P.D.856) 2.3. Environment Management Bureau regulations regarding emissions, waste treatment, noise and effluent treatment and control
3. Hygiene and sanitation requirements may include:	3.1. Department of Health – Food Establishments – Code of Sanitation of the Philippines (P.D.856) 3.2. Requirements set out by Bureau of Food and Drugs 3.3. Workplace requirements
4. Workplace requirements may include:	4.1. Work instructions 4.2. Standard operating procedures 4.3. OH&S requirements 4.4. Quality assurance requirements 4.5. Equipment manufacturers’ advice 4.6. Material Safety Data Sheets 4.7. Codes of Practice and related advice
5. Identification and control of hazards may include:	5.1. Procedures are available that outline appropriate response to environmental incidents, accidents and emergencies 5.2. At this level identification and control of environmental hazards relates to own work. Corrective action typically involves recognizing any event which occurs as part of the work process and presents an unacceptable environmental risk or outcome, taking corrective action within level of responsibility, and/or reporting to the appropriate person in the work area

	<p>5.3. Work responsibilities may involve handling of hazardous waste</p> <p>5.4. An environmental hazard is any activity, product or service that has the potential to affect the environment. This may also be referred to as an environmental aspect</p> <p>5.5. An environmental risk is the likelihood that the hazard can cause harm to the environment</p> <p>5.6. A control measure is a method or procedure used to prevent or minimize environmental risks</p> <p>5.7. Responsibility for identifying and controlling environmental risks relates to immediate work responsibilities</p> <p>5.8. Participating in improvement may involve participation in structured improvement programs, one-off projects and day-to-day problem solving and consultative groups</p>
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## EVIDENCE GUIDE

<p>1. Critical aspects of Competency</p>	<p>Assessment requires evidences that the candidate :</p> <ol style="list-style-type: none"> <li>1.1. Accessed and apply workplace information on environmental policies and procedures relating to own work</li> <li>1.2. Fitted and used appropriate personal protective clothing and equipment</li> <li>1.3. Checked own work area to identify environmental hazards</li> <li>1.4. Reported hazards according to workplace procedure in a clear and timely manner</li> <li>1.5. Followed work procedures to control or minimize environmental risk. This may include monitoring parameters set for environmental aspects such as airborne particulate, noise, and water quality. It may also include demonstrating use of emergency equipment according to work role requirements</li> <li>1.6. Recorded environmental information as required by the environmental management program</li> <li>1.7. Participated in processes to raise issues and suggestions to improve environmental issues management. This requires appropriate communication skills to structure and present information and interact with others</li> <li>1.8. Followed procedures to collect, deposit, recycle and/or dispose of waste in own work area</li> <li>1.9. Followed procedures to respond to environmental emergencies such as spills and emissions. This may include following procedures to alert the appropriate emergency services</li> <li>1.10. Maintained housekeeping standards in work area</li> </ol>
<p>2. Underpinning Knowledge and Attitudes</p>	<ol style="list-style-type: none"> <li>2.1. Workplace approach to managing environmental issues. This includes awareness of relevant work procedures, personnel responsible for environmental issues, consultative arrangements for reporting and improving environmental practices and may include an understanding of the role of internal and external auditors as appropriate</li> <li>2.2. Responsibilities of self and employer to manage environmental issues on site. This includes an awareness of any license or agreements in place</li> </ol>

	<p>with resource management authorities and the purpose of these arrangements</p> <p>2.3. Sources of advice on environmental issues in the workplace</p> <p>2.4. Environmental hazards and risks associated with the work carried out. Examples may include water pollution, air pollution, noise, waste handling, emergencies such as spills, and hazardous chemicals or waste</p> <p>2.5. Work procedures as they relate to environmental responsibilities. This includes use of appropriate personal protective clothing and equipment as required</p> <p>2.6. Procedures used to prevent or control environmental risks associated with own work. Where this requires use of emergency equipment, this includes understanding the purpose, capacity and limitations of equipment, location and storage requirements and safe handling and equipment use</p> <p>2.7. Basic concepts of hazard identification, risk assessment and control options. This includes an understanding of the hierarchy of hazard control</p> <p>2.8. Workplace procedures for identifying and responding to hazards, investigating incidents and improving environmental management and resource utilisation</p> <p>2.9. Impact of work practices on resource utilisation and wastage</p> <p>2.10. Procedures used to handle and dispose of waste according to workplace requirements. This includes an awareness of the need to separate solid and liquid waste, and remove waste in solid form rather than hosing down drains. It may also include an understanding of handling requirements for hazardous waste</p> <p>2.11. The difference between trade waste and storm water drains</p> <p>2.12. Consequences of inappropriate waste handling and disposal</p> <p>2.13. Procedures for responding to unplanned incidents such as spills and leaks as relevant to the work area</p>
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	<p>2.14. Emergency response system and procedures</p> <p>2.15. Responsible use of resources in own work area</p> <p>2.16. Reporting procedures and responsibilities</p> <p>2.17. Consultative processes in the workplace for raising issues/suggestions on environmental issues</p>
3. Underpinning Skills	<p>3.1. Planning and organizing work (time management)</p> <p>3.2. Working with others and in teams</p>
4. Resource Implication	<p>The following resources should be provided:</p> <p>4.1. Workplace location and access to workplace policies</p> <p>4.2. Materials relevant to the proposed activity and tasks</p>
5. Methods of Assessment	<p>Competency in this unit must be assessed using at least two (2) of the following methods:</p> <p>5.1. A combination of direct observation and oral questioning</p> <p>5.2. Written report</p> <p>5.3. Written Test</p> <p>5.4. Portfolio</p>
6. Context of Assessment	<p>Assessment should occur on the job or in a simulated workplace</p>

## CORE COMPETENCIES

### UNIT OF COMPETENCY: PROCESS FOODS BY SALTING, CURING AND SMOKING

UNIT CODE : AGR741301

**UNIT DESCRIPTOR:** This unit deals with the skills, knowledge and attitudes required to process foods by Salting, Curing and Smoking

ELEMENTS	PERFORMANCE CRITERIA
	<b>Bold, italicized terms</b> are elaborated in the Range of Variables
1. Prepare Equipment, Tools, Materials and Utensils	<p>1.1 <b><i>Equipment and tools</i></b> for salting, curing and smoking are prepared in accordance with manufacturer's specifications.</p> <p>1.2 Equipment for the above <b><i>food processing methods</i></b> are checked, sanitized and calibrated in accordance with manufacturer's specifications.</p> <p>1.3 <b><i>Kitchen utensils</i></b> for the above food processing methods are readied and sanitized in accordance with manufacturer's specifications.</p> <p>1.4 <b><i>Office equipment and materials/ supplies</i></b> needed are prepared in accordance with approved specifications.</p>
2. Prepare the Raw Materials	<p>2.1 <b><i>Raw materials</i></b> are sorted and graded in accordance with specifications</p> <p>2.2 Eggs for salting are cleaned and washed in accordance with approved standard procedures.</p> <p>2.3 Poultry for curing are skinned, eviscerated and washed in accordance with approved specifications and standard procedures.</p> <p>2.4 Meat for curing are deskinning, deboned, sliced, chopped and minced in accordance with approved specifications and standard procedures.</p> <p>2.5 Fish/other marine products are cleaned, descaled, eviscerated, deboned, filleted and washed in accordance with approved specifications and standard procedures.</p> <p>2.6 Cleaned raw materials are weighed in accordance with approved specifications</p>



3. Prepare Salting and Curing Solutions and Mixtures	<p>3.1 Required salt and other <b>ingredients</b> and adjuncts for salting and curing are measured and weighed in line with approved specifications and <b>OHS requirements</b></p> <p>3.2 Required ingredients for pumping pickle, cover pickle and dry cure mixture are measured and weighed in line with approved specifications</p>
4. Cure the Materials	<p>4.1 Curing mixture and prepared materials are mixed in accordance with approved specifications and enterprise requirements</p> <p>4.2 Mixture is allowed to be cured at room temperature or refrigerated temperature at appropriate number of days.</p> <p>4.3 Materials being cured are kept submerged in solution to obtain even distribution/penetration of cure mixture in line with approved specifications</p>
5. Finish the Cured Materials	<p>5.1 Cured food materials are removed from the solution, washed and drained in accordance with standard operating procedures</p> <p>5.2 Drained cured materials are cooked in appropriate cooking medium</p> <p>5.3 Cooked cured products are smoked according to specifications</p> <p>5.4 Cooked cured smoked products are transferred to containers and cooled according to specifications</p> <p>5.5 Salted eggs are hard boiled then dipped in grana solution according to approved specifications</p>
6. Prepare Production Report	<p>6.1 Daily production input is noted and documented according to standard operating procedures.</p> <p>6.2 Daily production output is noted and documented according to standard operating procedures.</p> <p>6.3 All <b>production data</b> are recorded and presented according to prescribed format.</p>

## RANGE OF VARIABLES

VARIABLE	SCOPE
1. Equipment, Tools and Materials	<p>1.1 Salting, Curing and Smoking equipment and materials may include but not limited to:</p> <ul style="list-style-type: none"> <li>1.1.1 Smokehouse</li> <li>1.1.2 Polysealer</li> <li>1.1.3 Soaking vats</li> <li>1.1.4 Chiller/refrigerator/ freezer</li> <li>1.1.5 Oven</li> <li>1.1.6 Salinometer</li> <li>1.1.7 Jack lifts, trolleys and wheelers</li> <li>1.1.8 Weighing scales of varying capacities and sensitivities</li> <li>1.1.9 Cutting implements like knives, slicers, peelers</li> <li>1.1.10 Fuel for smoking like wood, wood shavings, half-dried leaves, coconut husks &amp; shells, rice hulls, corn cobs, saw dust</li> </ul> <p>1.2 Office equipment, supplies may include but not limited to the following:</p> <ul style="list-style-type: none"> <li>1.2.1 Computer with printer</li> <li>1.2.2 Calculator</li> <li>1.2.3 Overhead projector</li> <li>1.2.4 Bond papers</li> <li>1.2.5 Computer papers</li> <li>1.2.6 Note pads</li> <li>1.2.7 Pencils/ball pen</li> <li>1.2.8 Index cards</li> <li>1.2.9 Clips</li> <li>1.2.10 Folders</li> <li>1.2.11 Clip pads</li> <li>1.2.12 Reporting and recording forms /logbooks</li> <li>1.2.13 Adhesive tapes.</li> <li>1.2.14 Bulletin boards</li> <li>1.2.15 White boards and white board markers</li> <li>1.2.16 Chalks</li> <li>1.2.17 Pentel pens</li> </ul>
2. Food Processing Methods	<p>Food Processing methods involved in this Unit of Competency is limited to:</p> <ul style="list-style-type: none"> <li>2.1 Salting</li> <li>2.2 Curing</li> <li>2.3 Smoking</li> </ul>

3. Kitchen Utensils	<p>Kitchen utensils include but not limited to:</p> <ul style="list-style-type: none"> <li>3.1 Casseroles</li> <li>3.2 Mixing bowls</li> <li>3.3 Chopping boards</li> <li>3.4 Colander</li> <li>3.5 Saucepans</li> <li>3.6 Utility trays</li> <li>3.7 Food tongs</li> </ul>
4. Raw Materials	<p>Raw materials include:</p> <ul style="list-style-type: none"> <li>4.1 Fresh eggs</li> <li>4.2 Dressed poultry</li> <li>4.3 Fresh meat</li> <li>4.4 Fish/other marine products</li> </ul>
5. Ingredients	<p>Ingredients may include but not limited to:</p> <ul style="list-style-type: none"> <li>5.1 Salt</li> <li>5.2 Sugar</li> <li>5.3 Condiments</li> <li>5.4 Spices</li> <li>5.5 Herbs</li> <li>5.6 Grana solutions</li> </ul>
6. OHS requirements	<p>Occupational Health and Safety requirements may include:</p> <ul style="list-style-type: none"> <li>6.1 Health/medical certificate</li> <li>6.2 Dole requirements</li> <li>6.3 Personal hygiene &amp; good grooming</li> <li>6.4 Plant sanitation &amp; waste management</li> <li>6.5 BFAD requirements</li> <li>6.6 PPE requirements <ul style="list-style-type: none"> <li>6.6.1 apron/laboratory gown</li> <li>6.6.2 mouth masks</li> <li>6.6.3 gloves</li> <li>6.6.4 rubber boots,</li> <li>6.6.5 head gears such as caps, hairnets, ear plug</li> </ul> </li> </ul>
7 Production Data	<p>Production data include:</p> <ul style="list-style-type: none"> <li>7.1 Production input</li> <li>7.2 Production output</li> <li>7.3 Production target</li> <li>7.4 Production schedule</li> </ul>

## EVIDENCE GUIDE

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Prepared, cleaned, checked and sanitized the equipment, tools, materials and utensils used for salting, curing and smoking meat, eggs poultry and fish/other marine products</li> <li>1.2 Followed the procedures and techniques in salting, curing and smoking</li> <li>1.3 Followed BFAD &amp; GRAS approved least minimum and maximum levels of usage for food and curing mixes</li> <li>1.4 Calibrated and operated equipment</li> <li>1.5 Cleaned and stowed equipment, tools, and utensils after using</li> </ul>
<p>2. Underpinning Knowledge</p>	<ul style="list-style-type: none"> <li>1.1 Safety Practices <ul style="list-style-type: none"> <li>2.1.1 Environmental protection and concerns</li> <li>2.1.2 Food safety principles and practices</li> <li>2.1.3 Food handling practices</li> <li>2.1.4 Proper waste disposal</li> <li>2.1.5 Good grooming &amp; personal hygiene</li> </ul> </li> <li>2.2 Communication <ul style="list-style-type: none"> <li>2.2.1 Preparation of daily production input report (spoilage and rejects)</li> <li>2.2.2 Preparation of daily production output report (yields and recoveries)</li> <li>2.2.3 Recording and documenting of production data</li> <li>2.2.4 Reporting of defects/breakdown to immediate head/supervisor</li> </ul> </li> <li>2.3 Equipment, Tools/Instruments and Utensils: Uses and Specifications <ul style="list-style-type: none"> <li>2.3.1 Parts and functions of equipment, tools/instruments and utensils</li> </ul> </li> <li>2.4 Systems, Processes and Operations <ul style="list-style-type: none"> <li>2.4.1 Preparing raw materials</li> <li>2.4.2 Cut-out procedures and techniques</li> <li>2.4.3 Recycling/by-product utilization</li> <li>2.4.4 Sorting and grading of raw materials</li> <li>2.4.5 Curing procedures and techniques</li> <li>2.4.6 Salting procedures and techniques</li> <li>2.4.6 Smoking procedures and techniques</li> <li>2.4.7 Operating various equipment, tools and utensils</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>2.5 Codes and Regulations <ul style="list-style-type: none"> <li>2.5.1 TQM and Food Quality Systems Principles</li> <li>2.5.2 Hazard Analysis Critical Control Points</li> <li>2.5.3 ISO and EMS</li> <li>2.5.4 Good Manufacturing Practices</li> </ul> </li> <li>2.6 Materials: Uses and Specifications <ul style="list-style-type: none"> <li>2.6.1 Raw materials and ingredients</li> <li>2.6.2 Fuel for smoking</li> <li>2.6.3 Office supplies like bond paper, computer papers, note pads</li> <li>2.6.4 Salting and curing solutions and mixtures</li> </ul> </li> <li>2.7 Mathematics and Measurements <ul style="list-style-type: none"> <li>2.7.1 Weights, measures, conversions, percentages, ratios and proportions</li> <li>2.7.2 Basic accounting procedures and techniques</li> <li>2.7.3 Basic arithmetical operations like multiplication, division, addition and subtraction</li> </ul> </li> <li>2.8 Maintenance <ul style="list-style-type: none"> <li>2.8.1 Maintaining the various equipment, tools and utensils</li> <li>2.8.2 Calibrating weighing scale and various equipment</li> <li>2.8.3 Proper cleaning and stowing of equipment, tools and utensils</li> </ul> </li> </ul>
3. Underpinning Skills	<ul style="list-style-type: none"> <li>3.1 Oral and written communication skills</li> <li>3.2 Calibrating skills</li> <li>3.3 Basic computer skills</li> <li>3.4 Cooking/culinary skills</li> <li>3.5 Basic mathematical skills ( conversion, percentage and formulation)</li> <li>3.6 Recording and reporting skills</li> <li>3.7 Preparing flow diagrams/flow charts</li> <li>3.8 Conducting cut-out tests</li> <li>3.9 Sanitary food handling practices</li> <li>3.10 Computation of yields and recoveries</li> </ul>
4. Underpinning Attitudes	<ul style="list-style-type: none"> <li>4.1 Self-esteem</li> <li>4.2 Punctual/Time conscious</li> <li>4.3 Cost conscious</li> <li>4.4 Environmental and pollution conscious</li> <li>4.5 Flexible/adaptable</li> <li>4.6 Honest</li> <li>4.7 Socially responsible</li> <li>4.8 Dependable</li> <li>4.9 Innovative</li> </ul>

	4.10 Alert 4.11 Systematic and organized 4.12 Committed 4.13 Good listener and fast learn 4.14 Creative 4.15 Resourceful 4.16 Self-starter 4.17 Nationalistic and patriotic
5. Methods of Assessment	Competency in this unit must be assessed using at least two (2) of the following methods: 5.1 A combination of direct observation and questioning of a candidate processing foods by salting, curing and smoking including preparation of equipment, tools and utensils, preparation of raw materials and salting/ curing solutions/mixtures 5.2 Written report on the preparation of daily production input and output and other production data 5.3 Written test 5.4 Portfolio
6. Resource Implications	The following resources should be provided: 6.1 Specific work area/station 6.2 Equipment, tools and utensils to be prepared for salting, curing and smoking 6.3 Fruits, vegetables, fish/other marine products, meat, poultry and eggs to be processed by salting, curing and smoking 6.4 Materials relevant to the proposed activity
7. Context of Assessment	7.1 Assessment should occur on the job or in a simulated workplace.

## UNIT OF COMPETENCY: PROCESS FOODS BY FERMENTATION AND PICKLING

UNIT CODE : AGR741302

**UNIT DESCRIPTOR:** This unit deals with the skills, knowledge and attitudes required to process foods by Fermentation and Pickling

ELEMENTS	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Prepare Equipment, Tools and Utensils	<p>1.1 <b>Equipment, tools and utensils</b> for fermentation and pickling are selected according to requirements</p> <p>1.2 Equipment, tools and utensils are checked and calibrated in accordance with manufacturer's specifications</p> <p>1.3 Equipment/ utensils for the above <b>food processing methods</b> are readied and sanitized according to manufacturer's specifications</p>
2. Prepare Raw Materials	<p>2.1 <b>Raw materials</b> are sorted and graded according to approved <b>criteria</b> and enterprise requirements</p> <p>2.2 Sorted and graded fresh fruits and vegetables are weighed, washed, peeled, cut and sliced according to required sizes and shapes</p> <p>2.3 Fish and other marine products are cleaned, eviscerated, cut and washed according to specifications.</p>
3. Perform Alcoholic Fermentation of Fruits/Vegetables	<p>3.1 Prepared fruit is mixed with water according to specifications</p> <p>3.2 Mixture is allowed to boil and juice is extracted in accordance with specifications and enterprise requirements</p> <p>3.3 Extracted juice is cooled and mixed with other <b>ingredients</b> like sugar and yeast in accordance with specifications</p> <p>3.4 Juice is fermented for 1-2 weeks as required</p> <p>3.5 Fermented juice is strained, filtered and heated according to specifications</p>

4. Perform Acetic Acid/ Lactic Acid Fermentation/pickling of Vegetables	4.1 Alcoholic liquid is mixed with mother vinegar according to specifications 4.2 Mixture is allowed to ferment for 2-4 weeks according to standard procedures 4.3 Mixture is strained/filtered then clarified according to specifications 4.4 Acetous liquid is heated according to specifications
5. Ferment Fish and Other Marine Products	5.1 Fish and other marine products are mixed with required salt according to mixing requirements 5.2 The mixture of fresh and other marine products and salt are left to ferment for 1-2 weeks in fermentation vats/vessels according to standard procedures 5.3 Fish paste/fish sauce are heated according to standard procedures
6. Prepare Production Report	6.1 All <b>production data</b> gathered are presented in prescribed format to include: Daily production input (spoilage, rejects and variances) and daily production output (yield, recoveries and variances)



## RANGE OF VARIABLES

VARIABLE	RANGE
1. Equipment, Tools, Utensils and Materials	<p>Equipment, tools and kitchen utensils for this unit of competency include:</p> <ul style="list-style-type: none"> <li>1.1 Cold storage equipment like chiller, refrigerator, freezer</li> <li>1.2 Jack lifts and trolleys</li> <li>1.3 Weighing scale of various capacities and sensitivities</li> <li>1.4 Fermentation vats</li> <li>1.5 Sealers (can and plastic)</li> <li>1.6 Cutting implements such as knives, peelers, slicer, cutter</li> <li>1.7 Kitchen utensils like casserole, colanders, bowls, food tongs</li> <li>1.8 Strainers, basting spoon paddle, steamer exhaustor</li> <li>1.9 Exhaust box, steam jacketed kettle lifter, wire baskets, chopping boards, vegetable cutter, osterizer</li> <li>1.10 Office equipment such as computer with printer, intercom</li> <li>1.11 Office materials like bond papers, computer papers, note pads, pencils/ball pen, index cards, clips, folders, clip pads, reporting and recording forms/logbooks, adhesive tapes.</li> <li>1.12 Bulletin boards, white boards, chalks, white board markers, pentel pens</li> </ul>
2. Food Processing Methods	<p>Food processing methods specified in this Unit of Competency is limited to:</p> <ul style="list-style-type: none"> <li>2.1 Fermentation</li> <li>2.2 Pickling</li> </ul>
3. Raw Materials	<p>Raw materials in this Unit of Competency include:</p> <ul style="list-style-type: none"> <li>3.1 Fresh fruits</li> <li>3.2 Fresh vegetables</li> <li>3.3 Fresh fish</li> <li>3.4 Other marine products</li> </ul>
4. Sorting/Grading Criteria	<ul style="list-style-type: none"> <li>4.1 Fresh fruits and vegetable crops are sorted and graded according to: <ul style="list-style-type: none"> <li>4.1.1 size</li> <li>4.1.2 shape</li> <li>4.1.3 maturity</li> <li>4.1.4 degree of ripeness</li> <li>4.1.5 presence/absence of defects/damaged parts</li> </ul> </li> </ul>

	4.2 Fish and other marine products are checked and sorted according to: 4.2.1 degree of freshness 4.2.2 level of spoilage 4.2.3 quality of eyes, gills and scales
5. Ingredients	Ingredients include but not limited to: 5.1 Refined sugar 5.2 Salt 5.3 Water 5.4 Pickling solution 5.5 Spices 5.6 Herbs 5.7 Condiments
6. Production Data	Production data include: 6.1 Production input 6.2 Production output 6.3 Production target 6.4 Production schedule

## EVIDENCE GUIDE

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Prepared the equipment, tools, and utensils used for fermenting fruits, vegetables, fish and other marine products</li> <li>1.2 Prepared equipment, tools and utensils used for pickling fruits and vegetables</li> <li>1.3 Cleaned and sanitized equipment, tools and utensils used for fermenting and pickling</li> <li>1.4 Operated the various equipment</li> <li>1.5 Prepared, sorted and graded raw materials</li> <li>1.6 Performed alcoholic fermentation of fruits and vegetables</li> <li>1.7 Performed lactic acid fermentation/pickling of vegetables</li> <li>1.8 Fermented fish and other marine products</li> </ul>
<p>2. Underpinning Knowledge</p>	<ul style="list-style-type: none"> <li>2.1 Safety Practices <ul style="list-style-type: none"> <li>2.1.1 Food safety principles and practices</li> <li>2.1.2 Food handling practices</li> <li>2.1.3 Environmental protection and concerns</li> <li>2.1.4 Proper waste disposal</li> <li>2.1.5 Good grooming &amp; personal hygiene</li> </ul> </li> <li>2.2 Communication <ul style="list-style-type: none"> <li>2.2.1 Preparation of daily production input report (spoilage, rejects and variances)</li> <li>2.2.2 Preparation of daily production output (yield, recoveries and variances)</li> <li>2.2.3 Recording and documenting of production data</li> <li>2.2.4 Reporting of defects/breakdown to immediate head/supervisor</li> </ul> </li> <li>3 Mathematics/Measurements <ul style="list-style-type: none"> <li>2.3.1 Basic accounting procedures and techniques</li> <li>2.3.2 Measures, conversions, weights and percentages and ratios</li> <li>2.3.3 Basic arithmetic operations (multiplication, division, addition, subtraction)</li> </ul> </li> <li>2.4 Codes and Regulations <ul style="list-style-type: none"> <li>2.4.1 TQM and other good food quality system principles</li> <li>2.4.2 HACCP, ISO &amp; EMS</li> <li>2.4.3 Good Food Manufacturing Practices</li> </ul> </li> </ul>

	<p>2.5 Equipment, Tools/Utensils and Utensils: Uses and Specifications</p> <p>2.5.1 Parts and functions of equipment, tools and utensils</p> <p>2.6 Materials: Uses and Specifications</p> <p>2.6.1 Raw materials</p> <p>2.6.2 Ingredients and spices</p> <p>2.7 Systems, Processes and Operations</p> <p>2.6.3 Basic computer operation (Microsoft word)</p> <p>2.6.4 Cut-out procedures and techniques</p> <p>2.6.5 Fermentation methods and techniques</p> <p>2.6.6 Pickling procedures and techniques</p> <p>2.7.5 Operating various equipment</p> <p>2.7.6 Recycling/by product utilization</p> <p>2.7.7 Sorting and grading of raw materials</p> <p>2.8 Maintenance</p> <p>2.8.1 Maintaining various equipment, tools, and utensils</p> <p>2.8.2 Calibrating weighing scale and equipment</p> <p>2.8.3 Proper cleaning and stowing of equipment, tools and utensils</p>
3. Underpinning Skills	<p>3.1 Communication skills (oral &amp; written)</p> <p>3.2 Calibrating skills</p> <p>3.3 Basic computer skills</p> <p>3.4 Cooking/culinary skills</p> <p>3.5 Basic mathematical skills (conversion, weights and measurements, ratios and proportions)</p> <p>3.6 Recording and reporting skills</p> <p>3.7 Preparing process flow charts/flow diagrams</p> <p>3.8 Cut-out test</p> <p>3.9 Sanitary food handling practices</p> <p>3.10 Computation for recovery/yields</p>
4. Underpinning Attitudes	<p>4.1 Self- esteem</p> <p>4.2 Time conscious/punctual</p> <p>4.3 Cost conscious</p> <p>4.4 Environment and pollution conscious</p> <p>4.5 Flexible/adaptable</p> <p>4.6 Honest</p> <p>4.7 Socially responsible</p> <p>4.8 Dependable</p> <p>4.9 Self starter</p> <p>4.10 Alert</p> <p>4.11 Systematic and organized</p>

	4.12 Committed 4.13 Good team worker 4.14 Good listener and fast learner 4.15 Creative 4.16 Nationalistic and patriotic
5. Methods of Assessment	Competency in this unit must be assessed using at least two (2) of the following methods: 5.1 A combination of direct observation and questioning of a candidate fermenting fish and other marine products and pickling of vegetables including preparation of equipment utensils, preparation, sorting and grading of raw materials 5.2 Written report on the preparation of daily production input and output and other production data 5.3 Written test 5.4 Portfolio
6. Resource Implications	The following resources should be provided: 6.1 Work area/ station 6.2 Equipment, tools and utensils to prepare and to process fruits, vegetables, meat, fish and other marine products by fermentation and pickling 6.3 Materials relevant to the proposed activity
7. Context of Assessment	7.1 Assessment should occur on the job or in a simulated workplace.

## UNIT OF COMPETENCY: PROCESS FOODS BY SUGAR CONCENTRATION

**UNIT CODE : AGR741303**

**UNIT DESCRIPTOR:** This unit deals with the knowledge, skills and attitudes required to process foods by Sugar Concentration

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>italicized terms</i> are elaborated in the Range of Variables
1. Prepare Equipment, Tools and Utensils	1.1. <b>Equipment, tools and utensils</b> for preserving foods by sugar concentration are prepared in accordance with manufacturer's manual 1.2 Equipment, tools and utensils are calibrated in accordance with manufacturer's specifications 1.3 Equipment, tools and utensils for preserving foods by sugar concentration are readied and sanitized as required.
2. Prepare the Raw Materials	2.1 Availability of <b>raw materials</b> are checked according to required <b>food processing methods</b> 2.2 Sorted fruits and vegetables are washed, peeled, sliced and cut according to required sizes and shapes 2.1 Prepared fruits and vegetables for jelly/jam and marmalade are chopped finely 2.2 Prepared fruits and vegetables for jelly and marmalade making are boiled to obtain the juice extract 2.3 Prepared finely chopped fruits and vegetables for jam making are mixed with sugar 2.4 Prepared fruits and vegetables to be preserved are cooked in syrup as specified
3. Prepare Acid, Pectin and Sugar Mixture	3.1 Required amounts of pectin, sugar and citric acid are measured according to approved specifications 3.2 Measured pectin, acid and sugar are mixed with chopped fruit pulp/juice extract/pieces of fruits according to approved specifications

4. Cook Sugar Concentrates	4.1 Mixture is heated and boiled/cooked to required consistency 4.2 Desired endpoint is checked/tested as specified
5. Prepare Production Report	5.1 Daily production report input, output and variances are documented according to enterprise requirements 5.2 All <b><i>production data</i></b> gathered are recorded and presented in prescribed format

## RANGE OF VARIABLES

VARIABLES	RANGE
<p>1. Equipment, Tools, Kitchen Utensils and Materials</p>	<p>Equipment, tools and kitchen utensils and materials may include but not limited to:</p> <p>1.1 Cold storage equipment like chiller, refrigerator, freezer</p> <p>1.2 Refractometer, candy thermometer, jelly thermometer, polmeter</p> <p>1.3 Weighing scale of various capacities and sensitivities</p> <p>1.4 Jack lifts and trolleys</p> <p>1.5 Cutting implements such as knives, peelers, slicer, cutter</p> <p>1.6 Cooking equipment like stove/burner</p> <p>1.7 Cooking utensils like stainless enameled plastic casserole, colanders, bowls, food tongs, steamer</p> <p>1.8 Strainers, basting spoon paddle, exhaustor, spatula</p> <p>1.9 Exhaust box, steam jacketed kettle, jar lifter, wire baskets, chopping boards, vegetable cutter, osterizer, juice extractor</p> <p>1.10 Office equipment like computer with printer, intercom/telephone, fax machine, overhead projector</p> <p>1.11 Office materials/supplies include bond paper, index cards, production report forms, white board, white board markers, white board erasers, folder, blank sticker label, note pad, pencils/ball pen</p> <p>1.12 PPE include apron, mouth masks, gloves and rubber boots, headgears such as caps, hairnets and ear plugs</p>
<p>2. Raw Materials</p>	<p>Raw materials in this Unit of Competency may include but not limited to:</p> <p>2.1 Fresh fruits and vegetables</p> <p>2.2 Sugar, salt and water</p> <p>2.3 Chemical additives and preservatives like firming agent, sodium benzoate, citric acid/ascorbic acid</p>
<p>3. Food Processing Methods</p>	<p>Food Processing Method in this Unit of Competency is limited to Processing of foods by sugar concentration</p>
<p>4. Production Data</p>	<p>Production data include:</p> <p>4.1 Production input</p> <p>4.2 Spoilage</p> <p>4.3 Rejects</p> <p>4.4 Production output</p> <p>4.5 Yields</p> <p>4.6 Recoveries</p> <p>4.7 Variances</p> <p>4.8 Production target</p> <p>4.9 Production schedule</p>



## EVIDENCE GUIDE

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Prepared raw materials and other ingredients used to preserve fruits and vegetables by sugar concentration</li> <li>1.2 Cleaned and sanitized equipment, tools and utensils used to preserve fruits and vegetables by sugar concentration</li> <li>1.3 Operated various equipment and utensils according to approved specifications</li> <li>1.4 Calibrated equipment</li> <li>1.5 Checked and adjusted the pectin acid and sugar of the prepared raw materials</li> <li>1.6 Cooked sugar concentrates to desired endpoint</li> </ul>
<p>2. Underpinning Knowledge</p>	<ul style="list-style-type: none"> <li>2.1 Safety Practices <ul style="list-style-type: none"> <li>2.1.1 Proper waste disposal</li> <li>2.1.2 Environmental protection and concerns</li> <li>2.1.3 Food safety principles and practices</li> <li>2.1.4 Food Handling practices</li> <li>2.1.5 Good Grooming &amp; Personal hygiene</li> </ul> </li> <li>2.2 Communication <ul style="list-style-type: none"> <li>2.2.1 Preparation of daily production input report</li> <li>2.2.2 Preparation of daily production output report</li> <li>2.2.3 Recording and documenting production data</li> </ul> </li> <li>2.3 Mathematics and Measurements <ul style="list-style-type: none"> <li>2.3.1 Measures and conversions</li> <li>2.3.2 Basic accounting procedures</li> <li>2.3.3 Ratios, proportions and percentages</li> <li>2.3.4 Pearson's square</li> </ul> </li> <li>2.4 Codes and Regulations <ul style="list-style-type: none"> <li>2.4.1 TQM and other good food quality system principles</li> <li>2.4.2 ISO, HACCP, EMS</li> <li>2.4.3 Good Food Manufacturing Practices</li> </ul> </li> <li>2.5 Tools and Equipment: Uses and Specifications <ul style="list-style-type: none"> <li>2.5.1 Parts and functions of equipment, tools and utensils for processing foods by sugar concentration</li> <li>2.5.2 Parts and functions of office equipment</li> <li>2.5.3 Parts and functions of personal protective equipment</li> </ul> </li> </ul>

	<p>2.6 Materials: Uses and Specifications</p> <p>2.6.1 Raw materials</p> <p>2.6.2 Packing medium</p> <p>2.6.3 Office supplies and equipment</p> <p>2.7 Systems, Processes and Operations</p> <p>2.7.1 Operating various equipment</p> <p>2.7.2 Preparing tools and utensils</p> <p>2.7.3 Sorting and grading of raw materials</p> <p>2.7.4 Procedures &amp; techniques in preserving fruits and vegetables by sugar concentration</p> <p>2.7.5 Recycling/by product utilization</p> <p>2.7.6 Cut-out procedures and techniques</p> <p>2.7.7 Basic computer operation (Microsoft word)</p> <p>2.8 Maintenance</p> <p>2.8.1 Calibrating equipment</p> <p>2.8.2 Maintaining various equipment, tools and utensils</p> <p>2.8.3 Proper cleaning and stowing of equipment, tools and utensils</p>
3. Underpinning Skills	<p>3.1 Test for pectin content and point of cooking for jam jelly marmalade</p> <p>3.2 Communication skills (oral &amp; written)</p> <p>3.3 Acid ratio adjustment and computation</p> <p>3.4 Calibrating skills</p> <p>3.5 Basic computer skills</p> <p>3.6 Cooking/culinary skills</p> <p>3.7 Basic mathematical skills, conversion, weights and measure</p> <p>3.8 Recording and reporting skills</p> <p>3.9 Preparing process flowcharts/flow diagrams</p> <p>3.10 Cut-out test</p> <p>3.11 Sanitary food handling practices</p> <p>3.12 Computation for recovery/ yields and variances</p>
4. Underpinning Attitudes	<p>4.1 Time conscious/punctual</p> <p>4.2 Cost conscious</p> <p>4.3 Environment and pollution conscious</p> <p>4.4 Flexible/adaptable</p> <p>4.5 Honest</p> <p>4.6 Socially responsible</p> <p>4.7 Dependable</p> <p>4.8 Self-starter</p>

	4.9 Alert 4.10 Systematic and organized 4.11 Committed 4.12 Good team worker 4.13 Good listener and fast learner 4.14 Creative 4.15 Self-esteem 4.16 Nationalistic/patriotic
5. Methods of Assessment	Competency in this unit must be assessed using at least two (2) of the following methods: 5.1 A combination of direct observation and questioning of a candidate processing foods by sugar concentration including preparation of the following: equipment, tools, utensils, raw materials, and sugar concentrate mixtures 5.2 Written report on the preparation and documentation of daily production input and output and other production data 5.3 Written test 5.4 Portfolio 5.5 Demonstration
6. Resource Implications	The following resources should be provided: 1.1 Work area/ station 1.2 Equipment, tools and utensils needed to prepare and to process fruits and vegetables by sugar concentration 1.3 Materials relevant to the proposed activity
7. Context of Assessment	7.1 Assessment should occur on the job or in a simulated workplace.

## UNIT OF COMPETENCY: PACKAGE FINISHED/PROCESSED FOOD PRODUCTS

UNIT CODE : AGR741304

**UNIT DESCRIPTOR:** This unit deals with the knowledge, skills and attitudes required to package finished/processed food products

ELEMENTS	PERFORMANCE CRITERIA <i>Italicized</i> terms are elaborated in the Range of Variables
1. Prepare Packaging Equipment, Tools and Materials	<p>1.1 <b>Packaging materials</b> are selected and checked according to the finished/processed food products specifications</p> <p>1.2 Packaging materials of varying sizes are washed and sterilized in accordance with manufacturer's specifications</p> <p>1.3 <b>Appropriate tools and equipment</b> are selected according to specified <b>packaging requirements</b>.</p> <p>1.4 Packaging equipment is checked and readied according to manufacturer's specifications</p> <p>1.5 Operation of packaging equipment is monitored to ensure conformity with specified product output.</p> <p>1.6 Finished/processed products are cooled to room temperature as required.</p>
2. Undertake Packaging of Finished/Processed Food Products	<p>2.1 Cooled cured products are placed in appropriate packaging materials.</p> <p>2.2 Salted eggs are placed in trays/boxes in accordance with specifications</p> <p>2.3 Fermented /Pickled products are packaged and sealed hermetically according to enterprise requirements</p> <p>2.4 Cooled processed products are wrapped clean according to specifications</p> <p>2.4 Canned/bottled products are sealed hermetically according to approved specifications</p> <p>2.5 Sugar concentrated finished products are hot packed in dry sterile glass bottles</p> <p>2.6 Dried/dehydrated food materials are packaged in appropriate packaging materials</p>

<p>3. Perform Post Packaging Procedures</p>	<p>3.1 Packaged finished/processed food products are sealed and labeled according to specifications.</p> <p>3.2 <b><i>Condition of packaged finished/processed food products</i></b> is checked to ensure conformity with specified outputs.</p> <p>3.3 Packaged finished/processed food products are stored according to required temperature and humidity.</p>
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**RANGE OF VARIABLES**

<b>VARIABLES</b>	<b>RANGE</b>
1. Packaging Materials	Packaging materials may include but not limited to: 1.1 Glass 1.2 Metal 1.3 Plastics 1.4 Paper and paper board 1.5 Corrugated carton 1.6 Flexibles 1.7 Wood and wood products 1.8 Composite can/containers 1.9 Indigenous materials 1.9.1. Trays 1.9.2. PE/PP bags 1.9.3. Labels 1.9.4. Stickers 1.9.5. Tags 1.9.6. Glue 1.9.7. Packaging tape
2. Packaging Tools and Equipment	Packaging tools and equipment may include but not limited to: 2.1 Packaging machinery/equipment/ tools 2.2 Weighing scales 2.3 Food scales 2.4 Can sealer 2.5 Plastic sealer 2.6 Pulper finisher 2.7 Plastic protect cap sealer
3. Packaging Process	Packaging Process includes: 3.1 Bottling 3.2 Canning 3.3 Cartoning 3.4 Wrapping 3.5 Bagging 3.6 Labeling 3.7 Case Packing
4. Condition of Packaged Finished Food Products	Condition of packaged products may be checked through: 4.1 Leak inspection 4.2 Checking of print labels 4.3 Product testing

## EVIDENCE GUIDE

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Prepared appropriate packaging equipment and tools</li> <li>1.2 Packaging materials are washed and sterilized as required</li> <li>1.3 Selected and checked appropriate packaging materials according to requirements of finished/processed food products</li> <li>1.4 Packaged finished/processed food products according to specifications under sanitary and hygienic conditions</li> <li>1.5 Checked condition of packaged food products</li> <li>1.6 Properly and safely stored the labeled packaged finished/processed product according to temperature and humidity requirements.</li> </ul>
<p>2. Underpinning Knowledge</p>	<ul style="list-style-type: none"> <li>2.1 Safety Practices <ul style="list-style-type: none"> <li>2.1.1 Proper waste disposal</li> <li>2.1.2 Environmental protection and concerns</li> <li>2.1.3 Food safety principles and practices</li> <li>2.1.4 Food Handling practices</li> <li>2.1.5 Good Grooming &amp; Personal hygiene</li> </ul> </li> <li>2.2 Communication <ul style="list-style-type: none"> <li>2.2.1 Recording and documenting of production data</li> <li>2.2.2 Reporting of defects/breakdown to immediate head/supervisor</li> </ul> </li> <li>2.3 Mathematics and Measurements <ul style="list-style-type: none"> <li>2.3.1 Weights, measure, conversions</li> <li>2.3.2 Basic accounting procedures</li> <li>2.3.3 Ratios, proportions and percentages</li> <li>2.3.4 Basic mathematical operations</li> </ul> </li> <li>2.4 Codes &amp; Regulations <ul style="list-style-type: none"> <li>2.4.1 TQM and other good food quality system principles</li> <li>2.4.2 ISO, HACCP, EMS</li> <li>2.4.3 Good Food Manufacturing Practices</li> </ul> </li> <li>2.5 Materials, Tools &amp; Equipment: Uses and Specifications <ul style="list-style-type: none"> <li>2.5.1 Packaging materials and blank labels and stickers</li> <li>2.5.2 Packaging equipment, tools and utensils</li> <li>2.5.3 Labeling materials</li> </ul> </li> </ul>

	2.6 Systems, Processes and Operations 2.6.1 Packaging procedure and techniques 2.6.2 Labeling procedures and techniques 2.6.3 Using various packaging equipment, tools and utensils
3. Underpinning Skills	3.1 Oral & written communication skills 3.2 Sanitary food handling practices 3.3 Package checks and inspection 3.4 Recording and reporting skills
4. Methods of Assessment	Competency in this unit must be assessed using at least two (2) of the following methods: 4.1 A combination of direct observation and questioning of a candidate packaging finished/processed food products 4.2 Portfolio (submission of work samples) 4.3 Demonstration 4.4 Written test
5. Resource Implications	The following resources must be provided: 5.1 Work area/station 5.2 Equipment, tools and utensils used to package finished/processed food products 5.3 Materials relevant to the proposed activity and tasks
6. Context of Assessment	6.1 Assessment should occur on the job or in a simulated workplace



## SECTION 3 TRAINING STANDARDS

These guidelines are set to provide the Technical and Vocational Education and Training (TVET) providers with information and other important requirements to consider when designing training programs for Food Processing NC II.

### 3.1. CURRICULUM DESIGN

Course Title: FOOD PROCESSING

NC Level: NC II

Course Description: **568 Hours**

This course is designed to enhance the knowledge, desirable skills and attitudes Food Processing NCII in accordance with industry standards. It covers the basic, common and core competencies.

#### BASIC COMPETENCIES

<b>Unit of Competency</b>	<b>Learning Outcomes</b>	<b>Methodology</b>	<b>Assessment Approach</b>
1. Participate in workplace communication	1.1 Obtain and convey workplace information 1.2 Complete relevant work related documents 1.3 Participate in workplace meeting and discussion	<ul style="list-style-type: none"><li>• Group discussion</li><li>• Interaction</li></ul>	<ul style="list-style-type: none"><li>• Demonstration</li><li>• Observation</li><li>• Interviews/questioning</li></ul>
2. Work in a team environment	2.1 Describe and identify team role and responsibility in a team 2.2 Describe work as a team member	<ul style="list-style-type: none"><li>• Discussion</li><li>• Interaction</li></ul>	<ul style="list-style-type: none"><li>• Demonstration</li><li>• Observation</li><li>• Interviews/questioning</li></ul>
3. Practice career professionalism	3.1 Integrate personal objectives with organizational goals 3.2 Set and meet work priorities 3.3 Maintain professional growth and development	<ul style="list-style-type: none"><li>• Discussion</li><li>• Interaction</li></ul>	<ul style="list-style-type: none"><li>• Demonstration</li><li>• Observation</li><li>• Interviews/questioning</li></ul>
4. Practice occupational health and safety procedures	4.1 Evaluate hazard and risks 4.2 Control hazards and risks 4.3 Maintain occupational health and safety awareness	<ul style="list-style-type: none"><li>• Discussion</li><li>• Plant tour</li><li>• Symposium</li></ul>	<ul style="list-style-type: none"><li>• Observation</li><li>• Interview</li></ul>

## COMMON COMPETENCIES

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Apply Food Safety and Sanitation	1.1 Wear personal protective equipment 1.2 Observe personal hygiene and good grooming 1.3 Implement food sanitation practices 1.4 Render safety measures and first aid procedures 1.5 Implement housekeeping activities	<ul style="list-style-type: none"> <li>• Demonstration</li> <li>• Dual training</li> <li>• Individual Self-paced learning</li> <li>• Lecture</li> </ul>	<ul style="list-style-type: none"> <li>• Written examination</li> <li>• Demonstration of practical skills</li> <li>• Direct observation</li> <li>• Interview</li> </ul>
2. Use Standard Measuring Devices/Instruments	2.1 Identify standard measuring devices and instruments 2.2 Review the procedures in using standard measuring devices and instruments 2.3 Follow procedures of using measuring devices and instruments	<ul style="list-style-type: none"> <li>• Demonstration</li> <li>• Dual training</li> <li>• Individual Self-paced Learning</li> <li>• Lecture</li> </ul>	<ul style="list-style-type: none"> <li>• Written examination</li> <li>• Demonstration of practical skills</li> <li>• Direct observation</li> <li>• Interview</li> </ul>
3. Use Food Processing Tools, Equipment and Utensils	3.1 Perform Pre-Operation Activities 3.2 Operate, monitor and maintain Food processing Equipment 3.3 Perform post operation activities	<ul style="list-style-type: none"> <li>• Demonstration</li> <li>• Dual training</li> <li>• Individual Self-paced Learning</li> <li>• Lecture</li> </ul>	<ul style="list-style-type: none"> <li>• Written examination</li> <li>• Demonstration of practical skills</li> <li>• Direct observation</li> <li>• Interview</li> </ul>
4. Perform Mathematical Computations	4.1 Gather, summarize and tabulate the recorded data 4.2 Review the various formulations 4.3 Calculate production input and output 4.4 Compute production cost	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Practical exercise</li> </ul>	<ul style="list-style-type: none"> <li>• Written examination</li> <li>• Practical exercise</li> <li>• Direct Observation</li> </ul>
5. Implement Good Manufacturing Practice	5.1 Perform pre-work activities in relation to GMP 5.2 Identify requirements of	<ul style="list-style-type: none"> <li>• Audio Visual</li> <li>• Lecture/ Discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Written/Oral examination</li> <li>• Demonstration of</li> </ul>

	<p>GMP related to own work</p> <p>5.3 Observe personal hygiene and conduct to meet GMP requirements</p> <p>5.4 Follow GMP requirements when carrying out work activities</p> <p>5.5 Perform post-work activities in relation to GMP</p> <p>5.6 Complete workplace documentation to support GMP</p>	<ul style="list-style-type: none"> <li>• Practical Lab</li> <li>• Demonstration</li> <li>• Individual Self-paced Learning</li> </ul>	<p>practical skills</p> <ul style="list-style-type: none"> <li>• Direct observation</li> <li>• Interview</li> </ul>
<b>6. Implement Environmental Policies and Procedures</b>	<p>6.1 Access and apply workplace information on environmental policies and procedures relating to own work</p> <p>6.2 Follow work procedures</p> <p>6.3 Identify, control and report unacceptable performance</p> <p>6.4 Maintain housekeeping standards in work area</p>	<ul style="list-style-type: none"> <li>• Audio Visual</li> <li>• Lecture/ Discussion</li> <li>• Practical Lab</li> <li>• Demonstration</li> <li>• Individual Self-paced Learning</li> </ul>	<ul style="list-style-type: none"> <li>• Written/Oral examination</li> <li>• Demonstration of practical skills</li> <li>• Direct observation</li> <li>• Interview</li> </ul>

### CORE COMPETENCIES

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Process food by salting curing and smoking	<p>1.1 Identify and prepare the different equipment, apparatus, tools and utensils for salting, curing and smoking.</p> <p>1.2 Perform proper cleaning operation and sanitation of the different equipment, apparatus, tools, and utensils</p> <p>1.3 Perform proper cleaning operation and sanitation of the work area</p> <p>1.4 Check and calibrate the different equipment,</p>	<ul style="list-style-type: none"> <li>• Lecturette</li> <li>• Discussion</li> <li>• Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Demonstration</li> <li>• Questioning</li> </ul>

	<p>apparatus, tools, utensils for the process.</p> <p>1.5 Identify raw materials needed for salting, curing and smoking.</p> <p>1.6 Sort and grade fish/other marine products, meat and eggs for salting, curing and smoking.</p> <p>1.7 Clean, wash and weigh raw materials in preparation for salting, curing and smoking.</p> <p>1.8 Measure and weigh the required raw materials ingredients adjuncts for salting, curing and smoking.</p> <p>1.9 Measure and weigh the required ingredients for pumping pickles, cover pickles and dry cure according to specifications.</p> <p>1.10 Mix curing ingredients and prepared materials.</p> <p>1.11 Follow processing step/techniques in salting, curing and smoking.</p> <p>1.12 Produce quality salted, cured and smoked products.</p> <p>1.13 Produce quality sugar concentrated products.</p>		
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<p>2. Process food by fermentation and pickling</p>	<p>2.1 Identify and prepare the different equipment, tools and utensil for process foods by fermentation and pickling.</p> <p>2.2 Perform proper cleaning operation and sanitation of the different equipment, utensils for the process.</p> <p>2.3 Perform proper clearing operation and sanitation of work area</p> <p>2.4 Check and calibrate the different equipment tools, utensils for the process</p> <p>2.5 Identify the raw materials and other ingredients needed in the fermentation of food products.</p> <p>2.6 Sort and grade fresh fruits and vegetables/fish and marine products according to specifications.</p> <p>2.7 Wash, peel and slice fruits and vegetables according to specified sizes</p> <p>2.8 Prepare appropriate pick solutions according to specifications</p> <p>2.9 Mix prepared fruit and vegetables according to specifications.</p> <p>2.10 Extract juice needed for fermentation.</p> <p>2.11 Mix juice extract with appropriate amounts of ingredients for alcoholic fermentation according to specifications.</p> <p>2.12 Mix alcoholic solution with appropriate amounts of matter vinegar for acetones fermentation according specifications.</p> <p>2.13 Weigh eviscerated/ wash and drain fresh fish other marine products .</p>	<ul style="list-style-type: none"> <li>• Demonstration</li> <li>• Discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Demonstration</li> <li>• Questioning</li> <li>• Written Test</li> </ul>
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	<p>2.14 Mix fish and other marine products with salt according to specifications.</p> <p>2.15 Follow the processing steps /procedures for pickling /fermenting food products</p> <p>2.16. Produce quality pickled/fermented fruits and vegetables, fish and other marine products.</p>		
3. Process food by Sugar Concentration	<p>3.1 Identify and prepare the different equipment apparatus, tools and utensils for preserving foods by sugar concentration</p> <p>3.2 Perform proper cleaning operation sanitation of the different tools, equipment, apparatus and utensils for the process.</p> <p>3.3 Perform proper cleaning and sanitation of work area.</p> <p>3.4 Check and calibrate the different equipment, apparatus, tools and utensils for the process</p> <p>3.5 Identify the raw materials and others ingredients needed for preserving fruits &amp; vegetables by sugar concentration</p> <p>3.6 Sort and grade fruits &amp; vegetables according to specifications</p> <p>3.7 Clean, wash and weigh the raw materials in preparation for preserving by sugar concentration</p> <p>3.8 Slice/ cut fruits and vegetables according to specifications</p> <p>3.9 Pre-treat slice /cut materials according to specification</p> <p>3.10 Measure and wash</p>	<ul style="list-style-type: none"> <li>• Discussion</li> <li>• Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Interview</li> <li>• Demonstration</li> </ul>

	<p>required ingredients</p> <p>3.11 Mix prepared materials and ingredients according to standards</p> <p>3.12 Follow processing steps/ procedures in preserving fruits and vegetables by sugar concentration</p> <p>3.13 Produce quality sugar concentrated products</p>		
4. Package Finished/ Processed Food Products	<p>4.1 Prepare Packaging Equipment, Tools and Materials</p> <p>4.2 Select and check packaging materials according to the finished/processed food products specifications</p> <p>4.3 Wash and/or sterilize packaging materials of varying sizes in accordance with manufacturer's specification</p> <p>4.4 Select appropriate tools and equipment according to specified packaging requirements</p> <p>4.5 Check packaging equipment according to manufacturer's specifications</p> <p>4.6 Undertake packaging of finished processed, salted/cured/ smoked meat, fish and other marine products, fermented/pickled fruits &amp; vegetables and fish and other marine products and sugar concentrated fruits and vegetables</p> <p>4.7 Perform Post Packaging Procedures</p> <p>4.8 Package finished/ processed food products are sealed and labeled according to</p>	<ul style="list-style-type: none"> <li>• Discussion</li> <li>• Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Demonstration</li> <li>• Questioning</li> <li>• Written Test</li> </ul>

	<p>specifications.</p> <p>4.9 Check Condition of packaged finished/processed food products to ensure conformity with specified outputs.</p> <p>4.10 Store packaged finished/processed food products are according to required temperature and humidity.</p>		
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### 3.2 TRAINING DELIVERY

**The delivery of training should adhere to the design of the curriculum. Delivery should be guided by the 10 basic principles of competency-based TVET.**

- The training is based on curriculum developed from the competency standards;
- Learning is modular in its structure;
- Training delivery is individualized and self-paced;
- Training is based on work that must be performed;
- Training materials are directly related to the competency standards and the curriculum modules;
- Assessment is based in the collection of evidence of the performance of work to the industry required standard;
- Training is based both on and off-the-job components;
- Allows for recognition of prior learning (RPL) or current competencies;
- Training allows for multiple entry and exit; and
- Approved training programs are Nationally Accredited

The competency-based TVET system recognizes various types of delivery modes, both on and off-the-job as long as the learning is driven by the competency standards specified by the industry. The following training modalities may be adopted when designing training programs:

- The dualized mode of training delivery is preferred and recommended. Thus programs would contain both in-school and in-industry training or fieldwork components. Details can be referred to the Dual Training System (DTS) Implementing Rules and Regulations.
- Modular/self-paced learning is a competency-based training modality wherein the trainee is allowed to progress at his own pace. The trainer just facilitates the training delivery.



- Peer teaching/mentoring is a training modality wherein fast learners are given the opportunity to assist the slow learners.
- Supervised industry training or on-the-job training is an approach in training designed to enhance the knowledge and skills of the trainee through actual experience in the workplace to acquire specific competencies prescribed in the training regulations.
- Distance learning is a formal education process in which majority of the instruction occurs when the students and instructor are not in the same place. Distance learning may employ correspondence study, audio, video or computer technologies.
- Project-based instruction is an authentic instructional model or strategy in which students plan, implement and evaluate projects that have real world applications.

### 3.3 TRAINEE ENTRY REQUIREMENTS

Trainees or students wishing to gain entry into this course should possess the following requirements:

- can communicate both oral and written
- physically and mentally fit
- with good moral character
- can perform basic mathematical computation

### 3.4 LIST OF TOOLS, EQUIPMENT AND MATERIALS

#### FOOD PROCESSING NC II

Recommended list of tools, equipment and materials for the training of 25 trainees for Food Processing NC II.

TOOLS		EQUIPMENT		MATERIALS	
QTY	Description	QTY	Description	QTY	Description
5	• Weighing scales (10 kg. capacity)	1	• Smoke house	<b>A. Food supplies</b>	
5	• Dietetic scales (1 kg. capacity)	1	• Chiller	5 doz	• Fresh eggs
15	• Pairing knives	1	• Refrigerator	10 kgs	• Fresh meat
10	• Peelers	1	• Freezer	10 pcs.	• Dressed poultry
5	• Measuring spoons, sets	5	• Stoves	20 kgs.	• Fresh fish (medium size)

5	• Measuring cups (solid)	1	• Jack lift	20 kgs.	• Fresh fish (small)
5	• Measuring cups (liquid)	1	• Trolley	10 kgs.	• Fresh fruits
2	• Clocks/timer	1	• Wheeler	10 kgs.	• Fresh vegetables
15	• Mixing bowls, stainless steel	1	• Poly/temperature sealer	1 set	• Curing ingredients for ham (good for 10 kgs.)
10	• Hard plastic chopping boards	1	• Cap sealer	1 set	• Curing ingredients for tocino/longanisa (good for 10 kgs.)
5	• Dial thermometers	1	• Pressure canner	3 kg	• Salt (Pangasinan)
5	• Osterizer	1	• Pressure cooker	1 sack	• Refined sugar
5	• Jar liter	1	• Cap seal	3 gal	• Vinegar
1	• Food processor, set	1	• Oven	2 gal	• All spice pickling solution
5	• Wire baskets	2	• Steam-jacketed kettle	1 kg	• Citric acid
15	• Casseroles stainless steel	5	• Smoking trays	1 kg	• Sodium benzoate
10	• Saucepan, stainless steel	1	• Meat grinder	1 kg	• Firming agent
15	• Spoons, wooden	1	• Stuffer/linker	2 gal	• Pineapple juice (unsweetened)
10	• Spoon, basting	1	• Silent cutter	1 can	• Active dry yeast
4	• Paddles, wooden	2	• Brix refractometers (0-20° brix)	1 gal	• Mother vinegar
10	• Food tongs	1	• Salinometer	<b>B. Non food</b>	
2	• Steamer	2	• Electronic scales (0.1 gm capacity)	2 packs	• PE plastic packaging materials
5	• Soaking container	1	• Consistometer/viscosimeter	3 boxes	• 8 oz., 12 oz., round bottles w/ PVC caps
5	• Fermented containers	1	• Vacuum pack machine	3 boxes	• Catsup bottles w/ plastic caps

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20	• Utility trays	1	• Laboratory scale cabinet drier or forced draft oven	2 packs	• Cap seals
15	• Colanders, stainless steel	1	• Headspace gauge	2 gals	• Disinfectant/sanitizers
			• <b>TRAINING MATERIALS</b>	5	• Bar soap/detergent
			• books/reference	1 btl.	• Glue
			• manual	1 pack	• Tags/labels
			• videos	10	• Corrugate cartons
				10 bundles	• Firewood for smoked house

### 3.5 TRAINING FACILITIES

#### FOOD PROCESSING NC II

The food processing workshop must be of concrete structure. Based on a class size of 25 students/trainees the space requirements for the teaching/learning and circulation areas are as follows:

SPACE REQUIREMENT	SIZE IN METERS	AREA IN SQ. METERS	TOTAL AREA IN SQ. METERS
<b>A. Building (permanent)</b>			
Laboratory area	6 x 10	60	60
Tool room & S/M storage area	4 x 5	20	20
Learning resource area	5 x 6	30	30
Wash area/comfort room (male & female)	2.5 x 4	10	10
Total			120
Facilities/Equipment/Circulation (30% of teaching accommodation)			40
<b>B. Experimental Land Area</b>			n/a
Total workshop area			160

Note: Experimental area will change according to availability of land.

### **3.6 TRAINER'S QUALIFICATIONS FOR AGRI-FISHERY SECTOR**

#### **FOOD PROCESSING NC II**

##### **TRAINER QUALIFICATION (TQ II)**

- Must be a holder of Food Processing NC III or its equivalent
- Must have undergone training on Training Methodology II (TM II)
- Must be computer literate
- Must be physically and mentally fit
- \*Must have at least 2 years job/industry experience
- Must be a civil service eligible (for government position or appropriate professional license issued by the Professional Regulatory Commission)

\* Optional. Only when required by the hiring institution.

Reference: TESDA Board Resolution No. 2004 03

### **3.7 INSTITUTIONAL ASSESSMENT**

Institutional Assessment is to be undertaken by the learner who enrolled in a structured learning program to determine the achievement of competencies. It is administered by the trainer/assessor at end of each learning module.

The result of the institutional assessment may be considered as an evidence for national assessment.

## **SECTION 4 NATIONAL ASSESSMENT AND CERTIFICATION ARRANGEMENTS**

- 4.1 To attain the National Qualification of **Food Processing, NC II**, the candidate must demonstrate competence through project type assessment covering all the units listed in Section 1. Successful candidates shall be awarded a National Certificate signed by the TESDA Director General.
- 4.2 The qualification of Food Processing, NC II may be attained through:
  - 4.2.1 Accumulation of Certificates of Competency (COCs) in the following areas:
    - 4.2.1.1 Process Food by Salting, Curing and Smoking
    - 4.2.1.2 Process Food by Fermentation and Pickling
    - 4.2.1.3 Process Food by Sugar Concentration
    - 4.2.1.4 Package Finished/Processed Food Products

Successful candidates shall be awarded Certificates of Competency (COCs)
  - 4.2.2 Demonstration of competence through project-type assessment covering all required units of the qualification.
- 4.3 Accumulation and submission of all COCs acquired for the relevant units of competency comprising a qualification, an individual shall be issued the corresponding National Certificate
- 4.4 Assessment shall focus on the core units of competency. The basic and common units shall be integrated or assessed concurrently with the core units.
- 4.5 The following are qualified to apply for assessment and certification:
  - 4.5.1 Graduates of formal, non formal and informal including enterprise-based training programs.
  - 4.5.2 Experienced workers ( wage employed or self-employed)
- 4.6 The guidelines on assessment and certification are discussed in detail in the Procedures manual on Assessment and Certification and Guidelines on the implementation of the Philippine TVET Qualification and Certification System (PTQCS).

## COMPETENCY MAP FOR AGRI-FISHERY AND FOOD MANUFACTURING SECTOR

### FOOD PROCESSING AND BEVERAGE SUB-SECTOR

CORE UNITS OF COMPETENCY				
Follow work procedures to maintain Good Manufacturing Practice	Follow work procedures to maintain environmental standards	Work with temperature controlled stock	Skin, loin and flake fish	Operate a high speed wrapping process
Inspect and sort materials and product	Implement Good Manufacturing Practice Procedures	Manually fill cans	Maintain the temperature of seafood	Clean and sanitize equipment
Prepare basic mixes	Dispense non bulk ingredients	Operate a can seaming process	Evaluate a batch of seafood	Clean equipment in place
Monitor process operation	Operate a mixing / blending process	Operate pumping equipment	Package product using manual packing and labeling equipment	Implement environmental policies and procedures
Operate basic equipment	Process Food by Salting, Curing and Smoking	Operate a retort process	Operate carton scales	Conduct routine maintenance
Measure and record workplace information	Process Food by Fermentation and Pickling	Operate a freezing process	Operate carton sealing machine	Work in a food handling area for non-food handlers
Assemble and prepare cartons	Process food by sugar concentration	Operate a water purification process	Operate scales and semi-automatic labeling machinery	Handle dangerous goods/ hazardous substances
Pack product manually	Package finished / processed food products	Pre-process raw materials	Operate strapping machine	Load and unload goods / cargo
Operate automated washing equipment	Work in a freezer storage area	Operate a steaming/cooking process	Operate a packaging process	Operate a forklift

**Continuation ..... Competency Map for Agri- Fishery Sector ( Food Processing and Beverage Sub-Sector)**

<b>CORE UNITS OF COMPETENCY</b>				
Use product knowledge to complete work operations	Use information technology devices and computer applications in the workplace	Implement sampling procedures	Participate in sensory analysis	Perform basic tests
Maintain food safety when loading, unloading and transporting food	Operate a boiler – basic	Operate a waste water treatment system	Apply principles of food packaging	Manage the implementation of environmental management policies
Apply raw materials / ingredients and process knowledge	Operate processes in packaging system	Set up a production / packaging line for operation	Control food contamination and spoilage	Manage the implementation of occupational health and safety policies and procedures in the workplace
Control and order stock	Participate in HACCP team	Solve problem using “quality tools”	Describe and analyze data using mathematical principles	Manage water treatment process
Implement the pest prevention program	Participate in an audit process	Use inventory system to organize stock control	Establish process capability	Optimize a work process
Monitor the implementation of environmental management policies	Participate in improvement process	Apply understanding of food additives	Manage a work area within budget	Participate in product recalls
Monitor the implementation of Good Manufacturing Practice Procedures	Receive and store stock	Apply understanding of legal requirements in food product	Manage and evaluate new product trials	Plan and coordinate maintenance
Operate processes in a production system	Report on workplace performance	Apply basic engineering principles to a food production process	Manage internal audits	Schedule and manage production

**Continuation ..... Competency Map for Agri Fishery Sector ( Food Processing and Beverage Sub-Sector)**

**COMMON UNITS OF COMPETENCY**

Apply Food Safety and Sanitation	Use Standard Measuring Devices / Instruments	Use Food Processing Tools, Equipment and Utensils	Perform Mathematical Computation
Implement good manufacturing practice procedures	Implement environmental policies and procedures		

**BASIC UNITS OF COMPETENCY**

Receive and Respond to Workplace Communication	Participate in Workplace Communication	Lead Workplace Communication	Utilize specialist communication	Develop Team and Individual
Work With Others	Work in a Team Environment	Lead Small Team	Solve Workplace Problems Related to Work Activities	Apply Problem Solving Techniques in the Workplace
Practice Career Professionalism	Practice Occupational Health and Safety	Practice housekeeping procedures	Demonstrate work values	Plan and Organize Work

**Food Processing NC II**



## DEFINITION OF TERMS

For the purpose of this competency standard, the following words are defined:

- .1 **Competency** – is the application of knowledge, skills and attitudes to perform work activities to the standard expected in the workplace.
- .2 **Unit of Competency** – describes a work activity.
- .3 **Elements** – are building blocks of a unit of competency. It describes in outcome terms the functions that a person who works in a particular area of work is able to perform.
- .4 **Performance Criteria** – are evaluative statements that specify what is to be assessed and the required level of performance.
- .5 **Range of Variables** – describe the circumstances or context in which the work is to be performed.
- .6 **Evidence Guide** – a guide for assessment that provides information on critical aspects of competency, underpinning knowledge, underpinning skills, resource implications, context of assessment and assessment methods.
- .7 **Blanching** – refers to a heat treatment in which the raw food material is immersed in hot water or exposed to live steam.
- .8 **Bottling/Canning** – refers to a preservation of foods in hermetically sealed containers such as tin cans and glass jars by sterilization with heat
- .9 **BFAD** - means Bureau of Food and Drug
- .10 **Brine** – refers to a salt solution
- .11 **Cabinet Drying** - refers to a process of dehydrating food material using a cabinet drier consisting of a closed chamber which is well insulated against heat loss
- .12 **Chilling** – is subjecting meat to a temperature of 2-4°C(36-40°F at certain period of time
- .13 **Curing** – refers to a process by which salt, sugar and salitre and other preservatives and adjuncts are introduced/are used to prolong the keeping quality of the products
- .14 **Dehydration**- refers to drying by artificially produced heat under carefully controlled conditions of temperature, humidity and airflow within a chamber

- .15 **Dry Curing**– refers to a method of curing meat where curing mixture is rubbed on the surface of the food material being cured.
- .16 **Exhausting** – refers to the removal of air and gases from the raw material and the container before sealing; It refers to the heating of canned foods to a center can temperature of 180°C to 205°F before sealing.
- .17 **Fermentation** – refers to the anaerobic oxidation of carbohydrates by microbial enzymes
- .18 **Food Additives**- refer to substances intentionally added to foods to achieve or retain desired characteristics
- .19 **Food Processing** – refers to the application of heat in varying degree to the food enclosed in a container for a sufficient time to sterilize the product
- .20 **GRAS**- means generally regarded as safe
- .21 **Hermetic Sealing**- refers to the closure of tin cans or glass jars tightly to prevent the entrance of microorganisms
- .22 **Packing Medium** – refers to brine, syrup, broth, oil or other similar ingredients used as canning medium
- .23 **Pickling**- refers to the preservation of foods by brine and vinegar with or without bacterial fermentation
- .24 **PH meter** – refers to an instrument used to measure the acidity of a sample
- .25 **Preservatives**- refer to food additives that retard spoilage and preserve the natural color & flavor of food products
- .26 **Pulverize** – to reduce by crushing or grinding to very small particles
- .27 **Raw Materials** – consist of the main food material to be processed including minor food ingredients
- .28 **Retort Specification** – refers to a steam pressure canner used in sterilizing low acid canned foods
- .29 **Sanitation** - refers to the process of treating food contact and non-food contact surface with physical agents and chemicals to kill the residual microorganisms present after cleaning
- .30 **Salinometer**- refers to the instrument to measure strength of brine

- .31 **Standard Measurement** – refers to something set up as a rule for measuring or a model to be followed
- .32 **Smoke** – refers to the gas from burning wood material containing combustible and noncombustible substances, the combustible substances are the main sources of smoke which consist of cellulose, lignin, pentosans, tannic acid, protein substances, resins and terpenes
- .33 **Smoking** – refers to subjecting the product to the action of smoke from burning wood materials
- .34 **Smoke House-** refers to a closed smoke chamber where smoke is produced which may range from the temporary (barrel) smoke house to the permanent frame or concrete smoke house.
- .35 **Sugar Concentrates** – refer to products cooked with sugar to attain a concentration of 40-65% or to saturated sucrose level
- .36 **Syrup** – refers to a sugar solution whether light, medium or heavy syrup
- .37 **Thermal Processing** – refers to the method of processing food in hermetically sealed container by applying heat with the right temperature and time, enough to kill microorganisms responsible in the spoilage of food which involve bottling and canning
- .38 **Water Bath** – it is a set up used for canning consisting of a large kettle with fitting cover deep enough to have an inch or two over the tops of the containers of food and an extra 1-2 inch space for boiling with a wooden or metal rack made for holding filled containers; used for processing high acid canned products.

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