COMPETENCY STANDARDS

TARO PROCESSING LEVEL II

PROCESSED FOODS & BEVERAGES SECTOR

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY

Technical Education and Skills Development Act of 1994
(Republic Act No. 7796)

Section 22, "Establishment and Administration of the National Trade Skills Standards" of the RA 7796 known as the TESDA Act mandates TESDA to establish national occupational skill standards. The Authority shall develop and implement a certification and accreditation program in which private industry group and trade associations are accredited to conduct approved trade tests, and the local government units to promote such trade testing activities in their respective areas in accordance with the guidelines to be set by the Authority.

The Competency Standards (CS) serve as basis for the:

1 Institutional competency assessment and training certification;
2 Registration and delivery of training programs; and
3 Development of curriculum and assessment instruments.

Each CS has 2 sections:

Section 1 **Definition of Competency Standards** - refers to the group of competencies that describes the different functions of the qualification.

Section 2 **The Competency Standards** - gives the specifications of competencies required for effective work performance.

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TARO PROCESSING LEVEL II

COMPETENCY STANDARDS FOR TARO PROCESSING

SECTION 1 TARO PROCESSING LEVEL II

The **TARO PROCESSING LEVEL II consists** of competencies that a person must have in order to process taro by frying, drying and grinding, fermentation, pickling and pureeing. The task of packing the processed product and operating simple packing equipment such as sealer will be highlighted in this competency**.** The person must also have competencies in practicing the Food Safety Act 2013, cGMP, HACCP, OSHS, and 7S of Good Housekeeping, including following relevant environmental rules and regulations.

Likewise, several activities include preparing equipment, tools, materials and utensils, raw materials, packing, and performing post-production activities.

The Units of Competency comprising these Competency Standards include the following:

Code	BASIC COMPETENCIES
400311210	Participate in workplace communication
400311211	Work in team environment
400311212	Solve/address general workplace problems
400311213	Develop career and life decisions
400311214	Contribute to workplace innovation
400311215	Present relevant information
400311216	Practice occupational safety and health policies and procedures
400311217	Exercise efficient and effective sustainable practices in the workplace
400311218	Practice entrepreneurial skills in the workplace

Code	COMMON COMPETENCIES
PFB751210	Apply Food Safety and Sanitation
PFB751211	Use Standard Measuring Devices / Instruments
PFB751212	Use Food Processing Tools, Equipment and Utensils
PFB751213	Perform Mathematical Computation
PFB751214	Implement Good Manufacturing Practice Procedure
PFB751215	Implement Environmental Policies and Procedures

Code	CORE COMPETENCIES
AB-PFB0506200751304	Process Taro (Unod) by Frying
AB-PFB0506200751305	Process Taro (Unod) by Drying and Grinding
AB-PFB0506200751306	Process Taro (Unod) by Fermentation and Pickling
AB-PFB0506200751307	Process Taro (Unod) by Pureeing

A person who has achieved this Competency Standards is competent to be:

- **Taro Processor**

SECTION 2 COMPETENCY STANDARDS

This section gives the details of the contents of the basic, common, and core units of competency required in **TARO PROCESSING LEVEL II.**

BASIC COMPETENCIES

UNIT OF COMPETENCY: PARTICIPATE IN WORKPLACE COMMUNICATION

UNIT CODE : 400311210

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 *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
1. Obtain and convey workplace information	***1.1*** Specific and relevant information is accessed from ***appropriate sources*** 1.2 Effective questioning, active listening and speaking skills are used to gather and convey information 1.3 Appropriate ***medium*** 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 ***storage*** of	1.1 Effective verbal and nonverbal communication 1.2 Different modes of communication 1.3 Medium of communication in the workplace 1.4 Organizational policies 1.5 Communication procedures and systems 1.6 Lines of Communication 1.7 Technology relevant to the enterprise and the individual's work responsibilities 1.8 Workplace etiquette 1.9 Basic	1.1 Follow simple spoken language 1.2 Perform routine workplace duties following simple written notices 1.3 Participate in workplace meetings and discussions 1.4 Prepare work- related documents 1.5 Estimate, calculate and record routine workplace measures 1.6 Relate/ Interact with people of various levels in the

	information are used 1.7 Personal interaction is carried out clearly and concisely	business writing skills 1.10 Interpersonal skills in the workplace 1.11 Active listening skills	workplace 1.7 Gather and provide basic information in response to workplace requirements

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** *terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
2. Perform duties following workplace instructions	2.1 Written notices and instructions are read and interpreted in accordance with organizational guidelines 2.2 Routine written instruction is followed based on established procedures 2.3 Feedback is given to workplace supervisor-based instructions/ information received 2.4 ***Workplace interactions*** are conducted in a courteous manner ***2.5*** Where necessary, clarifications about routine workplace procedures and matters concerning conditions of employment are sought and asked from ***appropriate sources*** 2.6 Meetings outcomes are interpreted and implemented	2.1 Effective verbal and non-verbal communication 2.2 Different modes of communication 2.3 Medium of communication in the workplace 2.4 Organizational/ Workplace policies 2.5 Communication procedures and systems 2.6 Lines of communication 2.7 Technology relevant to the enterprise and the individual's work responsibilities 2.8 Effective questioning techniques (clarifying and probing) 2.9 Workplace etiquette 2.10 Basic questioning/querying g	2.1 Follow simple spoken instructions 2.2 Perform routine workplace duties following simple written notices 2.3 Participate in workplace meetings and discussions 2.4 Complete work- related documents 2.5 Estimate, calculate and record routine workplace measures 2.6 Relate/ Respond to people of various levels in the workplace 2.7 Gather and provide information in response to workplace requirements 2.8 Skills in reading for information 2.9 Skills in locating

3. Complete relevant work-related documents	3.1 Range of ***forms*** relating to conditions of employment are	3.1 Effective verbal and non-verbal communication	3.1 Complete work-related documents

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** *terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
	completed accurately and legibly 3.2 Workplace data is recorded on standard workplace forms and documents 3.3 Errors in recording information on forms/ documents are identified and acted upon 3.4 Reporting requirements to supervisor are completed according to organizational guidelines	3.2 Different modes of communication 3.3 Workplace forms and documents 3.4 Organizational/ Workplace policies 3.5 Communication procedures and systems 3.6 Technology relevant to the enterprise and the individual's work responsibilities 3.7 Effective record keeping skills	3.2 Apply operations of addition, subtraction, division and multiplication 3.3 Gather and provide information in response to workplace requirements

RANGE OF VARIABLES

VARIABLES	RANGE
1. Appropriate sources	May include: 1.1. Team members 1.2. Supervisor/Department Head 1.3. Suppliers 1.4. Trade personnel 1.5. Local government 1.6. Industry bodies
2. Medium	May include: 2.1. Memorandum 2.2. Circular 2.3. Notice 2.4. Information dissemination 2.5. Follow-up or verbal instructions 2.6. Face-to-face communication 2.7. Electronic media (disk files, cyberspace)
3. Storage	May include: 3.1. Manual filing system 3.2. Computer-based filing system
4. Workplace interactions	May include: 4.1. Face-to-face 4.2. Telephone 4.3. Electronic and two-way radio 4.4. Written including electronic means, memos, instruction and forms 4.5. Non-verbal including gestures, signals, signs and diagrams
5. Forms	May include: 5.1. HR/Personnel forms, telephone message forms, safety reports

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Prepared written communication following standard format of the organization 1.2 Accessed information using workplace communication equipment/systems 1.3 Made use of relevant terms as an aid to transfer information effectively 1.4 Conveyed information effectively adopting formal or informal communication
2. Resource Implications	**The following resources should be provided:** 2.1 Fax machine 2.2 Telephone 2.3 Notebook 2.4 Writing materials 2.5 Computer with Internet connection
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Demonstration with oral questioning 3.2 Interview 3.3 Written test 3.4 Third-party report
4. Context for Assessment	4.1 Competency may be assessed individually in the actual workplace or through an accredited institution

UNIT OF COMPETENCY : WORK IN A TEAM ENVIRONMENT

UNIT CODE : 400311211

UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes to identify one's roles and responsibilities as a member of a team.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** *terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
1. Describe team role and scope	***1.1*** The ***role and objective of the team*** is identified from available ***sources of information*** 1.2 Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources	1.1 Group structure 1.2 Group development 1.3 Sources of information	1.1 Communicate with others, appropriately consistent with the culture of the workplace 1.2 Develop ways in improving work structure and performing respective roles in the group or organization
2. Identify one's role and responsibility within a team	2.1 Individual roles and responsibilities within the team environment are identified ***2.2*** Roles and objectives of the team is identified from available ***sources of information*** 2.3 Team parameters, reporting relationships and responsibilities are identified based on team discussions and appropriate external sources	2.1 Team roles and objectives 2.2 Team structure and parameters 2.3 Team development 2.4 Sources of information	2.1 Communicate with others, appropriately consistent with the culture of the workplace 2.2 Develop ways in improving work structure and performing respective roles in the group or organization

3. Work as a team member	3.1 Effective and appropriate forms of communications are used and interactions undertaken with team members based on company practices. 3.2 Effective and appropriate contributions made to	3.1 Communication Process 3.2 Workplace communication protocol 3.3 Team planning and decision making 3.4 Team thinking	3.1 Communicate appropriately, consistent with the culture of the workplace 3.2 Interact effectively with others 3.3 Decide as an individual and as

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** *terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
	complement team activities and objectives, based on ***workplace context*** 3.3 Protocols in reporting are observed based on standard company practices. 3.4 Contribute to the development of team work plans based on an understanding of team's role and objectives	3.5 Team roles 3.6 Process of team development 3.7 Workplace context	a group using group think strategies and techniques 3.4 Contribute to Resolution of issues and concerns

RANGE OF VARIABLES

VARIABLE	RANGE
1. Role and objective of team	May include but not limited to: 1.1. Work activities in a team environment with enterprise or specific sector 1.2. Limited discretion, initiative and judgement maybe demonstrated on the job, either individually or in a team environment
2. Sources of information	May include but not limited to: 2.1. Standard operating and/or other workplace procedures 2.2. Job procedures 2.3. Machine/equipment manufacturer's specifications and instructions 2.4. Organizational or external personnel 2.5. Client/supplier instructions 2.6. Quality standards 2.7. OHS and environmental standards
3. Workplace context	May include but not limited to: 3.1. Work procedures and practices 3.2. Conditions of work environments 3.3. Legislation and industrial agreements 3.4. Standard work practice including the storage, safe handling and disposal of chemicals 3.5. Safety, environmental, housekeeping and quality guidelines

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Worked in a team to complete workplace activity 1.2 Worked effectively with others 1.3 Conveyed information in written or oral form 1.4 Selected and used appropriate workplace language 1.5 Followed designated work plan for the job
2. Resource Implications	**The following resources should be provided:** 2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2 Materials relevant to the proposed activity or tasks
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Role play involving the participation of individual member to the attainment of organizational goal 3.2 Case studies and scenarios as a basis for discussion of issues and strategies in teamwork 3.3 Socio-drama and socio-metric methods 3.4 Sensitivity techniques 3.5 Written Test
4. Context for Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while task are being undertaken whether individually or in group

UNIT OF COMPETENCY : SOLVE/ADDRESS GENERAL WORKPLACE PROBLEMS

UNIT COD : 400311212

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to apply problem-solving techniques to determine the origin of problems and plan for their resolution. It also includes addressing procedural problems through documentation, and referral.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** *terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
1. Identify routine problems	1.1 Routine **problems or procedural problem** areas are identified 1.2 Problems to be investigated are defined and determined 1.3 Current conditions of the problem are identified and documented	1.1 Current industry hardware and software products and services 1.2 Industry maintenance, service and helpdesk practices, processes and procedures 1.3 Industry standard diagnostic tools 1.4 Malfunctions and resolutions	1.1 Identify current industry hardware and software products and services 1.2 Identify current industry maintenance, services and helpdesk practices, processes and procedures. 1.3 Identify current industry standard diagnostic tools 1.4 Describe common malfunctions and resolutions. 1.5 Determine the root cause of a routine malfunction

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** *terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
2. Look for solutions to routine problems	2.1 Potential solutions to problem are identified 2.2 Recommendations about possible solutions are developed, **documented**, ranked and presented to ***appropriate person*** for decision	2.1 Current industry hardware and software products and services 2.2 Industry service and helpdesk practices, processes and procedures 2.3 Operating systems 2.4 Industry standard diagnostic tools 2.5 Malfunctions and resolutions. 2.6 Root cause analysis	2.1 Identify current industry hardware and software products and services 2.2 Identify services and helpdesk practices, processes and procedures. 2.3 Identify operating system 2.4 Identify current industry standard diagnostic tools 2.5 Describe common malfunctions and resolutions. 2.6 Determine the root cause of a routine malfunction
3. Recommend solutions to problems	***3.1*** Implementation of solutions are ***planned*** 3.2 Evaluation of implemented solutions are planned 3.3 Recommended solutions are documented and submit to appropriate person for confirmation	3.1 Standard procedures 3.2 Documentation produce	3.1 Produce documentation that recommends solutions to problems 3.2 Follow established procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Problems/Procedural Problem	May include but not limited to: Routine/non – routine processes and quality problems Equipment selection, availability and failure Teamwork and work allocation problem Safety and emergency situations and incidents Work-related problems outside of own work area
2. Appropriate person	May include but not limited to: 2.1 Supervisor or manager 2.2 Peers/work colleagues 2.3 Other members of the organization
3. Document	May include but not limited to: 3.1 Electronic mail 3.2 Briefing notes 3.3 Written report 3.4 Evaluation report
4. Plan	May include but not limited to: 4.1 Priority requirements 4.2 Co-ordination and feedback requirements 4.3 Safety requirements 4.4 Risk assessment 4.5 Environmental requirements

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Determined the root cause of a routine problem 1.2 Identified solutions to procedural problems. 1.3 Produced documentation that recommends solutions to problems. 1.4 Followed established procedures. 1.5 Referred unresolved problems to support persons.
2. Resource Implications	2.1. Assessment will require access to a workplace over an extended period, or a suitable method of gathering evidence of operating ability over a range of situations.
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Case Formulation 3.2 Life Narrative Inquiry 3.3 Standardized test The unit will be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components.
4. Context for Assessment	4.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions.

UNIT OF COMPETENCY : DEVELOP CAREER AND LIFE DECISIONS

UNIT CODE : 400311213

UNIT DESCRIPTOR : This unit covers the knowledge, skills, and attitudes in managing one's emotions, developing reflective practice, and boosting self-confidence and developing self-regulation.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
1. Manage one's emotion	1.1 ***Self-management strategies*** are identified 1.2 Skills to work independently and to show initiative, to be conscientious, and persevering in the face of setbacks and frustrations are developed 1.3 Techniques for effectively handling negative emotions and ***unpleasant situation*** in the workplace are examined	1.1 Self-management strategies that assist in regulating behavior and achieving personal and learning goals (e.g. Nine self-management strategies according to Robert Kelley) 1.2 Enablers and barriers in achieving personal and career goals 1.3 Techniques in handling negative emotions and unpleasant situation in the workplace such as frustration, anger, worry, anxiety, etc.	1.1 Manage properly one's emotions and recognizing situations that cannot be changed and accept them and remain professional 1.2 Develop self-discipline, working independently and showing initiative to achieve personal and career goals 1.3 Show confidence, and resilience in the face of setbacks and frustrations and other negative emotions and unpleasant situations in the workplace

2. Develop reflective practice	2.1 Personal strengths and achievements, based on self-assessment strategies and teacher feedback are contemplated 2.2 Progress when seeking and responding to	2.1 Basic SWOT analysis 2.2 Strategies to improve one's attitude in the workplace 2.3 Gibbs' Reflective Cycle/Model (Description, Feelings,	2.1 Use the basic SWOT analysis as self-assessment strategy 2.2 Develop reflective practicethrough realization of limitations, likes/

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
	feedback from teachers to assist them in consolidating strengths, addressing weaknesses and fulfilling their potential are monitored 2.3 Outcomes of personal and academic challenges by reflecting on previous problem solving and decision making strategies and feedback from peers and teachers are predicted	Evaluation, Analysis, Conclusion, and Action plan)	dislikes; through showing of self-confidence 2.3 Demonstrate self-acceptance and being able to accept challenges
3. Boost self-confidence and develop self-regulation	3.1 Efforts for continuous self-improvement are demonstrated 3.2 Counter-productive tendencies at work are eliminated 3.3 Positive outlook in life are maintained.	3.1 Four components of self-regulation based on Self-Regulation Theory (SRT) 3.2 Personality development concepts 3.3 Self-help concepts (e. g., 7 Habits by Stephen Covey, transactional analysis, psycho-spiritual concepts)	3.1 Perform effective communication skills – reading, writing, conversing skills 3.2 Show affective skills – flexibility, adaptability, etc. 3.3 Assess one self

RANGE OF VARIABLES

VARIABLE	RANGE
1. Self-management strategies	**May include but not limited to:** 1.1 Seeking assistance in the form of job coaching or mentoring 1.2 Continuing dialogue to tackle workplace grievances 1.3 Collective negotiation/bargaining for better working conditions 1.4 Share your goals to improve with a trusted co-worker or supervisor 1.5 Make a negativity log of every instance when you catch yourself complaining to others 1.6 Make lists and schedules for necessary activities
2. Unpleasant situation	**May include but not limited to:** 2.1 Job burn-out 2.2 Drug dependence 2.3 Sulking

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Express emotions appropriately 1.2 Work independently and show initiative 1.3 Consistently demonstrate self-confidence and self-discipline
2. Resource Implications	**The following resources should be provided:** 2.1. Access to workplace and resource s 2.2. Case studies
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1. Demonstration or simulation with oral questioning 3.2. Case problems involving work improvement and sustainability issues 3.3. Third-party report
4. Context for Assessment	4.1. Competency assessment may occur in workplace or any appropriately simulated environment

UNIT OF COMPETENCY : CONTRIBUTE TO WORKPLACE INNOVATION

UNIT CODE : 400311214

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to make a pro-active and positive contribution to workplace innovation.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1.Identify opportunities to do things better.	1.1 ***Opportunities for improvement*** are identified proactively in own area of work. 1.2 ***Information*** are gathered and reviewed which may be relevant to ideas and which might assist in gaining support for idea.	1.1 Roles of individuals in suggesting and making improvements . 1.2 Positive impacts and challenges in innovation. 1.3 Types of changes and responsibility. 1.4 Seven habits of highly effective people.	1.1 Identify opportunities to improve and to do things better. Involvement. 1.2 Identify the positive impacts and the challenges of change and innovation. 1.3 Identify examples of the types of changes that are within and outside own scope of responsibility
2. Discuss and develop ideas with others	2.1 ***People who could provide input*** to ideas for improvements are identified. 2.2 Ways of approaching people to begin sharing ideas are selected. 2.3 Meeting is set with relevant people. 2.4 Ideas for follow up are review and selected based on feedback. 2.5 ***Critical inquiry method*** is used to discuss and	2.1 Roles of individuals in suggesting and making improvements . 2.2 Positive impacts and challenges in innovation. 2.3 Types of changes and responsibility. 2.4 Seven habits of highly effective people.	2.1 Identify opportunities to improve and to do things better. Involvement. 2.2 Identify the positive impacts and the challenges of change and innovation. 2.3 Provide examples of the types of changes that are within and outside own scope of responsibility 2.4 Communicate ideas for change through small group discussions and meetings.

	develop ideas with others.		
3. Integrate ideas for change in the workplace	3.1 Critical inquiry method is used to integrate different ideas for change of key people. 3.2 Summarizing, analyzing and	3.1 Roles of individuals in suggesting and making improvements.	3.1 Identify opportunities to improve and to do things better. Involvement. 3.2 Identify the positive impacts and the

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	generalizing skills are used to extract salient points in the pool of ideas. 3.3 ***Reporting skills*** are likewise used to communicate results. 3.4 ***Current Issues and concerns*** on the systems, processes and procedures, as well as the need for simple innovative practices are identified.	3.2 Positive impacts and challenges in innovation. 3.3 Types of changes and responsibility. 3.4 Seven habits of highly effective people. 3.5 Basic research skills.	challenges of change and innovation. 3.3 Provide examples of the types of changes that are within and outside own scope of responsibility. 3.4 Communicate ideas for change through small group discussions and meetings. 3.5 Demonstrate skills in analysis and interpretation of data.

RANGE OF VARIABLES

VARIABLES	RANGE
1. Opportunities for improvement	May include: 1.1 Systems. 1.2 Processes. 1.3 Procedures. 1.4 Protocols. 1.5 Codes. 1.6 Practices.
2. Information	May include: 2.1 Workplace communication problems. 2.2 Performance evaluation results. 2.3 Team dynamics issues and concerns. 2.4 Challenges on return of investment 2.5 New tools, processes and procedures. 2.6 New people in the organization.
3. People who could provide input	May include: 3.1 Leaders. 3.2 Managers. 3.3 Specialists. 3.4 Associates. 3.5 Researchers. 3.6 Supervisors. 3.7 Staff. 3.8 Consultants (external) 3.9 People outside the organization in the same field or similar expertise/industry. 3.10 Clients
4. Critical inquiry method	May include: 4.1 Preparation. 4.2 Discussion. 4.3 Clarification of goals. 4.4 Negotiate towards a Win-Win outcome. 4.5 Agreement. 4.6 Implementation of a course of action. 4.7 Effective verbal communication. See our pages: Verbal Communication and Effective Speaking. 4.8 Listening. 4.9 Reducing misunderstandings is a key part of effective negotiation. 4.10 Rapport Building. 4.11 Problem Solving. 4.12 Decision Making. 4.13 Assertiveness. 4.14 Dealing with Difficult Situations.

VARIABLES	RANGE
5. Reporting skills	May include: 5.1 Data management. 5.2 Coding. 5.3 Data analysis and interpretation. 5.4 Coherent writing. 5.5 Speaking.

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Identified opportunities to do things better. 1.2 Discussed and developed ideas with others on how to contribute to workplace innovation. 1.3 Integrated ideas for change in the workplace. 1.4 Analyzed and reported rooms for innovation and learning in the workplace.
2. Resource Implications	The following resources should be provided: 2.1 Pens, papers and writing implements. 2.2 Cartolina. 2.3 Manila papers.
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Psychological and behavioral Interviews. 3.2 Performance Evaluation. 3.3 Life Narrative Inquiry. 3.4 Review of portfolios of evidence and third-party workplace reports of on-the-job performance. 3.5 Sensitivity analysis. 3.6 Organizational analysis. 3.7 Standardized assessment of character strengths and virtues applied.
4. Context for Assessment	4.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions.

UNIT OF COMPETENCY : PRESENT RELEVANT INFORMATION

UNIT CODE : 400311215

UNIT DESCRIPTOR : This unit of covers the knowledge, skills and attitudes required to present data/information appropriately.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Gather data/ information	1.1 Evidence, facts and information are collected 1.2 Evaluation, terms of reference and conditions are reviewed to determine whether data/information falls within project scope	1.1 Organisational protocols 1.2 Confidentiality 1.3 Accuracy 1.4 Business mathematics and statistics 1.5 Data analysis techniques/procedures 1.6 Reporting requirements to a range of audiences 1.7 Legislation, policy and procedures relating to the conduct of evaluations 1.8 Organisational values, ethics and codes of conduct	1.1 Describe organisational protocols relating to client liaison 1.2 Protect confidentiality 1.3 Describe accuracy 1.4 Compute business mathematics and statistics 1.5 Describe data analysis techniques/ procedures 1.6 Report requirements to a range of audiences 1.7 State legislation, policy and procedures relating to the conduct of evaluations 1.8 State organisational values, ethics and codes of conduct

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Assess gathered data/ information	2.1 Validity of data/ information is assessed 2.2 Analysis techniques are applied to assess data/ information. 2.3 Trends and anomalies are identified 2.4 ***Data analysis techniques*** and procedures are documented 2.5 Recommendations are made on areas of possible improvement.	2.1 Business mathematics and statistics 2.2 Data analysis techniques/ procedures 2.3 Reporting requirements to a range of audiences 2.4 Legislation, policy and procedures relating to the conduct of evaluations 2.5 Organisational values, ethics and codes of conduct	2.1 Compute business mathematics and statistics 2.2 Describe data analysis techniques/ procedures 2.3 Report requirements to a range of audiences 2.4 State legislation, policy and procedures relating to the conduct of evaluations 2.5 State organisational values, ethics and codes of conduct

3. Record and present information	3.1 Studied data/information are recorded. 3.2 Recommendations are analyzed for action to ensure they are compatible with the project's scope and terms of reference. 3.3 Interim and final reports are analyzed and outcomes are compared to the criteria established at the outset. 3.4 Findings are presented to stakeholders.	3.1 Data analysis techniques/ procedures 3.2 Reporting requirements to a range of audiences 3.3 Legislation, policy, and procedures relating to the conduct of evaluations 3.4 Organisational values, ethics, and codes of conduct	3.1 Describe data analysis techniques/ procedures 3.2 Report requirements to a range of audiences 3.3 State legislation, policy, and procedures relating to the conduct of evaluations 3.4 State organizational values, ethics and codes of conduct practices

RANGE OF VARIABLES

VARIABLES	RANGE
1. Data analysis techniques	May include but not limited to: 1.1. Domain analysis 1.2. Content analysis 1.3. Comparison technique

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Determine data/information 1.2 Studied and applied gathered data/information 1.3 Recorded and studied data/information These aspects may be best assessed using a range of scenarios and what-ifs as a stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual, and improbable situations that may have happened.
2. Resource Implications	**Specific resources for assessment** 2.1 Evidence of competent performance should be obtained by observing an individual in an information management role within the workplace or operational or simulated environment.
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Written Test 3.2 Interview 3.3 Portfolio The unit will be assessed holistically as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components.
4. Context for Assessment	4.1 In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units.

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

UNIT CODE : 400311216

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to identify OSH compliance requirements, prepare OSH requirements for compliance, perform tasks in accordance with relevant OSH policies and procedures

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify OSH compliance requirements	1.1 Relevant ***OSH requirements, regulations, policies and procedures*** are identified in accordance with workplace policies and procedures ***1.2*** OSH activity non-conformities are conveyed to ***appropriate personnel*** 1.3 ***OSH preventive and control requirements*** are identified in accordance with OSH work policies and procedures	1.1. OSH preventive and control requirements 1.2. Hierarchy of Controls 1.3. Hazard Prevention and Control 1.4. General OSH principles 1.5. Work standards and procedures 1.6. Safe handling procedures of tools, equipment and materials 1.7. Standard emergency plan and procedures in the workplace	1.1. Communication skills 1.2. Interpersonal skills 1.3. Critical thinking skills 1.4. Observation skills

2. Prepare OSH requirements for compliance	2.1 OSH work activity material, tools and equipment requirements are identified in accordance with workplace policies and procedures 2.2. Required OSH materials, tools and equipment are acquired in accordance with	2.1. Resources necessary to execute hierarchy of controls 2.2. General OSH principles 2.3. Work standards and procedures 2.4. Safe handling procedures of tools, equipment and materials 2.5. Different OSH control measures	2.1. Communicatio n skills 2.2. Estimation skills 2.3. Interperson al skills 2.4. Critical thinking skills 2.5. Observatio n skills 2.6. Material, tool and equipment identification skills

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	workplace policies and procedures 2.3. Required OSH materials, tools and equipment are arranged/ placed in accordance with OSH work standards		
3. Perform tasks in accordance with relevant OSH policies and procedures	3.1 Relevant OSH work procedures are identified in accordance with workplace policies and procedures 3.2 Work Activities are executed in accordance with OSH work standards *3.3* ***Non-compliance work activities*** are reported to *appropriate personnel*	3.1. OSH work standards 3.2. Industry-related work activities 3.3. General OSH principles 3.4. OSH Violations Non-compliance work activities	3.1Communication skills 3.3 Interpersonal skills 3.4 Troubleshooting skills 3.5 Critical thinking skills 3.6 Observation skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. OSH Requirements, Regulations, Policies and Procedures	May include: 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 Permit to Operate 1.6 Philippine Occupational Safety and Health Standards 1.7 Department Order No. 13 (Construction Safety and Health) 1.8 ECC regulations
2. Appropriate Personnel	May include: 2.1 Manager 2.2 Safety Officer 2.3 EHS Offices 2.4 Supervisors 2.5 Team Leaders 2.6 Administrators 2.7 Stakeholders 2.8 Government Official 2.9 Key Personnel 2.10 Specialists 2.11 Himself
3. OSH Preventive and Control Requirements	May include: 3.1 Resources needed for removing hazard effectively 3.2 Resources needed for substitution or replacement 3.3 Resources needed to establishing engineering controls 3.4 Resources needed for enforcing administrative controls 3.5 Personal Protective equipment
4. Non OSH-Compliance Work Activities	May include non-compliance or observance of the following safety measures: 4.1 Violations that may lead to serious physical harm or death 4.2 Fall Protection 4.3 Hazard Communication 4.4 Respiratory Protection 4.5 Power Industrial Trucks 4.6 Lockout/Tag-out 4.7 Working at heights (use of ladder, scaffolding) 4.8 Electrical Wiring Methods 4.9 Machine Guarding 4.10 Electrical General Requirements 4.11 Asbestos work requirements 4.12 Excavations work requirements

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Convey OSH work non-conformities to appropriate personnel 1.2. Identify OSH preventive and control requirements in accordance with OSH work policies and procedures 1.3. Identify OSH work activity material, tools and equipment requirements in accordance with workplace policies and procedures 1.4. Arrange/Place required OSH materials, tools and equipment in accordance with OSH work standards 1.5. Execute work activities in accordance with OSH work standards 1.6. Report OSH activity non-compliance work activities to appropriate personnel
2. Resource Implications	**The following resources should be provided:** 2.1 Facilities, materials tools and equipment necessary for the activity
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Observation/Demonstration with oral questioning 3.2 Third party report
4. Context for Assessment	4.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY : EXERCISE EFFICIENT AND EFFECTIVE SUSTAINABLE PRACTICES IN THE WORKPLACE

UNIT CODE : 400311217

UNIT DESCRIPTOR : This unit covers knowledge, skills and attitude to identify the efficiency and effectiveness of resource utilization, determine causes of inefficiency and/or ineffectiveness of resource utilization and Convey inefficient and ineffective environmental practices

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify the efficiency and effectiveness of resource utilization	1.1 Required resource utilization in the workplace is measured using appropriate techniques 1.2 Data are recorded in accordance with workplace protocol ***1.3*** Recorded data are compared to determine the efficiency and effectiveness of resource utilization according to established ***environmental work procedures***	1.1. Importance of Environmental Literacy 1.2. Environmental Work Procedures 1.3. Waste Minimization 1.4. Efficient Energy Consumptions	1.1 Recording Skills 1.2 Writing Skills 1.3 Innovation Skills
2. Determine causes of inefficiency and/or ineffectiveness of resource utilization	2.1 Potential causes of inefficiency and/or ineffectiveness are listed 2.2 Causes of inefficiency and/or ineffectiveness are identified through deductive reasoning 2.3 Identified causes of inefficiency and/or ineffectiveness are validated thru	2.1 Causes of environmental inefficiencies and ineffectiveness	2.1 Deductive Reasoning Skills 2.2 Critical thinking 2.3 Problem Solving 2.4 Observation Skills

	established environmental procedures		
3. Convey inefficient and ineffective environmental practices	3.1 Efficiency and effectiveness of resource utilization are reported to	3.1 Appropriate Personnel to address the environmental hazards	3.1 Written and Oral Communication Skills 3.2 Critical thinking

	appropriate personnel 3.2 Concerns related resource utilization are discussed with appropriate personnel 3.3 Feedback on information/ concerns raised are clarified with appropriate personnel	3.2 Environmental corrective actions	3.3 Problem Solving 3.4 Observation Skills 3.5 Practice Environmental Awareness

RANGE OF VARIABLES

VARIABLE	RANGE
1. Environmental Work Procedures	May include: 1.1 Utilization of Energy, Water, Fuel Procedures 1.2 Waster Segregation Procedures 1.3 Waste Disposal and Reuse Procedures 1.4 Waste Collection Procedures 1.5 Usage of Hazardous Materials Procedures 1.6 Chemical Application Procedures 1.7 Labeling Procedures
2. Appropriate Personnel	May include: 2.1 Manager 2.2 Safety Officer 2.3 EHS Offices 2.4 Supervisors 2.5 Team Leaders 2.6 Administrators 2.7 Stakeholders 2.8 Government Official 2.9 Key Personnel 2.10 Specialists 2.11 Himself

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Measured required resource utilization in the workplace using appropriate techniques 1.2 Recorded data in accordance with workplace protocol 1.3 Identified causes of inefficiency and/or ineffectiveness through deductive reasoning 1.4 Validate the identified causes of inefficiency and/or ineffectiveness thru established environmental procedures 1.5 Report efficiency and effectives of resource utilization to appropriate personnel 1.6 Clarify feedback on information/concerns raised with appropriate personnel
2. Resource Implications	**The following resources should be provided:** 2.1 Workplace 2.2 Tools, materials and equipment relevant to the tasks 2.3 PPE 2.4 Manuals and references
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Demonstration 3.2 Oral questioning 3.3 Written examination
4. Context for Assessment	4.1 Competency assessment may occur in workplace or any appropriately simulated environment 4.2 Assessment shall be observed while task are being undertaken whether individually or in-group

UNIT OF COMPETENCY : **PRACTICE ENTREPRENEURIAL SKILLS IN THE WORKPLACE**

UNIT CODE : **400311218**

UNIT DESCRIPTOR : This unit covers the outcomes required to apply entrepreneurial workplace best practices and implement cost-effective operations

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Apply entrepreneurial workplace best practices	1.1 ***Good practices*** relating to workplace operations are observed and selected following workplace policy. 1.2 Quality procedures and practices are complied with according to workplace requirements. 1.3 Cost-conscious habits in ***resource utilization*** are applied based on industry standards.	1.1 Workplace best practices, policies and criteria 1.2 Resource utilization 1.3 Ways in fostering entrepreneurial attitudes: 1.3.1 Patience 1.3.2 Honesty 1.3.3 Quality-consciousness 1.3.4 Safety-consciousness 1.3.5 Resourcefulness	1.1 Communication skills 1.2 Complying with quality procedures

2. Communicate entrepreneurial workplace best practices	2.1 Observed good practices relating to workplace operations are communicated to ***appropriate person***. 2.2 Observed quality procedures and practices are communicated to appropriate person 2.3 Cost-conscious habits in resource utilization are communicated based on industry standards.	2.1 Workplace best practices, policies and criteria 2.2 Resource utilization 2.3 Ways in fostering entrepreneurial attitudes: 2.3.1 Patience 2.3.2 Honesty 2.3.3 Quality-consciousness	2.1 Communication skills 2.2 Complying with quality procedures 2.3 Follow workplace communication protocol

		2.3.4 Safety-consciousness 2.3.5 Resourcefulness	
3. Implement cost-effective operations	3.1 Preservation and optimization of workplace resources is implemented in accordance with enterprise policy 3.2 Judicious use of workplace tools, equipment and materials are observed according to manual and work requirements. 3.3 Constructive contributions to office operations are made according to enterprise requirements. 3.4 Ability to work within one's allotted time and finances is sustained.	3.1 Optimization of workplace resources 3.2 5S procedures and concepts 3.3 Criteria for cost-effectiveness 3.4 Workplace productivity 3.5 Impact of entrepreneurial mindset to workplace productivity 3.6 Ways in fostering entrepreneurial attitudes: 4. Quality-consciousness 5. Safety-consciousness	3.1 Implement preservation and optimizing workplace resources 3.2 Observe judicious use of workplace tools, equipment and materials 3.3 Make constructive contributions to office operations 3.4 Sustain abilityto work within allotted time and finances

RANGE OF VARIABLES

VARIABLE	RANGE
1.Good practices	May include: 1.1 Economy in use of resources 1.2 Documentation of quality practices
2.Resources utilization	May include: 2.1 Consumption/ use of consumables 2.2 Use/Maintenance of assigned equipment and furniture 2.3 Optimum use of allotted /available time

EVIDENCE GUIDE

3.1 Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Demonstrated ability to identify and sustain cost- effective activities in the workplace 1.2 Demonstrated ability to practice entrepreneurial knowledge, skills and attitudes in the workplace.
3.2 Resource Implications	The following resources should be provided: 2.1 Simulated or actual workplace 2.2 Tools, materials and supplies needed to demonstrate the required tasks 2.3 References and manuals 2.3.1 Enterprise procedures manuals 2.3.2 Company quality policy
3.3 Methods of Assessment	**Competency in this unit should be assessed through:** 3.1 Interview 3.2 Third-party report
4.Context of Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group

COMMON COMPETENCIES

UNIT OF COMPETENCY : APPLY FOOD SAFETY AND SANITATION

UNIT CODE : PFB751210

UNIT DESCRIPTOR : This unit covers skills and attitudes required to apply food safety and sanitation in the workplace

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Wear Personal Protective Equipment	***1.1*** Personal protective equipment is checked according to ***manufacturer's specifications*** 1.2 ***Personal Protective Equipment*** is worn according to the job requirement	**SCIENCE** 1.1 Ergonomics and fit of PPE 1.2 Properties of PPE Materials . . **TECHNOLOGY** 1.1 Monitoring of PPE materials 1.2 Sustainable PPE manufacturing practices **ENVIRONMENT CONCERNS** 1.1 Life Cycle Assessment of PPE 1.2 Environmental impact of PPE materials 1.3 Public awareness concerns of using PPEs **MATHEMATICS** 1.1 Environmental footprint analysis	1.1 Checking PPE 1.2 Practicing GMP

		1.2 Calculating material strength of PPEs **COMMUNICATION** 1.1 Different PPEs and its uses 1.2 Communicating health risks 1.3 Writing clear instructions for PPE use	
2. Observe Personal Hygiene and Good Grooming	2.1 Personal hygiene and good grooming are practiced in line with ***workplace health and safety requirements***	**SCIENCE** 2.1 Analyzing injury and illness data 2.2 Understanding occupational diseases 2.3 Response to workplace accidents 2.4 Chemical properties of personal care and products **TECHNOLOGY** 2.1 Designing ergonomic workstations **ENVIRONMENT CONCERNS** 2.1 Implementing health-conscious workplace policies 2.2 Hazardous waste disposal **COMMUNICATION** 2.1 Writing safety guidelines 2.2 Reporting safety incidents 2.3 Hygiene practices	2.1 Exercising health and safety practices 2.2 Practicing good grooming and personal hygiene practices

3.Implement Food Sanitation Practices	3.1 Sanitary food handling practices are implemented in line with workplace sanitation regulations 3.2 Safety measures are observed in line with workplace safety practices.	**SCIENCE** 3.1 Understanding food pathogens 3.2 Chemical properties of sanitizers **TECHNOLOGY** 3.1 Eco-friendly cleaning and sanitizing solutions and products 3.2 Food safety training programs **ENVIRONMENT CONCERNS** 3.1 Waste management in food production 3.2 Environmental impact of cleaning chemicals and products **MATHEMATICS** 3.1 Calculating chemical concentrations 3.2 Analyzing disease transmission **COMMUNICATION** 3.1 Food safety guidelines 3.2 Foodborne illnesses	3.1 Managing wastes 3.2 Implementing sanitary food handling practices 3.3 Practicing 3.4 workplace safety

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
4. Render Safety Measures and First Aid Procedures	4.1 ***Safety measures*** are applied according to workplace rules and regulations ***4.2 First aid procedures*** are applied and coordinated with concerned personnel according to workplace standard operating procedures.	**SCIENCE** 4.1 Workplace and environmental hazards **TECHNOLOGY** 4.1 Safety hazards 4.2 Safety monitoring devices **ENVIRONMENT CONCERNS** 4.1 Emergency response procedures 4.2 Natural disaster preparedness **MATHEMATICS** 4.1 Calculating vital signs **COMMUNICATION** 4.1 Emergency response plan 4.1 First aid response and treatment	4.1 Applying safety measures 4.2 Applying first aid treatment 4.3 Practicing PPE 4.4 Coordinating with concerned personnel

5. Implement housekeeping activities	5.1 Work area and surroundings are cleaned in accordance with workplace health and safety regulations 5.1 Waste is disposed of according to the organization's waste disposal system 5.2 ***Hazards*** in the work area are recognized and reported to designated personnel according to workplace procedures	**SCIENCE** 5.1 Understanding properties of physical and chemical hazards 5.2 Workplace and environmental hazards **TECHNOLOGY** 5 . 1 Safety training programs **ENVIRONMENT CONCERNS** 5.1 Waste Management **COMMUNICATION** 5.1 Safety procedures and safety protocols Hazard assessment reports	5.1 Implementing housekeeping activities 5.2 Practicing proper waste disposal 5.3 Coordinating skills

RANGE OF VARIABLES

VARIABLE	RANGE
1.Manufacturer's Specifications	**May include:** 1.1 Handling 1.2 Operating 1.3 Discharge Label 1.4 Reporting 1.5 Testing 1.6 Positioning 1.7 Refilling
2. Personal Protective Equipment	**May include:** 2.1 Apron/laboratory gown 2.2 Mouth masks 2.3 Gloves 2.4 Rubber boots/safety shoes 2.5 Head gears such as caps, hair nets, earl plug
3. Workplace Health and Safety Requirements	**May include:** 3.1 Health/Medical Certificate 3.2 DOLE requirements 3.3 BFAD requirements 3.4 Personal Hygiene and good grooming 3.5 Plant Sanitation and waste management
4. Safety Measures	**May include:** 4.1 Labeling of chemicals and other sanitizing agents 4.2 Installation of firefighting equipment in the work area 4.3 Installation of safety signage and symbols 4.4 Implementation of 5S in the work area 4.5 Removal of combustible material in the work area
5. First Aid Procedures	**May include:** 5.1 Mouth to mouth resuscitation 5.2 CPR 5.3 Application of tourniquet 5.4 Applying pressure to bleeding wounds or cuts 5.5 First aid treatment for burned victims
6. Hazards	**May include :** 6.1 Physical 6.2 Biological 6.3 Chemical

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Cleaned, checked and sanitized personal protective equipment 1.2 Practiced proper personal hygiene and good grooming 1.3 Implemented workplace food safety practices 1.4 Applied first aid measures to victims 1.5 Implemented good housekeeping activities in the work area
2. Resource implications	**The following resources should be provided:** 2.1 Work area/station 2.2 First Aid kit 2.3 PPE relevant to the activities 2.4 Fire extinguisher 2.5 Stretcher 2.6 Materials, tools and equipment relevant to the unit of competency
3. Method of assessment	**Competency may be assessed through:** 3.1 Demonstration with questioning 3.2 Written Test
4. Context of assessment	4.1. Competency may be assessed individually in the actual workplace or through an accredited institution

UNIT OF COMPETENCY : USE STANDARD MEASURING DEVICES AND INSTRUMENTS

UNIT CODE : PFB751211

UNIT DESCRIPTOR : This unit covers the knowledge, skills, and attitude required to use standard measuring devices, instruments in the workplace

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify Standard Measuring Devices and Instruments	1.1 ***Standard measuring devices and instruments*** are identified according to manufacturer's specifications 1.2 Devices and instruments for measuring are properly checked, sanitized and calibrated prior to use	**SCIENCE** 1.1 Defects and breakages of measuring devices and instruments 1.2 Principles of measurements and units 1.3 Calibration of devices and instruments **TECHNOLOGY** 1.1 Specifications and functions of measuring devices and instruments 1.2 Procedures in sanitizing calibrating and stowing equipment and instruments **MATHEMATICS** 1.1 Analyzing measurement errors **COMMUNICATION** 1.1 Safe handling of measuring devices and 1.2 instruments	1.1 Communication skills 1.2 Performing Sanitary 1.3 handling of devices and instruments 1.4 Calibrating skills

		Interpretation of measurement results	

2. Review the Procedures in Using Standard Measuring Devices and Instruments	2.1 Procedures in using the ***standard measuring devices*** and instruments are recalled according to manufacturer's specifications ***2.2*** Printed procedures/ brochures/ catalogues are consulted according to specified ***food processing methods***	**SCIENCE** 2.1 Understanding food processing methods **TECHNOLOGY** 2.1 Procedures in using different standard measuring devices 2.2 Different food processing technologies **ENVIRONMENT CONCERNS** 2.1 Waste reduction in food processing **MATHEMATICS** 2.1 Statistical process control **COMMUNICATION** 2.1 Interpretation of procedures manual Food processing protocols	2.1 Reading and following printed manuals and brochures 2.2 Using standard measuring devices

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Follow Procedures of Using Measuring Devices and Instruments	3.1 Methods/practices of using measuring devices and instruments are strictly observed according to manufacturer's specifications and workplace requirements 3.2 Measuring devices and instruments are cleaned, wiped dry and stowed after use to ensure conformity with workplace requirements	**SCIENCE** 3.1 Cleaning protocol of measuring devices and instruments **TECHNOLOGY** 3.1 Procedures for cleaning, and stowing equipment and instruments **ENVIRONMENT** 3.1 Waste reduction and recycling in cleaning **MATHEMATICS** 3.1 Calculating cleaning efficiency **COMMUNICATION** 3.1 Communicating safety precautions in cleaning	3.1 Applying 3.2 methods/practices in using measuring devices and instruments 3.3 Cleaning and stowing measuring devices and instruments

RANGE OF VARIABLES

VARIABLE	RANGE
1. Standard Measuring Devices	**May include:** 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	**May include:** 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	**May include:** 3.1 Process foods by Salting, and Curing 3.2 Process foods by Fermentation 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	**Assessment requires evidence that the candidate:** 1.1 Identified, prepared and calibrated standard measuring devices and instruments 1.2 Followed correctly the procedures in using standard measuring devices and instruments 1.3 Followed proper cleaning and sanitizing and stowing procedures of measuring devices and equipment before and after use
2. Resource implications	**The following resources should be provided:** 2.1 Work area/station 2.2 Materials, tools and equipment relevant to the Unit of Competency
3. Method of assessment	**Competency may be assessed through:** 3.1 Demonstration with questioning 3.2 Written Test
4. Context of assessment	4.1 Assessment should occur on the job or in a simulated workplace

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

UNIT CODE : PFB751212

UNIT DESCRIPTOR : This unit covers knowledge, skills and attitude required to operate food processing tools, equipment and instruments in the workplace.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Perform pre-operation activities	***1.1*** Appropriate tools and equipment/utensils are assembled according to ***food processing method*** 1.2 ***Food processing tools and equipment/utensils*** are inspected and checked according to manufacturer's specifications 1.3 Food processing equipment is set up, adjusted and readied according to job requirements	**SCIENCE** 1.1 Protocols for setting up food processing equipment 1.2 Understanding mechanical principle of food processing equipment **TECHNOLOGY** 1.1 Reading of instructional/manufacturer's manual **ENVIRONMENT CONCERNS** 1.1 Energy efficiency in equipment operation **MATHEMATICS** 1.1 Environmental Footprints Analysis **COMMUNICATION** 1.1 Safety precautions	1.1 Assembling 1.2 equipment/ utensils 1.3 Inspecting and check condition of equipment/ machines 1.4 Setting-up and adjust food processing equipment 1.5 Reporting 1.6 equipment/ machine, tools, instruments breakdown and recording same in standard forms 1.7 Communication skills

2. Operate food processing equipment	***1.1*** Food processing equipment is switched on according to ***manufacturer's specifications*** 1.2 Performance of food processing equipment is checked to ensure conformity with specified output 1.3 Operation of food processing equipment is managed to achieve planned outcomes 1.4 Minor trouble shooting on food processing tools, equipment and utensils is performed when necessary	**SCIENCE** 2.1 Understanding operational protocols **TECHNOLOGY** 2.1 Research in Equipment Functionality 2.2 Reading and following the manufacturer's manual **ENVIRONMENT CONCERNS** 2.1 Waste reduction strategies in operating equipment **MATHEMATICS** 2.1 Calculating optimal processing and utilization time of equipment **COMMUNICATION** 2.1 Standard operating procedures (SOPs) for food processing equipment	2.1 Inspecting and checking condition of equipment/ machines 2.2 Performing minor troubleshooting

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 3.3 ***Minor preventive maintenance*** on equipment is performed in line with organization's maintenance system 3.4 Main machine parts are inspected and checked in line with organization's policy 3.5 ***Condition of machine*** is monitored to ensure serviceability in accordance with workplace rules and regulations	**SCIENCE** 3.1 Analysis of product quality post-operation 3.2 Condition monitoring of equipment **TECHNOLOGY** 3.1 Equipment wear and tear 3.2 Maintenance schedule of equipment **MATHEMATICS** 3.1 Downtime analysis of equipment **COMMUNICATION** 3.1 Inspection and Maintenance Reports	3.1 Shutting down food processing equipment 3.2 Sanitizing, cleaning and stowing measuring devices and instruments 3.3 Checking main machine parts 3.4 Performing minor preventive maintenance 3.5 Monitoring machine condition 3.6 Accomplishing monitoring checklist 3.7 Wearing PPE 3.8 Applying OSHS 3.9 Performing regular maintenance

RANGE OF VARIABLES

VARIABLES	RANGE
1. Food processing methods	**May include:** 1.1 Salting 1.2 Curing 1.3 Fermentation 1.4 Canning 1.5 Bottling 1.6 Sugar concentration 1.7 Drying 1.8 Dehydration
2. Food processing tools, equipment and utensils	**May include:** **2.1 Tools** ○ Cutting implements such as: ○ Knives ○ Slicer ○ Vegetable cutter ○ Cutter ○ Peeler ○ Measuring spoons and cups ○ Scalers ○ wire basket ○ Blow torch ○ steam jacketed kettle ○ lifter ○ Exhaust box ○ Cooking tools like: ○ Syringe and needle ○ Saucepans ○ Non-stick pan ○ Containers for Fermentation ○ large stoneware crocks ○ food-grade plastic containers ○ large glass jars ○ a heavy plate or glass lid that fits down inside the container

VARIABLES	RANGE
	2.2 Equipment, o Cold storage equipment like: o refrigerators o Freezer o Chiller o Oven o Smoke house o Pressure cooker o Food processor o Plastic protect cap sealer o Sealers (can & plastic) o wheelers o Jack lifts o Stove/burner o Soaking vat o Tumbler o Meat grinder/chopper o Octo clam o Meat slicer o Trolleys o Sausage stuffer o Impulse sealer o Vacuum packaging machine machine o blanching o Machine sealer o Fermentation vat o Soaking container o Sterilizer mixer o Grinder o Enamel kettle/vat **2.3 Apparatus/Instruments** o Salinometer o Polyscalers o Weighing scales of varying capacities & sensitivities o Refractometer o Jelly thermometer o Politer o Candy thermometer **2.4 Utensils** o Kitchen utensils like: o Casserole o Chopping boards o Colanders o Mixing bowls o Food tongs o Spoon ladder o Wooden ladle o Wooden spoon o Bowls made from: o Stoneware o Glass o Aluminum o Stainless steel o Unchipped enamelware. o Funnel o Strainer o Strainers o Exhauster o Juice extractor o Steamer o Basting spoons paddle o Sorting tray o Smoking trays o Utility trays o Food tray
3. Manufacturer's specifications	**May include :** Handling requirements 3.1 Operating requirements

VARIABLES	RANGE
	3.3 Discharge Label 3.4 Reporting 3.5 Testing 3.6 Positioning 3.7 Refilling
4. Minor preventive machine maintenance	**May include:** 4.1 Machine temperature 4.2 Hydraulic fluid 4.3 Wear and surface condition 4.4 Crack 4.5 Leak detection 4.6 Vibration 4.7 Corrosion/erosion 4.8 Electric insulation
5. Condition of machine	May include: 5.1 Serviceable 5.2 Repairable 5.3 Defective

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Assembled, inspected, checked and sanitized appropriate tools and equipment/instruments 1.2 Set-up, adjusted and readied tools and equipment and instruments according to requirements 1.3 Operated and monitored performance of equipment to ensure specified output 1.4 Performed post operation activities 1.5 Performed minor trouble shooting on food processing tools, equipment and utensils
2. Methods of Assessment	**Competency in this unit must be assessed through**: 2.1 Direct observation and questioning of a candidate operating food processing tools and equipment/instruments 2.2 Submission of written report on the performance and condition of equipment/machine, tools, instruments used.

3. Resource Implications	**The following resources should be provided:** 3.1 Work area/station 3.2 Materials, tools and equipment relevant to the Unit of Competency
4. Context of Assessment	4.1 Assessment should occur on the job or in a simulated workplace

UNIT OF COMPETENCY : PERFORM MATHEMATICAL COMPUTATIONS

UNIT CODE : PFB751213

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitude to perform mathematical computations in the workplace.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Gather and tabulate the recorded data	1.1 Records of ***weights and measurements*** 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	**SCIENCE** 1.1 Scientific method, units, and measurements 1.2 Basic Mathematical Operations **TECHNOLOGY** 1.1 Calibration of weighing equipment and measuring devices **MATHEMATICS** 1.1 Calculating unit conversion 1.2 Inventory management 1.3 Data summary and analysis **COMMUNICATION** 1.1 Documentation and Reporting 1.2 Record Keeping	1.1 Gathering data 1.2 Keeping of records 1.3 Summarizing and analyzing data 1.4 Basic Mathematical skills 1.5 Basic Accounting skills

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	**SCIENCE** 2.1 Chemical formulations of raw materials and ingredients **TECHNOLOGY** 2.1 Understanding the selection of products and functionality of technological products **ENVIRONMENT CONCERNS** 2.1 Utilization of sustainable materials **MATHEMATICS** 2.1 Percentages and formulations of raw materials and ingredients and finished products **COMMUNICATION** Data analysis and reporting	2.1 Checking 2.2 percentages formulations of raw materials and ingredient 2.3 Reviewing 2.4 percentages and formulations of finished products 2.5 Numeracy skills

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
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 3.3 Data on actual yields and recoveries and corresponding percentage equivalents are calculated according to enterprise requirements 3.4 All calculated data are recorded according to enterprise requirements	**TECHNOLOGY** 3.1 Production Processes **MATHEMATICS** 3.1 Data Analysis 3.2 Percentage and Formulation **COMMUNICATION** 3.1 Record keeping	3.1 Basic Mathematical skills 3.2 Recording skills

4. Compute production cost	4.1 ***Costs of production*** are computed according to organization's standard procedures 4.2 Computed costs of production are reviewed and validated according to organization's production requirements	**SCIENCE** 4.1 Cost estimation procedures **MATHEMATICS** 4.1 Calculation production cost **COMMUNICATION** 4.1 Reports on cost production costs	4.1 Basic Mathematical skills 4.2 Basic Accounting skills 4.3 Reviewing and validating computed costs

RANGE OF VARIABLES

VARIABLES	RANGE
1. 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	**May include:** 2.1 Ingredient formulation 2.2 Percentage formulation 2.3 Conversion 2.4 Ratios and proportion 2.5 Spoilage and rejects and corresponding percentages 2.6 Recoveries and yields and corresponding percentages

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 2.1 Gathered the records of weights and measurements of raw materials/ingredients and finished processed products 2.2 Summarized and tabulated all raw data gathered 2.3 Calculated the production inputs and outputs 2.4 Computed the costs of production 2.5 Reviewed all formulations and concentrations of solutions according to specifications and standards of the enterprise
2. Methods of Assessment	**Competency in this unit must be assessed through:** 2.1 A combination of direct observation and questioning of a candidate computing costs of production 2.2 Submission of a written report showing a record of production data including raw data
3. Resource Implications	**The following resources should be provided:** 3.1 Work area/station 3.2 Materials relevant to recording and documentation of production data 3.3 Computer with printer and software 3.4 Calculator 3.5 Work table
4. Context of Assessment	4.1 Assessment should occur on the job or in a simulated workplace

UNIT OF COMPETENCY : IMPLEMENT GOOD MANUFACTURING PRACTICE AND PROCEDURES

UNIT CODE : PFB751214

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

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
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	**SCIENCE** 1.1 Contamination events and performance improvement processes 1.2 Micro biological, physical and chemical contaminants 1.3 Manufacturing formula and and processing instruction **TECHNOLOGY** 1.1 GMP Requirements 1.2 Personal clothing and footwear requirements at work areas 1.3 Procedures and records 1.4 Basic properties, handling and storage	1.1 Planning and organizing work (time management) 1.2 Working with others and in teams 1.3 Practicing GMP 1.4 Following contamination investigation procedures

		requirements of raw materials, packaging components and final product **ENVIRONMENT CONCERNS** 1.1 GMP Codes of practice, policies and procedures 1.2 GMP Role of internal and external auditors 1.3 Use of personal clothing, storage and disposal requirement 1.4 GMP responsibilities and requirements relating to work role **COMMUNICATION** 1.1 Basic concepts of quality assurance 1.2 Recall and traceability procedures relevant to work role 1.3 Good documentation practices 1.4 Procedures for identifying or isolating materials or product of unacceptable quality	

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
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	**SCIENCE** 2.1 Material for Personal Hygiene **TECHNOLOGY** 2.1 PPE Control resource allocation and processes in the workplace 2.2 Good Manufacturing Practices (GMP) **ENVIRONMENT CONCERNS** 2.1 Workplace entry and exit procedures **COMMUNICATION** 2.1 Hygiene practices	2.1 Following workplace entry and exit procedures 2.2 Practicing OSHS 2.3 Practicing GMP

3. Implement GMP requirements when carrying out work activities	3.1 GMP requirements are identified 3.2 ***Work area***, 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 standard	**SCIENCE** 3.1 Different Contaminants **TECHNOLOGY** 3.1 Monitoring methods of work area, materials and equipment 3.2 Good Manufacturing Practices (GMP) **ENVIRONMENT CONCERNS** 3.1 Control resource allocation and processes in the workplace **COMMUNICATION** 3.1 Handling of raw materials, packaging components and product	3.1 Identifying GMP requirements 3.2 Monitoring routinely work area, materials equipment, and product 3.3 Handling of raw materials, packaging components and product 3.4 Maintaining cleanliness in the workplace

4. Participate in improving GMP	4.1 Processes, practices or conditions which could result in non-compliance with GMP are identified and reported according to workplace reporting requirements 4.2 Corrective action is implemented within level of responsibility 3.7 GMP issues are raised with designated personnel	**ENVIRONMENT CONCERNS** 4.1 Non-compliance and corrective action in GMP **COMMUNICATION** 4.2 Corrective actions	4.1 Practicing GMP 4.2 Reporting workplace condition 4.3 Implementing 3.5 corrective measures

5. Participate in validation processes	5.1 Validation procedures are followed to GMP requirements 5.2 Issues arising from validation are raised with designated personnel 4.3 Validation procedures are documented to meet GMP requirements	**SCIENCE** 5.1 Analyze issues documented requirements **ENVIRONMENT CONCERNS** 5.1 Issues arising from validation **MATHEMATICS** 5.1 Validation and Assessment Data **COMMUNICATION** 5.1 Validation procedures in GMP 5.2 Documentation of validation procedures	5.1 Following validation procedures 5.2 Reporting issues arising from validation 5.3 Documenting 4.4 validation procedures

6. Complete workplace documentation to support GMP	6.1. Documentation and recording requirements are identified 5.3 Information is recorded according to ***workplace reporting procedures*** to meet GMP requirements	**ENVIRONMENT CONCERNS** 6 . 1 Quality and ventilation **COMMUNICATION** 6.1 Documentation and workplace reporting procedures in GMP	6.1. Keeping records 6.2. Recording 5.4 information

RANGE OF VARIABLES

VARIABLES	RANGE
1. OH&S requirements may include:	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:	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:	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:	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	May include: 5.1. Products, raw materials, packaging components and consumables, part-processed product, finished product and cleaning materials
6. Responsibility and reporting systems	May include: 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

1. Critical aspects of Competency	**Assessment requires evidences that the candidate:** 1.1 Located and followed workplace information relating to GMP responsibilities 1.2 Maintained personal hygiene consistent with GMP 1.3 Followed workplace procedures when moving around the workplace and/or from one task to another to maintain GMP 1.4 Used, stored and disposed of appropriate clothing/footwear as required by work tasks and consistent with GMP 1.5 Identified and reported situations that do or could compromise GMP

	1.6 Applied appropriate control measures to control contamination 1.7 Recorded results of monitoring, and maintain records as required by GMP 1.8 Followed validation procedures within level of responsibility 1.9 Identified and responded to out-of-specification or unacceptable raw materials, packaging components, final or part processed product within level of responsibility 1.10 Followed procedures to isolate or quarantine non-conforming product 1.11 Handled, cleaned and stored equipment, utensils, raw materials, packaging components and related items according to GMP and workplace procedures 1.12 Maintained GMP for own work 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 1.14 Maintained the work area in a clean and tidy state 1.15 Identified and reported signs of pest infestation
2. Resource Implication	**The following resources should be provided:** 2.1 Workplace location and access to workplace policies 2.2 Materials relevant to the proposed activity and tasks
3. Methods of Assessment	**Competency in this unit must be assessed using at least two** **(2) of the following methods:** 3.1 A combination of direct observation and oral questioning 3.2 Written report 3.3 Written Test 3.4 Portfolio
4. Context of Assessment	Assessment should occur on the job or in a simulated workplace

UNIT OF COMPETENCY : **IMPLEMENT ENVIRONMENTAL POLICIES AND PROCEDURES**

UNIT CODE : **PFB751215**

UNIT DESCRIPTOR : This unit covers skills and attitudes required to implement environmental policies and procedures when carrying out work responsibilities

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Conduct work in accordance with environmental policies and procedures	1.1. Immediate work area is routinely checked to ensure compliance with environmental requirements 1.2. ***Hazards*** and unacceptable performance are identified, removed and/or reported to appropriate personnel according to workplace procedures 1.3. Workplace procedures and work instructions are followed 1.4. Where control requirements are not met, incidents are promptly reported and corrective action is taken 1.5. Measures used to minimize and handle waste are followed 1.6. Environmental	**SCIENCE** 1.1 Environmental hazards and risks associated with the work 1.2 Basic concepts of hazard identification, risk assessment and control options 1.3 Identifying and responding to hazards 1.4 The difference between trade waste and storm water 1.5 drains **TECHNOLOGY** 1.1 Work procedures as they relate to environmental responsibilities 1.2 Procedures	1.1 Planning and organize work (time management) 1.2 Working with others and in teams 1.3 Practicing environmental skills environmental skills

	data is recorded in required format according to workplace reporting requirements	used to prevent or control environmental risks associated with own work **ENVIRONMENT CONCERNS** 1.1 Workplace approach to managing environmental issues 1.2 Responsibilities of self and employer to manage environmental issues on site 1.3 Consequences of inappropriate waste handling and disposal **COMMUNICATION** 1.1 Sources of advice on environmental issues in the workplace 1.2 Procedures used to handle and dispose of waste 1.3 Impact of work practices on resource utilization and wastage	

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Participate in improving environmental practices at work	2.1 Processes or conditions which could result in an unacceptable environmental outcome are identified and reported according to workplace reporting requirements. 2.2 Corrective action is taken in accordance with the environmental management and emergency response plans as required. 2.3 Contributions are made to participative arrangements for managing environmental issues in the workplace within workplace procedures and level of responsibility.	**SCIENCE** 2.1 Resource allocation 2.2 Improvement in environmental Practices **ENVIRONMENT CONCERNS** 3.1 Corrective action 3.2 Environmental responsibility **COMMUNICATION** 2.1 Unacceptable environmental outcomes 2.2 Emergency response plan 2.3 Report Preparation	2.1 Identifying and report unacceptable environmental outcomes 2.2 Implementing corrective actions 2.3 Participating in improvement of environmental practices 2.4 Practicing written communication skills

3. Respond to an environmental emergency	3.1 Emergency situations are identified and reported according to workplace reporting requirements 3.2 Emergency procedures are followed as appropriate to the nature of the emergency and according to workplace procedures	**SCIENCE** 3.1 Hazardous and toxic substances **TECHNOLOGY ENVIRONMENT CONCERNS** 3.1 Emergency Procedures **COMMUNICATION** 3.1 Emergency situations	3.1 Identifying emergency situations 3.2 Following emergency procedures 3.3 Practicing written communication skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. OH&S requirements may include:	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:	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:	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:	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:	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 5.3. Work responsibilities may involve handling of hazardous waste 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 5.5. An environmental risk is the likelihood that the hazard can cause harm to the environment 5.6. A control measure is a method or procedure used to prevent or minimize environmental risks 5.7. Responsibility for identifying and controlling environmental risks relates to immediate work responsibilities 5.8. Participating in improvement may involve participation in structured improvement programs, one-off projects and day-to-day problem solving and consultative groups

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidences that the candidate:** 1.1 Accessed and apply workplace information on environmental policies and procedures relating to own work 1.2 Fitted and used appropriate personal protective clothing and equipment 1.3 Checked own work area to identify environmental hazards 1.4 Reported hazards according to workplace procedure in a clear and timely manner 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 1.6 Recorded environmental information as required by the environmental management program 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 1.8 Followed procedures to collect, deposit, recycle and/or dispose of waste in own work area

	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 1.10 Maintained housekeeping standards in work area
2. Resource Implication	**The following resources should be provided:** 2.1 Workplace location and access to workplace policies 2.2 Materials relevant to the proposed activity and tasks
3. Methods of Assessment	**Competency in this unit must be assessed using at least two (2) of the following methods:** 3.1 A combination of direct observation and oral questioning 3.2 Written report 3.3 Written Test 3.4 Portfolio
4. Context of Assessment	4.1 Assessment should occur on the job or in a simulated workplace

CORE COMPETENCIES

UNIT OF COMPETENCY : PROCESS TARO (UNOD) BY FRYING TARO CHIPS

UNIT CODE : AB-PFB0506200751304

UNIT DESCRIPTOR **:** This unit deals with the knowledge, skills and attitudes required to process taro by frying which include to prepare equipment, tools, materials and utensils, prepare the raw materials, pack finished products and perform post - production activities.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Prepare equipment, tools, materials and utensils	1.1. Safety measures are applied in accordance with Occupational Safety and Health Standards (OSHS)	**SCIENCE** 1.1.1 Chemical reactions involved in the process of taro. 1.1.2 Biological effects of exposure to chemicals used in the process. **TECHNOLOGY** 1.1.1. OSHS guidelines for the safe handling of equipment and materials. . **ENVIRONMENT CONCERNS** 1.1.1Eco-friendly	1.1.1 Practicing OSHS such as wearing PPE Personal Protective Equipment) 1.1.2 Practicing cGMP,SSOP and 7S 1.1.3 Practicing sanitation in preparing various equipment, tools and utensils

		alternatives to chemical substances used in the process.	
	1. 2 Equipment and tools are prepared in accordance with manufacturer's specifications	**SCIENCE** 1.2.1. Mechanical properties of tools used in the concentration process. **TECHNOLOGY** 1.2.1. Inspection of equipment for any faults or malfunctions before use. **ENVIRONMENT CONCERNS** 1.2.1. Energy-efficient options for equipment to reduce environmental impact **MATHEMATICS** 1.2.1 Appropriate tool sizes and quantities needed for the process. **COMMUNICATION** 1.2.1Preparation of equipment maintenance logs and schedules to ensure proper upkeep	1.2.1.1. Inspecting and checking skills 1.2.2 Calibrating of weighing scales and quality control tools such as thermometer, and refractometer

			check skills 2. Calibrate of weighing scales and quality controltools such as thermometer, and refractometer
	1.3. Kitchen utensils are checked and sanitized in accordance with manufacturer's specifications.	**SCIENCE** 1.3.1. Microbiological risks associated with utensil contamination. **TECHNOLOGY** 1.3.1. Cleaning systems for utensils to ensure hygiene. **MATHEMATICS** 1.3.1. Inventory management systems for utensils to prevent shortages. **COMMUNICATION** 1.3.1. Standardized procedures for material handling and storage. 1.3.2. Proper utensil handling and sanitation practices.	1.3.1.1. Recording and reporting the condition anddefects of tools, utensils 1.3.2 Checking and 1. sanitizing kitchen utensils

	1.4 Processing materials are sourced-out and made available according to work requirements.	**SCIENCE** 1.4.1. Chemical properties of materials used in the concentration process, such as solubility and reactivity. **TECHNOLOGY** 1.4.1. Analysis of composition of processing materials **ENVIRONMENT CONCERNS** 1.4.1. Waste Reduction Strategies **COMMUNICATION** 1.4.1. Chemical Properties of Material Sustainable Sourcing Practices	1.4.1.Sourcing out of processing materials 1.4.2Practicing sanitation in preparing various equipment, tools and utensils 1.4.3Maintaining various equipment, tools and utensils suchas cleaning and sanitizing 1.4.4Sourcing quality supplies and materials according to specification s
2. Prepare the raw materials	2.1. ***Raw materials*** are sorted and graded in accordance with product specifications and standards.	**SCIENCE** 2.1.1. Physical and chemical properties of raw materials, such as moisture content and composite. **MATHEMATICS** 2.1.1. Metrics to identify areas for improvement and cost savings of raw materials **COMMUNICATION** 2.1.1. Sources of raw materials	2.1.1Demonstrating on how to identify acceptable quality raw materials and other ingredients used to preserve pili nut by sugar concentration 2.1.2Sorting and grading of raw materials

	2.2.Sorted ***raw materials*** are prepared according to standard operating procedure.	**TECHNOLOGY** 2.2.1. Procedure for preparing raw materials **ENVIRONMENT CONCERNS** 2.2.1. Sorting and grading methods for raw materials **COMMUNICATION** 2.2.1. Identification of acceptable quality raw materials and other ingredients	2.2.1.1. Preparing sorted raw materials
	2.3. Sorted taro (unod) is pre-processed according to the formulation of specific product.	**SCIENCE** 2.3.1. Procedure and Process **TECHNOLOGY** Pre-processing methods using washing, Peeling, draining Brining methods techniques and technology operationalization **ENVIRONMENT CONCERNS** environmental conservation control and minimize pollution **MATHEMATICS** 2.3.1. Measurement and calibration 2.3.2 Conversion calculations **COMMUNICATION** 2.3.1. Product formulation, quality control communication and feedback on the pre-processing stages of taro	2.3.1 Pre-processing taro according to formulation of specific product 2.3.2 Technical proficiency 2.3.3 precise knife skills for peeling slicing

	2.4. ***Tools and utensils*** for ***raw materials*** are used based on work requirements and manuals.	**SCIENCE** Mechanical properties of tools used in handling raw materials Digital manuals and guides for the correct use and maintenance of tools and utensils **TECHNOLOGY** Inspection of equipment for any faults or malfunctions before use **MATHEMATICS** Appropriate tool sizes and quantities needed for the process **ENVIRONMENT CONCERNS** Energy-efficient options for equipment to reduce environmental impact	2.4..1Inspecting and checking skills 2.4.2Calibrating of weighing scales and quality control tools 2.4.3 Problem solving skills to troubleshoot issues with tools and utensils based on manuals
	2.5. ***Equipment*** are operated following manufacturer's manual.	**SCIENCE** 2.1 Understanding operational protocols **TECHNOLOGY** 2.1 Research in Equipment Functionality 2.2 Reading and following the manufacturer's manual **ENVIRONMENT CONCERNS** 2.1 Waste reduction strategies in operating equipment **MATHEMATICS** 2.1 Calculating optimal processing and utilization time of equipment **COMMUNICATION**	2.5.1 Inspecting and checking condition of equipment/ machines 2.5.2 Performing minor troubleshooting

		MATHEMATICS Appropriate tool sizes and quantities needed for the process **COMMUNICATION** 1.2.1. Preparation of equipment maintenance logs and schedules to ensure proper upkeep.	
3.Cook Taro Chips	3.1 ***Pre -treated*** taro chips are deep -fried according to formulation's specific time and temperature	**SCIENCE** Principles of Maillard reaction in frying to achieve texture and crispiness of taro chips **TECHNOLOGY** ..Deep fryers used in frying **ENVIRONMENT CONCERNS** Proper Oil disposal practices ensuring energy-efficient frying practices to reduce resource consumption **MATHEMATICS** Mathematical calculations to monitor and adjust frying temperatures cooking time calculation on safety protocols	Timing coordination to ensure taro chips are fried for correct duration Quality assessment on color and texture of fried taro chips Reading thermometer and interpreting results

		COMMUNICATION Communicating specific formulations and cooking instructions Clear communication	
	3.2. Correct cooling procedure and techniques is done according to standard operating procedure.	**SCIENCE** Temperature and time analysis on cooling **TECHNOLOGY** Use of Cooling equipment **ENVIRONMENT CONCERNS** Optimizing cooling processes to reduce energy consumption **MATHEMATICS** Temperature and time monitoring using mathematical concepts to track and record cooling time **COMMUNICATION** Communicating following SOP for cooling and adherence to food safety	3.2.1Applying cooling technique and procedure 3.2.2 monitoring of cooling processes 3.2.3 Correct cooling procedures and techniques skills
	3.3. Product are checked and graded according to required specification	**SCIENCE** product quality attributes for checking and grading **ENVIRONMENT CONCERNS** Sustainable Practices in Product checking and grading **MATHEMATICS** Temperature and time monitoring using mathematical concepts to track and record cooling time	Checking cooled and graded product identifying subtle variations in product quality during checking Decision making skills on product grading based on specifications

		COMMUNICATION Communicating product specifications and grading criteria	
	3.4. Appropriate ***flavoring***s are added according to the desired amount.	**SCIENCE** Effects of flavor mixtures to create specific taste and aromas **TECHNOLOGY** Use of specific measuring tablesspoon for accurate flavor measurement **ENVIRONMENT CONCERNS** sustainable sourced flavorings to support eco-friendly practices proper disposal of flavorings and packaging materials during preparation **MATHEMATICS** conversion calculation on appropriate amount of flavorings **COMMUNICATION** instructions for adding flavorings	Applying correct amount of different food flavorings Identifying safety hazards, maintaining cleanliness
	3.5. Practice safety and good housekeeping in accordance to OSHS, HACCP and cGMP standards.	**SCIENCE** 3.5.1Understanding Microbial Hazards: Applying HACCP in Food Safety **TECHNOLOGY** 3.5.1Technology in Food Safety: cGMP Compliance in Manufacturing **ENVIRONMENT CONCERNS** 3.5.1Sustainability in	3.5.1Practicing safety and good housekeeping n accordance with OSHS such as wearing of PPE Practice cGMP, and HACCP

		Food Production: Environmental Impacts of HACCP and cGMP **COMMUNICATION** 3.5.1Food Safety principles	
4. Pack fried taro chips	4.1. Fried taro chips are ***packed and weighed*** in accordance with product specifications.	**SCIENCE** 4.1.1 food safety in proper handling and packaging of fried taro chips & principles to preserve freshness and crispiness of fried taro chips **TECHNOLOGY** 4.1.1 automated weighing for accurate measurement, efficient and hygienic packing **ENVIRONMENT CONCERNS** 4.1.1 use of eco-friendly packaging materials and practices to reduce waste **MATHEMATICS** Mathematic calculations to determiner precise weight of fried taro chips mathematical concepts to divide the total quantity of fried taro chips into individual portions **COMMUNICATION** Clear communication channels for product specifications, packaging requirements & reporting any deviations in weight or packaging quantity	Accurate weighing skills and portioning fried taro chips attention to details to meet quality standards to packed taro chips Packing and weighing fried taro chips

	4.2 ***Packing procedures*** are performed in accordance with cGMP.	**SCIENCE** 4.2.1 principles of quality control to ensure packing procedures meet cGMP **TECHNOLOGY** 4.2.1 use of packaging machinery and standardized packing processes **ENVIRONMENT CONCERNS** 4.2.1. Proper waste disposal practices 4.2.2 Using eco-friendly packaging materials and practices **MATHEMATICS** Mathematic calculations to ensure accurate measurements and batch detailed record documentation mathematical concepts to divide the total quantity of fried taro chips into individual portions **COMMUNICATION** communicating and following SOPs for packing procedure	packaging and documentation skills
	4.3. Fried taro chips are ***sealed and labeled*** in accordance with product specifications	**SCIENCE** 4.3.1science of food safety to maintain freshness and quality & principles of preserving the product **TECHNOLOGY** 4.3.1.heat sealers labeling machines 4.3.2 labelling software for designing and printing product labels	sealing and labelling skills

		ENVIRONMENT CONCERNS 4.3.1.Using eco-friendly packaging materials and practices 4.3.2incorporating recycling programs for packaging materials **MATHEMATICS** 4.3.1mathematical calculations to determine the correct placement and size of labels. And batch coding **COMMUNICATION** 4.3.1Labeling information • Name of products • Net weight • Ingredients • Production/expiry date • Manufacturer's address • Allergen Program • Nutrition Facts 4.3.2 Sealing procedures andtechniques 4.3.3 Sealing integrity/ standards: 4.3.4 Checking headspace Checking leakage	
	4.4***. Packing equipment*** is operated in accordance with manufacturer's manual.	**SCIENCE** 4.4.1Mechanics of Packing Equipment **TECHNOLOGY** 4.4.1Technology integration of packing equipment **COMMUNICATION**	4.4.1. Operating packing equipment such as sealer 4.4.2Reporting of any equipment malfunction, product or process nonconformance during packing operations

		4.4.1Packing Equipment used	
	4.5 Finished product is ***inspected f***ollowing industry operating procedure	**SCIENCE** 4.5.1 Understanding finished product inspection **ENVIRONMENT CONCERNS** 4.5.1 Sustainable Practices in Product Inspection **COMMUNICATION** 4.5.1 Control Parameters	4.5.1 Inspecting finished products for conformance to specifications 4.5.2Recording of finished products weights using enterprise forms/checklist
5.Perform post production activities	5.1 ***Packed finished product*** are stored according to required storage condition	**SCIENCE** 5.1Different storage conditions and period 5.1Storing procedures and techniques for packed products 5.3 Food safety principles and practices for storage of finished products 5.4 Food safety principles and practices for storage of finished products **Environment:** 5.1 HACCP basic principles on storage of finished products 5.2 HACCP basic principles on storage of finished products **Mathematics** 5.1 Recording of storage time and temperature. 5.2 Production	5.1.1.1. Practicing OSHS such as wearing PPE during post production activities 5.1.1.2. Practicing cGMP,7S, SSOP, PNS and HACCP 5.1.1.3. Maintaining working areas and storage facilities 5.1.1.4. Incubating packed food products 5.1.1.5. Storing packaged food products 5.1.1.6. Storing excess materials and ingredients 5.1.1.7. Practicing sanitary food handling upon storing finished Products

		data 5.3 Preparation of daily production input report(spoilage and rejects) 5.4 Recording procedures of production data Inventory of excess materials and ingredients	
	5.2. ***Tools, materials and equipment*** are cleaned and stored based on workplace procedures and operation manual.	**Science:** 5.1 Cleaning and storing methods for equipment, tools and utensils 5.2 Storing tools materials and equipment	5.1Maintaining various equipment, tools and utensils such as cleaning and sanitizing
	5.3 Proper disposal of wastes are practiced according to environmental rules and regulations.	**Technology:** 5.1 HACCP basic principles on storage of finished products **Communication;** 5.1 Following environmental rules and regulations such as wastes segregation and disposals. 5.2 Food safety principles and practices for storage of finished products	5.1 Practicing proper wastes disposal
	5.4. ***Production data*** checklist is accomplished according to enterprise protocol.	**Mathematics:** 6.1 Production data 6.2 Preparation of daily production input report (spoilage and rejects) 6.3 Recording procedures of production data using enterprise forms	• Recording of production data • Accomplishing inventory forms . Computing of yields, recoveries and rejects

RANGE OF VARIABLES

VARIABLES	RANGE
1. Equipment and tools	**Equipment and tools include calibration :** **1.1 Weighing scale calibration** **1.2 Thermometer** **1.3 Refractometer**
2. Kitchen utensils	**Kitchen utensils may include:** 3.1. **Cutting implements such as:** 1. **Knives (kitchen knife)** 2. **Slicer** 3. **Kitchen shears** 3.2. **Cooking utensils like:** 1. **Chopping boards** 2. **Basin** 3. **Strainer** 4. **GMP Kit (Apron, Hairnet, Mask, Gloves)** 5. **Timer** 6. **Pale** 7. **Dipper** 8. **Bowl (stainless)** 9. **Stainless tray (large)** 10. **Food Tongs** 11. **Mesh** 12. **Storage box** 13. **Manila paper** 14. **Pouches** 15. **Bottles** 16. **Cup liner/sealer** 17. **Photo paper**
2. Cleaning tools and sanitizing agents	**Cleaning tools and sanitizing agents include:** **2.1 Cleaning tools/materials** **2.1.1 Broom and dustpan** **2.1.2 Sponges** **2.3 Brushes** **2.4. Microfiber cleaning cloths** **Cleaning Agents** **2.5 Detergents (powder/liquid)** **2.6 Degreasers** **2.7. Abrasive** **2.8 Acids** **2.9 Deodorizers**

3. Processing tools/materials and equipment	**Processing tools/materials and equipment may include:** 2.1. **Cooking equipment like stove/burner (heavy duty) with Gas tank** 2.2. **Dehydrator*** 2.3. **Cold storage equipment like, refrigerator, chiller** 2.4. **Induction sealer** 2.5. **Impulse electric sealer/Vacuum Sealer/Plastic Sealer** 2.6. **Hot Blower** 2.7. **Digital weighing scale** 2.8. **Cooking thermometer** 2.9. **Basin** 2.10 **Vegetable peeler** 2.11 **Colander** 2.12 **Strainer** 2.13 **Plastic tray** 2.14 **Stainless tray** 2.15 **Stainless Table** 2.16 **Desktop/laptop with printer** 2.17 **Paper cutter** 2.18 **Scissors**

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Prepared equipment, tools, materials and utensils 1.2 Prepared the raw materials 1.3 Cooked taro chips 1.4 Packed fried taro chips 1.5 Performed post production activities 1.6 Practiced cGMP, HACCP, 7S of Good Housekeeping, SSOP, AQL and OSHS
2. Methods of Assessment	**Competency in this unit must be assessed using at least two (2) of the following methods:** 2.1 A combination of direct observation and questioning 2.2 Demonstration 2.3 Written test 2.4 Portfolio
3. Resource Implications	**The following resources should be provided:** 3.1 Specific work area/station 3.2 Equipment, tools and utensils to prepare and to process fruits and vegetables by sugar concentration. 3.3 Materials relevant to the proposed activity
4. Context of Assessment	4.1 Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY :**PROCESS TARO (UNOD) BY DRYING AND GRINDING –TARO-FLOUR**

UNIT CODE **: AB-PFB0506200751305**

UNIT DESCRIPTOR **:** This unit deals with the knowledge, skills and attitudes required to process taro by drying and grinding which include to prepare equipment, tools, materials and utensils, prepare the raw materials, pack finished products and perform post - production activities.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Prepare equipment, tools, materials and utensils	1.1. Safety measures are applied in accordancewith Occupational Safety and Health Standards (OSHS)	**Science:** 1.1.1 Identification of hazards and risks 1.1.2 Microorganism and sanitation their impact on food and safety and sanitation **Technology:** 1.1.3 Practicing Occupational Safety and Health Standard (OSHS) such as use of PPE **Environment:** **1.1.1** Occupational Safety and Health Standard (OSHS)	1.1Practicing OSHS such as wearing PPE Personal Protective Equipment) 1.2Practicing cGMP, SSOP and 7S 1.3Sanitizing tools equipment and materials 1.4 Checking equipment, tools, materials and utensils

		1.1.2 workplace safety practices in the use of chemical cleaning agents **Mathematics:** 1.1.1 mathematical calculations on capacity of safety equipment needed based on the size and nature of the workplace **Communication:** 1.1.1 Understanding Occupational Safety and Health Standard (OSHS) . 1.1.2 Emergency communication protocols strategies for reporting hazards, accidents	

	1. 2 Equipment and tools are prepared in accordance with manufacturer' s specifications	**Science:** 1.2 scientific principles used in equipment, and tools on durability, & potential risk associated with operation **Technology:** 1.2.1 Inspection and checking procedures of various equipment, tools and utensils 1.2.2 Calibration of equipment, tools and utensils 1.2.3 Procedures on reporting of conditions and defects /breakdow n of equipment, tools and utensils 1.2.4 Methods of accomplish ing inspection forms and checklists for preparation of equipment , tools and utensils **Environment:** 1.2.1Preventive maintenance of	1.2 .1Preparing equipment, tools and utensils 1.2.2 Inspecting and checking various equipment, tools and utensils 1.2.3Calibrating weighing scales, and quality control tools

		various equipment, tools and utensils **Mathematics:** mathematical concepts on measurement tolerances and calibration processes of tools equipment and materials **Communication:** 1.2.1 Types of equipment and tools for drying and grinding 1.2.2 Uses and specifications of equipment, tools and utensils 1.2 3. Basic components of a report	
	. ***1.3. Kitchen utensils*** are checked and sanitized in accordance with manufacturer's specifications	**Science:** 1.3.1 Component of cleaning and sanitizing agent 1.3.2 Chemical properties of cleaning and sanitizing agents **Technology:** 1.3.1Cleaning and sanitizing of equipment, tools and utensils **Environment:** 1.3.1 Environmental impacts of chemical cleaning and sanitizing agents and substances 1.3.2Proper waste	1.3.1 Recording and reporting the condition and defects of tools, utensils 1.3.2 Checking and sanitizing kitchen utensils 1.3.3 Practicing cleaning and sanitation in preparing various equipment, tools and utensils

		disposal of cleaning agents **Mathematics:** 1.3.1Ratio and proportion of cleaning agents/sanitizing and water **Communication:** 1.3.1 Cleaning protocols and procedures 1.3.2Types of cleaning substance/agents 1.3.3 Reporting procedures on any issues with kitchen utensils that may affect food safety	
	1.4 Processing materials are sourced-out and made available according to work requirements.	**Science:** 1.4.1 Temperature humidity requirements for pilinut storage 1.4.1 Lifespan of Taro Chips 1.4.3 Properties of PPE materials **Technology:** 1.4 Sourcing out of quality supplies and materials **Environment:** 1.4 7S of Good Housekeeping **Mathematics:** inventory optimization, calculating reorder, safety stocks and material requirement Cost analysis	1.4.1 Practicing OSHS such as wearing personal protective equipment 1.4.2 Types of PPE materials 1.4.3 Practicing cGMP, SSOP and 7S 1.4.4 Sourcing out quality supplies and material according to specifications

		mathematical calculations for cost effectiveness of sourcing materials **Communication:** 1.1 Sources of good quality supplies and materials	

2.Prepare raw materials	2.1 2.1 Practice safety in accordance to OHS, HACCP and cCGMP standards	**Science:** 1.1 OSHS principles **Technology:** 1.1 Practicing Occupational Safety and Health Standard (OSHS) **Environment:** 1.1 Occupational Safety and Health Standard (OSHS) **Mathematics:** 1.1 None **Communication:** 1.1 Understanding Occupational Safety and Health	2.1 Practicing Occupational Safety and Health Standard (OSHS)

		Standard (OSHS	
	2.2 Tubers (unod) for washing are inspected , sorted and weighed in accordance with standard operating procedures.	**Science:** 2.2.1 Cleaning agents for tubers without causing harm 2.2.2 Sorting and weighing principles **Technology:** 2.2.1Equipment use in washing process sorting and weighing **Environment:** 2.2.1 proper disposal methods for by-products generated during washing, sorting and grading 2.2.3 Environmentally friendly practices for tuber washing to avoid negative impact **Mathematics:** 2.2.1Ratio and proportion for mixing cleaning solutions if necessary 2.2.2 Proficiency in measurement and calculations for weighing tubers accurately	1. Sorting & weighing in accordance standard operating procedures. 2. Standard operating procedures in washing process 3. Hygienic and safety consciousness

		Communication: 2.2.1 Standard operating procedures for tuber washing process	
	2.3 Tubers(unod) subjected for processing of flour are washed and drained in accordance with standard operating procedures.	**Science:** 2.3.1 tubers Characteristics and its interaction with water on washing process 2.3.2 Water temperature and cleaning agents on tubers suited for flour processing **Technology:** 2.3.1 Washers designed for cleaning tubers **Environment:** 2.3.1Proper disposal of wastewater generated 2.3.2 Sustainable practices on water usage **Mathematics:** 2.3.1 Accuracy measurement of amount of water and cleaning agents 2.3.2 Calculations of tubers drainage time to avoid over wet **Communication:** 2.3.1 Washing and draining process 2.3.2 Quality	1. Washing and draining process 2. Following strict hygiene protocols during washing and draining

		control of tubers prior to processing into flour	

	2.4 Tubers are peeled and sorted in accordance with manufacturer's specification	**Science:** 2.4 .1Composition of different tuber varieties for best peeling methods 2.4.2Peelinbg techniques its impact on quality and texture of final product **Technology** 2.4.1 How to operate peeling machine or tools for tuber processing 2.4.2 Sorting equipment to segregate tubers based on size, quantity **Environment:** 2.4.1Proper disposal of peels and waste generated during processing 2.4.2 Sustainable practices on energy consumption during peeling and sorting **Mathematics:** 2.4.1 Time calculation for	1. Peeling & sorting procedures & techniques 2. Quality control 3. Time management on peeling and sorting process

		peeling tubers 2.4.2 Accuracy of measurement for sorting based on size or weight **Communication:** 2.4.1 Peeling and sorting procedures 2.4.2 Manufacturer's specification for quality assurance purposes	
	2.5 Peeled tubers are washed and drained according to work requirements	**Science:** **2.5.1** Biological composition of tubers and how washing affects their freshness and quality **Technology** **2.5.1** Use of washer and draining equipment such as sinks, colanders or industrial washers **Environment:** 2.5.1 Proper disposal of waste water generated 2.5.2 Eco-friendly practices on water usage **Mathematics:** 2.5.1 Calculation of correct amount of water and cleaning agent 2.5.2 Accurate weighing of tubers before and after washing	1. Washing and draining peeled tubers

		Communication: **2.5.1** Washing and draining process	
	2.6 Peeled tubers are sliced in accordance with manufacturer's specification	**Science:** 2.6.1 Different tuber varieties for slicing techniques 2.6.2 Slicing methods how it affects texture and appearance of final product **Technology** 2.6.1 Slicing equipment such as slicers or cutters designed for tubers 2.6.2 How to operate slicing equipment and familiarity on settings for thickness and shape of tubers **Environment:** 2.6.1 Proper disposal of waste generated during slicing **Mathematics:** 2.6.1 Calculation of number of slices to meet production target 2.6.2 Slicing parameters based on size and shape requirements **Communication:** 2.6.1 Slicing procedures or methods	1. Slicing tubers uniformly 2. Slicing techniques on different tuber varieties 3. Inspecting sliced tubers for quality and consistenc y before processing

	2.7 Dehydrate and sundry sliced tubers	**Science:** 2.6 Chemical and physical changes during dehydration and sun drying 2.7 Food safety during drying process **Technology** 2.7.1 use of dehydrators or oven 2.7.2 Use of thermometer to monitor temperature and humidity levels during drying process **Environment:** 2.7.1 Energy efficient drying practices 2.7.2 Proper disposal of any waste generated **Mathematics:** 2.7.1 Calculation of drying time based on quantity and thickness 2.7.2 Converting weight measurement to know yield of dehydrated tubers **Communication:** 2.7.1 Proper handling and processing of sliced tubers 2.7.2 Drying instructions and protocols	1. Operating dehydrator/ Performing Solar Drying 2. Drying time and scheduling 3. Hygiene awareness

	2.8 Air cooling and storing are performed after drying based on the requirements	**Science:** 2.8.1 Principles of food preservation and how temperature and humidity affect quality of dried products 2.8.2 Prevention of spoilage during storage **Technology** 2.8.1 Ideal Cooling system and storage facilities for preserving dried products 2.8.2 Thermometer to monitor temperature, humidity levels, air circulation in storage areas **Environment:** 2.8.1 Energy efficient practices in cooling and storage operations **Mathematics:** 2.8.1 Calculating ideal temperature ranges for storing dried products and determine storage capacity **Communication:** 2.8.1 Proper handling, cooling and storage of dried products 2.8.2 Importance of air cooling	1. Recording and storing process 2. Monitoring and adjusting storage condition 3. Arranging and labelling dried products in storage facilities 4. Conducting regular inspections of stored products

3. Produce Taro Flour	3.1 Safety is practiced in accordance to OHS, HACCP and cCGMP standards	**Science:** 1.2 OSHS principles **Technology:** 1.1 Practicing Occupational Safety and Health Standard (OSHS) **Environment:** 1.1 Occupational Safety and Health Standard (OSHS) **Mathematics:** 1.1 None **Communication:** 1.1 Understanding Occupational Safety and Health Standard (OSHS	2.1 Practicing Occupational Safety and Health Standard (OSHS)
	3.2 Sun dry taro are grind based on manufacturer's specification	**Science:** 3.2.1 Chemical changes due to sun drying 3.2.2 Physical properties of taro **Technology** 3.2.1 How to operate and Use grinders 3.2.2 Sun drying methods **Environment:** 3.2.1 Sunlight and humidity affect drying process 3.2.2 Eco-friendly practices during sun drying **Mathematics:**	1. Grinding taro 2. Monitoring sun drying process and grinding parameters for consistency 3. Following Hygiene protocols

		3.2.1calculating grinding parameters such as texture and fineness 3.2.2 Converting weight measurements on taro yield **Communication:** 3.2.1 Grinding process meets quality standard 3.2.2 Sun drying and grinding workflow	
	3.3 Flour products are evaluated based on manufacturer's specification	**Science:** 3.3.1 Chemical composition of flour 3.3.2 How Flour quality affects baking and other processes **Technology** **3.3.1** Use of technology to measure flour moisture **Environment:** sustainable practices on flour making **Mathematics:** analyzing data for flour quality **Communication:** Flour quality data	1. Recording and reporting the quality of flour using prescribed template 2. Understanding flour quality, testing methods
4. Pack & Label Taro Flour	4.1 Safety practiced in accordance to OHS, HACCP and cCGMP standards.	**Science:** 1.3 OSHS principles **Technology:** 1.1 Practicing Occupational Safety and Health Standard	2.1 Practicing Occupational Safety and Health

		(OSHS) **Environment:** 1.1 Occupational Safety and Health Standard (OSHS) **Mathematics:** 1.1 None **Communication:** 1.1 Understanding Occupational Safety and Health Standard (OSHS	Standard (OSHS)

	4.2 Packaging materials is used in accordance with product specification	**Science:** 4.2.1Properties of different packaging materials (strength) **4.2.2** Chemical interactions of products and packaging materials **4.2.3** Labeling information • Name of products • Net weight • Ingredients • Production/expiry date • Manufacturer's address • Allergen Program • Nutrition Facts **Technology** **4.2.1** use of software for designing **Environment:** **4.2.1** use of eco-friendly materials 4.2.2 awareness on environmental regulations on use of packaging materials **Mathematics:** 4.2.1 data analysis on packaging material and cost-effectiveness 4.2.2 calculati	1. Selecting appropriate packaging materials 2. Designing packaging materials

		ng material quantities and cost **Communication:** **4.2.1** Packaging labels and information 4.2.2 sourcing out right packaging materials with supplier	
	4.3 4.3 Taro flour is packed and weighed in accordance with product specification	**Science:** **4.3.1** Characteristics of taro flour, texture, moisture content and shelf stability 4.3.2 Food safety **Technology** 4.3.1 Use of packaging equipment, weighing scales, sealer **Environment:** 4.3.1 Eco-friendly packaging and waste reduction and disposal **Mathematics:** 4.3.1 Weighing taro flour 4.3.2 Conversion units of measurements on different packaging sizes and weights **Communication:** 4.3.1 Packaging labels regarding weight, ingredients and usage instruction	1. Weighing and packing flour

		4.3.2 Records of packaging weights, quantities and quality control measures	
	4.5 Taro flour is sealed and labeled in accordance with product specification	**Science:** 4.5.1 Food safety principles related to sealing process for quality & freshness of taro flour **Technology** 4.5.1 Use of sealing equipment (heat sealer or vacuum sealer) 4.5.2 Software design for labelling 4.5.3 Labeling information 5 Name of products 6 Net weight 7 Ingredients 8 Production/expiry date 9 Manufacturer's address 10 Allergen Program 11 Nutrition Facts 11.5.1 **Environment:** 4.5.1 Proper disposal of packaging materials 4.5.2 Energy-efficient sealing technology to reducer resource consumption **Mathematics:** 4.5.1 Measuring	1. Sealing & labelling packed taro flour

		and sealing quantities for accurate packaging weights 4.5.2 Labelling accuracy **Communication:** 4.5.1 Sealing and Labelling operations 4.5.2 Accurate product information on labels, such as weight, ingredients, & other details	
	4.1. Safety is practiced in accordance to OHS, HACCP and cCGMP standards.	**Science:** 1.4 OSHS principles **Technology:** 1.1 Practicing Occupational Safety and Health Standard (OSHS) **Environment:** 1.1 Occupational Safety and Health Standard (OSHS) **Mathematics:** 1.1 None **Communication:** 1.1 Understanding Occupational Safety and Health Standard (OSHS	2.1 Practicing Occupational Safety and Health Standard (OSHS)

RANGE OF VARIABLES

VARIABLES	RANGE
1. Equipment and tools	May include calibration : 1.1 Weighing scale calibration 1.2 Thermometer 1.3 Refractometer
2. Kitchen utensils	**May include:** 2.1 Cutting implements such as: 18. Knives (kitchen knife) 19. Slicer 20. Kitchen shears 2.2 Cooking utensils like: 2.2.1 Chopping boards 2.2.2 Basin 2.2.3 Strainer 2.2.4 GMP Kit (Apron, Hairnet, Mask, Gloves) 2.2.5 Timer 2.2.6 Pale 2.2.7 Dipper 2.2.8 Bowl (stainless) 2.2.9 Stainless tray (large) 2.2.10 Food Tongs 2.2.11 Mesh 2.2.12 Storage box 2.2.13 Manila paper 2.2.14 Pouches 2.2.15 Photo paper
3. Cleaning materials /agents	May include: 3.1 Cleaning tools/materials 3.1.1 Broom and dustpan 3.1.2 Sponges 3.3 Brushes 3.2.Microfiber cleaning cloths 3.3 Cleaning Agents 3.3.1 Detergents (powder/liquid) 3.3.2 Degreasers 3.3.3. Abrasive 3.3.4 Acids 3.3.5 Deodorizers 3.4Sanitizing agents
	3.4.1liquid chlorine 3.4.2 hypochlorites 3.4.3 inorganic chloramines 3.4.4 organic chloramines.

4. Raw materials	**May include:** 4.1. Taro roots/tuber 4.2. flavorings
5. Processing tools/materials and equipment	**May include:** 5.1 Dehydrator* 5.2 Induction sealer 5.3 Impulse electric sealer/Vacuum Sealer/Plastic Sealer 5.4 Hot Blower 5.5 Digital weighing scale 5.6 Moisture meter 5.7 Basin 5.8 Vegetable peeler 5.9 Colander 5.10 Strainer 5.11 Plastic tray 5.12 Stainless tray 5.13 Stainless Table 5.14 Desktop/laptop with printer 5.15 Paper cutter 5.16 Scissors
6.Preparation of raw materials	**May include:** 6.1 sorting 6.2 pre – washing
7. Processing of raw materials	**May include:** 7.1 peeling 7.2 slicing 7.3 washing 7.4 draining 7.5 brining 7.6 Dehydrating 7.7 Sun drying 7.8 Grinding
8. Cooling Procedure	**May include** **8** .1 Air cooling 8.2 room cooling
10. Packing Procedure	**May include :** 10.1 Cooling 10.2 Weighing 10.3 Sealing 10.4 Labeling
11. Packing and labeling equipments	**May include:** 11.1 Impulse sealer 11.2 Plastic sealer 11.3 Hot blower 11.4 Plastic jar 11.5 Stand- up pouch

12. Finished product inspection	**M a y include:** 12.1 Package Integrity 12.2 Appropriateness of label 12.3 Product specifications - List of ingredients -Open date marking
13.Production data	Production Data Sheet may include 13.1 Product name 13.2 Production Date 13.3 Raw materials and ingredients 13.4 Weight of raw materials as purchased 13.5 Weight of edible portion 13.6 Weight of waste 13.7 Total weight of input 13.8 Total weight of output
14.. Packaging information	May include: 14.1 Name of products 14.2 Net weight 14.3 Ingredients 14.4 Production/expiry date 14.5 Manufacturer's address 14.6 Allergen Program 14.7 Nutrition facts

UNIT OF COMPETENCY : PROCESS TARO (UNOD) BY FERMENTATION AND PICKLING

UNIT CODE : AB-PFB0506200751306

UNIT DESCRIPTOR : This module deals with the knowledge, skills and attitudes required to prepare equipment, tools, materials and utensils, prepare raw materials, perform alcoholic and lactic acid fermentation, pack fermented products and perform post – production activities to produce products such as fermented taro paste, alcoholic beverages and pickled taro.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Prepare equipment, tools, materials and utensils	1.1 Safety measures are applied in accordance with Occupational Safety and Health Standards (OSHS)	**SCIENCE** 1.1.3 Chemical reactions involved in the process of taro by fermentation and pickling. 1.1.4 Biological effects of exposure to chemicals used in the process. **TECHNOLOGY** 1.1.2. OSHS guidelines for the safe handling of equipment and materials. . **ENVIRONMENT CONCERNS** 1.1.1. Eco-friendly alternatives to chemical substances used in the process. **MATHEMATICS** 2.2.1. Correct ratios of chemicals needed	1.1.1.1 Practicing OSHS such as wearing PPE Personal Protective Equipment) 1.1.1.2 Practicing cGMP,SSOP and 7S 1.1.1.3 Practicing sanitation in preparing various equipment, tools and utensils

		for the concentration process. **COMMUNICATION** 1.1.1. Safety procedures for the concentration process. 1.1.2. . OSHS compliance for workers involved in the concentration process.	
	1.2 ***Equipment and tools*** are prepared in accordance with manufacturer's specifications	**SCIENCE** 1.2.2. Mechanical properties of tools used in the pickling and fermentation process. **TECHNOLOGY** 1.2.2. Inspection of equipment for any faults or malfunctions before use. **ENVIRONMENT CONCERNS** 1.2.2. Energy-efficient options for equipment to reduce environmental impact **MATHEMATICS** 1.3.1 Appropriate tool sizes and quantities needed for the process. **COMMUNICATION** 1.2.1. Preparation of equipment maintenance logs and schedules to ensure proper upkeep.	1.2.1.1 Inspecting and checking skills 1.2.1.2 Calibrating of weighing scales and quality control tools such as thermometer, and refractometer, salinometer, pH meter

	1.3 ***Kitchen utensils*** are checked and sanitized in accordance with manufacturer's specifications.	**SCIENCE** 1.3.2. Microbiological risks associated with utensil contamination. **TECHNOLOGY** 1.3.2. Cleaning systems for utensils to ensure hygiene. **MATHEMATICS** 1.3.2. Inventory management systems for utensils to prevent shortages. **COMMUNICATION** 1.3.1. Standardized procedures for material handling and storage. 1.3.2. Proper utensil handling and sanitation practices.	1.3.1.1 Recording and reporting the condition and defects of tools, utensils 1.3.1.2 Checking and sanitizing kitchen utensils
	1.4 ***Processing materials*** are sourced-out and made available according to work requirements.	**SCIENCE** 1.4.2. Chemical properties of materials used in the pickling and fermentation, such as solubility and reactivity. **TECHNOLOGY** 1.4.2. Analysis of composition of processing materials	1.4.1.1 Sourcing out of processing materials 1.4.1.2 Practicing sanitation in preparing various equipment, tools and utensils 1.4.1.3 Maintaining various equipment, tools and utensils such as cleaning and sanitizing 1.4.1.4 Sourcing quality supplies and materials according to specifications

		ENVIRONMENT CONCERNS 1.4.2. Waste Reduction Strategies **COMMUNICATION** 1.4.1. Chemical Properties of Material 1.4.2. Sustainable Sourcing Practices	
2. Prepare the raw materials	2.1 ***Raw materials*** are sorted and graded in accordance with product specifications and standards.	**SCIENCE** 2.1.2. Physical and chemical properties of raw materials, such as moisture content and composite. **MATHEMATICS** 2.1.1. Metrics to identify areas for improvement and cost savings of raw materials **COMMUNICATION** 2.1.1. Sources of raw materials	2.1.1.1 Demonstrating on how to identify acceptable quality raw materials and other ingredients used to process taro by fermentation and pickling. 2.1.1.2 Sorting and grading of raw materials
	2.2 Taro (unod) are washed and drained in accordance with standard operating procedures.	**SCIENCE** 2.2.1 Characteristics of a well – drained taro subjected to pickling and fermentation **TECHNOLOGY** 2.2.1 Washing and draining taro **ENVIRONMENT CONCERNS** 2.2.2. Proper disposal of used water **COMMUNICATION** 2.2.2. Washing and draining procedures and techniques	2.2.1.1 Performing washing and draining procedures 2.2.1.2 Practicing sanitary food handling 2.2.1.3 Practicing OSHS such as wearing of PPE 2.2.1.4 Practicing cGMP, 7s, SSOP and HACCP

		2.2.3. Tools used for washing and draining	
	2.3 Tubers are paired and sorted in accordance with manufacturer's specification	**SCIENCE** 2.3.2. Composition of different tuber varieties for best pairing method 2.3.2 Pairing techniques its impact on quality and texture of final product **TECHNOLOGY** 2.3.1 How to operate pairing machine or tools for tubers processing 2.3.1 Sorting equipment to segregate tubers based on size and quantity **ENVIRONMENT CONCERNS** 2.3.1 Proper disposal of skin and waste generated during processing 2.3.2 Sustainable practices on energy consumption during peeling and sorting **MATHEMATICS** 2.3.1. Time calculation for pairing tubers 2.3.2 Accuracy of measurement for sorting based on size or weight **COMMUNICATION** 2.3.1. Pairing and sorting procedure 2.3.2 Manufacturer's specification for quality assurance purposes	2.3.1.1 Pairing and sorting procedures and techniques 2.3.1.2 Quality control 2.3.1.3 Managing time during pairing and sorting process

	2.4 Paired tubers are washed and drained according to work requirements	**SCIENCE** 2.4.1 Biological composition of tubers and how washing affects their freshness and quality **TECHNOLOGY** 2.4.1. Use of washer and draining equipment such as sinks, colanders or industrial washers **ENVIRONMENT CONCERNS** 2.4.1. Proper disposal of waste water generated 2.4.2 Eco – friendly practices on water usage **MATHEMATICS** 2.4.1. Calculation of correct amount of water and cleaning agent 2.4.2 Accurate weighing of tubers before and after washing **COMMUNICATION** 2.4.1. Washing and draining process	2.4.1.1 Washing and draining of paired tubers
	2.5 Peeled tubers are sliced/grated in accordance to the desired end products	**SCIENCE** 2.5.1 Different tuber varieties for slicing ,grating techniques 2.5.2 Slicing methods how it affects texture and appearance of final product	2.5.1.1 Slicing tubers uniformly 2.5.1.2 Slicing techniques on different tubers varieties 2.5.1.3 Inspecting sliced/grated tubers for quality and consistency before processing

		TECHNOLOGY 2.5.1 Slicing/grating equipment such as slicers/graters or cutters designed for tubers 2.5.2 How to operate slicing equipment and familiarity on settings for thickness and shape of tubers **ENVIRONMENT** 2.5.1 Proper disposal of waste generated during slicing/grating/cutting **MATHEMATICS** 2.5.1 Calculation of number slices/grater to meet the production target **COMMUNICATION** 2.5.1 Slicing/grating/cutting methods or techniques	
3. Perform alcoholic fermentation	3.1 Sliced taro are blanched/boiled to soften slightly before fermentation.	**SCIENCE** 3.1.1 Blanching /boiling procedure and process 3.1.2 Methods for reducing water usage, minimizing wastewater discharge and recycling by products **TECHNOLOGY** 3.1.1. Blanching methods such as water bath, steam, or microwave techniques **ENVIRONMENT CONCERNS** 3.1.1. Nutrient loss during blanching and potential solutions	3.1.1.1 Blanching/boiling sliced taro according to required temperature

		MATHEMATICS 3.1.1. Blanching parameters to assess consistency **COMMUNICATION** 3.1.1. Nutritional impact of blanching	
	3.2 Blanched/boiled taro is mashed and added with sugar in preparation for fermentation process	**SCIENCE** 3.2.1 Enzymatic saccharification of taro for alcoholic fermentation **TECHNOLOGY** 3.2.1 Use of high – pressure technology to break down taro fibers **ENVIRONMENT CONCERNS** 3.2.1 Implementing water – efficient technologies or recycling for sustainability **MATHEMATICS** 3.2.1 Calculation of sugar content 3.2.2 Optimization of fermentation condition 3.2.3 Alcohol yield calculation **COMMUNICATION** 3.2.1 Instruction for mashing taro 3.2.2 Guidelines for adding sugar	3.2.1.1 Mashing boiled taro 3.2.1.2 Applying high pressure technology to breakdown taro fibers

	3.3 ***Fermentation procedures*** are done according to required period.	**SCIENCE** 3.3.1 Optimization of taro alcoholic fermentation to enhance ethanol production **TECHNOLOGY** 3.3.1 Sensors and data analytics to monitor fermentation parameters 3.3.2 Use of genetic engineering and yeast selection **ENVIRONMENT CONCERNS** 3.3.1 Waste reduction and recycling 3.3.2 Use of cleaning agents 3.3.3 Environmental management system **MATHEMATICS** 3.3.1 Calculation of sugar and starch content **COMMUNICATION** 3.3.1 Method of using genetic engineering and sensor and data analytic equipment	3.3.1.1 Performing fermentation procedure 3.3.1.2 Using of sensors and data analytics to monitor fermentation parameters 3.3.1.3 Using of genetic engineering and yeast selection
	3.4 ***Post fermentation procedures*** are performed according to enterprise procedures	**SCIENCE** 3.4.1. Clarification and filtration process 3.4.2 Maturation and aging of alcoholic fermented taro **TECHNOLOGY** 3.4.1 Removing suspended solids,	3.4.1 Clarifying and filtrating alcoholic fermented product 3.4.2 Monitoring alcoholic fermented products

		yeasts cells and other impurities to clarify the fermented taro product 3.4.2 Maturation and aging system 3.4.3 Stabilization and preservation techniques **ENVIRONMENT CONCERNS** 3.4.1 Prioritizing resource efficiency, waste reduction and biodiversity conservation **MATHEMATICS** 3.4.1 Quality control and analysis **COMMUNICATION** 3.4.1 Ways in stabilizing, enhancing and preserving the fermented products	
	3.5 Fermented products are evaluated using ***sensory testing*** according to enterprise procedures	**SCIENCE** 3.5.1 Product quality attributes for evaluating **TECHNOLOGY** 3.5.1 Use of Sensory testing score card of evaluation 3.5.2 Application of Virtual Reality (VR) and Augmented Reality (AR) **ENVIRONMENT CONCERNS** 3.5.1 Sustainable practices in evaluating the products **MATHEMATICS** 3.5.1 Temperature and time monitoring using	3.5.1.1 Evaluating finished products through AR and VR 3.5.1.2 Identifying subtle variations in product quality during checking 3.5.1.3 Decision making skills on product grading based on specification

		mathematical concepts to tract and record cooling time **COMMUNICATION** 3.5.1 Communicating product specification and evaluation criteria	
4. Perform lactic acid fermentation	4.1 Fresh taro are washed and cut into desired shapes	**SCIENCE** 4.1.1 Lactic Acid Bacteria Functions &Characteristics 4.1.2 Fermentation Process 4.1.3 Microbial Interactions **TECHNOLOGY** 4.1.1 Use of equipment and tools to regulate temperature **ENVIRONMENT** 4.1.1 Suitable environment for fermentation 4.1.2 5S **MATHEMATICS** 4.1.1 Calculating fermentation time 4.1.2 Measurement , proportions and yield **COMMUNICATION** 4.1.1 Fermentation Protocols	4.1.1.1 Performing lactic acid fermentation 4.1.1.2 Cuttings Taro 4.1.1.3 Practicing hygiene
	4.2 Cut taro are submerged in a brine solution according to the recipe and desired saltiness	**SCIENCE** 4.2.1 Brining Solution Procedure 4.2.2 Level of salt concentration	4.2.1.1 Performing accurate brining solution 4.2.1.2 Measuring Skills

		TECHNOLOGY 4.2.1 Use of measuring device, weighing scales, thermometer **ENVIRONMENT** 4.2.1 5S **MATHEMATICS** 4.2.1 Salt Calculating 4.2.2 Measurement percentage **COMMUNICATION** 4.2.1 Brining Coordination	
	4.3 Fermentation container is sterilized to ensure cleanliness and prevent contamination	**SCIENCE** 4.3.1 Types of contaminants 4.3.2 Methods of sterilization **TECHNOLOGY** 4.3.1 Use of equipment, steamers, sterilizers, fermentation containers **ENVIRONMENT** 4.3.1 Waste reduction strategies in operating equipment **MATHEMATICS** 4.3.1 Calculations and sterilization time, temperature **COMMUNICATION** 4.3.1 Preparation of equipment tools maintenance logs and schedules to ensure proper upkeep.	4.3.1.1 Sterilizing containers 4.3.1.2 Hygiene Practices Risk reduction
	4.4 ***Fermentation process*** are done according to required period.	**SCIENCE** 4.4.1 Fermentation Process 4.4.2 Microorganism on Fermentation	4.4.1.1 Fermenting skills 4.4.1.2 Performing and paying attention to OSHS & hygiene details

		TECHNOLOGY 4.4.1 Use of fermentation containers, tanks, PH meter, thermometer **ENVIRONMENT** 4.4.1 5S 4.4.2 Proper waste disposal **MATHEMATICS** 4.4.1 Calculation of microbial growth 4.4.2 Percentage **COMMUNCATION** 4.4.1 Fermentation timeline	
	4.5 ***Post fermentation procedures*** are performed according to enterprise procedures	**SCIENCE** 4.5.1 Methods of Post-fermentation treatment 4.5.2 Understanding finished product evaluation **TECHNOLOGY** 4.5.1 Use of clarifying and filtration machine 4.5.2 Use of appropriate packaging container **ENVIRONMENT** 4.5.1 Sanitation 4.5.2 5S 4.5.3 3Rs 4.5.4 Sustainable Practices in Product Evaluation **MATHEMATICS** 4.5.1 Mathematical calculations to determine the correct placement and size of labels and batch coding	4.5.1 Monitoring of fermentation completion 4.5.2 Straining or filtrating skills 4.5.3 Pasteurizing fermented products 4.5.4 Storing of fermented products for aging

		COMMUNICATION 4.5.1 Labeling information 4.5.2 SOP & Handling processing	
	4.6 Fermented products are evaluated using ***sensory testing*** according to enterprise procedures	**SCIENCE** 4.6. 1 Product quality attributes for evaluating **TECHNOLOGY** 4.6.1 Application of Virtual Reality (VR) and Augmented Reality (AR) **ENVIRONMENT CONCERNS** 4.6.1 Sustainable practices in evaluating the products **MATHEMATICS** 4.6.1 Temperature and time monitoring using mathematical concepts to tract and record cooling time **COMMUNICATION** 4.6.1 Communicating product specification and evaluation criteria	4.6.1.1 Evaluating finished products through VR and AR 4.6 .1.2 Identifying subtle variations in product quality during checking 4.6 .1.3 Decision making skills on product grading based on specification
5 .Perform pickling activities	5.1 Sliced taro are blanched to soften slightly before pickling.	**SCIENCE** 5.1.1 Blanching procedure and process 5.1.2 Methods for reducing water usage, minimizing wastewater discharge and recycling by products **TECHNOLOGY** 5.1.1 Blanching methods such as water bath, steam, or microwave techniques	5.1.1.1 Blanching of sliced taro according to required temperature

		ENVIRONMENT CONCERNS 5.1.1 Nutrient loss during blanching and potential solutions **MATHEMATICS** 5.1.1 Blanching parameters to assess consistency **COMMUNICATION** 5.1.1 Nutritional impact of blanching	
	5.2 Blanched taro pieces are combined with pickling mixture according to the specified ***pickling procedure***	**SCIENCE** 5.2.1 Microbial ecology of taro pickling 5.2.2 Chemical changes in pickled taro 5.2.3 Nutritional benefits of pickled taro **TECHNOLOGY** 5.2.1 Use of specialized equipment for brine preparation and management 5.2.2 Use of sensors and monitoring devices to track pH levels, temperature and microbial activity during fermentation **ENVIRONMENT CONCERNS** 5.2.1 Energy – intensive nature of taro processing for pickling 5.2.2 Disposal of waste material **MATHEMATICS** 5.2.1 Kinetics of fermentation during	5.2.1.1 Preparing of pickling solution 5.2.1.2 Using of specialized equipment and tools for brine preparation 5.2.1.3 using of sensors and monitoring devices in tracking the pH level, temperature and microbial activity during fermentation

		pickling process 5.2.2 Optimization techniques to determine the optimal combination of ingredients and processing parameters **COMMUNICATION** 5.1.1 Pickling methods and techniques	
	5.3 Equipment are operated in accordance with manufacturer's specifications requirements	**SCIENCE** 5.3.1 Understanding operational protocols **TECHNOLOGY** 5.3.1 Research in Equipment Functionality 5.3.2 Reading and following the manufacturer's manual **ENVIRONMENT C O N C E R N S** 5.3.1 Waste reduction strategies in operating equipment **MATHEMATICS** 5.3.1 Calculating optimal processing and utilization time of equipment **COMMUNICATION** Standard operating procedures (SOPs) for food processing equipment	5.3.1.1 Inspecting and checking condition of equipment/ machines 5.3.1.2 Performing minor troubleshooting
	5.4 Perform product evaluation according enterprise procedures.	**SCIENCE** 5.4.1 Product quality attributes for evaluating **TECHNOLOGY** 5.4.1 Application of Virtual Reality (VR) and	5.4.1.1 Evaluating finished products through VR and AR 5.4.1.2 Identifying subtle variations in product quality during checking

		Augmented Reality (AR) **ENVIRONMENT CONCERNS** 5.4.1. Sustainable practices in evaluating the products **MATHEMATICS** 5.4.1 Temperature and time monitoring using mathematical concepts to tract and record cooling time **COMMUNICATION** 5.4.1 Communicating product specification and evaluation criteria	5.4.1.3 Decision making skills on product grading based on specification
6 . Pack and label processed products	6.1 Safety is practiced in accordance to OHS, HACCP and cGMP standard	**SCIENCE** 6.1.1 OSHS principles **TECHNOLOGY** 6.1.1 Practicing Occupational Safety and Health Standard (OSHS) **ENVIRONMENT CONCERNS** 6.1.1 Occupational Safety and Health Standard (OSHS) **COMMUNICATION** 6.1.1 Understanding Occupational Safety and Health Standard (OSHS	6.1.1.1 Practicing Occupational Safety and Health Standard (OSHS)
	6.2 ***Packaging materials*** are used in accordance with product specification	**SCIENCE** 6.2.1 Properties of different packaging materials (strength) 6.2.2 Chemical interactions of products and packaging materials 6.2.3 Labeling information	6.2.1.1 Selecting appropriate packaging materials 6.2.1.2 Designing packaging materials

		• Name of products • Net weight • Ingredients • Production/expiry date • Manufacturer's address • Allergen Program • Nutrition Facts **TECHNOLOGY** 6.2.1 Use of software for designing **ENVIRONMENT** 6.2.1 Use of eco-friendly materials 6.2.2 Awareness on environmental regulations on use of packaging materials **MATHEMATICS** 6.2.1 Data analysis on packaging material and cost-effectiveness 6.2.2 Calculating material quantities and cost **COMMUNICATION** 6. 2.1 Packaging labels and information 6.2.2 Sourcing out right packaging materials with supplier	
	6.3 Processed taro are packed and weighed in accordance with product specification	**SCIENCE** 6.3.1 Characteristics of pickled and fermented taro, texture, moisture content and shelf stability 6.3.2 Food safety **TECHNOLOGY**	6.3.1.1 Weighing and packing fermented taro

		6.3.1 Use of packaging equipment, weighing scales, sealer **ENVIRONMENT** 6.3.1 Eco-friendly packaging and waste reduction and disposal **MATHEMATICS** 6.3.1 Weighing of fermented taro 6.3.2 Conversion units of measurements on different packaging sizes and weights **COMMUNICATION** 6.3.1 Packaging labels regarding weight, ingredients and usage instruction 6.3.2 Records of packaging weights, quantities and quality control measures	
	6.4 Processed/fermented taro is ***sealed and labeled*** in accordance with product specification	**SCIENCE** 6.4.1 Food safety principles related to sealing process for quality & freshness of taro flour **TECHNOLOGY** 6.4.1 Use of sealing equipment (heat sealer or vacuum sealer) 6.4.2 Software design for labelling 6.4.3 Labeling information • Name of products	6.4.1.1 Sealing and labelling of packed fermented products

		• Net weight • Ingredients • Production/expiry date • Manufacturer's address • Allergen Program • Nutrition Facts **ENVIRONMENT** 6.4.1 Proper disposal of packaging materials 6.4.2 Energy-efficient sealing technology to reducer resource consumption **MATHEMATICS** 6.4.1 Measuring and sealing quantities for accurate packaging weights 6.4.2 Labelling accuracy **COMMUNICATION** 6.4.1 Sealing and Labelling operations 6.4.2 Accurate product information on labels, such as weight, ingredients, & other details	
	6.5 ***Packing equipment*** is operated in accordance with manufacturer's manual	**SCIENCE** 6.5.1 Mechanics of Packing Equipment **TECHNOLOGY** 6.5.1 Technology integration of packing equipment **COMMUNICATION** 6.5.1 Packing Equipment used	6.5.1.1 Operating packing equipment such as sealer 6.5.1.2 Reporting of any equipment malfunction, product or process nonconformance during packing operations

	6.6 Finished product is inspected following industry operating procedure	**SCIENCE** 6.6.1 Understanding finished product inspection **ENVIRONMENT CONCERNS** 6.6.1 Sustainable Practices in Product Inspection **COMMUNICATION** 6.6.1 Control Parameters	6.6.1.1 Inspecting finished products for conformance to specifications 6.6.1.2 Recording of finished products weights using enterprise forms/checklist
7. Conduct post – production activities	7.1 Packed ***finished food products*** are stored according to required ***storage condition***.	**SCIENCE** 7.1.1. Different storage conditions and period 7.1.2 Storing procedures and techniques for packed products 7.1.3 Food safety principles and practices for storage of finished products 7.1.4 Food safety principles and practices for storage of finished products **ENVIRONMENT** 7.1.1 HACCP basic principles on storage of finished products 7.1.2 HACCP basic principles on storage of finished products **MATHEMATICS** 7.1.1 Recording of storage time and temperature.	7.1.1.1 Practicing OSHS such as wearing PPE during post production activities 7.1.1.2 Practicing cGMP,7S, SSOP, PNS and HACCP 7.1.1.3 Maintaining working areas and storage facilities 7.1.1.4 Incubating packed food products 7.1.1.5 Storing packaged food products 7.1.1.6 Storing excess materials and ingredients 7.1.1.7 Practicing sanitary food handling upon storing finished products

		7.1.2 Production data 7.1.3 Preparation of daily production input report(spoilage and rejects) 7.1.4 Recording procedures of production data Inventory of excess materials and ingredients	
	7.2 Tools, materials and equipment are cleaned and stored based on workplace procedure.	**SCIENCE** 7.2.1 Cleaning and storing methods for equipment, tools and utensils 7.2.2 Storing tools, materials and equipment	7.2.1.1 Maintaining various equipment, tools and utensils such as cleaning and sanitizing
	7.3 Proper disposal of wastes are practiced according to environmental rules and regulations.	**TECHNOLOGY** 7.3.1 HACCP basic principles on storage of finished products **COMMUNICATION** 7.3.1 Following environmental rules and regulations such as wastes segregation and disposals 7.3.2 Food safety principles and practices for storage of finished products	7.3.1. Practicing proper wastes disposal
	7.4 ***Production data*** checklist is accomplished according to enterprise protocol.	**MATHEMATICS** 7.4.1 Production data 7.4.2 Preparation of daily production input report (spoilage and rejects) 7.4.3 Recording procedures of	7.4.1.1 Recording of production data 7.4.1.2 Accomplishing inventory forms 7.4.1.3 Computing of yields, recoveries and rejects

		production data using enterprise forms	

RANGE OF VARIABLES

VARIABLES	RANGE
1. Equipment and tools	May include calibration : 1.1 Weighing scale calibration 1.2 Thermometer 1.3 Refractometer . 1.4 Salinometer . 1.5 ph meter
2. Kitchen utensils	**May include:** 2.3 Cutting implements such as: 21. Knives (kitchen knife) 22. Slicer 23. Kitchen shears 2.4 Cooking utensils like: 2.4.1 Chopping boards 2.4.2 Basin 2.4.3 Strainer 2.4.4 GMP Kit (Apron, Hairnet, Mask, Gloves) 2.4.5 Timer 2.4.6 Pale 2.4.7 Dipper 2.4.8 Bowl (stainless) 2.4.9 Stainless tray (large) 2.4.10 Food Tongs 2.4.11 Mesh 2.4.12 Storage box 2.4.13 Manila paper 2.4.14 Glass Jar 2.4.15 Photo paper
3. Processing materials	May include: 3.1 Cleaning tools/materials 3.1.1 Broom and dustpan 3.1.2 Sponges 3.3 Brushes 3.2.Microfiber cleaning cloths 3.3 Cleaning Agents 3.3.1 Detergents (powder/liquid) 3.3.2 Degreasers 3.3.3. Abrasive 3.3.4 Acids 3.3.5 Deodorizers 3.5 Sanitizing agents
	3.4.1liquid chlorine 3.4.4 hypochlorites 3.4.5 inorganic chloramines 3.4.4 organic chloramines.
4. Raw materials	**May include:** 4.3. Taro roots/tuber 4.4. flavorings

5. Processing tools and equipment	**May include:** 5.17 Slicer 5.18 Grater 5.19 Cutter 5.20 Induction sealer 5.21 Impulse electric sealer/Vacuum Sealer/Plastic Sealer 5.22 Hot Blower 5.23 Digital weighing scale 5.24 Moisture meter 5.25 Basin 5.26 Casserole 5.27 Perforated spoon 5.28 Vegetable peeler 5.29 Colander 5.30 Strainer 5.31 Plastic tray 5.32 Stainless tray 5.33 Stainless Table 5.34 Desktop/laptop with printer 5.35 Paper cutter 5.36 Scissors
6. Processing materials	6.1 Taro(unod) 6.2 Water 6.3 Sugar 6.4 Non-iodized salt 6.5 Chlorinated water (200ppm) 6.6 Mother vinegar 6.7 Yeast or mold culture 6.8 Amylase enzyme(optional) 6.9 Spices such as garlic, ginger,chili pepper or herbs(optional) 6.10 Containers for pickling and fermentation
7.Raw materials	**May include:** **7.1 Fresh taro(unod)**
8. Fermenting agent	8.1 Yeast for alcoholic fermentation 8.2 Mold for acidic fermentation 8.3 Starter culture 8.4 Lactic Acid Bacteria
	8.5 natural fermentation 8.6 Commercial yeast strain
7. Methods of processing	**May include:** 7.1 Peeling 7.2 Slicing 7.3 Washing 7.4 Draining 7.5 Draining 7.6 Blanching 7.7 Boiling 7.8 Mashing 7.9 Fermentation
8. Fermentation procedures	**May include :** 8.1 Preparation of raw materials 8.2 Pasteurization 8.3 Mixing with yeast/starter culture 8.4 Fermentation 8.5 Monitoring and adjustment

	8.6 Straining
9. Post fermentation procedure	**Post fermentation procedure include** 9.1 Clarification and filtration 9.2 Distillation 9.3 Maturation and aging 9.4 Quality control and analysis 9.5 package and storage
10. Sensory testing	**May include** 10.1 Appearance 10.2 Aroma 10.3Texture 10.4 Overall acceptability
11.Fermented products	Fermented products include: 11.1 Fermented taro paste 11.2 Alcoholic Beverages 11.3 Pickled taro 11.4 Taro vinegar
12. Pickling procedure	12.1 Preparation of raw materials 12.2 preparation of pickling solution 12.3 Sterilization of pickling jar 12.4 Combining the mixture 12.5 Sealing of jar 12.6 Cooling and storing
13.Packaging materials	**Packaging materials for fermented taro include** 13.1 Glass jar 13.2 Plastic containers 13.3 Ceramic crocks 13.4 vacuum sealed pouch 13.5 Bottles
14. Sealing equipment	**Sealing equipment include:** 14.1 Heat sealer 14.2 Vacuum sealer
15. Product label	15.1 Name of product 15.2 Ingredients (Large quantity to small quantity) 15.3 Net weight 15.4 Production/expiry date 15.5 Manufacturer's address 15.6 Nutrition facts
16. Finished food product	**M a y include:** 16.1 Fermented taro paste 16.2 Alcoholic beverages 16.3 Pickled taro 16.4 Taro vinegar
17.Production data	Production Data Sheet may include 17.1 Product name 17.2 Production Date 17.3 Raw materials and ingredients 17.4 Weight of raw materials as purchased 17.5 Weight of edible portion 17.6 Weight of waste 17.7 Total weight of input 17.8 Total weight of output

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Prepared equipment, tools, materials and utensils 1.2 Prepared the raw materials 1.3 Perform alcoholic fermentation 1.4 Perform lactic acid fermentation 1.5 Perform pickling activities 1.6 Packed processed products 1.7 Performed post production activities 1.8 Practiced cGMP, HACCP, 7S of Good Housekeeping, SSOP, AQL and OSHS
2. Methods of Assessment	**Competency in this unit must be assessed using at least two (2) of the following methods:** 2.1. A combination of direct observation and questioning 2.2. Demonstration 2.3. Written test 2.4. Portfolio
3. Resource Implications	**The following resources should be provided:** 3.1 Specific work area/station 3.2 Equipment, tools and utensils to prepare and to process taro by fermentation and pickling 3.3 Materials relevant to the proposed activities
4. Context of Assessment	4.1 Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY :**PROCESS TARO BY PUREEING**

UNIT CODE **: AB-PFB0506200751307**

UNIT DESCRIPTOR **:** This unit deals with the knowledge, skills and attitudes required to process taro by pureeing include to prepare equipment, tools, materials and utensils, prepare the raw materials, boil cut taro, drain and cool, cook blended taro, pack and label puree, store taro, and perform post- production activity.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Prepare equipment, tools, materials and utensils	1.1. Safety measures are applied in accordance with Occupational Safety and Health Standards (OSHS)	**SCIENCE** 1.1.1 Chemical reactions involved in the process taro puree **TECHNOLOGY** 1.1.1 Current Good Manufacturing Practices 1.1.2 OSHS guidelines for the safe handling of equipment and materials. **ENVIRONMENT CONCERNS** 1.1.3 Sanitation 1.1.4 Eco-friendly alternatives to chemical substances used in the process. 1.1.5 Correct ratios of chemicals needed for the concentration process. **COMMUNICATION** 1.1.4 Standard Operating Procedures (SSOP) for preparation of equipment, tools and kitchen Utensils	1.1.1.1 Practicing OSHS such as wearing PPE Personal Protective Equipment) Practicing cGMP, SSOP and 7S 1.1.1.2Practicing sanitation in preparing various equipment, tools and utensils

		HACCP	

	1. 2 Equipment and tools are prepared in accordance with manufacturer's specifications	**SCIENCE** 1.2.1 Mechanical properties of tools used in the concentration process. **TECHNOLOGY** 1.2.2 Types of equipment and tools for processing food by sugar concentration 1.2.3. Inspection of equipment for any faults or malfunctions before use. **ENVIRONMENT CONCERNS** 1.2.4 Energy-efficient options for equipment to reduce environmental impact 1.2.5 Inspection and checking procedures of various equipment, tools and utensils **COMMUNICATION** 1.2.6 Calibration of quality control tools 1.2.7 Calibration of weighing scales 1.2.8 Preparation of equipment maintenance logs and schedules to ensure proper upkeep 1.2.9 Standardized procedures for	1.2.1.1 Inspecting and checking skills 1.2.1.2 Recording and reporting the condition and defects of tools, utensils 1.2.2.2 Calibrating of weighing scales and quality control tools such as thermometer, and refractometer

		material handling and storage. 1.2.10 Proper utensil handling and sanitation practices.	
	1.3. Kitchen utensils are checked and sanitized in accordance with manufacturer's specifications.	**SCIENCE** 1.3.3. Microbiological risks associated with utensil contamination. **TECHNOLOGY** 1.3.3. Cleaning systems for utensils to ensure hygiene. **ENVIRONMENT CONCERNS** 1.3.2 Conditions and defects/ breakdown of equipment, tools and utensils **MATHEMATICS** 1.3 Inventory management systems for utensils to prevent shortages. **COMMUNICATION** 1.3.1. Standardized procedures for material handling and storage. 1.3.2. Proper utensil handling and sanitation practices.	1.3.1.1 Recording and report the condition and defects of tools, utensils 1.3.1.2 Checking and sanitizing kitchen utensils

	1.4 Processing materials are sourced-out and made available according to work requirements.	**SCIENCE** 1.4.3. Chemical properties of materials used in the concentration process, such as solubility and reactivity. **TECHNOLOGY** 1.4.3. Analysis of composition of processing materials **ENVIRONMENT CONCERNS** 1.4.3. Waste Reduction Strategies **COMMUNICATION** 1.4.1. Chemical Properties of Material Sustainable Sourcing Practices	1.4.1.1 Sourcing out of processing materials 1.4.1.2 Practicing sanitation in preparing various equipment, tools and utensils 1.4.1.3 Maintaining various equipment, tools and utensils such as cleaning and sanitizing 1.4.1.4 Sourcing quality supplies and materials according to specifications

2.Prepare raw materials	2.1 Practice safety in accordance to OHS, HACCP and cCGMP standards.	**SCIENCE** 2.1.3. Physical and chemical properties of raw materials, such as moisture content and composite. **COMMUNICATION** 2.1.2 Identification of acceptable quality raw materials	2.1.1 Demonstrating on how to identify acceptable quality raw materials and other ingredients used to process pureed taro
	2.2 ***Raw materials*** are sorted and graded in accordance with product specifications and standards.	**SCIENCE** 2.2.1 Physical and chemical properties of raw materials, such as moisture content and composite. **TECHNOLOGY** 2.2.1 Sorting and grading methods for raw materials 2.2.2 Procedure for Sorting and grading taro **ENVIRONMENT CONCERNS** 2.2.3 Proper waste disposal is implemented **MATHEMATICS** 2.2.4 Weigh percentage of recovery **COMMUNICATION** 2.2.5 Identification of acceptable quality raw materials	2.2.1 Performing sorting and grading according to criteria 2.2.2 Computing percentage of recovery
	2.2 Washed tubers (unod) in accordance with standard operating procedures.	**SCIENCE** 2.2.1 Tubers Characteristics and its interaction with water on washing process 2.3.2 Water temperature and cleaning agents used for washing **TECHNOLOGY** 2.3.2 Washers	2.1.1.2 Washing and draining is implemented

		designed for cleaning tubers **ENVIRONMENT** 2.3.3 Proper disposal of wastewater generated 2.3.2 Sustainable practices on water usage **MATHEMATICS** 2.3.1 Accuracy measurement of amount of water and cleaning agents 2.3.2 Calculations of tubers draining time **COMMUNICATION** 2.3.1 Washing and draining process	

	2.4 Tubers are peeled and sorted in accordance with manufacturer's specification	**SCIENCE** 2.2.2 Physical and chemical properties of raw materials, such discoloration and cuts **TECHNOLOGY** 2.2.6 Sorting and grading methods for raw materials 2.2.7 Procedure for Sorting and grading taro **ENVIRONMENT CONCERNS** 2.2.8 Proper waste disposal is implemented **MATHEMATICS** 2.2.9 Weigh percentage of recovery **COMMUNICATION** 2.2.10 Identification of acceptable quality raw materials	2.4.1.1 Peeling & sorting taro following industry standard 2.4.1.2 Weighing recovery of peeled taro 2.4.2 Practicing proper waste disposal following environmental guidelines
	2.5 Cut tubers is brined ,washed and drained according to work requirements	**SCIENCE** 2.5.1 Slicing techniques its impact on quality and texture of final product **TECHNOLOGY** 2.5.2 Cutting tools/equipment for tubers **ENVIRONMENT:** 2.4.1 Waste water generated during processing 2.4.2 Sustainable practices on energy consumption	2.5.1.1 Slicing techniques 2.5.1.2 Brining solution 2.5.1.3 Operating slicing equipment 2. 5.1.4 Managing time

		during brining **MATHEMATICS** 2.4.1 Time calculation for brining tubers **COMMUNICATION** 2.4.1 Slicing procedures 2.4.2Manufacturer's specification for quality assurance purposes	
3. Boil cut taro	3.1 Practice safety in accordance to OHS, HACCP and cCGMP standards.	**SCIENCE** Food safety principles and practices on boiling raw materials **TECHNOLOGY** 2.5.3 Cookin g tools/equipment for tubers **ENVIRONMENT:** 2.4.1 Waste water generated during processing **MATHEMATICS** 2.4.1 Time calculation for boiling tubers **COMMUNICATION** 2.4.2 Manufacturer's specification for quality assurance purposes	3.1.1 .1 Practicing cGMP, 7S HACCP and SSOP on preparing boiled taro
	3.2 Boil taro based on manufacturer's specification	**SCIENCE** 3.2.1 Boiling point during cooking **TECHNOLOGY** 3.2.2 Cooking tools/equipment for tubers **ENVIRONMENT:** 3.2.3 Save liquid during processing 3.2.4 Sustainable practices on energy consumption during boiling	3.2.2.3 Boiling requirement is observed

		MATHEMATICS 3.2.4 Time calculation for boiling tubers **COMMUNICATION** 3.2.5 Manufacturer's specification for quality assurance purposes 3.2.6 Check the quality of boiled taro using appropriate kitchen tools and utensils	
4.Drain and cool boiled taro	4.1 Cooked taro is drained and cool	**SCIENCE** 4.1.1 Temperature requirement 4.1.2 Food Safety during cooling **TECHNOLOGY** 4.1.2 Draining and cooling tools/equipment **ENVIRONMENT:** 3.2.3 Save liquid after processing **MATHEMATICS** 3.2.4 Time calculation for boiling tubers **COMMUNICATION** 3.2.5 Manufacturer's specification for quality assurance purposes	4.1.1.1 Cooling time is strictly observed
5. Blend taro	5.1 Blend boiled taro is blended until smooth	**SCIENCE** 5.1.1 Temperature requirement 5.1.2 Food Safety during cooling **TECHNOLOGY** 1.3 Adjust desired consistency and texture **ENVIRONMENT:** 5.1.4 Save liquid after processing	5.1.1.1 Seasoning is incorporated according to manufacturers requirement

		MATHEMATICS 5.1.5 Time calculation for blending	
. 6. Cook blended taro	6.1 Cook sweetened taro and unsweetened purred taro	**SCIENCE** 5.1.1 Food Safety blending **TECHNOLOGY** 1.2 Adjust desired Temperature and time **ENVIRONMENT:** 5.1.3 Energy saving & time saving **MATHEMATICS** 5.1.4 Temperature control and time of cooking **COMMUNICATION** 5.1.5 Procedure on cooking sweetened and unsweetened taro	6.1.1.1 Cooking requirement
. 7. Pack and label cooked puree	7.1 Safety is practiced in accordance to OHS, HACCP and cGMP standard	**7.1.1** OSHS principles **TECHNOLOGY** 6.1.1 Practicing Occupational Safety and Health Standard (OSHS) **ENVIRONMENT CONCERNS** 7.1.1 Occupational Safety and Health Standard (OSHS) **COMMUNICATION** 7.1.1 Understanding Occupational Safety and Health Standard (OSHS	7.1.1.1Practicing Occupational Safety and Health Standard (OSHS)
	7.2 ***Packaging and labeling materials*** are used in accordance with product specification	**SCIENCE** 7.2.1 Selecting appropriate packaging materials	7.1.2 Packaging & Labeling pureed taro using appropriate

		7.2.2 Food safety principles related to sealing process for quality & freshness of taro flour **TECHNOLOGY** 7.2.1 Using food grade packaging materials 7.2.2 Use of sealing equipment (heat sealer or vacuum sealer) **ENVIRONMENT CONCERNS** 7.2.1 Source out environmental friendly packaging materials 7.2.2.Proper disposal of packaging materials 7.2.3 Energy-efficient sealing technology to reducer resource consumption **COMMUNICATION** 7.2.1 Sealing and Labelling operations 7.2.2 Accurate product information on labels, such as Name of products Manufacturer's name and address Ingredients Net weight Date manufactured Expiration date	materials and equipment in accordance with manufacturers specification
.	7.2 Tools, materials and equipment are cleaned and stored based on workplace procedure.	**SCIENCE** 7.2.2 Cleaning and storing methods for equipment, tools and utensils 7.2.2 Storing tools, materials and equipment	7.2.1.1 Maintaining various equipment, tools and utensils such as cleaning and sanitizing solution
.	7.3 Proper disposal of wastes are practiced according to environmental rules and regulations.	**TECHNOLOGY** 7.3.1 HACCP basic principles on storage of finished products	7.3.1. Practicing proper wastes disposal

		COMMUNICATION 7.3.1 Following environmental rules and regulations such as wastes segregation and disposals 7.3.2 Food safety principles and practices for storage of finished products	
. 8.Perform post-production activities	7.4 ***Production data*** checklist is accomplished according to enterprise protocol.	**MATHEMATICS** 7.4.2 Production data 7.4.2 Preparation of daily production input report (spoilage and rejects) 7.4.3 Recording procedures of production data using enterprise forms	7.4.1.1 Recording of production data 7.4.1.2 Accomplishing inventory forms 7.4.1.3 Computing of yields, recoveries and rejects

RANGE OF VARIABLES

VARIABLES	RANGE
1. Equipment and tools	May include calibration : . 1.1 Weighing scale calibration . 1.2 Thermometer . 1.3 Refractometer . 1.4 Salinometer . 1.5 ph meter
2. Kitchen utensils	**May include:** 2.5 Cutting implements such as: 24. Knives (kitchen knife) 25. Slicer 26. Kitchen shears 2.6 Cooking utensils like: 2.6.1 Chopping boards 2.6.2 Basin 2.6.3 Strainer 2.6.4 GMP Kit (Apron, Hairnet, Mask, Gloves) 2.6.5 Timer 2.6.6 Pale 2.6.7 Dipper 2.6.8 Bowl (stainless) 2.6.9 Stainless tray (large) 2.6.10 Food Tongs 2.6.11 Mesh 2.6.12 Storage box 2.6.13 Manila paper 2.6.14 Glass Jar 2.6.15 Photo paper
3. Cleaning supplies/materials	May include: 3.1 Cleaning tools/materials 3.1.1 Broom and dustpan 3.1.2 Sponges 3.3 Brushes 3.2.Microfiber cleaning cloths 3.3 Cleaning Agents 3.3.1 Detergents (powder/liquid) 3.3.2 Degreasers 3.3.3. Abrasive 3.3.4 Acids 3.3.5 Deodorizers 3.6Sanitizing agents
	3.4.1liquid chlorine 3.4.6 hypochlorites 3.4.7 inorganic chloramines

	3.4.4 organic chloramines.
4. Raw materials	**May include:** 4.5. Taro roots/tuber 4.6. flavorings
5. Processing tools and equipment	May include: 5.37 Slicer 5.38 Grater 5.39 Cutter 5.40 Induction sealer 5.41 Impulse electric sealer/Vacuum Sealer/Plastic Sealer 5.42 Hot Blower 5.43 Digital weighing scale 5.44 Moisture meter 5.45 Basin 5.46 Casserole 5.47 Perforated spoon 5.48 Vegetable peeler 5.49 Colander 5.50 Strainer 5.51 Plastic tray 5.52 Stainless tray 5.53 Stainless Table 5.54 Desktop/laptop with printer 5.55 Paper cutter 5.56 Scissors
6. Processing materials	**Processing materials include:** 6.1 Taro(unod) 6.2 Water 6.3 Salt 6.4 Chlorinated water (200ppm)
7. Cooking procedure	**Cooking procedure include** 8.1 Boiling 8.2 Draining 8.3 Blending 8.4 Mixing with sugar/ without sugar 8.5 Pureeing
	8.5 natural fermentation 8.6 Commercial yeast strain
7. Methods of processing	**May include:** 7.10 Peeling 7.11 Slicing 7.12 Washing 7.13 Draining 7.14 Draining 7.15 Blanching

	7.16 Boiling 7.17 Mashing 7.18 Fermentation
13.Packaging materials	**Packaging materials for fermented taro include** 13.1 Glass jar 13.2 Plastic containers 13.3 vacuum sealed pouch
14. Sealing and labeling	**Sealing equipment include:** 14.1 Appropriate packaging materials 14.2 Sterilization 14.3 Filling 14.4 Sealing process 14.5 Cooling and inspection **Labeling requirement include:** 14.6 Name of product 14.7 Ingredients (Large quantity to small quantity) 14.8 Net weight 14.9 Production/expiry date 14.10 Manufacturer's address 14.11 Nutrition facts
15.Production data	Production Data Sheet may include 15.1 Product name 15.2 Production Date 15.3 Raw materials and ingredients 15.4 Weight of raw materials as purchased 15.5 Weight of edible portion 15.6 Weight of waste 15.7 Total weight of input 15.8 Total weight of output

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.9 Prepared equipment, tools, materials and utensils 1.10 Prepared the raw materials 1.11 Perform pureeing 1.12 Perform Packed processed products 1.13 Performed post production activities 1.14 Practiced cGMP, HACCP, 7S of Good Housekeeping, SSOP, AQL and OSHS

2. Methods of Assessment	**Competency in this unit must be assessed using at least two (2) of the following methods:** 2.5. A combination of direct observation and questioning 2.6. Demonstration 2.7. Written test 2.8. Portfolio
3. Resource Implications	**The following resources should be provided:** 3.4 Specific work area/station 3.5 Equipment, tools and utensils to prepare and to process taro by fermentation and pickling 3.6 Materials relevant to the proposed activities
4. Context of Assessment	4.1 Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

GLOSSARY

TARO PROCESSING

Dehydration - a process of reducing moisture of food to low levels for improved shelf life by adding one or more forms of energy to the food.

Dried products – refer to food items processed to low water activity levels, enhancing stability, reducing weight for cost-effective transportation, and improving shelf life through preservation methods like drying.

Drying - removes the moisture from the food so that bacteria, yeasts, and molds cannot grow and spoil the food.

Flavoring – is a food additive used to improve the taste or smell of food.

Pre -treated – an act or instance of treating someone or something in advance preliminary or preparatory treatment.

Processing materials – the series of steps or "unit operations" used in the manufacture of raw-materials into finished goods. *Processing materials* – the series of steps or "unit operations" used in the manufacture of raw-materials into finished goods.

Production data – information disclosing the actual quantity of material used to produce an article having commercial value, as well as information disclosing the actual quantity produced.

Puree - is cooked food that has been ground, pressed, blended or sieved to the consistency of a creamy paste or liquid. A puree is usually made in either a food processor or a blender,

Pureeing - is a processing method that transforms solid foods into a smooth texture.

Raw materials – are materials or substances used in the primary production or manufacturing of goods.

Taro/Tuber (Unod) - is a root vegetable. It is the most widely cultivated species of several plants in the family Araceae that are used as vegetables for their corms, leaves, stems and petioles. Taro corms are a food staple in African, Oceanic, East Asian, Southeast Asian and South Asian cultures (similar to yams)

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