

**REPUBLIC OF KENYA**

**COMPETENCY BASED NATIONAL OCCUPATIONAL STANDARD**

**FOR**

**FOOD TECHNOLOGIST**

**KNQF LEVEL 6**

**CODE FOR NOS: 0721 554A**

**2025**

**First published 2025**

All rights reserved. No part of this occupational standards may be reproduced, distributed, or transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods without the prior written permission of the authorizing agent, except in the case of brief quotations embodied in critical reviews and certain other non-commercial uses permitted by copyright law.

## FOREWORD

The provision of quality education and training is fundamental to the Government’s overall strategy for social-economic development. Quality education and training will contribute to the achievement of Kenya’s development blueprint, Vision 2030 and sustainable development goals.

Reforms in the education sector are necessary for the achievement of Kenya Vision 2030 and meeting the provisions of the Constitution of Kenya 2010. These reforms resulted to the formulation of the Policy Framework for Reforming Education and Training (Sessional Paper No.14 of 2012). A key feature of this policy is the radical change in the design and delivery of the TVET training. This policy document requires that training in TVET be competency based, certification be based on demonstration of competence and mode of delivery allows for multiple entry and exit in TVET programmes.

The reforms also demand that Industry takes a leading role in occupational standard development to ensure the occupational standard addresses its competence needs. This Occupational Standards will thus inform the development of Competency-Based Education and Training (CBET) curriculum for Industrial Chemistry level 6. This Occupational Standards will also be the basis for the assessment of an individual for competency certification.

It is my conviction that this Occupational Standard will play a great role in the development of a competent human resource for sustainable growth and development.

PREFACE

Kenya Vision 2030 aims to transform the country into a newly industrializing, “middle-income country providing a high-quality life to all its citizens by the year 2030”. Kenya intends to create a globally competitive and adaptive human resource base to meet the requirements of a rapidly industrializing economy through life-long education and training. The State Department for labour and Skills Development is mandated, under executive order No. 1 of 2023, to oversee skills and development among actors; establish sector specific skills councils; and establish and manage the institutional framework for linking industry, skills development, and training. It is in this context that the department has established NSSACs to entrench the sectoral approach to skills development in Kenya.

Among the functions of the NSSACs is to develop NOS to ensure skills development is aligned to demands of the labour market. To ensure uniformity in the development of NOS in Kenya, the State Department of Labour and Skills Development has developed the Guidelines for Development of National Occupational Standards in Kenya.

It is in this context the Ministry of Labour and Social Protection spearheaded development of Food Technologist Level 6 National Occupational Standard (NOS) to inform development of market driven curriculum and assessment frameworks.

The occupational standard is designed and organized with clear performance criteria for each element of a unit of competency. This standard also outlines the required knowledge and skills as well as evidence guide.

It is my believe that this occupational standard will form an important reference document for all stakeholders involved in training, assessment and certification of Food Technologist Level 6 in Kenya.

ACKNOWLEDGEMENT

This Occupational Standard was developed through the combined effort of various stakeholders from private and public organizations. I am thankful to the management of these organizations for allowing their staff to participate in this course. I wish to acknowledge the invaluable contribution of industry players who provided input towards the development of this Occupational Standard.

I also thank all the individuals and organizations who participated in the validation of this Occupational Standard

Table of Contents

[FOREWORD vi](#_Toc197158743)

[PREFACE vii](#_Toc197158744)

[ACKNOWLEDGEMENT viii](#_Toc197158745)

[ABBREVIATIONS AND ACRONYMS x](#_Toc197158746)

[KEY TO UNIT CODE xi](#_Toc197158747)

[COURSE OVERVIEW 1](#_Toc197158748)

[APPLY DIGITAL LITERACY 3](#_Toc197158749)

[APPLY COMMUNICATION SKILLS 16](#_Toc197158750)

[APPLY WORK ETHICS AND PRACTICES 22](#_Toc197158751)

[APPLY ENTREPRENEURIAL SKILLS 32](#_Toc197158752)

[PREPARE FOOD PROCESSING RAW MATERIALS 38](#_Toc197158753)

[MAINTAIN FOOD PLANT HYGIENE 41](#_Toc197158754)

[PROCESS DAIRY PRODUCTS 46](#_Toc197158755)

[APPLY FOOD PROCESSING AND PRESERVATION PRINCIPLES 53](#_Toc197158756)

[PROCESS FRUITS AND VEGETABLES PRODUCTS 56](#_Toc197158757)

[PROCESS BAKED PRODUCTS 61](#_Toc197158758)

[PERFORM FOOD LABORATORY PRACTICES 66](#_Toc197158759)

[PROCESS CONFECTIONERIES 72](#_Toc197158760)

[PROCESS MEAT PRODUCTS 75](#_Toc197158761)

[PERFORM STANDARD FOOD LABORATORY TECHNIQUES 79](#_Toc197158762)

[APPLY FOOD PROCESSING AND PRESERVATION PRINCIPLES 84](#_Toc197158763)

[PROCESS BEVERAGE PRODUCTS 88](#_Toc197158764)

[PROCESS MEAT PRODUCTS 92](#_Toc197158765)

[PROCESS CEREAL PRODUCTS 97](#_Toc197158766)

[PROCESS FATS AND OILS 101](#_Toc197158767)

[PROCESS SUGAR 105](#_Toc197158768)

[CONDUCT RESEARCH PROJECT 109](#_Toc197158769)

[FOOD PROCESSING QUALITY ASSURANCE 115](#_Toc197158770)

[DEVELOP NEW FOOD PRODUCTS 121](#_Toc197158771)

ABBREVIATIONS AND ACRONYMS

EMC Environmental Management Coordination

EMCA Environmental Management Coordination Act

HARPC Hazard Analysis and Risk-based Preventive Controls

ICT Information Communication Technology

NEMA National Environment Management Authority

NSSAC National Sector Skills Advisory Committee

PPEs Personal Protective Equipment

RA Rainforest Alliance

KEY TO UNIT CODE

**Sector / Industry**

**Sub Sector**

**Occupational Area**

**Version Control**

**Unit of Competence Number**

**ISCED level, Programme Orientation and Level of Completion**

xx

x

xxx

x

xx

x

OCCCUPATIONAL STANDARD OVERVIEW

Food Technologist Level 6 occupational standard consists of competencies that a person must perform food processing quality assurance, maintain food plant hygiene, process dairy products, process fruits and vegetables products, process beverages products, process meat products, process cereal products, process sugar and confectionary products, process fats and oils products and develop new products

The units of competency leading to Food processing Technologist Level 6 qualification include the following:

**SUMMARY OF UNITS OF COMPETENCY**

|  |  |
| --- | --- |
| **ISCED UNIT CODE** | **UNIT NAME** |
| 0611 451 01A | Apply Digital Literacy |
| 0031 441 02A | Communication Skills |
| **0417 441 03A** | Work Ethics and Practices |
| 0413 541 04A | Apply Entrepreneurial Skills |
| 0721 451 05A | Perform Food Processing Raw Materials Preparation |
| 0721 451 06A | Perform Food Plant Hygiene |
| 0721 451 07A | Process Dairy Products |
| 0721 551 08A | Apply Food Processing and Preservation Principles |
| 0721 451 09A | Process Fruits and Vegetables |
| 0721 451 10A | Process Baked Products |
| 0721 451 11A | Perform Food Laboratory Practice |
| 0721 451 12A | Process Confectioneries |
| 0721 451 13 A | Process Meat Products |
| 0721 551 14A | Perform Food Laboratory Techniques |
| 0721 551 15A | Food Processing and Preservation Principles |
| 0721 551 16A | Beverage Products Processing |
| 0721 551 17A | Meat Processing |
| 0721 551 18A | Cereal Products Processing |
| 0721 551 19A | Fats And Oils Processing |
| 0721 551 20A | Sugar Processing |
| 0111 551 21A | Conduct Research Project |
| 0721 551 22A | Food Processing Quality Assurance |
| 0721 551 23A | New Food Product Development |

## APPLY DIGITAL LITERACY

**UNIT CODE: 0611 451 01A**

**UNIT DESCRIPTION:**

This unit covers the competencies required to demonstrate digital literacy. It involves operating computer devices, solving tasks using the Office suite, accessing online/offline data and information, performing online communication and collaboration, applying cybersecurity skills and performing jobs online. It also involves applying job entry techniques**.**

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes that make up workplace functions | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements  ***(Bold and italicized terms are elaborated in the range)*** |
| --- | --- |
| 1. **Operate computer devices** | * 1. **C*omputer device*** usage is determined as per workplace requirements.   2. ***Computer hardware*** is identified according to job requirements.   3. ***Computer software* is** identified according to workplace requirements.   4. Computer devices are turned on or off as per the correct workplace procedure.   5. ***Mouse techniques*** are applied in solving tasks as per workplace requirements.   6. Keyboardtechniques are applied in solving tasks as per workplace requirements.   7. Computer files and folders are created and managed as per workplace requirements.   8. ***Internet connection option*s** are identified and applied in connecting computer devices to the Internet.   9. ***External devices*** are identified and connected to the computer devices as per the job requirement. |
| 1. **Solve tasks using Office suite** | 1. ***Word processing concepts***are applied in solving workplace tasks as per job requirements. 2. Worksheet data is entered and prepared in accordance with work procedures. 3. Worksheet data is built and edited in accordance with workplace procedures. 4. *Data manipulation* on a worksheet is undertaken in accordance with work requirements. 5. Worksheets are saved and printed in accordance with job requirements. 6. *Electronic presentation concepts* are applied in solving workplace tasks as per job requirements. |
| 1. **Manage data and information** | * 1. Office ***internet services*** are identified and applied in accordance with office procedures.   2. ***Internet access applications*** are determined in accordance with office operation procedures.   3. Internet search is performed as per job requirements.   4. Online digital content is downloaded in accordance with workplace requirements.   5. Digital content is identified and backed up in accordance with workplace procedures. |
| 1. **Perform online communication and collaboration** | * 1. Netiquette principles are observed as per work requirements.   2. Electronic mail communication is executed in accordance with workplace policy.   3. Digital content copyright and licenses are identified and applied according to workplace policies and regulatory requirements.   4. ***Online* *collaboration*** *tools* are applied in accordance with workplace policies and regulatory requirements. |
| 1. **Apply cybersecurity skills** | * 1. ***Data protection***and ***privacy***is classified in accordance with workplace policies and regulatory requirements.   2. ***Internet security threats*** are identified as per workplace policies and regulatory requirements.   3. Computer threats and crimes are detected in accordance to Information Management security guidelines   4. ***Cybersecurity control measures*** are applied in accordance with workplace policies and regulatory requirements. |
| 1. **Perform online jobs** | * 1. ***Online job platforms*** are identified as per the job requirements.   2. Online accounts and profiles are created in accordance with the work requirements.   3. Online jobs are identified according to the bidder’s skillset.   4. Online digital identity is managed according to industry best practices.   5. Online job bidding is done as per the specific job requirements.   6. Online tasks are executed according to the job requirements.   7. Personal online payment account is managed in accordance with financial regulations. |
| 1. **Apply job entry techniques** | * 1. ***Job opportunities***are sought based on competencies.   2. A winning resume/CV is developed as per job advertisement.   3. An application/cover letter is developed based on the job advertisement.   4. ***Certificates and testimonials*** are organized as per resume.   5. ***Interview skills*** are demonstrated as per job advertisement. |

**RANGE**

**This section provides a work environment and conditions to which the performance criteria apply. It allows for a different work environment and situations that will affect performance.**

| **Variable** | **Range** |
| --- | --- |
| * + - 1. Computer devices may include but are not limited to: | * Desktops * Laptops * Smartphones * Tablets * Smartwatches |
| 1. Computer hardware may include but are not limited to: | * The System Unit E.g., Motherboard, CPU, casing, * Input Devices e.g., Pointing, keying, scanning, voice/speech recognition, direct data capture devices. * Output Devices e.g., hardcopy output and softcopy output * Storage Devices e.g., main memory e.g., RAM, secondary storage (Solid state devices, Hard Drives, CDs & DVDs, Memory cards, Flash drives * Computer Ports e.g., HDMI, DVI, VGA, USB type C etc. |
| 1. Computer software may include but are not limited to: | * System software e.g., Operating System (Windows, Macintosh, Linux, Android, iOS) * Application Software e.g., Word Processors, Spreadsheets, Presentations etc. * Utility Software e.g., Antivirus programs |
| 1. External devices may include but are not limited to: | * Printers * Projectors * Smart Boards * Speakers * External storage drives * Digital/Smart TVs |
| 1. Word processing concepts may include but are not limited to: | * Creating word documents * Editing word documents * Formatting word documents * Saving word documents * Printing word documents |
| 1. Mouse techniques may include but are not limited to: | * Clicking * Double-clicking * Right-clicking * Drag and drop |
| 1. Internet connection options may include but are not limited to: | * Mobile Networks/Data Plans * Wireless Hotspots * Cabled (Ethernet/Fiber) * Dial-Up * Satellite * ISDN (Integrated Services Digital Network) |
| 1. Data manipulation may include but are not limited to: | * Use of formulae * Use of functions * Sorting * Filtering * Visual representation using charts |
| 1. Electronic presentation concepts may include but are not limited to: | * Creating slides * Editing slides * Formatting slides * Applying slide effects and transitions * Creating and playing slideshows * Saving presentations * Printing slides and handouts |
| 1. Internet services may include but are not limited to: | * Communication Services * Information Retrieval Services * File Transfer * World Wide Web Services * Web Services * Directory Services * Automatic Network Address Configuration * News Group * Ecommerce |
| 1. Internet access applications/ software may include but are not limited to: | * Browsers * Email Apps * eCommerce Apps |
| 1. Online collaboration tools may include but are not limited to: | * Online Storage * Online productivity applications * Online meetings, * Online learning environments, * Online calendars * Social networks |
| 1. Data protection and privacy may include but not limited to: | * Confidentiality of data/information * Integrity of data/information * Availability of data/information |
| 1. Internet security threats may include but not limited to: | * Malware attacks * Social engineering attacks * Software supply chain attacks * Advanced persistent threats (APT) * Distributed denial of service (DDoS) * Man-in-the-middle attack (MitM) * Password attacks * IoT Attacks * [Phishing Attacks](https://onlinedegrees.sandiego.edu/top-cyber-security-threats/#phishing-attacks) * [Ransomware](https://onlinedegrees.sandiego.edu/top-cyber-security-threats/#ransomware) |
| 1. Security threats control measures may include but not limited to: | * Counter measures against cyber terrorism * Physical Controls * Technical/Logical Controls * Operational Controls |
| 1. Online job platforms may include but are not limited to: | * Remotask * Data annotation. tech * Cloudworker * Upwork * Oneforma * Appen |
| 1. Job opportunities may include but not limited to: | * Self-employment * Service provision * product development * salaried employment |
| 1. Certificates and testimonialsmay include but not limited to: | * Academic credentials * Letters of previous employments/ services rendered * Letters of commendation * Certifications of participation * Awards |
| 1. Interview skills may include but not limited to: | * Listening skills * Grooming * Language command * Articulation of issues * Body language * Time management * Honesty * Generally knowledgeable in current affairs and technical area |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency.

Required knowledge

The individual needs to demonstrate knowledge of:

* Computer Hardware and Software Concepts
* Computer Security Concepts (Data security and privacy)
* Cyber security threats and control measures
* Understanding Computer Crimes
* Detection and protection against computer crimes
* Laws governing protection of ICT in Kenya
* Digital Identity Management
* Netiquette Principles
* Fundamentals of Copyright and Licenses
* Word processing;
  + - Functions and concepts of word processing;
    - Documents and tables creation and manipulations;
    - Document editing;
    - Document formatting;
    - Word processing utilities
* Spreadsheets;
  + - Meaning, types and importance of spreadsheets;
    - Components of spreadsheets;
    - Functions, formulae, and charts, uses and layout;
    - Data formulation, manipulation and application to cells;
    - Editing & formatting spreadsheets;
* Presentation Packages;
  + - Types of presentation Packages.
    - Creating, formulating, running, editing, printing and presenting slides and handouts
* Networking and Internet;
  + - Internet connectivity.
    - Browser and digital content management;
    - Managing data, information, and digital content
    - Electronic mail and World Wide Web
* Fundamentals of Online Working;
  + - Online Profile Management;
    - e-Portfolio Management;
    - Online Jobs Bidding;
    - Online Payment Systems;
* Job entry techniques
  + - Job searching sites
    - Interview preparation skills
    - Interview handling

**Required skills**

The individual needs to demonstrate the following skills:

* Active listening
* Keyboard Skills
* Mouse Skills
* Analytical skills
* Creativity
* Interpretation Skills
* Communication
* Spreadsheet operations (applying fundamental operations such as addition, subtraction, division and multiplication)
* Computer Use Safety Skills
* Document Editing Skills
* Document Formatting Skills
* Document Printing Skills
* Netiquette Skills
* Internet Browsing Skills
* Problem Solving Skills
* Online Collaboration Skills
* Cybersecurity Skills
* CV writing
* Grooming

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge, and skills range.

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Operated computer devices as per workplace policies and regulations.   2. Solved tasks using the office suite as per workplace policies and regulations.   3. Manage data and information as per workplace policies and regulations.   4. Performed online communication and collaboration as per workplace policies and regulations.   5. Applied cybersecurity skills in accordance with workplace policies and regulations.   6. Executed online tasks according to the job requirements.   7. Searched for job opportunity based on competencies.   8. Prepared job requirement documentations based on job opportunity.   9. Demonstrated interview skills based on the job opportunity. |
| 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. Methods of assessment | Competency in this unit may be assessed through:   * 1. Practical assessment   2. Oral assessment   3. Portfolio of evidence   4. Third party report   5. Written tests |
| 1. Context of assessment | Competency may be assessed in:   * 1. Workplace   2. Simulated workplace. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

## APPLY COMMUNICATION SKILLS

**UNIT CODE: 0031 441 02A**

**UNIT DESCRIPTION**

This unit covers the competencies required to demonstrate communication skills. It involves applying communication channels, written, non-verbal, oral, and group communication skills.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes that make up workplace function | **PERFORMANCE CRITERIA**  These are assessable statements that specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the Range*** |
| --- | --- |
| 1. **Apply communication channels** | 1. Specific communication channels are identified and applied based on workplace requirements. 2. Challenges are identified and addressed as per the operational standards of the organization. 3. Communication channels are evaluated to meet workplace needs. |
| 1. **Apply written communication skills** | * 1. Types of written communication are identified and applied according to the workplace requirements.   2. Written communication needs are identified and implemented according to workplace procedures.   3. Written communication guidelines are analyzed, evaluated, and revised based on workplace needs. |
| 1. **Apply non-verbal communication skills** | **3.1** Existing non-verbal communication techniques are identified and applied based on organization policy.  3.2 Non-verbal communication techniques are articulated and modeled to enhance inclusivity according to workplace requirements. |
| 1. **Apply oral communication skills** | **4.1** Types of oral communication are identified and established as per organization policy.  4.2 Pathways of oral communication are identified and established as per organization policy.  4.3 Pathways of oral communication are reviewed according to organization procedures.  4.4 Pathways of oral communication are maintained according to the organization standards. |
| 1. Apply group communication skills | 1. Group *communication strategies* are appliedbased on the workplace needs. 2. Groups are organized in accordance with workplace procedures. 3. Effective questioning, listening and non-verbal communication techniques are used as per needs.   5.4 Group communication challenges are identified and addressed according to the workplace needs. |

**RANGE**

This section provides the work environment and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| **Variable** | **Range** |
| --- | --- |
| * + - 1. Communication strategies may include but are not limited to: | * Language switch * Comprehension check * Repetition * Asking confirmation * Paraphrasing * Clarification request * Translation * Restructuring * Generalization |
| * + - 1. Effective group interaction may include but not limited to: | * Identifying and evaluating what is occurring within an interaction in a non-judgmental way. * Using active listening. * Making decision about appropriate words, behavior. * Putting together response which is culturally appropriate. * Expressing an individual perspective. * Expressing own philosophy, ideology and background and exploring impact with relevance to communication |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the skills and knowledge required for this unit of competency.

Required Knowledge

The individual needs to demonstrate knowledge of:

* Communication process
* Dynamics of groups
* Styles of group leadership
* Key elements of communications strategy
* Principles of effective communication
* Turn-taking techniques
* Conflict resolution techniques
* Work planning
* Work organization
* Company policies
* Company operations and procedure standards
* Fundamental rights at the workplace
* Personal hygiene
* Accountability
* Workplace problems and how to deal with them

Required Skills

The individual needs to demonstrate the following skills:

* Active listening
* Interpretation
* Negotiation
* Writing
* Oral skills
* Creative thinking
* Critical thinking
* Decision making
* Analytical
* Innovation
* Conflict skills
* Leadership
* Problem solving skills
* Management
* Organizational
* Teamwork

**EVIDENCE GUIDE**

**This provides advice on assessment and must be read in conjunction with the performance criteria, required skills, knowledge, and range.**

|  |  |
| --- | --- |
| 1. **Critical aspects of Competency.** | Assessment requires evidence that the candidate:   * 1. Identified and applied specific communication channels based on workplace requirements.   2. Identified and applied specific written communication correspondence according to the workplace requirements.   3. Applied and developed non-verbal strategies to communicate in all areas of the workplace requirements.   4. Established pathways of oral communication as per workplace policy.   5. Applied group communication strategies based on workplace needs. |
| 1. **Resource Implications** | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. **Methods of Assessment** | Competency in this unit may be assessed through:   * 1. Practical assessment   2. Oral assessment   3. Portfolio of evidence   4. Third party report   5. Written tests |
| 1. **Context of Assessment** | Competency may be assessed in:   * 1. Workplace   2. Simulated workplace. |
| 1. **Guidance information for assessment** | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## APPLY WORK ETHICS AND PRACTICES

**UNIT CODE: 0417 441 03A**

**UNIT DESCRIPTION**

This unit covers competencies required to effectively apply work ethics and practices. It involves the ability to: conduct self-management, promote ethical work practices and values, promote teamwork, manage workplace conflicts, maintain professional and personal development, apply problem-solving and promote customer care.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in Range*** |
| --- | --- |
| 1. Apply self-management skills | * 1. Personal vision, mission and goals are formulated based on potential and concerning organization objectives and strategic plan   2. Self-esteem and a positive self-image are developed and maintained based on value   3. Emotion intelligence and stress management are demonstrated as per workplace requirements.   4. Assertiveness is developed and maintained based on the requirements of the job.   5. Accountability and responsibility for one's actions are demonstrated based on workplace instructions.   6. Time management, attendance and punctuality are observed as per the organization’s policy.   7. Personal goals are managed as per the organization’s objective   8. Self-strengths and weaknesses are identified based on personal objectives   9. Motivation, initiative and proactivity are utilized as per the organization policy   10. Individual performance is evaluated and monitored according to the agreed targets. |
| 1. **Promote ethical work practices and values** | 1. Integrity is demonstrated as per acceptable norms 2. Codes of conduct is applied as per the workplace requirements 3. Policies and guidelines are observed as per the workplace requirements 4. Professionalism is exercised in line with organizational policies |
| 1. **Promote Team work** | 3.1 ***Teams*** are formed to enhance productivity based on organization’s objectives  3.2 Duties are assigned to teams under the organization policy.  3.3 Team activities are managed and coordinated as per set objectives.  3.4 Team performance is evaluated based on set targets as per workplace policy.  3.5 ***Conflicts***are resolved between team members in line with organization policy.  3.6 Gender and diversity-related issues are identified and mainstreamed in accordance with workplace policy.  3.7 Healthy ***relationships*** are developed and maintained in line with the workplace.  3.8 Adaptability and flexibility are applied in dealing with team members as per workplace policies |
| 1. **Maintain professional and personal development** | 4.**1 *Personal growth and development*** needs are identified and assessed in line with the requirements of the job.  *4.2* ***Training and career opportunities*** are identified and utilized based on job requirements.  4.3 ***Resources*** for training are mobilized and allocated based on organizations and individual skills needs.  4.4 Licenses and certifications relevant to the job and career are obtained and renewed as per policy.  4.5 Recognitions are sought as proof of career advancement in line with professional requirements.  4.6 Work priorities and personal commitments are balanced and managed based on the requirements of the job and personal objectives.  4.7 Dynamism and on-the-job learning are embraced in line with the organization’s goals and objectives. |
| 1. **Apply Problem solving skills** | 5.1 ***Creative, innovative*** and practical solutions are developed based on the problem  5.2 Independence and initiative in identifying and solving problems are demonstrated based on the requirements of the job.  5.3 Team problems are solved as per the workplace guidelines  5.4 Problem-solving strategies are applied as per the workplace guidelines  5.5 Problems are analyzed and assumptions tested as per the context of data and circumstances |
| 1. Promote Customer Care | **6.1** Customers' needs are identified based on their characteristics  6.2 Customer *feedback* is allowed and facilitated in line with organization policies.  6.3 Customer concerns and complaints are analyzed and resolved in line with the set organizational culture.  6.4 Proactive customer outreach programs are implemented as per organizational policies  6.5 Customer retention strategies are developed and implemented in line with the organizational policy |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

| **Variable** | **Range** |
| --- | --- |
| 1. Feedback may include but not limited to: | * Verbal * Written * Informal * Formal |
| 1. Conflicts include but are not limited to: | * Interpersonal Conflict. * Intrapersonal Conflict. * Intergroup Conflict. * Intragroup Conflict. |
| 1. Relationships may include but not limited to: | * Man/Woman * Trainer/trainee * Employee/employer * Client/service provider * Husband/wife * Boy/girl * Parent/child * Sibling relationships |
| 1. Team may include but not limited to: | * Small work group * Staff in a section/department * Inter-agency group * Virtual teams |
| 1. Personal growth may include but not limited to: | * Growth in the job * Career mobility * Gains and exposure the job gives * Net workings * Benefits that accrue to the individual as a result of noteworthy performance |
| 1. Personal objectives may include but not limited to: | * Long term * Short term * Broad * Specific |
| 1. Trainings and career opportunities may include but not limited to | * Participation in training programs * Serving as Resource Persons in conferences and workshops * Capacity building |
| 1. Resource may include may but not limited to: | * Human * Financial * Technology |
| 1. Creative and innovative may include but not limited to: | * New ideas * Original ideas * Different ideas * Methods/procedures * Processes * New tools |
| 1. Emerging issues may include but not limited to**:** | * Artificial Intelligence * Data confidentiality * National cohesion * Open offices |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the skills and knowledge required for this unit of competency.

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Work values and ethics
* Company policies and procedures
* Company operations, procedures and standards
* Flexibility and adaptability
* Concept of time and leisure time
* Decision making
* Work planning
* Organizing work
* Monitoring and evaluation
* Record keeping
* Gender and diversity mainstreaming
* Drug and substance abuse
* Professional growth and development
* creativity
* Innovation
* Problem solving
* Customer care
* Mentoring and coaching.
* Emerging issues

Required Skills

The individual needs to demonstrate the following skills:

* Active listening
* Critical thinking
* Organizational
* Negotiation
* Monitoring
* Evaluation
* Problem solving
* Decision Making
* Leadership
* Creative/innovative thinking
* Adaptability
* Conflict management
* Emotional intelligence
* Teamwork

**EVIDENCE GUIDE**

**This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.**

|  |  |
| --- | --- |
| 1. **Critical aspects of Competency** | Assessment require evidence that the candidate:   * 1. Applied self-management skills as per organizational procedures.   2. Promoted ethical practices and values as per organizational procedures.   3. Promoted Teamwork as per workplace assignments.   4. Maintained professional and personal development as per organizational procedures.   5. Applied Problem-solving skills based on work requirements.   6. Identified customer needs based on their characteristics.   7. Gave back Customer feedback in line with organization policies. |
| 1. **Resource Implications** | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. **Methods of Assessment** | Competency in this unit may be assessed through:   * 1. Practical assessment   2. Oral assessment   3. Portfolio of evidence   4. Third party report   5. Written tests |
| 1. **Context of Assessment** | Competency may be assessed in:   * 1. Workplace   2. Simulated workplace. |
| 1. **Guidance information for assessment** | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## APPLY ENTREPRENEURIAL SKILLS

**UNIT CODE :** 0413 541 04A

**UNIT DESCRIPTION**

This unit covers the competencies required to demonstrate an understanding of entrepreneurship. It involves demonstrating an understanding of financial literacy, applying entrepreneurial concepts identifying entrepreneurship opportunities, applying business legal aspects, developing business innovative strategies, and developing business plans.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes that make up workplace function. | **PERFORMANCE CRITERIA**  These are assessable statements that specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in Range*** |
| --- | --- |
| 1. Apply Financial Literacy Skills | 1. Sources of personal and business ***funds*** are identified as per financial procedures and standards 2. Personal finances are managed as per financial procedures and standards 3. Savings are managed as per financial procedures and standards 4. Debts are managed as per financial procedures and standards 5. Investments are undertaken as per financial procedures and standards 6. Insurance services are procured as per financial procedures and standards |
| 1. Apply entrepreneurial concept | 1. Entrepreneurs and Business persons are distinguished as per principles of entrepreneurship 2. ***Types of entrepreneurs*** are identified as per principles of entrepreneurship 3. Ways of becoming an entrepreneur are identified as per principles of Entrepreneurship 4. ***Characteristics of Entrepreneurs*** are identified as per principles of Entrepreneurship 5. Salaried employment and self-employment are distinguished as per principles of entrepreneurship 6. ***Requirements for entry into self-employment*** are identified according to business procedures and standards 7. Roles of an Entrepreneur in an enterprise are determined according to business procedures and standards 8. **Contributions of entrepreneurship** to National development are identified as per business procedures and standards |
| 1. Identify entrepreneurial opportunities | 1. Business ideas are identified as per business procedures and standards 2. Factors to consider when evaluating business opportunity viability are explored based on business procedure and standards 3. Entrepreneurial opportunities are evaluated as per business procedures and standards 4. Business ideas and opportunities are generated as per business procedures and standards 5. Business life cycle is analysed as per business procedures and standards |
| 1. Apply business legal aspects | 1. ***Forms of business ownership*** are identified as per legal procedures and practices 2. Business Registration and Licensing processes are identified as per legal procedures and practices 3. Types of Contracts and Agreements are analysed as per legal procedures and practices 4. Employment Laws are identified as per legal procedures and practices 5. Taxation laws are identified as per legal procedures and practices |
| 1. Innovate Business strategies | 1. Business innovation strategies are determined by the organization standards 2. Creativity in business development is demonstrated in accordance with business standards 3. ***Innovative business standards***  are developed as per business principles 4. Linkages with other entrepreneurs are created as per best practice 5. ICT is incorporated in business growth and development as per best practice |
| 1. Develop Business Plan | 1. Business idea is described as per business procedures and standards 2. Business description is developed as per business plan format 3. Marketing plan is developed as per business plan format 4. Organizational/Management plan is prepared in accordance with business plan format 5. Production/operation plan is prepared in accordance with business plan format 6. Financial plan is prepared in accordance with the business plan format 7. Executive summary is prepared in accordance with business plan format 8. Business plan is presented as per best practice 9. Business ideas are incubated as per institutional policy. |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

| **Variable** | **Range** |
| --- | --- |
| 1. Sources of personal funds mayinclude but not limited to: | * Salary/Wages * Investments * Savings * Inheritance * Government Benefits |
| 1. Sources of business finance mayinclude but not limited to: | * Equity Financing * Debt Financing, * Personal Savings/Investment * Retained Earnings * Grants and Subsidies * Crowdfunding * supplier Credit: * Leasing and Asset Financing: |
| 1. Types of entrepreneurs may include but not limited to: | * Innovators * Imitators * Craft * Opportunistic * Speculators |
| 1. Characteristics of Entrepreneurs may include but not limited to: | * Creative * Innovative * Planner * Risk taker * Networker * Confident * Flexible * Persistent * Patient * Independent * Future oriented * Goal oriented |
| 1. Requirements for entry into self-employment may include but not limited to | * Technical skills * Management skills * Entrepreneurial skills * Resources * Infrastructure |
| 1. Forms of businesses ownership may include but not limited to: | * Sole proprietorship * Partnership * Limited companies * Cooperatives |
| 1. Innovative business standards may include but not limited to: | * New products * New methods of production * New markets * New sources of supplies * Change in industrialization |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Analytical
* Management
* Problem-solving
* Root-cause analysis
* Communication

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Decision making
* Business communication
* Change management
* Competition
* Risk
* Net working
* Time management
* Leadership
* Factors affecting entrepreneurship development
* Principles of Entrepreneurship
* Features and benefits of common operational practices, e. g., continuous improvement (kaizen), waste elimination,
* Conflict resolution
* Health, safety and environment (HSE) principles and requirements
* Customer care standards
* Basic financial management
* Business strategic planning
* Impact of change on individuals, groups and industries
* Government and regulatory processes
* Local and international market trends
* Product promotion standards
* Market and feasibility studies
* Government and regulatory processes
* Local and international business environment
* Relevant developments in other industries
* Regional/ County business expansion standards

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   1. Identified Sources of personal and business finance as per financial procedures and standards 2. Managed Personal finances as per financial procedures and standards 3. Made Investment decisions as per financial procedures and standards 4. GeneratedBusiness ideas and opportunities based on business procedure and standards 5. Analysed business life cycle based on business procedure and standards 6. Determined business innovative standards as per business principles 7. Developed and presented a business plan as per regulatory framework. |
| 1. Resource Implications | The following resources should be provided:   1. Appropriately simulated environment where assessment can take place. 2. Access to relevant work environments where assessment can take place. 3. Resources relevant to the proposed activities or task. |
| 1. Methods of Assessment | Competency may be assessed through:   1. Written tests 2. Oral questions 3. Third party report 4. Interviews 5. Portfolio |
| 1. Context of Assessment | Competency may be assessed:   1. On-the-job 2. In a simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## PREPARE FOOD PROCESSING RAW MATERIALS

**ISCED UNIT CODE: 0721 451 05A**

**UNIT DESCRIPTION**

This unit specifies the competencies required to prepare food processing raw materials. It involves receiving, sorting and cleaning food processing raw materials.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENTS**  **These describe the key outcomes which make up workplace function.** | **PERFORMANCE CRITERIA**  **These are assessable statements which specify the required level of performance for each of the elements.**  ***Bold and italicized terms are elaborated in the range.*** |
| 1. Receive food processing raw materials | * 1. ***Raw materials*** are received as per product specifications   2. Documentations of supplies are checked for conformity as per workplace requirements   3. Conforming and non-conforming raw materials are documented as per workplace requirements |
| 1. Sort food processing raw materials | * 1. Raw materials are sorted as per as per workplace requirements   2. Raw materials are graded as per as per workplace requirements   3. Records for sorting and grading raw materials are maintained   as per workplace requirements |
| 1. Clean food processing raw materials | * 1. Raw materials are assembled for cleaning as per workplace procedures   2. Raw materials are cleaned as per workplace procedures   3. Raw material contaminants are disposed as per workplace procedures |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Raw materials may include but not limited to: | * 1.1 Milk * 1.2 Wheat flour * 1.3 Sugar * 1.4 Fruits * 1.5 Eggs * 1.6 Vegetables |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency.

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Food microbiology
* Food engineering
* Waste disposal
* Regulatory requirements

**Required skills**

The individual needs to demonstrate the following skills:

* Team work
* Raw material sampling
* Critical thinking
* Communication
* Record keeping
* Tools and equipment handling

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| * 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Checked documentation of supplies for conformity as per workplace requirement   2. Graded raw materials as per the work requirements   3. Maintained rrecords for sorting and grading of raw materials as per workplace requirements   4. Cleaned raw materials as per workplace procedure. |
| * 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| * 1. Methods of assessment | Competency in this unit may be assessed through:   * 1. Practical assessment   2. Oral assessment   3. Portfolio of evidence   4. Third party report   5. Written tests |
| * 1. Context of assessment | Competency may be assessed in:   * 1. Work place   2. Simulated workplace |
| * 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended |

## MAINTAIN FOOD PLANT HYGIENE

**ISCED UNIT CODE:** 0721 451 06A

**UNIT DESCRIPTION**

This unit describes the competencies required to maintain food plant hygiene. It involves cleaning food plant, sanitizing food plant, managing food wastes, controlling environmental pollution and using resources sustainably.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENTS** | **PERFORMANCE CRITERIA** |
| 1. Clean food plant | * 1. ***PPEs*** are used as per workplace requirements   2. ***Cleaning reagents*** are prepared as per workplace procedures   3. Cleaning-in- place is carried out as per workplace procedure   4. Cleaning-out-of-place is carried out as per workplace procedure   5. Cleaning records are maintained as per workplace procedures |
| 1. Sanitize food plant | * 1. Sanitization equipment is selected as per workplace procedures   2. Sanitization operations are performed as per workplace procedures   3. Sanitization Records are maintained per workplace procedures |
| 1. Manage food waste | * 1. Waste is collected as per NEMA regulations, 2006   2. Waste is segregated as per NEMA regulations, 2006   3. Waste is disposed as per NEMA regulations, 2006   4. Waste management Records are maintained as per workplace procedures |
| 1. Control environmental pollution | * 1. ***Hazardous wastes***are stored as per the Environmental Management and Coordination Act,1999.   2. Hazardous wastes are disposed in accordance with the EMCA 1999 (Toxic and hazardous chemicals and materials management) Regulations 2019   3. ***Pollutants***are controlled in accordance with EMCA 1999, Agriculture and food authority act 2022 and KFS Act 2015. |
| 1. Use resources sustainably | * 1. Resource usage is monitored based on Article 69(2) of the Constitution of Kenya   2. ***Resource wastage* *minimization***isperformedas per Article 69(2) of the Constitution of Kenya   3. ***Environmental conservation measures*** are applied as per EMCA 1999 |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. PPE may include but not limited to: | * Hair net * Dust coats * Gumboots * Gloves * Masks * Safety googles |
| 1. Cleaning reagents may include but not limited to: | * 2.1 Detergents * 2.2 Sanitizers * 2.3 Sterilant |
| 1. Hazardous waste may include but are not limited to: | * Explosives * Flammable liquids * Flammable solids and substances * Oxidizing substances and organic peroxides * Toxic and infectious substances * Radioactive materials * Corrosive substances |
| 1. Pollutants | * Water pollutants * Noise pollutants * Land pollutants * Air pollutants |
| 1. Resource wastage minimization may include but not limited to: | * Resources reuse * Resources recycle * Quality control improvement * Process monitoring * Optimization of resources |
| 1. Environmental conservation measuresmay include but are not limited to: | * Green energy technologies * Tree planting * Public awareness and sensitization * Waste management * Ecosystems conservation * Energy conservation |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Food microbiology
* Food engineering
* Waste disposal
* PPE usage
* Food plant cleaning detergents and sanitizers
* Methods of cleaning
  + Cleaning in place (CIP)
  + Cleaning out of place (COP)
* Regulatory requirements

**Required Skills**

The individual needs to demonstrate the following skills

* Communication
* Team work
* Record keeping
* Problem solving
* Hygiene monitoring
* Cleaning
* Critical thinking
* Tools and equipment handling

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Resource Implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Practical assessment   2. Project   3. Portfolio of evidence   4. Third party report   5. Written tests   6. Oral assessment |
| 1. Context of Assessment | Competency may be assessed in:   * 1. Work place   2. Simulated workplace |
| 1. Guidance information for assessment | H Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended |

## PROCESS DAIRY PRODUCTS

**ISCED UNIT CODE: 0721 451 07A**

**UNIT DESCRIPTION**

This unit specifies the competencies required to process dairy products. It involves milk quality testing, pasteurizing raw milk and processing fermented, ice-cream, and concentrated milk products.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENTS**  **These describe the key outcomes which make up workplace function.** | **PERFORMANCE CRITERIA**  **These are assessable statements which specify the required level of performance for each of the elements.**  ***Bold and italicized terms are elaborated in the range.*** |
| 1. Perform raw milk quality test | * 1. ***Organoleptic tests*** of milk are carried out according to the dairy requirements   2. ***Chemical tests*** of milk are carried out according to the dairy requirements   3. ***Microbial tests*** of milk are carried out according to the dairy requirements |
| 1. Pasteurize raw milk | 1. Milk Pasteurization equipment are assembled as per workplace procedure. 2. Raw milk is pasteurized as per workplace procedure 3. Pasteurization parameters are monitored as per pasteurization requirements 4. Pasteurized milk is cooled as per workplace procedure 5. Pasteurized milk is analyzed as per workplace procedure 6. Pasteurization records are maintained as per workplace procedure 7. Pasteurized milk is packaged as per product specification |
| 1. Process fermented milk products | * 1. ***Fermented products*** processing equipment are assembled as per work place procedure   2. ***Fermented ingredients***are assembled according to the workplace procedure   3. Milk is pasteurized according to product specifications   4. Pasteurized milk is fermented according to product specifications   5. Fermented products are analyzed according to product specifications  1. ***Fermented products*** are packed according to product specifications |
| 1. Process ice-cream | * 1. Ice-cream processing equipment are assembled as per work place procedures   2. ***Ice cream ingredients***are assembled according to workplace procedures   3. Ice-cream mix is pasteurized according to product specifications   4. Pasteurized ice-cream mix is aerated according to product specifications   5. Aerated ice-cream mix is frozen according to product specifications   6. Ice-cream is analyzed according to product specifications   7. Ice cream is packed according to product specifications  1. 4.8 Packaged ice cream is stored as per product specifications |
| 1. Process concentrated milk products | * 1. ***Concentrated milk products*** processing equipment are assembled as per work place procedures   2. Ingredients are assembled according to the workplace procedures   3. Milk is pasteurized according to the work place procedures   4. Pasteurized milk is concentrated according to concentrated milk product specifications   5. Concentrated milk products are analysed according to product specifications   6. Concentrated milk products are packaged according to product specifications |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Organoleptic tests may include but not limited to: | * Colour * Odour * Foreign material * Taste |
| 1. Chemical tests may include but not limited to: | * Acidity test * Phosphatase test * Butterfat test * Alcohol test * Methylene blue test * Resazurin test |
| 1. Microbial tests may include but not limited to: | * 3.1 Total plate count * 3.2 Ecoli and coliform counts |
| 1. Pasteurization parameters may include but not limited to: | * Temperature * PH * Pressure * Time |
| 1. Fermented and Ice cream ingredients may include but not limited to: | * Starch * Sugar * Skimmed milk powder * Lactic acid bacteria * Flavours * Milk |
| 1. Fermented dairy products may include but not limited to: | * Yoghurt * Mala * Cheese |
| 1. Concentrated milk products may include but not limited to: | * Sweetened condensed milk * Evaporated milk * Milk powder |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency.

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Food engineering
* Food analysis
* Food microbiology
* Dairy technology
* Food quality management systems
* Regulatory requirements
* Food processing and preservation principles

**Required skills**

**The individual needs to demonstrate the following skills:**

* Communication
* Team work
* Tools and equipment handling
* Waste disposal
* Sampling of dairy products
* Record keeping
* Planning
* Problem solving
* Analytical
* Numeracy
* Environmental literacy

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   1. Carried out organoleptic tests of milk according to the dairy requirements 2. Carried out chemical tests of milk according to the dairy requirements 3. Carried out microbial tests of milk according to the dairy requirements 4. Monitored pasteurization parameters as per pasteurization requirements 5. Maintained pasteurization records as per workplace procedure 6. Fermented pasteurized milk according to product specifications 7. Packed fermented products according to product specifications 8. Froze aerated ice-cream mix according to product specifications 9. Concentrated pasteurized milk according to concentrated milk product procedures 10. Analysed concentrated milk products according to product specifications 11. Packaged Concentrated milk products according to product specifications |
| 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. Methods of assessment | Competency in this unit may be assessed through:   1. Practical assessment 2. Oral assessment 3. Portfolio of evidence 4. Third party report 5. Written tests |
| 1. Context of assessment | Competency may be assessed in:   * 1. Work place   2. Simulated workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended |

## APPLY FOOD PROCESSING AND PRESERVATION PRINCIPLES

**ISCED UNIT CODE:** 0721 451 08A

**UNIT DESCRIPTION**

This unit specifies the competencies required to apply food processing and preservation principles. It involves performing thermal preservations, performing food dehydrations and performing chemical preservations.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **Elements**  These describe the key outcomes which make up workplace function. | **Performance Criteria**  These are assessablestatements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| 1. Perform food fermentations | * 1. Fermentation equipment are assembled as per work place procedures   2. Food materials are assembled according to workplace procedures   3. ***Fermentation*** is performed according to product specifications |
| 1. Perform food dehydrations | * 1. Dehydration equipment are assembled as per work place procedures   2. Food materialsare assembled according to workplace procedures   3. ***Dehydration*** is performed according to product specifications |
| 1. Perform chemical preservations | * 1. Equipment is assembled as per work place procedures   2. Food materials and ingredients are assembled according to workplace procedures   3. ***Chemical preservation*** is performed according to product specifications |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| * + 1. Fermentation may include but not limited to: | * Pickling * Sauerkraut making * Yoghurt making * Bread making |
| * + 1. Dehydration may include but not limited to: | * Sun drying * Oven drying * Freeze drying * Smoking * Salting * Concentration |
| * + 1. Chemical preservation may include but not limited to: | * Curing * Use of chemical preservatives * Use of preservative agents |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency.

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Food engineering
* Food analysis
* Food microbiology
* Food quality management
* Regulatory requirements for food processing
* Food Packaging principles
* Principles of food preservation

**Required skills**

The individual needs to demonstrate the following skills:

* Communication
* Analytical
* Raw material and product sampling
* Tools and equipment handling
* Chemical substances handling and storage
* Digital literacy
* Team work

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| * + - 1. Critical aspects of competency | Assessment requires evidence that the candidate:   1. Assembled food materials and ingredients according to workplace procedures 2. Performed fermentation according to product specifications 3. Performed dehydration according to product specifications 4. Performed chemical preservation according to product specifications |
| * + - 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| * + - 1. Methods of assessment | Competency in this unit may be assessed through:   * 1. Practical assessment   2. Oral assessment   3. Portfolio of evidence   4. Third party report   5. Written tests |
| * + - 1. Context of assessment | Competency may be assessed in:   * 1. Workplace   2. Simulated workplace |
| * + - 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

## PROCESS FRUITS AND VEGETABLES PRODUCTS

**ISCED UNIT CODE: 0721 451 09A**

**UNIT DESCRIPTION**

This unit specifies the competencies required to process fruits and vegetables products. It involves processing tomato products, fruit products, vegetable products, root and tuber products.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **Elements**  These describe the **key outcomes** which make up **workplace function** | **Performance Criteria**  These are **assessable** statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range*** |
| 1. Process tomato products | * 1. Tomato processing equipment are assembled according to the workplace procedures   2. Tomatoes are preparedfor processing according to the workplace procedures   3. ***Tomato products*** are processed according to product specifications   4. Tomato products are analysed according to product specifications   5. Tomato products are packaged according to product specifications |
| 1. Process fruit products | * 1. Fruit processing equipment are assembled as per work place procedure   2. Fruits are preparedfor processing according to workplace procedure   2.3 ***Fruit products*** are processed according to product specifications   * 1. Fruit products are analysed according to product specifications   2. Fruit’s products are packaged according to product specifications |
| 1. Process vegetable products | * 1. Vegetable processing equipment are assembled as per work place procedures   2. Vegetable ingredients are assembled as per work place procedures   3. ***Vegetable products*** are processed according to product specifications   4. Vegetable products are analysed according to product specifications   5. Vegetable products are packaged according to product specifications |
| 1. Process roots and tuber products | * 1. Roots and tubers processing equipment are assembled as per work place procedures   2. Roots and tubers ingredients are assembled as per work place procedures   3. ***Roots and tuber products*** are processed according to product specifications   4. Roots and tuber products are analysed according to product specifications   5. Roots and tuber products are packaged according to product specifications |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Tomato products may include but not limited to: | * Ketchup * Paste * Juice * Jam * Jelly * Tomato sauce |
| 1. Fruit products may include but not limited to: | * Juices * Nectar * Jam * Jelly * Marmalade |
| 1. Vegetable products may include but not limited to: | * Sauerkraut * Pickles * Juice |
| 1. Roots and tuber products may include but not limited to: | * Crisps * Chips * starch |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency.

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Food microbiology
* Food engineering
* Fruits and vegetables technology
* Food Quality Management Systems
* Regulatory requirements
* Principles of food Processing and preservation
* Waste management

**Required skills**

The individual needs to demonstrate the following skills:

* Communication
* Planning
* Analytical
* Sampling of fruits and vegetables
* Tools and equipment handling
* Numeracy skills
* Team work
* Critical thinking
* Report writing

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| 1.Critical aspects of competency | Assessment requires evidence that the candidate:   1. Processed tomato products according to product specifications 2. Packaged tomato products according to product specifications 3. Processed fruit products according to product specifications 4. Packaged fruit products according to product specifications 5. Processed vegetable products according to product specifications 6. Packaged vegetable products according to product specifications |
| 2.Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 3.Methods of assessment | Competency in this unit may be assessed through:   * 1. Practical assessment   2. Oral assessment   3. Portfolio of evidence   4. Project   5. Third party report   6. Written tests |
| 4.Context of assessment | Competency may be assessed in:   * 1. Workplace   2. Simulated workplace |
| 5.Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

## PROCESS BAKED PRODUCTS

**ISCED UNIT CODE: 0721 451 10A**

**UNIT DESCRIPTION**

This unit specifies the competencies required to process baked products. It involves baking bread, cakes and biscuits.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **Elements**  These describe the key outcomes which make up workplace function. | **Performance Criteria**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range*** |
| 1. Bake bread | * 1. Bread baking equipment are assembled as per work place procedures   2. Bread ***ingredients*** are prepared for processing according to workplace procedures   3. Bread is processed according to products specifications   4. Bread is analysed according to products specifications   5. Bread is packaged according to product specifications |
| 1. Bake cakes | * 1. Cake baking equipment are assembled as per work place procedure   2. Cake ingredients are prepared for processing according to workplace procedure   3. ***Cakes*** are processed according to products specifications   4. Cake is analysed according to products specifications   5. Cake is packaged according to products specifications |
| 1. Bake biscuits | * 1. Biscuit baking equipment are assembled as per work place procedure   2. Biscuit ingredients are prepared for processing according to workplace procedure   3. Biscuit is processed according to the products specifications   4. Biscuit is analysed according to products specifications   5. Biscuit is packaged according to products specifications |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Ingredients may include but not limited to: | * Wheat flour * Sugar * Salt * Eggs * Flavours * Water * Milk * Fat |
| 1. Cakes may include but not limited to: | * Queen cakes * Madeiras * Sponge cakes * Cream blocks |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency.

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Food engineering
* Principles of food processing and preservation
* Food microbiology
* Baking technology
* Food Quality management
* Regulatory requirements

**Required skills**

The individual needs to demonstrate the following skills:

* Communication
* Digital
* Problem solving
* Record keeping
* Analytical
* Tools and equipment handling
* Team work

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Processed bread according to product specifications   2. Packaged bread according to product specifications   3. Processed cakes according to product specifications   4. Packaged cakes according to product specifications   5. Processed biscuits according to product specifications   6. Packaged biscuits according to product specifications |
| 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. Methods of assessment | Competency in this unit may be assessed through:   1. Practical assessment 2. Oral assessment 3. Portfolio of evidence 4. Third party report 5. Written tests |
| 1. Context of assessment | Competency may be assessed in:   * 1. Work place   2. Simulated workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended |

## PERFORM FOOD LABORATORY PRACTICES

**ISCED UNIT CODE: 0721 451 11A**

**UNIT DESCRIPTION**

This unit covers the competencies required to perform standard laboratory practices. It involves performing laboratory safety procedures, implementing OSH programs, preparing laboratory reagents and carrying out food microbiological test.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  **These describe the key outcomes which make up workplace function (to be stated in active)** | **PERFORMANCE CRITERIA**  **These are assessable statements which specify the required level of performance for each of the elements (to be stated in passive voice)**  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Perform laboratory safety procedure | 1. ***Personal Protective Equipment*** (PPE) is donned as per work requirement 2. *Hazards* in the workplace are identified based on their *indicators.* 3. ***Risk assessments***are conducted according to the likelihood and severity. 4. Laboratory hazard and riskare controlled based on laboratory safety procedures 5. ***Laboratory waste***is disposed as per workplace requirement 6. Develop***emergency response procedures and preparedness***as per OSHA. 7. Maintain records of hazards, risk assessments and control measures as per legal requirement |
| 1. Implement OSH programs | * 1. Company OSH program is identified, evaluated and reviewed as per legal requirements   2. Company OSH programs are implemented as per OSHA 2007   3. Workers are capacity built on OSH standards and procedures as per legal requirements   4. ***OSH-related records*** are maintained as per legal requirements |
| 1. Prepare laboratory reagents | * 1. Personal protective equipment is donned as per work requirement   2. Laboratory reagents and apparatus are assembled as per work requirement   3. Laboratory reagents standardization is carried out as per work requirement |
| 1. Carry out food microbiological test | * 1. Apparatus and equipment are sterilized as per laboratory manual procedure   2. Culture media is prepared as per manufacturer’s specification   3. Food sample is cultured as per work place procedures   4. Microbial results are interpreted and documented as per work requirement |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **VARIABLE** | **RANGE** |
| 1. Personal Protective Equipment include but not limited to: | * Lab coats * Gloves * Hair nets * Masks |
| 1. Hazards may include but not limited to: | * Chemical * Biological * Physical * Safety |
| 1. Indicators may include but are not limited to: | * Increased incidents of accidents, injuries * Increased occurrence of sickness or health complaints/ symptoms * Common complaints of workers related to OSH * High absenteeism for work-related reasons |
| 1. Risk assessments may include but are not limited to: | * Health Audit * Safety Audit * Work Safety and Health Evaluation * Work Environment Measurements of Physical and Chemical Hazards |
| 1. Laboratory waste include but not limited to: | * Glassware * Food samples * Gloves * Chemicals |
| 1. Emergency procedures and preparedness may include but are not limited to: | * 1. Fire drill   2. Earthquake drill   3. Basic life support   4. First aid   5. Spillage control   6. Decontamination of chemical and toxic   7. Disaster preparedness/management   8. Use of fire-extinguisher |
| 1. OSH-related Records may include but are not limited to: | * 1. Medical/Health records   2. Incident/accident reports   3. Sickness notifications/sick leave application   4. OSH-related trainings obtained |
| 1. Laboratory reagent includes but not limited to: | * 1. Acids   2. Bases   3. Salts   4. Indicators   5. Distilled water |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the skills and knowledge required for this unit of competency.

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Food analysis
* Food chemistry
* Food microbiology
* Laboratory techniques
* Regulatory requirements
* Food quality audit
* Waste management
* General OSH principles
* OSHA 2007

**Required Skills**

The individual needs to demonstrate the following skills:

* Skills on preliminary identification of workplace hazards/risks
* Computer application
* Troubleshooting
* Coordinating
* Report writing
* Analytical
* First aid
* Communication
* Observation
* Critical thinking
* Presentation

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   * 1. Donned personal protective equipment (PPE) as per work requirement   2. Identified Hazards in the workplace based on their indicators   3. Implemented company OSH programs are implemented OSHA 2007   4. Controlled laboratory hazard and risk based on laboratory safety procedures   5. Carried out laboratory reagents standardization as per work requirement   6. Cultured food sample as per work place procedures   7. Interpreted and documented microbial results as per work requirement |
| 1. Resource Implications | The following resources should be provided   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Practical assessment   2. Oral assessment   3. Portfolio of evidence   4. Third party report   5. Written tests |
| 1. Context of Assessment | Competency in this unit may be assessed in;   * 1. Work place   2. Simulated workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended |

## PROCESS CONFECTIONERIES

**ISCED UNIT CODE: 0721 451 12A**

**UNIT DESCRIPTION:**

This unit specifies the competencies required to process confectioneries. It involves processing candies, highly boiled sweets and fondants.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **Elements**  **These describe the key outcomes which make up workplace function.** | **Performance Criteria**  **These are assessable statements which specify the required level of performance for each of the elements**  ***Bold and italicized terms are elaborated in the range*** |
| 1. Process candies | * 1. Candies***ingredients*** are assembled according to workplace procedures   2. Candies are processed according to product specifications   3. Candies are analysed according to product specifications   4. Candies are packaged according to product specifications |
| 1. Process high boiled sweets | * 1. High boiled sweets ingredients are assembled according to workplace procedures   2. High boiled sweets are processed according to product specifications   3. High boiled sweets are analysed according to product specifications   4. High boiled sweets are packaged according to product specifications |
| 1. Process fondants | * 1. Fondants ingredients are assembled according to workplace procedures   2. Fondants are processed according to product specifications   3. Fondants are analysed according to product specifications   4. Fondants are packaged according to product specifications |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| * + - 1. Ingredientsmay include but not limited to; | * Water * Sugar * Colour * Flavour |

**EQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency

Required knowledge

The individual needs to demonstrate knowledge of:

* Food engineering
* Food chemistry
* Food microbiology
* Sugar technology
* Food quality management system
* Food processing and preservation
* Regulatory requirements

**Required skills**

The individual needs to demonstrate the following skills:

* Communication
* Team work
* Numeracy
* Problem solving
* Analytical
* Tools and equipment handling

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Processed candies ingredients according to product specifications   2. Packaged candies according to product specification   3. Processed high boiled sweets according to product specifications   4. Packaged high boiled sweets according to product specification   5. Fondants are processed according to product specifications   6. Packaged fondants according to product specifications |
| 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. Methods of assessment | Competency in this unit may be assessed through:   1. Practical assessment 2. Oral assessment 3. Portfolio of evidence 4. Third party report 5. Written tests |
| 1. Context of assessment | Competency may be assessed in:   * 1. Work place   2. Simulated workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended |

## PROCESS MEAT PRODUCTS

**ISCED UNIT CODE: 0721 451 13A**

**UNIT DESCRIPTION**

This unit specifies the competencies required to process meat products. It involves processing beef, fish and poultry products.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **Elements**  These describe the **key outcomes** which make up **workplace function**. | **Performance Criteria**  These are **assessable** statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| 1. Process beef products | 1. Animal is slaughtered according to workplace procedures 2. Beef processing equipment are assembled as per workplace procedures 3. Beef processing ingredients are assembled as per workplace procedure 4. Beef is prepared according to beef processing procedures 5. ***Beef products*** are processed according to product specifications 6. Beef products are analysed according to product specifications 7. Beef products are packaged according to product specifications |
| 2. Process fish products | * 1. Fish is acquired according work place procedures   2. Fish processing equipment are assembled as per workplace procedures   3. Fish processing ingredients are assembled as per workplace procedures   4. Fish is prepared according to fish processing procedures   5. ***Fish products*** are processed according to product specification   6. Fish products are analysed according to product specifications   7. Fish products are packaged according to product specifications |
| 3. Process poultry products | * 1. Poultry is slaughtered according work place procedures   2. Poultry processing equipment are assembled as per workplace procedures   3. Poultry processing ingredients are assembled as per workplace procedures   4. Poultry is prepared according to workplace procedures   5. ***Poultry products*** are processed according to product specifications   6. Poultry products are analysed according to product specifications   7. Poultry products are packaged according to product specifications |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Beef products may include but not limited to: | * Sausages * Meat loaf * Meat ham * Frankfurters * Meat burgers * Biltong meats |
| 1. Fish products may include but not limited to: | * Fillets * Fish balls * Fish kebabs |
| 1. Poultry products may include but not limited to: | * Eggs * Poultry meat * Chicken meat ball * Chicken ham |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency.

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Food engineering
* Food analysis
* Food microbiology
* Food quality management system
* Technology of meat products
* Regulatory requirements
* Principles of food processing and preservation

**Required skills**

The individual needs to demonstrate the following skills:

* Communication
* Planning
* Problem solving
* Microbiological and chemical analysis
* Raw material and product sampling
* Tools and equipment handling
* Team work

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   1. Processed beef products according to product specifications 2. Packaged beef products according to product specifications 3. Processed fish products according to product specifications 4. Packaged fish products according to product specifications 5. Processed poultry products according to product specifications 6. Packaged poultry products according to product specifications |
| 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. Methods of assessment | Competency in this unit may be assessed through:   1. Practical assessment 2. Oral assessment 3. Portfolio of evidence 4. Project 5. Third party report 6. Written tests |
| 1. Context of assessment | Competency may be assessed in:   * 1. Workplace   2. Simulated workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

# PERFORM STANDARD FOOD LABORATORY TECHNIQUES

**UNIT CODE: 0721 551 14A**

**UNIT DESCRIPTION**

This unit specifies the competencies required to perform standard laboratory practices. It involves carrying out biochemical tests, carrying out instrumental analysis, and carrying out proximate analysis.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the **key outcomes** which make up workplace function (to be stated in active) | **PERFORMANCE CRITERIA**  These are **assessable statements** which specify the required level of performance for each of the elements (to be stated in passive voice)  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Carry-out biochemical tests | 1.1 Carry out Catalase Test as per laboratory manual  1.2 Carry out Oxidase Test as per laboratory manual  1.3 Carry out Nitrate Reduction Test as per laboratory manual  1.4 Carry out Triple Sugar Ion (TSI) Test as per laboratory manual  1.5 Carry out Methyl Red and Vogus Proskauer (MRVP) Test as per laboratory manual  1.6 Carry out Coagulase Test as per laboratory manual  1.7 Carry out Urease Test as per laboratory manual  1.8 Carry out Carbohydrate fermentation test as per laboratory manual |
| 1. Carry out instrumental analysis test | 2.1 Perform Spectrophotometry analysis as per workplace procedures  2.2 Carryout Chromatography tests as per workplace procedures  2.3 Carryout Refractometry test as per workplace procedures  2.4 Carryout Polarimetry as per workplace procedures  2.5 Carryout Rheological test as per workplace procedures  2.6 Carryout Densimetry as per workplace procedures |
| 1. Carry out proximate analysis | 3.1 Apparatus and equipment are assembled as per work place procedure  3.2 Food sample is prepared as per method specification  ***3.3 Proximate analysis*** is carried out as per work place procedures  3.4 Proximate analysis results are interpreted and documented as per work requirement |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **VARIABLE** | **RANGE** |
| 1. Personal Protective Equipment include but not limited to: | 1. Lab coats 2. Gloves 3. Hair nets 4. Masks |
| 1. Hazards may include but not limited to: | * 1. Chemical   2. Biological   3. Physical   4. Safety |
| 1. Spectroscopy may include but not limited to: | 2.1.1 Atomic Absorption spectrophotometry  2.1.2 Flame photometry  2.1.3 Colorimetry  2.1.4 UV spectrophotometry |
| 1. Indicators may include but are not limited to: | * 1. Increased incidents of accidents, injuries   2. Increased occurrence of sickness or health complaints/ symptoms   3. Common complaints of workers related to OSH   4. High absenteeism for work-related reasons |
| 1. Risk assessments may include but are not limited to: | * 1. Health Audit   2. Safety Audit   3. Work Safety and Health Evaluation   4. Work Environment Measurements of Physical and Chemical Hazards |
| 1. Laboratory waste include but not limited to: | * 1. Glassware   2. Food samples   3. Gloves   4. Chemicals |
| 1. Emergency procedures and preparedness may include but are not limited to: | * 1. Fire drill   2. Earthquake drill   3. Basic life support   4. First aid   5. Spillage control   6. Decontamination of chemical and toxic   7. Disaster preparedness/management   8. Use of fire-extinguisher |
| 1. OSH-related Records may include but are not limited to: | * 1. Medical/Health records   2. Incident/accident reports   3. Sickness notifications/sick leave application   4. OSH-related trainings obtained |
| 1. Laboratory reagent includes but not limited to: | * 1. Acids   2. Bases   3. Salts   4. Indicators   5. Distilled water |
| 1. Proximate analysis includes but not limited to: | * 1. Ash   2. Water   3. Protein   4. Lipids   5. Crude Fibre |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Skills on preliminary identification of workplace hazards/risks
* Computer application
* Troubleshooting
* Coordinating
* Report writing
* Analytical
* First aid
* Communication
* Observation
* Critical thinking
* Presentation

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Food analysis
* Food chemistry
* Food microbiology
* Laboratory techniques
* Regulatory requirements
* Food quality audit
* Waste management
* General OSH principles
* OSHA 2007

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   * 1. Donned personal protective equipment (PPE) as per work requirement   2. Carried-out biochemical tests as per lab manual   3. Identified ***Hazards*** in the workplace based on their ***indicators***   4. Controlled laboratory hazard and risk based on laboratory safety procedures   5. Interpreted and documented instrumental analysis results as per work requirement   6. Carried out proximate analysis is as per work place procedures |
| 1. Resource Implications | The following resources should be provided   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Practical test   2. Portfolio of evidence   3. Written tests   4. Third party report   5. Oral questioning |
| 1. Context of Assessment | Competency in this unit may be assessed in;   * 1. Work place   2. Simulated workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended |

# APPLY FOOD PROCESSING AND PRESERVATION PRINCIPLES

**UNIT CODE:** 0721 551 15A

**UNIT DESCRIPTION**

This unit specifies the competencies required to apply food processing and preservation principles. It involves performing thermal preservations, performing food dehydrations and performing chemical preservations.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **Elements**  These describe the key outcomes which make up workplace function. | **Performance Criteria**  These are assessablestatements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| 1. Perform thermal preservations | * 1. Food is grouped based on the PH level   2. Food is grouped based on nutritive profile   3. Microorganisms are identified based on the food groups   4. ***Thermal preservation*** is carried out as per product specifications |
| 1. Perform Unit operations | * 1. Filtration and membrane separation equipment are assembled as per work place procedures   2. Filtration and membrane separation is carried out as per workplace procedures   3. Evaporation equipment is assembled as per work place procedures   4. Evaporation is carried out as per workplace procedures   5. Mixing equipment is assembled as per work place procedures   6. Mixing is carried out as per workplace procedures   7. Centrifugation equipment is assembled as per work place procedures   8. Centrifugation is carried out as per workplace procedures   9. Emulsification is carried out as per workplace procedures   10. Solid liquid extraction equipment is assembled as per work place procedures   11. Solid -liquid extraction is carried out as per workplace procedures   12. Size reduction is carried out as per workplace procedures |
| 1. Perform Food preservation principles | * 1. Pickling is carried out as per workplace procedures   2. Salting is carried out as per workplace procedures   3. ***Chemical preservation*** is carried out as per workplace procedures   4. Vacuum sealing is carried out as per workplace procedures   5. Irradiation is carried out as per workplace procedures   6. Smoking is carried out as per workplace procedures   7. ***Dehydration*** is carried out as per workplace procedures |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Thermal preservation may include but not limited to: | * 1. Blanching   2. Retorting   3. Pasteurization   4. Evaporation   5. Freezing   6. Sublimation |
| 2. Fermentation may include but not limited to: | * 1. Pickling   2. Sauerkraut making   3. Yoghurt making   4. Bread making |
| 3. Dehydration may include but not limited to: | * 1. Sun drying   2. Oven drying   3. Freeze drying   4. Smoking   5. Salting   6. Concentration |
| 4. Chemical preservation may include but not limited to: | * 1. Curing   2. Use of chemical preservatives   3. Use of preservative agents |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency.

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Food engineering
* Food analysis
* Food microbiology
* Food quality management
* Regulatory requirements for food processing
* Food Packaging principles
* Principles of food preservation

**Required skills**

The individual needs to demonstrate the following skills:

* Communication
* Analytical
* Raw material and product sampling
* Tools and equipment handling
* Chemical substances handling and storage
* Digital literacy
* Team work

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| 1.Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Grouped foods based on the PH level   2. Identified microorganisms based on food groups   3. Carried out thermal preservation as per product specifications   4. Assembled food materials and ingredients according to workplace procedures   5. Performed fermentation according to product specifications   6. Performed dehydration according to product specifications   7. Performed chemical preservation according to product specifications |
| 2.Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 3.Methods of assessment | Competency in this unit may be assessed through:   * 1. Practical assessment   2. Oral assessment   3. Portfolio of evidence   4. Third party report   5. Written tests |
| 4.Context of assessment | Competency may be assessed in:   * 1. Workplace   2. Simulated workplace   3. Food workshop |
| 5.Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

# PROCESS BEVERAGE PRODUCTS

**UNIT CODE: 0721 551 16A**

**UNIT DESCRIPTION:**

This unit specifies the competencies required to process beverage products. It involves processing alcoholic beverages, non- alcoholic beverages and carbonated soft drinks

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **Elements**  These describe the **key outcomes** which make up **workplace function**. | **Performance Criteria**  These are **assessable** statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| 1. Process alcoholic beverages | 1. ***Alcoholic beverages ingredients*** are assembled as per the work place procedures 2. Ingredients are sorted according to workplace procedures 3. ***Alcoholic beverages*** are processed according to product specifications 4. Alcoholic beverages are analysed according to product specifications 5. Processed beverage is packaged according to product specifications |
| 1. Process non- alcoholic beverages | * 1. Non-alcoholic raw materials are received according to workplace procedures   2. ***Non-alcoholic beverages*** are processed according to product specifications   3. Non-alcoholic beverages are analysed according to product specifications   4. Non-alcoholic beverage is packaged according to product specifications |
| 1. Process carbonated soft drinks | 3.1 Ingredients are assembled according to workplace procedures  3.2 Ingredients are mixed according to workplace procedures  3.3 The mixture is carbonated according to product specifications  3.4 ***Carbonated soft drinks*** are analyzed according to product specifications  3.5 Carbonated soft drinks are packaged according to product specifications |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1.Alcoholic beverages may include but not limited to: | 1. Beer 2. Wine 3. Spirits |
| 2 Alcoholic beverage ingredients may include but not limited to: | 1. Yeast 2. Water 3. Malted barley 4. Hops 5. Fruits 6. Sugar |
| 3. Non-alcoholic beverages may include but not limited to: | 1. Tea 2. Coffee 3. Cocoa |
| 4. Carbonated soft drinks may include but not limited to: | 1. Sodas 2. Energy drinks |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency.

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Food engineering
* Food analysis
* Food microbiology
* Beverage technology
* Food Quality Management Systems
* Regulatory requirements
* Principles of food processing and preservation
* Waste management

**Required skills**

The individual needs to demonstrate the following skills:

* Communication
* Analytical
* Beverage sampling
* Tools and equipment handling
* Planning
* Problem solving
* Team work

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| 1.Critical aspects of competency | Assessment requires evidence that the candidate:  1.1 Sorted ingredients according to workplace procedures  1.2 Processednon-alcoholic beverages according to product specifications  1.3 Carbonate mixture according to product specifications  1.4 Analyzedcarbonated soft drinks according to product specifications  1.5 Packaged Carbonated soft drinks are according product specifications |
| 2.Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 3.Methods of assessment | Competency in this unit may be assessed through:   1. Practical assessment 2. Oral assessment 3. Portfolio of evidence 4. Project 5. Third party report 6. Written tests |
| 4.Context of assessment | Competency may be assessed in:  4.1 Workplace  4.2 Simulated workplace |
| 5.Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

# PROCESS MEAT PRODUCTS

**UNIT CODE: 0721 551 17A**

**UNIT DESCRIPTION**

This unit specifies the competencies required to processmeat products. It involves processing of beef products, fish, poultry and shoat products.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **Elements**  These describe the **key outcomes** which make up **workplace function**. | **Performance Criteria**  These are **assessable** statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| 1. Animal slaughter procedure and meat inspection | * 1. Animal is acquired according to workplace procedures   2. Animal is slaughtered according to ***animal slaughter procedure***   3. Postmortem changes   4. Meat quality is analysed according to product specifications |
| 2. Process fish products | * 1. Fish is acquired according work place procedures   2. Fish processing equipment are assembled as per workplace procedures   3. Fish processing ingredients are assembled as per workplace procedures   4. Fish is prepared according to fish processing procedures   5. ***Fish products*** are processed according to product specification   6. Fish products are analysed according to product specifications   7. Fish products are packaged according to product specifications |
| 2. Process pork products | * 1. Pork is slaughtered according to work place procedures   2. Pork processing equipment are assembled as per workplace procedures   3. Pork processing ingredients are assembled as per workplace procedures   4. Pork is prepared according to workplace procedures   5. ***Pork products*** are processed according to product specifications   6. Pork products are analysed according to product specifications   7. Pork products are packaged according to product specifications |
| 1. Process shoat products | * 1. ***Shoat*** is slaughtered according work place procedures   2. Shoat processing equipment are assembled as per work place procedures   3. Shoat processing ingredients are assembled as per work place procedures   4. Shoat is prepared according to workplace procedures   5. ***Shoat products*** are processed according to product specifications   6. Shoat products are analysed according to product specifications   7. Shoat products are packaged according to product specifications |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Animal slaughter procedure may include but not limited to: | * 1. Pre-slaughter handling,   2. Stunning and bleeding techniques,   3. Evisceration,   4. Carcass processing |
| 1. Meat quality may include but not limited to: | * 1. Meat colour   2. Juiciness of meat   3. Marbling fat content   4. Meat tenderness   5. Meat inspection |
| 1. Poultry products may include but not limited to: | 1. Ham 2. Bacon 3. Sausages |
| 1. Shoat | * 1. Sheep   2. Goat |
| 1. Shoat products | * 1. Mutton   2. Chevon   3. Frankfurters   4. Dry fermented sausages |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency.

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Food engineering
* Food analysis
* Food microbiology
* Food quality management system
* Technology of meat products
* Regulatory requirements
* Principles of food processing and preservation

**Required skills**

The individual needs to demonstrate the following skills:

* Communication
* Planning
* Problem solving
* Microbiological and chemical analysis
* Raw material and product sampling
* Tools and equipment handling
* Team work

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   1. Processed beef products according to product specifications 2. Packaged beef products according to product specifications 3. Processed fish products according to product specifications 4. Packaged fish products according to product specifications 5. Processed poultry products according to product specifications 6. Packaged poultry products according to product specifications 7. Processed shoat products according to product specifications 8. Packaged shoat products according to product specifications |
| 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. Methods of assessment | Competency in this unit may be assessed through:   1. Practical assessment 2. Oral assessment 3. Portfolio of evidence 4. Project 5. Third party report 6. Written tests |
| 4.Context of assessment | Competency may be assessed in:   * 1. Workplace   2. Simulated workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

# PROCESS CEREAL PRODUCTS

**UNIT CODE: 0721 551 18A**

**UNIT DESCRIPTION**

This unit specifies the competencies required to processcereal products. It involves milling cereals, processing baked products, pasta and cereal snacks.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **Elements**  These describe the **key outcomes** which make up **workplace function**. | **Performance Criteria**  These are **assessable** statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range*** |
| 1. Mill cereals | 1. Cereal milling equipment are assembled as per work place procedures 2. ***Cereals*** are tested according to product specifications 3. Cereals are prepared according to workplace procedures 4. Cereals are weighed as per product formulations 5. Cereals are milledaccording to product specifications 6. Flour is analyzed according to product specifications 7. Cereal products are packaged according to product specifications |
| 2. Process baked products | * 1. Baking equipment are assembled as per work place procedures   2. ***Baking ingredients*** are assembled according to baking procedure   3. Baking ingredients are mixed according to baking procedure   4. Dough is baked according to baking procedure   5. ***Baked******products*** are cooled according baking procedure   6. Baked products are analyzed according to baked product specifications   7. Baked products are packaged according to product specifications |
| 3. Process pasta products | * 1. Pasta processing equipment are assembled as per work place procedures   2. Pasta ingredients are assembled as per work place procedures   3. Pasta ingredients are mixed according as per product specifications   4. ***Pasta products*** are processed according as per product specifications   5. Pasta products are analyzed as per product specifications   6. Pasta products are packaged according to product specifications |
| 4. Process cereal snacks | 4.1Cereal snacks processing equipment are assembled as per work place procedures  4.2Cereal ingredients are assembled according to work place procedures  4.3Ingredients are mixed according to product specifications  4.4Cereals snacks are processed according to product specifications  4.5Cereals snacks are analyzed according as per product specifications  4.6cereals snacks are packaged according to product specifications |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Baking ingredients may include but not limited to: | 1. Wheat Flour 2. Rice flour 3. Corn flour 4. Sugar 5. Yeast 6. Salt 7. Eggs 8. Flavor 9. Oats 10. Fat and oils 11. Water 12. Honey |
| 1. Baked products may include but not limited to: | 1. Bread 2. Cakes 3. Doughnuts 4. Buns 5. Cookies 6. Biscuits |
| 1. Pasta products may include but not limited to: | 1. Noodles 2. Spaghetti 3. Macaroni |
| 1. Cereal snacks may include but not limited to: | 1. Corn flakes 2. Granola 3. Puffed cereals |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency.

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Food engineering
* Food analysis
* Cereal technology
* Food microbiology
* Food Quality Management Systems
* Regulatory requirements
* Principles of food processing and preservation
* Waste management

**Required skills**

The individual needs to demonstrate the following skills:

* Communication
* Record keeping
* Analytical
* Cereal sampling
* Tools and equipment handling
* Planning
* Critical thinking
* Team work

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   1. Tested cereals according to workplace procedure 2. Milled **c**ereals according to product specifications 3. Packaged baked products according to product specifications 4. Processed pasta products according to pasta making procedures 5. Packaged pasta products according to product specifications 6. Processed cereal snacks according to product specifications 7. Packaged cereals snacks according to product specifications |
| 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. Methods of assessment | Competency in this unit may be assessed through:   1. Practical assessment 2. Oral assessment 3. Portfolio of evidence 4. Project 5. Third party report 6. Written tests |
| 1. Context of assessment | Competency may be assessed in:   * 1. Workplace   2. Simulated workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended |

**PROCESS FATS AND OILS**

**UNIT CODE: 0721 551 19A**

**UNIT DESCRIPTION**

This unit specifies the competencies required to process fats and oils. It involves extracting, refining, modifying processing edible lipids.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **Elements**  These describe the **key outcomes** which make up **workplace function**. | **Performance Criteria**  These are **assessable** statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| 1. Extract edible lipids | * 1. ***Lipid extraction equipment*** are assembled as per workplace procedures   2. ***Lipid sources*** are prepared for extraction as per workplace procedures   3. Lipids are extracted as per lipids extraction procedures |
| 1. Refine edible lipids | * 1. Extracted lipid are degummed as per workplace procedures   2. Degummed lipids are bleached as per product specifications   3. Bleached lipids are deodorized and degassed as per product specifications |
| 1. Modify edible lipids | * 1. Refined lipids are hydrogenated as per as per product specifications   2. Hydrogenated lipids are winterized as per product specifications   3. Winterized lipids are plasticized as per product specifications |
| 1. Process edible lipids | * 1. ***Lipid ingredients*** are assembled according to specific processing procedures   2. Lipid processing equipment are assembled as per workplace procedures   3. Ingredients are weighed as per product formulations   4. Edible lipids are processed as per product specifications   5. Edible lipids are analysed according to product specifications   6. Edible lipids are packaged according to product specifications |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Lipid extraction equipment may include but not limited to: | 1. Screw presses 2. Extraction vats 3. Hydraulic presses |
| 1. Lipid sources may include but not limited to: | 2.1 Animal  2.2 Plant |
| 1. Lipid ingredients | * 1. Water   2. Salt   3. Emulsifier   4. Lipids   5. Colorants   6. Flavourings |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency.

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Food engineering
* Food analysis
* Food microbiology
* Quality management
* Lipid technology
* Food Safety Management Systems
* Regulatory requirements
* Principles of food processing and preservation

**Required skills**

The individual needs to demonstrate the following skills:

* Communication
* Analytical
* Lipid sampling
* Tools and equipment handling
* Planning
* Report writing
* Critical thinking
* Team work

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| 1.Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Extracted lipids as per extraction procedures   2. Processed edible lipids as per product specifications   3. Analyzed edible lipids according to product specifications   4. Packaged edible lipids are according to product specifications |
| 2.Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 3.Methods of assessment | Competency in this unit may be assessed through:   * 1. Practical assessment   2. Oral assessment   3. Portfolio of evidence   4. Project   5. Third party report   6. Written tests |
| 4.Context of assessment | Competency may be assessed in:   * 1. Workplace   2. Simulated workplace |
| 5.Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended |

# PROCESS SUGAR

**UNIT CODE: 0721 551 20A**

**UNIT DESCRIPTION:** This unit specifies the competencies required to process sugar. It involves processing sugar from sugarcane, honey.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **Elements**  These describe the **key outcomes** which make up **workplace function**. | **Performance Criteria**  These are **assessable** statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| * + - 1. Process sugar from sugarcane | 1.1 Sugarcane is analysed according to product specifications  1.2 Sugarcane is milled as per product specifications   * 1. Sugarcane juice is treated and clarified as per product specifications |
| 1. Perform sugar refining | * 1. Sugarcane juice is evaporated as per product specifications   2. Sugarcane syrup is crystallized as per product specifications   3. Sugar crystals are dried as per product specifications   4. Sugar is analysed according as per product specifications   5. Sugar is packaged according to product specifications |
| 1. Process honey | * 1. Honey is warmed for extraction as per product specifications   2. Honey is concentrated as per product specifications   3. Honey is cooled as per product specifications   4. Honey is skimmed off as per product specifications   5. Honey is analysed as per product specifications   6. Honey is packaged according to product specification   7. Honey quality is assessed according to workplace procedures |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. 1. Sugar processing may include but not limited to: | * 1. Cane harvesting  1. Cane milling 2. Cane juice clarification 3. Cane juice evaporation 4. Sugar syrup crystallization 5. Centrifugation 6. Drying 7. Packaging 8. Sugar analysis |
| 2.Honey processing may include but not limited to: | * 1. Honey harvesting   2. Honey sorting   3. Extraction   4. Concentration   5. Cooling   6. Packaging   7. Honey product assessment |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency.

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Food engineering
* Sugar Technology
* Food microbiology
* Food quality Management Systems
* Regulatory requirements
* Principles of Food processing and preservation
* Waste management

**Required skills**

The individual needs to demonstrate the following skills:

* Communication
* Analytical
* Sugar and confectionery Sampling
* Tools and equipment handling
* Critical thinking
* Team work
* Problem solving
* Digital literacy

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   1. Analyzed sugarcane according product specifications 2. Crystallized sugarcane syrup as per product specifications 3. Packaged sugar according to product specifications 4. Assessed honey quality according to product specifications 5. Packaged honey is according to product specifications 6. Processed confectioneries according to product specifications 7. Packaged confectioneries according to product specifications |
| 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. Methods of assessment | Competency in this unit may be assessed through:   1. Practical assessment 2. Oral assessment 3. Portfolio of evidence 4. Project 5. Third party report 6. Written tests 7. Industrial Training |
| 1. Context of assessment | Competency may be assessed in:  4.1 Workplace  4.2 Simulated workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended |

# CONDUCT RESEARCH PROJECT

**UNIT CODE:** 0721 551 21A

**UNIT DESCRIPTION**

This unit specifies the competencies required to conduct food research. It involves identifying research problems, preparing research proposal and performing data collection.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **Elements**  These describe the **key outcomes** which make up **workplace function**. | **Performance Criteria**  These are **assessable** statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| 1. Identify Research Problem | * 1. ***Literature review*** is conducted based on research publications   2. Research gaps are identified as per literature review   3. Research problems are identified based on literature analysis |
| 1. Prepare research proposal | * 1. Research topic is identified as per current trends and development in the food industry   2. Project objectives are formulated in accordance to research topic   3. Project proposal is developed as per the workplace guidelines |
| 1. Perform Data Collection | * 1. ***Sources of data*** are identified as per research proposal   2. ***Data collection*** ***instruments*** are prepared as per research proposal   3. Data is collected as per research proposal   4. Data is analysed as per research proposal   5. Research report is prepared as per research guidelines |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Literature review may include but not limited to: | * 1. Narrative   2. Systematic   3. Integrative   4. Theoretical   5. Scoping |
| 2.Sources of data may include but not limited to: | * 1. Government publications   2. Surveys   3. Journals and papers   4. Websites   5. Industry associations   6. Case studies |
| 3. Data collection instruments may include but not limited to: | * 1. Questionnaires   2. Checklists   3. Rating scales   4. Hedonic scales   5. Interview schedules   6. Audio recorders   7. Data collection software |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency.

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Data collection methods
* Questionnaire design
* Report writing
* Sampling techniques
* Literature review
* Research design
* Data analysis
* Problem identification
* Types of research

**Required skills**

The individual needs to demonstrate the following skills:

* Communication
* Analytical
* Sampling
* Data collection
* Tools and equipment handling
* Report writing
* Statistical
* Interpersonal
* Team work

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| 1.Critical aspects of competency | Assessment requires evidence that the candidate:   1. Identified research problem based on literature analysis 2. Formulated project objectives in accordance to research topic 3. Developed project proposal as per workplace guidelines 4. Analysed data as per research proposal 5. Prepared research report as per research guidelines |
| 2.Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 3.Methods of assessment | Competency in this unit may be assessed through:   1. Written research Projects 2. Oral assessment 3. Portfolio of evidence 4. Third party report 5. Written tests |
| 4.Context of assessment | Competency may be assessed in:   * 1. Workplace   2. Simulated workplace |
| 5.Guidance information for assessment | 5.1 Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

# FOOD PROCESSING QUALITY ASSURANCE

**UNIT CODE:** 0721 551 22A

**UNIT DESCRIPTION**

This unit specifies the competencies required to perform food processing quality assurance. It involves implementing food safety and quality systems, performing quality inspections and audits, analyzing raw materials and food products as well as using resources sustainably.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **Elements**  These describe the **key outcomes** which make up **workplace function**. | **Performance Criteria**  These are assessablestatements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| 1. Implement food safety and quality systems | 1.1. ***Food safety and quality systems*** are designed as per ***regulatory requirements***  1.2. Food safety and quality systems are maintained as per regulatory requirements and workplace quality manual  1.3. Food safety and quality records are maintained according to regulatory requirement |
| 1. Perform quality inspections and audits | 2.1. Raw material is inspected as per product specifications  2.2. In- Process line is monitored as per workplace procedures  2.3. Food Product quality is analyzed as per product specifications  2.4. Product packaging is monitored as per workplace procedures  2.5 Product storage is inspected as per workplace procedures  2.6 Hand wash areas and wash rooms are inspected as per workplace procedures  2.7 Audit of production processes is carried out based on workplace procedures |
| 1. Analyse raw material and product | 3.1. Raw materials and product sampling is done according to ***sampling procedures***  3.2. Raw materials and product samples are prepared based on ***test procedures***  3.3. Testing reagents are prepared according to workplace procedures  3.4 Equipment are calibrated according to manufacturer’s specifications  3.5 Food sample is analyzed as per workplace procedures  3.6. Analysis results are interpreted and documented as per workplace procedures |
| 1. Use resources sustainably | * 1. Resource usage is monitored based on Article 69(2) of the Constitution of Kenya   2. ***Resource wastage*** ***minimization*** isperformedas per Article 69(2) of the Constitution of Kenya   3. ***Environmental conservation measures*** are applied as per EMCA 1999 |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Food safety and quality systems may include but not limited to: | * 1. HACCP Plan   2. GMP   3. HARPC   4. GHP |
| 2. Regulatory requirements may include but not limited to: | * 1. International standards e.g. ISO 22000:2015, ISO 9000: 2015 QMS, HALAL   2. National standards e.g., KEBS   3. Workplace standards   4. Rainforest Alliance   5. NEMA Regulations 2006   6. OSH Act, 2007   7. KEBS standards and specifications   8. Business permits   9. County Public Health Act (CAP. 242) |
| 3. Sampling procedure may include but not limited to: | * 1. Simple Random   2. Stratified   3. Systematic sampling   4. Clustered sampling |
| 4.Test procedures may include but not limited to: | * 1. Microbiological   2. Physical   3. Chemical   4. Organic   5. Organoleptic |
| 5.Resource wastage minimization may include but not limited to: | * 1. Resources reuse   2. Resources recycle   3. Quality control improvement   4. Process monitoring   5. Optimization of resources |
| 1. Environmental conservation measuresmay include but are not limited to: | * 1. Green energy technologies   2. Tree planting   3. Public awareness and sensitization   4. Waste management   5. Ecosystems conservation   6. Energy conservation |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency.

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Food engineering
* Food analysis
* Food microbiology
* Food quality systems
* Laboratory techniques
* Regulatory requirements
* Food quality audit
* Environmental literacy

**Required skills**

The individual needs to demonstrate the following skills:

* Planning
* Food sampling
* Analytical
* Apparatus handling
* Communication
* Critical thinking
* Trouble shooting
* Team work
* Report writing

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   1. Designed Food safety and quality systems as per regulatory requirements 2. Inspected raw material as per product specifications 3. Monitored In- Process line as per workplace procedures 4. Analysed Food Product quality as per product specifications 5. Carried out audit of production processes based on workplace procedures 6. Sampled according to the sampling procedures 7. Analysed Food sample as per workplace procedures 8. Performed resource wastage minimizationas per Article 69(2) of the Constitution of Kenya 9. Used resources sustainably 10. Maintained professional and personal development as per organizational procedures. 11. Applied Problem-solving skills based on work requirements. |
| 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. Methods of assessment | Competency in this unit may be assessed through:   * 1. Practical assessment   2. Oral assessment   3. Portfolio of evidence   4. Third party report   5. Written tests |
| 1. Context of assessment | Competency may be assessed in:   * 1. Workplace   2. Simulated workplace.   3. Industrial training |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEVELOP NEW FOOD PRODUCTS

**UNIT CODE**: **0721 551 23A**

**UNIT DESCRIPTION**

This unit specifies the competencies required to develop new food product. It involves generating new food product ideas, conducting new product feasibility studies, producing new food product prototype, analyzing new food product prototype, conducting new food product tests, introducing new food product, conducting competitor product analyses

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **Elements**  These describe the **key** outcomes which make up workplace function. | **Performance Criteria**  These are **assessable** statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| 1. Generate new food product ideas | 1. Generation of ideas is done according to market trends 2. Screening of ideas is carried out according to workplace procedures 3. Idea is selected according to workplace procedures |
| 1. Conduct new product feasibility studies | * 1. Feasibility study strategy is developed based on overall plant plan   2. Required resources are identified as per the developed feasibility study strategy   3. Budget is developed as per feasibility study strategy   4. Feasibility study is conducted as per developed feasibility strategy   5. Collected data is analysed based on workplace procedure |
| 1. Produce new food product Prototype | * 1. New product raw materials and ingredients are assembled based on workplace procedures   2. Production equipment is assembled as per workplace procedures   3. Product prototype is produced according to workplace procedures |
| 1. Analyse product prototype | * 1. Preparation for product analysis is carried out based on workplace procedures   2. Sensory evaluation is conducted according to workplace procedures   3. ***Product standards*** analysis are performed according to product specification   4. Product analysis results are recorded based on workplace procedures   5. New product is reformulated based on analysis results as per workplace procedures |
| 1. Conduct new food product test | * 1. New product ***laboratory tests*** are conducted as per product standards and legal requirements   2. New product is certified as per legal requirements   3. Product packaging is done based on the product specification   4. New product information, properties and process specifications are documented as per workplace procedures |
| 1. Introduce new product | * 1. New product patents are obtained as per legal requirements   2. New product commercialisation is carried out as per workplace procedures   3. New product ***quality monitoring framework*** is adhered to as per workplace procedures |
| 1. Conduct competitor product analysis | * 1. Competing products are identified according to the market demands   2. Consumer feedbacks are analysed according to the product performance in the market   3. Recommendations are made based on competing products analysis report   4. Follow up on product performance is conducted based on workplace procedures   5. Documentation of product performance is carried out based on workplace procedures |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Product analysis may include but not limited to: | * 1. Colour   2. Test   3. Texture   4. Flavour |
| 2. Laboratory tests may include but not limited to: | * 1. Raw material tests   2. In-process tests   3. End-products tests   4. Shelf-life   5. Trade sample tests   6. Non-conformance |
| 3. Quality monitoring framework may include but not limited to: | * 1. Parameters to be tested   2. Tests to be done   3. Testing frequency   4. Sampling method |

**REQUIRED KNOWLEDGE AND SKILLS**

This section describes the knowledge and skills required for this unit of competency.

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Food engineering
* Food chemistry
* Food analysis
* Food microbiology
* Basic research
* Food quality management systems
* Technology of specific products
* Principles of procurement
* Regulatory requirements
* Principles of food processing and preservation
* Competing product analyses
* Product marketing

**Required skills**

The individual needs to demonstrate the following skills:

* Communication
* Planning
* Data collection
* Tools and equipment handling
* Analytical
* Sampling
* Marketing
* Digital literacy
* Problem solving
* Team work
* Report writing

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   1. Selected the idea according to workplace procedures 2. Conducted feasibility study as per developed feasibility strategy 3. Produced product prototype according to workplace procedures 4. Performed product standards analysis according to product specification 5. Conducted new product laboratory tests as per product standards and legal requirements 6. Carried out new product commercialization as per workplace procedures 7. Analysed consumer feedbacks according to the product performance in the market |
| 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. Methods of assessment | Competency in this unit may be assessed through:   1. Practical assessment 2. Oral assessment 3. Portfolio of evidence 4. Project 5. Third party reports 6. Written tests 7. Written business plan report |
| 1. Context of assessment | Competency may be assessed in:   * 1. Workplace   2. Simulated workplace   3. Industrial training |
| 1. Guidance information for assessment | 5.1 Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |