

**REPUBLIC OF KENYA**

**NATIONAL OCCUPATIONAL STANDARDS**

**FOR**

**SWEET POTATO PRODUCTION AND PROCESSING TECHNICIAN**

**LEVEL 5**

****

TVET CDACC

P.O. BOX 15745-00100

NAIROBI

First published 2020

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# 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 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. The education sector had to be aligned to the Constitution of Kenya 2010 and this resulted to the formulation of the Policy Framework for Reforming Education and Training. 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, curriculum development be industry led, certification be based on demonstration of competence and mode of delivery allows for multiple entry and exit in TVET programmes.

These reforms demand that Industry takes a leading role in curriculum development to ensure the curriculum addresses its competence needs. It is against this background that these Occupational Standards were developed for the purpose of developing a competency-based curriculum for Sweet Potato Production and Processing Technician. These Occupational Standards will also be the basis for assessment of an individual for competence certification.

It is my conviction that these Occupational Standards will play a great role towards development of competent human resource for Sweet Potato sector’s growth and development.

**PRINCIPAL SECRETARY, VOCATIONAL AND TECHNICAL TRAINING**

**MINISTRY OF EDUCATION**

# PREFACE

Kenya’s 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. TVET has a responsibility of facilitating the process of inculcating knowledge, skills and attitudes necessary for catapulting the nation to a globally competitive country, hence the paradigm shift to embrace Competency Based Education and Training (CBET).

The Technical and Vocational Education and Training Act No. 29 of 2013 on Reforming Education and Training in Kenya, emphasized the need to reform curriculum development, assessment and certification. This called for a shift to CBET in order to address the mismatch between skills acquired through training and skills needed by industry as well as increase the global competitiveness of Kenyan labor force.

The TVET Curriculum Development, Assessment and Certification Council (TVET CDACC), in conjunction with Sweet Potato Sector Skills Advisory Committee (SSAC) have developed these Occupational Standards for Sweet potato Production and Processing Technician. These standards will be the basis for development of competency-based curriculum for Sweet potato Production and Processing Technician level 5.

The occupational standards are designed and organized with clear performance criteria for each element of a unit of competency. These standards also outline the required knowledge and skills as well as evidence guide.

I am grateful to the Council Members, Council Secretariat, Sweet Potato SSAC, expert workers and all those who participated in the development of these Occupational Standards.

**CHAIRPERSON, TVET CDACC**

# ACKNOWLEDGMENT

These Occupational Standards were developed through 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 inputs towards the development of these Standards.

I thank TVET Curriculum Development, Assessment and Certification Council (TVET CDACC) for providing guidance on the development of these Standards. My gratitude goes to Sweet potato Sector Skills Advisory Committee (SSAC) members for their contribution to the development of these Standards. I thank all the individuals and organizations who participated in the validation of these Standards.

I acknowledge all other institutions which in one way or another contributed to the development of these Standards.

**CHAIRPERSON**

**SWEET POTATO SECTOR SKILLS ADVISORY COMMITTEE**

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# ACRONYMS AND ABBREVIATIONS

A Control Version

AFA Agriculture and Food Authority

AGR Agriculture and Rural development

BC Basic Competency

CBET Competency-Based Education and Training

CDACC Curriculum Development, Assessment and Certification Council

CR Core Competency

CU Curriculum

EAS East African Standards

FSMS Food Safety Management System

GAP Good Agricultural Practice

GMP Good Manufacturing Practice

HACCP Hazard Analysis Critical Control Points

ICT Information communication technology

KEBS Kenya Bureau of Standards

KEPHIS Kenya Plant Health Inspectorate

NEMA National Environment Management Authority

OSH Occupational Safety and Health

SOPs Standard Operating Procedures

SPP Sweet Potato Production and Processing

SPVD Sweet Potato Virus Diseases

TVET Technical and Vocational Education and Training

WSR Warehousing and Receipting System

# KEY TO UNIT CODE

**AGR/OS/SPP/BC/01/5/A**

Industry or sector

Occupational Standards

Occupational area

Type of competency

Competency number

Competency level

Control version

# OVERVIEW

Sweet potato Production and Processing Technician Certificate level 5 qualification consists of competencies that a person must achieve to carry out farm planning and land preparation, produce sweet potato seed materials and roots. It also enables an individual to produce sweet potato puree, sweet potato flour, sweet potato crisps, dry sweet potato chips and to manage food safety and quality assurance.

The units of competency leading to Sweet potato Production and Processing Technician certificate Level 5 qualification include the following basic and core competencies:

**BASIC UNITS OF COMPETENCY**

|  |  |
| --- | --- |
| **Unit Code** | **Unit Title** |
| AGR/OS/SPP/BC/01/5/A | Demonstrate communication skills |
| AGR/OS/SPP/BC/02/5/A | Demonstrate numeracy skills |
| AGR/OS/SPP/BC/03/5/A | Demonstrate digital literacy |
| AGR/OS/SPP/BC/04/5/A | Demonstrate entrepreneurial skills |
| AGR/OS/SPP/BC/05/5/A | Demonstrate employability skills |
| AGR/OS/SPP/BC/06/5/A | Demonstrate environmental literacy |
| AGR/OS/SPP/BC/07/5/A | Demonstrate Occupational safety and health practices |

**CORE UNITS OF COMPETENCY**

|  |  |
| --- | --- |
| **Unit Code** | **Unit Title** |
| AGR/OS/SPP/CR/01/5/A | Carry out farm planning |
| AGR/OS/SPP/CR/02/5/A | Carry out land preparation |
| AGR/OS/SPP/CR/03/5/A | Produce sweet potato seed materials |
| AGR/OS/SPP/CR/04/5/A | Produce sweet potato roots |
| AGR/OS/SPP/CR/05/5/A | Produce sweet potato puree |
| AGR/OS/SPP/CR/06/5/A | Produce sweet potato flour |
| AGR/OS/SPP/CR/07/5/A | Produce sweet potato crisps |
| AGR/OS/SPP/CR/08/5/A | Produce dry sweet potato chips |
| AGR/OS/SPP/CR/09/5/A | Manage food safety and quality assurance |

# BASIC UNITS OF COMPETENCY

# DEMONSTRATE COMMUNICATION SKILLS

**UNIT CODE:** AGR/OS/SPP/BC/01/5/A

**UNIT DESCRIPTION**

This unit covers the competencies required to demonstrate communication skills. It involves meeting communication needs of clients and colleagues, contributing to the development of communication strategies, conducting workplace interviews, facilitating group discussions and representing the organization.

**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 the Range*** |
| 1. Meet communication needs of clients and colleagues | 1. Specific communication needs of clients and colleagues are identified and met based on workplace requirements 2. Different communication approaches are identified and applied according to clients’ needs 3. Conflict is identified and addressed as per the standards of the organization |
| 1. Contribute to the development of communication strategies | 1. Strategies for internal and external dissemination of information are developed, promoted, implemented and reviewed as per organizations’ strategic plan 2. Channels of communication are established and reviewed based on the workplace needs 3. Communication training needs are identified and provided according to SOPs 4. Work related network and relationship are maintained based on workplace requirements 5. Negotiation and conflict resolution strategies are maintained as per the workplace procedures |
| 1. Conduct workplace interviews | 1. ***Communication strategies*** are identified and employed in ***interview situations*** based on workplace requirements 2. Records of interviews are made and maintained in accordance with organizational procedures 3. Effective questioning, listening and nonverbal communication techniques are used based on needs |
| 1. Facilitate group discussions | 1. Mechanisms to enhance ***effective group interaction*** are identified and implemented according to workplace requirements 2. Strategies to encourage group participation are identified and used as per organizations’ procedures 3. Meetings objectives and agenda are set and followed based on workplace requirements 4. Relevant information is provided and feedback obtained according to set protocols 5. Evaluation of group communication strategies is undertaken in accordance with workplace guidelines 6. Specific communication needs of individuals are identified and addressed as per individual needs |
| 1. Represent the organization | 1. Relevant presentation are researched and presented based on internal or external communication forums requirements Presentation is delivered in a clear and sequential manner as per the predetermined time 2. Presentation is made as per appropriate media 3. Difference views are respected based on workplace procedures 4. Written communication is done as per organizational standards 5. Inquiries are responded according to organizational standard |

**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. Communication strategies may include but not limited to: | * Language switch * Comprehension check * Repetition * Asking confirmation * Paraphrase * Clarification request * Translation * Restructuring * Approximation * 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 * Openness and flexibility in communication |
| 1. Interview situations may include but not limited to: | * Establishing rapport * Eliciting facts and information * Facilitating resolution of issues * Developing action plans * Diffusing potentially difficult situations |

**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:

* Active listening
* Giving/receiving feedback
* Interpretation of information
* Role boundaries setting
* Negotiation
* Communication

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Communication process
* Dynamics of groups and different styles of group leadership
* Communication skills relevant to client groups
* Flexibility in communication

**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. Met communication needs of clients and colleagues 2. Contributed to the development of communication strategies 3. Conducted interviews 4. Facilitated group discussions 5. Represented the organization |
| 1. Resource Implications | The following resources should be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Observation 2. Oral questioning 3. Written test 4. Portfolio of Evidence 5. Interview 6. Third party report |
| 1. Context of Assessment | Competency may be assessed:   1. On the job 2. Off the job 3. During industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEMONSTRATE NUMERACY SKILLS

**UNIT CODE:** AGR/OS/SPP/BC/02/5/A

**UNIT DESCRIPTION**

This unit covers the competencies required to demonstrate numeracy skills. it involves calculating with whole numbers and familiar fractions, decimals, and percentages for work estimating, measuring, and calculating with routine metric measurements for work, using routine maps and plans for work, interpreting, drawing and constructing 2D and 3D shapes for work, interpreting routine tables, graphs and charts for work, collecting data and constructing routine tables and graphs for work and using basic functions of calculator.

**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 the Range.*** |
| 1. Calculate with whole numbers and familiar fractions, decimals and percentages for work | 1. Mathematical information that may be partly embedded in routine workplace tasks and texts is selected and interpreted as per SOPs 2. Whole numbers and routine or familiar fractions, decimals and percentages including familiar rates are interpreted and comprehended as per SOPs 3. Calculations which may involve a number of steps are performed as per SOPs 4. Calculations done with whole numbers and routine or familiar fractions, decimals and percentages as per SOPs 5. Conversion between equivalent forms of fractions, decimals and percentages is done as per SOPs 6. Order of operations is applied to solve multi-step calculations as per SOPs 7. Problem solving strategies are appropriately applied as per SOPs 8. Estimations are made to check reasonableness of problem solving process, outcome and its appropriateness to the context and task as per SOPs 9. Formal and informal mathematical language and symbolism are used to communicate the result of the task as per SOPs. |
| 1. Estimate, measure, and calculate with routine metric measurements for work | 1. Measurement information in workplace tasks and texts are selected and interpreted in accordance with workplace requirements 2. Appropriate routine measuring equipment are identified and selected in accordance with workplace requirements 3. Measurements are estimated and made using correct units as per measurement manuals. 4. Estimations and calculations done as per routine measurements 5. Conversions performed routinely as per metric units 6. Problem solving processes are used to undertake the tasks as per workplace procedures. 7. Estimations are made to check reasonableness of problem solving process, outcome and its appropriateness to the context and task as per workplace procedures 8. Information is recorded using mathematical language and symbols appropriate to discuss the task as per workplace procedures. |
| 1. Use routine maps and plans for work | 1. Features are identified in routine maps and plans as per SOPs 2. Symbols and keys in routine maps and plans are clearly explained as per SOPs 3. Orientation of map to North is identified and interpreted as per SOPs 4. Understanding of direction and location is clearly demonstrated as per SOPs 5. Simple scale is applied to estimate length of objects, or distance to location or object as per SOPs 6. Directions are given and received using both formal and informal language as per SOPs |
| 1. Interpret, draw and construct 2D and 3D shapes for work | 1. Two dimensional shapes and routine three dimensional shapes identified in everyday objects and in different orientations in accordance with job specifications 2. The use and application of shapes elaborately explained as per SOPs 3. Formal and informal mathematical language and symbols used to describe and compare the features of two dimensional shapes and routine three dimensional shapes as per workplace procedures. 4. Common angles identified in accordance with SOPs 5. Common angles in everyday objects are appropriately estimated as per SOPs 6. Formal and informal mathematical language are used to describe and compare common angles as per workplace procedures. 7. Common geometric instruments used to draw two dimensional shapes as per SOPs 8. Routine three dimensional objects constructed from given nets as per SOPs. |
| 1. Interpret routine tables, graphs and charts for work | 1. Routine tables, graphs and charts identified in predominately familiar texts and contexts as per tables and graph manuals 2. Common types of graphs and their different uses identified as per SOPs 3. Features of tables, graphs and charts identified as per workplace procedures 4. Information in routine tables, graphs and charts located and interpreted as per workplace procedures 5. Calculations are perform to interpret information as per SOPs 6. How statistics can inform and persuade interpretations is explained as per SOPs 7. Misleading statistical information is identified as per workplace procedures. 8. Information relevant to the workplace is discussed as per workplace procedures. |
| 1. Collect data and construct routine tables and graphs for work | 1. Features of common tables and graphs identified as per SOPs 2. Uses of ***different tables and graphs*** identified as per job specifications 3. Data and variables to be collected are determined as per workplace procedures. 4. The audience is determined as per the workplace procedures 5. Method of data collection is select as per job requirement 6. Data is collected as per SOPs 7. Information is collated in a table as per SOPs 8. Suitable scale and axes determined as per job specifications 9. Graph to present information is drafted and drawn as per SOPs 10. Data checked to ensure that it meets the expected results and context as per workplace procedures 11. Information is reported or discussed using formal and informal mathematical language as per workplace procedures |
| 1. Use basic functions of calculator | * 1. Keys are identified and used for ***basic functions on a calculator*** as per SOPs   2. Calculation is done using whole numbers, money and routine decimals and percentages as per SOPs   3. Calculation done with routine fractions and percentages as per SOPs   4. Order of operations is applied to solve multi-step calculations as per SOPs   5. Results are interpreted, displayed and recorded as per workplace procedures   6. Estimations are made to check reasonableness of problem solving process, outcome and its appropriateness to the context and task as per workplace procedures   7. Formal and informal mathematical language and appropriate symbolism and conventions used to communicate the result of the task as per workplace procedures. |

**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. Use basic functions of calculator may include but not limited to: | * Addition * Multiplication * Calculate ratios * Conversion of ratios into percentages |
| 1. Different tables and graphs may include but not limited to: | * Bar Graphs * Flow Charts * Pie Charts * Pictograph * Line Graphs * Time Series Graphs * Stem and Leaf Plot * Histogram * Dot Plot * Scatter plot |

**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:

* Measuring
* Logical thinking
* Computing
* Drawing of graphs
* Applying mathematical formulas
* Analytical

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Types of common shapes
* Differentiation between two dimensional shapes / objects
* Formulae for calculating area and volume
* Types and purpose of measuring instruments
* Units of measurement and abbreviations
* Fundamental operations (addition, subtraction, division, multiplication)
* Rounding techniques
* Types of fractions
* Different types of tables and graphs
* Meaning of graphs, such as increasing, decreasing, and constant value
* Preparation of basic data, tables & graphs

**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. Calculated correctly with whole numbers and routine or familiar fractions, decimals and percentages 2. Estimated, measured and calculated with routine metric measurements 3. Applied simple scale to estimate length of objects or distance to location or object 4. Used formal and informal mathematical language to describe and compare common angles 5. Used common geometric instruments to draw two dimensional shapes 6. Collected data and constructed routine tables and graphs 7. Used basic functions of calculator correctly |
| 1. Resource Implications | The following resources should be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency may be assessed through:   1. Observation 2. Oral questioning 3. Written test 4. Portfolio of Evidence 5. Interview 6. Third party report |
| 1. Context of Assessment | Competency may be assessed in:   1. On the job 2. Off the job 3. Industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEMONSTRATE DIGITAL LITERACY

**UNIT CODE:** AGR/OS/SPP/BC/03/5/A

**UNIT DESCRIPTION**

This unit covers the competencies required to demonstrate digital literacy. It involves identifying appropriate computer software and hardware, applying security measures to data, hardware, software in automated environment, applying computer software in solving tasks, applying internet and email in communication at workplace, applying desktop publishing in official assignment and preparing presentation packages.

**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 the Range*** |
| 1. Identify appropriate computer software and hardware | 1. Concepts of ICT are determined in accordance with computer equipment 2. Classifications of computers are determined in accordance with manufacturers specification 3. ***Appropriate computer software*** is identified according to manufacturer’s specification 4. ***Appropriate computer hardware*** is identified according to manufacturer’s specification 5. Functions and commands ofoperating system are determined in accordance withmanufacturer’s specification |
| 1. Apply security measures to data, hardware, software in automated environment | 1. ***Data security and privacy are classified*** in accordance with the prevailing technology 2. ***Security threats*** areidentified, **and *control measures*** are applied in accordance with laws governing protection of ICT 3. Computer threats and crimes are detected in accordance with Information security management guidelines 4. Protection against computer crimes is undertaken in accordance with laws governing protection of ICT |
| 1. Apply computer software in solving tasks | 1. ***Word processing concepts***are applied in resolving workplace tasks, report writing and documentation as per job requirements 2. ***Word processing utilities*** are applied in accordance with workplace procedures 3. Worksheet layout is prepared in accordance with work procedures 4. Worksheet is build and data manipulated in the worksheet in accordance with workplace procedures 5. Continuous data manipulated on worksheet is undertaken in accordance with work requirements 6. Database design and manipulation is undertaken in accordance with office procedures 7. Data sorting, indexing, storage, retrieval and security is provided in accordance with workplace procedures |
| 1. Apply internet and email in communication at workplace | 1. Electronic mail addresses are opened and applied in workplace communication in accordance with office policy 2. Office internet functions are defined and executed in accordance with office procedures 3. ***Network configuration*** is determined in accordance with office operations procedures 4. Official World Wide Web is installed and managed according to workplace procedures |
| 1. Apply desktop publishing in official assignments | 1. Desktop publishing functions and tools are identified in accordance with manufactures specifications 2. Desktop publishing tools are developed in accordance with work requirements 3. Desktop publishing tools are applied in accordance with workplace requirements 4. Typeset work is enhanced in accordance with workplace standards |
| 1. Prepare presentation packages | 1. Types of presentation packages are identified in accordance with office requirements 2. Slides are created and formulated in accordance with workplace procedures 3. Slides are edited and run in accordance with work procedures 4. Slides and handouts are printed according to work requirements |

**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. Appropriate computer hardware may include but not limited to: | * Computer case * Monitor * keyboard * mouse |
| 1. Data security and privacy may include but not limited to: | * Confidentiality of data * Cloud computing * Integrity -but-curious data surfing |
| 1. Security and control measures may include but not limited to: | * Counter measures against cyber terrorism * Risk reduction * Cyber threat issues * Risk management * Pass wording |
| 1. Security threats may include but not limited to: | * Cyber terrorism * Hacking |

**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 skills
* Interpretation
* Typing
* Communication
* Basic ICT skills

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Software concept
* Functions of computer software and hardware
* Data security and privacy
* Computer security threats and control measures
* Technology underlying cyber-attacks and networks
* Cyber terrorism
* Computer crimes
* Detection and protection of computer crimes
* Laws governing protection of ICT
* Microsoft suite

**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 and controlled security threats 2. Detected and protected computer crimes 3. Applied word processing in office tasks 4. Designed, prepared work sheet and applied data to the cells in accordance to workplace procedures 5. Opened electronic mail for office communication as per workplace procedure 6. Installed internet and World Wide Web for office tasks in accordance with office procedures 7. Integrated emerging issues in computer ICT applications 8. Applied laws governing protection of ICT |
| 1. Resource Implications | The following resources should be provided:   1. Tablets 2. Laptops 3. Desktop computers 4. Calculators 5. Internet 6. Smart phones 7. Operation Manuals |
| 1. Methods of Assessment | Competency may be assessed through:   1. Written Test 2. Observation 3. Practical assignment 4. Interview/Oral Questioning |
| 1. Context of Assessment | Competency may be assessed in:   1. Off the job 2. On the job setting 3. Industrial attachment |
| 5. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEMONSTRATE ENTREPRENEURIAL SKILLS

**UNIT CODE :** AGR/OS/SPP/BC/04/5/A

**UNIT DESCRIPTION**

This unit covers the competencies required to demonstrate understanding of entrepreneurship. It involves demonstrating understanding of an entrepreneur, entrepreneurship, and self-employment, identifying entrepreneurship opportunities, creating entrepreneurial awareness, applying entrepreneurial motivation, developing business innovative strategies and developing business plan.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT** | **PERFORMANCE CRITERIA** |
| 1. Demonstrate understanding of an entrepreneur | 1. Entrepreneurs and Businesspersons 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. Factors affecting Entrepreneurship development are explored as per principles of Entrepreneurship |
| 1. Demonstrate understanding of Entrepreneurship and self-employment | 1. Entrepreneurship and self-employment are distinguished as per principles of entrepreneurship 2. Importance of self-employment is analysed based on business procedures and strategies 3. ***Requirements for entry into self-employment*** are identified according to business procedures and strategies 4. Role of an Entrepreneur in business is determined according to business procedures and strategies 5. Contributions of Entrepreneurs to National development are identified as per business procedures and strategies 6. Entrepreneurship culture in Kenya is explored as per business procedures and strategies 7. Born or made Entrepreneurs are distinguished as per entrepreneurial traits |
| 1. Identify Entrepreneurship opportunities | 1. Sources of business ideas are identified as per business procedures and strategies 2. Business ideas and opportunities are generated as per business procedures and strategies 3. Business life cycle is analysed as per business procedures and strategies 4. Legal aspects of business are identified as per procedures and strategies 5. Product demand is assessed as per market strategies 6. Types of ***business environment*** are identified and evaluated as per business procedures 7. Factors to consider when evaluating business environment are explored based on business procedure and strategies 8. Technology in business is incorporated as per best practice |
| 1. Create entrepreneurial awareness | 1. ***Forms of businesses*** are explored as per business procedures and strategies 2. Sources of business finance are identified as per business procedures and strategies 3. Factors in selecting source of business finance are identified as per business procedures and strategies 4. ***Governing policies*** on Small Scale Enterprises (SSEs) are determined as per business procedures and strategies 5. Problems of starting and operating SSEs are explored as per business procedures and strategies |
| 1. Apply entrepreneurial motivation | 1. ***Internal and external motivation*** factors are determined in accordance with motivational theories 2. Self-assessment is carried out as per entrepreneurial orientation 3. Effective communications are carried out in accordance with communication principles 4. Entrepreneurial motivation is applied as per motivational theories |
| 1. Develop innovative business strategies | 1. Business innovation strategies are determined in accordance with the organization strategies 2. Creativity in business development is demonstrated in accordance with business strategies 3. ***Innovative business strategies*** 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. Identified Business is described as per business procedures and strategies 2. Marketing plan is developed as per business plan format 3. Organizational/Management plan is prepared in accordance with business plan format 4. Production/operation plan in accordance with business plan format 5. Financial plan is prepared in accordance with the business plan format 6. Executive summary is prepared in accordance with business plan format 7. Business plan is presented as per best practice |

**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. 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. Internal and external motivation may include but not limited to: | * Interest * Passion * Freedom * Prestige * Rewards * Punishment * Enabling environment * Government policies |
| 1. Business environment may include but not limited to: | * External * Internal * Intermediate |
| 1. Forms of businesses may include but not limited to: | * Sole proprietorship * Partnership * Limited companies * Cooperatives |
| 1. Governing policies may include but not limited to: | * Increasing scope for finance * Promoting cooperation between entrepreneurs and private sector * Reducing regulatory burden on entrepreneurs * Developing IT tools for entrepreneurs |
| 1. Innovative business strategies 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 strategies
* 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 strategies
* Market and feasibility studies
* Government and regulatory processes
* Local and international business environment
* Relevant developments in other industries
* Regional/ County business expansion strategies

**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. Distinguished entrepreneurs and business persons correctly 2. Identified ways of becoming an entrepreneur appropriately 3. Explored factors affecting entrepreneurship development appropriately 4. Analysed importance of self-employment accurately 5. Identified requirements for entry into self-employment correctly 6. Identified sources of business ideas correctly 7. GeneratedBusiness ideas and opportunities correctly 8. Analysed business life cycle accurately 9. Identified legal aspects of business correctly 10. Assessed product demand accurately 11. Determined Internal and external motivation factors appropriately 12. Carried out communications effectively 13. Identified sources of business finance correctly 14. Determined Governing policy on small scale enterprise appropriately 15. Explored problems of starting and operating SSEs effectively 16. Developed Marketing, Organizational/Management, Production/Operation and Financial plans correctly 17. Prepared executive summary correctly 18. Determined business innovative strategies appropriately 19. Presented business plan effectively |
| 1. Resource Implications | The following resources should be provided:   1. Access to relevant workplace where assessment can take place 2. Appropriately simulated environment where assessment can take place |
| 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. Off-the –job 3. During Industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEMONSTRATE EMPLOYABILITY SKILLS

**UNIT CODE:** AGR/OS/SPP/BC/05/5/A

**UNIT DESCRIPTION**

This unit covers competencies required to demonstrate employability skills. It involves conducting self-management, demonstrating interpersonal communication, critical safe work habits, leading small teams, planning and organizing work, maintaining professional growth and development, demonstrating workplace learning, problem solving skills and managing workplace ethics.

**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 the Range*** |
| 1. Conduct self-management | 1. Personal vision, mission and goals are formulated based on potential and in relation to organization objectives 2. Emotional intelligence is demonstrated as per workplace requirements. 3. Individual performance is evaluated and monitored according to the agreed targets. 4. Assertiveness is developed and maintained based on the requirements of the job. 5. Accountability and responsibility for own actions are demonstrated based on workplace instructions. 6. Self-esteem and a positive self-image are developed and maintained based on values. 7. Time management, attendance and punctuality are observed as per the organization policy. 8. Goals are managed as per the organization’s objective 9. Self-strengths and weaknesses are identified based on personal objectives |
| 1. Demonstrate interpersonal communication | 1. Writing skills are demonstrated as per communication policy 2. Negotiation and persuasion skills are demonstrated as per communication policy 3. Internal and external stakeholders’ needs are identified and interpreted as per the communication policy 4. Communication networks are established based on workplace policy 5. Information is shared as per communication policy |
| 1. Demonstrate critical safe work habits | 1. Stress is managed in accordance with workplace policy. 2. Punctuality and time consciousness is demonstrated in line with workplace policy. 3. Personal objectives are integrated with organization goals based on organization’s strategic plan. 4. ***Resources*** are utilized in accordance with workplace policy. 5. Work priorities are set in accordance to workplace goals and objectives. 6. Leisure time is recognized and utilized in line with personal objectives. 7. ***Drugs and substances of abuse*** are identified and avoided based on workplace policy. 8. HIV and AIDS prevention awareness is demonstrated in line with workplace policy. 9. Safety consciousness is demonstrated in the workplace based on organization safety policy. 10. ***Emerging issues*** are identified and dealt with in accordance with organization policy. |
| 1. Lead small teams | 1. Performance targets for the ***team*** are set based on organization’s objectives 2. Duties are assigned in accordance with the organization policy. 3. ***Forms of communication*** in a team are established according to organization’s policy. 4. Team performance is evaluated based on set targets as per workplace policy. 5. Conflicts are resolved between team members in line with organization policy. 6. Gender related issues are identified and mainstreamed in accordance workplace policy. 7. Human rights and fundamental freedoms are identified and respected as Constitution of Kenya 2010. 8. Healthy relationships are developed and maintained in line with workplace. |
| 1. Plan and organize work | 1. Task requirements are identified as per the workplace objectives 2. Task is interpreted in accordance with safety (OHS ), environmental requirements and quality requirements 3. Work activity is organized with other involved personnel as per the SOPs 4. Resources are mobilized, allocated and utilized to meet project goals and deliverables. 5. Work activities are monitored and evaluated in line with organization procedures. 6. Job planning is documented in accordance with workplace requirements. 7. Time is managed achieve workplace set goals and objectives. |
| 1. Maintain professional growth and development | 1. Personal training needs are identified and assessed in line with the requirements of the job. 2. ***Training and career opportunities*** are identified and utilized based on job requirements. 3. Resources for training are mobilized and allocated based organizations and individual skills needs. 4. Licensees and certifications relevant to job and career are obtained and renewed as per policy. 5. Work priorities and personal commitments are balanced and managed based on requirements of the job and personal objectives. 6. Recognitions are sought as proof of career advancement in line with professional requirements. |
| 1. Demonstrate workplace learning | 1. Learning opportunities are sought and managed based on job requirement and organization policy. 2. Improvement in performance is demonstrated based on courses attended. 3. Application of learning is demonstrated in both technical and non-technical aspects based on requirements of the job 4. Time and effort is invested in learning new skills based on job requirements 5. Initiative is taken to create more effective and efficient processes and procedures in line with workplace policy. 6. New systems are developed and maintained in accordance with the requirements of the job. 7. Awareness of personal role in workplace ***innovation*** is demonstrated based on requirements of the job. |
| 1. Demonstrate problem solving skills | 1. Creative, innovative and practical solutions are developed based on the problem 2. Independence and initiative in identifying and solving problems is demonstrated based on requirements of the job. 3. Team problems are solved as per the workplace guidelines 4. Problem solving strategies are applied as per the workplace guidelines 5. Problems are analyzed and assumptions tested as per the context of data and circumstances |
| 1. Demonstrate workplace ethics | 1. Policies and guidelines are observed as per the workplace requirements 2. Self-worth and professionalism is exercised in line with personal goals and organizational policies 3. Code of conduct is observed as per the workplace requirements 4. Integrity is demonstrated as per legal requirement |

**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.

|  |  |
| --- | --- |
| **Range** | **Variable** |
| 1. Drug and substance abuse may include but not limited to: | Commonly abused   * Alcohol * Tobacco * Miraa * Over-the-counter drugs * Cocaine * Bhang * Glue |
| 1. Feedback may include but not limited to: | * Verbal * Written * Informal * Formal |
| 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. Forms of communication may include but not limited to: | * Written * Visual * Verbal * Non verbal * Formal and informal |
| 1. Team may include but not limited to: | * Small work group * Staff in a section/department * Inter-agency group |
| 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 * Technical * Supervisory * Managerial * Continuing Education * Serving as Resource Persons in conferences and workshops |
| 1. Resource may include but not limited to: | * Human * Financial * Hardware * Software |
| 1. Innovation 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: | * Terrorism * Social media * National cohesion * Open offices |
| 1. Range of media for learning may include but not limited to: | * Mentoring * peer support and networking * IT and courses |

**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:

* Communication
* Critical thinking
* Observation
* Organizing
* Negotiation
* Monitoring
* Evaluation
* Record keeping
* Problem solving
* Decision Making
* Resource utilization
* Resource mobilization

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Work values and ethics
* Company policies
* Company operations, procedures and standards
* Occupational Health and safety procedures
* Fundamental rights at work
* Personal hygiene practices
* Workplace communication
* Concept of time
* Time management
* Decision making
* Types of resources
* Work planning
* Resources and allocating resources
* Organizing work
* Monitoring and evaluation
* Record keeping
* Workplace problems and how to deal with them
* Gender mainstreaming
* HIV and AIDS
* Drug and substance abuse
* Leadership
* Safe work habits
* Professional growth and development
* Technology in the workplace
* Emerging issues
* Social media
* Terrorism
* National cohesion

**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. Conducted self-management 2. Demonstrated interpersonal communication 3. Demonstrated critical safe work habits 4. Led small teams 5. Planned and organized work 6. Maintained professional growth and development 7. Demonstrated workplace learning 8. Demonstrated problem solving skills 9. Demonstrated workplace ethics |
| 1. Resource Implications | |  | | --- | | The following resources should be provided:   1. Access to relevant workplace where assessment can take place 2. Appropriately simulated environment where assessment can take place | |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Oral questioning 2. Portfolio of evidence 3. Third Party Reports 4. Written tests |
| 1. Context of Assessment | Competency may be assessed:   1. On-the-job 2. Off-the –job 3. During Industrial attachment |
| 1. Guidance information for assessment | | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEMONSTRATE ENVIRONMENTAL LITERACY

**UNIT CODE:** AGR/OS/SPP/BC/06/5/A

**UNIT DESCRIPTION**

This unit describes the competencies required to demonstrate understanding of environmental literacy. It involves controlling environmental hazard, controlling control environmental pollution, complying with workplace sustainable resource use, evaluating current practices in relation to resource usage, identifying environmental legislations/conventions for environmental concerns, implementing specific environmental programs and monitoring activities on environmental protection/programs.

**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 the Range*** |
| 1. Control environmental hazard | 1. ***Storage methods*** for environmentally***hazardous*** materials are strictly followed according to environmental regulations and OSHS. 2. ***Disposal methods*** of hazardous wastes are followed always according to environmental regulations and OSHS. 3. ***PPE*** is used according to OSHS. |
| 1. Control environmental Pollution control | 1. Environmental pollution ***control measures*** are compiled following standard protocol. 2. Procedures for solid waste management are observed according to Environmental Management and Coordination Act 1999 3. Methods for minimizing ***noise pollution*** is complied with based on *Noise* and Excessive Vibration *Pollution and*  *Control Regulations*, 2009 |
| 1. Demonstrate sustainable resource use | 1. Methods for minimizing wastage are complied with. 2. Waste management procedures are employed following principles of 3Rs (Reduce, Reuse, Recycle) 3. Methods for economizing and reducing resource consumption are practiced as per the Environmental Management and Coordination Act 1999 |
| 1. Evaluate current practices in relation to resource usage | 1. Information on resource efficiency **systems and procedures** are collected and provided to the work group where appropriate. 2. Current resource usage is measured and recorded by members of the work group. 3. Current purchasing strategies are analyzed and recorded according to industry procedures. 4. Current work processes to access information and data is analyzed following enterprise protocol. |
| 1. Identify Environmental legislations/conventions for environmental concerns | 1. Environmental ***legislations/conventions*** and local ordinances are identified according to the different ***environmental aspects/impact*** 2. ***Industrial standard/environmental practices*** are described according to the different environmental concerns |
| 1. Implement specific environmental programs | 1. Programs/Activities are identified according to organizations policies and guidelines. 2. Individual roles/responsibilities are determined and performed based on the activities identified. 3. Problems/constraints encountered are resolved in accordance with organizations’ policies and guidelines 4. Stakeholders are consulted based on company guidelines |
| 1. Monitor activities on Environmental protection/Programs | 1. Activities are periodically monitored and evaluated according to the objectives of the environmental Program 2. Feedback from stakeholders are gathered and considered in proposing enhancements to the program based on consultations 3. Data gathered are analyzed based on evaluation requirements 4. Recommendations are submitted based on the findings 5. Management support systems are set/established to sustain and enhance the program 6. Environmental incidents are monitored and reported to concerned/proper authorities |

**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: | * Mask * Gloves * Goggles * Safety hat * Overall * Hearing protector * Safety boots |
| 1. Environmental pollution control measures may include but not limited to: | * Methods for minimizing or stopping spread and ingestion of airborne particles * Methods for minimizing or stopping spread and ingestion of gases and fumes * Methods for minimizing or stopping spread and ingestion of liquid wastes |
| 1. Waste management procedures may include but not limited to: | * Sorting * Storing of items * Recycling of items * Disposal of items |
| 1. Resources may include but not limited to: | * Electric * Water * Fuel * Telecommunications * Supplies * Materials |
| 1. Workplace environmental hazards may include but not limited to: | * Biological hazards * Chemical and dust hazards * Physical hazards |
| 1. Organizational systems and procedures may include but not limited to: | * Supply chain, procurement and purchasing * Quality assurance * Making recommendations and seeking approvals |

**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:

* Observation
* Measuring
* Writing
* Communication
* Analytical
* Monitoring
* Evaluation

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Storage methods of environmentally hazardous materials
* Disposal methods of hazardous wastes
* Usage of PPE Environmental regulations
* OSHS
* Types of pollution
* Environmental pollution control measures
* Different solid wastes
* Solid waste management
* Different noise pollution
* Methods of minimizing noise pollution
* Solid Waste Act
* Methods of minimizing wastage
* Waste management procedures
* Economizing of resource consumption
* 3Rs principle
* Types of resources
* Techniques in measuring current usage of resources
* Calculating current usage of resources
* Types of workplace environmental hazards
* Environmental regulations
* Environmental regulations applying to the enterprise.
* Measurement and recording of current resource usage
* Analysis current work processes to access information and data Analysis of data and information
* Identification of areas for improvement
* Resource consuming processes
* Determination of quantity and nature of resource consumed
* Analysis of resource flow of different parts of the resource flow process
* Use/conversion of resources
* Causes of low efficiency of use
* Increasing the efficiency of resource use
* Inspection of resource use plans
* Regulations/licensing requirements
* Determine benefit/cost for alternative resource sources
* Benefit/costs for different alternatives
* Components of proposals
* Criteria on ranking proposals
* Regulatory requirements
* Proposals for improving resource efficiency
* Implementation of resource efficiency plans
* Procedures in monitor implementation
* Adjustments of implementation plan
* Inspection of new resource usage

**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. Controlled environmental hazard 2. Controlled environmental pollution 3. Demonstrated sustainable resource use 4. Evaluated current practices in relation to resource usage 5. Demonstrated knowledge of environmental legislations and local ordinances according to the different environmental issues /concerns. 6. Described industrial standard environmental practices according to the different environmental issues/concerns. 7. Resolved problems/ constraints encountered based on management standard procedures 8. Implemented and monitored environmental practices on a periodic basis as per company guidelines 9. Recommended solutions for the improvement of the Program 10. Monitored and reported to proper authorities any environmental incidents |
| 1. Resource Implications | The following resources should be provided:   1. Workplace with storage facilities 2. Tools, materials and equipment relevant to the tasks (ex. Cleaning tools, cleaning materials, trash bags, etc.) 3. PPE 4. Manuals and references 5. Legislation, policies, procedures, protocols and local ordinances relating to environmental protection 6. Case studies/scenarios relating to environmental Protection |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Observation 2. Oral questioning 3. Written test 4. Interview/Third Party Reports 5. Portfolio of evidence |
| 1. Context of Assessment | Competency may be assessed:   1. On-the-job 2. Off-the –job 3. During Industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEMONSTRATE OCCUPATIONAL SAFETY AND HEALTH PRACTICES

**UNIT CODE:** AGR/OS/SPP/BC/07/5/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to identify workplace hazards and risk, identify and implement appropriate control measures and implement OSH programs, procedures and policies/ guidelines

**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 the Range*** |
| 1. Identify workplace hazards and risk | 1. ***Hazards*** in the workplace are identified ***based their indicators*** 2. Risks and hazards are evaluated based on legal requirements. 3. ***OSH concerns*** raised by workers are addressed as per legal requirements. |
| 1. Control OSH hazards | 1. Hazard prevention ***and control measures*** are implemented as per legal requirement. 2. Risk assessment is conductedand a risk matrix developed based on likely impact. 3. ***Contingency measures***, including ***emergency procedures*** during workplace ***incidents and emergencies*** are recognized and established in accordance with organization procedures. |
| 1. Implement OSH programs | 1. Company OSH program is identified, evaluated and reviewed based on legal requirements. 2. Company OSH programs are implemented as per legal requirements. 3. Workers are capacity built on OSH standards and procedures as per legal requirements 4. ***OSH-related records*** are maintained as per legal requirements. |

**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. Hazards may include but are not limited to: | * Physical hazards * Biological hazards * Chemical hazards * Ergonomics * Psychological factors * Physiological factors * Safety hazards * Unsafe workers’ act |
| 1. Indicators may include but are not limited to: | * Increased of 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. Evaluation and/or work environment measurements 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. OSH issues and/or concerns may include but are not limited to: | * Workers’ experience/observance on presence of work hazards * Unsafe/unhealthy administrative arrangements (prolonged work hours, no break time, constant overtime, scheduling of tasks) * Reasons for compliance/non-compliance to use of PPEs or other OSH procedures/policies/guidelines |
| 1. Prevention and control measures may include but are not limited to: | * Eliminate the hazard * Isolate the hazard * Substitute the hazard with a safer alternative * Use administrative controls to reduce the risk * Use engineering controls to reduce the risk * Use personal protective equipment * Safety, Health and Work Environment Evaluation * Periodic and/or special medical examinations of workers |
| 1. Safety gears /PPE (Personal Protective Equipment’s) may include but are not limited to: | * Arm/Hand guard, gloves * Eye protection (goggles, shield) * Hearing protection (ear muffs, ear plugs) * Hair Net/cap/bonnet * Hard hat * Face protection (mask, shield) * Apron/Gown/coverall/jump suit * Anti-static suits * High-visibility reflective vest |
| 1. Appropriate risk controls | * Eliminate the hazard altogether * Isolate the hazard from anyone who could be harmed * Substitute the hazard with a safer alternative * Use administrative controls to reduce the risk * Use engineering controls to reduce the risk * Use personal protective equipment |
| 1. Contingency measures may include but are not limited to: | * Evacuation * Isolation * Decontamination * Emergency personnel |
| 1. Emergency procedures may include but are not limited to: | * Fire drill * Earthquake drill * Basic life support/CPR * First aid * Spillage control * Decontamination of chemical and toxic * Disaster preparedness/management * Set of fire-extinguisher |
| 1. Incidents and emergencies may include but are not limited to: | * Chemical spills * Equipment/vehicle accidents * Explosion * Fire * Gas leak * Injury to personnel * Structural collapse * Toxic and/or flammable vapors emission. |
| 1. OSH-related Records may include but are not limited to: | * Medical/Health records * Incident/accident reports * Sickness notifications/sick leave application * OSH-related trainings obtained |

**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:

* Communication
* Interpersonal
* Presentation
* Risk assessment
* Evaluation
* Critical thinking
* Problem solving
* Negotiation

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* General OSH Principles
* Occupational hazards/risks recognition
* OSH organizations providing services on OSH evaluation and/or work environment measurements (WEM)
* National OSH regulations; company OSH policies and protocols
* Systematic gathering of OSH issues and concerns
* General OSH principles
* National OSH regulations
* Company OSH and recording protocols, procedures and policies/guidelines
* Training and/or counseling methodologies and strategies

**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 hazards in the workplace based their indicators 2. Evaluated workplace hazards based on legal requirements. 3. Addressed OSH concerns raised by workers as per legal requirements. 4. Implemented hazard prevention and control measures as per legal requirement. 5. Conducted risk assessment as per legal requirement. 6. Developed risk matrix based on likely impact. 7. Recognized and established contingency measures in accordance with organization procedures. 8. Identified, evaluated and reviewed company OSH program based on legal requirements. 9. Implemented company OSH programs as per legal requirements. 10. Capacity built workers on OSH standards and procedures as per legal requirements 11. Maintained OSH-related records as per legal requirements. |
| 1. Resource Implications | The following resources should be provided:   1. Access to relevant workplace where assessment can take place 2. Appropriately simulated environment where assessment can take place |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Observation 2. Oral questioning 3. Written test 4. Portfolio of Evidence 5. Interview 6. Third party report |
| 1. Context of Assessment | Competency may be assessed:   1. On-the-job 2. Off-the –job 3. During Industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# CORE UNITS OF COMPETENCY

# CARRY OUT FARM PLANNING

**UNIT CODE:** AGR/OS/SPP/CR/01/5/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to carry out farm planning. It involves carrying out site selection, determining farm layout and conducting soil testing. It also entails determining soil, soil – water and water conservation structures and determining farm budget.

**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 site selection | * 1. Tools, equipment and materials for farm planning are identified and assembled based on work place requirements and procedures   2. Land is surveyed to establish boundaries and ***suitable parameters*** as per Good Agricultural Practice and survey map   3. Actual location is identified based on Good Agricultural Practice and survey findings |
| 1. Determine farm layout | * 1. Land use is determined as per GAP and survey findings   2. History of the farm use is determined as per existing farm records   3. Farm layout sketch is drawn according to land use and history of farm use   4. Actual site to establish the sweet potato crop is demarcated based on scale of production |
| 1. Conduct soil testing | * 1. Soil sampling is conducted based on ***standard operating procedures for soil sampling***   2. ***Preparation and handling of soil samples*** is carried out as per soil sample handling procedures   3. ***Soil samples are analyzed*** as per standard soil testing and analysis procedures   4. Soil analysis results are interpreted as per standard soil testing and analysis procedures   5. Recommendations on soil fertility management are determined based on soil analysis results and interpretation |
| 1. Determine soil, soil-water and water conservation structures | * 1. Terrain of the farm is determined according to profiling survey procedures   2. Evidence of soil erosion within the farm is determined according to EMCA 1999 procedures and soil conservation practices   3. ***Type of soil, soil-water and water conservation structure*** to be erected is determined according to GAP procedures and best water conservation practices |
| 1. Determine farm budget | * 1. Activity to be carried out is identified as per the farm business plan   2. Requirements of every activity are established based on the business plan   3. Implementation plan is drawn according to the business plan   4. Cost is determined based on the farm activity requirements |

**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. Suitable parameters may include but are not limited to: | * Proximity to source of water * Proximity to another crop * Slope gradient * Soil type |
| 1. Preparation and handling of soil samples may include but are not limited to: | * Cleaning * Drying * Labelling * Packaging * Sample delivery/transportation |
| 1. Soil samples are analyzed may include but are not limited to: | * In situ testing * Laboratory testing |
| 1. Standard operating procedures for soil sampling may include but are not limited to: | * Reconnaissance survey * Sampling plan * Sampling methods * Sample collection techniques |
| 1. Soil, soil-water and water conservation structures may include but are not limited to: | Soil conservation structures   * Fanya juu terraces * Cut off drains * Fanya chini terraces * Retention ditches * Grass strips * Hedge rows * Contour bunds   Soil – water conservation structures   * In-situ water harvesting systems * Ex-situ water harvesting systems * Trapozoidal bunds * Zai pits * Negarims * Mulching * Plastic membranes   Water conservation structures   * Water ponds * Small earth dams * Water pans |

**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 skill

* Communication
* Analytical
* Critical thinking
* Problem solving
* Innovation

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Budgeting
* Soil conservation
* Good Agricultural Practice
* Principles of Environmental Management
* Planning
* Construction of farm structures
* Simple survey
* Drainage

**EVIDENCE GUIDE**

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

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| --- | --- |
| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   * 1. Identified and assembled tools, equipment and materials for farm planning   2. Surveyed land to establish boundaries and suitable parameters   3. Identified actual location   4. Determined land use   5. Determined history of farm   6. Drew farm layout sketch   7. Demarcated actual site to establish the sweet potato crop   8. Conducted soil sampling   9. Conducted basic soil testing   10. Carried out preparation and handling of soil samples   11. Determined soil, soil-water and water conservation structures   12. Determined farm budget |
| 1. Resource Implications | The following resources must be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Oral   2. Written   3. Observation   4. Third party   5. Practical test |
| 1. Context of Assessment | Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# CARRY OUT LAND PREPARATION

**UNIT CODE:** AGR/OS/SPP/CR/02/5/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to carry out land preparation. It involves clearing land, constructing soil, soil – water and water conservation structures and carrying out tillage and preparing seedbed

**ELEMENTS AND PERFORMANCE CRITERIA**

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| **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. Clear land | * 1. Tools, equipment and materials for land preparation are identified and assembled as per work place requirements   2. Land is cleared to establish a clean field for ploughing based on ***suitable parameters*** as per Good Agricultural Practices   3. Trash from the cleared land is disposed as per GAPs and EMCA 1999 guidelines |
| 1. Construct soil, soil-water and water conservation structures | * 1. Evidence of types of soil erosion and water loss within the farm is determined according to EMCA 1999 procedures and soil and soil-water conservation practices   2. Type of ***soil, soil-water and water conservation structures*** to be erected are determined according to field condition, GAP procedures and best water conservation practices   3. Soil, soil-water and water conservation structures are constructed based on soil and water conservation standards and procedures and provided layout design |
| 1. Carry out tillage | * 1. ***Land preparation practice*** is identified as per the GAPs   2. Tools and equipment for use during tillage are identified and assembled as per type of tillage   3. Field is ploughed as per GAPs requirements |
| 1. Prepare seedbed | * 1. ***Type of seedbed*** to be prepared is determined based on topography and available tools and implements   2. Tools, equipment and implements are identified and assembled based on type of seedbed to be prepared   3. Selected type of seedbed is prepared based on GAP and recommended spacing as per the AEZ |

**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.

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| **VARIABLE** | **RANGE** |
| 1. Suitable parameters may include but are not limited to: | * Vegetation   + Stumps   + Trees   + Grass |
| 1. Soil, soil-water and water conservation structures may include but are not limited to: | Soil conservation structures   * Fanya juu terraces * Cut off drains * Fanya chini terraces * Detention ditches * Grass strips * Hedge rows * Contour bunds   Soil – water conservation structures   * In-situ water harvesting systems * Ex-situ water harvesting systems * Trapozoidal bunds * Zai pits * Negarims * Mulching * Plastic membranes   Water conservation structures   * Water ponds * Small earth dams * Water pans |
| 1. Soil conservation standards and procedures may include but are not limited to: | * Ministry of Agriculture on soil and water conservation manual * FAO soil and water conservation guidelines |
| 1. Land preparation practice may include but are not limited to: | * Conservation agriculture * Minimum tillage * Conventional tillage * Zero tillage |
| 1. Type of seedbed may include but are not limited to: | * Ridges * Mounds * Flatbeds |

**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:

* Technical
* Observation
* Problem solving
* Analytical
* Reporting
* Interpretation

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Use and management of tools, equipment and materials
* Bush clearing
* Types of conservation measures
* Construction of soil conservation structures
* Tillage methods
* Making ridges, seedbeds and mounds

**EVIDENCE GUIDE**

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

|  |  |
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| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   * 1. Identified and assembled tools, equipment and materials for land preparation   2. Cleared land to establish a clean field for ploughing   3. Identified types of soil and water conservation measures   4. Constructed soil conservation structures   5. Identified tillage types   6. Tilled land   7. Made ridges to plant sweet potatoes   8. Made flatbeds to plant sweet potatoes   9. Made mounds to plant sweet potatoes |
| 1. Resource Implications | The following resources must be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Oral   2. Written   3. Observation   4. Third party report   5. Practical test |
| 1. Context of Assessment | Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# PRODUCE SWEET POTATO SEED MATERIALS

**UNIT CODE:** AGR/OS/SPP/CR/03/5/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to produce sweet potato seed materials. It involves determining vine production budget, carrying out site selection, selecting sweet potato variety, preparing seedbed, procuring planting materials, supplies and other inputs and preparing planting materials. It also involves planting seed material, maintaining seed field, harvesting seed materials and handling harvested seed material.

**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. Determine vine production budget | * 1. ***Activities*** are identified based on Good Agricultural Practices guidelines   2. Implementation plan is drawn based on the time frame schedule and market demand   3. Cost allocation to specific activities is carried out based on materials and input required |
| 1. Carry out site selection | * 1. Land is assessed to establish the history of the farm based on good agricultural practices and survey findings.   2. A suitable location is identified based on method of vine multiplication to be used   3. Layout of farm plots is done based on land use practice requirements, history of farm use and ***physical land conditions*** |
| 1. Select sweet potato variety | * 1. ***Customer profile*** is determined based on customer profiling procedure   2. Suitable variety is identified based on the customer profiling results |
| 1. Prepare nursery bed | * 1. ***Tools and equipment*** for preparing nursery bed are identified and assembled as per ***type of nursery beds***   2. For tray nursery, trays are arranged based on the standard tray nursery management procedure   3. For rapid multiplication, beds are demarcated based on the Good Agricultural practice procedures   4. For conventional multiplication, a seedbed is prepared based on the Good Agricultural Practices manual |
| 1. Procure planting materials, supplies and other inputs | * 1. Quality planting materials, supplies and inputs are identified and selected as per ecological features and GAPs   2. Selected planting materials, supplies and inputs are procured as per workplace procurement procedures   3. Planting materialspreparedbased on GAP |
| 1. Prepare planting materials | * 1. Tools and equipment are identified and assembled based on the types of nursery bed   2. ***Types of planting materials*** are identified and selected as per Good Agricultural Practices and based on their quality   3. Planting materials are hardened depending on type of seed bed   4. Planting materials are ***treated*** based on their condition and type of planting material   5. Clean planting materials are cut based on the type of nursery bed identified   6. Planting materials are preserved based on cold chain management procedure |
| 1. Plant seed material | * 1. Planting materials are established based on the method of propagation identified and seed certification standards   2. Planted materials are watered based on soil moisture content   3. Fertilizer is applied based on recommendations from soil tests and fertilizer application protocols |
| 1. Maintain seed bed | * 1. The seed bed is weeded based on the recommendations in Good Agricultural Practices   2. Gapping and rogueing is conducted based on GAPs   3. Scouting for pests and diseases is carried out based on the crop protection guidelines   4. Pests and diseases identified are controlled based on GAP   5. Maintenance of seed bed is done based on seed certification standards |
| 1. Harvest seed materials | * 1. ***Seed material quality*** is assessed before harvesting based on GAP and seed certification standards   2. Tools and equipment for harvesting and ***handling*** are identified and assembled as per GAPs   3. For seed tray materials, seedlings are harvested as per the ***good agricultural practice guidelines for harvesting***   4. For rapid and conventional multiplication, vines are harvested as per the good agricultural practice guidelines for harvesting |
| 1. Handle harvested seed material | * 1. ***Conditioning*** of the vines is conducted as per the cold chain procedure   2. Harvested seed materials are cleaned as per SOPs   3. Harvested seed materials are sorted as per SOPs   4. Harvested seed materials are packaged as per SOPs   5. Harvested seed materials are stored as per GMP   6. Harvested seed materials are dispatched as per SOPs |

**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.

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| **VARIABLE** | **RANGE** |
| 1. Physical land conditions include but not limited to: | * Slope of land * Orientation of land * Existing land structures/ plants / trees * Existing land features - stones * Land Shape   + Square   + Rectangle |
| 1. Activitiesincludes but not limited to: | * Land preparation * Input purchase * Tools purchase * Fertilizer purchase |
| 1. Customer profile include but not limited to: | * Underlying needs * Customer location |
| 1. Tools and equipment include but not limited to; | * Jembe * Measuring line * Demarcation sticks |
| 1. Types of nursery beds include but not limited to; | * Rapid multiplication * Tray multiplication/single node * Conventional |
| 1. Types of planting materials include but not limited to; | * Vines * Roots * Seedlings |
| 1. Treated include but not limited to; | * Fungicides |
| 1. Seed material quality include but not limited to; | * Health status * True to type |
| 1. Handling include but not limited to; | * Storage * Packaging * Transportation |
| 1. Good agricultural practice guidelines for harvesting include but not limited to; | * Vines are cut from 2 to 3 month old crop * Vines are cut using a sharp tool * Vines are cut from the growing tip * Length of the vine 20 to 30cm |
| 1. Conditioning includes but not limited to: | * Cooling |

**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:

* Estimation
* Observation
* Costing
* Pest and disease identification
* Nursery management

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Accounting
* Crop protection
* Plant morphology
* Computing

**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. Determined vine production budget   2. Assessed land to establish the history of the farm   3. Identified a suitable location   4. Performed layout of farm plots   5. Determined customer profile   6. Identified suitable variety   7. Identified tools and equipment for preparing nursery bed   8. Arranged trays   9. Demarcated beds   10. Prepared seedbed   11. Identified types of planting materials   12. Hardened planting materials   13. Treated planting materials   14. Cut clean planting materials   15. Preserved planting materials   16. Established planting materials   17. Watered planted materials   18. Applied fertilizer   19. Weeded the seed bed   20. Conducted gapping and rogueing   21. Carried scouting for pests and diseases   22. Identified and controlled pests and diseases   23. Maintained of seed bed   24. Harvested seed material   25. Performed post-harvest activities |
| 1. Resource Implications | The following resources must be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Oral   2. Written   3. Third party report   4. Observation |
| 1. Context of Assessment | Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# PRODUCE SWEET POTATO ROOTS

**UNIT CODE:** AGR/OS/SPP/CR/04/5/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to produce sweet potato roots. It involves determining root production budget, carrying out site selection, selecting sweet potato variety, preparing land and procuring planting materials, supplies and other inputs. It also involves preparing planting materials, planting sweet potato seed materials, managing sweet potato crop, harvesting sweet potato roots, handling harvested sweet potato roots.

**ELEMENTS AND PERFORMANCE CRITERIA**

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| --- | --- |
| **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. Determine root production budget | * 1. ***Activities*** are identified based on Good Agricultural Practices guidelines   2. Implementation plan is drawn based on the time frame schedule and market demand   3. Cost allocation to specific activities is carried out based on materials and input required |
| 1. Carry out site selection | * 1. Location of where to grow sweet potato for root production is identified based on suitable ***ecological requirements***   2. Actual site is identified based on the ***history of the field and the neighboring fields*** |
| 1. Select sweet potato variety | * 1. Appropriate sweet potato variety is identified based on ***adaptability and seed availability***   2. R***ecommended varieties*** are selected based on suitability of performance, ***purpose and scale*** of operation and market demand |
| 1. Prepare land | * 1. Tools and equipment are identified and assembled as per the scale of production   2. Seedbed is prepared to achieve the ***recommended tilth*** as per good agricultural practices and based on ***scale of operation.***   3. Preparation of ridges and mounds done as per GAP and dictated by prevailing ***field conditions and grower’s preference***. |
| 1. Procure planting materials, supplies and other inputs | * 1. ***Quality planting materials***, supplies and inputs are identified and selected as per ecological features and GAPs   2. Selected planting materials, supplies and inputs are procured as per workplace procurement procedures   3. ***Planting materials*** preparedbased on GAP |
| 1. Prepare planting materials | * 1. Tools and equipment are identified and assembled based on the types of nursery bed   2. Types of planting materials are identified and selected as per Good Agricultural Practices and based on their quality   3. Planting materials are hardened depending on type of seed bed   4. Planting materials are treated based on their condition and type of planting material   5. Clean planting materials are cut based on the type of nursery bed identified   6. Planting materials are preserved based on cold chain management procedure |
| 1. Plant sweet potato seed materials | * 1. ***Appropriate time for planting*** is determined as per crop establishment requirement   2. ***Right spacing, depth and orientation*** are determined as per GAPs   3. ***Fertilizer and manure*** is applied based on S***oil analysis recommendations*** given   4. Actual planting is carried out as per GAPs |
| 1. Manage sweet potato crop | * 1. ***Integrated soil fertility management*** applied as a sustainable management option based on soil analysis results   2. Rogueing of ***diseased plants and off types;*** and ***replacing missing plants*** in the field is conducted within the first two weeks after planting as per GAP.   3. The crop is ***kept free of weeds*** within the first two months after planting according to GAP.   4. ***Earthing up*** is carried out when ***cracks*** are noticed as per GAP   5. Sweet potato is ***intercropped with other crops*** to increase production per unit area as per GAP   6. ***Diseases and pests*** are identified and managed to maximize fresh root yield as per GAP |
| 1. Harvest sweet potato roots | * 1. ***Maturity of the crop*** is established before harvesting as per GAP   2. ***Preparation*** for harvesting is carried out according to GAP.   3. Roots are harvested either piece meal or completely using appropriate ***tools and equipment*** as per GAP |
| 1. Handle harvested sweet potato roots | * 1. Harvested roots are transported from the field as per good handling practices   2. Harvested roots are washed as per SOPs   3. Harvested roots are sorted as per SOPs   4. Harvested roots are graded as per SOPs   5. Harvested roots are cured as per SOPs   6. Harvested roots are packaged as per SOPs   7. Harvested roots are stored as per GMP |

**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.

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| **VARIABLE** | **RANGE** |
| 1. Activities may include but not   limited to: | * Land preparation * Input purchase * Tools purchase * Fertilizer purchase |
| 1. Ecological requirements may   include but not limited to: | * Temperature * Altitude * Rainfall * Soils |
| 1. History of the field and the   neighboring fields may include but  not limited to: | * Previous crops grown on the field * Crop rotation plan, * Previous and current crops in the neighbourhood * Distance from nearest sweet potato field |
| 1. Variety adaptability and seed availability may include but not   limited to: | * Available good performing varieties * Popular/demanded varieties * Vine multipliers in the community * Quality planting materials |
| 1. Recommended varieties may   include but not limited to: | * Varieties determined by market demand * Rural and urban markets * Skin and flesh colours * For processing |
| 1. Purpose and scale of operation may include but not limited to: | * Food and nutritional security * Smallholder farmers * Commercial growers |
| 1. Recommended tilth may include   but not limited to: | * Ploughing * Harrowing * Number of operations * Depth of ploughing * Minimum tillage * Root development and enlargement |
| 1. Scale of operation may include but   not limited to: | * Smallholder farmers   + - Hand tools     - Ox ploughs * Large scale farmers   + - Tractor drawn implements |
| 1. Field conditions and grower’s preference may include but not   limited to: | * Flat land * Sloppy land * Swamps/poorly drained fields * Labour availability * Mole infestation * Making of ridges and mounds * Spacing of ridges and mounds |
| 1. Quality planting materials may   include but not limited to: | * Planting materials not showing symptoms of virus diseases * Age of plants for planting materials * Free of weevils, eggs, larvae or pupae. * Cuttings from vine tips * Use of insecticides to treat materials with weevils * Conservation of planting materials |
| 1. Planting materials may include but   not limited to: | * Splits * Seedlings * Vine cuttings |
| 1. Appropriate time of planting may include but not limited to: | * Sufficient soil moisture * Pest infestation * Scale of operation * Availability of equipment and machinery * Target market |
| 1. Soil analysis recommendations may include but not limited to: | * Soil samples taken * Soil tested or analysis done * Recommendations given on the action to be taken |
| 1. Fertilizer and manure application   may include but not limited to: | * Fertilizer recommendation * Fertilizers * Poor soils * Well rotten manure |
| 1. Right spacing, depth and orientation may include but not limited to: | * Spacing of ridges and mounds * Spacing of vine cuttings * Insertion of cuttings in the soil * Depth of planting * Orientation of cuttings at planting * Planting on the mounds * Planting on ridges: * Seed rate per ha |
| 1. Fertilizer applied may include but   not limited to: | * Fertilizer application * Soil analysis recommendations * NPK (17: 17: 17) * Split applications |
| 1. Integrated soil fertility management may include but not limited to: | * Sustainability * Fallow system * Crop rotation * Well decomposed farm yard manure * Compost manure * Green manures * Mulching * Reduction in soil erosion * Conservation agriculture |
| 1. Diseased plants and off types may include but not limited to: | * Disease symptoms * Virus disease * Off types * Rogueing |
| 1. Replacing missing plants may   include but not limited to: | * Gap filling * Optimum plant population * Field establishment |
| 1. Kept free of weeds may include but   not limited to: | * Time of weeding * Hand weeding * Tools * Mulching * Use of herbicides |
| 1. Earthing up may include but not limited to: | * Cracks * Dry spell |
| 1. Cracks may include but not limited   to: | * Weevil damage * Maturity of roots |
| 1. Intercropped with other crops   may include but not limited to: | * Pure stand * Cereals * Legumes * Competition effects * Relay cropping |
| 1. Diseases and pests may include   but not limited to: | Sweet potato diseases   * Sweet potato viral diseases * Sweet potato bacterial diseases * Sweet potato fungal diseases   Pests   * Foliage * Root pest |
| 1. Maturity of the crop may include   but not limited to: | * Variety maturity period * Maturity indicators * Altitude * Temperature |
| 1. Preparation may include but not limited to: | * Purpose for harvesting * Tools and other requirements * Cutting back * Market/disposal. |
| 1. Harvesting tools and equipment may include but not limited to: | * Jembe/fork * Ox plough * Tractor drawn implements * Crates * Gunny bags |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication
* Analytical
* Computer
* Maintenance
* Problem solving
* Technical
* Critical thinking
* Observation
* Interpretation
* Sample handling
* Soil sampling
* Composting
* Preparation of planting materials
* Chemical application
* Field layout
* Variety identification
* Pest identification
* Marketing

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Sweet potato crop
* Importance of sweet potato
* Measurement units; length, weights, heights
* Good agricultural practices
* Land preparation/Tillage
* Farm tools
* Varieties
* Diseases and pests
* Soils and soil fertility
* Weed management
* Seasonality
* Seed multiplication
* Indigenous technical knowledge
* Moisture stress
* Drainage
* Crop rotation
* Importance of leguminous crops
* Crop protection
* Post-harvest handling
* Group dynamics

**EVIDENCE GUIDE**

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

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| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:  1.1 Identified necessary input requirements for root production  1.2 Understood costs involved in sweet potato root production  1.3 Made a budget  1.4 Explained factors considered in site selection  1.5 Determined the field history  1.6 Identified ecological requirements for growing sweet potato  1.7 Identified key characteristics that differentiate varieties  1.8 Understood the effect ecological factors has on variety performance  1.9 Identified some of the recommended varieties  1.10 Identified different types of sweet potatoes based on flesh color  1.11 Explained importance of orange fleshed sweet potato (OFSP)  1.12 Identified tools used in land preparation  1.13 Identified different types of land preparation  1.14 Made seedbed for root production  1.15 Made ridges and mounds at the right spacing  1.16 Understood soil fertility  1.17 Explained how soil fertility can be improved  1.18 Understood what clean planting material is  1.19 Identified different types of planting materials  1.20 Determined sources of clean planting materials  1.21 Selected clean planting material  1.22 Prepared clean planting materials  1.23 Understood soil analysis results  1.24 Applied fertilizer and manure as recommended  1.25 Carried out planting  1.26 Planting materials inserted in the soil at the right spacing, depth and orientation  1.27 Applied fertilizer as recommended  1.28 Implemented integrated soil fertility management based on field situation  1.29 Rogued diseased plants and off types  1.30 Replaced missing plants  1.31 Weeded crop  1.32 Covered cracks by earthing up  1.33 Intercropped sweet potato with other crops  1.34 Determined presence of diseases and pests  1.35 Identified important diseases and pests and their causes  1.37 Established disease symptoms  1.38 Took control measures to manage diseases and pests.  1.39 Established maturity period of varieties  1.40 Determined maturity indicators  1.41 Established appropriate tools for harvesting  1.42 Determined piece meal or complete harvesting.  1.43 Took precautions for maintaining fresh root quality  1.44 Did post-harvest handling practices |
| 1. Resource Implications | The following resources must be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks 3. Land or field for demonstration |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Oral   2. Written   3. Third party report   4. Observation |
| 1. Context of Assessment | Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# PRODUCE SWEET POTATO PUREE

**UNIT CODE:** AGR/OS/SPP/CR/05/5/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to produce sweet potato puree. It involves procuring sweet potato roots, sorting and grading sweet potato roots, washing sweet potato roots, steaming and cooling sweet potato roots and pureeing steamed sweet potato roots. It also involves packaging sweet potato puree, storing sweet potato puree and dispatching sweet potato puree.

**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. Procure sweet potato roots | * 1. Production target is determined depending on processing, storage capacity and market demand.   2. Farmers to supply quality roots are identified based on company records.   3. Root collection tools are identified and assembled based on workplace requirements.   4. Roots are transported to processing facility in accordance to GMP on ***postharvest handling*.** |
| 1. Sort and grade sweet potato roots | * 1. Roots are sorted, graded and stored as per the company guidelines on postharvest handling**.**   2. Roots are weighed and documented in accordance to workplace operating procedures.   3. Storage is done as per the standard operating procedures on storage of perishable produce. |
| 1. Wash sweet potato roots | * 1. Batch size is determined depending on production target.   2. Roots are pre-soaked to prepare them for washing as per processor guidelines   3. Roots are washed as per SOPs   4. Inspection of washed roots is done to assess process effectiveness as per company protocol |
| 1. Steam and cool sweet potato roots | * 1. Size reduction is done to facilitate uniform steaming as per the factory guidelines.   2. Steamer is assembled in accordance to the company protocol   3. Water quantity for steam generation is determined according to steamer capacity.   4. Loading of roots is done as per the recommended capacity and guidelines   5. Temperature is monitored until roots are adequately steamed based on temperature control guidelines.   6. Cooling is rapidly done to desired temperature as per the company protocol.   7. Sample collection for testing is done as per the quality control plan |
| 1. Puree steamed sweet potato roots | * 1. Puree equipment is cleaned and sterilized as per the Standard Operating Procedure   2. The equipment is assembled and turned on as per manufacturer guide.   3. Feeding of roots for puree production is done as per the manufacturer guide on feeding range.   4. Sample collection for ***parameter***analysis is done as per the quality control plan. |
| 1. Package sweet potato puree | * 1. Weighing is done into desirable quantities as per the client’s request.   2. Sealing is done according to GMP   3. Labelling and coding is done in accordance to labeling regulations. |
| 1. Store sweet potato puree | * 1. Storage temperature is determined depending on processing technique used and factory storage protocol   2. Storage is done as per the GMP |
| 1. Dispatch sweet potato puree | * 1. Order size is determined depending on LPOs   2. Packing is done in accordance to SOPs guiding shipment of frozen and non-frozen food products.   3. Dispatch is done according to company protocol |

**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.

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| **VARIABLE** | **RANGE** |
| 1. Parameters may include but not limited to: | * PH * Consistency/firmness * Brix * Vitamin A, Iodine, * Microbial load |
| 1. Postharvest handling may include but not limited to: | * Removal of soil debris * Sorting * Grading * Packing * Transportation |

**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:

* Communication
* Analytical
* Computer
* Maintenance
* Problem solving
* Technical
* Critical thinking
* Interpretation
* Sample collection
* Sample handling
* Sample testing
* Observation

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Sorting and grading
* Machine operation
* Machine maintenance
* Store keeping
* Record keeping

**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. Determined production capacity   2. Identified quality mature roots for processing   3. Identified root collection tools   4. Demonstrated practical understanding of postharvest handling of roots   5. Operated puree processing equipment   6. Identified critical production parameters and critical control points   7. Conducted sample collection, handling and testing   8. Demonstrated understanding of puree handling |
| 1. Resource Implications | The following resources must be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Oral   2. Written   3. Third party report   4. Observation |
| 1. Context of Assessment | Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# PRODUCE SWEET POTATO FLOUR

**UNIT CODE:** AGR/OS/SPP/CR/06/5/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to produce sweet potato flour. It involves procuring sweet potato roots, sorting and grading sweet potato roots, cleaning sweet potato roots, drying sweet potato chips and milling sweet potato chips. It also involves packaging sweet potato flour, storing sweet potato flour and dispatching sweet potato flour.

**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. Procure sweet potato roots | * 1. Production needs for sweet potato roots are identified according to procurement procedures   2. Sweet potato root suppliers are identified according to procurement procedures   3. Supplier information is collected according to procurement procedures   4. A sweet potato sourcing method is selected according to workplace procurement procedures   5. Sweet potato sourcing method is implemented according to workplace procurement procedures   6. Negotiations with sweet potato suppliers is conducted according to workplace procurement procedures   7. A sweet potato supplier is selected and awarded according to workplace procurement procedures |
| 1. Sort and grade sweet potato roots | * 1. Sweet potato roots are ***presented for sorting and grading*** as per GMP   2. ***Damaged and unwanted roots*** are eliminated as per GMP   3. Sweet potato roots with ***similar features*** are graded as per SOPs |
| 1. Clean sweet potato roots | * 1. Sweet potato roots are soaked in water according to SOPs   2. Soil and other foreign materials are removed from the sweet potato surface according to SOPs   3. Sweet potato roots are rinsed according to SOPs   4. Sweet potato roots are de-watered according to SOPs |
| 1. Dry sweet potato chips | * 1. Sweet potato roots are peeled according to GMP   2. Sweet potato roots are chipped/ grated according to GMP   3. Sweet potato chips are spread onto drying trays/beds according to GMP   4. Sweet potato chips are dried according to GMP |
| 1. Mill sweet potato chips | * 1. Dried sweet potato chips are milled to flour according to GMP   2. Sweet potato flour is sieved according to GMP |
| 1. Package sweet potato flour | * 1. Sweet potato flour is weighed according to GMP   2. Sweet potato flour is filled into packaging according to GMP   3. Packaged sweet potato flour is sealed according to GMP   4. Packaged sweet potato flour is labelled and coded according labelling regulations |
| 1. Store sweet potato flour | * 1. Packed sweet potato flour is transported to the store according to GMP   2. Packed sweet potato flour is stored according to storage regulations |
| 1. Dispatch sweet potato flour | * 1. Sweet potato flour is dispatched according to dispatch plan |

**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. Presented for sorting and grading may include but not limited to: | * Table presentation * Conveyor presentation |
| 1. Damaged and unwanted roots may include but not limited to: | * Insect damaged roots * Decomposing roots |
| 1. Similar features may include but not limited to: | * Size * Shape * Color |

**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:

* Communication
* Analytical
* Computer
* Maintenance
* Problem solving
* Technical
* Critical thinking
* Observation
* Interpretation
* Sample handling
* Use of tools and equipment
* Measuring
* Record keeping
* Multi-Tasking
* Decision Making
* Leadership
* Teamwork
* Organizing
* Report Writing
* Supervising
* Sensory
* Food handling
* Interpersonal
* Social
* Seasoning
* Recipe formulation
* Numeracy

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Sweet potato products
* Sweet potato composition
* Chemical reactions
* Procurement
* Sorting and grading methods
* Cleaning techniques
* Size reduction techniques
* Pureeing techniques
* Drying methods
* Food preparation methods
* Milling techniques
* Food packaging and labelling
* Food storage and dispatch
* Food hygiene and safety
* GMP and SOP
* HACCP
* Quality control
* Food legislation
* Food standards
* Recipes and ingredients
* Sweet potato preservation
* Equipment operation and maintenance

**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 production needs for sweet potato roots   2. Identified sweet potato root suppliers   3. Selected a sweet potato sourcing method   4. Selected and awarded a sweet potato root supplier   5. Presented sweet potato roots for sorting and grading   6. Eliminated damaged and unwanted roots   7. Graded sweet potato roots with similar features   8. Soaked sweet potato roots   9. Removed soil and other foreign materials from sweet potato roots   10. Rinsed sweet potato roots   11. De-watered sweet potato roots   12. Peeled sweet potato roots   13. Chipped/grated sweet potato roots   14. Dried sweet potato chips   15. Milled sweet potato chips   16. Sieved sweet potato flour   17. Weighed sweet potato flour   18. Packaged sweet potato flour   19. Sealed packets for sweet potato flour   20. Labelled and coded packets for sweet potato flour   21. Transported packaged sweet potato flour to store   22. Stored packaged sweet potato flour   23. Dispatched sweet potato flour |
| 1. Resource Implications | The following resources must be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Oral   2. Written   3. Third party report   4. Observation |
| 1. Context of Assessment | Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# PRODUCE SWEET POTATO CRISPS

**UNIT CODE:** AGR/OS/SPP/CR/07/5/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to produce sweet potato crisps. It involves procuring sweet potato roots, sorting and grading sweet potato roots, cleaning sweet potato roots, preparing sweet potato slices, frying sweet potato slices and seasoning sweet potato crisps. It also involves packaging sweet potato crisps, storing sweet potato crisps and dispatching sweet potato crisps.

**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. Procure sweet potato roots | * 1. Productions needs for sweet potato roots are identified according to procurement procedures   2. Sweet potato root suppliers are identified according to procurement procedures   3. Supplier information is collected according to procurement procedures   4. A sweet potato sourcing method is selected according to workplace procurement procedures   5. Sweet potato sourcing method is implemented according to workplace procurement procedures   6. Negotiations with sweet potato suppliers is conducted according to workplace procurement procedures   7. A sweet potato supplier is selected and awarded according to workplace procurement procedures |
| 1. Sort and grade sweet potato roots | * 1. Sweet potato roots are ***presented for sorting and grading*** as per GMP   2. ***Damaged and unwanted* roots** are eliminated as per GMP   3. Sweet potato roots with ***similar features*** are graded as per SOPs |
| 1. Clean sweet potato roots | * 1. Sweet potato roots are soaked in water according to SOPs   2. Soil and other foreign materials are removed from the sweet potato surface according to SOPs   3. Sweet potato roots are rinsed according to SOPs   4. Sweet potato roots are de-watered according to SOPs |
| 1. Prepare sweet potato slices | * 1. Sweet potato roots are peeled according to GMP   2. Sweet potato roots are sliced according to GMP   3. Sweet potato slices are sulphated/blanched according to GMP   4. Sweet potato slices are de-watered according to GMP |
| 1. Fry sweet potato slices | * 1. Sweet potato slices are dip-fried according to GMP   2. Sweet potato crisps are de – oiled according to GMP   3. Sweet potato crisps are cooled according to GMP   4. Sweet potato crisps are inspected to eliminate over cooked or under cooked crisps according to quality control procedures |
| 1. Season sweet potato crisps | * 1. Sweet potato seasoning is prepared according to GMP   2. Sweet potato crisps are seasoned according to GMP |
| 1. Package sweet potato crisps | * 1. Sweet potato crisps are weighed according to GMP   2. Sweet potato crisps are filled into packaging according to GMP   3. Packaged sweet potato crisps are sealed according to GMP   4. Packaged sweet potato crisps are labelled and coded according labelling regulations |
| 1. Store sweet potato crisps | * 1. Packed sweet potato crisps are transported to the store according to GMP   2. Packed sweet potato crisps are stored according to storage regulations |
| 1. Dispatch sweet potato crisps | * 1. Sweet potato crisps are dispatched according to dispatch plan |

**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. Presented for sorting and grading may include but not limited to: | * Table presentation * Conveyor presentation |
| 1. Damaged and unwanted roots may include but not limited to: | * Insect damaged roots * Decomposing roots |
| 1. Similar features may include but not limited to: | * Size * Shape * Color |

**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:

* Communication
* Analytical
* Computer
* Maintenance
* Problem solving
* Technical
* Critical thinking
* Observation
* Interpretation
* Sample handling
* Use of tools and equipment
* Measuring
* Record keeping
* Basic first aid
* Multi-Tasking
* Decision Making
* Leadership
* Teamwork
* Organizing
* Report Writing
* Supervising
* Sensory
* Food handling
* Interpersonal
* Social
* Seasoning
* Recipe formulation
* Numeracy

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Sweet potato products
* Sweet potato composition
* Chemical reactions
* Procurement
* Sorting and grading methods
* Cleaning techniques
* Size reduction techniques
* Pureeing techniques
* Drying methods
* Food preparation methods
* Milling techniques
* Food packaging and labelling
* Food storage and dispatch
* Food hygiene and safety
* GMP and SOPs
* HACCP
* Quality control
* Food legislation
* Food standards
* Recipes and ingredients
* Sweet potato preservation
* Equipment operation and maintenance

**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 production needs for sweet potato roots   2. Identified sweet potato root suppliers   3. Selected a sweet potato sourcing method   4. Selected and awarded a sweet potato root supplier   5. Presented sweet potato roots for sorting and grading   6. Eliminated damaged and unwanted roots   7. Graded sweet potato roots with similar features   8. Soaked sweet potato roots   9. Removed soil and other foreign materials from sweet potato roots   10. Rinsed sweet potato roots   11. De-watered sweet potato roots   12. Peeled sweet potato roots   13. Sliced sweet potato roots   14. Sulphated/blanched sweet potato slices   15. De-watered sweet potato slices   16. Fried sweet potato slices   17. Cooled sweet potato crisps   18. Prepared seasoning and seasoned sweet potato crisps   19. Weighed sweet potato crisps   20. Packaged sweet potato crisps   21. Sealed packets for sweet potato crisps   22. Labelled and coded packets for sweet potato crisps   23. Transported packaged sweet potato crisps to store   24. Stored packaged sweet potato crisps   25. Dispatched sweet potato crisps |
| 1. Resource Implications | The following resources must be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Oral   2. Written   3. Third party report   4. Observation |
| 1. Context of Assessment | Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# PRODUCE DRY SWEET POTATO CHIPS

**UNIT CODE:** AGR/OS/SPP/CR/08/5/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to produce dry sweet potato chips. It involves procuring sweet potato roots, sorting and grading sweet potato roots, cleaning sweet potato roots, preparing sweet potato chips and drying sweet potato chips. It also involves packaging sweet potato chips, storing sweet potato chips and dispatching sweet potato chips.

**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. Procure sweet potato roots | * 1. Production needs for sweet potato roots are identified according to procurement procedures   2. Sweet potato root suppliers are identified according to procurement procedures   3. Supplier information is collected according to procurement procedures   4. A sweet potato sourcing method is selected according to workplace procurement procedures   5. Sweet potato sourcing method is implemented according to workplace procurement procedures   6. Negotiations with sweet potato suppliers is conducted according to workplace procurement procedures   7. A sweet potato supplier is selected and awarded according to workplace procurement procedures |
| 1. Sort and grade sweet potato roots | * 1. Sweet potato roots are ***presented for sorting and grading*** as per GMP   2. ***Damaged and unwanted* roots** are eliminated as per GMP   3. Sweet potato roots with ***similar features*** are graded as per SOP |
| 1. Clean sweet potato roots | * 1. Sweet potato roots are soaked in water according to SOPs   2. Soil and other foreign materials are removed from the sweet potato surface according to SOPs   3. Sweet potato roots are rinsed according to SOPs   4. Sweet potato roots are de-watered according to SOPs |
| 1. Prepare sweet potato chips | * 1. Sweet potato roots are peeled according to GMP   2. ***Size reduction*** of sweet potato roots is conducted according to GMP |
| 1. Dry sweet potato chips | * 1. Sweet potato chips are spread onto drying trays/beds according to GMP   2. Sweet potato chips are dried according to GMP |
| 1. Package dried sweet potato chips | * 1. Dried sweet potato chips are weighed according to GMP   2. Dried sweet potato chips are filled into packaging material according to GMP   3. Packed sweet potato chips are sealed according to GMP   4. Packed sweet potato chips are labelled and coded as per labelling regulations |
| 1. Store dried sweet potato chips | * 1. Packed sweet potato chips are transported to the store according to Good handling practices   2. Packed sweet potato chips are stored according to storage regulations |
| 1. Dispatch sweet potato chips | * 1. A dispatch plan for sweet potato chips is developed based on Good handling practices   2. Sweet potato chips are dispatched as per the dispatch plan |

**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. Presented for sorting and grading may include but not limited to: | * Table presentation * Conveyor presentation |
| 1. Damaged and unwanted roots may include but not limited to: | * Insect damaged roots * Decomposing roots |
| 1. Similar features may include but not limited to: | * Size * Shape * Color |
| 1. Size reduction may include but not limited to: | * Slicing * Grating * Chopping |

**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:

* Communication
* Analytical
* Computer
* Maintenance
* Problem solving
* Technical
* Critical thinking
* Observation
* Interpretation
* Sample handling
* Use of tools and equipment
* Measuring
* Record keeping
* Basic first aid
* Multi-Tasking
* Decision Making
* Leadership
* Teamwork
* Organizing
* Report Writing
* Supervising
* Sensory
* Food handling
* Interpersonal
* Social
* Seasoning
* Recipe formulation
* Numeracy

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Sweet potato products
* Sweet potato composition
* Chemical reactions
* Procurement
* Sorting and grading methods
* Cleaning techniques
* Size reduction techniques
* Pureeing techniques
* Drying methods
* Food preparation methods
* Milling techniques
* Food packaging and labelling
* Food storage and dispatch
* Food hygiene and safety
* GMP and SOP
* HACCP
* Quality control
* Food legislation
* Food standards
* Recipes and ingredients
* Sweet potato preservation
* Equipment operation and maintenance

**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 internal needs for sweet potato roots   2. Identified sweet potato root suppliers   3. Selected a sweet potato sourcing method   4. Selected and awarded a sweet potato root supplier   5. Presented sweet potato roots for sorting and grading   6. Eliminated damaged and unwanted roots   7. Graded sweet potato roots with similar features   8. Soaked sweet potato roots   9. Removed soil and other foreign materials from sweet potato roots   10. Rinsed sweet potato roots   11. De-watered sweet potato roots   12. Peeled sweet potato roots   13. Sliced/grated sweet potato roots   14. Dried sweet potato chips   15. Weighed sweet potato chips   16. Packaged sweet potato chips   17. Sealed packets for sweet potato chips   18. Labelled packets for sweet potato chips   19. Transported packaged sweet potato chips to store   20. Stored packaged sweet potato chips   21. Dispatched sweet potato chips |
| 1. Resource Implications | The following resources must be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Oral   2. Written   3. Third party report   4. Observation |
| 1. Context of Assessment | Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# MANAGE FOOD SAFETY AND QUALITY ASSURANCE

**UNIT CODE:** AGR/OS/SPP/CR/09/5/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to manage food safety and quality assurance. It involves planning and implementing pre - requisite programs, formulating HACCP plan and implementing HACCP plan. It also involves observing food safety legislations and standards and implementing quality assurance programs.

**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. Plan and implement pre - requisite programs | * 1. Good agricultural practices are identified and implemented according to CODEX and Kenya standards   2. ***Good handling practices*** are identified and implemented according to CODEX standards and Kenya standards for warehousing and receipting system (WRS)   3. ***Good manufacturing practices*** are identified and implemented according to CODEX standards   4. ***Standard operating procedures*** are identified and implemented according to CODEX standards |
| 1. Establish HACCP concepts | * 1. HACCP and Hazards are defined based on CODEX principles and Food Safety Management System (FSMS) principles   2. ***Safe food handling practices and procedures*** are identified based on CODEX principles and FSMS principles   3. ***Food safety hazards*** are identified based on CODEX principles and FSMS principles |
| 1. Implement HACCP plan | * 1. A HACCP team is assembled based on CODEX principles   2. The product is described according to CODEX standards   3. The intended use of the product is identified according to ***population characteristics***   4. A flow diagram is constructed based on CODEX principles   5. The flow diagram is confirmed on-site as per CODEX principles   6. Hazard analysis is conducted based on CODEX standards   7. Critical control points are determined based on CODEX principles   8. Critical limits are established according to CODEX principles   9. A monitoring system for each critical control point is established based on CODEX principles   10. Corrective actions are established for each critical control point based on CODEX principles   11. Verification procedures are established for each critical control point based on CODEX principles   12. Documentation and record keeping are established according to CODEX standards   13. A food safety/HACCP plan is developed and implemented based on CODEX principles and FSMS principles |
| 1. Observe food safety legislations and standards | * 1. Food laws are identified and adhered to based on existing legislative framework   2. ***Food safety management institutions*** are identified based on existing legal framework   3. ***Food standards*** are identified and adhered to based on existing institutional frameworks |
| 1. Implement quality assurance programs | * 1. ***Quality control records*** are kept based ***quality assurance standards***   2. Raw material quality is controlled based on quality assurance standards   3. Process is controlled based on quality assurance standards   4. Finished product quality is controlled based on quality assurance standards |

**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. Good handling practices may include but not limited to: | * Quality of water for cleaning * Sanitation * Personal hygiene * Containers for transport * Storage practices * Transportation practices |
| 1. Good manufacturing practicesmay include but not limited to: | * Personal hygiene * Pest control * Prevention of cross contamination * Waste disposal * Use of PPEs * Plant and equipment cleaning * Maintenance of equipment and machinery * Maintenance of food safety records |
| 1. Standard operating procedures may include but not limited to: | * Pre-operational procedures * Operational procedures |
| 1. Safe food handling practices and procedures may include but not limited to: | * Hand washing * Use of thermometers * Clean utensils |
| 1. Food safety management institutions may include but not limited to: | * Kenya Bureau of standards * KEPHIS * Public Health department * AFA * Crops department |
| 1. Food safety hazards may include but not limited to: | * Biological * Chemical * Physical |
| 1. Population characteristicsmay include but not limited to: | * Age * Gender * Health condition |
| 1. Food standards may include but not limited to: | * Mandatory standards * Voluntary standards * Kenya Bureau of standards * East African Standards * CODEX * ISO |
| 1. Quality control records may include but not limited to: | * Food and equipment inventory * Cleaning records * Storage and stock control records |
| 1. Quality assurance standards may include but not limited to: | * KEBS * EAS * ISO |

**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:

* Communication
* Analytical
* Numeracy
* Computer
* Maintenance
* Problem solving
* Technical
* Critical thinking
* Observation
* Interpretation
* Sample handling

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Food safety
* Pre-requisite programs
* HACCP
* Food standards
* Food legislation
* Quality assurance
* Quality control

**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 and implementedgood agricultural, manufacturing and handling practices   2. Establishedstandard operating procedures   3. Identifiedsafe food handling practices and procedures   4. Identifiedfood safety hazards   5. Developed a food safety/HACCP plan   6. Assembled a HACCP team   7. Described the product   8. Identified the intended use of the product   9. Constructed a flow diagram   10. Confirmed the flow diagram on-site   11. Conducted hazard analysis   12. Determined critical control points   13. Established critical limits   14. Established a monitoring system for each critical control point   15. Established corrective actions   16. Established verification procedures   17. Established documentation and records kept   18. Identified food laws   19. Identified food safety management institutions   20. Identified food standards   21. Kept quality control records   22. Controlled raw material quality   23. Controlled process   24. Controlled finished product quality |
| 1. Resource Implications | The following resources must be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Oral   2. Written   3. Third party report   4. Observation |
| 1. Context of Assessment | Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |