

**REPUBLIC OF KENYA**

**NATIONAL OCCUPATIONAL STANDARD**

**FOR**

**ANIMAL PRODUCTION TECHNOLOGIST**

**LEVEL 6**

**OS ISCED CODE: 0811 554A**

First published 2024

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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 the achievement of Kenya’s development blueprint, Vision 2030 and the government agenda, bottom-up economic transformation agenda (BeTA)

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

The reforms also demand that industry informs occupational standard development to ensure the curriculum addresses its competence needs. This Occupational Standard will thus inform the development of the Competency-Based Education and Training (CBET) curriculum for Aquaculture practitioners.

The Standard will also be the basis for the assessment of an individual for competency certification.

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

**PREFACE**

Kenya Vision 2030 aims to transform the country into a newly industrializing, middle-income country providing a high-quality life to all its citizens by the year 2030. Kenya intends to create a globally competitive and adaptive human resource base to meet the requirements of a rapidly industrializing economy through life-long education and training. 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 TVET Act CAP 210A and Sessional Paper No. 14 of 2012 on Reforming Education and Training in Kenya, emphasized the need to reform curriculum development, assessment and certification. This called for a shift to CBET to address the mismatch between skills acquired through training and skills needed by the industry as well as increase the global competitiveness of the Kenyan labor force am grateful to the Governing Council Members, TVETA, sector regulators, the industry experts, and subject experts who participated in the development of this standard.

**ACKNOWLEDGMENT**

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

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

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# ACRONYMS

|  |  |
| --- | --- |
| PPEs | Personal Protective Equipment |
| ISCED | International Standard Classification of Education |
| TVET | Technical and vocational education and training |

# 

# KEY TO ISCED UNIT CODE

Sector / Industry

Sub Sector

Occupational Area

Version Control

Unit of Competence Number

ISCED level, Programme Orientation and Level of Completion

xx

x

xxx

x

x

x

**OCCUPATIONAL STANDARD OVERVIEW**

This occupation standard consists of competencies required by a person to perform duties of an animal production technologist of a level 6 qualification. It entails: Livestock feed production, manage dairy cattle, manage beef animals, carry out sheep production, carry out goat production, carry out pig production, carry out poultry production, carry out rabbit production, carry out bee production, manage fish farm, manage draught animals, manage emerging livestock and companion animals.

This Occupational Standard consists of Basic, Common and Core Units of Learning as indicated below:

# SUMMARY OF UNITS OF COMPETENCY

**Basic Units of Competency**

|  |  |
| --- | --- |
| **Unit Code** | **Unit Title** |
| 0611 551 01 A | Apply digital literacy |
| 0031 551 02A | Apply communication skills |
| 0417 541 03A | Apply work ethics and practices |
| 0413 541 04A | Apply entrepreneurial skills |

**Common Units of Competency**

|  |  |
| --- | --- |
| **Unit Code** | **Unit Title** |
| 0732 551 05 A | Establish farm structures |
| 0511 551 06 A | Apply animal anatomy and physiology |
| 0716 551 07A | Operate farm machinery |
| 0511 551 08 A | Apply genetic concepts |
| 0531 551 09A | Apply inorganic and organic chemistry |
| 0512 551 10 A | Apply biochemistry principles |
| 0811 551 11 A | Apply farm management principles |
| 0811 551 12A | Apply soil science principles |
| 0532 551 13A | Apply geographic information system |
| 0111 551 14A | Conduct scientific research |

**Core Units of Competency**

|  |  |
| --- | --- |
| **Unit Code** | **Unit Title** |
| 0811 551 15A | Produce livestock feeds |
| 0811 551 16A | Manage dairy cattle |
| 0811 551 17A | Manage beef animals |
| 0811 551 18A | Carry out sheep production |
| 0811 551 19A | Carry out goat production |
| 0811 551 20A | Carry out pig production |
| 0811 551 21A | Carry out poultry production |
| 0811 551 22A | Carry out rabbit production |
| 0811 551 23A | Carry out bee production |
| 0831 551 24A | Manage fish farm |
| 0811 551 25A | Manage draught animals |
| 0811 551 26A | Manage emerging livestock and companion animals |

# 

# BASIC UNITS OF COMPETENCY

## APPLY DIGITAL LITERACY

**UNIT CODE:** 0611 551 01A

**UNIT DESCRIPTION:**

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

**ELEMENTS AND PERFORMANCE CRITERIA**

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

**RANGE**

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

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

**REQUIRED KNOWLEDGE AND SKILLS**

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

**Required knowledge**

The individual needs to demonstrate knowledge of:

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

**Required skills**

The individual needs to demonstrate the following skills:

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

**EVIDENCE GUIDE**

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

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

## APPLY COMMUNICATION SKILLS

**UNIT CODE:** 0031 541 02A

**UNIT DESCRIPTION**

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

**ELEMENTS AND PERFORMANCE CRITERIA**

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

**RANGE**

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

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

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

**Required Knowledge**

The individual needs to demonstrate knowledge of:

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

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspects of Competency. | Assessment requires evidence that the candidate:   * 1. Identified and applied specific communication channels based on workplace requirements.   2. Identified and applied specific written communication correspondence according to the workplace requirements.   3. Applied and developed non-verbal strategies to communicate in all areas of the workplace requirements.   4. Established pathways of oral communication as per workplace policy.   5. Applied group communication strategies based on workplace needs. |
| 1. Resource Implications | The following resources should be provided:   1. Access to relevant workplace where assessment can take place. 2. Appropriately simulated environment where assessment can take place. 3. Resources relevant to the proposed activity or tasks. |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral assessment   3. Portfolio of evidence   4. Interviews   5. Third party report   6. Written assessment   7. Practical assessment   8. Projects |
| 1. Context of Assessment | Competency may be assessed:   1. On-the-job 2. In a simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## APPLY WORK ETHICS AND PRACTICES

**UNIT CODE:** 0417 541 03A

**UNIT DESCRIPTION**

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

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in Range*** |
| --- | --- |
| 1. Apply self-management skills | 1. Personal vision, mission and goals are formulated based on potential and concerning organization objectives and strategic plan 2. Self-esteem and a positive self-image are developed and maintained based on value 3. Emotional intelligence and stress management are demonstrated as per workplace requirements. 4. Assertiveness is developed and maintained based on the requirements of the job. 5. Accountability and responsibility for one's actions are demonstrated based on workplace instructions. 6. Time management, attendance and punctuality are observed as per the organization’s policy. 7. Personal goals are managed as per the organization’s objective 8. Self-strengths and weaknesses are identified based on personal objectives 9. Motivation, initiative and proactivity are utilized as per the organization policy 10. Individual performance is evaluated and monitored according to the agreed targets. |
| 1. Promote ethical work practices and values | 1. Integrity is demonstrated as per acceptable norms 2. Codes of conduct is applied as per the workplace requirements 3. Policies and guidelines are observed as per the workplace requirements 4. Professionalism is exercised in line with organizational policies |
| 1. Promote Team work | 3.1 ***Teams*** are formed to enhance productivity based on organization’s objectives  3.2 Duties are assigned to teams under the organization policy.  3.3 Team activities are managed and coordinated as per set objectives.  3.4 Team performance is evaluated based on set targets as per workplace policy.  3.5 ***Conflicts*** are resolved between team members in line with organization policy.  3.6 Gender and diversity-related issues are identified and mainstreamed in accordance with workplace policy.  3.7 Healthy ***relationships*** are developed and maintained in line with the workplace.  3.8 Adaptability and flexibility are applied in dealing with team members as per workplace policies |
| 1. Maintain professional and personal development | 4.1 ***Personal growth and development*** needs are identified and assessed in line with the requirements of the job.  ***4.2 Training and career opportunities*** are identified and utilized based on job requirements.  4.3 ***Resources*** for training are mobilized and allocated based on organizations and individual skills needs.  4.4 Licenses and certifications relevant to the job and career are obtained and renewed as per policy.  4.5 Recognitions are sought as proof of career advancement in line with professional requirements.  4.6 Work priorities and personal commitments are balanced and managed based on the requirements of the job and personal objectives.  4.7 Dynamism and on-the-job learning are embraced in line with the organization’s goals and objectives. |
| 1. Apply Problem solving skills | 5.1 ***Creative, innovative*** and practical solutions are developed based on the problem  5.2 Independence and initiative in identifying and solving problems are demonstrated based on the requirements of the job.  5.3 Team problems are solved as per the workplace guidelines  5.4 Problem-solving strategies are applied as per the workplace guidelines  5.5 Problems are analyzed and assumptions tested as per the context of data and circumstances |
| 1. Promote Customer Care | 6.1 Customers' needs are identified based on their characteristics  6.2 Customer ***feedback*** is allowed and facilitated in line with organization policies.  6.3 Customer concerns and complaints are analyzed and resolved in line with the set organizational culture.  6.4 Proactive customer outreach programs are implemented as per organizational policies  6.5 Customer retention strategies are developed and implemented in line with the organizational policy |

**RANGE**

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

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

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

**Required Knowledge**

The individual needs to demonstrate knowledge of:

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

**EVIDENCE GUIDE**

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

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

## APPLY ENTREPRENEURIAL SKILLS

**UNIT CODE :** 0413 541 04A

**UNIT DESCRIPTION**

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

**ELEMENTS AND PERFORMANCE CRITERIA**

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

**RANGE**

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

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

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

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

**Required Knowledge**

The individual needs to demonstrate knowledge of:

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

**EVIDENCE GUIDE**

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

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

# COMMON UNITS OF COMPETENCY

## ESTABLISH FARM STRUCTURES

**UNIT CODE: 0732 551 05 A**

**UNIT DESCRIPTION**

This unit specifies competencies required to set up farm structures. It involves developing of farm plan, designing farm structures and constructing farm structures. It also involves maintenance of used farm structures.

**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. Develop farm plan | * 1. ***Farm conditions*** are analysed based on work requirement   2. Space requirements and relationships between farm components are determined as per work requirement   3. Farm plan layout is drawn based on efficiency, expansion capability, farmer’s preference and environmental impacts. |
| 1. Design farm structure | * 1. Drawing instruments are used as per work procedure   2. Scales are used as per structure design drawing   3. Areas and volumes are determined as per work requirement   4. Plan of farm structure is drawn as per work requirement |
| 1. Construct farm structure | * 1. Personal protective equipment (PPEs) are used as per work procedures   2. Site for construction is prepared as per the design   3. Tools and equipment are assembled as per work requirement   4. Measurements are taken as per work requirement   5. Markings are carried out as per work requirement   6. Construction materials are selected based on design.   7. Construction procedure is carried out as per work requirement |
| 1. Maintain farm structure | * 1. Personal protective equipment (PPEs) is used as per work requirement   2. Performance of constructed structure is assessed as per work requirement   3. Quality of structure is assessed as per work requirement.   4. Repairs are carried out as per need and design |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Farm structures/ constructed structuresincludes but not limited to: | * Nursery beds * green house * screen house * tunnels * Sheds * Fence * Apiaries * Storage rooms * Calf pens * Poultry houses |
| 1. Tools and equipmentinclude but not limited to: | * Wooden pegs * Measuring tape * Hammer * Sisal twine * Masonry tools * Carpentry tools * Plumbing tools * Hoe * Jembe * Panga * Slashers * Rakes * Mowers * Wheel barrows * Personal Protective Equipment (PPE) |
| 1. Materials include but not limited to: | * Power * Green house construction materials * Tunnel construction materials * Shed construction materials * Screen house construction materials * Nursery beds construction materials * Fencing materials * Water * Metals * Woods * Nails * Hammer * Stones * Ballast * Iron sheets * Nails * Cement |
| 1. Farm conditions include but not limited to: | * Topography * Wind direction * Soil type * Accessibility * Location of related structures * Security |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required skills**

* + Planning
  + Innovation and creativity
  + Accounting skills
* Estimation
* Masonry
* Carpentry
* Plumbing
* Joinery
* Measuring
* Drawing
* Basic structural design interpretation skills
* Basic numeracy
* Craftsmanship
* Tilling skills

**Required knowledge**

The individual needs to demonstrate knowledge of:

* + Factors to consider in selecting construction site
  + Farm Structure plan development
  + Preparation of construction site
  + Interpretation of an architectural plan
  + Preparation of bill of quantities
  + Budgeting
  + Types of tools and equipment required in farm structures construction
  + Materials for constructing Farm structures
  + Sources of funds
  + Nursery Irrigation systems
  + Construction of farm structures
  + Record keeping
  + Costing
  + Report writing
  + environmental Impact Assessment

**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. Analysed Farm conditions based on work requirement   2. Drawn Farm plan layout based on efficiency, expansion capability, farmer’s preference and environmental impacts   3. Drawn Plan of farm structure as per work requirement   4. Prepared site for construction as per the design   5. Selected Construction materials based on design.   6. Carried out Construction procedure as per work requirement   7. Carried out repairs as per need and design |
| 2. Resource Implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant workplace assessment environment   3. Resources relevant to the proposed assessment activity or tasks |
| 3. Methods of Assessment | Competency may be assessed through:   * 1. Practical assessment   2. Project   3. Portfolio of evidence   4. Third party report   5. Written assessment   6. Oral assessment |
| 4. Context of Assessment | This competency may be assessed in a workplace or in a simulated workplace. |
| 5. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job roles is recommended. Attitude is assessed alongside construction of farm structures |

## APPLY ANIMAL ANATOMY AND PHYSIOLOGY

**UNIT CODE:** **0511 551 06A**

**UNIT DESCRIPTION**

This unit describes knowledge, skills and attitudes required to apply animal anatomy and physiology. It involves carrying out animal classification, applying morphology and physiology in animal production

**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. Classify farm animals | 1. ***Mammals*** are classified based on taxonomic principles of classification 2. ***Aves*** are classified based on taxonomic principles of classification 3. ***Pisces*** are classified based on taxonomic principles of classification 4. ***Reptiles*** are classified based on taxonomic principles of classification 5. ***Amphibians*** are classified based on taxonomic principles of classification 6. ***Arthropods*** are classified based on taxonomic principles of classification |
| 1. Apply morphology in animal production | 1. External features of animals are identified and illustrated based on animal classification 2. ***Animal anatomical structures***are identified and illustrated based on animal classification 3. Relationship between animal structures is illustrated based on physiological functions |
| 1. Apply animal physiological functions | 1. ***Animal organ systems*** are identified and illustrated based on animal morphology 2. ***Animal physiological processes*** are identified and illustrated based on animal morphology 3. 3.3 Adaptations of ***Animal body organs*** are identified and illustrated based on animal morphology |

**RANGE OF VARIABLES**

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.

| **RANGE** | **VARIABLE** |
| --- | --- |
| 1. Mammals may include but not limited to: | * Cattle * Rabbits * Sheep * Goats * Donkeys * Camel * Horses |
| 1. Aves may include but not limited to: | * Chicken * Ducks * Guinea fowl * Geese * Turkey |
| 1. Pisces may include but not limited to: | * Tilapia * Nile perch * Cat fish * Mudfish * Salmon fish |
| 1. Reptiles may include but not limited to: | * Crocodile * Turtles * Lizards * Tortoise * Snake |
| 1. Amphibians may include but not limited to: | * Frogs * Toad * Newts * Salamander |
| 1. Arthropods may include but not limited to: | * Tick * Spider * Obsters, * Crabs * Mites * Centipedes * Millipedes |
| 1. Animal anatomical structures may include but not limited to: | * + Vertebral column   + Skull   + Rib   + Forelimb   + Hind limb   + Pectoral girdle   + Pelvic girdle |
| 1. Animal organ systems may include but not limited to: | * + Circulatory system   + Digestive system   + Reproductive system   + Respiratory system   + Excretory system   + Nervous system   + Lymphatic system   + Cardiovascular system   + Musculoskeletal system |
| 1. Animal physiological processes may include but not limited to: | * + Respiration   + Thermoregulation   + Osmoregulation |
| 1. Animal body organs may include but not limited to: | * + Heart   + Lungs   + Kidney   + Skin   + Liver   + Pancreas |

**REQUIRED KNOWLEDGE AND SKILLS**

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

**Required knowledge**

The individual needs to demonstrate the following knowledge:

* Animal anatomy and morphology
* Animal physiological functions
* Animal classification

**Required Skills**

The individual needs to demonstrate the following skills:

* Drawing
* Decision Making
* Critical thinking
* Communication
* Organizational
* Assertiveness
* Responsibility

**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. Classified animals 2. Identified and illustrated animal anatomy 3. Identified and illustrated animal organ systems 4. Identified and illustrated animal physiological processes 5. Illustrated how body organs are adapted to perform physiological processes |
| 1. Resource   implication | 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   3. Material relevant to the proposed assessment activities or tasks |
| 1. Method of   assessment | Competency in this unit may be assessed through:   * 1. Practicals   2. Projects   3. Written tests   4. Questionnaires   5. Oral questioning |
| 1. Context of   assessment | 4.1 Competency elements must be assessed in a safe working environment  4.2 Assessment may be conducted in a workplace or simulated environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## OPERATE FARM MACHINERY

**UNIT CODE:** **0716 551 07A**

**UNIT DESCRIPTION**

This unit equips trainees with knowledge and skills to operate farm power and machinery. The unit entails description of the types and sources of farm power, demonstration of the working principles of the internal combustion engine and tractor systems and maintenance of the tractor and tractor systems. It also involves operation and maintenance of farm tools, equipment and machinery.

**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. Operate hand tools and equipment | * 1. ***Hand tools*** and ***equipment*** are assembled as per work requirement   2. Hand tools and equipment are utilized as per work procedure   3. Hand tools and equipment are serviced as per work procedure   4. Hand tools and equipment are stored as per work procedure |
| 1. Operate tillage machinery | * 1. ***Personal protective equipment*** is worn as per safety procedures   2. ***Tillage machinery*** is operated as per work procedures   3. Tillage machinery is maintained as per work procedure   4. Tillage machinery is stored as per work procedure |
| 1. Operate planting machinery | * 1. Personal protective equipment is worn as per safety procedure   2. ***Planting machinery*** is calibrated as per work requirement   3. Planting machinery is operated as per work procedure   4. Planting machinery is maintained as per work procedure   5. Planting machinery is stored as per work procedure |
| 1. Operate crop protection machinery | * 1. Personal protective equipment is worn as per safety procedure   2. ***Crop protection machinery*** calibrated as per work requirement   3. Crop protection machinery is operated as per work requirement   4. Crop protection machinery is maintained as per work procedure   5. Crop protection machinery is stored as per work requirement |
| 1. Operate harvesting machinery | * 1. Personal protective equipment is worn as per safety procedures   2. Harvesting machinery is operated as per work procedures   3. Harvesting machinery is maintained as per work requirement   4. Harvesting machinery is stored as per work requirement |
| 1. Operate Agro-processing machinery | * 1. Personal protective equipment is worn as per safety procedures   2. ***Agro-processing machinery*** is operated as per work requirement   3. Agro-processing machinery is maintained and repaired as per work requirement   4. Agro-processing machinery is stored as per work requirementA |

**RANGE**

| **VARIABLE** | **RANGE** |
| --- | --- |
| 1. PPEs include but not limited to: | * Googles * Ear muffs * Safety boots * Nose mask * Gloves * Overall * Dust coat |
| 1. Hand tools and equipment include but not limited to: | * Garden tools and equipment   Panga  Slasher  Spade  Rake  Secateurs  Fork Jembe  Dibber   * Workshop tools and equipment   Jack plane  Hand saw  Hammer  Hand drill  Tape measure  Files   * Carpentry tools and equipment   Hand saw  Hammer  Chisel  Try square  Coping saw   * Masonry tools and equipment   Plumb line  Brick hammer  Cold chisel  Masons level  Wheelbarrow  Masonry saw  Masonry tape measure   * Livestock handling tools and equipment   Burdizzo  Tooth clipper  Ear notcher  Hoof trimmer  Elastrator  Shears  Halter |
| 1. Tillage machineryinclude but not limited to: | 1 Ploughs   * Disc plough * Mouldboard plough * Ox- plough   + 1. Harrows * Disc harrow * Spring tine harrow   2.2.3 Tillers   * Chisel plough * Subsoilers |
| 1. Hand tools and equipment | * Cultivation tools and equipment * Harvesting tools and equipment * Crop protection tools and equipment |
| 1. Planting machinery include but not limited to: | * Seed drills * Planters * Ridgers * Fertilizer distributors * Manure spreaders |
| 1. Crop protection machinery include but not limited to: | * Sprayers * Dusters |
| 1. Harvesting machinery include but not limited to: | * Balers * Mowers * Combined harvesters * Potato harvester * Threshers |
| 1. Processing machinery include but not limited to: | * Mills * Grinders * Shellers * Dryers * Elevator conveyors |
| 1. Secondary tillage machinery | * Harrows * rotary tillers |
| 1. Sowing machinery | * seed drill * planters * potato planter |
| 1. Crop protection | * boom sprayer * dusters * knapsack sprayers |

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

**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:

* Identification
* Drawing
* Communication
* Demonstration
* Interpersonal
* Calculation
* Analytical
* Observation
* Problem solving
* First aid
* Innovation
  + - Creativity

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Types and sources of farm power
* Tractor engine
* Tractor systems and their principles of operation
* Power transmission in a tractor
* Tractor components, controls and features and operational functions
* Tractor steering systems and features
* Attached equipment, features and operational functions and procedures
* Operating principles and operating of farm machinery
* Maintenance of tractors
* Maintenance of farm tools, equipment and machinery

**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 | The evidence required to demonstrate competency in this unit must be relevant to workplace operations and satisfy holistically all of the requirements of the performance criteria and required skills and knowledge and include evidence of the following   1. Utilized hand tools and equipment 2. Serviced Hand tools and equipment 3. Operated Tillage machinery 4. Calibrated ***Planting machinery*** calibrated as per work requirement 5. Operated Planting machinery as per work procedure 6. calibrated ***Crop protection machinery*** as per work requirement 7. Operated Crop protection machinery as per work requirement 8. Operated Harvesting machinery as per work procedures 9. Wore Personal protective equipment per safety procedures 10. Operated ***Agro-processing machinery*** is as per work requirement |
| 1. Resource Implications | The following resources must be provided:   1. Tractor engine 2. Tractor 3. Hand tools and equipment 4. Farm machinery |
| 1. Methods of Assessment | Competency may be assessed through:   * 1. Observation   2. Written tests   3. Oral questioning   4. Interviewing |
| 1. Context of Assessment | Competency may be assessed:   1. Competency may be assessed in workplace or in a simulated workplace setting 2. Assessment shall be observed while tasks are being undertaken whether individually or in-group |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job roles is recommended. Attitude is assessed operation of farm power and machinery. |

## APPLY GENETICS CONCEPTS

**UNIT CODE:** 0511 551 08A

**UNIT DESCRIPTION**

This unit covers describes knowledge, skills and attitudes required to apply genetic concepts. It involves applying Mendelian and chromosomal theories in theory in agricultural production it also involves illustrating genetic mutations in agricultural production.

**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. Apply chromosomal theory | * 1. Chromosome structure is identified and illustrated based on genetic principles   2. DNA structure is identified and illustrated based on genetic principles   3. Role of DNA is illustrated based on genetic principles   4. ***Cell division stages*** are identified and illustrated based on genetic principles |
| 1. Apply Mendelian theory | * 1. Concept of variation is applied in animal breeding based on genetic principles   2. Monohybrid inheritance is identified and illustrated based on genetic principles   3. Dihybrid inheritance is identified and illustrated based on genetic principles   4. Complete dominance is identified and illustrated based on genetic principles   5. Co-dominance is identified and illustrated based on genetic principles   6. Incomplete dominance is identified and illustrated based on genetic principles   7. Phenotypes and genotypes are illustrated based on genetic principles   8. Phenotypic and genotypic frequencies are illustrated based on genetic principles |
| 1. Apply genetic mutation | 1. ***Causes of mutations*** are identified based on genetic principles 2. ***Types of mutation*** are identified and illustrated based 3. ***Mutational disorders*** are identified and illustrated based on genetic principles |

**RANGE OF VARIABLES**

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.

|  |  |
| --- | --- |
| **RANGE** | **VARIABLE** |
| 1. Cell division stages may include but not limited to: | * Interphase * Prophase * Metaphase * Anaphase * Telophase |
| 1. Causes of mutations may include but not limited to: | * Radioactive rays * Chemicals * Infectious agents |
| 1. Types of mutation may include but not limited to: | * Chromosomal mutation * Gene mutation |
| 1. Mutational disorders may include but not limited to: | * Hypotrichosis * Beta-man * Osteoporosis * Pulmonary hypoplasia |

**REQUIRED KNOWLEDGE AND SKILLS**

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

**Required knowledge**

The individual needs to demonstrate the following skills:

* Inheritance and variation
* Chromosome structures
* Structure of DNA
* Role of DNA
* Causes of mutation
* Cell division
* Types of mutation
* Mutational disorders

**Required skills**

The individual needs to demonstrate knowledge of:

* Critical thinking
* Logical thinking
* Problem Solving
* Drawing
* Interpretation
* Application
* 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:  Concept of variation is applied in animal breeding based on genetic principles   1. Identified and illustrated Monohybrid inheritance 2. 1.2Identified and illustrated Dihybrid inheritance 3. Identified and illustrated Complete dominance 4. Identified and illustrated Co-dominance 5. Identified and illustrated Incomplete dominance 6. Identified and illustrated Chromosome structure 7. Identified and illustrated DNA structure 8. Role of DNA is illustrated based on genetic principles 9. Identified and illustrated Cell division 10. Identified Causes of mutations 11. Types of mutation are identified and illustrated 12. Identified and illustrated mutational disorders |
| 1. Resource implication | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant workplace assessment environment   3. Resources relevant to the proposed assessment activity or tasks |
| 1. Method of assessment | Competency in this unit may be assessed through:   * 1. Projects   2. practicals   3. Written tests   4. Questionnaires   5. Oral questioning |
| 1. Context of assessment | 1. Competency elements must be assessed in a safe working environment 2. Assessment may be conducted in a workplace or simulated environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

APPLY INORGANIC AND ORGANIC CHEMISTRY

**UNIT CODE:** 0531 551 09A

**UNIT DESCRIPTION**

This unit specifies the competencies required by an Animal Production Technologist Level 6 to apply inorganic and organic chemistry. It involves applying physical chemistry principles, inorganic and organic chemistry concepts.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace functions | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements  ***(Bold and italicized terms are elaborated in the range)*** |
| 1. Apply physical chemistry principles | 1. Acid and bases properties are applied as per acid-base theory. 2. Salt properties are applied as per salt solubility rules 3. Ionic and chemical equilibrium properties are applied as per physical chemistry theory. 4. Reaction kinetics properties are applied as per physical chemistry theory. 5. Gas properties are applied as per kinetic theory of gases. |
| 1. Apply inorganic chemistry concepts | * 1. Knowledge of element is applied as per the periodic table.   2. ***Chemical bonds*** are determined according to Valence Shell Electron Pair Repulsion (VSEPR) theory.   3. Inorganic salts are tested as per solubility rules |
| 1. Apply organic chemistry concepts | * 1. ***Organic compounds classes*** are used according to International Union of Pure and Applied Chemistry (IUPAC) rules.   2. ***Physical properties*** of organic compounds are applied as per IUPAC rules.   3. ***Chemical properties*** organic compounds are applied as per IUPAC rules.   4. Synthesized compounds are purified as per or laboratory manual   5. Purified compounds are used as per organic laboratory manual |

**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. Chemical bonds may include but are not limited to: | * Ionic bonds * Covalent bonds * Metallic bonds * Hydrogen bonds |
| 2. Organic compounds classes may include but are not limited to: | * Carbohydrates * Proteins * Lipids * Hydrocarbons |
| 3.Physical properties may include but are not limited to: | * Colour * Hardness * Mass * Solubility * Density * Melting point |
| 4.Chemical properties may include but are not limited to: | * pH * Chemical stability * Radioactivity * Flammability * Heat of combustion |

**REQUIRED KNOWLEDGE AND SKILLS**

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

Required knowledge

The individual needs to demonstrate knowledge of:

* Periodic table
* Hydrocarbons
* Chemical reaction
* Laboratory safety
* Laboratory apparatus
* Laboratory rules and regulation

**Required skills**

The individual needs to demonstrate the following skills:

* Observation
* Analytical
* Critical thinking
* Writing
* Active listening
* Problem solving

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Applied acid and bases properties as per acid-base theory.   2. Applied salts properties as per salt solubility rules   3. Applied Ionic and chemical equilibrium properties as per physical chemistry theory.   4. Applied reaction kinetics properties as per physical chemistry theory.   5. Applied gas properties as per kinetic theory of gases.   6. Tested inorganic salts as per solubility rules   7. Applied physical properties of organic compounds as per IUPAC rules.   8. Applied chemical properties organic compounds as per IUPAC rules.   9. Used purified compounds as per organic laboratory manual |
| 1. Resource implications | The following resources should be provided:   1. Appropriately simulated environment where assessment can take place 2. Access to relevant work environment 3. Resources relevant to the proposed activities or tasks |
| 1. Methods of assessment | Competency in this unit may be assessed through:   1. Observation 2. Oral questioning 3. Portfolio of evidence 4. Third party report 5. Written tests |
| 1. Context of assessment | Competency may be assessed:   * 1. Workplace or simulated workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

APPLY BIOCHEMISTRY PRINCIPLES

**UNIT CODE:** 0512 551 10A

**UNIT DESCRIPTION**

This unit specifies the competencies required by an Animal Production Technologist Level 6 to apply biochemistry principles. It involves measuring enzyme kinetics, analyzing carbohydrates, proteins, lipids, vitamins and minerals.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace functions | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements  ***(Bold and italicized terms are elaborated in the range)*** |
| 1. Measure Enzyme kinetics | 1. Enzyme and substrate are prepared as per laboratory procedures. 2. Enzyme assay are set up as per laboratory procedures. 3. Enzyme reaction rate are measured as per laboratory procedures. |
| 1. Analyse carbohydrates | 1. Carbohydrates are identified based on chemical composition as per laboratory procedure. 2. ***Carbohydrates are classified*** based on chemical composition as per laboratory procedure. 3. Carbohydrates are classified based on chemical structure. 4. Carbohydrate functions are applied based on chemical structure. |
| 1. Analyse proteins | 1. Proteins are identified based on chemical composition as per laboratory procedure. 2. Proteins classify based on chemical structure. 3. Proteins functions are applied based on chemical structure. |
| 1. Analyse lipids | 1. ***Lipids*** are identified based on chemical composition as per laboratory procedure. 2. Lipids classified based on chemical structure. 3. Lipids functions are applied based on functional groups. |
| 1. Analyse Minerals and vitamins | 1. Minerals and vitamins are identified based on chemical composition as per laboratory procedure. 2. ***Minerals*** functions areapplied based on chemical structure. 3. ***Vitamins*** functions are appliedbased on chemical structure. |

**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. Carbohydrates are classified may include but are not limited to: | * Monosaccharide’s * Disaccharides * Polysaccharides * Oligosaccharides |
| 1. Fats and lipids classified may include but are not limited to | * Phospholipids * Triglycerides * Sphingolipids * Steroids |
| 1. Minerals are classified may include but are not limited to | * Macro elements * Micro elements |
| 1. Vitamins classified may include but are not limited to | * Water soluble vitamins * Fat soluble vitamins |

**REQUIRED KNOWLEDGE AND SKILLS**

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

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Hydrocarbons
* Chemical reaction
* Laboratory safety
* Laboratory apparatus
* Laboratory rules and regulation
* Basic cell biology

**Required skills**

The individual needs to demonstrate the following skills:

* Observation
* Analytical
* Critical thinking
* Writing
* Active listening
* Problem solving
* Numeracy
* Communication

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   1. Measured enzyme reaction rate as per laboratory procedures. 2. Applied carbohydrate functions based on chemical structure. 3. Applied proteins functions based on chemical structure. 4. Applied lipids functions based on functional groups. 5. Applied minerals functions based on chemical structure. 6. Applied vitamins functions based on chemical structure. |
| 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. Methods of assessment | Competency in this unit may be assessed through:  Observation   * 1. Oral questioning   2. Portfolio of evidence   3. Interviews   4. Third party report   5. Written tests |
| 1. Context of assessment | Competency may be assessed:   1. Workplace or simulated workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

## APPLY FARM MANAGEMENT PRINCIPLES

**UNIT CODE:** 0811 551 11A

**UNIT DESCRIPTION**

This unit specifies competencies required to apply farm management principles**.** It involves Apply farm planning techniques, control farm operations, manage farm resources and Organize farm operations

**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. Apply farm Planning techniques | 1. Goals and objectives of livestock enterprise are established as per workplace procedures 2. ***Organization plans*** for livestock farm are established as per type of plan 3. ***Resources*** required to achieve the goals in livestock farm are identified as per workplace requirements |
| 1. Control farm operations | 1. Motivation of employees to achieve organizational objectives is performed as per operational plan 2. Incorporation of different ***leadership styles*** is done as per workplace requirements 3. Evaluation of plan and making adjustments to ensure the organizational goals are conducted as per type of plan 4. Capacity building of the employees is performed as per workplace procedures 5. ***Performance appraisals*** are conducted as per workplace procedures 6. ***Resource adjustments*** is performed as per workplace procedures |
| 1. Manage farm resources | 1. Assessment of corporate social responsibilities and cultural opportunities is conducted as per workplace procedures 2. Costs and pricing of the livestock farm enterprise is as per cost-budget analysis 3. Quality control and customer service is conducted as per workplace procedures 4. 3.4 Direction of resources and efforts of business towards opportunities for economically significant results is conducted as per workplace procedures |
| 1. Organize farm operations | 1. Resources distribution is performed as per workplace procedures 2. Achieve established goals as per workplace procedures 3. Livestock farm enterprise is budgeted as per workplace procedures 4. ***Staffing of workers*** in the livestock farm is executed as per workplace procedures |

**RANGE OF VARIABLES**

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.

| **RANGE** | **VARIABLE** |
| --- | --- |
| 1. Organization plans may include but not limited to: | * Strategic plan * Tactical plan * Operational plan   + Working plan |
| 1. Resources may include but not limited to: | * + Human   + Financial   + Agricultural machines   + Agricultural inputs |
| 1. Leadership styles may include but not limited to: | * + Authoritarian Leadership   + Democratic Leadership   + Transformational Leadership   + Laissez-Faire Leadership |
| 1. Performance appraisals may include but not limited to: | * + Straight ranking appraisals   + Grading   + Management by objective appraisals   + Behavior-based appraisal   + Performance appraisal |
| 1. Resource adjustments may include but not limited to: | * + Budget   + Staff |
| 1. Staffing of workers may include but not limited to: | * + Advertisement of vacant   + Shortlisting   + Interview   + Recruitment   + Training   + Motivation |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required s knowledge**

The individual needs to demonstrate the following skills:

* Basic numeracy
* Record Keeping
* Report writing
* Basic accounting

**Required skills**

The individual needs to demonstrate the following knowledge:

* Strategic planning
* Monitoring and evaluation
* Business management function
* Human resources management
* Sales and Marketing
* Basic accounting
* Critical thinking
* Leadership skills

**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 assessment of corporate social responsibilities and cultural opportunities as per work place procedure   2. Conducted quality control and customer service as per work place procedure   3. Conducted ***Performance appraisals*** as per work place procedure   4. Performed ***Resource adjustments*** as per work place procedure |
| 1. Resource   implication | The following resources should be provided:   * 1. Agricultural farm   2. Work place procedure |
| 1. Method of   assessment | Competency in this unit may be assessed through:   * 1. Written tests   2. Oral questioning   3. Third party reports |
| 1. Context of   assessment | 4.1 Competency elements must be assessed in a safe working environment  4.2 Assessment may be conducted in a workplace or simulated environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## APPLY SOIL SCIENCE PRINCIPLES

**UNIT CODE:** 0811 551 12A

**UNIT DESCRIPTION**

This unit specifies the competencies required to apply soil science principles. It includes competencies for performing soil sampling and analysis and improving soil fertility.

**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. Perform soil sampling | 1. ***Personal protective equipment*** are worn as per work requirement 2. Soil sampling tools and soil testing equipment are assembled as per work requirement 3. Soil samples are obtained as per work procedure 4. Composite soil samples are prepared and recorded for analysis as per ***sampling procedures*** |
| 1. Perform soil analysis | * 1. Personal protective equipment are worn as per work requirement   2. Soil analysis equipment and materials are assembled according to work requirement   3. Soil samples are processed based on test requirement   4. ***Soil properties*** are analysed in accordance to work requirement   5. Soil analysis report is prepared as per work procedure |
| 1. Improve soil fertility | * 1. Personal protective equipment are worn as per work requirement   2. Tools, equipment and materials are assembled according to work requirement   3. ***Fertilizers*** are prepared as per soil analysis report   4. ***Soil amendments*** are applied as per soil analysis report   5. ***Soil conservation measures*** are applied as per field condition |

**RANGE**

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

| **VARIABLE** | **RANGE** |
| --- | --- |
| 1. Soil sampling tools includes but not limited to: | * Hoes * Machetes * Secateurs * Shovels * Soil augur * Panga * Hammer * Saw * Bucket * Shears * Dibbler * Pegs |
| 1. Soil testing equipment includes but not limited to: | * Digestion block * Kjeldahl apparatus * UV-VIS Spectrophotometer * Atomic absorption spectrophotometer (AAS) * Flame photometer * pH meter * EC meter * TDS meter * Fume chamber * Measuring cylinders * Assorted glassware for routine laboratory procedures * Mechanical stirrer * Electric shaker * Eureka cans * Meteorological equipment |
| 1. Personal protective equipment may include but are not limited to: | * Gloves * Safety goggles * Safety boots * Overalls * Dust coat * Ear muffs * Face masks |
| 1. Sampling procedures may include but are not limited to: | * Field layout * Sample collection * Compositing * Packaging * Processing * Storage |
| 1. Soil properties may include but are not limited to: | * Soil texture * Soil aggregation * Soil consistency * Soil colour * Soil moisture * Soil air * Soil bulk density * Water holding capacity * Soil pH * Soil EC * Cation exchange capacity * Percent base saturation * Salt index * Microbial activity * CN ratio * Nutrient’s concentration |
| 1. Fertilizers may include but are not limited to: | * Organic fertilizers * Inorganic fertilizers |
| 1. Soil amendments may include but are not limited to: | * Fertilizers * Agricultural lime * Gypsum |
| 1. Soil conservation measures may include but are not limited to: | * Cover cropping * Mulching * Strip cropping * Building of terraces * Minimum tillage * Contour ploughing |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Essential plant nutrients
* Soil-plant relationship
* Types of fertilizers and their nutrition content
* Fertilizer formulation and use
* Sources of soil acidity
* Management of soil acidity
* Types of tools and equipment used in soil sampling and soil testing
* Soil sampling and testing
* Soil degradation
* Soil conservation
* Standard operating procedures
* Accounting principles
* Waste Management
* Occupational Safety and Health Procedures

**Required skills**

The individual needs to demonstrate the following skills:

* Measuring
* Nutrient deficiency scouting
* Equipment calibration
* Technical Report writing
* Soil sampling
* Soil testing
* Plant tissue analysis
* Fertilizer recommendation
* Computation of lime requirement
* Observation
* Digital literacy

**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. Observed safety measures by using Personal Protective Equipment (PPE) and correct tools 2. Assemble soil sampling tools and soil testing equipment 3. Collected soil samples as per soil sampling procedures 4. Processed soil samples for laboratory analysis in accordance to work procedures 5. Analysed soil physical, chemical and biological properties in accordance to work procedures 6. Computed fertilizer application rates as per crop nutrient requirement 7. Computed lime requirement as per soil analysis report and agronomic requirement 8. Applied soil amendments as per soil analysis report 9. Applied soil conservation measures as per field conditions |
| 1. Resource Implications (required for assessment) | The following resources must be provided during assessment:   1. Assessment location 2. Equipped soil laboratory 3. Soil laboratory manual |
| 1. Methods of Assessment | Competency may be assessed through:   * 1. Observation   2. Written tests   3. Practical report   4. Oral questioning   5. interviews |
| 1. Context of Assessment | Competency may be assessed:   1. Off-the-job 2. On-the-job 3. Work placement -attachment   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 and workplace job role is recommended |

## APPLY GEOGRAPHIC INFORMATION SYSTEM

**UNIT CODE:** **0532 551 13A**

**UNIT DESCRIPTION**

This unit covers the competencies required to apply information systems It involves Applying Geographic Information Systems (GIS) and remote sensing techniques, performing geo-graphic communication and producing geo-maps.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace functions | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements  (Bold and italicized terms are elaborated in the range) |
| 1. Apply GIS and remote sensing techniques | 1. Objectives and guiding principles are determined as per national environment policy, 2013 2. Management of ecosystems and sustainable natural resource use as per national environment policy, 2013 3. Environmental stewardship as per national environment policy, 2013 4. Environmental quality and health as per national environment policy, 2013 5. Environmental governance laws are determined as per national environment policy, 2013 |
| 1. Perform geo-graphic communication | 1. Digital maps developed to scale as per Open Geospatial Consortium 2. Digital maps presented to scale as per Open Geospatial Consortium 3. Graphs are generated as per Open Geospatial Consortium 4. Images are georeferenced and processed as per Open Geospatial Consortium. 5. Digital models are generated from raw data as per Open Geospatial Consortium |
| 1. Produce geo-maps | 1. Maps are generated as per Federal Geographic Data Committee 2. Maps are designed and compiled as per Federal Geographic Data Committee 3. Maps are projected Coordinate reference systems are applied a per Federal Geographic Data Committee |

**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. Collected may include but are not limited to: | * GNSS receivers * Aerial photography * Remote sensing |
| 2. Coordinate reference systems may include but are not limited to: | * Geographical coordinates * Projected Coordinate system |
| 3. Map projections may include but are not limited to: | * UTM (Universal Transverse Mercator) * UPS (Universal Polar Stereographic) |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Map layout
* Geographical information systems
* Types of GNSS receivers
* Aerial photography
* Digital models
* Watershed delineation
* Remote sensing
* Data processing
* Data presentation
* Mapping scales
* Map projections required
* Geo-referencing
* Map design
* Reference systems

**Required Skills**

The individual needs to demonstrate the following skills:

* ICT skills
* Operating GNSS receivers
* Geo-referencing
* Collecting data
* Taking aerial photographs
* Scanning maps
* Layering features
* Interpretation
* Presentation
* Mathematical skills
* Designing maps

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:   1. Collected data as per Open Geospatial Consortium. 2. Processed data as per Open Geospatial Consortium. 3. Mapped natural resources and agricultural facilities as per Open Geospatial Consortium 4. Designed, developed and presented digital maps as per Federal Geographic Data Committee 5. Georeferenced and processed images as per Federal Geographic Data Committee 6. Generated digital models as per Federal Geographic Data Committee |
| 1. Resource Implications | The following resources should be provided:  2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place  2.2 Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:  3.1 practical  3.2 Oral questioning  3.2 Written test  3.4 direct instructions |
| 1. Context of Assessment | Competency may be assessed:  4.1 On-the-job  4.2 Off-the –job  4.3 During Industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## CONDUCT SCIENTIFIC RESEARCH

**UNIT CODE:**0111 551 14A

**UNIT DESCRIPTION**

This unit specifies the competencies required by an Industrial Chemist to conduct scientific research**.** It involves preparing scientific research proposal, carrying out laboratory research, analyzing the laboratory research findings and documenting and disseminating laboratory research findings.

**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 |
| 1. Prepare scientific research proposal | 1. Scientific research problem is identified based on existing research gap 2. Research objectives are developed according to research problem 3. Research questions are designed based on research objectives 4. Scientific research proposal is developed as per standard research procedures |
| 1. Apply scientific research methods | 1. ***Scientific study design*** is determined in accordance with research problem and research data 2. Sample size is determined based on the research methodology 3. ***Sampling techniques*** are determined in accordance with scope and research methodology 4. Ethical considerations are determined based on research methods utilized 5. Research materials are identified based on scope and research methodology 6. Data is collected in accordance with research methodology |
| 1. Analyze scientific research finding | 1. ***Data analysis methods*** are identified as per job requirement. 2. Data analysis is performed as per work procedure 3. Research report is prepared as per work procedure. |

**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** |
| Scientific study design may include but are not limited to: | * Qualitative designs * Quantitative designs |
| Sampling techniques may include but are not limited to: | * Probability * Non-probability |
| Data analytical methods may include but are not limited to: | * ANOVA * Measures of central tendency * Measures of dispersal |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Introduction to research
* Problem identification
* Types of research
* Purposes of research
* Basic terms in research
* Problem identification
* Literature review
* Research design
* Data collection and analysis
* Research materials
* Statistics
* Mathematics
* Research proposal
* Research report

**Required Skills**

The individual needs to demonstrate the following skills:

* Analytical
* Communication
* Computer
* Creativity
* Interpersonal
* Critical thinking
* Data collection
* Decision making
* Dissemination
* Observation
* Problem solving
* Report writing
* Statistical

**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 scientific research problem based on existing research gap 2. Developed scientific research proposal as per work requirement. 3. DeterminedScientific study design in accordance with research problem and research data 4. Collected data in accordance with research methodology 5. Applied data analysis techniques as per work requirement Compiled Research report as per work requirement |
| 1. Resource Implications | The following resources should be provided:   1. Workstation 2. Reporting tools 3. Data collection tools 4. Stationery 5. Data analysis tools 6. PPEs |
| 1. Methods of Assessment | Competency may be assessed through:   1. Practical Assessment 2. Project-Based Assessment 3. Portfolio of Evidence 4. Third Party Reports 5. Written Assessment |
| 1. Context of Assessment | Competency may be assessed in a workplace or simulated workplace |
| 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

## PRODUCE LIVESTOCK FEEDS

**UNIT CODE:** 0811 551 15A

**UNIT DESCRIPTION**

This unit specifies competencies required to produce livestock feeds. It involves producing livestock forage, conserving livestock forage, and formulating livestock feed rations.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**  These are asses-sable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the Range.*** |
| --- | --- |
| 1. Produce livestock forage | 1. ***Tools and equipment*** are assembled as per work requirements 2. ***Propagation materials*** are sourced as per ***Agro-Ecological Zone*** *(AEZ)* 3. Land is prepared as per planting material requirements 4. Propagation materials are prepared according to ***Good Agricultural Practices*** (GAP) 5. Propagation materials are established as per good agricultural practices 6. ***Forages*** are ***managed*** as per good agricultural practices 7. Forages are harvested as per maturity index and height |
| 1. Conserve livestock forage | 1. Quality of harvested forages is assessed based livestock production manual 2. Forages are conserved into silage or hay as per LPM 3. Conserved forage is stored based on established storage requirements and conditions 4. Forage production records are generated and disseminated as per the workplace requirements 5. Waste is managed according to environmental protection regulations |
| 1. Formulate livestock rations | 1. Feed formulation tools, equipment and materials are identified and assembled based on feed formulation manual and workplace requirements 2. ***Animal feeds ingredients*** are identified as per animal feeding standard 3. Animal feeds ingredient are sourced as per type of feed to be formulated and animal nutritional requirements 4. Ingredient proportions are weighed as per feed formulation formula 5. Livestock feed rations are formulated using ***feed formulation methods*** as per animal feeding standard 6. Formulated feeds are packaged and labeled as per feed manufacturing guidelines 7. Packaged feeds are stored as per livestock feed manufacturing guidelines 8. Waste is managed according to environmental protection regulations |

**RANGE OF VARIABLES**

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.

| **RANGE** | **VARIABLE** |
| --- | --- |
| 1. Tools and equipment may include but are not limited to: | * Equipment * Grass cutters * Generator * Water pump with hose * Tractors (optional) * Draft animals * Plow and harrow * Shovel * Hoe * Water sprinklers * Planter * Wheelborrow * Hole digger * Planting materials * Fertilizer (Organic and inorganic) * Pesticides * Root inoculants * Herbicides * Fencing materials |
| 1. Propagation materials may include but are not limited to: | * Seeds, Seedlings * Cuttings, Splits and * Tubers for propagation |
| 1. Good Agricultural Practices (GAP) includes but not limited | * Liming * Mulching |
| 1. Forages may include but not limited to; | * Pastures * Fodder crops |
| 1. Animal feeds ingredients may include but not limited to; | * Feed additives , Bran * Mineral premixes |
| 1. Feed formulation methods may include but not limited to; | * Person square * Trial and error * Computer method |

**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 skills
* Food safety risk assessment and communication
* Training skills
* Measuring skills
* Agronomic skills
* Communication skills
* Basic mechanical operations
* Maintenance of forage

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Agro ecological zoning
* Types of planting materials
* Primary and secondary cultivation
* Hazard Analysis Critical Control Point (HACCP) process
* Code of hygienic practice (s)
* Risk assessment
* Mycotoxins
* Water quality
* Safe use of pesticides and herbicides
* Code of practice for the animal feed industry
* Principles of forage establishment and management
  + Methods of planting
  + Weeds, pests and diseases control methods
  + Irrigation methods
* Forage harvesting and conservation methods
* Occupational safety and health Act

**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. Carried out food safety measures to produce forage   2. Prepared planting land to a level suitable to the planting material   3. Established forage suitable for the AE zone   4. Managed and harvested forage according to guidelines in the livestock production manual   5. Conserved and stored fodder using correct method and procedures   6. Observed occupational safety and health measures in the working environment   7. Observed laid down environmental protection measures at the work place   8. Documented and maintained dairy forage production and food safety records |
| 1. Resource implication | The following resources should be provided:   * 1. Tools, equipment and machineries   2. Materials and supplies |
| 1. Method of assessment | Competency in this unit may be assessed through:   * 1. Practical   2. project   3. Written tests   4. Oral questioning |
| 1. Context of assessment | 4.1 Competency elements must be assessed in a safe working environment  4.2 Assessment may be conducted in a workplace or simulated environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## MANAGE DAIRY CATTLE

**UNIT CODE:** 0811 551 16A

**UNIT DESCRIPTION**

This unit specifies competencies required to manage dairy cattle which involves construction dairy cattle structures, feeding of dairy cattle, breeding of dairy cattle, managing of dairy calf, production of clean milk, Performing dairy cattle routine management practices and marketing of dairy products

**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. Construct dairy cattle structures | 1. Tools, equipment and materials are assembled as per work requirements 2. Site of ***dairy cattle structures*** is selected based on LPM 3. Dairy cattle structures are designed according to Livestock Production Manual (LPM) 4. Dairy cattle structures are constructed based on livestock production manual 5. Dairy cattle structures are maintained as per workplace procedures 6. Maintenance records are kept as per workplace requirements 7. Waste is managed according to environmental protection regulations |
| 1. Feed dairy cattle | 1. Tools, equipment and materials are assembled as per work requirements 2. ***Dairy cattle feeds*** are identified as per the nutritional requirements 3. Dairy cattle are grouped based on their nutritional requirements 4. Dairy cattle feeding regime is determined based on LPM 5. Dairy cattle are fed based on their nutritional requirements in accordance with LPM 6. Feed intake is evaluated as per the LPM 7. Feed conversion efficiency is evaluated based on productivity 8. Dairy cattle feeding record is generated as per the workplace procedures 9. Waste is managed according to environmental protection regulations |
| 1. Breed dairy cattle | 1. Breeding management tools, equipment and materials are assembled in accordance with LPM 2. ***Dairy Cattle breeds*** are identified based on LPM 3. Dairy Cattle breeds are selected based on traits of economic importance and farmer requirements 4. Dairy cattle on heat are detected based on LPM 5. Flushing is carried out as per LPM 6. Service is performed based on the ***breeding method*** ***and technologies*** as per the LPM 7. Gestationis managed as per the LPM 8. In-calf dairy cows are cared for based on the LPM 9. Steaming-up is carried out based on LPM 10. Parturition Breeding records are prepared as per work procedures |
| 1. Manage dairy calf | 1. Calf management tools, equipment and materials are assembled as per the LPM 2. Calf pens are prepared as per LPM 3. Calf is handled at birth as per LPM 4. Calf is fed colostrum according to the LPM 5. Orphaned calves are fostered according to LPM 6. Artificial colostrum is prepared as per LPM 7. Calf is identified using suitable method in accordance with LPM, animal welfare regulations and work place policy 8. Calf is housed based on production system, prevailing climatic conditions and age within LPM standards 9. Calf is introduced to roughage feeding in accordance with LPM 10. Calf is disbudded and extra mammary teats removed in accordance with animal welfare regulations and work place policy 11. Calf is weighed in accordance with LPM instructions and work place policy 12. Calf growth rate is monitored as per LPM 13. Calf is weaned in accordance with the LPM 14. Waste is managed and disposed based on environmental protection regulations |
| 1. Produce clean milk | 1. ***Milking materials and equipment*** are assembled based on the milking technique selected 2. Milking cows are assembled in accordance with the LPM 3. Milking cow is restrained in accordance with the LPM 4. Udder is cleaned and pre-dipped according to LPM 5. ***Mastitis test*** is carried out based LPM 6. Milk let down is stimulated based on selected ***milking technique*** 7. Milking is carried out based on Essentials of Clean Milk Production Standard. 8. Udder quarters are disinfected as per the LPM 9. Milked cow is released as per workplace procedures 10. Milk is sieved and weighed according to the workplace procedures 11. Milk is stored and cooled in accordance with LPM 12. Milk production record is maintained based on the workplace procedures 13. Milking equipment are cleaned as per workplace procedures 14. Milking parlour is cleaned as per workplace procedures 15. Re-usable materials are stored as per manufactures instruction and workplace policy 16. Waste is managed and disposed with due regard to environment protection regulations |
| 1. Perform dairy cattle routine management practices | 1. Dairy ***Cattle identification method*** is selected based on GAPs 2. Cattle is dehorned or disbudded based on GAPs 3. Cattle overgrown hooves are trimmed based on GAPs 4. Dairy cattle are culled based on workplace policy 5. Internal and external parasites are controlled based on LPM and GAPs 6. Vaccination is performed as per workplace policy, manufacturer’s instructions and LPM 7. Cattle isolation and quarantine is carried out to control notifiable diseases based on GAPs 8. Dairy cattle are provided with clean water ad-libitum as per LPM |
| 1. Market dairy cattle products | 1. Market survey is conducted based on Standard Survey guidelines 2. ***Dairy Cattle products*** are sold based on market demands 3. Dairy Cattle is transported to the market based on Animal Welfare Act, 4. Marketing records are maintained based on the organization’s record management guidelines |

**RANGE OF VARIABLES**

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.

| **RANGE** | **VARIABLE** |
| --- | --- |
| 1. Dairy cattle structures may include but not limited to: | * + Crushes   + Milking parlour   + Barn   + Feeding facility   + Cattle shed   + Cattle dips   + Feed storage facility   + Farm office |
| 1. Dairy cattle feeds may include but not limited to: | * + Carbohydrates   + Proteins   + Vitamins   + Minerals   + Fats/ lipids   + Water |
| 1. Dairy Cattle breeds method may include but not limited to: | * + Friesian   + Aryshire   + Sahiwal   + Jersey   + Brown Swiss |
| 1. Breeding method and technologies may include but not limited to: | * + Artificial insemination   + Natural method   + Cross breeding   + Pure breeding   + Inbreeding   + Embryo transfer   + Surrogate   + Signs of heat   + Estrus synchronization |
| 1. Milking materials and equipment may include but not limited to: | * Animal Restraint * Cleaning * Cups * Herd Test Buckets * Thermometer * Separator |
| 1. Mastitis test may include but not limited to: | * + CMT   + Strip cup |
| 1. Milking technique may include but not limited to: | * + Hand milking   + Milking machine |
| 1. Cattle identification method may include but not limited to: | * + Ear tagging   + Ear notching   + Branding   + Neck chains   + Straps with numbers   + Ear tattooing |
| 1. Dairy Cattle products may include but not limited to: | * + Milk   + Hides   + Hooves   + Cream.   + Butter.   + Fermented.   + Yogurt.   + Cheese |

**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
* Evaluation
* Management
* Problem solving
* Time management
* Data collection
* Numeracy
* Observation
* Negotiation
* Digital literacy
* Equipment calibration

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Principles of animal production
* Cattle selection and breeding
* Cattle nutrition
* Parasite and disease management in cattle
* Cattle value added products
* Cattle routine management practices
* Cattle structures
* Cattle production records

**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 | 1. Assessment requires evidence that the candidate: 2. Selected site of dairy cattle structures based on LPM 3. Kept maintenance records as per workplace requirements 4. Grouped dairy cattle based on their nutritional requirements 5. Determined dairy cattle feeding regime based on LPM 6. Fed dairy cattle based on their nutritional requirements in accordance with LPM 7. Selected dairy cattle breeds based on traits of economic importance and farmer requirements 8. Cleaned udder and pre-dipped according to LPM 9. Carried mastitis test out based LPM 10. Stimulated milk let down based on selected milking technique 11. Carried out milking based on Essentials of Clean Milk Production Standard. 12. Disinfected udder quarters as per the LPM 13. Carried out cattle isolation and quarantine is to control notifiable diseases based on GAPs 14. Sold dairy Cattle products are based on market demands 15. Managed waste is with due regard to environment protection regulations |
| 1. Resource   implication | 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   3. Materials relevant to the proposed assessment activity or tasks |
| 1. Method of   assessment | Competency in this unit may be assessed through:   * 1. Written tests   2. Questionnaires   3. Oral questioning   4. Projects   5. Observation |
| 1. Context of   assessment | 4.1 Competency elements must be assessed in a safe working environment  4.2 Assessment may be conducted in a workplace or simulated environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## MANAGE BEEF ANIMALS

**UNIT CODE:** 0811 551 17A

**UNIT DESCRIPTION**

This unit specifies competencies required to manage beef animals. It involves constructing beef cattle structures, carrying out beef cattle feeding, carrying out beef cattle breeding carrying out calf management, performing beef cattle routine management practices managing fattening stock slaughtering beef cattle and marketing beef products

**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. Construct beef cattle structures | 1. Tools, equipment and materials are assembled as per work requirements 2. Site of ***beef cattle structures*** is selected based on LPM 3. Beef cattle structures are designed according to Livestock Production Manual (LPM) 4. Beef cattle structures are constructed based on livestock production manual 5. Beef cattle structures are maintained as per workplace procedures 6. Beef cattle structures construction and maintenance records are kept as per workplace requirements 7. Waste is managed according to environmental protection regulations |
| 1. Carry out beef cattle feeding | 1. Tools, equipment and materials are assembled as per work requirements 2. ***Beef cattle feeds*** are identified as per the nutritional requirements 3. Beef cattle are grouped based on their nutritional requirements 4. Beef cattle feeding regime is determined based on LPM 5. Beef cattle are fed based on their nutritional requirements in accordance with LPM 6. Feed supplements are provided according to beef cattle dietary requirements 7. Feed intake is evaluated as per the LPM 8. Feed conversion efficiency is evaluated based on productivity 9. Beef cattle feeding record is generated as per the workplace procedures 10. Waste is managed according to environmental protection regulations |
| 1. Carry out beef cattle breeding | 1. Breeding management tools, equipment and materials are assembled in accordance with LPM 2. ***Beef Cattle breeds*** are identified based on LPM 3. Beef Cattle breeds are selected based on traits of economic importance and farmer requirements 4. Beef cows on heat are detected based on LPM 5. Flushing is carried out as per LPM 6. Service is performed based on the ***breeding method*** ***and technologies*** as per the LPM 7. In-calf beef cows are provided care based on the LPM 8. Steaming-up is carried out based on LPM 9. Parturition is managed as per the LPM 10. Breeding records are prepared as per work procedures |
| 1. Carry out calf management | 1. Calf management tools, equipment and materials are assembled as per the LPM 2. Calf pens are prepared as per LPM 3. Calf is handled at birth according to instructions in LPM 4. Calf is fed colostrum according to LPM 5. Calf is identified using suitable method in accordance with LPM, animal welfare regulations and work place policy 6. Calf is housed based on production system, prevailing climatic conditions and age within LPM standards 7. Calf is introduced to roughage feeding in accordance with LPM 8. Calf is disbudded in accordance with animal welfare regulations and work place policy 9. Calf is weighed in accordance with LPM instructions and work place policy 10. Calf growth rate is monitored in accordance with principles of animal nutrition and breeding 11. Calf is weaned in accordance with the LPM 12. Waste is managed and disposed based on environmental protection regulations |
| 1. Perform beef cattle routine management practices | 1. Beef ***Cattle identification method*** is selected based on GAPs 2. Beef Cattle are ***dehorned*** or disbudded based on GAPs 3. Castration is performed as per the LPM and market requirements 4. Overgrown hooves are trimmed based on GAPs 5. Culling is performed based on workplace policy 6. Internal and external parasites are controlled based on LPM and GAPs 7. Vaccination is performed as per workplace policy, manufacturer’s instructions and LPM 8. Cattle isolation and quarantine is carried out to control notifiable diseases based on GAPs 9. Beef cattle are provided with clean water ad-libitum as per LPM |
| 1. Manage fattening stock | 1. Tools, equipment and materials are assembled as per the LPM 2. ***Feedlot facilities*** are prepared based on LPM 3. Fattening stock are selected for finishing as per the market requirements 4. ***Management practices*** ***for fattening stock*** are carried out based on LPM 5. Fattening is monitored as per growth curve of beef cattle 6. Fattened beef cattle are marketed based on market specifications 7. Records are maintained as per the workplace procedures 8. Waste is managed based on environmental protection regulations |
| 1. Slaughter beef cattle | 1. Tools, equipment and materials for slaughter are assembled based on the Kenya Meat Control Act 2. Slaughter house/slab is prepared in accordance to the Kenya Meat Control Act 3. Pre-slaughter handling of Beef cattle is carried out as per the Animal Welfare Act 4. Humane slaughter of beef cattle is performed as per Animal Welfare Act 5. Dressing of carcass is carried out in accordance with Kenya Meat Control Act 6. Cleaning of the offal is done as per the workplace procedures 7. Dressed meat is preserved as per the Kenya Meat Act 8. Dressed meat is transported as per the Kenya Meat Control Act 9. By-products are handled according to the Kenya Meat Control Act 10. ***Condemned materials*** and wastes are disposed as per the Kenya Meat Control Act 11. Cleaning of slaughterhouse and equipment is done as per Kenya Meat Control Act and environmental management regulations 12. Slaughter structures are maintained as per Kenya Meat Control Act 13. Records are generated based on the workplace record management guidelines |
| 1. Market Beef products | 1. Market survey is conducted based on Standard Survey guidelines 2. Cattle is transported to the market based on Animal Welfare Act 3. Beef products are sold based on market requirements 4. Marketing records are maintained based on workplace guidelines |

**RANGE OF VARIABLES**

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.

| **RANGE** | **VARIABLE** |
| --- | --- |
| 1. Beef cattle structures may include but not limited to; | * Crushes, Feeding facility * Cattle shed, Cattle dips * Feed storage facility * Farm office |
| 1. Beef cattle feeds may include but not limited to; | * Pasture forage * Hay, Silage * Straw * Grain by-products |
| 1. Beef Cattle breeds may include but not limited to; | * + Angus   + Hereford   + Charolais   + Simmental |
| 1. Breeding method and technologies may include but not limited to; | * + Artificial insemination   + Natural method   + Cross breeding   + In breeding   + Pure breeding   + Embryo transfer   + Surrogate   + Signs of heat   + Estrus synchronization |
| 1. Beef cattle identification method may include but not limited to; | * Ear tagging * Ear notching * Branding * Neck chains * Straps with numbers   + Ear tattooing |
| 1. Dehorning methods may include but not limited to; | * Hot iron * Use of chemicals * Use of Saws * Electric method * Disbudding rod * Dehorning wire |
| 1. Feedlot facilities may include but not limited to; | * + Feedlot pens   + Feed storage   + Feed processing mill   + Feed mixing/batching   + Feed bunks |
| 1. Management practices for fattening stock may include but not limited to; | * + Vaccination   + Hoof care   + Deworming   + Disease and parasite control |
| 1. Condemned materials may include but not limited to; | * + Any parts of the animal that are deemed unfit for human consumption |

**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
* Evaluation
* Problem solving
* Time management
* Data collection
* Numeracy
* Observation
* Negotiation
* Digital literacy

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Beef cattle selection and breeding
* Beef cattle nutrition
* Parasite and disease management in beef
* Beef cattle value added products
* Beef cattle routine management practices
* Beef cattle structures
* Production records

**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. Selected site of beef cattle structures based on LPM 2. Constructed beef cattle structures based on livestock production manual 3. Kept records as per workplace requirements 4. Provided Basal rations at various physiological stage based on feeding plan. 5. Evaluated feed intake as per the LPM 6. Evaluated feed conversion efficiency based on productivity 7. Identified Beef cattle breeds based on LPM 8. Performed breeding method and technologies service based on the s as per the LPM 9. Provided pregnant cows care based on the LPM 10. Managed calving as per the LPM 11. Fostered orphaned calves according to LPM 12. Selected Beef cattle identification method based on GAPs 13. Controlled internal and external parasites based on LPM and GAPs 14. Managed waste according to environmental protection regulations |
| 1. Resource implication | 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   3. Materials relevant to the proposed assessment activity or tasks |
| 1. Method of assessment | Competency in this unit may be assessed through:   * 1. Written tests   2. Questionnaires   3. Oral questioning   4. Projects   5. Observation |
| 1. Context of assessment | 1. Competency elements must be assessed in a safe working environment 2. Assessment may be conducted in a workplace or simulated environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## CARRY OUT SHEEP PRODUCTION

**UNIT CODE:** 0811 551 18A

**UNIT DESCRIPTION**

This unit specifies competencies required to carry out sheep production. It involves constructing sheep structures, carrying out sheep feeding, carrying out sheep breeding, carrying out lamb management, performing sheep routine management practices and marketing sheep products.

**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. Construct sheep structures | 1. Tools, equipment and materials are assembled as per work requirements 2. Site of sheep structures is selected based on LPM 3. Sheep structures are designed according to Livestock Production Manual (LPM) 4. Sheep structures are constructed based on livestock production manual 5. Sheep structures are maintained as per workplace procedures 6. Sheep structures construction and maintenance records are kept as per workplace requirements 7. Waste is managed according to environmental protection regulations |
| 1. Carry out Sheep feeding | 1. Tools, equipment and materials are assembled as per work requirements 2. Sheep feeds are identified as per the nutritional requirements 3. 2.3 Basal rations at various physiological stage are provided based on feeding plan. 4. Feed supplements are offered according to animal dietary requirements 5. Grazing management is identified and practiced 6. Grazing capacity of the pasture is determined based on pasture land condition 7. Feed intake is evaluated as per the LPM 8. Feed conversion efficiency is evaluated based on productivity 9. Sheep feeding record is generated as per the workplace procedures 10. Waste is managed according to environmental protection regulations |
| 1. Carry out sheep breeding | 1. Breeding management tools, equipment and materials are assembled in accordance with LPM 2. ***Sheep breeds*** are identified based on LPM 3. Sheep breeds are selected based on traits of economic importance and farmer requirements 4. Ewes on heat are detected based on LPM 5. Flushing is carried out as per LPM 6. Raddling is carried out based on GAPs 7. Crutching and ringing are carried out based on GAPs 8. Service is performed based on the ***breeding method*** ***and technologies*** as per the LPM 9. Pregnant ewes are provided care based on the LPM 10. Steaming-up is carried out based on LPM 11. Lambing is managed as per the LPM 12. Breeding records are prepared as per work procedures |
| 1. Carry out lamb management | 1. 4.1 Lamb is handled at birth according to instructions in the LPM 2. Lamb is fed colostrum according to the LPM 3. Orphaned lambs are fostered according to LPM 4. Lamb is identified using suitable method in accordance with LPM, animal welfare regulations and work place policy 5. Docking is performed according to animal welfare regulations and work place policy 6. Lamb is weighed in accordance with LPM instructions and work place policy 7. Lamb growth rate is monitored as per LPM 8. Waste is managed and disposed based on environmental protection regulations |
| 1. Perform sheep routine management practices | 1. ***Sheep identification method*** is selected based on GAPs 2. ***Sheep castration*** is performed based on GAPs 3. Sheep overgrown hooves are trimmed based on GAPs 4. Wigging is performed based on GAPs 5. Shearing is performed based on GAPs 6. Culling is performed based on workplace policy 7. Internal and external parasites are controlled based on LPM and GAPs 8. Vaccination is performed as per workplace policy, manufacturer’s instructions and LPM 9. Isolation/ quarantine is carried out to control notifiable diseases based on GAPs 10. Sheep are provided with clean water ad-libitum as per LPM 11. Records are prepared as per work procedures |
| 1. Market sheep products | 1. Market survey is conducted based on Standard Survey guidelines 2. Sheep is classified as per products 3. Sheep is transported to the market based on Animal Welfare Act 4. Sheep products are sold based on market requirements 5. Marketing records are maintained based on workplace guidelines |

**RANGE OF VARIABLES**

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.

| **RANGE** | **VARIABLE** |
| --- | --- |
| 1. Sheep breeds may include but not limited to: | * + Hampshire Sheep   + Dorset Sheep   + Merino Sheep   + Corriedale Sheep   + Maasai sheep   + Doper   + Black head Persian |
| 1. Breeding method and technologies may include but not limited to: | * + Artificial insemination   + Natural method   + Embryo transfer   + Surrogate   + Signs of heat   + Estrus synchronization |
| 1. Sheep identification method may include but not limited to: | * + Ear Tagging   + Ear Notching   + Neck Chains or Straps |
| 1. Sheep castrationmay include but not limited to: | * + **Closed castration**   + **Surgical Castration** |

**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
* Evaluation
* Management
* Problem solving
* Time management
* Data collection
* Numeracy
* Observation
* Negotiation
* Digital literacy
* Equipment calibration

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Principles of animal production
* Sheep selection and breeding
* Sheep nutrition
* Parasite and disease management in sheep
* Sheep products
* Wool shearing
* Sheep docking
* Sheep production records

**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 | 1. Assessment requires evidence that the candidate: 2. Selected site of sheep structures based on LPM 3. Constructed sheep structures based on livestock production manual 4. Kept records as per workplace requirements 5. Managed waste according to environmental protection regulations 6. Provided Basal rations at various physiological stage based on feeding plan. 7. Evaluated feed intake as per the LPM 8. Evaluated feed conversion efficiency based on productivity 9. Identified Sheep breeds based on LPM 10. Performed breeding method and technologies service based on the s as per the LPM 11. Provided pregnant ewes care based on the LPM 12. Managed lambing as per the LPM 13. Fostered orphaned lambs according to LPM 14. Selected Sheep identification method based on GAPs 15. Controlled internal and external parasites based on LPM and GAPs |
| 1. Resource implication | The following resources should be provided:   * 1. Tools, equipment and machineries   2. Materials and supplies |
| 1. Method of assessment | Competency in this unit may be assessed through:   * 1. Written tests   2. Questionnaires   3. Oral questioning   4. Projects   5. Observation |
| 1. Context of assessment | 1. Competency elements must be assessed in a safe working environment 2. Assessment may be conducted in a workplace or simulated environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## CARRY OUT GOAT PRODUCTION

**UNIT CODE:** 0811 551 19A

**UNIT DESCRIPTION**

This unit specifies competencies required to carry out goat production. It involves constructing goat structures, carrying out goat breeding, carrying out goat feeding, performing goat routine management practices, carrying out kid management and marketing goat products.

**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. Construct goat structures | 1. Tools, equipment and materials are assembled as per work requirements 2. Site of goat structures is selected based on LPM 3. Goat structures are designed according to Livestock Production Manual (LPM) 4. Goat structures are constructed based on livestock production manual 5. Goat structures are maintained as per workplace procedures 6. Goat structures construction and maintenance records are kept as per workplace requirements 7. Waste is managed according to environmental protection regulations |
| 1. Carry out goat feeding | 1. Tools, equipment and materials are assembled as per work requirements 2. ***Goat feeds*** are identified as per the nutritional requirements 3. Basal rations at various physiological stage are provided based on feeding plan. 4. ***Feed supplements*** are offered according to animal dietary requirements 5. ***Grazing management*** isidentified and practiced 6. Grazing capacity of the pasture is determined based on pasture land condition 7. Feed intake is evaluated as per the LPM 8. Feed conversion efficiency is evaluated based on productivity 9. Goat feeding record is generated as per the workplace procedures 10. Waste is managed according to environmental protection regulations |
| 1. Carry out goat breeding | 1. Breeding management tools, equipment and materials are assembled in accordance with LPM 2. ***Goat breeds*** are identified based on LPM 3. Goat breeds are selected based on traits of economic importance and farmer requirements 4. Does on heat are detected based on LPM 5. Flushing is carried out as per LPM 6. Service is performed based on the ***breeding method*** ***and technologies*** as per the LPM 7. Pregnant does are provided care based on the LPM 8. Steaming-up is carried out based on LPM 9. Kidding is managed as per the LPM 10. Breeding records are prepared as per work procedures |
| 1. Perform goat routine management practices | 1. ***Goat identification method*** is selected based on GAPs 2. ***Goat castration*** is performed based on GAPs 3. Goat overgrown hooves are trimmed based on GAPs 4. Shearing is performed based on GAPs 5. Culling is performed based on workplace policy 6. Internal and external parasites are controlled based on LPM and GAPs 7. Vaccination is performed as per workplace policy, manufacturer’s instructions and LPM 8. Isolation and quarantine is carried out to control notifiable diseases based on GAPs 9. Goats are provided with clean water ad-libitum as per LPM 10. Records are prepared as per work procedures |
| 1. Carry out kid management | 1. Kid is handled at birth according to instructions in the LPM 2. Kid is fed colostrum according to the LPM 3. Orphaned kids are fostered according to LPM 4. Kid is identified using suitable method in accordance with LPM, animal welfare regulations and work place policy 5. Kid is weighed in accordance with LPM instructions and work place policy 6. Kid growth rate is monitored as per LPM 7. Waste is managed and disposed based on environmental protection regulations |
| 1. Market goat products | 1. Market survey is conducted based on Standard Survey guidelines 2. Goats are classified as per products 3. Goats are transported to the market based on Animal Welfare Act 4. Goat products are sold based on market requirements 5. Marketing records are maintained based on workplace guidelines |

**RANGE OF VARIABLES**

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.

| **RANGE** | **VARIABLE** |
| --- | --- |
| 1. Construction tools and equipment may include but are not limited to: | * + Hammer   + Hand drill   + Nails   + Wheelbarrow   + Crowbar   + Saw   + Scissors   + Spade   + Measuring tape   + Panga   + String/line |
| 1. Goat feeds may include but are not limited to: | * + Grass   + Shrubs   + Commercially formulated feeds |
| 1. Feed supplements may include but are not limited to: | * + Vitamins   + Minerals   + Hormones   + Medicants |
| 1. Goat breed may include but are not limited to: | * + Angora, Alpine   + Toggenburg   + Saanen, Jamnapuri   + Boar, Anglo-Nubian   + Somali/ Galla |
| 1. Breeding methods may include but are not limited to: | * + Natural mating   + Artificial insemination |
| 1. Identification methods may include but are not limited to: | * + Tattooing, Ear-tagging   + Ear notching, Microchips   + Naming |
| 1. Castration methods may include but are not limited to: | * + Rubber ringing   + Open castration |
| 1. Classification of goats may include but are not limited to: | * + Hair goats   + Meat goats   + Dairy goats |

**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 skills
* Problem solving
* Organizational skills
* Time management
* Critical thinking
* Record keeping
* Routine management

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Goat handling
* Procurement procedures
* Reporting
* Rearing goats
* Feed handling
* Proper disposal of waste
* Types of inputs
* Types of wastes
* Sources of farm wastes
* Biosecurity measures
* Marketing goat products

**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. Constructed goat structures as per the LPM   2. Handled the goats as per the LPM   3. Fed the goats as per the LPM   4. Bred the goats and reared the kids as per the LPM   5. Managed waste based on the environmental protection regulations   6. Kept records according to the work place policy |
| 1. Resource   implication | The following resources should be provided:   * 1. Tools, equipment and machineries   2. Materials and supplies |
| 1. Method of   assessment | Competency in this unit may be assessed through:   * 1. Projects   2. Observation   3. Written tests   4. Questionnaires   5. Oral questioning |
| 1. Context of   assessment | 1. Competency elements must be assessed in a safe working environment 2. Assessment may be conducted in a workplace or simulated environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## CARRY OUT PIG PRODUCTION

**UNIT CODE:** 0811 551 20A

**UNIT DESCRIPTION**

This unit describes competencies required to carry out pig production. It involves feeding pigs, carrying out breeding, carrying out piglet rearing, performing routine management practices and performing pig slaughter.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes which make up workplace functions | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements  ***(Bold and italicized terms are elaborated in the range)*** |
| --- | --- |
| 1. Construct pig structures | * 1. **Tools, equipment and materials** are assembled as per work requirements   2. Site for pig structures is selected based on LPM   3. Pig structures are designed according to Livestock Production Manual (LPM)   4. Pig structures are constructed based on livestock production manual   5. ***Piggery equipment*** are installed as per LPM   6. Pig structures are maintained as per workplace procedures   7. Pig structures construction and maintenance records are kept as per workplace requirements   8. Waste is managed according to environmental protection regulations |
| 1. Carry out pig feeding | 1. Tools, equipment and materials are assembled as per work requirements 2. Pig feeds are provided to pigs as per age groups. 3. Basal rations at various physiological stage are provided based on feeding plan 4. ***Feed supplements*** are offered according to animal dietary requirements 5. Feed intake is evaluated as per the LPM 6. Feed conversion efficiency is evaluated based on productivity 7. Pig feeds records are kept as per the workplace procedures 8. Waste is managed according to environmental protection regulations |
| 1. Carry out pig breeding | 1. **Breeding management tools,** equipment and materials are assembled in accordance with LPM 2. ***Pig breeds*** are identified based on LPM 3. Pig breeds are selected based on traits of economic importance and farmer requirements 4. Pigs on heat are detected based on LPM 5. Flushing is carried out as per LPM 6. Service is performed based on the ***breeding method*** ***and technologies*** as per the LPM 7. Pregnant pigs are provided care based on the LPM 8. Steaming-up is carried out based on LPM 9. Farrowing is managed as per the LPM 10. Breeding records are prepared as per work procedures |
| 1. Carry out piglet rearing | 1. Tools, equipment and materials are assembled as per work requirements 2. ***Nutritional Management*** is applied on suckling sow and piglets according to their developmental stage and LPM 3. ***Environmental conditions*** in the piglet pens is maintained in accordance to LPM 4. Health monitoring and management is performed based on the LPM 5. Piglets are handled in accordance to the LPM 6. Artificial colostrum is prepared as per pig husbandry manual 7. Piglets are weighed as per LPM 8. Vaccination is performed as per LPM 9. **Iron supplementation** is carried out as per the workplace procedures and the LPM 10. Teeth clipping is carried out as per the LPM 11. Castration is performed as the Standard Operating Procedures (SOPs) and Livestock welfare Act 12. Docking is performed as per Livestock welfare Act 13. ***Weaning Management*** is conducted in accordance to the LPM 14. Internal and external parasites are controlled as per the LPM 15. Records are maintained in accordance to the workplace 16. Waste is managed and disposed based on environmental protection regulations |
| 1. Perform pig routine management practices | 1. ***Pig identification method*** is selected based on GAPs 2. Grooming is performed as per workplace requirements 3. Hygiene and sanitation are performed as per pig husbandry manual (LPM) 4. Culling is performed based on workplace policy 5. Internal and external parasites are controlled based on LPM and GAPs 6. Vaccination is performed as per workplace policy, manufacturer’s instructions and LPM 7. Isolation and quarantine are carried out to control notifiable diseases based on GAPs 8. Pigs are provided with clean water ad-libitum as per LPM 9. Records are prepared as per work procedures 10. ***Pig farm bio-security practices*** are carried out based on good animal husbandry management guidelines, animal welfare practices, workplace instructions and legal requirement as per standard operating procedures. |
| 1. Perform pig slaughter | 1. Tools, equipment and materials for slaughter are assembled based on the Meat Control Act 2. Slaughter house/slab is prepared in accordance to the Kenya Meat Control Act 3. Pre-slaughter handling of pig is carried out as per the Animal Welfare Act 4. Humane slaughter of pig is performed as per Animal Welfare Act 5. Dressing of carcass is carried out in accordance with Meat Control Act 6. Cleaning of the offal is performed as per the workplace procedures 7. Dressed meat is preserved as per the Meat Control Act 8. Dressed meat is transported as per the Meat Control Act 9. ***Food safety and hygiene*** measures are implemented based on legal and statutory requirements (to be inserted where there is food. 10. ***By-products*** are handled according to the Meat Control Act 11. ***Condemned materials*** and wastes are disposed as per the Meat Control Act 12. Cleaning of slaughterhouse and equipment is performed as per Meat Control Act and environmental management regulations 13. Slaughter structures are maintained as per Meat Control Act 14. Records are kept based on the workplace record management guidelines |
| 1. Process pig products and by-products | 1. ***Data collection tools*** for conducting market survey are obtained based on data to be collected. 2. Market survey is conducted to establish preference for pig products and by products in accordance to workplace policy. 3. Survey report is prepared and recommendations given based on findings. 4. ***Pig products*** identified based on market survey report. 5. Necessary ***permits and certifications*** are obtained based legal and statutory requirements 6. Tools, equipment and materials for slaughter are assembled based on the Meat Control Act 7. Production schedules are developed based on plant capacity and market demand. 8. ***PPEs*** are identified and worn based on job requirements. 9. Carcasses for processing are identified and selected based on standard operating procedures 10. ***Pig products*** are processed based on recipe and processing chart, in accordance with standard operating procedures. 11. Mechanisms to assure food safety and hygiene are implemented based on legal and statutory requirements.     1. Pig products are packaged and stored based on type and product requirements     2. Report on pig products and by-products marketing is prepared and documented as per workplace policy.     3. Wastes are managed based on environmental regulations and workplace requirements |
| 1. Market pig products | 1. Market survey conducted for pig products and by-products as per workplace procedures 2. Marketing channels are identified based on market segmentation. 3. Marketing strategy is developed and implemented based on market needs. 4. Products’ competitive advantage is identified and promotion carried out based on market demand. 5. Product price is set based on cost of production, profit margins, organization objectives and competitor pricing. 6. Products outlets are selected based on identified channels. 7. **Contractual agreements** are undertaken, signed off and managed based on agreed terms. 8. Marketing strategy is reviewed based on performance. 9. Report on pig products marketing and sales activities is prepared and documented as per workplace policy. |

**RANGE**

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

| **VARIABLE** | **RANGE** |
| --- | --- |
| 1. Tools and equipment may include but are not limited to: | * Pangas * Slashers * Measuring tape * Hoes * Axe * Saw * Spade * Wheelbarrow |
| 1. *PPE* may include but are not limited to: | * Equipment and apparel used for safety of the worker e.g.   + Gum boots, Overall, Goggles,   + Helmet, Nose masks, Gloves |
| 1. Pig Breeds may include but are not limited to: | * Large white * Landrace * Duroc jersey * Berkshire |
| 1. Piggery equipment may include but are not limited to: | * Drinkers * Feeding trough * Surgical blades |
| 1. Pig identification method may include but are not limited to: | * Ear tags * Ear notching * Neck chains * Straps with numbers |
| 1. Legal requirements may include but are not limited to: | * Public health Act Cap 242 * EMCA 1999 * NEMA regulations * Meat control Act Cap 365 * OSH Act 2007 * Factories Act 514 |
| 1. Permits and certifications may include but are not limited to: | * Movement permits * No objection permits * Meat inspection permits * Food and hygiene certificate * Meat transportation permit |
| 1. Weaning Management may include but are not limited to: | * Weaning weight estimation * Creep feeding * Water access * Vaccination * Deworming * Housing * Feeding management * Health monitoring * Sow management * Record keeping |
| 1. Iron Supplementation includes but not limited; | * Iron injection * Sterilized soil * Iron sulphate paste |
| 1. Feed supplements may include but are not limited to: | * Wheat bran * Creep feed * Mineral licks * Feed additives |
| 1. Environmental conditions may include but are not limited to: | * Temperature * Cleanliness * Humidity * Light |
| 1. Health monitoring and management may include but are not limited to: | * Vaccination * Temperature checks |
| 1. Pig farm bio-security practicesmay include but are not limited to: | * Foot bath * Quarantine * Pen disinfection * Equipment sterilization * Fencing |
| 1. Breeding method and technologies   may include but are not limited to: | * A.1 * Synchronization * Cross breeding * Pure breeding * Inbreeding |
| 1. Breeding management tools may include but are not limited to: | * Heat detection devices * Insemination guns |
| 1. Nutritional Management may include but are not limited to: | * Flushing * Steaming up * Fattening |
| 1. Food safety and hygiene may include but are not limited to: | * HACCP * Sanitation |
| 1. Pig products may include but are not limited to: | * Sausages * Bacon * Lard * Cuts * Brawn * Smokies * Burgers |
| 1. Pig by-products may include but are not limited to: | * Blood meal * Bone meal * Biogas * Manure * Brushes * Buttons * Leather |
| 1. Condemned materials may include but are not limited to: | * Parasite infested organs * Dead foetus * Hydrated infested liver * Whole carcass |
| 1. Data collection methods may include but are not limited to: | * Focus group discussions * Media * KNBS * Observation * Interviews * Forecasting |
| 1. Contractual agreements may include but are not limited to: | * Verbal * Written |
| 1. Animal welfare regulations may include but are not limited to: | * KVB * KSPCA * OIE |

**REQUIRED KNOWLEDGE AND SKILLS**

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

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Pig handling
* Littering
* Rearing piglets, growers and finishers
* Rearing gilt, sow and boar for breeding
* Implementation of medication program
* Proper disposal of hazardous wastes
* Feeding habit of pig
* Digestive system of pigs
* Building materials, tools and equipment
* Consideration in siting a pig unit
* Development and management contract document
* Housing care, repair and maintenance
* Monitoring work progress
* Pig housing types and designs
* Report writing and record keeping
* Requisition of building materials
* Safety precautions
* Terms of reference development
* Types of pig production systems

**Required skills**

The individual needs to demonstrate the following skills:

* Analytical
* Communication
* Critical thinking
* Decision making
* Equipment operation
* Feed handling
* Problem solving
* Record keeping
* Routine management skills
* Report Writing

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   1. Designed pig structure 2. Constructed pig production structures based on available resources 3. Prepared pig breeding stock 4. Mated pigs 5. Performed pig husbandry practices 6. Selected and used clearing tools correctly. 7. Recorded and stored construction materials appropriately. 8. Maintained a clear pig unit repair and maintenance records. 9. Slaughtered pigs based on Kenya Meat Control Act. 10. Marketed pigs based on market demands. 11. Prepared pig production records based on organization’s record management guidelines |
| 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   3. A busy pig farm which is in the process of upscaling production or   4. A farm starting/diversifying into pig production. |
| 1. Methods of assessment | Competency in this unit may be assessed through:   1. Third-party reports 2. Portfolio of Evidence 3. Interview 4. Written tests 5. Observation 6. Oral questioning |
| 1. Context of assessment | Competency may be assessed in a:   1. Off-the-job 2. On-the-job 3. During industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

## CARRY OUT POULTRY PRODUCTION

**UNIT CODE:**0811 551 21A

**UNIT DESCRIPTION**

This unit specifies competencies required to carry out poultry production. It involves constructing poultry structures, carrying out chick brooding, managing layer poultry, managing meat poultry, managing poultry slaughter, managing poultry breeding and marketing poultry products.

**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. Construct poultry structures | 1. ***Tools, equipment and materials*** are assembled as per work requirements 2. Site of ***poultry structures*** is selected based on LPM 3. Poultry structures are designed according to Livestock Production Manual (LPM) 4. Poultry structures are constructed based on livestock production manual 5. Poultry structures are maintained as per workplace procedures 6. Poultry structures construction and maintenance records are kept as per workplace requirements 7. Waste is managed according to environmental protection regulations 8. Necessary ***poultry house equipment and material*** are identified according to production system 9. Poultry house equipment and materials are installed as per specifications in the ***poultry production manual (PPM)*** 10. Poultry structures construction and maintenance records are kept as per workplace requirements 11. Waste is managed according to environmental protection regulations |
| 1. Carry out chick brooding | 1. Tools, equipment and materials are assembled as per work requirements 2. Brooder is constructed as per poultry production guidelines 3. Brooder and brooder equipment are disinfected as per poultry production guidelines 4. Chick brooder equipment are set as per poultry production guidelines 5. Microclimate is monitored as per workplace requirements 6. Brooding chicks are fed as per the poultry production guidelines 7. Bio-safety structures/facilities are set as per workplace requirements 8. Brooding chicks are vaccinated as per the vaccination schedule 9. Predator control is executed as per workplace requirements 10. Chick brooding records are kept as the PPM 11. Waste is managed according to environmental protection regulations |
| 1. Manage Layer Poultry | 1. Tools, equipment and materials are assembled as per work requirements 2. Layers house sanitization procedures are performed as per manufacturer’s guidelines 3. Micro climate is monitored as per workplace requirements 4. Layer poultry are fed as per the poultry production guidelines 5. Layer poultry are vaccinated as per the vaccination schedule 6. Post-vaccination behaviour is monitored as per workplace requirements 7. Table poultry eggs are collected as per workplace requirements 8. Table poultry eggs are Sorted and graded as per poultry production manual 9. Table poultry eggs are cleaned as per poultry production manual 10. Table poultry eggs are packaged as per workplace requirements 11. Table poultry eggs are branded based on the KEBS specifications 12. Layer poultry records are kept as the PPM 13. Waste is managed according to environmental protection regulations |
| 1. Manage meat poultry | 1. Tools, equipment and materials are assembled as per work requirements 2. Meat poultry house sanitization procedures are performed as per manufacturer’s guidelines 3. Micro climate is monitored as per workplace requirements 4. Meat poultry are fed as per the poultry production guidelines 5. Meat poultry are vaccinated as per the vaccination schedule 6. Post-vaccination behavior is monitored as per workplace requirements 7. Meat poultry is caught as per workplace requirements 8. Meat poultry is weighed and sorted as per market requirement 9. Packaging and loading of meat poultry is carried out as per animal welfare guidelines 10. Meat poultry is recorded as per workplace requirements 11. Meat poultry is dispatched as per animal welfare guidelines 12. Meat poultry records are kept as the PPM 13. Waste is managed according to environmental protection regulations |
| 1. Manage Poultry Slaughter | 1. Tools, equipment and materials are assembled as per work requirements 2. Poultry for slaughter is selected as per the poultry farm regulations 3. Ante-mortem inspection is performed based on the veterinary regulations 4. Poultry is slaughtered as per poultry slaughtering procedure 5. Cleaned eviscerated poultry carcass is chilled as per poultry slaughtering procedure 6. Poultry carcass is chilled and graded as per workplace requirements 7. Portioned poultry meat is packaged as per the workplace procedures 8. Poultry slaughter records are kept as the PPM 9. Waste is managed according to environmental protection regulations |
| 1. Manage Breeding Poultry | 1. Tools, equipment and materials are assembled as per work requirements 2. Mating and breeding systems are designed in accordance with farm preferences and desired mating ratios 3. Breeding poultry are selectedin accordance with the poultry production manual (PPM) and poultry welfare regulations 4. Selected breeding poultry are mated as per designed mating and breeding systems 5. Breeding poultry are fed as per the poultry production guidelines 6. Breeding poultry are vaccinated as per the vaccination schedule 7. Post-vaccination behavior is monitored as per workplace requirements 8. Collected eggs in trays are fumigated in the farm fumigation chamber according to procedures described in the PPM 9. Poultry eggs are sorted and stored according to ***regulatory body standards*** 10. Selected eggs for hatching are transported to the hatchery according to PPM 11. Breeding poultry records are kept as the PPM 12. Waste is managed according to environmental protection regulations |
| 1. Market poultry products | 1. Market survey is conducted based on Standard Survey guidelines 2. ***Poultry products*** are sold based on market demands 3. Meat poultry is transported to the market based on Animal Welfare Act 4. Marketing records are maintained based on the organization’s record management guidelines |

**RANGE OF VARIABLES**

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.

| **RANGE** | **VARIABLE** |
| --- | --- |
| 1. Poultry structures may include but not limited to: | * Brooder * Grower house * Layer’s house * Broiler house * Feed store * Slated floors * Cages * Pallets |
| 1. Tools, equipment and materials may include but not limited to: | * Waterers * Feeders * Thermometer (maximum – minimum) * Heat sources * Litter material * Curtains * False ceilings * Hygrometer |
| 1. Poultry production manual (PPM) may include but not limited to: | * + National Poultry Development Programme Manual   + Breeder’s manuals by breeders like Cobb and Issa Brown |
| 1. Chick brooder equipment and Tools may include but not limited to: | * Brooder thermometer * Charcoal jiko * Infra-red bulb * Gas burner * Kerosene lamp * Chick feeder * Chick drinker   + Hygrometer |
| 1. Bio-safety structures/facilities includes but not limited to: | * Foot bath * Sanitizer * Fence |
| 1. Regulatory body standards include but is not limited to: | * Standards by bodies like: * Kenya Bureau of Standards (KEBS) * State Directorate of Veterinary Services (SDVS) |
| 1. Poultry products includes but is not limited to: | * Eggs * Poultry meat * Feathers * Manure * Offal |

**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 skills
* Problem solving
* Organizational skills
* Time management
* Listening skills
* Critical thinking
* Negotiation
* Data collection
* Digital literacy
* Analytical skills

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Anatomy and physiology of the poultry reproductive system
* Breeding systems
* Selection criteria for breeding poultry
* Poultry selection and breeding
* Animal nutrition
* Parasite and disease management in poultry
* Marketing poultry and eggs
* Egg handling
* Egg sorting
* Egg storage
* Feeding strategies, systems and regimes
* Mating systems
* Nutritional composition of feed materials
* Poultry feed intake
* Poultry housing requirements
* Poultry identification methods
* Poultry Immunology
* Poultry nutritional requirements
* Poultry spacing requirements
* Poultry welfare
* Reconstitution of vaccines
* Record keeping
* Refrigeration methods
* Restraining methods
* Selection and culling criteria
* Stocking density
* Traits of economic importance in poultry
* Types and breeds of poultry
* Types and functions of nutrients
* Types of drinkers and waterers
* Types of feed additives
* Types of poultry records
* Types of vaccines
* Vaccinology
* Water quality

**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. Constructed poultry structure as per the design and type of construction materials   2. Installed poultry house equipment and materials as per specifications in the ***poultry production manual (PPM)***Collected data as per statistical manual   3. Mated breeding poultry as per designed mating and breeding systems   4. Fed poultry as per the poultry production guidelines   5. Vaccinated poultry as per the vaccination schedule   6. Monitored microclimate as per workplace requirements   7. Stored eggs for incubation at a correct temperature in preparation for incubation in accordance with PPM guidelines   8. Carried out packaging and loading of meat producing poultry as per animal welfare guidelines   9. Slaughtered poultry as per poultry slaughtering procedure   10. Chilled and graded poultry carcass as workplace requirements   11. Packaged portioned poultry meat as per workplace procedures   12. Kept records as per the LPM   13. Managed wastes according to environmental protection regulations |
| 1. Resource implication | The following resources should be provided:   * 1. Tools, equipment and machineries   2. Materials and supplies |
| 1. Method of assessment | Competency in this unit may be assessed through:   * 1. Projects   2. Observation   3. Written tests   4. Questionnaires   5. Oral questioning |
| 1. Context of assessment | 1. Competency elements must be assessed in a safe working environment 2. 4.2 Assessment may be conducted in a workplace or simulated environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## CARRY OUT RABBIT PRODUCTION

**UNIT CODE:** 0811 551 22A

**UNIT DESCRIPTION**

This unit specifies competencies required to carry-out rabbit production. It involves construction of rabbit structures, feeding of rabbits, breeding of rabbits, rearing of rabbit litter, performing of routine management practices and marketing of rabbit products.

**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. Construct rabbit structures | 1. PPEs are worn as per standard operating procedures 2. Rabbit structures are designed in accordance with Ministry of Agriculture Livestock Production Manual (LPM) 3. Construction tools are assembled based on workplace requirements 4. Rabbit structures are constructed in accordance with the LPM |
| 1. Carry out rabbit feeding | 1. ***Rabbit feeds*** are identified as per the nutritional requirements 2. Rabbits are grouped based on their nutritional requirements 3. Rabbit feeding regime is determined based on LPM 4. Rabbits are fed based on their nutritional requirements in accordance with LPM 5. Feed intake is evaluated as per the LPM 6. Feed conversion efficiency is evaluated based on productivity 7. Feeding records are kept as per the workplace procedures 8. Waste is managed according to environmental protection regulations |
| 1. Carry out rabbit breeding | 1. ***Breeds of rabbits*** are identified based on their characteristics 2. Breeding schedule is applied based on GAP 3. Breeding programis followed according to the breeding schedule |
| 1. Rear rabbit litter | 1. Newly born kindles are reared according to LPM 2. Routine feeding is carried-out at prescribed feeding intervals as per LPM 3. Kindles are identified in accordance to the LPM 4. Small and less vigorous kindles are identified and separated from others for specialized feeding 5. Progress and development of kindles is monitored regularly through weighing and/or visual appraisal. |
| 1. Perform rabbit routine management practices | 1. External parasite control methods are performed based on GAPs 2. ***Internal*** ***parasites*** are controlled by drenching based on GAPS 3. Bio-security measures are applied to prevent diseases based on GAP 4. Rabbit management records are prepared based on the organization’s record management guidelines |
| 1. Market rabbit products | 1. Rabbit is prepared for slaughter as per the LPM and Meat Control Act 2. Rabbit is slaughter as per LPM and Meat Control Act 3. Rabbit carcass is package for the market as per market specification and and Meat Control Act. |

**RANGE OF VARIABLES**

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.

|  |  |
| --- | --- |
| **RANGE** | **VARIABLE** |
| 1. Rabbit structures may include but are not limited to: | * Crushes * Barn * Feeding facility * Sheep shed * Sheep dips   + Feed storage facility |
| 1. Breeds of Rabbits may include but are not limited to: | * New Zealand white rabbit * Flemish Giant rabbit   + French Lop |
| 1. External and internal parasite control methods may include but are not limited to: | * Drenching * Dusting * Injection |

**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 skills
* Problem solving
* Organizational skills
* Time management
* Listening skills
* Critical thinking

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Principles of animal production
* Rabbit breeding and selection
* Rabbit nutrition
* Parasite and disease management in rabbits
* Rabbit marketing
* Rabbit production records
* Rabbit handling
* Communication
* Analytical
* Evaluation
* Management
* Problem solving
* Time management
* Data collection
* Numeracy
* Observation
* Negotiation
* Digital literacy
* Equipment calibration

**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 rabbit breeds based on farmer requirement 2. Performed rabbit breeding based on GAPs 3. Constructed rabbit production structures based on available resources 4. Performed rabbit identification based on GAPs 5. Managed rabbit parasites and diseases based on GAPs 6. Slaughtered rabbits based on Meat Control Act 7. Marketed rabbits based on market demands 8. Prepared rabbit production records based on organizations record management guidelines |
| 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 3. Materials relevant to the proposed assessment activity or tasks |
| 1. Methods of Assessment. | Competency may be assessed through:   1. Practical 2. Project 3. Portfolio of evidence 4. Third Party Report 5. Written Tests 6. Oral Questioning |
| 1. Context of Assessment. | This competency may be assessed in a work place or in assimilated work place |
| 1. Guidance information for assessment. | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

CARRY OUT BEE PRODUCTION

**UNIT CODE:** 0811 551 23A

**UNIT DESCRIPTION**

This unit specifies competencies required to carry-out bee production. It involves establishing an apiary, managing bee facilities, tools and equipment, managing bee colony, managing bee pests and diseases, harvesting bee products and marketing of bee products

**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. Establish an apiary | 1. Materials, tools and equipment for preparing the apiary site are assembled as per workplace procedures. 2. The ***apiary site*** is selected as per work place procedures 3. The apiary site is prepared as per the workplace procedures |
| 1. Manage bee facilities, tools and equipment | 1. ***Personal protective equipment*** are worn as per the occupational health and safety procedures 2. Relevant equipment and accessories are identified as per work place procedures 3. Repairable facilities, equipment and tools are repaired as per work place procedures 4. Equipment, tools and accessories are stored according to use the identified storage procedure |
| 1. Manage bee colony | 1. Personal protective equipmentis worn as per the occupational health and safety procedures 2. The ***bee hive*** is opened as per workplace procedures 3. ***Tools and equipment for dividing the colony*** are identified and used as per the workplace procedure 4. Honey bee colony is divided as per the workplace procedures |
| 1. Manage bee pests and diseases | 1. Protective gears are worn as per the procedures 2. Hive is smoked and opened according to workplace procedures 3. Colonies to be inspected are identified based on apiary records 4. Observation of *signs and symptoms*of ***pests and diseases*** evidence is doneaccording to bee brood health guidelines 5. ***Control measures*** are implemented as per the workplace procedures |
| 1. Harvest bee products | 1. Personal protective equipment are worn as per the occupational health and safety procedures 2. Colonies to be harvested are identified as per workplace procedures. 3. Hive is opened as per the workplace procedures 4. ***Hive products*** are harvested as per the workplace procedures |
| 1. Market bee products | 1. Hive products packaged as per industry standards 2. Hive products labelled and branded as per industry standards 3. Hive products marketed as per industry regulations |

**RANGE OF VARIABLES**

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.

| **RANGE** | **VARIABLE** |
| --- | --- |
| 1. Bee products may include but are not limited to: | * Honey, Propolis * Bee venom * Creamed honey * Manuka honey * Comb honey * Honeycomb, Beeswax * Bee pollen, Royal jelly |
| 1. Tools and equipment may include but are not limited to: | * Smokers, Hive tools * Conical honey strainer * Wax press, Solar wax melter |
| 1. Personal protective equipment may include but are not limited to: | * + Bee suit, Gloves   + Gumboots |
| 1. Bee disease may include but are not limited to: | * Bee viruses, Nosemosis * Varroa mites * American Foulbrood (AFB) * European Foulbrood (EFB) * Amebiosis, Chalkbrood * Stonebrood * Small Hive Beetle (SHB) |
| 1. Bee pests may include but are not limited to: | * Carpenter bee * Honey bee * Bumblebee * Ants * Mite * Lesser wax moth * Bee louse   + Greater wax moth |

**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
* Evaluation
* Management
* Problem solving
* Time management
* Data collection
* Numeracy
* Observation
* Negotiation
* Digital literacy
* Equipment calibration

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Beehive construction
* Apiary site selection
* Beehive stocking
* Swarming of bee
* Bee multiplication
* Bee nutrition
* Parasite and disease management in bees
* Bee products
* Bee production records
* Animal Produce handling

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency. | Assessment requires evidence that the candidate:   1. Constructed beehives based on resources available 2. Managed apiaries based on GAPs 3. Harvested bee products based on market demand 4. Managed bee diseases based on GAPs 5. 1.6 Controlled bee parasites and predators based on GAPs |
| 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 3. 2.3 Materials relevant to the proposed assessment activity or tasks |
| 1. Methods of Assessment. | Competency may be assessed through:   1. Practical 2. Project 3. Portfolio of evidence 4. Third Party Report 5. Written Tests 6. Oral Questioning |
| 1. Context of Assessment. | This competency may be assessed in a work place or in assimilated work place |
| 1. Guidance information for assessment. | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## MANAGE FISH FARM

**UNIT CODE:** 0831 551 24A

**UNIT DESCRIPTION**

This unit describes competencies required to manage fish farm. This involves constructing fish holding units, producing fish fingerlings, producing table size fish, handling harvested fish and producing live fish feeds.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes which make up workplace functions | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements  ***(Bold and italicized terms are elaborated in the range)*** |
| --- | --- |
| 1. Construct fish holding units | * 1. Tools, equipment and materials are assembled as per workplace requirements   2. Fish farm site is selected based on Fish Production Manual (FPM)   3. Fish farm is designed based on FPM   4. ***Fish farm site is prepared*** as per FPM.   5. Fish holding unit is constructed and installed according to FPM   6. Fish farm water filtration system is installed based on design features   7. ***Auxiliary farm structures*** are constructed or installed based on the farm design specifications   8. Predator control devices are installed as per FPM   9. Soil erosion control measures are taken based on good agricultural practices |
| 1. Perform fish farm management practices | 2.1 ***Water quality parameters*** are monitored as per FPM  2.2 Fish Pond is fertilized as per FPM  2.3 Fish Pond liming is carried out as per FPM  2.4 Fish Pond weed is controlled as per FPM  2.5 **Pond repair and maintenance** is performed as per workplace procedure  2.7 Fish predators are controlled as per FPM  2.8 Brood stock are monitored for signs of infections and stress according to FPM  2.9 ***Fish disease causes*** are identified as per standard operation procedures  2.12 ***Sanitation and hygiene*** are practiced as per recommended fish farm procedures  2.13 ***Fish feeds*** are produced as per recommended procedures.  2.14 Fish are fed as per FPM  2.15 Fish feed performance is evaluated according to FPM  2.16 Fish ***bio-security measures*** are applied as per FPM  2.17 Fish farm wastes are managed as per environmental protection guidelines  2.18 Records are kept as per work procedures |
| 1. Process harvested fish | 1. Tools, equipment and materials are assembled as per workplace requirements 2. Harvesting of fish is carried out as per FPM 3. Harvested fish is sorted according to FPM 4. ***Preservation methods*** are performed as per FPM 5. Fish processing methods are performed as per FPM 6. Fish quality assurance is adhered to as per Hazard Analysis and Critical Control Points (HACCP) and Integrated Quality Management (IQM) procedures. 7. Fish products and by-products ***are*** marketed as per market specifications 8. Records are kept as per work procedures |
| 1. Manage fish hatcheries | 1. PPEs are worn as per task requirements 2. Hatchery management tools, equipment and materialsare assembled as per task requirements 3. ***Hatchery Pre-stocking activities*** are performed as perFPM 4. Brood stock is sourced as per FPM 5. Brood stock is sorted and stocked into brood stock ponds based on FPM 6. Brood stock is fed according to FPM. 7. ***Water quality parameters*** are monitored and corrective action taken as per FPM 8. Brood stock are monitored for signs of infections and stress as per FPM 9. Fingerlings are produced as per FPM 10. Records are kept as per work procedures |
| 1. Manage fish cages | 1. Fish cage is designed as per FPM 2. Cages are set up in the water body as per Fisheries Management and Development Act 3. Cages are stocked based on FPM 4. ***Husbandry practices*** are performed based on FPM 5. Fish safety and Bio security measures are applied as per FPM 6. Fish stock is harvested based on FPM 7. Cages are maintained based on FPM 8. Records are kept as per work procedures |
| 1. Manage re-circulatory aquaculture systems | 1. ***Recirculating Aquaculture System*** (RAS) is designed based on FPM 2. Recirculating Aquaculture System is installed based on design specifications 3. Bio safety measures are set up based on good animal husbandry practices   ***2.4 RAS management activities*** are performed as per standard operating procedures. |

**RANGE**

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

| **VARIABLE** | **RANGE** |
| --- | --- |
| 1. Fish farm site preparation activities may include but not limited to: | * Site selection * Site clearance * Measurement and pegging |
| 1. Auxiliary farm structures may include but not limited to: | * Farm stores * Roads * Fences * Offices * Laboratories * washrooms |
| 1. Water quality parameters may include but not limited to: | * Water temperature * Water PH * Dissolved oxygen * Ammonia * Nitrates * nitrites * Salinity * Turbidity * Salinity * Total suspended solids * Heavy metals * Hydrogen sulphide |
| 1. Pond repair and maintenance may include but not limited to: | * Sealing leakage * De-clogging * Water flow rate regulation |
| 1. Fish disease causes may include but not limited to: | * Environmental/water quality causes * Hereditary/genetic causes * Microbial/pathogenic causes * Nutritional causes * Physical injury |
| 1. Sanitation and hygiene may include but not limited to: | * Regular hand washing * Sanitization * Disinfection * Use of foot bath |
| 1. Fish feeds | * Live or natural feeds * Concentrate feeds |
| 1. bio-security measures may include but not limited to: | * Sanitation and hygiene practices * Sourcing of feeds, fingerlings, brood stock * Self-closing doors * Use of air conditioning instead of natural ventilation. * Use of artificial lights. * Visitor Movement control |
| 1. Preservation methods may include but not limited to: | * Chilling * Freezing * Salting * Drying * Salting * smoking |
| 1. Fish processing methods may include but not limited to: | * Salting * Drying * Salting * Smoking * Filleting * Frying |
| 1. Hatchery Pre-stocking activities may include but not limited to: | * Cleaning * De-clogging * Removal of sludge * Fixing water leakages * liming * Filling with water * Controlling water flow rate |
| 1. Husbandry practices may include but not limited to: | * Feeding * Aeration * Water flow rate control * Water quality monitoring * Predator control * Sludge removal * De-clogging of drainage system * Cleaning of filters * Harvesting * Growth monitoring * Fingerling/fry grading * Marketing of hatchery products * Fish health monitoring * Fish propagation * Fish stocking * Fingerling packaging and transport |
| 1. Fish safety and Bio security measures may include but not limited to: | * Fencing * Proper Sourcing of feeds, fingerlings, brood stock * Predator control * Visitor Movement control * Quarantine and isolation |
| 1. Recirculating Aquaculture System (RAS) may include but not limited to: | * Bio-filters * Mechanical filters * Fish culture unit(s) * Water reservoir * Water drainage system * Water aeration system |
| 1. RAS management activities may include but not limited to: | * Cleaning of the unit * De-clogging * Water flow rate control * Water aeration or oxygenation * Fish feeding * Water quality monitoring * Predator control * Sludge removal * De-clogging of drainage system * Cleaning of filters * Harvesting * Growth monitoring * Fingerling/fry grading * Marketing of hatchery products * Fish health monitoring * Fish propagation * Fish stocking * Fingerling packaging and transport |

**REQUIRED KNOWLEDGE AND SKILLS**

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

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Water chemistry
* Fish biology
* Fish handling
* Fish stocking
* Fish harvesting
* Fish packaging and transportation
* Fish health monitoring
* Water flow rate control
* Fish feeding
* Fish growth monitoring
* Fish marketing

**Required skills**

The individual needs to demonstrate the following skills:

* Procurement
* water quality equipment Calibration
* Net repair and maintenance
* Record keeping
* Communication
* Problem solving
* Time management
* Digital
* Critical thinking

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Adhered to safe work procedures as per the workplace policy.   2. Set up fish culture unit as per the FPM   3. Maintained water flow rate as per the FPM   4. Aerated fish holding unit as per the FPM   5. Produced fish feeds as per the FPM   6. Stocked fish holding units as per the FPM   7. Fish are fed as per FPM   8. Fertilized fish pond as per FPM   9. Carried out fish pond liming as per FPM   10. Managed fish health as per the FPM.   11. Harvested fish as per the FPM   12. Handled harvested fish as per the FPM.   13. Packaged and transported fish as per FPM   14. Marketed fish products and by products as per FPM   15. Managed fish farm wastes as per environmental protection guidelines   16. Repaired and maintained pond as per workplace procedure   17. **Kept** records Package and transport fish |
| 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. Methods of assessment | Competency in this unit may be assessed through:   1. Practical assessment 2. Oral assessment 3. Portfolio of evidence 4. Project 5. Case study 6. Third party report (recognition of prior learning) 7. Written tests |
| 1. Context of assessment | Competency may be assessed in a:  4.1 Workplace  4.2 Simulated workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

## MANAGE DRAUGHT ANIMALS

**UNIT CODE:** 0811 551 25A

**UNIT DESCRIPTION**

This unit describes knowledge, skills and attitudes required to carry out camel, donkey and horse production. It involves constructing camel, donkey and horse production structures; carrying out camel, donkey and horse breeding; carrying out routine management practices and marketing camels, donkeys and horses.

**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. Carry out camel production | 1. ***Camel production structures*** are identified and designed based on Camel Production Manual (CPM) 2. ***Materials for construction*** of camel production structure are identified based on the design of the structure 3. Tools and equipment for Camel production structures construction are assembled based on structure selected 4. Camel production structure is constructed as per the design 5. ***Camel breeds*** are identified and selected based on Camel Production Manual (CPM) 6. Selection of breeding male and female camels is done according to CPM 7. Heat signsare detected as per the CMP 8. Rutting signsare detected as per the CPM. 9. Breeding of camel is carried out based on GAPs 10. Pregnancy diagnosis is performed as per the CPM 11. Parturition is managed as per the CPM 12. ***Rearing of camel calf*** is carried out as per the CPM 13. ***Milking methods and techniques*** are applied during milking as per LPM and CPM 14. Camel production routine management practices are performed as per the CPM 15. Camel, camel products and by-products are sold based on market demand 16. Records are prepared based on the workplace guidelines |
| 1. Carry out donkey production | 1. Donkey farm layout is designed based on LPM and CPM 2. ***Donkey production structures*** are identified and designed based on CPM 3. ***Materials for construction*** of donkey production structure are identified based on the design of the structure 4. Tools and equipment for donkey production structures construction are assembled based on structure selected 5. Donkey structures are constructed as per the design 6. ***Donkey breeds*** are identified and selected based on Camel Production Manual (CPM) 7. Selection of breeding male and female donkeys is done according to CPM 8. Heat signs are detected as per the CMP 9. Breeding of camel is carried out based on GAPs 10. Pregnancy diagnosis is performed as per the CPM 11. Parturition is managed as per the CPM 12. ***Rearing of a foal*** is carried out as per the CPM 13. Donkey production routine management practices are performed as per the CPM 14. Donkey is marketed based on demand and existing legislative frameworks 15. ***Records*** are prepared based on the workplace guidelines |
| 1. Carry out horse production | 1. ***Horse rearing structures*** are identified as per Horse Care Manual (HCM) 2. ***Horse types,*** characteristics and common uses are identified based on (HCM) 3. ***Breeding decisions*** are made according to HCM 4. Selection criteria for stallion and mare that have reached puberty is performed according to HCM 5. Heat detection is carried out as per the HCM 6. ***Breeding methods*** are applied to serve mares on heat as per HCM 7. Pregnancy diagnosis is performed as per HCM 8. Mare care during pregnancyis provided according to the HCM 9. Foaling and foal care management is performed as per HCM 10. Foal weaningis carried out as per HCM 11. Horse routine management practices are carried out as per HCM 12. Bio-security practicesare carried out in accordance to HCM 13. Records are maintained as per workplace requirements |

**RANGE OF VARIABLES**

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. Camel breeds may include but not limited to; | * Somali * Rendille/ Gabbra * Turkana * Pakistani |
| 1. Donkey breeds may include but not limited to; | * East African * Maasai * Somalia |
| 1. Horse breeding decisions may include but not limited to; | * Defining breeding goals * Selection of breeding stock * Mare health pre-breeding |
| 1. Breeding method may include but not limited to; | * Natural * Artificial insemination * Embryo transfer |
| 1. Camel production structures may include but not limited to; | * Crushes * Milking parlour * Barn * Feeding facility * Camel shed * Camel dips * Feed storage facility |
| 1. Donkey production structures may include but not limited to; | * Crushes * Barn * Feeding facility * Donkey shed * Donkey dips * Feed storage facility |
| 1. Horse rearing structures may include but not limited to; | * Crushes * Barn * Feeding facility * Horse shed * Horse dips * Feed storage facility |
| 1. Horse types may include but not limited to; | * Light horses * Draft horses * Ponies * Gaited horses * Warmbloods |
| 1. Materials for construction may include but not limited to; | * Timber * Iron sheets * Cement * Nails * Pipes |
| 1. Camel and donkey identification methods may include but not limited to; | * Ear tags * Ear notching * Branding * Neck chains * Straps with numbers * Ear tattooing |
| 1. Camel and donkey castration methods may include but not limited to; | * Closed castration * Open castration * Chemical |
| 1. Camel diseases may include but not limited to; | * Trypanosomiasis * Camel mange disease * Camel pox * Anthrax * Salmonellosis |
| 1. Donkey diseases may include but not limited to; | * Tetanus * Strangles * Rabies * Anthrax * Dermatophilosis |
| 1. Vector control methods may include but not limited to; | * Insecticides * Larvicides * Rodenticides * Lethal ovitraps * Repellents |
| 1. Carcass disposal methods may include but not limited to; | * Burial * Landfill * Incineration * Rendering * Compositing * Chemical digestion |
| 1. Parasites may include but not limited to; | * Lice * Tape worms * Warble flies * Cattle tick * Liver fluke * Itch mite * Coccidiosis |
| 1. External parasite control methods may include but not limited to; | * Plunge dip * Spray race |
| 1. Milking materials and equipment may include but not limited to; | * Milking bucket * Milk strainer * Milk churn * Milk weighing scale * Milking salve * Strip cup |
| 1. Milking techniques may include but not limited to; | * Stripping method * Full hand method * Knuckling method * Machine milking |
| 1. Materials and equipment for slaughter may include but not limited to; | * Stunning gun * Meat saw * 6-inch skinning knife * Beef spreader |
| 1. Camel, donkey and horse routine management practices may include but not limited to; | * Housing * Feeding * Hoof care * Dental care * Handling and Training * Record keeping * Deworming |
| 1. Foaling and foal care management may include but not limited to; | * Preparing foaling stall * Close monitoring of the mare * New born foal care |

**REQUIRED KNOWLEDGE AND SKILLS**

**Required knowledge:**

* Principles of animal production
* Donkey/camel/horse breeding and selection
* Donkey/camel/ horse nutrition
* Parasite and disease management on camels, horses and donkeys
* Marketing of camels/donkeys/horses
* Camel/donkey/horse production records
* Camel/donkey/horse handling

**Required skills:**

* Communication
* Analytical
* Evaluation
* Management
* Problem solving
* Time management
* Data collection
* Numeracy
* Observation
* Negotiation
* Digital literacy
* Equipment calibration

**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. Performed camel, donkey and horse breeding based on GAPs 2. Constructed camel, donkey and horse production structures based on resources available 3. Performed camel, donkey and horse identification based on GAPs 4. Managed camel, donkey and horse parasites and diseases GAPs 5. Carried out camel hand and machine milking based on GAPs 6. Marketed camels and donkeys based on market demand 7. Prepared camel, donkey and horse production records based on organization record management guidelines |
| 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 3. Materials relevant to the proposed assessment activity or tasks |
| 1. Methods of Assessment. | Competency may be assessed through:   1. Practical 2. Project 3. Portfolio of evidence 4. Third Party Report 5. Written Tests 6. Oral Questioning |
| 1. Context of Assessment. | This competency may be assessed in a work place or in assimilated work place |
| 1. Guidance information for assessment. | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## MANAGE EMERGING LIVESTOCK AND COMPANION ANIMALS

**UNIT CODE:** 0811 551 26A

**UNIT DESCRIPTION**

This unit specifies competencies required to manage emerging livestock. It involves rearing of ostrich, rearing of quail, rearing of guinea fowls, farming of crocodile, and management of companion animals.

**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. Carry out rearing of ostrich | 1. ***Planning*** for ostrich farming is conducted as per the LPM 2. ***Facilities and equipment*** for rearing ostrich are prepared as per LPM 3. Breeding managementis carried out according to LPM 4. ***Hatching and Chick care*** is performed as per LPM 5. Routine management practices are carried out as per LPM 6. Ostrich and products are marketed as per LPM 7. Bio-security practicesare carried out in accordance to HCM 8. Waste is managed as per the environmental protection regulations 9. Records are maintained as per workplace policies |
| 1. Carry out rearing of quail | 1. Planning for quail farming is conducted as per the LPM 2. Facilities and equipment for rearing quail are prepared as per LPM 3. Breeding management is carried out according to LPM 4. Hatching and Chick care is performed as per LPM 5. Routine management practices are carried out as per LPM 6. Quail and products are marketed as per LPM 7. Bio-security practices are carried out in accordance to HCM 8. Waste is managed as the environmental protection regulations 9. Records are maintained as per workplace requirements |
| 1. Carry out rearing of guinea fowls | 1. Planning for guinea fowl farming is conducted as per the LPM 2. Facilities and equipment for rearing guinea fowl are prepared as per LPM 3. ***Breeding management*** is carried out according to LPM 4. Hatching and Chick care is performed as per LPM 5. Routine management practices are carried out as per LPM 6. Guinea fowls and products are marketed as per LPM 7. Bio-security practices are carried out in accordance to HCM 8. Waste is managed as the environmental protection regulations 9. Records are maintained as per workplace requirements |
| 1. Carry out rearing of crocodile | 1. Planning for crocodile farming is conducted as per the LPM 2. Facilities and equipment for farming crocodile are prepared as per LPM 3. ***Breeding management*** is carried out according to LPM 4. ***Hatchling care*** is performed as per LPM 5. Routine management practices are carried out as per LPM 6. Crocodiles are bred using ***breeding methods and technologies*** as per Conservation and Management Act 7. Crocodile and products are marketed according to Conservation and Management Act 8. ***Bio-security practices*** are carried out in accordance to Conservation and Management Act 9. Waste is managed as the environmental protection regulations 10. Records are maintained as per workplace requirements |
| 1. Carry out management of companion animals | 1. Nutrient requirements of dogs and cats are determined according to feed requirement standards. 2. Dog and cat feed are selected based on nutritional requirements 3. ***Feeding regime / schedule*** for dogs and cats is established base on LPM 4. ***Breeding management*** of male and female dogs and cats is performed as per Directorate of Veterinary Services guidelines. 5. ***Management of pregnant*** dogs and cats is performed as per Animal Welfare Act 6. Parturition preparation is carried out as per LPM 7. ***Management of puppies and kittens*** are carried out as per KSPCA regulations 8. Dogs and cats are housed as per Animal Welfare Act 9. Routine management practices in dogs and cats husbandry are carried out as per LPM. 10. Records used in the management of dogs and cats are maintained as per LPM |

**RANGE OF VARIABLES**

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. Planning may include but not limited to; | * Research on;   + Market,   + Legal requirements,   + Welfare requirements,   + Potential challenges   + Financial considerations before starting * Business plan development * Acquiring permits and licences * Species selection |
| 1. Facilities and equipment for ostrich, quail and guinea fowl rearing may include but not limited to; | * Land * Shelter * Fencing * Feeding and watering systems * Handling facilities |
| 1. Facilities and equipment for crocodile farming may include but not limited to; | * Land * Secure enclosures with deep pools for swimming, basking areas, and nesting sites. * High and sturdy walls to prevent escape. * Holding pens for capturing, handling, and veterinary procedures * Hygiene and waste management (maintaining clean water in pools, regular waste removal, and proper carcass disposal) |
| 1. Breeding management in ostrich, guinea fowl and quail may include but not limited to; | * Breeding stock selection * Breeding ratio * Egg collection * Egg incubation * Brooding |
| 1. Breeding management in crocodiles may include but not limited to; | * Feeding * Grading and segregation * Monitoring progress * Health care provision * Breeding stock selection |
| 1. Hatchling care in crocodiles may include but not limited to; | * Egg collection * Incubation * Started diet * Vaccination * Parasite control |
| 1. Breeding management in dogs and cats may include but not limited to; | * Animal selection * Health checks * Breeding age * Heat cycles (females) * Stud selection * Mating methods (natural/artificial insemination) * Pregnancy and whelping/kittening |
| 1. Management of pregnant dogs and cats may include but not limited to; | * Prenatal care * Whelping/kittening box preparation * Delivery monitoring * Postnatal care |
| 1. Management of puppies and kittens may include but not limited to; | * Monitoring weight gain, * Keeping them warm and clean, * Stimulating elimination in young pups/kittens * Vaccination * Deworming * Early socialization |
| 1. Breeding methods and technologies may include but not limited to; | * Breeding methods (natural breeding or hormone induced) |
| 1. Bio-security practices may include but not limited to; | * Fencing * Vaccination * Movement control * Depopulation |
| 1. Feeding regime / schedule for dogs and cats may include but not limited to; | * Feeding based on age – puppies/kittens, adult dogs/cats, senior dogs/ cats * Feeding based on breeds – giant breeds, active breeds * Feeding based on health status – weight management, medical conditions * Feeding based on type of food – dry, wet, raw food diets * Feeding schedule consistency * Fresh water availability |
| 1. Routine management practices for ostrich, guinea fowl and quail may include but not limited to; | * Housing * Internal parasite control * External parasite control * Mineral supplementation |
| 1. Routine management practices for crocodile may include but not limited to; | * Enclosure management * Water quality monitoring * Temperature monitoring * Feeding management * Regular health monitoring * Biosecurity measures * Animal welfare checks – space, enrichment activities, handling * Record keeping * Waste management * Human safety controls |
| 1. Routine management practices for dogs and cats may include but not limited to; | * Feeding * Elimination (potty breaks) * Exercise * Shelter * Preventive care * Grooming * Dental care |

**REQUIRED KNOWLEDGE AND SKILLS**

**Required knowledge:**

* Principles of animal production
* Ostrich/guinea fowl/quail breeding and selection
* Crocodile breeding
* Ostrich/guinea fowl/quail nutrition
* Crocodile nutrition
* Parasite and disease management on ostrich/guinea fowl/quail/ crocodile
* Marketing of camels/donkeys/horses
* Ostrich/guinea fowl/quail/ crocodile production records
* Ostrich/guinea fowl/quail/ crocodile handling

**Required skills:**

* Communication
* Analytical
* Evaluation
* Management
* Problem solving
* Time management
* Data collection
* Numeracy
* Observation
* Negotiation
* Digital literacy
* Equipment calibration

**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. Prepared facilities and equipment for rearing/farming emerging livestock as per LPM 2. Hatched eggs of emerging livestock according to the LPM 3. Managed young ones of emerging livestock as per the LPM 4. Carried out routine management practices as per LPM 5. Carried out bio-security practices in accordance to HCM 6. Established feeding regime / schedule for emerging livestock and companion animals based on LPM 7. Prepared for parturition in companion animals as per LPM 8. Housed dogs and cats as per Animal Welfare Act 9. Managed wastes as per the environmental protection regulations 10. Maintained records as per workplace policies |
| 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 3. Materials relevant to the proposed assessment activity or tasks |
| 1. Methods of Assessment. | Competency may be assessed through:   1. Practical 2. Project 3. Portfolio of evidence 4. Third Party Report 5. Written Tests 6. Oral Questioning |
| 1. Context of Assessment. | This competency may be assessed in a work place or in assimilated work place |
| 1. Guidance information for assessment. | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

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