THE NATIONAL COUNCIL FOR TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING

OCCUPATIONAL STANDARDS

OCCUPATION: LIVESTOCK VETERINARY TECHNICIAN

LEVEL: NTA LEVEL 5

FEBRUARY 2024

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ABBREVIATIONS

AB	Antibody
AG	Antigen
CBC	Blood Routine Test
CBET	Competency Based Education and Training
FP	Fowl Pox
HA	Hemagglutination Assay
HI	Hemagglutination Inhibition Test
HPAI	High Pathogenic AI
IAP	Immunization Plan
IG	Immunoglobulin
IM	Intramuscular Injection
IV	Intravenous Injection
NACTVET	National Council for Technical and Vocational Education and Training
NOS	National Occupational Standards
OS	Occupational Standards
RBC	Red Blood Cell Count
RV	Rotavirus
TET	Technical Education and Training
TVET	Technical and Vocational Education and Training
WBC	White Blood Cell

GLOSSARY OF TERMS

Circumstantial Knowledge:	Detailed knowledge, which allows the decision-making in regard to different circumstances and cross cutting issues.
Competence:	The ability to use knowledge, understanding, practical, and thinking skills to perform effectively to the workplace standards required in employment.
Competency:	A description of the ability one possesses when able to perform a given occupational task effectively and efficiently.
Competency-based Education:	An instructional programme that derives its content from validated tasks and bases assessment on the learner's performance.
Curriculum:	A description or composite of statements about "what is to be learned" by the trainee/student in a particular instructional programme; a product that states the "intended learning outcomes".
Educational/Training Programme:	The complete curriculum and instruction (what and how) that is designed to prepare a person for employment in a job or other particular performance situation.
Occupation:	A specific position requiring the performance of specific tasks - essentially the same tasks are performed by all employees having the same title. (Example: baker)
Occupational Area:	This is a broad grouping of related jobs. (Example: food service).
Occupational Standards:	Specific requirements of competences for personnel in a particular occupational area, including knowledge and relevant attitudes. They also act as performance tools of assessment of the prescribed outcomes.
Occupational/Job Analysis:	A process used to identify the tasks that are important to employees in any given occupation.
Performance Criteria:	Indicate expected end results or outcomes in the form of evaluative statements.

Skills:	The ability to perform occupational tasks with a high degree of proficiency within a given occupation. Skill is conceived of as a composite of three completely interdependent components: cognitive, affective, and psychomotor.
Standards:	A set of statements, which, if proved true under working conditions, means that an individual is meeting an expected level and type of performance.
Task Analysis:	The process of analysing each task to determine the steps, circumstantial knowledge, attitudes, performance criteria, tools and materials needed, as well as safety concerns required for the employees performing it.
Task:	A work activity that has a definite beginning and ending, is observable or measurable, consists of two or more definite steps, and leads to products, service, or decisions.
Underpinning Knowledge:	Crucial knowledge that an individual must acquire in order to demonstrate competences that are associated in performing a given task.
Verification Process:	The process of having experts review and confirm the importance of the task (competency) statements identified through occupational analysis. Other questions, such as the degree of task learning difficulty are also frequently asked. This process is also sometimes referred to as validation.
Occupational Competence:	The application of knowledge and skills that consistently meet the standards required by the working conditions.

1.0. INTRODUCTION

Technical Education and Training (TET) is one of the most important education sub-sectors in Tanzania, responsible for developing a skilled workforce to support the country's industrialization economic agenda. Tanzania's *Development Vision 2025* intends to raise the country's economy to a middle-income status, with a high level of human development. This requires a skilled workforce that is aligned with the needs of the public and private sectors of the economy. The National Council for Technical and Vocational Education and Training (NACTVET) has begun the job of drafting Occupational Standards (OS) that will eventually be adopted as National Occupational Standards (NOS) for use in the delivery of TET that meets the needs of the labour market and the country's economic agenda.

Occupational Standards (OS) are performance criteria that are matched with labour market demands. Each of them describes the functions, performance standards, and understanding or knowledge underpinning a given occupation. They combine skills, knowledge, and attitudes to describe best practice. They are useful tools for establishing job roles, personnel recruitment, supervision, and appraisal, as well as TET Standards. They are also helpful for benchmarking and harmonizing job qualifications on a national and international level. Standards, in general, provide a solid framework for high-quality TET that is labour market-relevant, current, and consistent in application across all public and private institutions.

However, it must be noted that Occupational Standards are different from Training /Education Standards. Occupational standards are defined in terms of activities performed by a person in a selected occupation (e.g., an electrical engineer designs electrical circuits, performs troubleshooting in electrical circuits, etc.), and are usually defined by Employers following procedures as agreed upon by all the stakeholders. On the other hand, Training and Education Standards are developed from the activities defined in the occupational standards, and they specify learning objectives to ensure that the necessary skills and knowledge are developed by a person to enable him/her to function at an agreed level in an occupation. Training and Education Standards are used to define curricula in training institutions. It is critical, however, to establish a direct link between the occupational standards and the training standards for both of them to respond collaboratively to the demands of the labour market.

For the purpose of TET delivery, Tanzania has adopted the Competence Based Education and Training (CBET) approach. The CBET approach focuses on providing learners with the skills and knowledge required to meet the occupational standards. Occupational standards are thus the starting point for developing competency-based training (CBET) programmes. Therefore, it is quite pertinent for TET institutions to use the relevant occupational standards as a benchmark for formulating their curricula.

Occupational Standards are developed based on a given occupation's current and future demands. As a result, they serve as a means of bridging the gap between the worlds of employment and technical education and training.

The document explains how the occupational standards were developed, as well as the scope, the occupational profile in the form of DACUM charts, and the Occupational Standards.

2.0. OCCUPATIONAL STANDARD DEVELOPMENT PROCESS

The process of developing these Occupational Standards involved both local and international expertise. The process began with an examination of major documents that guide Tanzanian skills development including the *10-year National Skills Development Strategy (2016-2026).* NACTVET labour market reports were also used in the literature review to determine the skills demand in the Tanzanian labour market as a whole.

After the literature review, a team of experts in consultation with practitioners developed draft occupational standards. The draft document was used to develop an occupational profile for each occupation (DACUM Chart), which is attached as an **Appendix** to every Occupational Standard.

The occupational standards were validated during the stakeholders' forum held on 22nd and 23rd February 2024 at Morogoro. The information from the stakeholders' forum provides insight from the workplace, professional bodies, regulatory bodies and sector ministries regarding trends and changes in the profession, including how well graduates are prepared for working in the occupation.

3.0. THE SCOPE AND OVERVIEW OF THE OCCUPATION STANDARDS FOR LIVESTOCK VETERINARY TECHNICIANS

The standards cover a broad range of duties and tasks that can be performed by a Livestock Veterinary Technician However, the occupational standards are not meant to replace individual job descriptions. Instead, they are to be used for guidance in defining skill levels and knowledge for the technician in specific settings or positions. The Livestock Veterinary Technician may perform tasks in a number of key areas of the Occupational Standards, but not necessarily in all areas. For example, in large operations, other individuals may be employed or designated to perform specific tasks.

Livestock Veterinary Technicians are responsible for basic operational techniques, including the anatomy, breeding, feed processing, breeding management, vaccination, pharmacology pathology and disease prevention and control of the livestock and poultry (pigs, chickens, cows, horses, rabbits, dogs and cats) and they work under the supervision of Livestock Veterinary Engineers. Generally, the Livestock Veterinary Technician performs the following duties:

a) Fixation of animal

b) Sterilization operations
c) Preparation of experimental materials
d) Basic clinical examination
e) Biosafety protection
f) Appearance identification and health evaluation
g) Immunization and immunization effect monitoring
h) Collection and delivery of blood samples
i) Use of common instruments
j) Storage of drugs and reagents, and drug compatibility and administration technique
k) Inspection and handling of animals and animal products
l) Feed processing and formula design
m) Estrus identification and artificial insemination technique
n) Collection and delivery of pathological tissue samples
o) Examination of parasites
p) Clinical tests
q) Necropsy
r) Quarantine and treatment after slaughtering
s) Feeding and management of livestock and poultry

The Occupational Standards have been clustered into NTA qualification levels, i.e. NTA 4, 5 and 6.

4.0. VALIDITY PERIOD

Due to the rapid development of technology, the validity period of occupational standards is 3-5 years. The review will proceed in the same manner as the one before it, with new occupational standards being developed based on current trends of the labour market.

5.0. OCCUPATIONAL STANDARDS

5.1 OCCUPATIONAL STANDARDS FOR LIVESTOCK VETERINARY TECHNICIAN - NTA 5

<table>
<tr><td>OCCUPATION</td><td>LIVESTOCK VETERINARY TECHNICIAN</td><td>OCCUPATION CODE</td><td></td></tr>
<tr><td>DUTY TITLE</td><td>CONDUCT IMMUNIZATION</td><td>DUTY NO.</td><td>501</td></tr>
<tr><td>TASK TITLE</td><td>CARRY OUT ANIMAL IMMUNIZATION</td><td>TASK NO.</td><td>5011</td></tr>
<tr><td>PERFORMANCE CRITERIA</td><td colspan="3">The person performing this task must be able to immunize animals in accordance with the requirements of the immunization plan (IAP) and the actual situation of the animals.</td></tr>
<tr><td>RANGE STATEMENT</td><td colspan="3">The task can be performed in farms of livestock and poultry under the supervision of middle and senior livestock veterinary technicians or engineers. The tools and equipment to be used include:
1. Water dispenser;
2. Syringe (including metal syringe, glass syringe, and continuous syringe);
3. Skin prick needle or injection needle;
4. Dropper;
5. Commonly-used attenuated vaccines and inactivated vaccines for animals;
6. Disinfection tools, equipment, drugs, and supplies, such as sterilizing pan, tweezer, scissors, alcohol, iodine, sterilized cotton swabs, and gauze;
7. Immunization record card;
8. Stalls;
9. Personal protective equipment (PPE), such as masks, disposable latex gloves, and protective clothing.</td></tr>
<tr><td colspan="4">EVIDENCE REQUIREMENT</td></tr>
<tr><td colspan="2">PRACTICAL PERFORMANCE</td><td colspan="2">UNDERPINNING KNOWLEDGE</td></tr>
<tr><td colspan="2">The person performing this task must be able to do the following:
1. Select appropriate tools and equipment;
2. Administer immunization through water drinking;
3. Administer immunization through the subcutaneous injection;
4. Administer immunization through intramuscular (IM) injection;
5. Administer immunization through nasal or ocular instillation;
6. Administer immunization through skin prick;
7. Thaw and dilute the vaccines;
8. Immunize cattle, goats, sheep, pigs, donkeys, and chickens;</td><td colspan="2">Detailed knowledge about:
1.0 Methods
The person performing this task must be able to explain how to:
1.1 Establish corresponding immunization schedules for the following different immunization methods: water drinking, subcutaneous injection, intramuscular injection, nasal or ocular instillation, and skin prick.
1.2 Perform immunization.

2.0 Principle
The person performing this task must be able to explain the following principles:
2.1 Principle of specific immune mechanism.</td></tr>
</table>

9. Observe the animals' reactions following immunization; 10. Complete the immunization record card; 11. Clean the tools, equipment and the workplace; 12. Store tools and equipment safely. 13. Observe health, occupational and environmental safety rules and regulations.	**3.0 Theories** The person performing this task must be able to explain the following: 3.1 Methods for health condition examination of animals before immunization; 3.2 Methods for thawing and dilution of vaccines; 3.3 Adverse reactions in animals following immunization. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Animal immunization is carried out in accordance with approved technical requirements and vaccine instructions.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Knowledge of animal immunization; 2. Animal pharmacological knowledge; 3. Occupational health and safety; 4. Disposal methods for equipment and remaining vaccines following immunization.

<table>
<tr><td>OCCUPATION</td><td>LIVESTOCK VETERINARY TECHNICIAN</td><td>OCCUPATION CODE</td><td></td></tr>
<tr><td>DUTY TITLE</td><td>CONDUCT IMMUNIZATION</td><td>DUTY NO.</td><td>501</td></tr>
<tr><td>TASK TITLE</td><td>CARRY OUT ASSESSMENT AND MANAGEMENT OF ADVERSE IMMUNIZATION REACTIONS</td><td>TASK NO.</td><td>5012</td></tr>
<tr><td>PERFORMANCE CRITERIA</td><td colspan="3">The person performing this task must be able to carry out assessment and management of adverse immunization reactions in accordance with the requirements of the immunization plan (IAP) and the actual situation of the animals and provide appropriate management for animals with severe reactions.</td></tr>
<tr><td>RANGE STATEMENT</td><td colspan="3">The task can be performed in farms under the supervision of middle and senior livestock veterinary technicians or engineers. The tools and equipment to be used include:
1. Thermometer;
2. Stethoscope;
3. Drugs such as adrenaline, atropine, alcohol, and iodine;
4. Syringe, and tweezer;
5. Sterilized cotton swab;
6. Personal protective equipment (PPE), such as masks, disposable latex gloves, and protective clothing.</td></tr>
<tr><td colspan="4">EVIDENCE REQUIREMENT</td></tr>
<tr><td colspan="2">PRACTICAL PERFORMANCE</td><td colspan="2">UNDERPINNING KNOWLEDGE</td></tr>
<tr><td colspan="2">The person performing this task must be able to do the following:
1. Select appropriate tools and equipment;
2. Perform clinical examination of animals;
3. Determine adverse immunization reactions;
4. Administer adrenaline to manage severe reactions following immunization;
5. Administer atropine to manage severe reactions following immunization;
6. Clean the tools, equipment and workplace;
7. Safely store tools, equipment, and vaccines.
8. Observe health, occupational and environmental safety rules and regulations</td><td colspan="2">Detailed knowledge about:
1.0 Methods
The person performing this task must be able to explain how to:
1.1 Develop a protocol for managing severe reactions following immunization;
1.2 Conduct clinical examination of animals;
1.3 Assess adverse immunization reactions;
1.4 Manage severe reactions following immunization.

2.0 Principle
The person performing this task must be able to explain the following principles:
2.1 Mechanism of elevated blood pressure by adrenaline;
2.2 Mechanism of action of atropine;
2.3 Causes of severe reactions following immunization.

3.0 Theories
The person performing this task must be able to explain the following:
3.1 Methods of veterinary clinical examination.</td></tr>
</table>

	4.0 Essential Skills 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Assessment and management of adverse immunization reactions are performed in accordance with technical requirements and the actual situation of the animals.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Knowledge of animal immunization; 2. Animal pharmacological knowledge; 3. Occupational health and safety; 4. Disposal method of medical waste.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CONDUCT IMMUNIZATION	**DUTY NO.**	501
TASK TITLE	CARRY OUT DISPOSAL OF REMAINING VACCINES FOLLOWING IMMUNIZATION	**TASK NO.**	5013
PERFORMANCE CRITERIA	The person performing this task must be able to carry out disposal of remaining vaccines following immunization in accordance with the requirements of the immunization plan (IAP) and relevant laws and regulations.		
RANGE STATEMENT	The task can be performed in farms under the supervision of middle and senior livestock veterinary technicians or engineers. The tools and equipment to be used include: 1. Disinfection equipment, such as autoclaves and boiling sterilizers; 2. Vaccination of remaining vaccines; 3. Tweezer; 4. Personal protective equipment (PPE), such as masks, disposable latex gloves, and protective clothing.		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Select appropriate tools and equipment; 2. Select disinfection methods and disinfection equipment; 3. Treat remaining vaccines with a boiling sterilizer; 4. Treat remaining vaccines with an autoclave; 5. Verify the effectiveness of remaining vaccines; 6. Clean the tools, equipment and workplace; 7. Store tools and equipment safely. 8. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Develop a plan for handling remaining vaccines following immunization; 1.2 Dispose of the remaining vaccines following immunization. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Working principles for boiling sterilization; 2.2 Working principles for high-pressure, high-moisture sterilization. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Instructions for using a boiling sterilizer; 3.2 Instructions for using an autoclave; 3.3 Knowledge of biosafety. **4.0 Essential Skills** 4.1 Communication skills;

	4.2 Customer service skills; 4.3 Teamwork skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Disposal of remaining vaccines following immunization is handled in accordance with approved technical requirements and relevant laws and regulations.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Knowledge of animal immunization; 2. Animal pharmacological knowledge; 3. Occupational health and safety; 4. Disposal method of medical waste.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	PERFORM COLLECTION AND DELIVERY OF BLOOD SAMPLES	**DUTY NO.**	502
TASK TITLE	CARRY OUT NECESSARY PREPARATION FOR BLOOD SAMPLE COLLECTION	**TASK NO.**	5021
PERFORMANCE CRITERIA	The person performing this task must be able to carry out the necessary preparation for blood sample collection in accordance with the requirements of various laboratory examination techniques and the actual situations of farms, slaughterhouses, animal hospitals, and veterinary laboratories.		
RANGE STATEMENT	The task can be performed in farms, slaughterhouses, animal hospitals, and veterinary laboratories under the supervision of senior livestock veterinary technicians or livestock veterinary engineers. The tools and equipment to be used include: 1. Blood collectors, such as vacuum blood collection tubes, disposable syringes, and capillary pipets; 2. Animal fixation table (fixation chute); 3. Anticoagulants, such as 3.8% sodium citrate, sodium heparin, disodium EDTA, and sodium oxalate; 4. Centrifuge; 5. Tray balance; 6. Pipettor; 7. Disinfectants and supplies, such as alcohol, iodine, and sterilized cotton swabs; 8. Blood storage equipment, such as refrigerator, and freezer; 9. Sterilization equipment, such as autoclave; 10. Glass slide; 11. Hair clipper; 12. Personal protective equipment (PPE), such as masks, disposable latex gloves, and protective clothing.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Select appropriate tools and equipment; 2. Prepare a 3.8% sodium citrate solution; 3. Prepare sodium heparin; 4. Prepare disodium EDTA; 5. Prepare sodium oxalate; 6. Wash and dry glass slides; 7. Kill pathogenic microorganisms on blood collection and blood sampling tools; 8. Clean the tools, equipment and workplace; 9. Store tools and equipment safely.	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Choose a blood collection method, and formulate a corresponding blood sample collection plan; 1.2 Select a blood collection method, and prepare for blood sample collection. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Working principles of vacuum blood collection tubes.

10. Observe health, occupational and environmental safety rules and regulations	**3.0 Theories** The person performing this task must be able to explain the following: 3.1 Types of anticoagulants and their preparation methods; 3.2 Methods of blood sample collection; 3.3 Methods for preservation and delivery of blood samples. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The necessary preparation before blood sample collection is carried out in accordance with approved technical requirements and the requirements of various laboratory examination techniques.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Occupational health and safety; 2. Disposal method of medical waste.

<table>
<tr><td>OCCUPATION</td><td>LIVESTOCK VETERINARY TECHNICIAN</td><td>OCCUPATION CODE</td><td></td></tr>
<tr><td>DUTY TITLE</td><td>PERFORM COLLECTION AND DELIVERY OF BLOOD SAMPLES</td><td>DUTY NO.</td><td>502</td></tr>
<tr><td>TASK TITLE</td><td>CARRY OUT COLLECTION OF BLOOD SAMPLES</td><td>TASK NO.</td><td>5022</td></tr>
<tr><td>PERFORMANCE CRITERIA</td><td colspan="3">The person performing this task must be able to carry out blood sample collection in accordance with the requirements of various laboratory examination techniques and the actual situations of farms, slaughterhouses, animal hospitals, and veterinary laboratories.</td></tr>
<tr><td>RANGE STATEMENT</td><td colspan="3">The task can be performed in farms, slaughterhouses, animal hospitals, and veterinary laboratories under the supervision of senior livestock veterinary technicians or livestock veterinary engineers. The tools and equipment to be used include:
1. Blood collectors, such as vacuum blood collection tubes, disposable syringes, and capillary pipets;
2. Animal fixation table (fixation chute);
3. Anticoagulants, such as 3.8% sodium citrate, sodium heparin, disodium EDTA, and sodium oxalate;
4. Centrifuge;
5. Tray balance;
6. Pipettor;
7. Disinfectants and supplies, such as alcohol, iodine, and sterilized cotton swabs;
8. Blood storage equipment, such as refrigerator, and freezer;
9. Sterilization equipment, such as autoclave;
10. Glass slide;
11. Hair clipper;
12. Personal protective equipment (PPE), such as masks, disposable latex gloves, and protective clothing.</td></tr>
<tr><td colspan="4">EVIDENCE REQUIREMENT</td></tr>
<tr><td colspan="2">PRACTICAL PERFORMANCE</td><td colspan="2">UNDERPINNING KNOWLEDGE</td></tr>
<tr><td colspan="2">The person performing this task must be able to do the following:
1. Select appropriate tools and equipment;
2. Collect blood samples from capillaries;
3. Prepare blood smears;
4. Collect venous blood samples;
5. Collect cardiac blood samples;
6. Clean the tools, equipment and workplace;
7. Store tools and equipment safely.
8. Observe health, occupational and environmental safety rules and regulations</td><td colspan="2">Detailed knowledge about:
1.0 Methods
The person performing this task must be able to explain how to:
1.1 Choose a blood collection method, and formulate a corresponding blood sample collection plan;
1.2 Collect blood samples.

2.0 Principle
The person performing this task must be able to explain the following principles:
2.1 Mechanism of blood clotting;
2.2 Mechanism of action of various anticoagulants.</td></tr>
</table>

	3.0 Theories The person performing this task must be able to explain the following: 3.1 Types of anticoagulants and their preparation methods; 3.2 Sites, methods, and operational steps for blood sample collection. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The collection of blood samples is performed in accordance with approved technical requirements and the requirements of various laboratory examination techniques.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Preservation method of blood samples; 2. Occupational health and safety; 3. Disposal method of medical waste.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	PERFORM COLLECTION AND DELIVERY OF BLOOD SAMPLES	**DUTY NO.**	502
TASK TITLE	PRESERVE BLOOD SAMPLES	**TASK NO.**	5023
PERFORMANCE CRITERIA	The person performing this task must be able to preserve blood samples in accordance with the requirements of various laboratory examination techniques.		
RANGE STATEMENT	The task can be performed in farms, slaughterhouses, animal hospitals, and veterinary laboratories under the supervision of senior livestock veterinary technicians or livestock veterinary engineers. The tools and equipment to be used include: 1. Newly-collected blood samples; 2. Anticoagulants, such as 3.8% sodium citrate, sodium heparin, disodium EDTA, and sodium oxalate; 3. Centrifuge; 4. Tray balance; 5. Pipette; 6. Water bath kettle; 7. Disinfectants and supplies, such as alcohol, iodine, and sterilized cotton swabs; 8. Blood storage equipment, such as refrigerator, and freezer; 9. Sterilization equipment, such as autoclave; 10. Personal protective equipment (PPE), such as masks, disposable latex gloves, and protective clothing.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Select appropriate tools and equipment; 2. Perform blood anticoagulation treatment; 3. Rapidly separate serum from blood; 4. Preserve blood samples; 5. Inspect the effectiveness of blood sample preservation; 6. Clean the tools, equipment and workplace; 7. Store tools and equipment safely. 8. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Select a blood anticoagulant, and develop a blood sample preservation plan; 1.2 Select a blood anticoagulant, and perform blood anticoagulation treatment; 1.3 Rapidly separate serum from blood; 1.4 Preserve blood samples. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Mechanism of blood clotting; 2.2 Mechanism of action of various anticoagulants. **3.0 Theories** The person performing this task must be able to

	explain the following: 3.1 Types of anticoagulants, their range of use, and preparation methods; 3.2 Methods for preserving blood samples based on different detection requirements. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The blood samples are preserved in accordance with the requirements of various veterinary inspection rules.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Animal pathology material packaging and delivery methods; 2. Occupational health and safety; 3. Disposal method of medical waste.

<table>
<tr><td>OCCUPATION</td><td>LIVESTOCK VETERINARY TECHNICIAN</td><td>OCCUPATION CODE</td><td></td></tr>
<tr><td>DUTY TITLE</td><td>PERFORM COLLECTION AND DELIVERY OF BLOOD SAMPLES</td><td>DUTY NO.</td><td>502</td></tr>
<tr><td>TASK TITLE</td><td>CONDUCT THE DELIVERY OF BLOOD SAMPLES FOR TESTING</td><td>TASK NO.</td><td>5024</td></tr>
<tr><td>PERFORMANCE CRITERIA</td><td colspan="3">The person performing this task must be able to conduct the delivery of blood samples for testing in accordance with the requirements of various laboratory examination techniques.</td></tr>
<tr><td>RANGE STATEMENT</td><td colspan="3">The task can be performed in farms, slaughterhouses, and animal hospitals under the supervision of senior livestock veterinary technicians or livestock veterinary engineers. The tools and equipment to be used include:
1. Packaging tools for pathological materials, such as sterilized glass tubes, cotton wool, ligatures, kraft paper, or packaging boxes;
2. Incubator;
3. Delivery tool;
4. Animal pathology material submission form (blank form);
5. Personal protective equipment (PPE), such as masks, disposable latex gloves, and protective clothing.</td></tr>
<tr><td colspan="4">EVIDENCE REQUIREMENT</td></tr>
<tr><td colspan="2">PRACTICAL PERFORMANCE</td><td colspan="2">UNDERPINNING KNOWLEDGE</td></tr>
<tr><td colspan="2">The person performing this task must be able to do the following:
1. Select appropriate tools and equipment;
2. Inspect the effectiveness of blood sample preservation;
3. Package blood samples;
4. Fill in the animal pathology material submission form;
5. Transport blood samples;
6. Clean the tools, equipment and workplace;
7. Store tools and equipment safely.
8. Observe health, occupational and environmental safety rules and regulations</td><td colspan="2">Detailed knowledge about:
1.0 Methods
The person performing this task must be able to explain how to:
1.1 Develop a delivery plan for blood samples;
1.2 Package blood samples according to the delivery requirements;
1.3 Select appropriate delivery tools to safely transport blood samples.

2.0 Principle
The person performing this task must be able to explain the following principles:
2.1 Aseptic operation principle.

3.0 Theories
The person performing this task must be able to explain the following:
3.1 Methods for inspecting the preservation effectiveness of blood samples;
3.2 Methods for packaging blood samples;
3.3 Methods for submitting blood samples for testing.

4.0 Essential Skills</td></tr>
</table>

	4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The delivery of blood samples for testing is conducted in accordance with the requirements of various laboratory examination techniques.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Requirements of various laboratory examination methods for blood samples; 2. Occupational health and safety; 3. Disposal method of medical waste.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	PERFORM PROPER USE OF COMMON INSTRUMENTS	**DUTY NO.**	503
TASK TITLE	CONDUCT STANDARD OPERATIONS OF COMMONLY USED INSTRUMENTS AND EQUIPMENT	**TASK NO.**	5031
PERFORMANCE CRITERIA	The person performing this task must be able to conduct standard operations of commonly used laboratory instruments and equipment according to the working performance of the instruments and the requirements of different experimental operations.		
RANGE STATEMENT	The task can be performed in laboratories under the supervision of middle and senior livestock veterinary technicians or engineers. The instruments and equipment to be used include: 1. Biological microscope; 2. Constant temperature incubator; 3. Biochemical incubator; 4. Hot air sterilizer; 5. Autoclave; 6. Water distiller; 7. PH meter; 8. General refrigerator; 9. Thermostat water bath; 10. Micro oscillator; 11. Balance, such as tray balance, and electronic balance (0.001g); 12. Pipette, such as multi-channel pipette, and single-channel pipette; 13. General centrifuge; and 14. Safety gears.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Select appropriate instruments and equipment; 2. Standardize the operation of common instruments and equipment; 3. Use common instruments for handling, preservation, and detection of experiment samples; 4. Use commonly used instruments and equipment for inspection and analysis of experiment materials; 5. Formulate the management system of laboratory instruments and equipment; 6. Clean instruments and equipment;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Apply the principles and operating procedures of instruments and equipment; 1.2 Properly interpret and analyze experimental results obtained from instruments and equipment; 1.3 Establish records of commonly used instruments and equipment. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Working principles of Optical microscope; 2.2 Working principles of autoclave;

7. Fill in the register for the use of instruments and equipment; 8. Clean the tools, equipment and workplace. 9. Observe health, occupational and environmental safety rules and regulations	2.3 Applicable range and working environment requirements of various instruments. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Methods for using commonly-used laboratory instruments; 3.2 Criteria for selecting appropriate instruments and equipment for different tasks. **4.0 Essential Skills** 4.1 Consciousness of responsibility; 4.2 Communication skills; 4.3 Teamwork skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The standard operations of commonly used laboratory equipment and instruments are conducted according to the standard experimental operations.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Laboratory safety knowledge; 2. Biosafety knowledge; 3. Occupational health and safety.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	PERFORM PROPER USE OF COMMON INSTRUMENTS	**DUTY NO.**	503
TASK TITLE	PERFORM STORAGE AND MAINTENANCE OF COMMONLY USED INSTRUMENTS AND EQUIPMENT	**TASK NO.**	5032
PERFORMANCE CRITERIA	The person performing this task must be able to perform storage and maintenance of commonly used instruments and equipment according to the standard storage and maintenance instructions of the instruments and equipment.		
RANGE STATEMENT	The task can be performed in laboratories under the supervision of middle and senior livestock veterinary technicians or engineers. The instruments and equipment to be used include: 1. Biological microscope; 2. Constant temperature incubator; 3. Biochemical incubator; 4. Hot air sterilizer; 5. Autoclave; 6. Water distiller; 7. PH meter; 8. General refrigerator; 9. Thermostat water bath; 10. Micro oscillator; 11. Balance, such as tray balance, and electronic balance (0.001g); 12. Pipette, such as multi-channel pipette, and single-channel pipette; 13. General centrifuge; and 14. Safety gears.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Select appropriate instruments and equipment; 2. Standardize the operation of common instruments and equipment; 3. Maintain common instruments and equipment; 4. Fill in the register, and establish records for the use of instruments and equipment; 5. Standardize the management of commonly-used laboratory instruments and equipment; 6. Clean tools and workplaces. 7. Identify potential safety hazards in the laboratory;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Methods for cleaning and maintenance specified in the instrument manual; 1.2 Methods for establishing records of storage and maintenance of instruments and equipment. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Working principles of optical microscope; 2.2 Working principles of autoclave; 2.3 Applicable range and working environment requirements of various instruments.

8. Establish a system for reporting damages to common instruments.	**3.0 Theories** The person performing this task must be able to explain the following: 3.1 Methods for using commonly-used laboratory instruments; 3.2 Criteria for selecting appropriate instruments and equipment for different tasks. **4.0 Essential Skills** 4.1 Consciousness of responsibility; 4.2 Communication skills; 4.3 Teamwork skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The storage and maintenance of commonly used instruments and equipment are performed according to the standard storage and maintenance instructions of the instruments and equipment
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Laboratory safety hazard identification methods; 2. Internal structure of commonly-used instruments and equipment; 3. Occupational health and safety; 4. Disposal methods for scrapped common instruments.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CONDUCT STORAGE OF DRUGS AND REAGENTS	**DUTY NO.**	504
TASK TITLE	CARRY OUT STORAGE OF FLAMMABLE, EXPLOSIVE, CORROSIVE, RADIOACTIVE MATERIALS, AND HIGHLY TOXIC SUBSTANCES	**TASK NO.**	5041
PERFORMANCE CRITERIA	The person performing this task must be able to carry out storage of flammable, explosive, corrosive, radioactive materials and highly toxic substances in accordance with technical requirements and drug characteristics.		
RANGE STATEMENT	The task can be performed in the pharmacy under the supervision of senior livestock veterinary technicians or livestock veterinary engineers. The tools and equipment to be used include: 1. Fire extinguisher/dry sand, and dry powder; 2. Gas mask; 3. Protective suit and veil; 4. Lead apron, lead gloves, or mechanical hands for protection; 5. Light-blocking materials; 6. Insulation materials; 7. Ventilation equipment; 8. Dehumidifier; 9. Lime bucket; 10. Refrigerator; 11. Hygrometer; 12. First aid and disinfection equipment and supplies; 13. Personal protective equipment (PPE), such as masks, disposable latex gloves, and protective clothing.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Select appropriate tools and equipment; 2. Store explosive materials; 3. Store oxidants; 4. Store water-reactive flammable materials; 5. Store flammable liquids; 6. Store flammable solid materials; 7. Store toxic substances; 8. Store corrosive materials; 9. Store radioactive materials; 10. Clean the tools, equipment and the workplace; 11. Store tools and equipment safely.	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Develop a storage plan for flammable, explosive, corrosive, and radioactive materials, and highly toxic substances; 1.2 Store flammable, explosive, corrosive, and radioactive materials, and highly toxic substances. **2.0 Principle** The person performing this task must be able to explain the following principles:

12. Observe health, occupational and environmental safety rules and regulations	2.1 Methods of storing flammable, explosive, corrosive, and radioactive materials, and highly toxic substances. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Reasons for the storage of flammable, explosive, corrosive, and radioactive materials, and highly toxic substances; 3.2 Ways of the storage of flammable, explosive, corrosive, and radioactive materials, and highly toxic substances. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Safety consciousness.
DESCRIPTION OF THE END PRODUCT / SERVICE	Flammable, explosive, corrosive, radioactive materials and highly toxic substances are stored in accordance with approved technical requirements and drug characteristics.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safe storage of different drugs; 2. Chemical characteristics of drugs; 3. Strategies and procedures for medication storage; 4. Occupational health and safety; 5. Disposal methods for expired drugs.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CONDUCT STORAGE OF DRUGS AND REAGENTS	**DUTY NO.**	504
TASK TITLE	ESTABLISH THE USE OF FLAMMABLE, EXPLOSIVE, CORROSIVE, RADIOACTIVE MATERIALS, AND HIGHLY TOXIC SUBSTANCES	**TASK NO.**	5042
PERFORMANCE CRITERIA	The person performing this task must be able to use flammable, explosive, corrosive, and radioactive materials, and highly toxic substances in accordance with the technical requirements and drug characteristics.		
RANGE STATEMENT	The task can be performed under the supervision of senior livestock veterinary technicians or livestock veterinary engineers during laboratory testing and detection processes. The tools and equipment to be used include: 1. Fire extinguisher/dry sand, and dry powder; 2. Gas mask; 3. Protective suit and veil; 4. Lead apron, lead gloves, or mechanical hands for protection; 5. First aid and disinfection equipment and supplies; 6. Personal protective equipment (PPE), such as masks, disposable latex gloves, and protective clothing.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Observe the health and safety prevention measures; 2. Select appropriate tools and equipment; 3. Use explosive materials; 4. Use oxidants; 5. Use corrosive materials; 6. Use toxic substances; 7. Use radioactive materials; 8. Clean the tools, equipment and workplace; 9. Store tools and equipment safely; and 10. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Develop a use plan for flammable, explosive, corrosive, and radioactive materials, and highly toxic substances; 1.2 Properly handle and use flammable, explosive, corrosive, and radioactive materials, and highly toxic substances. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Significance of the "double-lock" management of hazardous chemicals in the laboratory; 2.2 First aid principles for accidents caused by flammable, explosive, corrosive, and radioactive materials, and highly toxic substances. **3.0 Theories** The person performing this task must be able to explain the following:

	3.1 Ways of the use of flammable, explosive, corrosive, and radioactive materials, and highly toxic substances; 3.2 First aid methods for accidents caused by flammable, explosive, corrosive, and radioactive materials, and highly toxic substances. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Safety consciousness.
DESCRIPTION OF THE END PRODUCT / SERVICE	The use of flammable, explosive, corrosive, and radioactive materials and highly toxic substances is established in accordance with approved safety technical requirements and drug characteristics.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safe storage of different drugs; 2. Chemical characteristics of drugs; 3. Strategies and procedures for medication storage; 4. Occupational health and safety; 5. Disposal methods for expired drugs.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	ESTABLISH DRUG COMPATIBILITY AND ADMINISTRATION TECHNIQUE	**DUTY NO.**	505
TASK TITLE	PERFORM COMPATIBILITY TESTS OF COMMONLY USED DRUGS	**TASK NO.**	5051
PERFORMANCE CRITERIA	The person performing this task must be able to perform a compatibility test of commonly used drugs in accordance with technical requirements and drug characteristics.		
RANGE STATEMENT	The task can be performed in farms, animal hospitals, and laboratories under the supervision of senior livestock veterinary technicians or livestock veterinary engineers. The tools and equipment to be used include: 1. Commonly-used drugs and their instructions; 2. Syringe and needle; 3. Normal saline injection; 4. Glucose injection; 5. Tweezer; 6. Personal protective equipment (PPE), such as masks, disposable latex gloves, and protective clothing.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Select appropriate tools and equipment; 2. Use various drugs; 3. Perform compatibility of drugs based on their properties; 4. Clean the tools, equipment and workplace; 5. Store tools and equipment safely; and 6. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Develop a use plan for liquid formulations, gas formulations, semi-solid formulations, and solid formulations of drugs; 1.2 Prepare and use various formulations of drugs. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Physical incompatibilities of drugs; 2.2 Chemical incompatibilities of drugs. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Knowledge related to veterinary labeling; 3.2 Regulations regarding prohibited veterinary drugs and withdrawal periods for veterinary drugs; 3.3 Relevant knowledge of commonly-used veterinary incompatibilities; 3.4 Instructions for various drugs.

	4.0 Essential Skills 4.1 Awareness of animal food safety; 4.2 Communication skills; 4.3 Customer service skills; 4.4 Report writing skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The compatibility tests of commonly used drugs are performed in accordance with technical requirements and drug characteristics.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Physical characteristics of various formulation types of drugs; 2. Safety operation of various formulation types of drugs; 3. Operating policies and procedures; 4. Occupational health and safety; 5. Disposal methods for expired drugs.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	ESTABLISH DRUG COMPATIBILITY AND ADMINISTRATION TECHNIQUE	**DUTY NO.**	505
TASK TITLE	PREPARE MEDICAL SOLUTIONS	**TASK NO.**	5052
PERFORMANCE CRITERIA	The person performing this task must be able to prepare medical solutions in accordance with technical requirements and drug characteristics.		
RANGE STATEMENT	The task can be performed under the supervision of senior livestock veterinary technicians or livestock veterinary engineers during site disinfection and animal feeding processes. The tools and equipment to be used include: 1. Platform scale (or balance); 2. Medicine spoon; 3. Beaker; 4. Glass rod; 5. Measuring cylinder (or measuring cup); 6. Volumetric flask (narrow-mouth flask); 7. Pipette; 8. Dropper; 9. Personal protective equipment (PPE), such as masks, disposable latex gloves, and protective clothing.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Select appropriate tools and equipment; 2. Calculate the mass of solid solute or volume of concentrated liquid solute; 3. Weigh the mass of solid, or measure the volume of liquid; 4. Dissolve or dilute the solute; 5. Transfer solutions, rinse beakers and glass rods; 6. Prepare a fixed volume, and mix the solution; 7. Clean the tools, equipment and workplace; 8. Store tools and equipment safely; and 9. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Develop a solution preparation plan for solid solutes and concentrated liquid solutes; 1.2 Prepare solutions on-site. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Methods for preparing solutions from solid solutes and concentrated liquid solutes. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Methods for preparing solutions from solid solutes and concentrated liquid solutes. **4.0 Essential Skills** 4.1 Communication skills;

	4.2 Customer service skills; 4.3 Teamwork skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Medical solutions are prepared in accordance with approved technical requirements and the actual situation of drugs.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Operation method for preparing solutions; 2. Strategies and procedures for solution preparation; 3. Occupational health and safety; 4. Waste disposal methods.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	ESTABLISH DRUG COMPATIBILITY AND ADMINISTRATION TECHNIQUE	**DUTY NO.**	505
TASK TITLE	PERFORM DRUG ADMINISTRATION	**TASK NO.**	5053
PERFORMANCE CRITERIA	The person performing this task must be able to perform drug administration in accordance with technical requirements and drug characteristics.		
RANGE STATEMENT	The task can be performed under the supervision of senior livestock veterinary technicians or livestock veterinary engineers during animal prevention and treatment processes. The tools and equipment to be used include: 1. Warm water; 2. Tissue or towel; 3. Surface disinfectant solution; 4. Syringe and needle; 5. Disinfection cotton swab; 6. Forceps; 7. Bottle opener; 8. Personal protective equipment (PPE), such as masks, disposable latex gloves, and protective clothing.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Observe the health and safety prevention measures; 2. Select appropriate tools and equipment; 3. Administer oral medication; 4. Administer drugs via gastric tube; 5. Administer drugs via subcutaneous injection; 6. Administer drugs via intramuscular injection; 7. Administer drugs via intravenous injection; 8. Clean the tools, equipment and workplace; 9. Store tools and equipment safely; and 10. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Develop a medication plan for oral administration, gastric tube administration, intramuscular injection, and intravenous injection; 1.2 Administer medication on-site using appropriate methods such as oral administration, gastric tube administration, intramuscular injection, and intravenous injection. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 First aid principles for accidents related to different administration methods; 2.2 Principles for administering specific drugs through different routes. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Administration method.

	4.0 Essential Skills 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Drug administration is performed in accordance with approved technical requirements and the actual situation.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Key points of administering drugs through different routes; 2. Commonly-used administration strategies and procedures; 3. Occupational health and safety; 4. Disposal methods for remaining drugs.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	ESTABLISH DRUG COMPATIBILITY AND ADMINISTRATION TECHNIQUE	**DUTY NO.**	505
TASK TITLE	HANDLE ADVERSE DRUG REACTIONS	**TASK NO.**	5054
PERFORMANCE CRITERIA	The person performing this task must be able to handle adverse drug reactions in accordance with technical requirements and manifestations of adverse drug reactions.		
RANGE STATEMENT	The task can be performed under the supervision of senior livestock veterinary technicians or livestock veterinary engineers during the drug treatment process. The tools and equipment to be used include: 1. Surface disinfectant solution; 2. Syringe and needle; 3. Disinfection cotton swab; 4. Forceps; 5. First aid drug; 6. Personal protective equipment (PPE), such as masks, disposable latex gloves, and protective clothing.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Observe the health and safety prevention measures; 2. Select appropriate tools and equipment; 3. Handle mild adverse reactions; 4. Handle severe adverse reactions; 5. Handle drug allergies; 6. Clean the tools, equipment and workplace; 7. Store tools and equipment safely; and 8. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Develop plans for handling mild adverse reactions, severe adverse reactions, and drug allergies; 1.2 Properly carry out on-site handling of mild adverse reactions, severe adverse reactions, and drug allergies. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 First aid principles for adverse drug reactions. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Relevant knowledge about various drugs; 3.2 Handling of adverse drug reaction. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Report writing skills.

DESCRIPTION OF THE END PRODUCT / SERVICE	Adverse drug reactions are handled in accordance with approved technical specifications and the actual situation of the animals.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Key points for handling adverse drug reactions: 2. Strategies and procedures for handling adverse drug reactions; 3. Occupational health and safety.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	IPERFORM NSPECTION AND HANDLING OF ANIMALS AND ANIMAL PRODUCTS	**DUTY NO.**	506
TASK TITLE	CONDUCT INSPECTION OF SLAUGHTERED ANIMALS	**TASK NO.**	5061
PERFORMANCE CRITERIA	The person performing this task must be able to conduct inspection of slaughtered animals according to the prescribed procedures, and make comprehensive judgments based on the inspection results.		
RANGE STATEMENT	The task can be performed in slaughterhouses under the supervision of middle and senior livestock veterinary technicians or engineers. The materials, and instruments and equipment to be used include: 1. *Animal Origin Quarantine Certificate*; 2. Veterinary clinical examination tools, such as stethoscope and thermometer; 3. Inspection tools, such as inspection knives and hooks; 4. *Animal Product Quarantine Certificate* (blank form); 5. Animal quarantine inspection stamp; 6. Slaughter quarantine record book; 7. Personal protective equipment (PPE), such as latex gloves, waterproof apron, sleeves, and high boots.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Select appropriate tools and equipment; 2. Perform proper pre-slaughter quarantine on animals; 3. Implement correct post-slaughter quarantine on animals and their products; 3. Issue *Animal Product Quarantine Certificate*; 4. Affix the inspection stamp; 5. Ensure the harmless treatment of animal disease carcasses and their products; 6. Clean the tools, equipment and workplace; 7. Store tools and equipment safely; and 8. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Develop work plans for pre-slaughter quarantine and post-slaughter quarantine; 1.2 Requirements and procedures for animal quarantine during slaughter. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Pathological characteristics of visceral organs. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Relevant knowledge of pre-slaughter quarantine; 3.2 Relevant knowledge of post-slaughter quarantine;

	3.3 Common pathological changes in animals and their visceral organs. **4.0 Essential Skills** 4.1 Biosafety awareness; 4.2 Communication skills; 4.3 Teamwork skills; 4.4 Report writing skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The inspection of slaughtered animals is conducted in accordance with the prescribed procedures and inspection regulations.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Knowledge of animal quarantine; 2. Occupational health and safety; 3. Methods for harmless treatment of animal disease carcasses and their products; 4. Laws and regulations regarding animal quarantine.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	PERFORM INSPECTION AND HANDLING OF ANIMALS AND ANIMAL PRODUCTS	**DUTY NO.**	506
TASK TITLE	CARRY OUT QUALITY INSPECTION OF ANIMAL PRODUCTS	**TASK NO.**	5062
PERFORMANCE CRITERIA	The person performing this task must be able to conduct quality inspections of animal products according to the prescribed procedures, and make comprehensive judgments based on the inspection results.		
RANGE STATEMENT	The task can be performed in slaughterhouses under the supervision of middle and senior livestock veterinary technicians or engineers. The materials, and instruments and equipment to be used include: 1. Inspection tools, such as inspection knives and hooks; 2. *Animal Product Quarantine Certificate* (blank form); 3. Animal quarantine inspection stamp; 4. Personal protective equipment (PPE), such as latex gloves, waterproof apron, sleeves, and high boots.		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Select appropriate tools and equipment; 2. Conduct simultaneous quality inspection of meat products; 3. Make comprehensive judgments of inspection results according to the prescribed procedures; 4. Affix the inspection stamp; 5. Clean the tools, equipment and workplace; 6. Store tools and equipment safely; and 7. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** **1.0. Methods** The person performing this task must be able to explain how to: 1.1 Identify the following: a. Yellow fat meat; b. Jaundiced meat; c. White muscle meat; d. Water-injected meat; e. Meat injected with other substances. 1.2 Conduct animal product quality inspection. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Characteristics of abnormal changes in animal product quality. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Yellow fat meat, jaundiced meat, white muscle meat, water-injected meat, and meat injected with other substances; 3.2 Common pathological changes in animals and their visceral organs.

	4.0 Essential Skills 4.1 Biosafety awareness; 4.2 Communication skills; 4.3 Teamwork skills; 4.4 Quarantine report writing skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The quality inspection of animal products is conducted in accordance with approved technical requirements.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Knowledge of animal quarantine; 2. Legal regulations regarding animal quarantine; 3. Occupational health and safety; 4. Harmless treatment of animal disease carcasses and their products.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	PERFORM INSPECTION AND HANDLING OF ANIMALS AND ANIMAL PRODUCTS	**DUTY NO.**	506
TASK TITLE	DETERMINE MOISTURE CONTENT IN ANIMAL PRODUCTS	**TASK NO.**	5063
PERFORMANCE CRITERIA	The person performing this task must be able to conduct moisture content determination in animal products according to the prescribed procedures and instructions provided with moisture testing strips, and make comprehensive judgments based on the inspection results.		
RANGE STATEMENT	The task can be performed under the supervision of senior livestock veterinary technicians or livestock veterinary engineers in a slaughterhouse or veterinary laboratory. The materials, and instruments and equipment to be used include: 1. Inspection tools, such as inspection knives, inspection hooks, large tweezers, and ceramic plates; 2. Moisture testing instrument; 3. Moisture testing strips; 4. Personal protective equipment (PPE), such as latex gloves, waterproof apron, sleeves, and high boots.		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Select appropriate tools and equipment; 2. Process the moisture testing samples of animal products; 3. Use moisture testing instruments to measure the water content of animal products; 4. Use moisture testing strips to measure the water content of animal products; 5. Make comprehensive judgments of inspection results according to the prescribed procedures; 6. Clean the tools, equipment and workplace; 7. Store tools and equipment safely; and 8. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Develop animal product moisture testing plans for the following; a. Moisture testing instrument; b. Moisture testing strip. 1.2 Methods for moisture testing of animal products. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Technical requirements for inspection of moisture testing samples of animal products; 2.2 Standards for determining water content in animal products; 2.3 Instructions for using moisture testing strips. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Methods for processing moisture testing samples of animal products;

	3.2 Steps for determining water content in animal products; 3.3 Knowledge of using and maintaining moisture testing instruments; 3.4 Techniques for using moisture testing strips and analyzing the results. **4.0 Essential Skills** 4.1 Biosafety awareness; 4.2 Communication skills; 4.3 Teamwork skills; 4.4 Test report writing skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The animal product moisture content determination is carried out in accordance with the standard prescribed technical procedures.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Knowledge of quarantine procedures and operations related to moisture testing samples of animal products; 2. Standards for determining water content in animal products; 3. Operating procedures and maintenance methods for moisture testing instruments; 4. Use of moisture testing strips; 5. Occupational health and safety.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	PERFORM INSPECTION AND HANDLING OF ANIMALS AND ANIMAL PRODUCTS	**DUTY NO.**	506
TASK TITLE	HANDLE QUARANTINED ANIMAL PRODUCTS	**TASK NO.**	5064
PERFORMANCE CRITERIA	The person performing this task must be able to handle quarantined animal products accordingly to the quarantine results and relevant legal requirements for both qualified and non-qualified products.		
RANGE STATEMENT	The task can be performed under the supervision of senior livestock veterinary technicians or livestock veterinary engineers in slaughterhouses, farmers' markets, and customs offices. The materials, and instruments and equipment to be used include: 1. *Animal Product Quarantine Certificate* (blank form); 2. Animal quarantine inspection stamp; 3. Disinfectants, such as quicklime, 84 disinfectants, and bromogeramine; 4. Disinfection equipment, such as autoclaves, boiling sterilizers, and chemical furnaces; 5. Personal protective equipment (PPE), such as work clothes, helmets, rubber shoes, gloves, masks, and goggles.		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Select appropriate tools and equipment; 2. Issue relevant certifications for qualified animal products based on inspection and testing results; 3. Issue relevant certifications for substandard animal products based on inspection and testing results; 4. Carry out non-destructive tests of substandard animal products; 5. Disinfect tools, equipment, and workplaces that have come into contact with substandard animal products according to disinfection protocols; 6. Store tools and equipment safely; and 7. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Develop animal product handling plans for the following: a. Qualified animal products; b. Substandard animal products. 1.2 Develop harmless treatment plans for the following substandard animal products: a. High-temperature boiling disinfection; b. Chemical processing. 1.3 Issue relevant certifications for qualified animal products; 1.4 Issue relevant certifications for substandard animal products, and carry out harmless treatment. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Principles of animal product handling; 2.2 Principles of harmless treatment for substandard animal products.

	3.0 Theories The person performing this task must be able to explain the following: 3.1 Knowledge related to animal clinical examination; 3.2 Methods for handling qualified animal products; 3.3 Methods of harmless treatment for substandard animal products; 3.4 Technical requirements for animal epidemic prevention and disinfection. **4.0 Essential Skills** 4.1 Biosafety awareness; 4.2 Communication skills; 4.3 Teamwork skills; 4.4 Report writing skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The quarantined animal products are handled according to the quarantine compliance with relevant laws and regulations.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Relevant knowledge of pathological changes in visceral organs; 2. Knowledge of animal quarantine; 3. Methods for harmless treatment of substandard animal products; 4. Occupational health and safety.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	PERFORM INSPECTION AND HANDLING OF ANIMALS AND ANIMAL PRODUCTS	**DUTY NO.**	506
TASK TITLE	CARRY OUT DETECTION AND ANALYSIS OF TOXIC AND HAZARDOUS SUBSTANCES IN ANIMALS AND ANIMAL PRODUCTS	**TASK NO.**	5065
PERFORMANCE CRITERIA	The person performing this task must be able to carry out detection and analysis of toxic and hazardous components in animals and animal products in accordance with technical requirements and relevant instrument operation specifications.		
RANGE STATEMENT	The task can be performed in slaughterhouses, animal hospitals, and veterinary customs offices under the supervision of senior livestock veterinary technicians or livestock veterinary engineers. The materials, and instruments and equipment to be used include: 1. ELIASA; 2. ELISA plates compatible with the specifications of the ELIASA; 3. Pipette; 4. ELIASA kit; 5. Chromatograph; 6. Personal protective equipment (PPE), such as work clothes, helmets, gloves, and masks.		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Select appropriate tools and equipment; 2. Detect toxic and hazardous components in animals and animal products using equipment such as an ELIASA; 3. Detect toxic and hazardous components in animals and animal products using an ELIASA kit; 4. Detect toxic and hazardous components in animals and animal products using equipment such as a chromatograph; 5. Clean the tools, equipment and workplace; 6. Store tools and equipment safely; and 7. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** The person performing this task must be able to explain how to: **1.0 Methods** 1.1 Develop a plan for the detection of toxic and hazardous components in the following: a. ELIASA; b. ELIASA kit; c. Chromatograph. 1.2 Detect toxic and hazardous components in animals and animal products. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Detection principle of ELIASA; 2.2 Detection principle of chromatograph. **3.0 Theories**

	The person performing this task must be able to explain the following: 3.1 Operation specifications for ELIASA; 3.2 Operation specifications for chromatography; 3.3 Methods and steps for the detection of toxic and hazardous substances; 3.4 Knowledge of maintenance and use of laboratory instruments. **4.0 Essential Skills** 4.1 Biosafety awareness; 4.2 Communication skills; 4.3 Teamwork skills; 4.4 Report writing skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The detection and analysis of toxic and hazardous components are carried out in accordance with the laid down rules and regulations using relevant instruments.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Knowledge of animal quarantine; 2. Maintenance procedures for laboratory instruments; 3. Principles and methods for the disposal of meat products containing toxic and hazardous substances; 4. Common methods for toxic substance analysis; 5. Occupational health and safety.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	PERFORM INSPECTION AND HANDLING OF ANIMALS AND ANIMAL PRODUCTS	**DUTY NO.**	506
TASK TITLE	CARRY OUT MEAT SAFETY RISK ASSESSMENT	**TASK NO.**	5066
PERFORMANCE CRITERIA	The person performing this task must be able to carry out risk assessments of meat safety according to the standard meat safety testing procedures.		
RANGE STATEMENT	The task can be performed in slaughterhouses, animal hospitals, and veterinary customs offices under the supervision of senior livestock veterinary technicians or livestock veterinary engineers. The materials, and instruments and equipment to be used include: 1. Meat-related test reports. 2. Safety gears		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Collect the test reports from various stages, including livestock and poultry farming, livestock and poultry slaughter, meat processing, meat distribution, and meat retail; 3. Analyze the risk based on the relevant test reports of the meat; 4. Assess the meat safety risk based on the results of data analysis; 5. Clean the workplace; and 6. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** **1.0. Methods** The person performing this task must be able to explain how to: 1.1 Collect the test reports from the following stages of meat production and distribution: a. Livestock and poultry farming; b. Livestock and poultry slaughter; c. Meat processing; d. Meat distribution; e. Meat retail. 1.2 Conduct risk analysis of the relevant test reports for meat products; 1.3 Conduct data analysis for meat safety risk assessment. **2.0. Principle** The person performing this task must be able to explain the following principles: 2.1 Principles of the range, spread speed, and severity of animal epidemic diseases. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Basis and methods for meat safety risk analysis; 3.2 Knowledge related to animal epidemic disease, safety risk assessment, and early warning for animal products.

	4.0 Essential Skills 4.1 Biosafety awareness; 4.2 Communication skills; 4.3 Teamwork skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Safety risk assessments of meat products are carried out according to the approved meat safety testing standards.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Knowledge related to the data analysis of test reports on animal epidemic diseases, including zoonotic diseases; 2. Knowledge related to animal epidemic disease, safety risk assessment, and early warning for animal products; 3. Procedures related to the handling of meat safety incidents, including disposal techniques; 4. Occupational health and safety.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	PERFORM FEED PROCESSING AND FORMULA DESIGN	**DUTY NO.**	507
TASK TITLE	CARRY OUT FEED PROCESSING AND MIXING	**TASK NO.**	5071
PERFORMANCE CRITERIA	The person performing this task must be able to process and mix animal feeds according to approved standards.		
RANGE STATEMENT	The task can be performed in farms or feed mills under the supervision of middle and senior livestock veterinary technicians or engineers. The tools and equipment to be used include: 1. Ammonization equipment (pond, trench, silo, or plastic bags); 2. Feed cutting equipment (chopper or forage harvester); 3. Silage equipment (tower, trench, silo, or plastic bags). 4. Safety gears		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Identify and use green forage; 2. Identify and use coarse fodder; 3. Select appropriate tools and equipment; 4. Process coarse fodder via physical methods; 5. Process coarse fodder via chemical methods; 6. Process coarse fodder via microbiological methods; 7. Prepare silage; 8. Evaluate the quality of silage; and 9. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Develop utilization plans for green forage, coarse fodder, and silage; 1.2 Properly collocate different types of green forage; 1.3 Process coarse fodder via physical, chemical, and microbiological approaches; 1.4 Prepare silage via silage towers, trenches, silos, or plastic bags; 1.5 Conduct sensory evaluation and laboratory analysis of silage. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Principles of proper collocation and processing of feed to enhance its nutritional value, palatability, and feed intake; 2.2 Principles of silage preparation. **4.0 Theories** The person performing this task must be able to explain the following: 4.1 Standards for the nutritional value of various types of feed; 4.2 Methods for collocating and using various types of feed.

	4.0 Essential Skills 4.1 Biosafety awareness; 4.2 Communication skills; 4.3 Teamwork skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Feed processing and mixing are carried out according to the actual requirements of livestock farming.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operation of feed harvesting; 2. Safety operation of feed processing; 3. Feed hygiene, safety, and nutritional balance; 4. Identification of feed quality and safe utilization.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CONDUCT FEED PROCESSING AND FORMULA DESIGN	**DUTY NO.**	507
TASK TITLE	DESIGN FEED FORMULA	**TASK NO.**	5072
PERFORMANCE CRITERIA	The person performing this task must be able to design feed formula according to animal feeding standards.		
RANGE STATEMENT	The task can be performed in farms or feed mills under the supervision of middle and senior livestock veterinary technicians or engineers. The tools and equipment to be used include: 1. Computer (with office software installed); 2. Calculator.		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Consult the appropriate animal husbandry standards; 2. Determine the nutritional composition of feed ingredients; 3. Design complete feed, concentrated feed, and premix feed formulations for livestock and poultry via a calculator; 4. Design complete feed, concentrated feed, and premix feed formulations for livestock and poultry via a computer; 5. Adjust the feed formula for livestock and poultry; and 6. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Design livestock and poultry feed formulas by the trial and error method; 1.2 Design livestock and poultry feed formulas by the computer-aided design (CAD) method; 1.3 Adjust the feed formula for livestock and poultry; 1.4 Select the optimal formula, and provide instructions. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Principles of feed formulation; 2.2 Principles of nutritional requirements for animals at different growth stages. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Method of using office software such as EXEL to design feed formulas by the trial and error method. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills;

	4.4 Computer application skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Feed formula is designed according to approved standards and specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Nutritional composition and safe usage range of feed ingredients; 2. Sensitivity to feed ingredient prices and costs; 3. Feed hygiene, safety, and nutritional balance; 4. Awareness of cost-saving and environmental sustainability in feed formulation design.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CONDUCT ESTRUS IDENTIFICATION AND ARTIFICIAL INSEMINATION	**DUTY NO.**	508
TASK TITLE	IDENTIFY ESTRUS IDENTIFICATION	**TASK NO.**	5081
PERFORMANCE CRITERIA	The person performing this task must be able to identify the estrus signs of female animals in accordance with technical requirements and animal behaviours.		
RANGE STATEMENT	The task can be performed in farms under the supervision of middle and senior livestock veterinary technicians or engineers. The tools and equipment to be used include: 1. Stalls; 2. Estrus female animals; 3. Vaginal dilators; 4. Personal protective equipment (PPE), such as masks, disposable latex gloves, and protective clothing.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Select appropriate tools and equipment; 2. Select the appropriate estrus identification methods; 3. Describe the symptoms of estrus; 4. Record the symptoms of estrus; 5. Predict the timing of peak estrus; 6. Clean the tools, equipment and workplace; 7. Store tools and equipment safely; and 8. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Develop identification methods for the following: a. Estrus identification in pigs; b. Estrus identification in cows; c. Estrus identification in sheep; d. Estrus identification in chickens. 1.2 Describe the symptoms of estrus; 1.3 Predict the timing of peak estrus. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Principles of specific identification for each female animal. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Estrus cycles in livestock and poultry; 3.2 External observation method; 3.3 Trial mating method; 3.4 Rectal inspection method; 3.5 Reproductive hormone detection method; 3.6 Biomimetic method;

	3.7 Measurement of reproductive tract mucus PH method; 3.8 Ultrasound detection method. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills; 4.4 Report writing skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Estrus identification is performed according to technical requirements and animal behaviours.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Occupational health and safety; 2. Disposal method of medical waste.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CONDUCT ESTRUS IDENTIFICATION AND ARTIFICIAL INSEMINATION	**DUTY NO.**	508
TASK TITLE	PERFORM ARTIFICIAL INSEMINATION	**TASK NO.**	5082
PERFORMANCE CRITERIA	The person performing this task must be able to perform artificial insemination on female animals in accordance with standard artificial insemination procedures.		
RANGE STATEMENT	The task can be performed in farms under the supervision of middle and senior livestock veterinary technicians or engineers. The tools and equipment to be used include: 1. Stalls; 2. Estrus female animals; 3. Artificial insemination equipment: vaginal dilator, and sperm duct; 4. Lubricant; 5. Semen; 6. Disinfection drugs: 75% alcohol, 0.1% potassium permanganate solution, baking soda solution, Lysol, normal saline, etc.; 7. Clean and disinfected towel, and water bucket; 8. Personal protective equipment (PPE), such as masks, disposable latex gloves, and protective clothing.		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Select appropriate tools and equipment; 2. Assess the estrus condition of the female livestock; 3. Predict the time and frequency of insemination; 4. Determine the method and location of insemination; 5. Perform insemination; 6. Evaluate the effectiveness of insemination; 7. Record the time and frequency of insemination; 8. Clean the tools, equipment and workplace; 9. Store tools and equipment safely; and 10. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Develop insemination methods for the following: a. Pig insemination; b. Cow insemination; c. Sheep insemination; d. Chicken insemination. 1.2 Predict insemination time; 1.3 Determine the method and location of insemination; 1.4 Check the effectiveness of insemination. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Principles of predicting the time and frequency of insemination; 2.2 Principles of insemination for livestock and poultry.

	2.3 Principles for evaluating insemination effectiveness. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Vaginal insemination method; 3.2 Rectal palpation insemination method; 3.3 Standards for insemination time; 3.4 Standards for evaluating the effectiveness of insemination. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills; 4.4 Report writing skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The artificial insemination procedure is performed in accordance with the standard artificial insemination procedures.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Occupational health and safety; 2. Disposal method of medical waste.

OCCUPATION	LIVESTOCK VETERINARY TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CONDUCT ESTRUS IDENTIFICATION AND ARTIFICIAL INSEMINATION	**DUTY NO.**	508
TASK TITLE	CARRY OUT SEMEN COLLECTION AND SEMEN QUALITY ANALYSIS	**TASK NO.**	5083
PERFORMANCE CRITERIA	The person performing this task must be able to carry out semen collection and semen quality identification in accordance with standard semen quality analysis procedures.		
RANGE STATEMENT	The task can be performed in farms under the supervision of middle and senior livestock veterinary technicians or engineers. The tools and equipment to be used include: 1. Semen collection site; 2. Estrus stand; 3. Trained boar; 4. Disinfected gauze and towels; 5. Solutions: diluent, lubricant, 75% alcohol, 0.1% potassium permanganate solution, baking soda solution, Lysol, etc. 6. Semen collection cup; 7. Semen storage bottle; 8. High-temperature autoclave; 9. Thermometer; 10. Glass rod; 11. Long-handled forceps; 12. Air drying oven; 13. Artificial vagina; 14. Microscope. 15. Safety gears		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Select appropriate tools and equipment; 2. Determine the method of semen collection; 3. Collect semen; 4. Perform semen quality identification; 5. Store semen; 6. Clean the tools, equipment and workplace; 7. Store tools and equipment safely; and 8. Observe health, occupational and environmental safety rules and regulations	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Semen collection; 1.2 Semen quality identification; 1.3 Semen storage. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.0 Estrus induction and training; 2.1 Principles of semen collection; 2.2 Standards for sperm characteristics, motility, density, and morphology.

	3.0 Theories The person performing this task must be able to explain the following: 3.1 Semen collection by hand; 3.2 Semen collection by artificial vagina; 3.3 Semen collection by massage; 3.4 Semen collection by electrical stimulation; 3.5 Examination of semen appearance; 3.6 Examination of sperm motility; 3.7 Examination of sperm density; 3.8 Examination of sperm morphology. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills; 4.4 Report writing skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Semen collection and semen quality identification of the male livestock are conducted in accordance with the standard semen quality analysis procedures.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Occupational health and safety; 2. Disposal method of medical waste.

APPENDIX: LIVESTOCK VETERINARY TECHNICIAN DACUM TABLE -NTA LEVEL 5

DUTIES	TASKS	ENABLERS
1.0 Conduct immunization	1.1 Carry out animal immunization.	**General skills and knowledge** · Identification of the different types of adverse immunization reactions · Measurement of animal body temperature · Identification of animal breathing and heart sounds · Weighing and calculation of the dosage of drugs · Oral immunization · Intramuscular injection · Subcutaneous injection · Nasal or ocular instillation · Skin prick · Selection and application of vaccines · Treatment of adverse immunization reaction · Clean of disinfection tools, equipment and workplaces · Knowledge of animal immunization · Knowledge of biosafety · Disposal methods for medical equipment and remaining vaccines following immunization **Tools and equipment** · Veterinary thermometer · Water dispenser · Stethoscope · Disposable syringe · Mask · Disposable latex gloves · Protective clothing · Platform scales or weighing scales · Disinfection tools, equipment, drugs, and supplies, such as autoclave, boiling sterilizer, tweezer, scissors, adrenaline, atropine, alcohol, iodine, sterilized cotton swab, and gauze. · Water distiller · Immunization record card **Materials** · Commonly-used attenuated vaccines and inactivated vaccines for animals · Distilled water
	1.2 Carry out assessment and management of adverse immunization reactions.	
	1.3 Carry out disposal of remaining vaccines following immunization.	

DUTIES	TASKS	ENABLERS
		Requirements for employees · Honesty and trustworthiness · Communication skills · Customer service skills · Teamwork skills
2.0 Perform collection and delivery of blood samples	2.1 Carry out necessary preparation for blood sample collection. 2.2 Carry out collection of blood samples. 2.3 Preserve blood samples. 2.4 Conduct the delivery of blood samples for testing.	**General skills and knowledge** · Blood collection from poultry wing veins · Blood collection from porcine anterior vena cava · Blood collection from bovine jugular vein · Blood collection from oxtail vein · Blood collection from sheep jugular vein · Selection and application of anticoagulants · Serum isolation and preservation · Packaging and submission of blood samples for testing · Clean of disinfection tools, equipment and workplaces · Knowledge of biosafety · Medical waste disposal methods **Tools and equipment** · Blood collection tools, such as vacuum blood collection tube, disposable syringe, capillary pipet, and glass slide · Tweezer, hair clipper, and marker pen · Personal protective equipment, such as masks, doctor's clothes and gloves · Thermostat water bath · Benchtop low-speed centrifuge · Pipette · Tray balance · Refrigeration equipment, refrigerator, freezer, and incubator · Sterilization equipment, such as autoclave, and boiling sterilizer · Water distiller **Materials**

DUTIES	TASKS	ENABLERS
		· Anticoagulants, such as 3.8% sodium citrate, sodium heparin, disodium EDTA, and sodium oxalate · Disinfectants and supplies, such as alcohol, iodine, and sterilized cotton swabs · Deionized water **Requirements for employees** · Communication skills · Customer service skills · Teamwork skills
3.0 Perform proper use of common instruments	3.1 Conduct standard operations of commonly-used instruments and equipment.	**General skills and knowledge** · Instructions for the use of commonly-used instruments and safety operation procedures · Storage and maintenance of commonly-used instruments · Clean of disinfection tools, equipment and workplaces · Knowledge of biosafety · Medical waste disposal methods
	3.2 Perform storage and maintenance of commonly-used instruments.	**Tools and equipment** · Platform scales or weighing scales · Constant temperature incubator · Biochemical incubator · Benchtop low-speed centrifuge · Pipette · PH meter · ELIASA · Tray balance · Micro oscillator · Refrigerator · Biological microscope · Air drying oven · Ultra-clean workbench · Autoclave · Boiling sterilizer · Water distiller · Liquid nitrogen container **Materials** · Pathology materials · Remaining vaccines from immunization

DUTIES	TASKS	ENABLERS
		Requirements for employees · Consciousness of responsibility · Communication skills · Teamwork skills
4.0 Conduct storage of drugs and reagents	4.1 Carry out storage of flammable, explosive, corrosive, and radioactive materials, and highly toxic substances.	**General skills and knowledge** · Storage, instructions, and safety operation procedures for commonly-used flammable, explosive, corrosive, and radioactive materials, and highly toxic substances · Clean of disinfection tools, equipment and workplaces · Knowledge of biosafety · Disposal methods for expired drugs **Tools and equipment** · Gas mask · Protective suit and veil · Lead apron, lead gloves, or mechanical hands for protection · Ventilation equipment · Dehumidifier · Lime bucket · Refrigerator · Hygrometer · First aid and disinfection equipment and supplies · Personal protective equipment, such as masks, doctor's clothes and gloves **Materials**
	4.2 Establish the use of flammable, explosive, corrosive, and radioactive materials, and highly toxic substances.	

DUTIES	TASKS	ENABLERS
		· All kinds of dangerous drugs · Fire extinguisher/dry sand, and dry powder · Light-blocking materials · Insulation materials **Requirements for employees** · Consciousness of responsibility · Communication skills
5.0 Establish Drug compatibility and administration techniques.	5.1 Perform compatibility tests of commonly used drugs. 6.2 Prepare solutions. 6.3 Perform drug administration. 6.4 Handle adverse drug reactions.	**General skills and knowledge** · Storage and usage instructions, as well as safety operation procedures, for commonly-used drugs · Knowledge of drug compatibility · Preparation of solutions with solid solutes · Preparation of solutions with concentrated liquid solutes · Oral administration · Injection administration · Handling of adverse drug reaction · Clean of disinfection tools, equipment and workplaces · Knowledge of biosafety · Medical waste disposal methods **Tools and equipment** · Platform scale (or balance) · Beaker · Glass rod · Measuring cylinder (or measuring cup) · Volumetric flask (narrow-mouth flask) · Pipette · Dropper · Tissue or towel · Syringe and needle · Disinfection cotton swab · Bottle opener · Forcep · Personal protective equipment, such as masks, doctor's clothes and gloves **Materials**

DUTIES	TASKS	ENABLERS
		· Surface disinfectant solution · Various commonly-used drugs **Requirements for employees** · Consciousness of responsibility · Communication skills
6.0 Perform inspection and handling of animals and animal products.	6.1 Conduct inspection of slaughtered animals. 6.2 Carry out quality inspection of animal products. 6.3 Determine the moisture content in animal products. 6.4 Handle animal products. 6.5 Carry out detection of toxic and hazardous substances. 6.6 Carry out meat safety risk assessment.	**General skills and knowledge** · Clean of disinfection tools, equipment and workplaces · Veterinary clinical diagnostic knowledge · Process and testing contents of slaughter quarantine · Knowledge of animal pharmacology · Knowledge of biosafety · Medical waste disposal methods · Harmless treatment of substandard animals and animal products **Tools and equipment** · Veterinary clinical examination tools, such as stethoscope and thermometer · Inspection tools, such as inspection knives and hooks · Personal protective equipment, such as waterproof aprons, disposable latex gloves, sleeve covers, and high boots · Animal quarantine inspection stamp · Slaughter quarantine record book · *Animal Product Quarantine Certificate* · Moisture testing instrument · Moisture testing strip · Disinfection equipment, such as autoclaves, boiling sterilizers, and chemical furnaces · Pipette · ELISA plates compatible with the specifications of the ELIASA · ELIASA · Chromatograph · Water distiller **Materials** · ELIASA kit · Deionized water

DUTIES	TASKS	ENABLERS
		Requirements for employees · Biosafety awareness · Communication skills · Teamwork skills
8.0 Perform feed processing and formula design	8.1 Carry out feed processing and mixing.	**General skills and knowledge** · Types of green forage · Types of coarse fodder · Processing of coarse fodder · Preparation of silage · Animal feeding standards · Nutritional value of feed ingredients · Energy feed · Protein feed · Mineral feed · Types of feed additives
	8.2 Carry out feed formula design.	· Concept and formulation methods for complete feed · Concept and formulation methods for concentrated feed · Concept and formulation methods for premix feed · Growth regulator · Immunomodulator · Intake regulator · Microecological regulator **Tools and equipment** · Silage equipment (tower, trench, silo, or plastic bags) · Feed cutting equipment (chopper or forage harvester) · Ammoniation equipment (pond, trench, silo, or plastic bags) · Computer (with office software installed) **Materials** · Coarse fodder, such as straw, corn stalk, and dried forage grass · Green forage for silage, such as green-chopped corn, green-chopped soybean stalks, etc. · Nutritional composition table for feed ingredients · Animal feeding standards

DUTIES	TASKS	ENABLERS
		Requirements for employees · Teamwork skills · Customer service skills · Communication skills · Work safety consciousness
8.0 Conduct Estrus identification and artificial insemination	8.1 Perform estrus identification.	**General skills and knowledge** · Clean of disinfection tools, equipment and workplaces · Methods for identifying signs of estrus in common livestock species · Techniques for insemination of female animals · Methods for semen collection from male animals · Key points and dilution methods for semen quality identification · Knowledge of biosafety · Medical waste disposal methods

DUTIES	TASKS	ENABLERS
	8.2 Perform artificial insemination.	· Harmless treatment of substandard animals and animal products **Tools and equipment** · Disposable syringe · Mask · Disposable latex gloves · Protective clothing · Disinfected towel · Bucket · Semen collection cup · Platform scales or weighing scales · Pipette · Tray balance · Refrigerator · Biological microscope · Air drying oven · Disinfection tools, equipment, drugs, and supplies, such as autoclave, glass rod, long-handled forceps, boiling sterilizer, tweezer, scissors, adrenaline, atropine, alcohol, iodine, sterilized cotton swab, gauze, and sperm duct. · Water distiller · Liquid nitrogen container · Artificial vagina · Vaginal dilator · Stall · Estrus stand **Materials** · Semen diluent · Lubricant · Disinfection drug · Deionized water **Requirements for employees** · Biosafety awareness · Communication skills · Teamwork skills
	8.3 Carry out semen collection and semen quality analysis.	