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Ministry of Labor and Skills

# Animal Production

# Level III

# CURRICULUM

## Based on April, 2022 (V- I) Occupational standard (OS)

**April, 2022**

**Addis Ababa, Ethiopia**

## Preface

The reformed TVET-System is an outcome-based system. It utilizes the needs of the labor market and occupational requirements from the world of work as the benchmark and standard for TVET delivery. The requirements from the world of work are analyzed and documented – taking into account international benchmarking – as occupational standards (OS).

In the reformed TVET-System, curricula and curriculum development play an important role with regard to quality driven comparable TVET-Delivery. The Curricula help to facilitate the training process in a way, that trainees acquire the set of occupational competences (skills, knowledge and attitude) required at the working place and defined in the occupational standards (OS).

This curriculum has been developed by a group of professional experts and lecturers from Alage, Agarfa, Kombolcha, Mizan and Gewane ATVET Colleges based on the occupational standard for **Animal production Level III.**

The curriculum development process has been actively supported and facilitated by **Ministry of Labor and Skills.**

**TVET-Program Design**

**1.1. TVET-Program Title: Animal production Level III**

**1.2. TVET-Program Description**

The Program is designed to develop the necessary knowledge, skills and attitude of the trainees to the standard required by the occupation. The contents of this program are in line with the occupational standard. The Trainees who successfully completed the Program will be qualified to work as an **Animal production** with competencies elaborated in the respective OS. Graduates of the program will have the required qualification to work in the **agricultural** sector in the field of **Animal production.**

The prime objective of this training program is to equip the Trainees with the identified competences specified in the OS. Graduates are therefore expected to Conduct Dairy Cattle Production, Undertake milk handling and processing, Perform Apiculture production, Carryout Camel production, Conduct Sheep and Goat Production, Carry out Aquaculture and Fishery Production, Perform Poultry production, Undertake livestock fattening operation, Perform Artificial insemination for livestock, Design farm stead structure and facilities and Apply Digital Technology in Agriculture in accordance with the performance criteria described in the OS in accordance with the performance criteria described in the OS in accordance with the performance criteria and evidence guide described in the OS.

**1.3. TVET-Program Training Outcomes**

The expected outputs of this program are the acquisition and implementation of the following units of competences:

**AGR ANP3 01 0322 Conduct Dairy Cattle Production**
**AGR ANP3 02 0322 Undertake milk handling and processing**
**AGR ANP3 03 0322 Perform Apiculture production**
**AGR ANP3 04 0322 Carryout Camel production**
**AGR ANP3 05 0322 Conduct Sheep and Goat Production**
**AGR ANP3 06 0322 Carry out Aquaculture and Fishery Production**
**AGR ANP3 07 0322 Perform Poultry production**
**AGR ANP3 08 0322 Undertake livestock fattening operation**
**AGR ANP3 09 0322 Perform Artificial insemination for livestock**
**AGR ANP3 10 0322 Design farm stead structure and facilities**
**AGR ANP3 11 0322 Apply Digital Technology in Agriculture**

### 1.4. Duration of the TVET-Program

The Program will have duration of **456 hours** including all in school/ Institution training and on-the-job practice or cooperative training time. Such cooperative training based on realities of the industry, nature of the occupation, location of the TVET institution, and other factors will be considered in the training delivery to ensure that trainees acquire practical and workplace experience.

| s.no | Unit competency | TVET Institution training | | Cooperative training | Total hours | Remark |
|---|---|---|---|---|---|---|
| | | Theory | Practical | | | |
| 1 | AGR ANP3 01 0322 Conduct Dairy Cattle Production | 20 | 20 | 10 | 50 | |
| 2 | AGR ANP3 02 0322 Undertake milk handling and processing | 10 | 15 | 10 | 35 | |
| 3 | AGR ANP3 03 0322 Perform Apiculture production | 15 | 20 | 10 | 45 | |
| 4 | AGR ANP3 04 0322 Carryout Camel production | 20 | 15 | 10 | 45 | |
| 5 | AGR ANP3 05 0322 Conduct Sheep and Goat Production | 20 | 20 | 10 | 50 | |
| 6 | AGR ANP3 06 0322 Carry out Aquaculture and Fishery Production | 15 | 15 | 5 | 35 | |
| 7 | AGR ANP3 07 0322 Perform Poultry production | 20 | 30 | 0 | 50 | |
| 8 | AGR ANP3 08 0322 Undertake livestock fattening operation | 20 | 20 | 10 | 50 | |
| 9 | AGR ANP3 09 0322 Perform Artificial insemination for livestock | 15 | 10 | 5 | 30 | |
| 10 | AGR ANP3 10 0322 Design farm stead structure and facilities | 15 | 10 | 5 | 30 | |
| 11 | AGR ANP3 11 0322 Apply Digital Technology in Agriculture | 20 | 10 | 6 | 36 | |
| | **Total hours for the level** | 180 | 185 | 80 | **456** | |

### 1.5. Qualification Level and Certification

Based on the descriptors elaborated on the Ethiopian National TVET Qualification Framework (NTQF) the qualification of this specific TVET Program is Level III.

The trainee can exit after successfully completing the modules in one level and will be awarded the equivalent institutional certificate on the level completed. However, only institutional certificate of training accomplishment will be awarded.

### 1.6. Target Groups

Any citizen who meets the entry requirements under items 1.7 and capable of participating in the training activities is entitled to take part in the Program.

### 1.7 Entry Requirements

The prospective participants of this program are required to possess the requirements or directive of the **Ministry of Labor and Skills**.

### 1.8 Mode of Delivery

This TVET-Program is characterized as a formal Program on middle level technical skills. The mode of delivery is co-operative training. The time spent by the trainees in the real work place/ industry will give them enough exposure to the actual world of work and enable them to get hands-on experience.

The co-operative approach will be supported with school-based lecture-discussion, simulation and actual practice. These modalities will be utilized before the trainees are exposed to the industry environment.

Hence based on the nature of the occupation, location of the TVET institutions, and interest of the industry alternative mode of cooperative training such as apprenticeships, internship and traineeship will be employed. In addition, in the areas where industry is not sufficiently available the established production and service centers/learning factories in TVET institutions will be used as cooperative training places. The Training-Institution and identified companies have forged an agreement to co-operate with regard to the implementation of this program.

### 1.9. TVET-Program Structure

| Unit of Competence | Module Code & Title | Training Outcomes | Duration (In Hours) |
|---|---|---|---|
| **AGR ANP3 01 0322** Conduct Dairy Cattle Production | **AGR ANP3 M01 0422** Conducting Dairy Cattle Production | • Determine dairy cattle production and productivity<br>• Dairy cattle feed and management practices<br>• Apply Breeding management of dairy cattle | **50** |
| **AGR ANP3 02 0322** Undertake milk handling and processing | **AGR ANP3 M02 0422** Undertaking milk handling and processing | • Undertake milking operation and Preservation<br>• Process milk into different products<br>• Clean up on completion of work | **35** |
| **AGR ANP3 03 0322** Perform Apiculture production | **AGR ANP3 M03 0422** Performing Apiculture production | • Identify species and races of honey bee<br>• Identify requirements for queen rearing and re-queen honey bee<br>• Prepare Honey Bee Brood to Manipulate<br>• Manage honey bee swarm and swarming behavior<br>• Remove honey crops from hive and extract<br>• Assess pest and disease of honeybee | **45** |
| **AGR ANP3 04 0322** Carryout Camel production | **AGR ANP3 M04 0422** Carrying out Camel production | • Develop production plan for camel<br>• Select camel for milk production<br>• Identify Camel reproduction requirements<br>• Undertake camel raising work<br>• Handle and clean material and equipment | **45** |
| **AGR ANP3 05 0322** Conduct Sheep and Goat Production | **AGR ANP3 M05 0422** Conducting Sheep and Goat Production | • Determine sheep and goat production and productivity<br>• Perform Breeding management of sheep and goat<br>• Identify feed and feeding of sheep and goats<br>• Identify sheep and goat housing and facilities | **50** |

| | | | |
|---|---|---|---|
| **AGR ANP3 06 0322** Carry out Aquaculture and Fishery Production | **AGR ANP3 M06 0422** Carrying out Aquaculture and Fishery Production | • Identify body parts of fish<br>• Prepare facilities and Undertake fish stock selection and handling<br>• Under take management and monitoring water quality<br>• Practices Feed and feeding of fish<br>• Undertake harvesting and handling of fish stocks<br>• Control and prevent common disease and parasite of fish | **35** |
| **AGR ANP3 07 0322** Perform Poultry production | **AGR ANP3 M07 0422** Performing Poultry production | • Identify poultry production systems and their requirements<br>• Identify and select poultry breed and breeding<br>• Plan poultry house construction and facilities<br>• Feed and Manage different classes of poultry<br>• Prevent and control common poultry diseases | **50** |
| **AGR ANP3 08 0322** Undertake livestock fattening operation | **AGR ANP3 M08 0422** Undertaking livestock fattening operation | • Prepare for livestock fattening<br>• Select livestock for fattening<br>• Carryout fattening<br>• Feed and Feeding for fattening animals<br>• Monitor performance of feedlots | **50** |
| **AGR ANP3 09 0322** Perform Artificial insemination for livestock | **AGR ANP3 M09 0422** Performing Artificial insemination for livestock | • Prepare animals for insemination<br>• Handle semen<br>• Perform insemination procedures<br>• Record data and clean up on completion of work | **30** |
| **AGR ANP3 10 0322** Design farm stead structure and facilities | **AGR ANP3 M10 0422** Designing farm stead structure and facilities | • Undertake a site suitability analysis<br>• Prepare a brief layout | **30** |

| | | | |
|---|---|---|---|
| | | • Determine requirements<br>• Develop a final plan | |
| **AGR ANP3 11 0322** Apply Digital Technology in Agriculture | **AGR ANP3 M11 0422** Applying Digital Technology in Agriculture | • Understand the Concept of digital technology<br>• Apply Digital technologies among rural population and farmers<br>• Recording and documentation | **36** |

*The time duration (Hours) indicated for the module should include all activities in and out of the TVET institution.

### 1.10 Institutional Assessment

Two types of evaluation will be used in determining the extent to which training outcomes are achieved. The specific training outcomes are stated in the modules. In assessing them, verifiable and observable indicators and standards shall be used.

The ***formative assessment*** is incorporated in the training modules and form part of the training process. Formative evaluation provides the trainee with feedback regarding success or failure in attaining training outcomes. It identifies the specific training errors that need to be corrected, and provides reinforcement for successful performance as well. For the teacher, formative evaluation provides information for making instruction and remedial work more effective.

***Summative Evaluation*** the other form of evaluation is given when all the modules in the program have been accomplished. It determines the extent to which competence have been achieved. And, the result of this assessment decision shall be expressed in the term of institutional Assessment implementation guidelines..

Techniques or tools for obtaining information about trainees' achievement include oral or written test, demonstration and on-site observation.

### 1.11 TVET Teachers Profile

The teachers conducting this particular TVET Program are **A Level** and above who have satisfactory practical experiences or equivalent qualifications.

| LEARNING MODULE 01 |
|---|
| **TVET-PROGRAMME TITLE: Animal Production Level- III** |
| **MODULE TITLE: Conducting Dairy Cattle Production** |
| **MODULE CODE: AGR ANP3 M01 0422** |
| **NOMINAL DURATION: 50 Hours** |
| **MODULE DESCRIPTION**: This module covers the knowledge, skills and attitude required to determine dairy cattle production and productivity, dairy cattle feed and management practices, apply breeding management of dairy cattle to support the industry and farming community. |
| **LEARNING OUTCOMES**<br>At the end of the module the trainee will be able to:<br>**LO1. Determine dairy cattle production and productivity**<br>**LO2. Dairy cattle feed and management practices**<br>**LO3. Apply breeding management of dairy cattle** |
| **MODULE CONTENT**<br>**LO1. Determine dairy cattle production and productivity**<br>1.1 Identifying and managing dairy production systems<br>1.2 Describing productivity and economic importance of dairy cattle<br>1.3 Identifying and describing dairy cattle selection criteria<br>1.4 Analyzing dairy cattle production status<br>1.5 Performing and recording culling operation<br>**LO2. Dairy cattle feed and management practices**<br>2.1 Identifying digestion system of dairy cattle<br>2.2 Describing dairy cattle feed sources<br>2.3 Recognizing nutrient requirement of dairy cattle<br>2.4 Preparing and formulating feeding plans<br>2.5 Describing feeding strategies of dairy cattle<br>2.6 Undertaking and recording body condition scoring<br>2.7 Identifying, selecting and preparing facilities and equipment<br>2.8 Performing new born calf management practices<br>2.9 Performing heifers management practices<br>2.10 Performing lactating, pregnant and dry cow management practices<br>2.11 Identifying and maintaining hygiene, health and environmental requirements |

2.12 Carrying out record keeping

**LO3. Apply breeding management of dairy cattle**

3.1. Identifying common dairy cattle breeds and breeding systems

3.2. Recognizing reproductive organ and mammary gland

3.3. Carrying out estrus synchronization and heat detection

3.4. Providing secure mating areas

3.5. Using mating procedures and handling techniques

3.6. Identifying common reproduction index

**LEARNING METHODS**

- Lecture and Discussion
- Demonstration
- Role playing
- Group Works

**ASSESSMENT METHODS:**

- Written test
- Oral questioning
- Quiz's and assignment
- Practical demonstration

**ASSESSMENT CRITERIA:**

**LO1. Determine dairy cattle production and productivity**

- Types of dairy production systems are identified and managed according industry guide line
- Productivity and economic importance of dairy cattle are described
- Dairy cattle selection criteria are identified and described
- Dairy cattle production status is analysis according to industry requirements.
- Animals culling operation are performed that do not fit within the established ideal range are identified, and record is made for culling operation

**LO2. Dairy cattle feed and management practices**

- Digestion system of dairy cattle are identified

- Feed sources for dairy cattle are described
- Nutrient requirement of dairy cattle are recognized
- Feeding plan is prepared and formulated to different class of dairy cattle.
- Feeding strategies of dairy cattle are described
- Dairy cattle body condition scoring is undertaken and recorded according to industry standards requirements.
- Facilities and equipment for dairy animal needed to provide care are identified, selected and prepared
- New born animals management practices are performed
- Heifers management practices are performed
- Lactating, pregnant and dry cow management practices are performed according to standards
- Hygiene, health and environmental requirements are identified and maintained according to industry and legislative requirements.
- Record keeping is carried out for dairy cattle in line with industry requirements.

**LO3. Apply Breeding management of dairy cattle**

- Common dairy cattle breeds are identified
- Reproductive organ and mammary gland of dairy cattle are recognize
- Estrus synchronization and heat detection procedures are carried out according to established industry practice.
- Mating areas are secure and provide according to established industry practice.
- Mating procedures and handling techniques that minimize stress and discomfort to dairy meet OHS requirements are used.
- Common Reproduction index or fertility indicators are Identified

**Annex: Resource Requirements**

| AGR ANP3 M04 0422 Carrying Dairy Production | | | | |
|---|---|---|---|---|
| **Item No.** | **Category/Item** | **Description/ Specifications** | **Quantity** | **Recommended Ratio (Item: Trainee)** |
| ***A.*** | ***Learning Materials*** | | | |
| 1. | TTLM | Prepared by the trainer | 35 | 1:1 |
| 2. | Reference Books | Dairy Herd Nutrition Management By DrOfer Kroll, Senior Israeli Dairy Nutritionist,2002. | 7 | 1:5 |
| 3 | Journals/Publication/Magazines | Standard | 7 | 1:5 |
| ***B.*** | ***Facilities & Infrastructure*** | | | |
| 1. | Class room | 5*10m | 1 | 1:25 |
| 2. | Clinic/first aid provision area | 6*8m | 1 | 1:25 |
| 3. | Library | 5*7.5m | 1 | 1:25 |
| 4 | Simulation room for assessment | 3*5m | 1 | 1:25 |
| 5 | Demonstration site | 5*10m | 1 | 1:25 |
| 6 | Laboratory | 5*10m | 1 | 1:25 |
| 7 | Work shop | 9*4m | 1 | 1:25 |
| 8 | Audiovisual room | 5*10m | 1 | 1:25 |
| 9 | **ICT room** | 7*9m | 1 | 1:25 |
| 10 | Printing and photocopy service | Standard | 1 | 1:25 |
| 11 | Vehicles for cooperative/practical | Standard | 1 | 1:25 |
| 12 | White board | 1.2*1.8m | 1 | 1:25 |
| 13 | Black board | 1.2*2m | 1 | 1:25 |
| 14 | Chalk | Dubai | 1 Packet | 1:25 |
| 15 | A3 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 16 | A4 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 17 | Fixer with lid | HB/1.5 mm | 25 Packet | 1:1 |
| 18 | Stencils | Ball point | 10 Pcs | 1:3 |
| 19 | Toner | HP | As needed, 10 pieces | 1:3 |
| 20 | Fastener | ACCO two-piece paper | As needed, | 2:1 |

| | | | | |
|---|---|---|---|---|
| | | fasteners | 50 pieces | |
| 21 | UTP cable | Cat5E UTP cable | 2 boxes | 1:13 |
| 22 | Notice board | 900 mm x 600 mm Heavy duty wooden | 1 | 1:25 |
| 23 | Green board | China Magnetic Green Board | 1 | 1:25 |
| 24 | T-square | Aluminum metal type | 25 | 1:1 |
| 25 | Flip chart | Sinar Line | 1 | 1:25 |
| 26 | Graph paper | Roll | 5 | 1:5 |
| 27 | pencil | HB | 5 | 1:5 |
| 28 | Computer table | 1*2m | 13 Pcs | 1:2 |
| 29 | LCD projector | EB-2250U HDMI/USB/LAN | 1 | 1:25 |
| 30 | Laptop | Core i7, RAM 8, storag1TB | 1 | 1:25 |
| 31 | Vaccination kits, | | 5 | 1:5 |
| 32 | Crush, | $3m*2m*=6m^2$ | 1 | 1:25 |
| 34 | Knapsack sprayer, | 20 litter capacity | 2 | 1:5 |
| 35 | Drench gun, | standard | 2 | 1:5 |
| 36 | Hoof trimmer, | stainlessstel | 2 | 1:12 |
| 37 | Weighing scale, | digital | 2 | 1:12 |
| 38 | Ear tag | standard | 2 | 1:12 |
| 39 | Washing brushes, | standard | 2 | 1:12 |
| 40 | Needles, | different types | 2 | 1:12 |
| 41 | Disinfectants, | omo | 2 | 1:12 |
| 42 | Foot baths | $50cm*50cm=2500cm^2$ | 2 | 1:12 |
| 43 | Dips | $2m*2m*3m=18m^2$ | 1 | 1:25 |
| 44 | Antibiotics | albendazole 500mg | 5 | 1:5 |

| LEARNING MODULE 02 |
|---|
| **TVET-PROGRAMME TITLE: Animal Production Level III** |
| **MODULE TITLE: Undertaking Milk Handling and Processing** |
| **MODULE CODE: AGR ANP3 M02 0422** |
| **NOMINAL DURATION: 35 hour** |
| **MODULE DESCRIPTION**: This module the knowledge, skills and attitude required to Undertake milking operation, preservation and process milk in to different products and clean up materials, tools and equipment up on completion of work. |
| **LEARNING OUTCOMES**<br>**At the end of the module the trainee will be able to:**<br>**LO1. Undertake milking operation and Preservation**<br>**LO2. Process milk into different products**<br>**LO3. Clean up on completion of work** |
| **MODULE CONTENTS:**<br>**LO1. Undertake milking operation**<br>1.1. Preparing and using required materials, tools and equipment<br>1.2. Carrying out hygiene and sanitation<br>1.3. Recognizing milk composition<br>1.4. Conducting milking procedure<br>1.5. Undertaking milk quality tests<br>**LO2. Process milk into different products and Preservation**<br>2.1. Determining types of milk products<br>2.2. Preparing whole milk processing ingredients<br>2.3. Milk processing<br>2.4. Preserving milk and milk Product<br>**LO3. Clean up on completion of work**<br>3.1. Storing processed milk and milk by products<br>3.2. Cleaning, maintaining and storing tools and equipment<br>3.3. Storing reusable and disposing disposable materials<br>3.4. Disposing all waste products<br>3.5. Reporting work outcomes |

| |
|---|
| • Lecture and Discussion<br>• Démonstration<br>• Group work<br>• Practical labratory exercices |
| **ASSESSMENT METHODS:** |
| • Written test<br>• Oral questioning<br>• Practical Evaluation |

**ASSESSMENT CRITERIA:**

**LO.1 Undertake milking operation**

- Required materials, tools and equipment are prepared and used.
- Hygiene and sanitation of working area and equipment are carried out in relation to industry requirement milking operation
- Milk composition are recognized according to standards
- Milking procedure, Milking schedule and ***milking methods*** are conducted according to industry guideline
- Milk quality test is undertaken to meet production plan according to industry requirements.

**LO.2 Process milk into different products and Preservation**

- ***Types of milk products*** to be processed are determined based on the industry requirements
- Whole milk processing ***ingredients*** are prepared according to industry guidelines.
- Milk is processed into different types of products according to industry requirement and guidelines
- Milk and milk Product is preserved using different ***methods of preservation.***

**LO.3 Clean up on completion of work**

- The processed milk and milk by products are properly stored until transporting.
- Tools and equipment are cleaned, maintained and stored according to manufacturer's specifications and work instructions.
- Reusable materials are returned to store and disposable are disposed according to OHS instructions.
- All waste products are disposed of according to industry procedures.
- Work outcomes are reported to the supervisor.

**Annex: Resource Requirements**

| AGR ANP3 M02 0422 Undertaking Milk Handling and milking procedures | | | | |
|---|---|---|---|---|
| **Item No.** | **Category/Item** | **Description/ Specifications** | **Quantity** | **Recommended Ratio (Item: Trainee)** |
| ***A.*** | ***Learning Materials*** | | | |
| 1. | TTLM | Prepared by the trainer | 25 | 1:1 |
| 2. | Reference Books | Handbook of Good Dairy Husbandry Practices | 5 | 1:5 |
| | | Modern Livestock & Poultry Production, 9th, Student Edition | 5 | 1:5 |
| | | Sheep and goat production Handbook for Ethiopia, Alemu Yami and R.C.Merkel,2008 | 7 | 1:5 |
| 3 | Journals/Publication/Magazines | Standard | 7 | 1:5 |
| ***B.*** | ***Learning Facilities & Infrastructure*** | | | |
| 1. | Class room | 5*10m | 1 | 1:25 |
| 2. | Clinic/first aid provision area | 6*8m | 1 | 1:25 |
| 3. | Library | 5*7.5m | 1 | 1:25 |
| 4. | Simulation room for assessment | 3*5m | 1 | 1:25 |
| 5. | Demonstration site | 5*10m | 1 | 1:25 |
| 6. | Laboratory | 5*10m | 1 | 1:25 |
| 7. | Work shop | 9*4m | 1 | 1:25 |
| 8. | Audiovisual room | 5*10m | 1 | 1:25 |
| 9. | **ICT room** | 7*9m | 1 | 1:25 |
| 10. | Printing and photocopy service | Standard | 1 | 1:25 |
| 11. | Vehicles for cooperative/practical training | Standard | 1 | 1:25 |
| 12. | White board | 1.2*1.8m | 1 | 1:25 |
| 13. | Black board | 1.2*2m | 1 | 1:25 |

| | | | | |
|---|---|---|---|---|
| 14. | Chalk | Dubai | 1 Packet | 1:25 |
| 15. | Marker | Permanent and non permanent | 2 Packet | 1:13 |
| 16. | A3 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 17. | A4 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 18. | Fixer with lid | HB/1.5 mm | 25 Packet | 1:1 |
| 19. | Stencils | Ball point | 10 Pcs | 1:3 |
| 20. | Toner | HP | As needed, 10 pieces | 1:3 |
| 21. | Fastener | ACCO two-piece paper fasteners | As needed, 50 pieces | 2:1 |
| 22. | UTP cable | Cat5E UTP cable | 2 boxes | 1:13 |
| 23. | Notice board | 900 mm x 600 mm Heavy duty wooden | 1 | 1:25 |
| 24. | Green board | China Magnetic Green Board | 1 | 1:25 |
| 25. | T-square | Aluminum metal type | 25 | 1:1 |
| 26. | Flip chart | Sinar Line | 1 | 1:25 |
| 27. | Graph paper | Roll | 5 | 1:5 |
| 28. | pencil | HB | 5 | 1:5 |
| 29. | Drawings with specifications | Any suitable drawing | 5 | 1:5 |
| 30. | Ruler | Mica 30 cm | 25 | 1:1 |
| 31. | Eraser | Standard | 1 | 1:25 |
| 32. | Duster | Wooden made | 1 | 1:25 |
| 33. | Computer | Desktop | 25 Pcs | 1:1 |
| 34. | Computer table | 1*2m | 13 Pcs | 1:2 |
| 10 | Duster | Omega | 1 | |
| 11 | Work station | 10*10 m | 1 | 1:35 |
| ***C.*** | ***Consumable Materials*** | | | |
| 1 | Savlon | 1.0%–1.5% Glutaraldehyde concentration | 5L | 1:5 |
| 2 | 68% ethanol alcohol | Often abbreviated ETOH absolutely free of acid | 5L | 1:5 |
| 4 | Milk | Fresh Whole Milk | 25 liter | 1:1 |
| 5 | - Lemon juice or<br>- Lactic acids or<br>- Acetic acid or | packed | 2L | 1:25 |

| | | | | |
|---|---|---|---|---|
| | - Acid whey | | | |
| 5 | Yeast extract powder 500gm | Standard solution | 2L | 1:13 |
| 6 | Standard plate count agar | Standard solution | 2L | 1:13 |
| 7 | Coliform test agar | Standard solution | 2L | 1:13 |
| 8 | Hydrogen per oxide (H2O2 | Standard solution | 2L | 1:13 |
| 9 | Sodium hydroxide | NAOH base0.1M | 2L | 1:13 |
| 10 | Bandage | Sterilized | 2 roll | |
| 11 | Formalin solution | 40% | 2L | 1:13 |
| 12 | Towel(Muslin) | 80"W x 60"L & 100% cotton | 5 pics | 1:5 |
| 13 | Detergent material | Omo | 5 pack | |
| 14 | Distilled sterile water | 1 Litter | 2L | 1:13 |
| 15 | Iodine | Snacked 1000ml bottle solution | 2 L | 1:13 |
| 16 | Starter culture | | | |
| 17 | Salt | Nacl | 5kg | 1:5 |
| 18 | Soaps | Solid or liquid form | 5 | 1:5 |
| ***D.*** | ***Tools and Equipment's*** | | | |
| 1 | Calibrated Jog | Plastic with 1000ml capacity | 5 | 1:5 |
| 2 | Strip cup | Immucell 7900 California mastitis test kit | 5 | 1:5 |
| 3 | Pail | Plastic with 5 L capacity | 5 | 1:5 |
| 4 | Milk can | Stainless steel with 30L | 5 | 1:5 |
| 5 | Cream separator | 150 per hour (Model #26/18) | 1 pics | 1:25 |
| 6 | Churner | Standard | 1pics | 1:25 |
| 7 | Refrigerator | Deep & 350 liter capacity | 1pics | 1:25 |
| 8 | Pasteurizer | Stainless steel type | 1pics | 1:25 |
| 9 | Homogenizer | Stainless steel type | 1pics | 1:25 |
| 10 | weighing scale | Digital >100kg | 1 | 1:25 |
| | | Mechanical | 1 | 1:25 |
| 11 | Ladle cooking dish | Stainless steel type | 5 pics | 1:25 |
| 12 | Cooking stove | Electrical with thermostat | 1 pics | 1:25 |
| 13 | Sterilizer | Electric Steam Steriliser | 2 pcs | 1:13 |
| 14 | Lacto meter | consist of test tube and meter bulb | 10 pcs | 1:3 |

| | | | | |
|---|---|---|---|---|
| 15 | Lacto scan | Electrical | 1 pcs | 1:25 |
| 16 | Graduated jog | Plastic 1000ml | 5 | 1:5 |
| 17 | Rope | Nylon made with 0.25 inch | 50 m | 1:2 |
| 18 | Milking machine | Portable mechanical | 1 pics | 1:25 |
| 19 | Milk sample bottle | Medela Breastfeeding Gift Set | 13 | 1:2 |
| 20 | **pipette** | • Transfer pipet, 7.0mL, 155mm<br>• grad to 3mL, STR, 1/pk<br>• Transfer Pipets | 25 | 1:1 |
| 21 | Digital burette(Milk quality Test) | • 50ml and 100m<br>• Automatic read | | |
| ***E*** | ***PPE*** | | | |
| 1 | Plastic boots/shoes | Large size | 25 | 1:1 |
| 2 | Overalls | Large size | 25 | 1:1 |
| 3 | Gloves | Large size | 25 | 1:1 |
| 4 | Apron | Large size | 25 | 1:1 |
| 5 | Plastic boots/shoes | Large size | 25 | 1:1 |
| 6 | Sun hat | Large size | 25 | 1:1 |
| 7 | Safety goggles | | 25 | 1:1 |
| 8 | Face mask | | 25 | 1:1 |
| 9 | Ear protectors | | 25 | 1:1 |

| LEARNING MODULE 03 |
|---|
| **TVET-PROGRAMME TITLE: Animal Production Level III** |
| **MODULE TITLE: Performing apiculture production** |
| **MODULE CODE: AGR ANP3 M03 0422** |
| **NOMINAL DURATION: 45 Hours** |
| **MODULE DESCRIPTION**: This module covers the knowledge, skills and attitude required in identify species and races of honey bee perform beekeeping operation to establish and monitor queen rearing and re-queen honey bee, manipulate honey bee brood, manage honey bee swarm, remove and extract honey crops and prevent and control pests and diseases in beekeeping activities. |
| **LEARNING OUTCOMES**<br>At the end of the module the trainee will be able to:<br>**LO1. Identify species and races of honey bee**<br>**LO2. Identify requirements for queen rearing and re-queen honey bee**<br>**LO3. Prepare Honey Bee Brood to Manipulate**<br>**LO4. Manage honey bee swarm and swarming behavior**<br>**LO5. Remove honey crops from hive and extract**<br>**LO6. Assess pest and disease of honeybee** |

**MODULE CONTENTS:**

**LO1. Identify species and races of honey bee**

1.1.Describing history and advantages honey bees

1.2.Describing races of honey bees

1.3.Describing duties & responsibilities of honey bee

**LO2. Identify requirements for queen rearing and re-queen honey bee**

2.1 Obtaining and confirming beekeeping tools, equipment and PPE

2.2 Selecting productive breeding stock

2.3 Identifying breeding program criteria

2.4 Conducting queen rearing

2.5 Selecting and transferring day-old larvae

2.6 Confirming nurse bees in cell raising colonies

2.7 Placing grafted cells into starting colonies and finishing colonies

2.8 Transferring ripe queen cells

2.9 Confirming drones during mating

2.10 Assessing Vigor of the new queen

2.11 Monitoring signs of replacement queen

2.12 Handling and monitoring replacement queens

2.13 Applying re-queening techniques

2.14 Monitoring egg laying and level of hatching

**LO3. Prepare Honey Bee Brood to Manipulate**

3.1. Selecting tools and equipment

3.2. Observing bio security protocols

3.3. Identifying hazard and risks

3.4. Conducting hive inspection

3.5. Monitoring hive and taking actions

3.6. Cleaning and disposing waste materials

**Lo4. Manage honey bee swarm and swarming behavior**

4.1. Obtaining and confirming swarming equipment

4.2. Undertaking swarm catching and collecting procedure's

4.3. Conducting transferring procedure's

4.4. Conducting strict bio-security practice

4.5. Swarm quarantining and monitoring hive health

4.6. Monitoring and determining egg laying performance

4.7. Monitoring signs of swarming

4.8. Assessing and managing colony swarming behavior

4.9. Identifying types of swarm

4.10. Selecting and implementing controlling options of swarming

4.11. Identifying risks associated with catching and collecting bees

**LO5. Remove honey crops from hive and extract**

5.1. Obtaining and confirming tools and equipment

5.2. Determining and monitoring ripeness of honey

5.3. Planning time and location harvesting

5.4. Recognizing honey contaminates

5.5. Obtaining quality and types of honey

5.6. Using methods of removing bees

5.7. Undertaking honey harvesting procedures

5.8. Transporting and storing ripen honey frames

5.9. Extracting and purifying honey

5.10. Labeling and storing honey

**LO6. Assess pest and disease of honeybee**

6.1 Hive inspection of diseases, pests and enemies

6.2 Observing adult bees and brood combs for signs of disease

6.3 Observing flight paths of bees around hive entrance

6.4 Implementing bio-security

6.5 Recording results of inspections

**LEARNING METHODS:**

- Lecture and Discussion
- Démonstration/Pratical exercices
- Audio-visuals shows
- Rôle playing

**ASSESSMENT METHODS:**

- Written test and Oral questioning
- Practical demonstration

- Interview
- Observation

**ASSESSMENT CRITERIA:**

**LO1. Identify species and races of honey bee**

- History, advantages and species of honey bees are described
- Races of honey bees are describe
- Duties of honey bee are described

**LO.2 Identify requirements for queen rearing and re-queen honey bee**

- In all beekeeping activity tools, equipment, ***PPE*** and other requirements needed to rear queen bees are obtained and confirmed as being in good repair and serviceable for use.
- Breeding stock is selected from productive healthy stock according to established breeding program criteria.
- Day-old larvae from the breeder queen bee are selected for grafting and transferred from worker cells into queen cell cups.
- Adequate numbers of nurse bees are confirmed as being present in cell raising colonies.
- Grafted cells are placed into cell starting colonies and then into cell finishing colonies
- Ripe queen cells are transferred into the nucleus 10-11 days after grafting, confirm the availability of drones during mating and record the work.
- Vigor of the current queen is assessed accordingly.
- Colony is monitored for signs that indicate queen replacement is necessary work.
- Replacement queens according to industry criteria and any escort worker bees are stored in appropriate conditions and monitoring until re-queening is undertaken.
- Queen bee has been raised from a nucleus colony and re-queen according to code of practice
- Hive is monitored for acceptance by egg laying and adequate level of hatching according to industry requirements.

**LO.3 Prepare Honey Bee Brood to Manipulate**

- Tools and equipment required are selected to manipulate brood and ensure serviceability prior to use.
- Any site quarantine or other bio security protocols in force are observed.

- Hazard and Risks to colony, including to brood and queen bee, are identified and actions are taken to minimize likelihood and consequences of risks.
- Hive inspection is conducted according to industry procedures
- Hive and colony are monitored after manipulation process and appropriate action is taken if needed.

- Work area are Cleaned and disposed of waste materials according to workplace waste management and biosecurity procedures

**LO4. Manage honey bee swarm and swarming behavior**

- All equipment required to collect a swarm of honey bees are obtained and confirmed as being in good repair and serviceable for use.
- All procedure of catching and collecting swarm are undertaken.
- Work are Conducted according to quarantine regulations and biosecurity codes of practice.
- Swarm from apiary is quarantined and monitored hive health according to biosecurity procedures.
- Egg laying performance of queen is monitored and determined if re-queening is required according to workplace procedures.
- Honey bee colony is monitored and for signs that swarming may occur.
- Options for controlling swarming behavior is Consider, selected and implemented the best option
- Colony swarming behavior has been assessed, managed and monitor to ensure that further management options
- Risks associated with catching and collecting bees are identified and actions are taken to minimize likelihood and consequences of risks.

**LO5. Remove honey crops from hive and extract**

- All tools and equipment required to remove a honey crop from a hive are obtained and confirmed as being in good repair and serviceable for use and Risk minimizing.
- Ripeness of honey and factors affecting quantity and quality of honey is determined and monitored to ensure that the honey is mature enough to be harvested.
- Time and location of planned honey removal takes into account potential contaminants,

impact on the colony and quality and type of honey to be obtained.

- Range of suitable methods for removing bees and how much honey to remove is used.
- Honey harvesting procedures are undertaken.
- Honey-filled frames are transported to extracting facility.
- Ripen honey comb are stored in a pest and bee protected environment to prevent robbing, damage and contamination according to workplace procedures
- Honey –filled combs are extracted, purified and moisture content of honey is checked and stored in suitable containers to keep its quality and customer requirements.
- Reference sample of honey is taken, correctly labeled and stored according to industry, food safety and quality assurance requirements.

**LO6. Assess pest and disease of honeybee**

- Bee hive is inspected for signs of ***diseases*** and ***pests/enemies*** are notified as required by legislation and appropriate action is taken.
- Adult bees and brood combs are observed for signs of disease and, where notifiable disease is present, appropriate authorities are informed as required by legislation and appropriate action is taken.
- Flight paths around hive entrance are observed for signs of poor or irregular flight patterns, and for dead or dying bees at hive entrance.
- Biosecurity measures are implemented according to industry biosecurity plans and instructions from appropriate authority.
- Results of inspections and any remedial action taken are recorded and used as the basis for future beekeeping operations.

**Annex: Resource Requirements**

| AGR ANP3 M03 0422 Performing Apiculture production | | | | |
|---|---|---|---|---|
| **Item No.** | **Category/Item** | **Description/ Specifications** | **Quantity** | **Recommended Ratio (Item: Trainee)** |
| ***A.*** | ***Learning Materials*** | | | |
| 1. | TTLM | Prepared by the trainer | 25 | 1:1 |
| 2 | Reference Books | The National Bee Keeping Training and Extension Manual, 2012. | 5 | 1:5 |
| | | The Beekeeper's hand Book (2011 ), Fourth Edition, Diana Sammataro and Alphonse Avitabile | 5 | 1:5 |
| | | | 5 | 1:5 |
| 3 | Journals/Publication/Magazines | Standard | 7 | 1:5 |
| ***B.*** | ***Learning Facilities & Infrastructure*** | | | |
| 1. | Class room | 5*10m | 1 | 1:25 |
| 2. | Clinic/first aid provision area | 6*8m | 1 | 1:25 |
| 3. | Library | 5*7.5m | 1 | 1:25 |
| 4. | Simulation room for assessment | 3*5m | 1 | 1:25 |
| 5. | Demonstration site | 5*10m | 1 | 1:25 |
| 6. | Laboratory | 5*10m | 1 | 1:25 |
| 7. | Work shop | 9*4m | 1 | 1:25 |
| 8. | Audiovisual room | 5*10m | 1 | 1:25 |
| 9. | **ICT room** | 7*9m | 1 | 1:25 |
| 10. | Printing and photocopy service | Standard | 1 | 1:25 |
| 11. | Vehicles for cooperative/practical training | Standard | 1 | 1:25 |
| 12. | White board | 1.2*1.8m | 1 | 1:25 |
| 13. | Black board | 1.2*2m | 1 | 1:25 |
| 14. | Chalk | Dubai | 1 Packet | 1:25 |
| 15. | Marker | Permanent and non permanent | 2 Packet | 1:13 |

| | | | | |
|---|---|---|---|---|
| 16. | A3 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 17. | A4 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 18. | Fixer with lid | HB/1.5 mm | 25 Packet | 1:1 |
| 19. | Stencils | Ball point | 10 Pcs | 1:3 |
| 20. | Toner | HP | As needed, 10 pieces | 1:3 |
| 21. | Fastener | ACCO two-piece paper fasteners | As needed, 50 pieces | 2:1 |
| 22. | UTP cable | Cat5E UTP cable | 2 boxes | 1:13 |
| 23. | Notice board | 900 mm x 600 mm Heavy duty wooden | 1 | 1:25 |
| 24. | Green board | China Magnetic Green Board | 1 | 1:25 |
| 25. | T-square | Aluminum metal type | 25 | 1:1 |
| 26. | Flip chart | Sinar Line | 1 | 1:25 |
| 27. | Graph paper | Roll | 5 | 1:5 |
| 28. | pencil | HB | 5 | 1:5 |
| 29. | Drawings with specifications | Any suitable drawing | 5 | 1:5 |
| 30. | Ruler | Mica 30 cm | 25 | 1:1 |
| 31. | Eraser | Standard | 1 | 1:25 |
| 32. | Duster | Wooden made | 1 | 1:25 |
| 33. | Computer | Desktop | 25 Pcs | 1:1 |
| 34. | Computer table | 1*2m | 13 Pcs | 1:2 |
| 35. | LCD projector | EB-2250U HDMI/USB/LAN | 1 | 1:25 |
| 36. | Laptop | Core i7, RAM 8, storag1TB | 1 | 1:25 |
| ***C.*** | ***Consumable Materials*** | | | |
| 1 | Honey bee feeds | Honey | 1kg | 1:25 |
| | | Sugar syrup solution | 5kg | 1:5 |
| | | Pollen substituent in powder form | 5kg | 1:5 |
| 2 | Detergents | Soap | 5 Pcs | 1:5 |
| | | Powder (Omo) | 5 Pcs | 1:5 |
| | | Liquid soap | 5L | 1:5 |
| 3 | Beeswax | Standard | 50kg | 2:1 |
| 4 | Honey | Standard | 5 | 1:5 |
| 5 | Pollen | Standard | 5 | 1:5 |

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|---|---|---|---|---|
| ***D.*** | ***Tools and Equipments*** | | | |
| 1 | Sack | Sisal sack | 5 | 1:5 |
| 2 | Cooking dish/pot | Made of stainless steel | 5 | 1:5 |
| 3 | Embedder/Transformer | Standard | 2 | 1:13 |
| 4 | First aid kits | Plasters in a variety of different sizes and shapes. | 3 | 1:9 |
| | | Small, medium and large sterile gauze dressings | 3 pack | 1:9 |
| | | Sterile eye dressings | 1 pack | 1:25 |
| | | Triangular bandages. | 1 roll | 1:25 |
| | | Crêpe rolled bandages | 1 roll | 1:25 |
| | | Safety pins | 1 | 1:25 |
| | | Disposable sterile gloves | 2 Pack | 1:13 |
| | | Tweezers | | |
| 5 | Water sprayer | Simple plastic pump stirrer | 5 | 1:5 |
| | Homogenizer | Standard | 2 | 1:13 |
| 6 | Pollen trap | Standard | 2 | 1:13 |
| 7 | Solar wax extractor | Standard | 2 | 1:13 |
| 8 | Fire extinguisher | Standard | 1 | 1:25 |
| 9 | Bee smoker | Made of galvanized metal sheet or long shaft | 5 | 1:5 |
| 10 | Hive tool/Chisel | Small crowbar made of stainless steel | 5 | 1:5 |
| 11 | Bee Brushes | Soft long brush handle made of wooden handle and natural bristles | 5 | 1:5 |
| 12 | Feeder frames | Standard | 25 | 1:1 |
| 13 | Hive fastening belt | Standard | 7 | 1:4 |
| 14 | Bowel | Stainless steel | 2 | 1:13 |
| 15 | Buckets | Stainless steel | 5 | 1:5 |
| 16 | Brooms | Standard | 5 | 1:5 |
| 17 | Wheelbarrows | Stainless steel | 5 | 1:5 |
| 18 | Hoses | Standard | 5 | 1:5 |

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|---|---|---|---|---|
| 19 | Hose fittings | Standard | 5 | 1:5 |
| 20 | Ladle | Stainless steel | 5 | 1:5 |
| 21 | Knives | Stainless steel | 7 | 1:4 |
| 22 | Casting mould | Stainless steel | 2 | 1:13 |
| 23 | Frame wire | Stainless | 2 Roll | 1:13 |
| 24 | Spades | Stainless steel | 5 | 1:5 |
| 25 | Shovel | Stainless steel | 5 | 1:5 |
| 26 | Forks | Stainless steel | 5 | 1:5 |
| 27 | Rakes | Stainless steel | 5 | 1:5 |
| 28 | Weighing scale | Mechanical (50kg) | 5 | 1:5 |
| | | Digital (50kg) | 5 | 1:5 |
| 29 | Rakes | Stainless steel | 5 | 1:5 |
| 30 | Butterfly entrances fitted to escape boards | Standard | 5 | 1:5 |
| 31 | Escape boards | Standard | 5 | 1:5 |
| 32 | Queen excluders | Plastic | 5 | 1:5 |
| 33 | Spare boxes | Standard | 5 | 1:5 |
| 34 | Hand drive honey extractor | Made from stainless steel | 1 | 1:25 |
| 35 | Electrical drive honey extractor | Made from stainless steel | 1 | 1:25 |
| 36 | Honey Presser | Made from aluminum sheet. | 1 | 1:25 |
| 37 | Honey Containers | Made from stainless metal and plastic that have tightly closed lid | 3 | 1:8 |
| 38 | Uncapping fork | Made of plastic handle with stainless steel | 5 | 1:5 |
| 39 | Honey strainer | A sieve like device made from stainless steel | 1 | 1:25 |
| 40 | Honey filtering cloth | Cotton | 10m | 1:3 |
| 41 | Honey Scrapper | Made of rustproof stainless steel tins and smooth wooden handle | 5 | 1:5 |
| 42 | Honey melter | An electrode device made from stainless steel | 1 | 1:25 |
| 43 | Refractometer | Standard | 1 | 1:25 |
| 42 | Bee blower | Standard | 1 | 1:25 |
| 43 | Honey settling Tank | Made from food grade plastic tanks | 2 | 1:13 |

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|---|---|---|---|---|
| | | and stainless steel tanks | | |
| 44 | Queen Cell | Queen rearing equipment | 25 | 1:1 |
| 45 | Grafting Needle | Queen rearing equipment | 25 | 1:1 |
| 46 | Queen cage | Queen rearing equipment | 25 | 1:1 |
| 47 | Dipping stick | Queen rearing equipment | 25 | 1:1 |
| 48 | Magnifying glass | Queen rearing equipment | 25 | 1:1 |
| 49 | Queen cell cup | Queen rearing equipment | 25 | 1:1 |
| 50 | cell bar holders | Queen rearing equipment | 25 | 1:1 |
| 51 | cell bars | Queen rearing equipment | 25 | 1:1 |
| 52 | Bee veils | Black mesh integrated into a hat so that no bees can enter | 25 | 1:1 |
| 53 | Bee-proof | Standard | 25 | 1:1 |
| 54 | Overalls (beekeeper suit) | Made from white khaki material with a head veil attached to and that close tightly so no bee enter | 25 | 1:1 |
| 55 | Gloves | Made of soft leather material or soft latex gloves and joined with a piece of cloth | 25 | 1:1 |
| 56 | Boots/shoes | Made of leather or Plastic | 25 | 1:1 |
| 57 | Sun hat | Made from straw | 25 | 1:1 |
| 58 | Bee veils | Black mesh integrated into a hat so that no bees can enter | 25 | 1:1 |
| 59 | Bee-proof | Standard | 25 | 1:1 |
| 60 | Overalls (beekeeper suit) | Made from white khaki material with a head veil attached to and that close tightly so no bee enter | 25 | 1:1 |
| 61 | Gloves | Made of soft leather material or soft latex gloves and joined with a piece of cloth | 25 | 1:1 |

**TVET-PROGRAMME TITLE: Animal Production Level- III**

**MODULE TITLE: Carrying out Camel Production**

**MODULE CODE: AGR ANP3 M04 0422**

**NOMINAL DURATION: 45 hours**

**MODULE DESCRIPTION**: This module covers the knowledge, skills and attitude required to raise camels that needs application to develop production plan, select camel for milk production, identify for reproduction requirements and undertake handling and husbandry operation of camel production activities.

**LEARNING OUTCOMES**

At the end of the module the trainee will be able to:

**LO1. Develop production plan for camel**

**LO2. Select camel for milk production**

**LO3. Identify Camel reproduction requirements**

**LO4. Undertake camel raising work**

**LO5. Handle and clean material and equipment**

**MODULE CONTENTS:**

**LO1. Develop production plan for camel**

1.1. Selecting camel types
1.2. Determining camel production system
1.3. Camel production factors & objectives
1.4. Identifying resource requirements
1.5. Identifying production risks and strategies
1.6. Determining feed requirements
1.7. Determining feeding strategies
1.8. Preparing production plan
1.9. Establishing physical and financial record keeping system

**LO2. Select camel for milk production**

2.1. Determining selection criteria
2.2. Determining culling and replacement practices
2.3. Preparing milking sheds; yard and equipment
2.4. Identifying and reporting hazards
2.5. Handling lactating camel

**LO3. Identify Camel reproduction requirements**

3.1. Identifying sign of puberty and sexual maturity
3.2. Identifying sign of rutting and behavioral change
3.3. Anatomy and physiology of camel reproductive system
3.4. Identifying type of mating system and different physiological condition of camel
3.5. Identifying breeding season
3.6. Determining body condition scores of camels
3.7. Checking camels for signs of infection
3.8. Identifying receptive females
3.9. Using mating procedures and handling techniques
3.10. Supervising field mating and undertaking intervention
3.11. Undertaking pregnancy testing
3.12. Recording mating data
3.13. Identifying abnormal, normal and difficultness of husbandry activities

**LO4. Undertake camel raising work**

4.1. Providing instructions and directions
4.2. Undertaking raising activities

**LO5. Handle and clean material and equipment**

5.1. Handling waste material
5.2. Handling and transporting materials, tools and equipment
5.3. Maintaining clean and safe work site
5.4. Returning materials to store and disposing disposable wastes
5.5. Cleaning, maintaining and storing tools and equipment
5.6. Reporting work outcomes and problems

**LEARNING METHODS:**

- Lecture and Discussion
- Demonstration
- Role playing
- Group works

**ASSESSMENT METHODS:**

- Written test with Oral questioning
- Quiz’s and assignment
- Practical demonstration

ASSESSMENT CRITERIA:

**LO1. Develop production plan for camel**

- Camel types are selected according to production requirement
- Camel Production factors & production objectives are defined.
- Resource requirements are identified
- Production risks and strategies to address them are identified.
- Feed requirements are determined for each age/sex/category and physiological condition of camel herds.
- Feeding strategies including grazing, browsing management where appropriate are determined and feeding programs are developed for each camel herd category.
- Production plan is prepared incorporating a calendar of operations for the enterprise production cycle.
- Appropriate physical and financial record keeping system is established to provide data for the analysis of Camel Production performance.

**LO2. Select camel for milk production**

- Criteria for selection are determined
- Culling and replacement practices are determined
- Milking sheds; yard and equipment are prepared for milking operations
- Existing and potential hazards are identified and reported to the supervisor according to OHS and industry requirements
- Lactating camel is handled as required to having maximum production.

**LO3. Identify Camel reproduction requirements**

- Sign of puberty and sexual maturity is identified according to physiology and age of camel.
- Sign of rutting and behavioral change and type of mating system and different physiological condition of camel are identified.
- Factors decide breeding season is identified based on the management system.
- Condition of camels selected for mating is accurately determined and body scores are recorded according to recognized industry practices.
- Camels are checked for signs of infection or other reason not to proceed with the planned mating and remedial action is taken as appropriate.
- Receptive females are identified according to industry practice.
- Mating procedures and handling techniques that minimize stress and discomfort to camels

and meet OHS and camel welfare requirements are used.

- Field mating is supervised and, when required, intervention is undertaken.
- Pregnancy testing is undertaken.
- Records of mating are recorded accurately, legibly and according to industry requirements.
- Abnormal, normal and difficultness are identified to maximize husbandry and routine activity according to industry manual.

**LO4. Undertake camel raising work**

- Instructions and directions provided by supervisor are followed and clarification is sought when necessary.
- Raising activities are undertaken in a safe and environmentally appropriate manner and according to industry guidelines

**LO5. Handle and clean material and equipment**

- Waste material produced during work is handled properly.
- Materials, tools and equipment are handled and transported according to instruction
- Clean and safe work site is maintained while working.
- Materials are returned to store or disposable materials are disposed of according to the instruction.
- Tools and equipment are cleaned, maintained and stored properly.
- Work outcomes and problems are reported to supervisor, feedback on performance is sought and any required improvements are noted for future action.

**Annex: Resource Requirements**

| AGR ANP3M040422 Carrying out Camel Production | | | | |
|---|---|---|---|---|
| **Item No.** | **Category/Item** | **Description/ Specifications** | **Quantity** | **Recommended Ratio (Item: Trainee)** |
| ***A.*** | ***Learning Materials*** | | | |
| 1. | TTLM | Prepared by the trainer | 35 | 1:1 |
| 2. | Reference Books | Ahmed Shek, and A.A. Asefa. 2005b. Reproduction, breeding and management of camels. | 7 | 1:5 |
| | | Bekele, T. and T. Kibebew. 2002. Camel production and productivity in eastern lowlands of Ethiopia | 7 | 1:5 |
| 3 | Journals/Publication/Magazines | Standard | 7 | 1:5 |
| ***B.*** | ***Facilities & Infrastructure*** | | | |
| 1. | Class room | 5*10m | 1 | 1:25 |
| 2. | Clinic/first aid provision area | 6*8m | 1 | 1:25 |
| 3. | Library | 5*7.5m | 1 | 1:25 |
| 4 | Simulation room for assessment | 3*5m | 1 | 1:25 |
| 5 | Demonstration site | 5*10m | 1 | 1:25 |
| 6 | Laboratory | 5*10m | 1 | 1:25 |
| 7 | Work shop | 9*4m | 1 | 1:25 |
| 8 | Audiovisual room | 5*10m | 1 | 1:25 |
| 9 | **ICT room** | 7*9m | 1 | 1:25 |
| 10 | Printing and photocopy service | Standard | 1 | 1:25 |
| 11 | Vehicles for cooperative/practical | Standard | 1 | 1:25 |
| 12 | White board | 1.2*1.8m | 1 | 1:25 |
| 13 | Black board | 1.2*2m | 1 | 1:25 |
| 14 | Chalk | Dubai | 1 Packet | 1:25 |
| 15 | A3 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |

| | | | | |
|---|---|---|---|---|
| 16 | A4 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 17 | Fixer with lid | HB/1.5 mm | 25 Packet | 1:1 |
| 18 | Stencils | Ball point | 10 Pcs | 1:3 |
| 19 | Toner | HP | As needed, 10 pieces | 1:3 |
| 20 | Fastener | ACCO two-piece paper fasteners | As needed, 50 pieces | 2:1 |
| 21 | UTP cable | Cat5E UTP cable | 2 boxes | 1:13 |
| 22 | Notice board | 900 mm x 600 mm Heavy duty wooden | 1 | 1:25 |
| 23 | Green board | China Magnetic Green Board | 1 | 1:25 |
| 24 | T-square | Aluminum metal type | 25 | 1:1 |
| 25 | Flip chart | Sinar Line | 1 | 1:25 |
| 26 | Graph paper | Roll | 5 | 1:5 |
| 27 | pencil | HB | 5 | 1:5 |
| 28 | Computer table | 1*2m | 13 Pcs | 1:2 |
| 29 | LCD projector | EB-2250U HDMI/USB/LAN | 1 | 1:25 |
| 30 | Laptop | Core i7, RAM 8, storag1TB | 1 | 1:25 |

| LEARNING MODULE 05 |
|---|
| **TVET-PROGRAMME TITLE: Animal Production Level III** |
| **MODULE TITLE: Conducting Sheep and Goat Production** |
| **MODULE CODE: AGR ANP3 M05 0422** |
| **NOMINAL DURATION: 50 hours** |
| **MODULE DESCRIPTION:** This module covers the knowledge, skills and attitude required to conduct sheep and goat production that required to determine sheep and goat production and productivity, perform breeding management of sheep and goat, identify feed and feeding of sheep and goats and identify sheep and goat housing and facilities. |
| **LEARNING OUTCOMES**<br>At the end of the module the trainee will be able to:<br>**LO1. Determine sheep and goat production and productivity**<br>**LO2 Perform Breeding management of sheep and goat**<br>**LO3. Identify feed and feeding of sheep and goat**<br>**LO4. Identify sheep and goat housing and facilities** |
| **MODULE CONTENTS**:<br>**LO1. Determine sheep and goat production and productivity**<br>1.1. Types of sheep and goat production systems<br>1.2. Describing productivity of sheep and goat<br>1.3. Economic importance of sheep and goat<br>1.4. Sheep and goat selection criteria<br>1.5. Analyzing sheep and goat production status<br>1.6. Performing sheep and goat culling operation<br>1.7. Identifying sheep and goat preventive health<br>**LO2. Perform Breeding management of sheep and goat**<br>2.1. Common sheep and goat breeds<br>2.2. Reproductive organ of sheep and goat<br>2.3. Identifying common reproduction index<br>2.4. Carrying out estrus inducement<br>2.5. Establishing heat detection procedures<br>2.6. Breeding methods of sheep and goat |

2.7. Applying pregnancy diagnosis techniques
2.8. Caring of sheep and goats
2.9. Sign of parturition
2.10. Assisting ewes and doe during giving birth
2.11. Caring new born lambs and kids
2.12. Preparing and implementing contingency measure
2.13. Reporting potential problems

**LO3. Identify feed and feeding of sheep and goat**

3.1. Structure and function of digestive system
3.2. Feeding behaviors of sheep and goat
3.3. Identifying feed and feed supplements source
3.4. Nutritional requirements of sheep and goat
3.5. Monitoring feeding strategies
3.6. Implementing procedures to minimize feed wastage and spoilage
3.7. Sheep and goat body condition score
3.8. Monitoring and maintaining condition and security of paddocks
3.9. Recording and reporting abnormalities of feeding

**LO4. Identify sheep and goat housing and facilities**

4.1. Selecting and preparing sheep and goat production site
4.2. Assessing and preparing sheep and goat housing and building materials
4.3. Confirming sheep and goat housing budgetary constraints
4.4. Assessing and determining facilities

**LEARNING METHODS:**

- Lecture and Discussion
- Démonstration
- Observation
- Pratical exercices
- Simulation
- Rôle playing

**ASSESSMENT METHODS:**

- Written test
- Oral questioning
- Practical demonstration
- Interview
- Move exam

**ASSESSMENT CRITERIA**:

**LO1. Determine sheep and goat production and productivity**

- Types of sheep and goat production systems are identified and managed according industry guide line
- Productivity and economic importance of sheep and goat are described
- sheep and goat selection criteria are identified and described
- Sheep and goat production status is analysis according to industry requirements.
- Sheep and goat culling operation are performed

**LO.2 Perform Breeding management of sheep and goat**

- Common sheep and goat breeds are identified
- Reproductive organ of sheep and goat are recognize
- Common Reproduction index are identified
- Estrus inducement and detection procedures are carried out according to established industry practice.
- Breeding methods of sheep and goat are carried out
- Pregnancy diagnosis techniques are applied at earliest opportunities to identify suitable action and condition of animals.

- Sign of parturition is identified and reported potential problems to supervisor or Animal health practitioner
- Ewes and Doe are prepared and assisted during giving birth
- new born lamps and kids are cared according to industry operation standards
- Contingency measures are prepared and implemented as required

**LO3 Identify feed and feeding of sheep and goat**

- Normal Feeding behaviors and Digestive systems of sheep and goat are identified and aligned
- Feed and feed supplements source are identified and confirmed against the industry feeding plan and local condition
- Nutritional requirements of sheep and goat are identified and confirmed
- Feeding strategies are monitored and abnormalities are recorded and reported
- Procedures to minimize feed wastage and spoilage are implemented in line with industry requirements.
- Sheep and goat body condition score are assessed and determined
- Condition and security of paddocks are monitored and maintained in line with industry requirements.

**LO4. Identify sheep and goat housing and facilities**

- Appropriate site is selected according to sheep and goat production site selection criteria.
- Sheep and goat production site is prepared.
- Requirements for sheep and goat housing is assessed and clarified according to industry objectives
- Sheep and goat house building materials are assessed and prepared in relation to the industry requirements
- Sheep and goat housing is confirmed within industry budgetary constraints
- Facilities are assessed and determined according to industry objectives

**Annex: Resource Requirements**

| AGR ANP3 M05 0422 Conducting Sheep and Goat Production | | | | |
|---|---|---|---|---|
| **Item No.** | **Category/Item** | **Description/ Specifications** | **Quantity** | **Recommended Ratio (Item: Trainee)** |
| ***A.*** | ***Learning Materials*** | | | |
| 1. | TTLM | Prepared by the trainer | 25 | 1:1 |
| 2 | Reference Books | Sheep and Goat Production Handbook for Ethiopia,(2008) Edited by Alemu Yami and R.C. Merkel. | 5 | 1:5 |
| | | Scientific Farm Animal Production: An Introduction to Animal Science, 10th Edition, Ro,bert W. Taylor and Thomas G.,2012. | 5 | 1:5 |
| 3 | Journals/Publication/Magazines | | 7 | 1:5 |
| ***B.*** | **Learning Facilities & Infrastructure** | | | |
| 35. | Class room | 5*10m | 1 | 1:25 |
| 36. | Clinic/first aid provision area | 6*8m | 1 | 1:25 |
| 37. | Library | 5*7.5m | 1 | 1:25 |
| 38. | Simulation room for assessment | 3*5m | 1 | 1:25 |
| 39. | Demonstration site | 5*10m | 1 | 1:25 |
| 40. | Laboratory | 5*10m | 1 | 1:25 |
| 41. | Work shop | 9*4m | 1 | 1:25 |
| 42. | Audiovisual room | 5*10m | 1 | 1:25 |
| 43. | **ICT room** | 7*9m | 1 | 1:25 |
| | | Permanent | 1 packet | 1:25 |
| 44. | Printing and photocopy | Standard | 1 | 1:25 |

| | | | | |
|---|---|---|---|---|
| | service | | | |
| 45. | Vehicles for cooperative/practical training | Standard | 1 | 1:25 |
| 46. | White board | 1.2*1.8m | 1 | 1:25 |
| 47. | Black board | 1.2*2m | 1 | 1:25 |
| 48. | Chalk | Dubai | 1 Packet | 1:25 |
| 49. | Marker | Permanent and non permanent | 2 Packet | 1:13 |
| 50. | A3 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 51. | A4 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 52. | Fixer with lid | HB/1.5 mm | 25 Packet | 1:1 |
| 53. | Stencils | Ball point | 10 Pcs | 1:3 |
| 54. | Toner | HP | As needed, 10 pieces | 1:3 |
| 55. | Fastener | ACCO two-piece paper fasteners | As needed, 50 pieces | 2:1 |
| 56. | UTP cable | Cat5E UTP cable | 2 boxes | 1:13 |
| 57. | Notice board | 900 mm x 600 mm Heavy duty wooden | 1 | 1:25 |
| 58. | Green board | China Magnetic Green Board | 1 | 1:25 |
| 59. | T-square | Aluminum metal type | 25 | 1:1 |
| 60. | Flip chart | Sinar Line | 1 | 1:25 |
| 61. | Graph paper | Roll | 5 | 1:5 |
| 62. | pencil | HB | 5 | 1:5 |
| 63. | Drawings with specifications | Any suitable drawing | 5 | 1:5 |
| 64. | Ruler | Mica 30 cm | 25 | 1:1 |
| 65. | Eraser | Standard | 1 | 1:25 |
| 66. | Duster | Wooden made | 1 | 1:25 |
| 67. | Computer | Desktop | 25 Pcs | 1:1 |
| 68. | Computer table | 1*2m | 13 Pcs | 1:2 |
| 69. | LCD projector | EB-2250U HDMI/USB/LAN | 1 | 1:25 |

| | | | | |
|---|---|---|---|---|
| 70. | Laptop | Core i7, RAM 8, storag1TB | 1 | 1:25 |
| 71. | Computer | Desktop | 25 Pcs | 1:1 |
| 72. | Diagram | Diagram show anatomy and physiology of sheep and goat | 2 | 1:13 |
| 73. | Foot baths | 5*1m | 1 | 1:25 |
| 74. | Crush | 10*10m | 1 | 1:25 |
| 75. | Dipping bath | 1*2m | 1 | 1:25 |
| 76. | Isolation pen | Standard | 1 | 1:25 |
| 77. | Quarantine | Standard | | |
| 78. | Exercising yard | 20*20 | 1 | 1:25 |
| 79. | Ewe | Life | 5 | 1:5 |
| 80. | Doe | Life | 5 | 1:5 |
| 81. | Ram | Life | 5 | 1:5 |
| 82. | buck | Life | 5 | 1:5 |
| 83. | Lambing | Life | 5 | 1:5 |
| 84. | kidding | Life | 5 | 1:5 |
| 85. | Shearing room | | 1 | 1:25 |
| 86. | Accommodation Area | | 1 | 1:25 |
| 87. | Ventilator | Standard | 2 | 1:13 |
| 88. | Fences | Made of mesh wire | | |
| 89. | Milking house | 4*6m | 1 | 1:25 |
| 90. | Slaughter house (abattoir) | Standard | 1 | 1:25 |
| 91. | Store | Standard | 1 | 1:25 |
| 92. | Dirt pit | Concrete 4*6 m | 1 | 1:25 |
| 93. | Dirt bin | Concert | 1 | 1:25 |
| 94. | Pit to burn left over | | 2 | 1:13 |
| 95. | Handling pens | 15*15m | 1 | 1:25 |
| 96. | Dipping vats | 1.5*2m | 1 | 1:25 |
| 97. | Spraying area | 3*4m | 1 | 1:25 |
| 98. | Manure disposal pit | 6*4m | 1 | 1:25 |
| 99. | Feeding trough | Standard | 1 | 1:25 |
| 100. | Watering trough | Standard | 1 | 1:25 |

| | | | | |
|---|---|---|---|---|
| 101. | Hay racks | Standard | 5 | 1:5 |
| ***C.*** | ***Consumable Materials*** | | | |
| 1. | Lubricant (Savlon) | 1.0%–1.5% Glutaraldehyde concentration | 1L | 1:25 |
| 2. | Litmus paper | Standard | 1 Pack | 1:25 |
| 3. | Towel | Cotton | 25 Pieces | 1:1 |
| 4. | Soap | | 4 piece | 1:7 |
| 5. | MO | Arial | 2 pack | 1:13 |
| 6. | Liquid soap | Largo | 2L | 1:13 |
| 7. | Formalin | 100% **formalin** | 2L | 1:13 |
| 8. | Alcohol | 96% | 2L | 1:13 |
| 9. | Diesoline | | 5L | 1:5 |
| 10. | Anthelmintics | selectively toxic to the parasite and not the host | 1 pack | 1:25 |
| 11. | Acaricides | chemicals used to kill ticks and mites | 1L | 1:25 |
| 12. | Anticeptics | chemicals for cleaning the skin and wounds | 1L | 1:25 |
| 13. | Vaccines | Protecting life animal against harmful diseases | | |
| 14. | Disposable gloves | Standard | 25 | 1:1 |
| 15. | Pasture | Grass and legume | 5 kg | |
| 16. | Cultivated fodder crops | Protein sourced | 5 kg | 1:5 |
| 17. | Tree leaves | Protein sourced | 5 kg | 1:5 |
| 18. | Root crops | Energy sourced | 5 kg | 1:5 |
| 19. | Silage | Energy sourced | 5 kg | 1:5 |
| 20. | Grains and seeds | Energy sourced | 5 kg | 1:5 |
| 21. | Mill by-products | Energy sourced | 5 kg | 1:5 |
| 22. | Root crops | | 5 kg | 1:5 |
| 23. | Oilseed cakes | Protein sourced | 5 kg | 1:5 |
| 24. | Brewer’s grain | Protein sourced | 5 kg | 1:5 |
| 25. | Feed supplement | Vitamins supplement | 1kg | 1:5 |

| | | | | |
|---|---|---|---|---|
| | | Mineral supplement | 1kg | 1:5 |
| ***D.*** | ***Tools and Equipments*** | | | |
| 1 | Tractor | | 1 | 1:25 |
| 4 | Motorbike/motorcycle | Standard | 1 | 1:25 |
| 5 | Weighing scale | Mechanical (50kg) | 5 | 1:5 |
| | | Digital (50kg) | 5 | 1:5 |
| 6 | Tattoo pliers | Standard | 5 | 1:5 |
| 8 | Hooves Trimmer | Standard | 5 | 1:5 |
| 9 | Dehorning saw | Standard | 5 | 1:5 |
| 10 | Dehorning wire | Standard | 1 roll | 1:25 |
| 11 | Burdizo | Stainless steel | 5 | 1:5 |
| 12 | Elastrator | Made of premium latex for excellent retention | 5 | 1:5 |
| 13 | Rubber rings | Made of solid **rubber** | 7 | 1:4 |
| 14 | Knife | Stainless Steel | 10 | 1:3 |
| 15 | Ear tags | Plastic made | 25 pieces | 1:25 |
| 16 | Ear tag applicator | Standard | 5 | 1:5 |
| 17 | Shovel | Standard | 7 | 7:35 |
| 18 | Wheel barrow | Standard | 2 | 1:13 |
| 19 | Mineral boxes | Standard | 5 | 1:5 |
| 20 | Spade | Stainless Steel | 7 | 1:3 |
| 21 | Fork | Stainless Steel | 7 | 1:3 |
| 22 | Hoe | Stainless Steel | 6 | 1:4 |
| 23 | Thermometer | Digital thermometers | 1 | 1:25 |
| | | Mercury thermometers. | 1 | 1:25 |
| 24 | Lactometer | Standard | 5 | 1:25 |
| 25 | Heart girth | Standard | 5 | 1:5 |
| 26 | Meter (measuring tape) | Standard | 2 | 1:13 |
| 27 | Hand shears | Standard | 5 | 1:5 |
| 28 | Machine shearing, | Standard | 5 | 1:5 |
| 29 | Drench guns | Standard | 4 | 1:7 |

| | | | | |
|---|---|---|---|---|
| 30 | Vaccinating guns | Standard | 5 | 1:5 |
| 31 | Syringe | Standard | 25 | 1:1 |
| 32 | Rake | Standard | 4 | 1:7 |
| 33 | Axe | Standard | 5 | 1:5 |
| E | PPE | | | |
| 1 | Boots/shoes | Plastic made | 25 | 1:1 |
| 2 | Overalls | Made from canvas or kaki cloth | 25 | 1:1 |
| 3 | Gloves | Made from Synthetic rubber | 25 | 1:1 |
| 6 | Sun hat | From straw | 25 | 1:1 |
| 7 | Safety goggles | Made from glasses | 25 | 1:1 |
| 8 | Face mask | Made with non-woven fabric, better bacteria filtration and air permeability | 25 | 1:1 |
| 9 | Ear protectors | Made from a hard thermoplastic or metal | 25 | 1:1 |
| 10 | Boots/shoes | Plastic made | 25 | 1:1 |
| 11 | Overalls | Made from canvas or kaki cloth | 25 | 1:1 |
| 12 | Gloves | Made from Synthetic rubber | 25 | 1:1 |

| LEARNING MODULE 06 |
|---|
| **TVET-PROGRAMME TITLE: Animal Production Level III** |
| **MODULE TITLE: Carrying out Aquaculture and Fishery Production** |
| **MODULE CODE: AGR ANP3 M06 0422** |
| **NOMINAL DURATION: 35 hours** |
| **MODULE DESCRIPTION**: This module covers the knowledge, skills and attitude required to perform aquaculture and fishery production that required Identify body parts of fish, prepare facilities and undertake fish stock selection and handling, under take management and monitoring water quality, practices feed and feeding of fish, undertake harvesting and handling of fish stocks and control and prevent common disease and parasite of fish. |
| **LEARNING OUTCOMES**<br>At the end of the module the trainee will be able to:<br>**LO1. Identify body parts of fish**<br>**LO2. Prepare facilities and Undertake fish stock selection and handling**<br>**LO3. Under take management and monitoring water quality**<br>**LO4. Practices Feed and feeding of fish**<br>**LO5. Undertake Harvesting and Handling of Fish Stocks**<br>**LO6. Control and prevent common disease and parasite of fish** |

**MODULE CONTENTS:**

**LO1. Identify body parts of fish**

1.1. Recognizing fish body location, structure and function

1.2. Practicing fish dissection

1.3. Identifying fish sex

**LO2. Prepare facilities and undertake fish stock selection and handling**

2.1. Arranging labor resource requirements

2.2. Selecting and checking suitable material, tools and equipment

2.3. Preparing ponds, pens, cages and tanks

2.4. Identifying fish species

2.5. Fish stock selection criteria

2.6. Fish stock handling activity

2.7. Kinds of fish culture systems

2.8. Identifying factors affecting health of fish stock

2.9. Making plans to minimize risk and disease problem

**LO3. Under take management and monitoring water quality**

3.1. Identifying advanced water quality management

3.2. Identifying routine water quality and environmental parameters

3.3. Making repairs and calibrations

3.4. Planning operational guidelines

3.5. Communicating effectively to staff

**LO4. Practices Feed and feeding of fish**

4.1. Fish species feeding habits

4.2. Assessing fish feed sources

4.3. Fish species nutritional requirements

4.4. Selecting feeds

4.5. Sampling feeds

4.6. Analyzing feeds

4.7. Computing feeds

4.8. Recording feeds

4.9. Feeding rate

4.10. Feeding methods of fish

4.11. Feeding principles of fish

**LO5. Undertake harvesting and handling of fish stocks**

5.1. Marking infected pond

5.2. Determining fish harvesting and handling methods

5.3. Seining Pond and cages

5.4. Determining fish processing methods

5.5. Fish processing waste management

**LO6. Control and prevent common disease and parasite of fish**

6.1. Common fish diseases and parasite

6.2. Common fish diseases symptoms

6.3. Disease prevention and control measures

6.4. Isolating and disinfecting infected tools and equipment

6.5. Collecting data or record sheets/books

6.6. Reporting the outbreak

| **LEARNING METHODS:** |
|---|
| • Lecture and Discussion<br>• Demonstration<br>• Simulation<br>• Role playing |
| **ASSESSMENT METHODS:** |
| • Written test<br>• Oral questioning<br>• Practical demonstration<br>• Interview<br>• Observation |

**ASSESSMENT CRITERIA:**

**LO.1 Identify body parts of fish**

- Fish body location, structure and function are recognized.
- Fish dissection is practiced.
- Fish sex is identified.

**LO.2 Prepare facilities and Undertake fish stock selection and handling**

- Labor and resource requirements for fish stock handling activity are confirmed with senior personnel and arranged.
- Suitable material, tools and equipment are selected and checked prior to use.
- Ponds, pens, cages and tanks are prepared.
- Stock selection criteria are undertaken according to stock culture and production plans.
- Kinds of culture systems are determined based on stocking density, level of input and management
- Factors which could place the health of stock at risk during handling are identified and plans are made to minimize risk and disease problem.

**LO.3 Under take management and monitoring water quality**

- Advanced water quality management, routine water quality and environmental parameters to be measured are identified.
- Repairs and calibrations are made in accordance with industry procedures and manufacturer's instructions
- Operational guidelines to achieve desired handling objectives are planned and communicated effectively to staff.

**LO.4 Practices Feed and feeding of fish**

- Fish species feeding habits are determined
- Fish feed sources are assessed.
- Fish species nutritional requirements are identified
- Feeds are selected, sampled, analyzed, computed and recorded based on daily feed ration
- Fish are fed based on appropriate feeding methods and Principles of feeding

**LO.5 Undertake Harvesting and Handling of Fish Stocks**

- Pond and cages are seined.
- Cages are lifted.
- Fish harvesting and processing methods are determined
- The infected pond is marked and protected from being harvested

**LO.6 Control and prevent common disease and parasite of fish**

- Common fish diseases are identified and their symptoms are recognized.
- Disease prevention and control measures relevant to fish production are recognized and infected tools and equipment are isolated and disinfected.
- The outbreak is reported for further assistance
- Data or record sheets/books are collected for use.

**Annex: Resource Requirements**

| AGR ANP3 M06 0322 Carrying out Aquaculture and Fishery Production | | | | |
|---|---|---|---|---|
| **Item No.** | **Category/Item** | **Description/ Specifications** | **Quantity** | **Recommended Ratio (Item: Trainee)** |
| ***A.*** | ***Learning Materials*** | | | |
| 1. | TTLM | Prepared by the trainer | 25 | 1:1 |
| 2. | Reference Books | Agyakwah, S.K., R. Asmah, E.T.D. Mensah, C. Ragasa, S. Amewu, N. Tran, M. Oyih and P. Ziddah (2020). Farmers' manual on small-scale tilapia cage farming in Ghana. ISBN: 9964-85-286-X. CSIR-Water Research Institute, CSIR/WRI/MA/SKA/2020/1. Accra, Ghana. 28 pp. | 5 | 1:5 |
| | | Small-scale freshwater fish Farming, Second edition: 2004, Assiah van Eer, Ton van Schie, Aldin Hilbrands | 5 | 1:5 |
| | | Agyakwah, S.K., R. Asmah, E.T.D. Mensah, C. Ragasa, S. Amewu, N. Tran, M. Oyih and P. Ziddah (2020). Farmers' | 5 | 1:5 |

| | | | | |
|---|---|---|---|---|
| | | manual on small-scale tilapia pond farming in Ghana. ISBN: 9964-85-191-X. CSIR-Water Research Institute, CSIR/WRI/MA/SKA/2020/2. Accra, Ghana. 37 pp. | | |
| 3. | Journals/Publication/Magazines | Water quality guidelines for the management of pond fish culture, international journal of environmental sciences volume 3, no 6, 2013. | 5 | 1:5 |
| ***B.*** | ***Learning Facilities & Infrastructure*** | | | |
| 1. | Class room | 5*10m | 1 | 1:25 |
| 2. | Clinic/first aid provision area | 6*8m | 1 | 1:25 |
| 3. | Library | 5*7.5m | 1 | 1:25 |
| 4. | Simulation room for assessment | 3*5m | 1 | 1:25 |
| 5. | Demonstration site | 5*10m | 1 | 1:25 |
| 6. | Laboratory | 5*10m | 1 | 1:25 |
| 7. | Work shop | 9*4m | 1 | 1:25 |
| 8. | Audiovisual room | 5*10m | 1 | 1:25 |
| 9. | **ICT room** | 7*9m | 1 | 1:25 |
| 10. | Printing and photocopy service | Standard | 1 | 1:25 |
| 11. | Vehicles for cooperative/practical training | Standard | 1 | 1:25 |
| 12. | White board | 1.2*1.8m | 1 | 1:25 |
| 13. | Black board | 1.2*2m | 1 | 1:25 |
| 14. | Chalk | Dubai | 1 Packet | 1:25 |
| 15. | Marker | Permanent and non permanent | 2 Packet | 1:13 |

| | | | | |
|---|---|---|---|---|
| 16. | A3 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 17. | A4 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 18. | Fixer with lid | HB/1.5 mm | 25 Packet | 1:1 |
| 19. | Stencils | Ball point | 10 Pcs | 1:3 |
| 20. | Toner | HP | As needed, 10 pieces | 1:3 |
| 21. | Fastener | ACCO two-piece paper fasteners | As needed, 50 pieces | 2:1 |
| 22. | UTP cable | Cat5E UTP cable | 2 boxes | 1:13 |
| 23. | Notice board | 900 mm x 600 mm Heavy duty wooden | 1 | 1:25 |
| 24. | Green board | China Magnetic Green Board | 1 | 1:25 |
| 25. | T-square | Aluminum metal type | 25 | 1:1 |
| 26. | Flip chart | Sinar Line | 1 | 1:25 |
| 27. | Graph paper | Roll | 5 | 1:5 |
| 28. | pencil | HB | 5 | 1:5 |
| 29. | Drawings with specifications | Any suitable drawing | 5 | 1:5 |
| 30. | Ruler | Mica 30 cm | 25 | 1:1 |
| 31. | Eraser | Standard | 1 | 1:25 |
| 32. | Duster | Wooden made | 1 | 1:25 |
| 33. | Computer | Desktop | 25 Pcs | 1:1 |
| 34. | Computer table | 1*2m | 13 Pcs | 1:2 |
| 35. | LCD projector | EB-2250U HDMI/USB/LAN | 1 | 1:25 |
| 36. | Laptop | Core i7, RAM 8, storag1TB | 1 | 1:25 |
| 37. | Diagram | Diagram show anatomy and physiology of fish | 2 | 1:13 |
| 38. | Processing room | Standard | 1 | 1:25 |
| 39. | Spawning ponds | ½ to 1 inch **diameter**, 4 to 6 inches deep | 1 | 1:25 |
| 40. | Brood ponds | **Pond** having 100m X 15m | 1 | 1:25 |

| | | | | |
|---|---|---|---|---|
| | | X 2m size | | |
| 41. | Nursery ponds | 1.0 to 1.5 metre of water depth | 1 | 1:25 |
| 42. | Storage ponds | Standard | 1 | 1:25 |
| 43. | Fattening ponds | Standard | 1 | 1:25 |
| 44. | Sediment pond | Standard | 1 | 1:25 |
| ***C.*** | ***Consumable Materials*** | | | |
| 1. | Litmus paper | | 1 pack | 1:25 |
| 2. | Potassium permanganate | Content >97% | 100g | |
| 3. | Salt | Iodized **salt** | 1kg | |
| 4. | Organic fertilizer | Compost | 5 ton | 1:5 |
| 5. | DAP | NP 18:46 | 50kg | 1:2 |
| 6. | UREA | Urea 46% | 50kg | 1:2 |
| 7. | Soap | standard | 25 piece | 1:1 |
| 8. | Powder detergent | standard | 25 pack | 1:1 |
| 9. | Liquid soap | Largo | 5L | 1:5 |
| 10. | Disposable gloves | Standard | 25 | 1:1 |
| 11. | Fresh feed | Standard | 50kg | 2:1 |
| 12. | Mixed feed | Standard | 50kg | 2:1 |
| 13. | Pellet | Standard | 50kg | 2:1 |
| ***D.*** | ***Tools and Equipments*** | | | |
| 1. | Polyethylene bag | Capacity 50kg | 1 | 1:25 |
| 2. | Fry | Life | 75 | 2:1 |
| 3. | Fingerlings | Life | 50 | 2:1 |
| 4. | Juveniles | Life | 50 | 2:1 |
| 5. | Adult male | Life | 1 | 1:25 |
| 6. | Adult female | Life | 1 | 1:25 |
| 7. | Gill net | Standard | 1 | 1:25 |
| 8. | Seine net | Standard | 1 | 1:25 |
| 9. | Scoop net | Standard | 1 | 1:25 |
| 10. | Fishing hooks | Standard | 1 | 1:25 |

| | | | | |
|---|---|---|---|---|
| 11. | Cast net | Standard | 1 | 1:25 |
| 12. | Ice box | Standard | 3 | 1:9 |
| 13. | Refrigerator | Standard | 2 | 1:13 |
| 14. | Measuring board | Standard | | |
| 15. | Various needles | Standard | 10 | 1:3 |
| 16. | Knives | Made of Stainless steel | 5 | 1:5 |
| 17. | Thermometer | Digital thermometers | 5 | 1:5 |
| | | Mercury thermometers | | |
| 18. | pH meter | Standard | 5 | |
| 19. | Dissolved oxygen meter | Standard | 5 | |
| 20. | Conductivity meter | Standard | 3 | 1:10 |
| 21. | Secchi desk | Standard | 7 | 1:5 |
| 22. | Ammonia Test Kits | Standard | 5 | 1:5 |
| 23. | Nitrate Test Kits | Standard | 5 | 1:5 |
| 24. | Plankton nets | Standard | 10 | 1:3 |
| 25. | Benthic sampler | Standard | 10 | 1:3 |
| 26. | Weighing balance | Electro scale | 1 | 1:25 |
| | | Mechanical scale | 1 | 1:25 |
| 27. | Fish Grader | Simple fish grader | 5 | 1:5 |
| 28. | Fish Sorter | Simple fish sorter | 5 | 1:5 |
| 29. | Water | | | |
| 30. | Buckets | Standard | 5 | 1:5 |
| 31. | Bowls | Standard | 5 | 1:5 |
| 32. | Oxygenated cylinder and accessories | Standard | 1 | 1:25 |
| 33. | Record book | Standard | 5 | 1:5 |
| 34. | Trucks | | | |
| 35. | Microscope | | | |
| 36. | Motorized boat | | | |
| **E** | **PPE** | | | |
| 1 | Boots/shoes | Plastic made | 25 | 1:25 |
| 2 | Overalls | Made from plastic or kaki | 25 | 1:25 |

| | | | | |
|---|---|---|---|---|
| | | cloth | | |
| 3 | Disposable Glove | Made from Synthetic rubber | 25 | 1:25 |
| 4 | Sun hat | Made from straw | 25 | 1:25 |
| 5 | Safety goggles | Made from glasses | 25 | 1:25 |
| 6 | Face mask | Made with non-woven fabric, better bacteria filtration and air permeability | 25 | 1:25 |
| 11 | Raincoat | Standard | 25 | 1:1 |
| 13 | Waders | Standard | 25 | |
| 10 | Life saver jacket | Standard | 25 | |

| LEARNING MODULE 07 |
|---|
| **TVET-PROGRAMME TITLE: Animal Production Level III** |
| **MODULE TITLE: Performing Poultry Production** |
| **MODULE CODE: AGR ANP3 M 07 0422** |
| **NOMINAL DURATION: 50 hours** |
| **MODULE DESCRIPTION**: This module covers the knowledge, skills and attitude required to perform poultry production that required in identify poultry production systems and their requirements, identify and select poultry breed and breeding, plan poultry house construction and facilities, feed and manage different classes of poultry and prevent and control common poultry diseases. |
| **LEARNING OUTCOMES**<br>At the end of the module the trainee will be able to:<br>**LO1. Identify poultry production systems and their requirements**<br>**LO2. Identify and select poultry breed and breeding**<br>**LO3. Plan poultry house construction and facilities**<br>**LO4. Feed and Manage different classes of poultry**<br>**LO5. Prevent and control common poultry diseases** |

**MODULE CONTENTS:**

**LO1. Identify poultry production systems and their requirements**

1.1. Preparing poultry Production plan

1.2. Poultry production systems

1.3. Poultry production requirements

**LO2. Identify and select poultry breed and breeding**

2.1. Characterizing common poultry breeds

2.2. Breeds selection criteria

2.3. Poultry mating methods

**LO3. Plan poultry house construction and facilities**

3.1. Site Selection

3.2. Planning farm lay out and chickens' houses

3.3. Determining types of poultry house

3.4. Requirements for poultry house construction

3.5. Selecting and constructing farm design

3.6. Identifying and deciding facilities

LO4. **Feed and manage different classes of poultry**

4.1. Structure and function of the digestion systems

4.2. Types and sources of poultry feeds

4.3. Carrying out routine poultry management activities

4.4. Ration formulation for classes of chicken

4.5. Chicken feeding and watering systems

4.6. Coordinating and monitoring on farm activities

**LO5. Prevent and control common poultry diseases**

5.1 Common poultry diseases

5.2 Determining and following routine vaccination program

5.3 Determining poultry farm bio-security activities

**LEARNING METHODS:**

- Lecture and Discussion
- Demonstration
- Simulation
- Role playing

**ASSESSMENT METHODS:**

- Written test
- Oral questioning
- Practical demonstration
- Interview
- Observation

**ASSESSMENT CRITERIA:**

**LO.1 Identify poultry production systems and their requirements**

- Poultry production systems are identified and characterized to meet production plan
- Requirements in each production Systems are identified
- Suitable and feasible production system that is helpful to achieve pre-determined farm objective and in line with environmental legislations is recommended.

**LO.2 Identify and select poultry breed and breeding**

- Common poultry breeds are identified and characterized.
- Appropriate breeds Criteria for selection are decided based on the pre-determined farm objectives and standard
- Poultry mating methods are identified

**LO.3 Plan poultry house construction and facilities**

- Appropriate site is selected for poultry house establishment according to industry requirements
- Types of poultry house are identified and determined.
- Requirements for poultry house construction are identified according to industry requirements
- Space required for different poultry classes is determined according to industry requirements

- Farm lay out and chickens' houses are planned according to farm objectives and standards
- Farm design are selected and constructed according to industry requirements
- Facilities are identified and ways to obtain them are decided according to industry requirements

**LO.4 Feed and Manage different classes of poultry**

- Digestion systems structure and function of poultry are identified and compared to the other livestock
- Types and sources of poultry feeds are recognized
- Routine poultry management activities are identified, recognized and carried out according to industry standards.

- Ration formulation for different classes of poultry are prepared
- Prepare and provide feed and water timely according to industry standards
- Chicken feeding systems are determined

**LO5. Prevent and control common poultry diseases**

- Common poultry diseases are identified according to the symptoms
- Routine vaccination program are determined and followed for common poultry diseases according to the guideline Farm Bio-security activities are determined according to the standard

**Annex: Resource Requirements**

| AGR ANP3 M07 0422 Performing Poultry Production | | | | |
|---|---|---|---|---|
| **Item No.** | **Category/Item** | **Description/ Specifications** | **Quantity** | **Recommended Ratio (Item: Trainee)** |
| ***A.*** | ***Learning Materials*** | | | |
| 1. | TTLM | Prepared by the trainer | 25 | 1:1 |
| 2. | Reference Books | Modern Livestock and Poultry Production on, 8th Edition, 2010. | 5 | 1:5 |
| | | Habte, T., Amare, A., Bettridge, J., Collins, M., Christley, R. and Wigley, P. 2017. Guide to chicken health and management in Ethiopia. ILRI Manual 25. Nairobi, Kenya: International Livestock Research Institute (ILRI). | 5 | 1:5 |
| | | Scientific Farm Animal Production: An Introduction to Animal Science, 10th Edition, Ro,bert W. Taylor and Thomas G.,2012. | 5 | 1:5 |
| | | Shri Sanjay Bhoosreddy, Joint Secretary, National Livestock Mission, Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture and Farmers Welfare, Government of India, 2014-15. | 5 | 1:5 |
| | | Training manual on backyard poultry production, Under Triba sub plan (TSP) for livelihood improvement of Tribal society, 2017. | 5 | 1:5 |
| | | The role of poultry in human nutrition, FAO 2013. | 5 | 1:5 |

| | | | | |
|---|---|---|---|---|
| 4. | Journals/Publication/Magazines | | | |
| ***B.*** | **Learning Facilities & Infrastructure** | | | |
| 1. | Class room | 5*10m | 1 | 1:25 |
| 2. | Clinic/first aid provision area | 6*8m | 1 | 1:25 |
| 3. | Library | 5*7.5m | 1 | 1:25 |
| 4. | Simulation room for assessment | 3*5m | 1 | 1:25 |
| 5. | Demonstration site | 5*10m | 1 | 1:25 |
| 6. | Laboratory | 5*10m | 1 | 1:25 |
| 7. | Work shop | 9*4m | 1 | 1:25 |
| 8. | Audiovisual room | 5*10m | 1 | 1:25 |
| 9. | **ICT room** | 7*9m | 1 | 1:25 |
| 10. | Printing and photocopy service | Standard | 1 | 1:25 |
| 11. | Vehicles for cooperative/practical training | Standard | 1 | 1:25 |
| 12. | White board | 1.2*1.8m | 1 | 1:25 |
| 13. | Black board | 1.2*2m | 1 | 1:25 |
| 14. | Chalk | Dubai | 1 Packet | 1:25 |
| 15. | Marker | Permanent and non permanent | 2 Packet | 1:13 |
| 16. | A3 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 17. | A4 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 18. | Fixer with lid | HB/1.5 mm | 25 Packet | 1:1 |
| 19. | Stencils | Ball point | 10 Pcs | 1:3 |
| 20. | Toner | HP | As needed, 10 pieces | 1:3 |

| | | | | |
|---|---|---|---|---|
| 21. | Fastener | ACCO two-piece paper fasteners | As needed, 50 pieces | 2:1 |
| 22. | UTP cable | Cat5E UTP cable | 2 boxes | 1:13 |
| 24. | Notice board | 900 mm x 600 mm Heavy duty wooden | 1 | 1:25 |
| 25. | Green board | China Magnetic Green Board | 1 | 1:25 |
| 26. | T-square | Aluminum metal type | 25 | 1:1 |
| 27. | Flip chart | Sinar Line | 1 | 1:25 |
| 28. | Graph paper | Roll | 5 | 1:5 |
| 29. | pencil | HB | 5 | 1:5 |
| 30. | Drawings with specifications | Any suitable drawing | 5 | 1:5 |
| 31. | Ruler | Mica 30 cm | 25 | 1:1 |
| 32. | Eraser | Standard | 1 | 1:25 |
| 33. | Duster | Wooden made | 1 | 1:25 |
| 34. | Computer | Desktop | 25 Pcs | 1:1 |
| 35. | Computer table | 1*2m | 13 Pcs | 1:2 |
| 36. | LCD projector | EB-2250U HDMI/USB/LAN | 1 | 1:25 |
| 37. | Laptop | Core i7, RAM 8, storag1TB | 1 | 1:25 |
| 38. | UTP cable | Cat5E UTP cable | 2 boxes | 1:13 |
| 40. | Brooder / chick house | Standard | 1 | 1:25 |
| 41. | Grower house | Standard | 1 | 1:25 |
| 42. | Broiler house | Standard | 1 | 1:25 |
| 43. | Layer house | Standard | 1 | 1:25 |
| 44. | Breeder house | Standard | 1 | 1:25 |
| 45. | Lightening | Standard | | |
| 46. | Ventilation | Standard | 2 | 1:13 |
| 47. | Isolation house | 4*6m | 1 | 1:25 |
| 48. | Quarantine house | 6*7m | 1 | 1:25 |
| 48. | Diagram | Diagram show anatomy and | 2 | 1:13 |

| | | | | |
|---|---|---|---|---|
| | | physiology of poultry | | |
| 49. | Foot baths | 1*1m | 1 | 1:25 |
| 50. | Store | | 1 | 1:25 |
| 51. | Dirt pit | Concrete 4*6 m | 1 | 1:25 |
| 52. | Dirt bin | Concert | 1 | 1:25 |
| 53. | Pit to burn left over | | 2 | 1:13 |
| 54. | Manure disposal pit | 6*4m | 1 | 1:25 |
| 55. | Floor space | Chicken size | | |
| | | Adult chicken size | | |
| 56 | House orientation | East to West direction | | |
| ***C.*** | ***Consumable Materials*** | | | |
| 1. | Detergents Soap | | 10 piece | 1:3 |
| 2 | Powder detergent | 1 sachet with 1 kg | 5 | 1:5 |
| 3. | Liquid soap | | 5L | 1:5 |
| 4. | Permanganate | Content >97% | 5kg | 1:5 |
| 5. | Hydrogen peroxide | 70% concentration | 5L | 1:5 |
| **6.** | Alcohol | 80-96% concentration | 5L | 1:5 |
| 7. | Formalin | 40% concentration | 5L | 1:5 |
| 8. | DDT | 1% concentration | 5kg | 1:5 |
| 9. | Permanganate | Content >97% | 5kg | 1:5 |
| 10. | Hydrogen peroxide | 70% concentration | 5L | 1:5 |
| 11. | Vitamin K | Minimum 5.00% **vitamin K1**. | 1kg | 1:25 |
| ***D.*** | ***Tools and Equipments*** | | | |
| 1. | Feeding trough | Chicken sized | 5 | 1:5 |
| | | Adult chicken sized | 5 | 1:5 |

| | | | | |
|---|---|---|---|---|
| 2. | Watering trough | Chicken sized | 5 | 1:5 |
| | | Adult chicken sized | 5 | 1:5 |
| 3. | Weighing scale | Mechanical (50kg) | 5 | 1:5 |
| | | Digital (50kg) | 5 | 1:5 |
| 4. | Roosts | Adult chicken size | 5 | 1:5 |
| | Nests | Adult layer size | 5 | 1:5 |
| 5. | Thermometer | Digital thermometers | 5 | |
| | | Mercury thermometers | 5 | 1:5 |
| 6. | Hygrometer | Manual hygrometers | 5 | 1:5 |
| | | Electrical hygrometers | 5 | |
| 7. | Heater | standard | | |
| | Cooler | standard | | |
| 8. | Litter | Old paper | 10kg | 1:3 |
| 9. | | Saw dust | 50kg | 2:1 |
| 10. | | Straw | 50kg | 2:1 |
| 11. | | Rice hulls | 50kg | 2:1 |
| 12. | | Coffee pulp | 50kg | 2:1 |
| 13. | Debeaker | Manual debeaker | 2 | 1:13 |
| | | Electric debeaker | 1 | 1:25 |
| 14. | Knapsacks sprayer | 15L sized | 5 | 1:5 |
| 15. | Egg grader | | 1 | 1:5 |
| 16. | Pail | | 25 | 1;1 |
| 17. | Feed scoop | | 25 | 1:1 |
| 18. | Hover | | | |
| 19. | Chick guard | | 10 | |
| 20. | Generator | | 2 | 1:13 |
| 21. | Electric lamps | 100W | 5 | 1:5 |
| | | 60W | 5 | 1:5 |
| 22. | Wheel barrow | | 5 | 1:5 |
| 23. | Candler | | 5 | 1:5 |
| 24. | Layer cages | Chicken sized | 10 | 1:3 |
| 25. | Water pump | | 2 | 1:13 |

| | | | | |
|---|---|---|---|---|
| 26. | Perch | Chicken sized | 5 | 1:5 |
| 27. | Hay box | Timber and mesh wire made | 5 | 1:5 |
| | PPE | | | |
| 1 | Boots/shoes | Plastic made | 25 | 1:1 |
| 2 | Overalls | Made from canvas or kaki cloth | 25 | 1:1 |
| 3 | Gloves | Made from Synthetic rubber | 25 | 1:1 |
| 6 | Sun hat | From straw | 25 | 1:1 |
| 8 | Safety goggles | Made from glasses | 25 | 1:1 |
| 9 | Face mask | Made with non-woven fabric, better bacteria filtration and air permeability | 25 | 1:1 |
| 10 | Ear protectors | Made from a hard thermoplastic or metal | 25 | 1:1 |
| 1 | Boots/shoes | Plastic made | 25 | 1:1 |
| 2 | Overalls | Made from canvas or kaki cloth | 25 | 1:1 |
| 3 | Gloves | Made from Synthetic rubber | 25 | 1:1 |
| 6 | Sun hat | From straw | 25 | 1:1 |
| 8 | Safety goggles | Made from glasses | 25 | 1:1 |

| LEARNING MODULE 08 |
|---|
| **TVET-PROGRAMME TITLE: Animal Production Level III** |
| **MODULE TITLE: Undertaking Livestock Fattening** |
| **MODULE CODE: AGR ANP3 M08 0422** |
| **NOMINAL DURATION: 50 hours** |
| **MODULE DESCRIPTION** : This module covers the knowledge, skills and attitude required to undertake livestock fattening that able to prepare for livestock fattening, to select livestock for fattening carryout fattening, feed and feeding for fattening animals and monitor performance of feedlots to aid farming community and enterprises. |
| **LEARNING OUTCOMES**<br>At the end of the module the trainee will be able to:<br>**LO1. Prepare for livestock fattening**<br>**LO2. Select livestock for fattening**<br>**LO3. Carryout fattening**<br>**LO4. Feed and Feeding for fattening animals**<br>**LO5. Monitor performance of feedlots** |
| **MODULE CONTENTS:**<br>**LO1. Prepare for livestock fattening**<br>1.1. Required materials, tools and equipment<br>1.2. House and housing facilities<br>1.3. Techniques for loading and unloading materials<br>**LO2. Select livestock for fattening**<br>2.1 . Criteria for livestock selection<br>2.2 . Deciding the length of fattening period and profitability<br>2.3 . Recognizing and controlling hazards<br>2.4 . Plan and manage different breeds, classes and numbers of livestock<br>**LO3. Carryout fattening**<br>3.1. Ssystems of fattening<br>3.2. Performing routine fattening activities<br>3.3. Inspecting purchased livestock<br>3.4. De-worming and vaccination livestock<br>3.5. Planning weight gain, availability of feed resource and feeding condition |

**LO4. Feed and Feeding for fattening animals**

4.1. Nutritional requirement of fattening animals

4.2. Identifying , treating, measuring and blending ingredients

4.3. Checking physical quality, quantity and type of feed

4.4. Storing feed

4.5. Identifying method(s) of feeding

4.6. Feeding scheduled time, type, rate and frequency of fattening

4.7. Providing adequate and clean water

**LO5. Monitor performance of feedlots**

5.1. Monitoring and maintaining shed hygiene

5.2. Monitoring of the hygiene and health of the livestock

5.3. Monitoring and reporting any change in production levels

5.4. Giving advice to operational staff during the feeding operation

5.5. Removing and storing wastes

5.6. Record keeping

**LEARNING METHODS:**

- Lecture and Discussion
- Demonstration
- Simulation
- Role playing

**ASSESSMENT METHODS:**

- Written test
- Oral questioning
- Practical demonstration

**ASSESSMENT CRITERIA:**

**LO1. Prepare for livestock fattening**

- Required materials, tools and equipment are identified and checked for their functionality.
- House and housing facilities are prepared according to industry guideline.
- Correct manual handling techniques are used when loading and unloading materials to minimize damage to self, others, load and vehicle.

**LO2. Select livestock for fattening**

- Criteria for livestock selection are identified and clarified from production and marketing information and supervisor or management instructions.
- Decide the length of fattening period according to feeding and profitability.
- Existing and potential hazards in the workplace are recognized and risk is assessed and controlled in line with OHS and environmental management requirements
- Organizational plans and management are consulted regarding the breeds, classes and numbers of livestock to be obtained for feed letting.

**LO3. Carryout fattening**

- Decide systems of fattening depend on feed resource and preferred farm fattening system.
- Purchased livestock are inspected on delivery to the organization for health (de-worming and vaccination)
- Weight gain is planned according to age, availability of feed resource and feeding condition of livestock.
- Routine activities are performed according to work situation to minimize different risk facing during fattening period.

**LO4. Feed and Feeding for fattening animals**

- Nutritional requirement of fattening animals are identified from information available and class of livestock.
- Ingredients are identified, treated, measured and blended in the specified ratios and quantities from instructions and obtained from storage locations.
- .Feed physical quality, quantity and type are checked on their arrival to the shed.
- .Feed is stored according to organizational procedures and standards.
- .Method(s) of feeding to livestock is identified from production plan and confirmed with

supplier of ingredients and other expert advice.

- .Livestock is fed at scheduled time, type, rate and frequency according to organization plans and procedures and the codes of welfare.
- Throughout the feeding process, adequate and clean water is provided.

**LO5. Monitor performance of feedlots**

- Shed hygiene is monitored and maintained according to the organization practices and relevant regulations
- The hygiene and health of the livestock are monitored and any reaction to a change in feed or schedules is noted and reported upon.
- Any change in production levels as a direct result of changes to feed types, ingredients or schedules is monitored and reported upon.
- Advice is given to operational staff during the feeding operation when requested, or when the need is observed.
- All waste materials and substances are removed from the site and stored, or disposed of responsibly.
- Record keeping are collated and stored according to the requirements of the organization

**Annex: Resource Requirements**

| AGR ANP3 M08 0422 Undertaking Livestock Fattening | | | | |
|---|---|---|---|---|
| **Item No.** | **Category/Item** | **Description/ Specifications** | **Quantity** | **Recommended Ratio (Item: Trainee)** |
| ***A.*** | ***Learning Materials*** | | | |
| 1. | TTLM | Prepared by the trainer | 25 | 1:1 |
| 2. | Reference Books | 1. Feedlot management practices, USDA, 2011.<br>2. Animal production and feedlot cattle fattening manual, USAID, 2015. | 5 | 1:5 |
| 3 | Journals/Publication/Magazines | Standard | 5 | 1:5 |
| ***B.*** | ***Learning Facilities & Infrastructure*** | | | |
| 1. | Class room | 5*10m | 1 | 1:25 |
| 2. | Clinic/first aid provision area | 6*8m | 1 | 1:25 |
| 3. | Library | 5*7.5m | 1 | 1:25 |
| 4. | Simulation room for assessment | 3*5m | 1 | 1:25 |
| 5. | Demonstration site | 5*10m | 1 | 1:25 |
| 6. | Laboratory | 5*10m | 1 | 1:25 |
| 7. | Work shop | 9*4m | 1 | 1:25 |
| 8. | Audiovisual room | 5*10m | 1 | 1:25 |
| 9. | **ICT room** | 7*9m | 1 | 1:25 |
| 10. | Printing and photocopy service | Standard | 1 | 1:25 |
| 11. | Vehicles for cooperative/practical training | Standard | 1 | 1:25 |
| 12. | White board | 1.2*1.8m | 1 | 1:25 |
| 13. | Black board | 1.2*2m | 1 | 1:25 |
| 14. | Chalk | Dubai | 1 Packet | 1:25 |

| | | | | |
|---|---|---|---|---|
| 15. | Marker | Permanent and non permanent | 2 Packet | 1:13 |
| 16. | A3 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 17. | A4 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 18. | Fixer with lid | HB/1.5 mm | 25 Packet | 1:1 |
| 19. | Stencils | Ball point | 10 Pcs | 1:3 |
| 20. | Toner | HP | As needed, 10 pieces | 1:3 |
| 21. | Fastener | ACCO two-piece paper fasteners | As needed, 50 pieces | 2:1 |
| 22. | UTP cable | Cat5E UTP cable | 2 boxes | 1:13 |
| 23. | Notice board | 900 mm x 600 mm Heavy duty wooden | 1 | 1:25 |
| 24. | Green board | China Magnetic Green Board | 1 | 1:25 |
| 25. | T-square | Aluminum metal type | 25 | 1:1 |
| 26. | Flip chart | Sinar Line | 1 | 1:25 |
| 27. | Graph paper | Roll | 5 | 1:5 |
| 28. | pencil | HB | 5 | 1:5 |
| 29. | Drawings with specifications | Any suitable drawing | 5 | 1:5 |
| 30. | Ruler | Mica 30 cm | 25 | 1:1 |
| 31. | Eraser | Standard | 1 | 1:25 |
| 32. | Duster | Wooden made | 1 | 1:25 |
| 33. | Computer | Desktop | 25 Pcs | 1:1 |
| 34. | Computer table | 1*2m | 13 Pcs | 1:2 |
| 35. | LCD projector | EB-2250U HDMI/USB/LAN | 1 | 1:25 |
| 36. | Laptop | Core i7, RAM 8, storag1TB | 1 | 1:25 |
| 37. | Feed store room | Concrete 5*5=25m2 | 1 | 1:25 |
| 38. | Cattle | Zebu | 5 | 1:5 |
| 39. | Sheep | Local breed | 5 | 1:5 |
| 40. | Goat | Local breed | 5 | 1:5 |
| ***C.*** | ***Consumable Materials*** | | | |
| ***C.*** | ***Consumable Materials*** | | | |

| | | | | |
|---|---|---|---|---|
| 1. | Harvested green legumes and grasses | Improved seed varity | 5 kg | 1:5 |
| 2. | Molasses | Standard | 10 L | 1:3 |
| 3. | Urea | Standard | 10 kg | 1:3 |
| 4. | salts | Standard | 5 kg | 1:5 |
| 5. | water | Nacl | 10 kg | 1:3 |
| 6. | cement | fresh | 10 kg | 1:3 |
| 7. | wheat barn | Standard | 10 kg | 1:3 |
| 8. | wheat short | Standard | 2kg | 1:13 |
| 9. | Potassium Diphosphate | Standard | 1 kg | 1:25 |
| 10. | Noug cake | Standard | 5 kg | 1:5 |
| 11. | brewery by-products | Dried | 5 kg | 1:5 |
| 12. | Fish meal | 40% cp | 1 kg | 1:25 |
| 13. | Bone meal | Standard | 1 kg | 1:25 |
| 14. | Meat meal | Standard | 1 kg | 1:25 |
| 15. | Crop residues | 15% moisture content | 10 kg | 1:3 |
| 16. | Hay | 15% moisture content | 10 kg | 1:3 |
| 17. | Cereal grains | 15% moisture content | 10 kg | 1:3 |
| 18. | Wheat straw | 15% moisture content | 1 kg | 1:25 |
| 19. | Teff straw | 20% moisture content | 1 kg | 1:25 |
| 20. | Barley straw | 20% moisture content | 1 kg | 1:25 |
| 21. | Maize Stover | Fresh as fed basis | 1 kg | 1:25 |
| 22. | Alfalfa hay | 15% moisture | 1 kg | 1:25 |
| 23. | Pigean pea leaf | Fresh as fed basis | 1 kg | 1:25 |
| 24. | Vetch leaf hay | Fresh as fed basis | 1 kg | 1:25 |
| 25. | cow pea leaf | Fresh as fed basis | 5 kg | 1:5 |
| 26. | Lablab leaf | Fresh as fed basis | 1 kg | 1:25 |
| 27. | Desmodium leaf | Fresh as fed basis | 1 kg | 1:25 |
| 28. | Rice bran | Standard | 5 kg | 1:5 |
| 29. | Line seed cake | Standard | 5 kg | 1:5 |
| 30. | Cotton seed cake | Standard | 5 kg | 1:5 |
| 31. | Maize bran | Standard | 5 kg | 1:5 |
| 32. | Sun flower cake | Standard | 5 kg | 1:5 |
| ***D.*** | ***Tools and Equipments*** | | | |

| | | | | |
|---|---|---|---|---|
| 1. | Feederer | Plastic | 10 | 1:3 |
| 2. | Waterers | Plastic | 10 | 1:3 |
| 3. | Feed mixer | 1000 kg per hour | 10 | 1:3 |
| 4. | Feed bucket | Standard | 10 | 1:3 |
| 5. | Overalls | Cotton | 25 | 1:1 |
| 6. | Nose protector | Standard | 25 | 1:1 |
| 7. | Helmet | Plastic | 25 | 1:1 |
| 8. | Gloves | Plastic, rubber | 25 | 1:1 |
| 9. | Safety goggles | Glass | 25 | 1:1 |
| 10. | Plastic boots/shoes | Plastic | 25 | 1:1 |
| 11. | Sunhats | Straw made | 25 | 1:1 |
| 12. | Identification/ear tagging/ | Plastic | 50 | 2:1 |
| 13. | ear tag applicator | Manual | 5 | 1.5 |
| 14. | Dehorner | Standard | 5 | 1.5 |
| 15. | Dewormer | Standard | Needed dose | |
| 16. | Vaccines | Standard | Needed dose | |
| 17. | Burdizo | stainless steel | 2 | 1:3 |

**LEARNING MODULE 09**

**TVET-PROGRAMME TITLE: Animal Production Level III**

**MODULE TITLE: Performing Artificial Insemination for Livestock**

**MODULE CODE: AGR ANP3 M09 0422**

**NOMINAL DURATION: 30 hours**

MODULE DESCRIPTION : This module covers the application of knowledge and skills to prepare animals for insemination, handle semen, perform insemination, clean materials and equipment, disposal of Wastes and record of data after completion of the work.

**LEARNING OUTCOMES**

At the end of the module the trainee will be able to:

**LO1. Prepare animals for insemination**
**LO2. Undertake artificial insemination work**
**LO3. Perform insemination procedures**
**LO4. Record data and clean up on completion of work**

**MODULE CONTENTS:**

**LO1. Prepare animals for insemination**

1.1. History of the animal for the insemination
1.2. Body condition and body frame of animal
1.3. Nutrition, animal health and abnormalities in reproduction
1.4. Physiological status and signs of heat
1.5. Anatomy and physiology of reproductive organ
1.6. Scheduling insemination process
1.7. Estruses synchronization
1.8. Identifying and preparing animals for insemination
1.9. Veterinary sanitation procedures for insemination
1.10. Semen transmission diseases

**LO2. Undertaking artificial insemination work**

2.1. Required materials, tools and equipment
2.2. Determining artificial insemination activities
2.3. Semen handling and periodically top-upping

**LO3. Perform insemination procedures**

3.1. Preparing necessary materials and equipment
3.2. Handling techniques and restraint methods

3.3. Using Personal protective clothes and equipment

3.4. Selecting and thawing semen

3.5. occupational health and safety (**OHS**) requirements

3.6. Carry out insemination

**LO4. Record data and clean up on completion of work**

4.1 . Recording insemination and breeding data

4.2 . Evaluating AI efficiency

4.3 . Cleaning and maintaining work area

4.4 . Cleaning and returning reused materials and equipment

4.5 . Disposing Wastes

**LEARNING METHODS:**

- Lecture and Discussion
- Demonstration
- Simulation
- Role playing

**ASSESSMENT METHODS:**

- Written test
- Oral questioning
- Practical demonstration

**ASSESSMENT CRITERIA:**

**LO1. Prepare animals for insemination**

- Detail case history of the animal came for the service is addressed form the owner.
- Animals intended for insemination are restrained and correctly identified for insemination according to the supervisor/ industry guide lines.
- The animal body condition and body frame (in particular pelvic cavity) for its capacity to hold the foetus is considered
- Its physiological status and cardinal signs of heat are addressed through rectal palpation and visual inspection.
- Timing of insemination process is scheduled to ensure availability of resource and personnel requirements.
- Estruses synchronization is carried out according to the industry code of practice.
- Animals in heat are identified and prepared for insemination according to the industry guide lines.

**LO2. Undertake artificial insemination work**

- The required materials, tools and equipment are used according to the industry guidelines.
- Artificial insemination activities are undertaken in a safe and environmentally appropriate manner according to the industry guidelines.
- Semen is properly handled and periodically top-upped during storage, distribution and at field levels according to the industry guidelines.

**LO3. Perform insemination procedures**

- The necessary materials and equipment are prepared for insemination according to industry code of practice.
- Personal protective clothes and equipment are used according to the industry guidelines.
- The semen is selected and thawed according to accepted industry practices.
- Work is done according to occupational health and safety (OHS) requirements and workplace information.
- Insemination is carried out maintaining all the veterinary sanitation procedures.

**LO4. Record data and clean up on completion of work**

- Insemination and breeding data are recorded and AI efficiency is evaluated according to the industry requirements.
- Work area is cleaned and maintained according to the industry guidelines.
- Materials and equipment to be reused are cleaned and returned to safe and appropriate place.
- Wastes are disposed off according to recommended hygiene standards and environmental policy.

**Annex: Resource Requirements**

| AGR ANP3 M09 0422 Performing Artificial Insemination for Livestock | | | | |
|---|---|---|---|---|
| **Item No.** | **Category/Item** | **Description/ Specifications** | **Quantity** | **Recommended Ratio (Item: Trainee)** |
| ***A.*** | ***Learning Materials*** | | | |
| 1. | TTLM | Prepared by the trainer | 25 | 1:1 |
| 2. | Reference Books | Improving artificial breeding of cattle and buffalo, A manual prepared under the framework of an IAEA Technical Cooperation Regional RCA Project on "Improving Animal Productivity and Reproductive Efficiency", FAO, 2005. | 5 | 1:5 |
| 3 | Journals/Publication/Magazines | Standard | 5 | 1:5 |
| ***B.*** | ***Learning Facilities & Infrastructure*** | | | |
| 1. | Class room | 5*10m | 1 | 1:25 |
| 2. | Clinic/first aid provision area | 6*8m | 1 | 1:25 |
| 3. | Library | 5*7.5m | 1 | 1:25 |
| 4. | Simulation room for assessment | 3*5m | 1 | 1:25 |
| 5. | Demonstration site | 5*10m | 1 | 1:25 |
| 6. | Laboratory | 5*10m | 1 | 1:25 |
| 7. | Work shop | 9*4m | 1 | 1:25 |
| 8. | Audiovisual room | 5*10m | 1 | 1:25 |
| 9. | **ICT room** | 7*9m | 1 | 1:25 |
| 10. | Printing and photocopy service | Standard | 1 | 1:25 |

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|---|---|---|---|---|
| 11. | Vehicles for cooperative/practical training | Standard | 1 | 1:25 |
| 12. | White board | 1.2*1.8m | 1 | 1:25 |
| 13. | Black board | 1.2*2m | 1 | 1:25 |
| 14. | Chalk | Dubai | 1 Packet | 1:25 |
| 15. | Marker | Permanent and non permanent | 2 Packet | 1:13 |
| 16. | A3 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 17. | A4 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 18. | Fixer with lid | HB/1.5 mm | 25 Packet | 1:1 |
| 19. | Stencils | Ball point | 10 Pcs | 1:3 |
| 20. | Toner | HP | As needed, 10 pieces | 1:3 |
| 21. | Fastener | ACCO two-piece paper fasteners | As needed, 50 pieces | 2:1 |
| 22. | UTP cable | Cat5E UTP cable | 2 boxes | 1:13 |
| 23. | Notice board | 900 mm x 600 mm Heavy duty wooden | 1 | 1:25 |
| 24. | Green board | China Magnetic Green Board | 1 | 1:25 |
| 25. | T-square | Aluminum metal type | 25 | 1:1 |
| 26. | Flip chart | Sinar Line | 1 | 1:25 |
| 27. | Graph paper | Roll | 5 | 1:5 |
| 28. | pencil | HB | 5 | 1:5 |
| 29. | Drawings with specifications | Any suitable drawing | 5 | 1:5 |
| 30. | Ruler | Mica 30 cm | 25 | 1:1 |
| 31. | Eraser | Standard | 1 | 1:25 |
| 32. | Duster | Wooden made | 1 | 1:25 |
| 33. | Computer | Desktop | 25 Pcs | 1:1 |
| 34. | Computer table | 1*2m | 13 Pcs | 1:2 |
| 35. | LCD projector | EB-2250U HDMI/USB/LAN | 1 | 1:25 |
| 36. | Laptop | Core i7, RAM 8, storag1TB | 1 | 1:25 |
| ***C.*** | ***Consumable Materials*** | | | |
| 33. | Liquid nitrogen | | 10 L | 1:3 |
| 34. | Hormone | Standard | As required | 1:3 |
| 35. | Semen straw | Plastic | 25 | 1:25 |
| 36. | AI sheath | Plastic | 25 | 1:25 |

| | | | | |
|---|---|---|---|---|
| 37. | Savlon | 40% | 2L | 1:13 |
| 38. | Feed | Concentrate | 10 kg | 1:3 |
| D. | Tools and Equipments | | | |
| 1. | Overalls | Cotton | 25 | 1:1 |
| 2. | Nose protector | Standard | 25 | 1:1 |
| 3. | Helmet | Plastic with front glass | 25 | 1:1 |
| 4. | Gloves | plastic/different size | 25 | 1:1 |
| 5. | Safety goggles | Glass | 25 | 1:1 |
| 6. | Boots/shoes | plastic/different size | 25 | 1:1 |
| 7. | Sunhats | Straw made | 25 | 1:1 |
| 8. | Insemination bags | Leather | 5 | 1:5 |
| 9. | Liquid nitrogen containers | 5,10,15 and 20L | 2 each | 1:13 |
| 10. | Vehicles (motorcycles) | Standard | 5 | 1:5 |
| 11. | Insemination gun | Stainless steel | 5 | 1:5 |
| 12. | Thermos flask | 1L volume | 2 | 1:13 |
| 13. | Scissors | Stainless steel | 5 | 1:5 |
| 14. | Canister | Standard | 3 | 1:12 |
| 15. | Towel or tissue paper | Standard | 10 | 1:3 |
| 16. | Forceps | Stainless steel | 5 | 1:5 |
| 17. | Thermometer | Digital | 10 | 1:3 |
| 18. | Case recording book | Standard | 25 | 1:1 |
| 19. | Apron | Synthetic | 25 | 1:1 |

| LEARNING MODULE 10 |
|---|
| **TVET-PROGRAMME TITLE: Animal Production Level III** |
| **MODULE TITLE: Designing Livestock Farmstead Structure and Facilities** |
| **MODULE CODE: AGR ANP3 M10 0422** |
| **NOMINAL DURATION: 30 hours** |
| **MODULE DESCRIPTION**: This module covers the knowledge, skills and attitude required to identify and incorporate both livestock needs and industry objectives into an efficient and cost-effective design through advising on site selection, determine requirements and prepare brief layout with respect to livestock farmstead structure and facilities. It requires the ability to undertake a site suitability analysis, Prepare a brief layout, determine requirements, develop a final plan. |

**LEARNING OUTCOMES**

At the end of the module the trainee will be able to:

**LO1. Undertake a site suitability analysis**

**LO2. Prepare a brief layout**

**LO3. Determine requirements**

**LO4. Develop a final plan**

**MODULE CONTENTS:**

**LO1. Undertake a site suitability analysis**

1.1. Recording physical elements and features for assessment

1.2 Identifying legal requirements and constraints

1.3. Undertaking industry requirements

1.4. Site preparation

**.LO2. Prepare a brief layout**

2.1. Assessing handling operations

2.2. OHS codes of practice

2.3. Undertaking establish agreement for development

**LO3. Determine requirements**

3.1. Livestock handling facilities

3.2. Livestock behavior and design interactions

3.3. Calculating number of livestock to be handled

3.4. Estimating and measuring dimensions

3.5. Negotiating cost structures

**Lo4. Develop a final plan**

4.1. Preparing recommendation analysis of data

4.2. Obtaining authorization and approvals implementation plans

4.3. Produces detail plan

4.4. Modifying appropriate plan

**LEARNING METHODS:**

- Lecture and Discussion
- Démonstration
- Group work
- Simulation
- Role playing

**ASSESSMENT METHODS:**

- Written test
- Oral questioning
- Practical demonstration

**ASSESSMENT CRITERIA:**

**LO.1 Undertake a site suitability analysis**

- Location of new or existing site is inspected and physical elements and features of the site are recorded for assessment of suitability.
- Legal requirements and constraints on development processes are identified.
- Surveys to be undertaken are specified and tolerances determined according to industry requirements.
- Site preparation requirements are assessed and determined according to enterprise policies and site parameters.

**LO.2 Prepare a brief layout**

- Options to modify existing facilities or establish alternative handling operations are assessed.
- OHS codes of practice and enterprise quality assurance requirements are identified and incorporated into the plan.
- Brief layout is prepared and consultation is undertaken to establish agreement on options and approaches for development.

**LO.3 Determine requirements**

- Requirements for livestock handling and/or accommodation facilities are assessed and clarified according to industry objectives.
- Cost structures and timelines are negotiated and confirmed within enterprise budgetary constraints.

Plans are obtained for livestock handling facilities from a variety of sources and are assessed in relation to industry.

**LO.4 Develop a final plan**

- Recommendations are prepared based on the analysis of data and industry instructions.
- Authorizations and approvals required for implementation of the plans are obtained.
- Detailed plan is produced with consideration for safety, environmental implications and meeting industry objectives.
- Plans are modified appropriate to the individual site and reflect enterprise objectives as required

**Annex: Resource Requirements**

| AGR ANP3 M10 0422 Designing Livestock Farmstead Structure and Facilities | | | | |
|---|---|---|---|---|
| **Item No.** | **Category/Item** | **Description/ Specifications** | **Quantity** | **Recommended Ratio (Item: Trainee)** |
| ***A.*** | ***Learning Materials*** | | | |
| 1. | TTLM | Prepared by the trainer | 25 | 1:1 |
| 2. | Reference Books | Farm structure: Concept and definition By B. F. Stanton March 1991 no. 91-6 | 5 | 1:5 |
| | | | 7 | 1:4 |
| | | | | |
| 3 | Journals/Publication/Magazines | | | |
| ***B.*** | ***Learning Facilities & Infrastructure*** | | | |
| 1. | Class room | 5*10m | 1 | 1:25 |
| 2. | Clinic/first aid provision area | 6*8m | 1 | 1:25 |
| 3. | Library | 5*7.5m | 1 | 1:25 |
| 4. | Simulation room for assessment | 3*5m | 1 | 1:25 |
| 5. | Demonstration site | 5*10m | 1 | 1:25 |
| 6. | Laboratory | 5*10m | 1 | 1:25 |
| 7. | Work shop | 9*4m | 1 | 1:25 |
| 8. | Audiovisual room | 5*10m | 1 | 1:25 |
| 9. | **ICT room** | 7*9m | 1 | 1:25 |
| 10. | Printing and photocopy service | Standard | 1 | 1:25 |
| 11. | Vehicles for cooperative/practical training | Standard | 1 | 1:25 |
| 12. | White board | 1.2*1.8m | 1 | 1:25 |
| 13. | Black board | 1.2*2m | 1 | 1:25 |

| | | | | |
|---|---|---|---|---|
| 14. | Chalk | Dubai | 1 Packet | 1:25 |
| 15. | Marker | Permanent and non permanent | 2 Packet | 1:13 |
| 16. | A3 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 17. | A4 paper | Double A Stationary A4 paper | 25 Packet | 1:1 |
| 18. | Fixer with lid | HB/1.5 mm | 25 Packet | 1:1 |
| 19. | Stencils | Ball point | 10 Pcs | 1:3 |
| 20. | Toner | HP | As needed, 10 pieces | 1:3 |
| 21. | Fastener | ACCO two-piece paper fasteners | As needed, 50 pieces | 2:1 |
| 22. | UTP cable | Cat5E UTP cable | 2 boxes | 1:13 |
| 23. | Notice board | 900 mm x 600 mm Heavy duty wooden | 1 | 1:25 |
| 24. | Green board | China Magnetic Green Board | 1 | 1:25 |
| 25. | T-square | Aluminum metal type | 25 | 1:1 |
| 26. | Flip chart | Sinar Line | 1 | 1:25 |
| 27. | Graph paper | Roll | 5 | 1:5 |
| 28. | pencil | HB | 5 | 1:5 |
| 29. | Drawings with specifications | Any suitable drawing | 5 | 1:5 |
| 30. | Ruler | Mica 30 cm | 25 | 1:1 |
| 31. | Eraser | Standard | 1 | 1:25 |
| 32. | Duster | Wooden made | 1 | 1:25 |
| 33. | Computer | Desktop | 25 Pcs | 1:1 |
| 34. | Computer table | 1*2m | 13 Pcs | 1:2 |
| 35. | LCD projector | EB-2250U HDMI/USB/LAN | 1 | 1:25 |
| 36. | Laptop | Core i7, RAM 8, storag1TB | 1 | 1:25 |
| ***C*** | ***Equipments & Tools*** | | | |
| 1 | Fixed and portable yards | | | |
| *2* | Drafting gates | | | |
| 3 | Animal dips | Concert | 1 | 1:25 |

| | | | | |
|---|---|---|---|---|
| 4 | Laneways, | 1m | 1 | 1:25 |
| 5 | gates | | | |
| 6 | Crutching | Digital | 1 | 1:25 |
| 7 | shearing machinery | | | |
| 8 | Mule sing and | | 1 | 1:25 |
| 9 | marking cradles | | | |
| 10 | Loading ramps | | 1 | 1:25 |
| 11 | Races, | | 2 | 1:15 |
| 12 | pens | | | |
| 13 | Showers | Concert | 1 | 1:25 |
| 14 | Fencing | Wire | 1 | 1:25 |
| 15 | Shearing shed | | 1 | 1:25 |
| 16 | crutching sheds | | | |
| 17 | crush | Metal made | 1 | 1:25 |
| 18 | Drying sheds | | 1 | 1:25 |
| 19 | Intensive production sheds | | 7 | 1:4 |
| 20 | Cages | | 2 | 1:13 |
| 21 | milking sheds | | | |
| **E** | **PPE** | | | |
| 1 | Plastic boots/shoes | Plastic | 25 | 1:1 |
| 2 | Overalls | Polyster | 25 | 1:1 |
| 3 | Gloves | Plastic | 25 | 1:1 |
| 5 | Plastic boots/shoes | Plastic | 25 | 1:1 |
| 6 | Sun hat | Straw sun hat | 25 | 1:1 |
| 7 | Safety goggles | Glass | 25 | 1:1 |
| 8 | Face mask | Polyster | 25 | 1:1 |
| 9 | Ear protectors | Cotton | 25 | 1:1 |
| 10 | Sun hat | Straw sun hat | 25 | 1:1 |

| LEARNING MODULE 11 |
|---|
| **TVET-PROGRAMME TITLE: Animal Production Level III** |
| **MODULE TITLE: Applying Digital Technology in Agriculture** |
| **MODULE CODE: AGR ANP3 M11 0422** |
| **NOMINAL DURATION: 36 hours** |
| **MODULE DESCRIPTION**: This module covers the knowledge, skills and attitude required to understand the concepts of agricultural marketing, understand the concepts of agribusiness, identify marketing targets for agricultural products, implement marketing strategy, establish contract farming, and apply agricultural marketing services. |
| **LEARNING OUTCOMES**<br>At the end of the module the trainee will be able to:<br>**LO1.**Understand the Concept of digital technology<br>**LO2.** Apply Digital technologies among rural population and farmers<br>**LO3.** Recording and documentation |
| **MODULE CONTENTS:**<br>**LO1. Understand the Concept of digital technology**<br>1.1.Introduction to digital technologies<br>1.2. The role of digital technologies in agriculture<br>1.3. Principles of Agricultural science and technology<br>1.4. Application of mobile/smartphones and tablet<br>**LO2.Apply Digital technologies among rural population and farmers**<br>2.1.Identifying and coordinating required tools and equipment<br>2.2. Identification of digital technology infrastructures<br>2.3.Developing digital technology skills<br>2.4.Developing digital agri-preneurial skill.<br>2.6. Using digital technologies, communication tools andtechniques<br>2.7. Promoting the implementation of digital technologies<br>**LO3. Recording and documentation**<br>3.1. Developing data collecting formats<br>3.2. Identifying and selecting data collection methodologies<br>3.3. Organizing, analyzing and interpreting collected data<br>3.4. Documenting and reporting organized, analyzed and interpreted data<br>3.5. Collecting feedbacks from relevant stakeholders |

| LEARNING METHODS: |
| --- |
| • Lecture and Discussion<br>• Demonstration<br>• Simulation<br>• Roleplaying |
| **ASSESSMENT METHODS:** |
| • Written test with Oral questioning<br>• Practical demonstration |

**ASSESSMENT CRITERIA:**

**LO.1.** Understand the Concept of digital technology

- Digital technologies are understood to apply digital technology.
- Importance of digital technologies are understood in agricultural sector
- Role of digital technologies in agriculture is identified to enhance agricultural development.
- Principles of Agricultural technology are identified to apply in the agricultural sector
- Mobile/Smart phones and template functions are understood to collect data and use in the reporting system

**LO.2. Apply Digital technologies among rural population and farmers**

- Require tools and equipment are identified and coordinated to apply digital technologies
- Digital technology infrastructures are identified to implement in agricultural development
- Digital technology skills are developed among the rural population
- Digital Agri-preneurial skill is developed for agricultural transformation.
- Digitaltechnology communication tools are used to collect data and reporting system
- Digital technologies, tools andtechniques are used to deliver digital education
- Implementation of digital technologies is promoted to enhance productivity

**LO.3. Recording and documentation**

- Data collecting formats are developed based on the needs
- Data collection methodologies are identified and selected based on the intended objectives
- Collected data are organized, analyzed and interpreted based on the intended objectives
- Organized, analyzed and interpreted data are documented and reported
- Feedbacks are collected from the relevant stakeholders

**Annex: Resource Requirements**

| AGR APN3 M11 0422: Applying Digital Technology in Agriculture | | | | |
|---|---|---|---|---|
| **Item No.** | **Category/Item** | **Description/ Specifications** | **Quantity** | **Recommended Ratio (Item: Trainee)** |
| ***A.*** | ***Learning Materials*** | | | |
| 1. | TTLM | Prepared by the trainer | 25 pcs | 1:1 |
| 2. | Reference Books | | | |
| 2.1 | Digital Technologies for Agricultural and Rural Development in the Global South | Duncombe, R., (edit), 2018. | 5 pcs | 1:5 |
| 2.2 | Digital Technologies in Agriculture and Rural Areas | Trendov, N.M., *et al.* 2019. | 5 pcs | 1:5 |
| 3 | Journals/Publication/Magazines | Online access | | |
| ***B.*** | **Learning Facilities and Infrastructure** | | | |
| 1. | Lecture Room | 56 $m^2$ | | 1:25 |
| 2. | Library | 1.7 $m^2$/ trainee | | |
| 3. | Audio Visual Center | | | 1:13 |
| 4. | Smart Class | | | 1:25 |
| **C.** | **Consumable Materials** | | | |
| 1. | Dust masks | Plastic | 25 Pcs | 1:1 |
| 2. | Glove | Plastic | 25 Pcs | 1:1 |
| 3. | Working cloth | Tertian | 25 Pcs | 1:1 |
| 4. | First aid Kit | Per workshop | 1 Kit | 1:25 |
| 5. | Safety shoes | Leather | 25 Pcs | 1:1 |
| 6. | Paper | A4,A3,A2 | 5 Pack | 1:2 |
| 7. | Pencil | 0.5 | 50 Pack | 2:1 |
| 8. | Flip chart | A1 | 1 Pcs | 1:25 |
| 9. | Marker | Temporary/ Permanent | 50 Pack | 2:1 |
| **D.** | **Tools and equipment** | | | |
| 1. | Ruler | Scale | 1 Pcs per shop | 1:25 |
| 2 | Dust masks | Plastic | 25 Pcs | 1:1 |

| | | | | |
|---|---|---|---|---|
| 3 | Glove | Plastic | 25 Pcs | 1:1 |
| 4 | Working cloth | Tertian | 25 Pcs | 1:1 |
| 5 | Digital camera | | 2 pcs | 1:13 |
| 6 | Smart phone | | 25 pcs | 1:1 |
| 7 | Tablet | | 5 pcs | 1:5 |
| 8 | Portable projector | | 1 pcs | |
| 9 | computer | | 8 pcs | 1:3 |
| 10. | GPS | | 5 pcs | 1:5 |
| 11. | Different charger and cable | | | As required |

| Learning Methods: | | | | |
|---|---|---|---|---|
| **For none impaired trainees** | **Reasonable Adjustment for Trainees with Disability (TWD)** | | | |
| | **Low Vision** | **Deaf** | **Hard of hearing** | **Physical impairment** |
| **Lecture-discussion** | ❖ Provide large print text<br>❖ Prepare the lecture in **Audio/video**<br>❖ Organize the class room seating arrangement to be accessible to trainees<br>❖ Write short notes on the black/white board using large text<br>❖ Make sure the luminosity of the light of class room is kept<br>❖ Use normal tone of voice<br>❖ Encourage trainees to record the lecture in audio format<br>❖ Provide Orientation on the physical feature of the work shop<br>❖ Summarize main points | ❖ Assign sign language interpreter<br>❖ Arrange the class room seating to be conducive for eye to eye contact<br>❖ Make sure the luminosity of the light of class room is kept<br>❖ Introduce new and relevant vocabularies<br>❖ Use short and clear sentences<br>❖ Give emphasis on visual lecture and ensure the attention of the trainees<br>❖ Avoid movement during lecture time<br>❖ Present the lecture in video format<br>❖ Summarize main points | ❖ Organize the class room seating arrangement to be accessible to trainees<br>❖ Speak loudly<br>❖ Ensure the attention of the trainees<br>❖ Present the lecture in video format<br>❖ Ensure the attention of the trainees | ❖ Organize the class room seating arrangement to be accessible for wheelchairs users.<br>❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note<br>❖ Provide Orientation on the physical feature of the work shop |
| **Demonstration** | ❖ Conduct close follow up<br>❖ Use verbal description<br>❖ Provide special attention in the process of guidance<br>❖ facilitate the support of peer trainees<br>❖ Prepare & use simulation | ❖ use Sign language interpreter<br>❖ Use video recorded material<br>❖ Ensure attention of the trainees<br>❖ Provide structured training<br>❖ Show clear and short method<br>❖ Use gesture<br>❖ Provide tutorial support (if necessary) | ❖ Illustrate in clear & short method<br>❖ Use Video recorded material<br>❖ Ensure the attention of the trainees<br>❖ Provide tutorial support (if necessary) | ❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipment's/ machines<br>❖ Assign peer trainees to assist<br>❖ Conduct close follow up<br>❖ provide tutorial support (if necessary |
| **Group discussion** | ❖ Facilitate the integration of trainees with group members<br>❖ Conduct close follow up<br>❖ Introduce the trainees with other group member<br>❖ Brief the thematic issues of the work | ❖ Use sign language interpreters<br>❖ Facilitate the integration of trainees with group members<br>❖ Conduct close follow up<br>❖ Introduce the trainees with other group member | ❖ Facilitate the integration of trainees with group members<br>❖ Conduct close follow up<br>❖ Introduce the trainees with other group member<br>❖ Inform the group members to speak loudly | ❖ Introduce the trainees with their peers |

| | | | | |
|---|---|---|---|---|
| **Exercise** | ❖ Conduct close follow up and guidance<br>❖ Provide tutorial support if necessary<br>❖ provide special attention in the process | ❖ Conduct close follow up and guidance<br>❖ Provide tutorial support if necessary<br>❖ provide special attention in the process/practical training<br>❖ Introduce new and relevant vocabularies | ❖ Conduct close follow up and guidance<br>❖ Provide tutorial support if necessary<br>❖ provide special attention in the process/ practical training | ❖ Assign peer trainees<br>❖ Use additional nominal hours if necessary |
| **Individual assignment** | ❖ prepare the assignment questions in large text<br>❖ Encourage the trainees to prepare and submit the assignment in large texts<br>❖ Make available recorded assignment questions<br>❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy | ❖ Use sign language interpreter<br>❖ Provide briefing /orientation on the assignment<br>❖ Provide visual recorded material | ❖ Provide briefing /orientation on the assignment<br>❖ Provide visual recorded material | |

| **ASSESSMENT METHODS:** | | | | |
|---|---|---|---|---|
| **Interview** | | ❖ Use sign language interpreter<br>❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter<br>❖ Use short and clear questioning<br>❖ Time extension | ❖ Speak loudly<br>❖ Using sign language interpreter if necessary | ❖ Use written response as an option for the trainees having speech challenges |
| **Written test** | ❖ Prepare the exam in large texts<br>❖ Use interview as an option if necessary<br>❖ Prepare the exam in audio format<br>❖ Assign human reader<br>❖ (if necessary)<br>❖ Time extension | ❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers<br>❖ Avoid essay writing<br>❖ Time extension | ❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary. | ❖ Use oral response as an option to give answer for trainees having severe upper limb impairment<br>❖ Time extension for trainees having severe upper limb impairment |
| **Demonstration/Observation** | ❖ Brief the instruction or provide them in large text<br>❖ Time extension | ❖ Use sign language interpreter<br>❖ Brief on the instruction of the exam<br>❖ Provide activity-based/ practical assessment method<br>❖ Time extension | ❖ Provide activity based assessment<br>❖ Brief on the instruction of the exam<br>❖ Use loud voice<br>❖ Time extension | ❖ Provide activity based assessment<br>❖ Conduct close follow up<br>❖ Time extension |

**Acknowledgement**

The **Ministry of Labor and Skills** wishes to thank and extend its appreciation for the trainers who donated their effort and time to develop this outcome based curriculum for the TVET program **Animal production Level III**.

**The experts who developed the curriculum**



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