

Animal Production

Level II



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 II**.

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

Page 1 of 92	Author/Copyright : Ministry of Labor and Skills	Animal production Level II.	Version - I
			April, 202

TVET-Program Design

1.1. TVET-Program Title: Animal production Level II

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 forage development & preservation, carryout husbandry practice of ruminants, carryout husbandry practice of poultry, raise swine production, perform husbandry practices of draft animals, raise fish production, carryout beekeeping operations, perform sericulture development, conduct crop residues treatment and urea molasses block, undertake quarantine procedures for livestock farm, apply agricultural extension service for rural development and prevent and eliminate MUDA 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 ANP2 01 0322 Conduct Forage Development & Preservation

AGR ANP2 02 0322 Carryout Husbandry Practice of Ruminants

AGR ANP2 03 0322 Carryout Husbandry Practice of Poultry

AGR ANP2 04 0322 Raise Swine production

AGR ANP2 05 0322 Perform Husbandry Practices of Draft Animals

AGR ANP2 06 0322 Raise Fish Production

AGR ANP2 07 0322 Carryout Beekeeping Operations

AGR ANP2 08 0322 Perform Sericulture Development

AGR ANP2 09 0322 Conduct Crop Residues Treatment and Urea Molasses Block

AGR ANP2 10 0322 Undertake Quarantine Procedures for Livestock Farm

AGR ANP2 11 0322 Apply Agricultural Extension service for Rural development

AGR ANP2 12 0322 Prevent and Eliminate MUDA

1.4. Duration of the TVET-Program

The Program will have duration of **606 hours** including the on 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	Remarks
		Theory	Practical			
1.	AGR ANP2 01 0322 Conduct Forage Development & Preservation	20	25	20	65	
2.	AGR ANP2 02 0322 Carryout Husbandry Practice of Ruminants	15	20	15	50	
3.	AGR ANP2 03 0322 Carryout Husbandry Practice of Poultry	15	20	25	60	
4.	AGR ANP2 04 0322 Raise Swine production	20	25	25	70	
5.	AGR ANP2 05 0322 Perform Husbandry Practices of Draft Animals	10	20	10	40	
6.	AGR ANP2 06 0322 Raise Fish Production	20	15	15	50	
7.	AGR ANP2 07 0322 Carryout Beekeeping Operations	20	20	20	60	
8.	AGR ANP2 08 0322 Perform Sericulture Development	30	50	0	80	
9.	AGR ANP2 09 0322 Conduct Crop Residues Treatment and Urea Molasses Block	10	20	0	30	
10.	AGR ANP2 10 0322 Undertake Quarantine Procedures for Livestock Farm	10	5	15	30	
11.	AGR ANP2 11 0322 Apply Agricultural Extension service for Rural development	20	10	6	36	
12.	AGR ANP2 12 0322 Prevent and Eliminate MUDA	10	10	15	35	
Total time required for level II		205	245	168	606	

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 II**.

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

No	Unit of Competence	Module Code & Title	Training Outcomes	Duration (In Hours)
1	AGR ANP2 01 0322 Conduct Forage Development & Preservation	AGR ANP2 M01 0422 Conducting Forage Development & Preservation	<ul style="list-style-type: none"> • Prepare site for forage development • Undertake forage development • Monitor forage growth and production • Perform harvesting and Preserve Forage • Clean up on completion of work 	65
2	AGR ANP2 02 0322 Carryout Husbandry Practice of Ruminants	AGR ANP2 M02 0422 Carrying out Husbandry Practice of Ruminants	<ul style="list-style-type: none"> • Prepare husbandry practices for ruminant • Undertake raising ruminant work • Handle and clean materials and equipment 	50
3	AGR ANP2 03 0322 Carryout Husbandry Practice of Poultry	AGR ANP2 M03 0422 Carrying out Husbandry Practice of Poultry	<ul style="list-style-type: none"> • Prepare for husbandry practices of poultry • Undertake poultry raising activities • Handle and clean materials and equipment 	60
4	AGR ANP2 04 0322 Raise swine Production	AGR ANP2 M04 0422 Raising swine Production	<ul style="list-style-type: none"> • Identify and characterize swine production systems • Identify and select swine breeds • plan for swine house construction and facilities • Formulate ration for swine • Manage different classes of swine • Mate and prepare swine for parturition • carryout swine health care activities • Monitor swine growing environment 	70
5	AGR ANP2 05 0322 Perform Husbandry Practices of Draft Animal	AGR ANP2 M05 0422 Performing Husbandry Practices of Draft Animal	<ul style="list-style-type: none"> • Prepare and provide house and work for draft animals • Perform daily work program • Select, catch and tie up draft animals • Clean and maintain stable gear and surrounding areas • Monitor health and welfare of horses 	40
6	AGR ANP2 06 0322 Raise Fish Production	AGR ANP2 M 06 0422 Raising Fish Production	<ul style="list-style-type: none"> • Prepare for fish raising activities • Participate in construction or installation work • Undertake fish farming work • Handle and clean material and equipment 	50
7	AGR ANP2 07 0322 Carryout Beekeeping Operation	AGR ANP2 M07 0422 Carrying out Beekeeping Operation	<ul style="list-style-type: none"> • Prepare for beekeeping work • Undertake beekeeping work • Identify and plant honey bee flora • Handle and clean material and 	60

			Equipment	
8	AGR ANP2 08 0322 Perform Sericulture Development	AGR ANP2 M08 0422 Performing Sericulture Development	<ul style="list-style-type: none"> Identify the morphology and characterize the physiology of silk worm Prepare materials, tools and equipment for sericulture development activities Undertake Sericulture development work Treat plant pests, diseases and disorders and carry out post treatment operations Treat moth, pupae, larvae, egg pests, diseases and carry out post treatment operations Handle and Clean materials, tools and equipment 	80
9	AGR ANP2 09 0322 Conduct Crop Residues Treatment and Urea Molasses Block	AGR ANP2 M09 0422 Conducting Crop Residues Treatment and Urea Molasses Block	<ul style="list-style-type: none"> Determine the type of crop residues Determine the method of treatment Prepare appropriate packing material for treatment Complete treatment and store Prepare urea-molasses Block (UMB) 	30
10	AGR ANP2 10 0322 Undertake Quarantine Procedures for Livestock Farm	AGR ANP2 M10 0422 Undertaking Quarantine Procedures for Livestock Farm	<ul style="list-style-type: none"> Prepare for quarantine site activities Carryout quarantine site activities/work Follow quarantine site procedures Respond to quarantine site breach or problem 	30
11	AGR ANP2 11 0322 Apply Agricultural Extension service for Rural development	AGR ANP2 M11 0422 Applying Agricultural Extension service for Rural development	<ul style="list-style-type: none"> Promote the use of digital technology in Agricultural Extension Understand Adult Learning Integrate Gender in Agricultural Extension Recognize Indigenous Knowledge 	36
12	AGR ANP2 12 0322 Prevent and Eliminate MUDA	AGR ANP2M 12 0422 Prevent and Eliminate MUDA	<ul style="list-style-type: none"> Prepare for work Identify MUDA and problem Analyze causes of a problem Eliminate MUDA and Assess effectiveness of the solution Prevent occurrence of wastes and sustain operation 	35

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 **B Level** and above who have satisfactory practical experiences or equivalent qualifications.

LEARNING MODULE 01	
TVET-PROGRAMME TITLE: Animal Production Level II	
MODULE TITLE: Conducting Forage Development & Preservation	
MODULE CODE: AGR ANP2 M01 0422	
NOMINAL DURATION: 65 hours	
MODULE DESCRIPTION: This module covers the knowledge, skills and attitude required to conduct forage development & preservation to prepare site for forage development, undertake forage development activities, monitor forage growth and production, Perform harvesting and Preserve Forage and clean up on completion in forage development works.	
LEARNING OUTCOMES	
At the end of the module the trainee will be able to:	
LO1. Prepare site for forage development	
LO2. Undertake forage development	
LO3. Monitor forage growth and production	
LO4. Perform harvesting and Preserve Forage	
LO5. Clean up on completion of work	

MODULE CONTENTS:

LO1. Prepare site for forage development

- 1.1. Forage development materials, tools, equipment and machinery
- 1.2. Site selection and land preparation
- 1.3. Determining forage development options
- 1.4. Identifying risk factors in forage development
- 1.5. Assessing suitable soil conditions for forage production

LO2. Undertake forage development

- 2.1. Selecting and developing forage species
- 2.2. Undertaking forage development activities
- 2.4. Undertaking seed treatment techniques
- 2.5. Determining and recording seasonal growth pattern
- 2.6. Developing pests, weeds and diseases control methods

LO3. Monitor forage growth and Production

- 3.1. Determining and monitoring weed, pest and disease incidence
- 3.2. Determining and monitoring soil structure and erosion
- 3.3. Checking and maintaining irrigation and drainage system
- 3.4. Monitoring grazing management
- 3.5. Monitoring forage maturity

Lo4. Perform harvesting and Preserve Forage

- 4.1. Determining harvesting stage
- 4.2. Storing harvested forage
- 4.3. Determining utilization of harvested and stored forage
- 4.4. Undertaking forage preservation methods

LO5. Clean up on completion of work

- 5.1. Storing waste materials
- 5.2. Transporting and storing material, tools, equipment and machinery
- 5.3. Cleaning, maintaining and handling material, tools, equipment and machinery
- 5.4. Carrying out record keeping
- 5.5. Reporting work outcomes

LEARNING METHODS:

- Lecture and Discussion
- Démonstration
- Project work
- Audio Visual

ASSESSMENT METHODS:

- Written test
- Oral questioning
- Practical demonstration

ASSESSMENT CRITERIA:

LO.1 Prepare site for forage development

- Forage development materials, tools, equipment and machinery are prepared in accordance with industries Objectives
- Site selection and land preparation are carried out according to production plan
- Forage development options are determined according to production plan.
- Risk factors are identified in forage development
- Soil conditions are assessed for forage production suitability to meet production plan

LO.2 Undertake forage development

- Instructions and directions are followed and clarification sought when necessary.
- Forage species to be developed are selected based on agro ecology
- Site selection and land preparation are carried out in accordance with the industry requirements.
- Forage development activities are undertaken in a safe and environmentally appropriate manner according to the industry guidelines
- Seed treatment techniques are undertaken according to the industry guidelines
- Seasonal growth pattern of forage crop is recorded for harvesting time is determined according to production plan
- Pests, weeds and diseases controlled methods are set to develop quality forage

LO.3 Monitor forage growth and Production

- Longer term trends in weed, pest and disease incidence are determined and any necessary changes to control measures are monitored according to industry requirements
- Soil structure and erosion are monitored and necessary changes to cultural practices, grazing management and drainage are determined according to production objectives
- Irrigation and drainage systems are checked and scheduled regularly and maintained, according to guideline
- Grazing management is monitored to ensure high pasture and livestock production levels according to industry requirements
- Forage maturity is monitored for harvesting to meet marketing and production targets

4 Perform harvesting and Preserve Forage

- Harvesting time/stage/ is determined according to forage characters to meet production plan
- Harvested forage is stored in appropriate place and according to the industry
- Utilization of harvested and stored forage is determined according to the industry
- Forage preservation methods are undertaken

LO.5. Clean up on completion of work

- Waste materials produced during forage development and preservation work are stored in a designated area
- Material, Tools, equipment and machinery are cleaned, maintained, handled, transported and stored according to the industry guidelines
- Difficulties in completion and work outcomes are reported to supervisor, feedback on performance is sought and any required improvements are noted for future action
- Record keeping are carried out
- Work outcomes are reported to the supervisor

Annex: Resource Requirements

AGR ANP2 M01 0422 Conducting Forage Development & Preservation				
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	Forage production Hand Book of forage development by: Bhutan, 2nd Edition June, 2008	7	1:4
3	Journals/Publication/Magazines		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	As needed,	2:1

		fasteners	50 pieces	
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	Dismodium	Improved seed variety	2kg	2:13
2	Alfalfa	Improved seed variety	1kg	1:25
3	Cow pea	Improved seed variety	1kg	1:25
4	Peagen pea	Improved seed variety	1kg	1:25
5	Lablab	Improved seed variety	1kg	1:25
6	Vech	Improved seed variety	1kg	
7	Rhodes grass	Improved seed variety	2kg	2:13
8	Elephant grass	Improved seed variety	25pcs	1:1
9	Cetaria grass	Improved seed variety	1kg	1:25
10	Buffel grass	Improved seed variety	1kg	1:25
11	Oat	Improved seed variety	1kg	1:25
12	Fertilize	DAP	50kg	2:1
		UREA	50kg	2:1
		Compost	100kg	4:1
D.	Tools and Equipment's			
1.	Disc harrow	Steelness steal	1	1:25
2	Hammer	Steelness steal	2	1:13
3	Fork	Steelness steal	2	1:13
4	Peg	Wood made	15	1:2
5	Rope	50m	2 roll	1:13
6	empty sacks	Sisal sack	7	1:4

7	Hoe	Steelness steal	7	1:4
8	Sickle	Steelness steal	7	1:4
9	Meter	100m	2roll	1:13
10	Tractor with its accessories	Steelness steal	1	1:25
11	combine harvester	Steelness steal	1	1:25
12	Chopper	Steelness steal	2	1:13
13	Weighing scale(digital)	100kg	2	1:5
14	Water pump	150m	2	1:13
15	watering can	Plastic	7	1:4
16	Barrel	Plastic 500L	7	1:4
17	Spade	Steelness steal	7pcs	1:4
18	Wheelbarrow	Steelness steal	5pcs	1:5
19	Bailer	Wood made	1pcs	1:25
18	Rack	Steelness steal	2pcs	1:13
19	Hayfork	Steelness steal	5pcs	1:5
20	Silo/pit	Pit with Plastic(4*4m)	1	1:25
		Concrete (2*2m)	1	1:25
E	PPE			
21	Plastic boots/shoes	Plastic	25pcs	1:1
22	Overalls	Syntetic	25pcs	1:1
23	Gloves	Plastic	25pcs	1:1
24	Sun hat	Straw sun hat	25pcs	1:1
25	Face mask	Standard	25pcs	1:1
26	Ear protectors	Standard	25pcs	1:1

LEARNING MODULE 02

TVET-PROGRAMME TITLE: Animal Production Level - II

MODULE TITLE: Carrying out husbandry practices of ruminants

MODULE CODE: AGR ANP2 M02 0422

NOMINAL DURATION: 50 hours

MODULE DESCRIPTION: This module covers specifies the knowledge, skill and attitude required to carryout husbandry practice of ruminants that requires prepare husbandry practices for ruminant, undertake raising ruminant work and handle and clean materials and equipment.

LEARNING OUTCOMES

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

LO1. Prepare husbandry practices for ruminant

LO2. Undertake raising ruminant work

LO3. Handle and clean materials and equipment

MODULE CONTENTS:

LO1. Prepare husbandry practices for ruminant

- 1.1. Identifying and checking materials, tools and equipment
- 1.2. Selecting and checking suitable **PPE**
- 1.3. Housing type and facilities
- 1.4. Manual handling techniques
- 1.5. Providing work tasks

LO2. Undertake raising ruminant work

- 2.1. Providing instructions and directions
- 2.2. Undertaking husbandry practices
- 2.3. Observing policies and procedures

LO3. Handle and clean materials and equipment

- 3.1. Handling waste materials
- 3.2. Handling and transporting materials, tools and equipment
- 3.3. Cleaning ,maintaining and storing materials, tools and equipment
- 3.4. Reporting problems or difficulties

LEARNING METHODS:

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

ASSESSMENT METHODS:

- Written
- Oral questioning
- Practical demonstration
- Move Exam
- Assignment
- Quizes

ASSESSMENT CRITERIA:

LO1. Prepare husbandry practices for ruminant

- Required materials, tools and equipment are identified and checked for their functionality.
- Housing type and 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.
- Suitable PPE are selected and checked prior to use.
- Work task is provided according to OHS requirements and supervisor instructions

LO2. Undertake raising ruminant work

- Instructions and directions provided by supervisor are followed and clarification is sought when necessary.
- Husbandry practices are undertaken in a safe and environmentally appropriate manner and according to industry guidelines.
- Enterprise policies and procedures in relation to workplace practices in the handling and disposal of materials are observed.

LO3. Handle and clean materials and equipment

- Waste material produced during work is handled according to supervisor instructions.
- Materials, tools and equipment are handled and transported according to supervisor instructions and industry guidelines.
- Problems or difficulties in completing work to required standards or timelines are reported to supervisor.
- Materials, tools and equipment are cleaned, maintained and stored according to manufacturer specifications and supervisor instructions.

Annex: Resource Requirements

AGR ANP2 M02 0422 Carrying out husbandry practices of ruminants				
Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
A.	<i>Learning Materials</i>			
1.	TTLM	Prepared by the trainer	25	1:1
2.	Reference Books	Payne, W.J.A. & Wilson, R.T. (1999). Animal Husbandry in the Tropics. (5th ed.).	5	1:5
		Williamson, G & Payne, W.J.A (1990). An Introduction to Animal Husbandry in the Tropics.	5	1:5
3	Journals/Publication	Standard	5	1:5
B.	<i>Learning Facilities & Infrastructure</i>			
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	Savlon	Standard	5 litter	1:5
2	Alcohol	Standard	5 litter	1:5
4	Milk	Whole milk	5 litter	1:5
D.	Tools and Equipment's			
1.	Weighing scale	Digital & 1000 kg	1	1:25
		Mechanical &100kg	1	1:25
2.	Hooves Trimmer	Electrical	2	1:12
		Manual	2	1:12
3.	Dehorner	saw type	2	1:12
		Wire types	2	1:12
4.	Crush (multipurpose)	Steel made	1	1:25
		Wood made	1	1:25

5.	Ear tag applicator	Manual	5	1:5
6.	Ear tags	Plastic	25	1:1
7.	Bull holder/ nose lead	Stainless steel made	1	1:25
8.	Burdizo	For large ruminant	5	1:5
		For small ruminant	5	1:5
9.	Waterier	Standard	7	1:5
10.	Feeding trough	wooden made	1	1:25
11.	Heart girth	For large ruminant	5	1:5
		For small ruminant	5	1:5
12.	Drench guns	Standard	1	1:25
13.	Vaccinating guns	Different types	5	1:5
14.	Strip cup	Standard	2	1:5
15.	Wheel barrow	Standard	1	1:25
16.	Mineral boxes	Standard	2	1:12
17.	Vaccine Syringes	Different Types	2	1:12
18.	Sprayer	15 litter holding capacity	2	1:12
19.	Scissors	Different types	2	1:12
20.	AI gun	Stainless stell	2	1:12
21.	Liquid Nitrogen Container	5 litter holding capacity	1	1:25
22.	Thermometer	Digital thermometer	2	1:12
		Mercury thermometer		
E	PPE			
1.	Boots/shoes	Plastic	25	1:1
2.	Overalls	Cotton	25	1:1
3.	Gloves	Plastic	25	1:1
4.	Apron	Synthetic made leather	25	1:1
5.	Sun hat	Straw sun hat	25	1:1
6.	Safety goggles	Standard	25	1:1
7.	Face mask	Standard	25	1:1
8.	Ear protectors	Standard	25	1:1

LEARNING MODULE 03
TVET-PROGRAMME TITLE: Animal Production Level II
MODULE TITLE: Carrying out Husbandry Practice of Poultry
MODULE CODE: AGR ANP2 M03 0422
NOMINAL DURATION : 60 hours
MODULE DESCRIPTION: This module covers the knowledge, skills and attitude required to carry out husbandry practice of poultry. It also requires the ability to Prepare for husbandry practices of poultry, Undertake poultry raising activities and Handle and clean materials and equipment.
<p>LEARNING OUTCOMES</p> <p>At the end of the module the trainee will be able to:</p> <p>LO1. Prepare for husbandry practices of poultry</p> <p>LO2. Undertake poultry raising activities</p> <p>LO3. Handle and clean materials and equipment</p>
<p>MODULE CONTENTS:</p> <p>LO1. Prepare for husbandry practices of poultry</p> <ol style="list-style-type: none"> 1.1. Conducting and checks on all materials, tools and equipment 1.2. Selecting and checking PPE 1.3. Manual handling techniques 1.4. Providing work task and instructions <p>LO2. Undertake poultry raising activities</p> <ol style="list-style-type: none"> 2.1. Following instructions and directions 2.2. Undertaking poultry raising activities 2.3. Observing policies and procedures 2.4. Observing handling and disposal of waste materials <p>LO3. Handle and clean materials and equipment</p> <ol style="list-style-type: none"> 3.1. Handling waste material 3.2. Handling materials, tools and equipment 3.3. Cleaning , maintaining and storing tools and equipment 3.4. Reporting work outcomes
LEARNING METHODS:

- Lecture and Discussion
- Démonstration
- Practical exercises
- Simulation
- Role playing

ASSESSMENT METHODS:

- Written test
- Oral questioning
- Practical demonstration

ASSESSMENT CRITERIA:

LO.1 Prepare for husbandry practices of poultry

- Required materials, tools and equipment are identified according to lists provided and/or supervisor instructions.
- Checks are conducted on all materials, tools and equipment, and insufficient or faulty items are reported to supervisor.
- Correct manual handling techniques are used when loading and unloading materials to minimize damage to self, others, load and vehicle.
- Suitable PPE are selected and checked prior to use.
- Work task is provided according to OHS requirements and supervisor instructions

LO.2 Undertake poultry raising activities

- Instructions and directions provided by supervisor are followed and clarification is sought when necessary.
- Poultry raising activities are undertaken in a safe and environmentally appropriate manner and according to Industry guidelines.
- Industry policies and procedures in relation to workplace practices in the handling and disposal of waste materials are observed.

LO.3 Handle and clean materials and equipment

- Waste material is handled according to supervisor instructions.
- Materials, tools and equipment are handled according to-Industry guidelines.
- Tools and equipment are cleaned, maintained and stored according to manufacturer specifications and supervisor instructions.
- Problems or difficulties in completing the work to required standards or timelines are reported to supervisor.
- Work outcomes are reported to supervisor, noted for future action

Annex: Resource Requirements

AGR ANP2 M03 0422 Carrying out husbandry practice of poultry

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	Oosterwijk, G., Van Aken, D. and Vongthi lath, S., 2003. A Manual on Improved Rural Poultry Production (1st Edition, English Language). Department of Livestock and Fisheries, Ministry of Agriculture and Forestry, Vientiane, Lao PDR. VIII + 115 pp.	5	1:5
		Scientific Farm Animal Production: An Introduction to Animal Science 10th Edition by Thomas G. Field and Robert E. Taylor.	5	1:5
		Indigenous chicken farming training manual	5	1:5
		Modern Livestock & Poultry Production, 9th, Student Edition	5	1:5
		Basic Management of Poultry in Developing Communities, By Jon Moyle, Ph.D.	5	1:5
3	Journals/Publication/Magazines		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.	Poultry Posters	Poultry anatomy and physiology diagram	1	1:25
C.	Consumable Materials			
1	Disinfectants	Formaldehyde	5L	1:1
		Alcohol	5L	1:1
2	Duplicating paper	Standard A4 paper	1 packet	1:1
3	Pencil	Dote pencil	2 pcs	1:1
4	Pen	Standard	5 pcs	1:1
9	Layers feed	16.5 %Cp	50kg	2:1
	Starter feed	20 % Cp	50kg	2:1
	Growers and pullets feed	18.5 % Cp	50kg	2:1
	Broiler starter	20 % Cp	50kg	2:1
	Broiler finisher	18% Cp	50kg	
10	Straw, Old newspaper, Rice hulls	Bedding materials	100kg	
D.	Tools and Equipment			

1.	Generator	Standard	1	1:25
2	Heater	Standard	2	1:13
3	Electric lamps	100W Glass	2	1:13
		60W Glass	5	1:5
5	Weighing scale	Mechanical (50kg)	5	1:5
		Digital (50kg)	5	1:5
7	Feed scoop	Standard	7	1:4
8	Wheel barrow	Standard	5Pcs	1:5
9	Feed bin	Standard	1	1:25
10	Debeaker	Manual debeaker	2	1:13
		Electric debeaker	1	1:25
11	Hover/brooder	Standard	2	1:13
12	Candler	Standard	5Pcs	1:5
14	Layer cages	Chicken sized	25	1:1
15	Knapsacks sprayer	Standard	2	1:13
16	Egg grader	Standard	2	1:13
17	Chick guard	Made form fabricated finest quality plastic	1 roll	1:25
18	Curtains	Made from linen or polyester	20m	1:2
19	Rake	Made from stainless steel	5 Pcs	1:5
20	Spade/ Shovel	Made from stainless steel	5 Pcs	1:5
21	Jars	plastic jars or metallic containers	5 Pcs	1:5
22	Gauze	Dressing equipment	1 Roll	1:1
23	Lint	Dressing equipment	1Roll	1:25
24	Plaster	Dressing equipment	1 Pcs	1:25
25	Cotton wool	Dressing equipment	1 Roll	1:25
27	Portable coolers	Standard	2	1:13
28	Water pump	Standard	2	1:13
29	Nest	Chicken sized made from grass	5	1:5
30	Perch	Made from tree branches	5	1:5
31	Hay box	Hay boxes for 10-70 chicks made from wood and half inch wire-mesh	2	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
8	Safety goggles	Made from glasses	25	1:1
9	Face mask	Made with non-woven fabric	25	1:1
10	Ear protectors	Made from a hard thermoplastic or metal	25	1:1

LEARNING MODULE 04	
TVET-PROGRAMME TITLE: Animal Production Level II	
MODULE TITLE: Raising swine production	
MODULE CODE: AGR ANP2 M04 0422	
NOMINAL DURATION: 70 hours	
MODULE DESCRIPTION: This module covers the knowledge, skills and attitude required for carrying out swine production operations and monitoring housing facilities and growing environment. It requires the knowledge of swine production system, requirements in swine growing environments, and application of routine swine management activities.	
LEARNING OUTCOMES At the end of the module the trainee will be able to: LO1. Identify and characterize swine production systems LO2. Identify and select swine breeds LO3. Plan for swine house construction and facilities LO4. Formulate ration for swine LO5. Manage different classes of swine LO6. Mate and prepare swine for parturition LO7. Carryout swine health care activities LO8. Monitor swine growing environment	
MODULE CONTENTS: LO1. Identify and characterize swine production systems 1.1 Identifying and characterizing swine production systems 1.2 Selecting the feasible swine production system LO2. Identify and select swine breeds 2.1 Identifying and charactering swine breeds types 2.2. Selecting specific swine breed LO3. Plan for swine house construction and facilities 3.1. Selecting site 3.2. Designing swine house and farm layout space requirement 3.3. Swine house construction facilities and materials Lo4. Formulate ration for swine 4.1. Identifying swine nutritional requirements and nutritional value of feedstuffs 4.2. Making decisions concerning dietary elements for particular rations	

- 4.3. Selecting, checking, and maintaining materials, tools and equipment
- 4.4. Identifying and obtaining feed ingredients
- 4.5. Measuring feed ingredients
- 4.6. Specifying and milling ingredients
- 4.7. Mixing feed ingredients

LO5. Manage different classes of swine

- 5.1. Swine routine management activities
- 5.2. Cleaning equipments, swine house and it's environment
- 5.3. Carrying out piglet rearing activities

LO6. Mate and prepare swine for parturition

- 6.1. Selecting breeding stock
- 6.2. Facilitating natural and artificial breeding
- 6.3. Diagnosing swine pregnancy
- 6.4. Handling pregnant sows

LO7. Carryout swine health care activities

- 7.1 Undertaking swine health care activities
- 7.2 Identifying main swine diseases and parasites

LO8. Monitor swine growing environment

- 8.1 Monitoring environmental parameters
- 8.2 Monitoring hygienic procedures
- 8.3 Monitoring disposal of waste and debris
- 8.4 Monitoring feed diet
- 8.5 Monitoring fresh palatable feed
- 8.6 Inspecting and checking all buildings and structures
- 8.7 Checking equipment and installations
- 8.8 Identifying, assessing risk and implementing OHS hazards

LEARNING METHODS:

- Lecture and Discussion
- Démonstration

<ul style="list-style-type: none"> • Group work • Simulation • Project work and farm visits
ASSESSMENT METHODS:
<ul style="list-style-type: none"> • Written test • Oral questioning • Practical demonstration

ASSESSMENT CRITERIA:

LO.1 Identify and characterize swine production systems

- Swine production systems are identified and characterized.
- Suitable and feasible production system is selected/ recommended based on farming objective, environmental condition, financial resource, market demand and other factors.

LO.2 Identify and select swine breeds

- Commercial and non-commercial swine breeds are identified and characterized
- Criteria are set to select swine breed for specific production purposes
- Specific breed is selected based on criteria settled and industry standards

LO.3 Plan for swine house construction and facilities

- Rules of thumb to select site for house construction are recognized
- Proper site is selected for house construction
- Space requirement of different swine classes is determined
- The house and farm layout is designed based on space requirement of the animals, topography and weather condition of the site
- Materials required for house construction and facilities are identified and specified

LO4. Formulate ration for swine

- Swine nutritional requirements and the nutritional value of available feedstuffs are identified
- Decisions are made concerning dietary elements for particular rations.
- Materials, tools and equipment suitable for ration formulation are selected, checked, and maintained if necessary.
- Ingredients are identified from instructions and obtained from storage locations.
- Ingredients are measured in the specified ratios and quantities.

- Where milling is required, it is done in the manner specified and using the appropriate equipment.
- Ingredients are blended adequately and hygienically in the manner specified and using the appropriate equipment.

LO5. Manage different classes of swine

- Routine swine management activities are identified and recognized.
- Feed and water are Prepared and provided timely
- Equipments, swine' house and it's environment are Cleaned
- Swine health care activities are carried out in accordance with animal welfare requirements
- Piglet rearing activities are carried out

LO6. Mate and prepare swine for parturition

- Breeding stock is select based on the criteria settled
- natural and artificial breeding are facilitated according to industry guidelines
- pregnancy is diagnosed based on the principles
- Care is needed for pregnant sows

LO7. Carryout swine health care activities

- The main swine diseases and parasites are identified
- Swine health care activities are undertaken according to the industry standards

LO8. Monitor swine growing environment

- Environmental parameters are monitored according to the production plan and adjustments made as required.
- Hygiene procedures are monitored and adjusted according to industry guidelines.
- Disposal of waste and debris is monitored to ensure it follows industry guidelines, and with due consideration of the environmental implications.
- Feed is monitored to ensure the correct diet is offered to swine for optimum growing conditions according to industry procedures.
- Feed is monitored to ensure fresh palatable feed is available to swine according to enterprise procedures.
- All buildings and structures are inspected and checked for wear and tear.
- Equipment for delivering water and feed is checked according to industry guidelines.

- Equipment controlling the atmospheric environment is checked according to industry guidelines.
- OHS hazards are identified, risk assessed and suitable controls implemented according to industry guidelines.

Annex: Resource Requirements

AGR ANP1 M03 0422 Establishing of Pasture and Preservation of Feeds				
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	Swine Husbandry: A Practical Manual for the Breeding, Rearing and Management 2017	5	1:5
		Modern Livestock & Poultry Production, 9th, Student Edition	5	1:5
		Swine Care Hand book (Pdf Soft copy) 2019	5	1:5
3	Journals/Publication/Magazines	Pig management (ELRI Manual 15), 2015	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.	Wallowing pond	5*5m	1	1:25
C.	Consumable Materials			
1	Formalin	40 %	1 litre	1:25
5	Vitamins and minerals	Sachets	7	1:5
D.	Tools and Equipment's			
1.	Hammer mill machine	1000/hour	1	1:25
2	Mixer machine	1000/hour	1	1:25
3	Pen for natural mating	1.5*2m Crush	1	1:25
4	Surgical blade	Sterile	1 pack	1:25
5	Sterile scissor	Castration equipment	5	1:5
6	Restrain Crush	0.5*1.2m	1	1:25
7	Forceps	Stainless steel	5 pics	1:5
9	Teeth clippers	Stainless steel	5 pics	1:5

10	Tail clipper	Stainless steel	5 pics	1:5
11	Water hose	Plastic ½ inch	50 m	1:25
12	watering can	Stainless steel	5	1:5
13	Spade	Stainless steel	5	1:5
14	Weight balance	Digital & 500 kg	1	1:25
E	PPE			
1	Plastic boots/shoes	Standard	25	1:1
2	Overalls	Standard	25	1:1
3	Gloves	Standard	25	1:1
4	Apron	Standard	25	1:1
5	Plastic boots/shoes	Standard	25	1:1
6	Sun hat	Standard	25	1:1
7	Sunscreen lotion	Standard	25	1:1
8	Safety goggles	Standard	25	1:1
9	Face mask	Standard	25	1:1
10	Ear protectors	Standard	25	1:1
11	Sun hat	Standard	25	1:1

LEARNING MODULE 05
TVET-PROGRAMME TITLE: Animal Production Level-II
MODULE TITLE: Performing husbandry practices of draft animal
MODULE CODE: AGR ANP2 M05 0422
NOMINAL DURATION: 40 hours
MODULE DESCRIPTION: This module covers the knowledge, skills and attitude required to Perform husbandry practices of draft animal. It also requires the ability to prepare and handle materials, tools and equipment for the work and clean up on completion of work.
<p>LEARNING OUTCOMES</p> <p>At the end of the module the trainee will be able to:</p> <ul style="list-style-type: none"> LO1. Prepare and provide house and work for draft animals LO2. Perform daily work program LO3. Select, catch and tie up draft animals LO4. Clean and maintain stable gear and surrounding areas LO5. Monitor health and welfare of horses

MODULE CONTENTS:

LO1. Prepare and provide house and work for draft animals

- 1.1. Providing required housing
- 1.2. Providing feed and water
- 1.3. Interpreting and confirming draft animal management
- 1.4. Selecting, checking and maintaining material, tools and equipment
- 1.5. disappear z shed Selecting, using and maintaining **PPE**

LO2. Perform daily work program

- 2.1. Carrying out Work program for each stable animal
- 2.2. Selecting and preparing draft animals
- 2.3. Conducting organizational procedures
- 2.4. Washing down draft animals after working
- 2.5. Keeping and maintaining routines work and performance records

LO3. Select, catch and tie up draft animals

- 3.1 Identifying individual characteristics of draft animals
- 3.2 Identifying selection criteria's
- 3.3 Catching selected draft animal
- 3.4 Inspecting legs and hooves
- 3.5 Leading and securing draft animal
- 3.6 Identifying and implementing **OHS** hazards
- 3.7** Handling draft animals

LO4. Clean and maintain stable gear and surrounding areas

- 4.1 Checking all gear for wear and damage
- 4.2 Cleaning and polishing gear
- 4.3 Maintaining work gear
- 4.4 Cleaning and storing work gear and saddlers
- 4.5 Reporting unsafe buildings and fixtures

LO5. Monitor health and welfare of horses

- 5.1. Identifying Signs of good health
- 5.2. Checking draft animal condition, health and soundness
- 5.3. Identifying symptoms of common illnesses and injuries
- 5.4. Reporting inspected manure, stale feed and soiled bedding
- 5.5. Isolating abnormal conditions
- 5.6. Cleaning feed bin, hay nets/bins and water troughs
- 5.7. Sweeping and removing walkways
- 5.8. Providing basic first aid

LEARNING METHODS:

- Lecture and Discussion

- Demonstration
- Simulation
- Role playing

ASSESSMENT METHODS:

- Written test
- Oral Questioning
- Practical demonstration
- Move exam

ASSESSMENT CRITERIA:

LO1. Prepare and provide house and work for draft animals

- Required buildings or housing are/is provided for draft animal based on their space requirements.
- Feeding and watering to draft animals are applied appropriately.
- Work to be undertaken is interpreted and confirmed with management.
- Material, tools and equipment suitable for the work to be undertaken are selected, checked, and maintained if necessary.
- Suitable **PPE** are selected, used and maintained.

LO2. Perform daily work program

- Work program for each stable animal is carried out as instructed by the stable manager.
- Draft animals are selected and prepared for professional services.
- Supervisor is contacted as required by organizational procedures or supervisors instructions according selection criteria.
- Draft animals are prepared for specified daily work program as required by organizational procedures or supervisors instructions.
- Draft animals are washed down after working, dried, rugged, returned to their stable and fed.
- Work routines and performance records are kept and maintained as an integral part of the stable business.

LO3. Select, catch and tie up draft animals

- Individual characteristics of draft animals are identified according to specified criteria and nominated animals are selected.
- Selected draft animal is caught quickly and gently and working gear is fitted.
- Legs and hooves of selected draft animals are inspected for abnormalities, cuts or damage.
- Draft animal is led to work area or rail quietly and calmly and safely secured.
- While handling the draft animal, OHS hazards are continually identified, risks assessed and suitable controls implemented.
- Draft animals are handled safely within the organizations and industry guidelines for animal health and welfare.

LO4. Clean and maintain stable gear and surrounding areas

- All gear is regularly checked for wear and damage.
- Gear is thoroughly cleaned and polished and oils or preservatives are applied as required according to stud practice.

- Working gear is maintained or repaired as required to ensure safe draft animal working conditions.
- Working gear and saddlers is cleaned and stored after use in line with organization policy.
- Buildings or fixtures that are in need of maintenance or/ are unsafe are reported to the stable management.

LO5. Monitor health and welfare of horses

- Signs of good health are identified.
- Draft animal is checked for condition, health and soundness and removed from stable or secured appropriately.
- Identify symptoms of common illnesses and injuries.
- Manure, stale feed and soiled bedding are inspected; removed and abnormal conditions are reported and/or disposed.
- Feed bin, hay nets/bins and water troughs are cleaned thoroughly and troughs are filled with fresh water.
- Walkways are swept and/or raked and/or removed.
- Provide basic first aid to minor injuries under supervision

Annex: Resource Requirements

AGR ANP2 M02 0422 Performing Husbandry Practices of Draft Animal				
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	Dikshit, A.K. Environmental Value of Draught Animals, 2010.	5	1:5
		Pearson, R.A. Performance and Management of Draught Animals in Agriculture in Sub-Saharan Africa, 1998.	5	1:5
3	Journals/Publication links	https://www.mdpi.com/2076-2615/11/9/2683/htm	25	1:1
4		https://www.ijset.net/journal/1311.pdf		
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.	Class room	5*10m	1	1:25
C.	Consumable Materials			
1	Savlon	standard	20 litter	1:1
2	alcohol	standard	20 litter	1:1
4	Milk	Whole milk	25 litter	1:1
D.	Tools and Equipment's			
23.	Knives	stainless steel	2	1:12
24.	Brushes	wooden made	5	1:5
25.	Wheel barrow	metal made	5	1:5
26.	Crush,	3*2m	1	1:25
27.	Ear tag applicator,	standard	5	1:5
28.	Knapsack sprayer,	10 litter capacity	2	1:5
29.	Drench gun,	0.5 litter holding capacity	2	1:5
30.	Hoof trimmer,	stainless steel	2	1:12
31.	Weighing scale,	digital	2	1:12
32.	Ear tag	Standard	2	1:12
33.	Needles,	different types	2	1:12
34.	Detergents,	Omo	2	1:12
35.	Foot baths	50cm*50cm*15cm	2	1:12
36.	Dips	2m*2m*3m	1	1:25
37.	Antibiotics	albendazole 500mg	5	1:5
E	Personal Protective Equipment's			
1.	Plastic boots/shoes	plastic/different size	25	1:1

2.	Overalls	Cotton	25	1:1
3.	Gloves	Plastic	25	1:1
4.	Apron	Synthetic	25	1:1
5.	Sun hat	straw sun hut	25	1:1
6.	Safety goggles	Standard	25	1:1
7.	Face mask	Standard	25	1:1
8.	Ear protectors	Standard	25	1:1
F	working gear			
1.	Saddles	standard	5	1:5
2.	Ropes	standard	2	1:1
3.	Breastplates	standard	5	1:5
4.	Martingales	standard	5	1:5
5.	Bridles	standard	5	1:5
6.	Cruppers	standard	5	1:5
7.	Saddlebags	standard	5	1:5
8.	Headstalls	standard	5	1:5
9.	Saddlecloths	standard	5	1:5

LEARNING MODULE 06	
TVET-PROGRAMME TITLE: Animal Production Level II	
MODULE TITLE: Raising Fish Production	
MODULE CODE: AGR ANP2 M06 0422	
NOMINAL DURATION: 50 hours	
MODULE DESCRIPTION: This module specifies the knowledge, skills and attitude required to raise fish production. It also requires the ability to prepare for fish raising activities, participate in construction or installation work, undertake fish farming work and handle and clean material and equipment.	
LEARNING OUTCOMES At the end of the module the trainee will be able to: LO1. Prepare for fish raising activities LO2. Participate in construction or installation work LO3. Undertake fish farming work LO4 Handle and clean material and equipment	
MODULE CONTENTS: LO1. Prepare for fish raising activities 1.1. Identifying and Checking materials, tools and equipment 1.2. Selecting and checking suitable PPE 1.3. Using correct manual handling techniques 1.4. Assessing site selection criteria 1.5. Providing work support to OHS requirements LO2. Participate in construction or installation work 2.1. Undertaking construction work plan 2.2. Building or installing farm stock structure 2.3. Determining pond type and size 2.4. Carrying out pond lay out 2.5. Excavating and constructing pond 2.6. Assembling and fixing fixtures and fittings 2.7. Constructing water supply and disposal systems LO3. Undertake Fish Farming Work 3.1. Following instructions and directions 3.2. Identifying fish feed sources and types 3.3. Undertaking fish farming activity 3.4. Reporting problems or difficulties in completing work LO4. Handle and clean material and equipment 4.1. Handling waste material 4.2. Handling and transporting materials, tools and equipment 4.3. Disposing disposable materials	

- 4.4. Cleaning maintaining and storing tools and equipment
4.5. Maintaining clean and safe work site
4.6. Reporting work outcomes and difficulties

LEARNING METHODS:

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

ASSESSMENT METHODS:

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

ASSESSMENT CRITERIA:

LO. Prepare for fish raising activities

- Required materials, tools and equipment are identified according to lists provided and/or supervisor instructions.
- Checks are conducted on all materials, tools and equipment, and insufficient or faulty items are reported to supervisor.
- Correct manual handling techniques are used when loading and unloading materials to minimize damage to self, others, load and vehicle.
- Suitable PPE are selected and checked prior to use.
- Work support is provided according to OHS requirements and supervisor instructions.
- Site selection criteria are assessed

LO.2 Participate in construction or installation work

- Construction tasks relevant to the Farm Stock structure being built or installed are undertaken as indicated in the construction work plan.
- Pond type and size is determined according to production plan
- Pond lay out is carried out according to the enterprise requirements.
- Pond is excavated and constructed according to the layout of the enterprise.
- Fixtures and fittings are assembled and fixed, and construction works are finished according to construction work plan.
- Water supply and disposal systems are constructed

LO.3 Undertake fish farming work

- Instructions and directions provided by supervisor are followed and clarification is sought when necessary.
- Fish farming activity is undertaken in a safe and environmentally appropriate manner and according to industry guidelines.
- Problems or difficulties in completing work to required standards or timelines are reported to supervisor.

Fish feed sources or types are identified.

LO.4 Handle and clean material and equipment

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

AGR ANP2 M06 0422 Raise Fish Production

Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
A. Learning Materials				
1.	TTLM	Prepared by the trainer	25	1:1
		Small-scale freshwater fish Farming, Second edition: 2004, Assiah van Eer, Ton van Schie, Aldin Hilbrands	7	1:4
		Manual for the Commercial Pond Production of the African Catfish in Uganda, 2009.	7	1:4
3	Journals/Publication/Magazines	Standard	7	1:4
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
	Computer table	1*2m	13 Pcs	1:2
34.	LCD projector	EB-2250U HDMI/USB/LAN	1	1:25
35.	Laptop	Core i7, RAM 8, storag1TB	1	1:25
36.	Pond	10*20m	1	1:25
37.	Store	10*10m	1	1:25
38.	Dirt pit	4*6 m ² Concrete	1	1:25
39.	Dirt bin	4*6m ² Concert	1	1:25
C.	Consumable Materials			
1	Lime	Limestone (powdered) CaCO ₃	10kg	1:3
		Quicklime CaO	10kg	1:3
		Hydrated lime Ca(OH) ₂	10kg	1:3
2	Feed	Natural Food	100 kg	4:1
		Artificial feeds	100 kg	4:1
3	Fertilizer	Organic Fertilizers	100 kg	1:25
		Inorganic Fertilizer	100 kg	4:1
4	Detergents	Omo	5 pcs	
D.	Tools and Equipment			
1	Rope	Standard	1Roll	1:25
	Meter			
2	Sack		7	1:4
3	Buckets	Standard	5	1:5
4	Weighing scale	Mechanical	1	1:25

		Digital	1	1:25
5	Loaders		1	1:25
6	Rake	Made from stainless steel	5 Pcs	1:5
7	Forks	Made from stainless steel	5 Pcs	1:5
8	Rakes	Made from stainless steel	5 Pcs	1:5
9	Hoes	Made from stainless steel	5 Pcs	1:5
10	Knapsack	15L measure	1	1:25
11	Wheel barrow	Made from stainless steel	5	1:5
12	Vehicles		1	1:25
13	Intake structure support screens			
14	Tube /water Channel	concrete or plastic lined		
15	Channels	concrete or plastic lined		
16	Trenches	concrete or plastic lined		
17	Roaded banks			
18	Spill ways			
19	Siphon			
20	Hose			
21	Pipes	Made from metal, pvc, rubber, concrete or polyethylene		
22	Sumps			
23	Pumps			
24	Bores			
25	Windmills			
26	Storage dams or reservoirs			
27	Sediment dams			
28	Sprays			
29	Flow meters, pressure gauges			
30	Float switches			
31	Solenoids			
32	Header tank			
33	Settlement tank			
34	Depth gauges			
35	Sieves			
36	Biological treatment structures			
37	Flow control devices			
38	Foset valve	Metallic or PVC 1.5 inch		
E	PPE			
1	Boots/shoes	Plastic made	25	1:25
2	Overalls	Made from canvas or kaki cloth	25	1:25
3	Gloves	Made from Synthetic rubber	25	1:25

6	Sun hat	Made from straw	25	1:25
7	Safety goggles	Made from glasses	25	1:25
8	Face mask	better bacteria filtration and air permeability	25	1:25
9	Ear protectors	Made from a hard thermoplastic or metal	25	1:25
10	Boots/shoes	Plastic made	25	1:25
11	Overalls	Made from canvas or kaki cloth	25	1:25
12	Gloves	Made from Synthetic rubber	25	1:25

LEARNING MODULE 07	
TVET-PROGRAMME TITLE: Animal production Level II	
MODULE TITLE: Carrying out Beekeeping Operations	
MODULE CODE: AGR ANP2 M07 0422	
NOMINAL DURATION: 60 hours	
<p>MODULE DESCRIPTION: This module covers the knowledge, skills and attitude required to carry out beekeeping operation. It also requires the ability to prepare for beekeeping work, undertake beekeeping work, identify and plant honey bee flora, handle and clean material and equipment</p>	
<p>LEARNING OUTCOMES</p> <p>At the end of the module the trainee will be able to:</p> <p>LO1. Prepare for beekeeping work</p> <p>LO2. Undertake beekeeping work</p> <p>LO3. Identify and plant honey bee flora</p> <p>LO4. Handle and clean material and equipment</p>	
<p>MODULE CONTENTS:</p> <p>LO1. Prepare for beekeeping work</p> <ol style="list-style-type: none"> 1.1. Identifying materials, tools and equipment 1.2. Checking and reporting all materials, tools and equipment 1.3. Using correct manual handling techniques 1.4. Selecting and checking suitable PPE 1.5. Providing work support to OHS requirements <p>LO2. Undertake beekeeping work</p> <ol style="list-style-type: none"> 2.1. Following instructions and directions 2.2. Undertaking beekeeping work 2.3. Carrying out interactions with stockholders 2.4. Reporting problems or difficulties <p>LO3. Identify and plant honey bee flora</p> <ol style="list-style-type: none"> 3.1. Carrying out identification of honeybee flora 3.2. Confirming bee floral calendar 3.3. Assessing a basic nutritional need of honey bee 3.4. Identifying conditions affecting plants for honey bee <p>LO4. Handle and clean material and equipment</p> <ol style="list-style-type: none"> 4.1. Handling waste material 4.2. Handling and transporting materials, tools and equipment 4.3. Recycling materials and disposing disposable waste material 4.4. Cleaning, maintaining and storing tools and equipment 4.5. Reporting work outcomes and difficulties 	

LEARNING METHODS:

- Lecture and Discussion
- Démonstrations
- Observation
- Simulation
- Role playing

ASSESSMENT METHODS:

- Written test
- Oral questioning
- Practical assessment
- Theoretical exam

ASSESSMENT CRITERIA:

LO.1 Prepare for beekeeping work

- Required materials, tools and equipment are identified according to lists provided and/or supervisor instructions.
- Checks are conducted on all materials, tools and equipment, and insufficient or faulty items reported to supervisor.
- Correct manual handling techniques are used when loading and unloading materials to minimize damage to self, others, load and vehicle.
- Suitable PPE are selected and checked prior to use.
- Work support is provided according to OHS requirements and supervisor instructions.

LO.2 Undertake beekeeping work

- Instructions and directions provided by supervisor are followed and clarification is sought when necessary.
- Beekeeping work is undertaken in a safe and environmentally appropriate manner and according to industry guidelines.
- Interactions with other staff, apiary site owners and customers are carried out in a positive and professional manner.
- Problems or difficulties in completing work to required standards or timelines are reported to supervisor.

LO.3 Identify and plant honey bee flora

- Identification of honeybee flora for providing nectar and pollen is carried out according to industry requirements

- Bee floral calendar is confirmed in to appropriate beekeeping operations
- A basic nutritional need of honey bee is assessed as required by industry requirements.
- Conditions affecting plants for honey bee is identified accordingly

LO.4 Handle and clean material and equipment

- Waste material produced during work is handled according to supervisor instructions.
- Materials, tools and equipment are handled and transported according to supervisor instructions and industry guidelines.
- Materials are returned to store or disposed of according to supervisor instructions.
- Tools and equipment are cleaned, maintained and stored according to manufacturer specifications and supervisor instructions.
- Work outcomes and difficulties in completing work are reported to supervisor, feedback on performance is sought and any required improvements are noted for future action.

Annex: Resource Requirements

AGR ANP2 M07 0422 Carrying out Beekeeping Operation				
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, The African Development Bank and Government of Uganda, 2012.	5	1:5
		The Beekeepers Handbook, Fourth Edition, Diana Sammataro and Alphonse Avitabile	5	1:5
3.	Journals/Publication/Magazines		7	1:4
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
11.	Printing and photocopy service	Standard	1	1:25
	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		50kg	2:1
4.	Honey		5kg	1:5
5.	Pollen		5kg	1:5
D.	Tools and Equipment			
1.	Sack	Sisal sack	5	1:5
2.	Cooking dish/pot		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
5.	Water sprayer	Simple plastic pump stirrer	5	1:5
7.	Homogenizer	Standard	2	1:13
8.	Pollen trap	Standard	2	1:13
9.	Solar wax extractor	Standard	2	1:13
10.	Fire extinguisher	Standard	1	1:25

11	Bee smoker	Made of galvanized metal sheet or long shaft	5	1:5
13	Hive tool/Chisel	Small crowbar made of stainless steel	5	1:5
14	Bee Brushes	Soft long brush handle made of wooden handle and natural bristles	5	1:5
15	Feeder frames	Standard	25	1:1
16	Hive fastening belt	Standard	7	1:4
17	Bowel	Stainless steel	2	1:13
18	Buckets	Stainless steel	5	1:5
19	Brooms	Standard	5	1:5
20	Wheelbarrows	Stainless steel	5	1:5
21	Hoses	Standard	5	1:5
20	Hose fittings	Standard	5	1:5
24	Ladle	Stainless steel	5	1:5
25	Knives	Stainless steel	7	1:4
26	Casting mould	Stainless steel	2	1:13
27	Frame wire	Stainless	2 Roll	1:13
28	Spades	Stainless steel	5	1:5
29	Shovel	Stainless steel	5	1:5
30	Forks	Stainless steel	5	1:5
31	Rakes	Stainless steel	5	1:5
35	Weighing scale	Mechanical (50kg)	5	1:5
		Digital (50kg)	5	1:5
E	PPE			
1	Bee veils	Black mesh integrated into a hat so that no bees can enter	25	1:1
2	Bee-proof	Standard	25	1:1
3	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
4	Gloves	Made of soft leather material or soft latex gloves and joined with a piece of cloth	25	1:1
5	Boots/shoes	Made of leather or Plastic	25	1:1
	Sun hat	Made from straw	25	1:1

LEARNING MODULE 08	
TVET-PROGRAMME TITLE: Animal Production Level II	
MODULE TITLE: Performing sericulture development	
MODULE CODE: AGR ANP2 M08 0422	
NOMINAL DURATION: 80 hours	
MODULE DESCRIPTION : This module covers the knowledge, skills and attitude required to raise sericulture. It requires the ability to prepare and handle materials, tools and equipment for sericulture work activities and clean up on completion of work.	
LEARNING OUTCOMES	
At the end of the module the trainee will be able to:	
LO1. Identify the morphology and characterize the physiology of silk worms	
LO2. Prepare materials, tools and equipment for sericulture development activities	
LO3. Undertake sericulture development work	
LO4. Treat plant pests, diseases and disorders and carry out post treatment operations	
LO5. Treat moth, pupae, larvae , egg pests , diseases and carry out post treatment operations	
LO6. Handle and Clean materials, tools and equipment	

MODULE CONTENTS:

LO1. Identify the morphology and characterize the physiology of silk worms

- 1.1 . Identifying materials, tools, equipment and PPE
- 1.2 . Grain age seed production and hibernation of silkworms eggs
- 1.3 . Acid treatment of diapausing eggs activities
- 1.4 . Life cycle of silkworms
- 1.5 . Morphology of silkworms
- 1.6 . Comparing mulberry and non-mulberry silkworms
- 1.7 . Digestive and excretory systems of silkworms
- 1.8 . Identifying silk glands, reproductive, respiratory and nervous system

LO2. Prepare materials, tools and equipment for sericulture development activities

- 2.1 Identifying materials, tools and equipment
- 2.2. Using manual handling techniques
- 2.4. Selecting and checking suitable PPE
- 2.5. Providing OHS requirement

LO3. Undertake sericulture development work

- 3.1. Seri-culture development activities
- 3.2. Interactions with stakeholders
- 3.3. Reporting problems or difficulties

LO4. Treat plant pests, diseases and disorders and carry out post treatment operations

- 4.1. Recognizing feed plant pests, diseases and disorders
- 4.2. Preparing and applying of treatments
- 4.3. Cleaning equipment, disposing wastes and maintaining records

LO5. Treat moth, pupae, larvae , egg pests , diseases and carry out post treatment operations

- 5.1. Handling egg, larvae, pupae and moth pests
- 5.2. Treatments of egg, larvae, pupae and moth pests and diseases
- 5.3. Cleaning equipments, disposing wastes and maintaining records

LO6. Handle and Clean materials, tools and equipment

- 6.1. Handling waste materials
- 6.2. Handling and transporting materials, tools and equipment
- 6.3. Maintaining clean and safe work site
- 6.4. Recycling , storing, disposing disposable materials
- 6.6. Reporting work outcomes

LEARNING METHODS:

- Lecture and Discussion
- Demonstration
- Simulation
- Role playing

ASSESSMENT METHODS:

- Written test
- Oral questioning
- Practical demonstration

ASSESSMENT CRITERIA:

LO1. Identify the morphology and characterize the physiology of silk worms

- All required materials, tools, equipment and Personal Protective Equipment (PPE) are identified.
- Grain age seed production is implemented and Hibernation of silkworms eggs considerations are identified
- Acid treatment for diapausing eggs activities is carried out
- The life cycle of silkworms is studied at each stage and the morphology of silkworms is identified in accordance with cocoon yield and quality.
- Comparative study of mulberry and non-mulberry silkworms are carried out at different lifecycle stages and digestive and excretory systems are identified
- Silk glands, reproductive system, respiratory system and nervous system are identified

LO2. Prepare materials, tools and equipment for sericulture development activities

- Required materials, tools and equipment are identified according to lists provided.
- Checks are conducted on all materials, tools and equipment, and insufficient or faulty items are reported to supervisor.
- Correct manual handling techniques are used when loading and unloading materials to minimize damage to self, others, load and vehicle.
- Suitable PPE are selected and checked prior to use.
- Work support is provided according to OHS requirements

LO3. Undertake sericulture development work

- Seri-culture development activities are undertaken in a safe and environmentally appropriate manner and according to industry guidelines.
- Interactions with other staff, in Seri-culture development areas, owners, stakeholders and customers are carried out in a positive and professional manner.
- Problems or difficulties in completing work to required standards or timelines are reported to supervisor.

LO4. Treat plant pests, diseases and disorders and carry out post treatment operations

- Feed plant pests, diseases and disorders , details of them and treatment methods are recognized , recorded and selected in consultation with the supervisor
- Treatments are prepared and applied according to Occupational health and safety and regulatory requirements
- Equipment is cleaned , wastes are disposed and Records are maintained according to industry guidelines

LO5. Treat moth, pupae, larvae , egg pests , diseases and carry out post treatment operations

- Egg, larvae, pupae and moth pests and diseases, details of them and treatment methods are recognized, recorded and selected.
- Treatments are prepared , applied according to Occupational Health and Safety and regulatory requirements

- Equipment is cleaned , waste is disposed and records are maintained according to industry guidelines

LO6. Handle and Clean materials, tools and equipment

- Waste materials produced during work are handled according to supervisor instructions.
- Materials, tools and equipment are handled and transported according to industry guidelines.
- Clean and safe work site is maintained while working
- Materials are returned to store or disposable materials are disposed.
- Work outcomes are reported to supervisor, feedback on performance is sought and any required improvements are noted for future action

Annex: Resource Requirements

AGR ANP2 M08 0422 Performing sericulture development				
Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
A. Learning Materials				
1.	TTLM	TTTLM prepared by the trainer	25	1:1
2.	Reference Book	<ol style="list-style-type: none"> 1. Good practices for silk cocoon production, National Bureau of Agricultural Commodity and Food Standards Ministry of Agriculture and Cooperatives, THAI Agricultural standard, 2012. 2. Requirement and procedure animal quarantine, embassy of Indonesia, 2020. 	5	1:5
3	Journals/Publication/Magazines	Sericulture in Ethiopia: Production status, opportunities, challenges and potential areas. A review, Demelash Sime and Zemedkun Siraj, 2020.	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
C.	Consumable Materials			
1.	Formalin	Standard	1 L	1:25
2.	bleach	Standard	1 L	1:25
3.	Lime	Standard	5kg	1:5
4.	Alcohol	Standard	1 L	1:25
5.	Tissue paper	Standard	5 Pcs	1:5
6.	Soap/detergents	Standard	5 Pcs	1:5
7.	Black sheet cloth	Standard	3m	1:9
8.	Paraffin paper	Standard	10 Pcs	1:3
9.	Mulberry leaf	Standard	5 kg	1:5
10.	Mulberry seed	Standard	1 kg	1:13
D.	Tools and equipments	Standard		
1.	White birds feather	Standard	25 Pcs	1:1
2.	Local mountages (dried leaves of banana/enset, mango, eucalyptus)	Standard	10 Pcs	1:3

3.	Nylon string	Standard	5 Pcs	1:5
4.	Plastic tube for watering	Standard	10m	1:3
5.	Chopsticks	Standard	25 Pcs	1:1
6.	Empty sacks	Standard	5 Pcs	1:5
7.	Plastic bag for seedlings	Standard	10 Pcs	1:3
8.	Paper bags	Standard	10 Pcs	1:3
9.	Brooms	Standard	10 Pcs	1:3
10.	Log sheet (record book)	Standard	2 Pcs	1:1
11.	Lumber and plywood	Standard	5 Pcs	1:5
12.	Hard card board	Standard	5 Pcs	1:5
13.	Bamboo basket	Standard	5 Pcs	1:5
14.	Bamboo tray	Standard	10 Pcs	1:3
15.	Hand washing tray/towel	Standard	3 Pcs	1:9
16.	Foam pad	Standard	10 Pcs	1:3
17.	Refrigerator	Standard	5 Pcs	1:5
18.	Balance	Standard	5 Pcs	1:5
19.	Brushes	Standard	10 Pcs	1:3
20.	Ruler	Standard	Pcs	1:3
21.	Stirrer	Standard	10 Pcs	1:3
1.	Buckets	Standard	5 Pcs	1:5
2.	Wheelbarrows	Standard	5 Pcs	1:5
3.	Shovel	Standard	5 Pcs	1:5
4.	Forks	Standard	5 Pcs	1:5
5.	Rakes	Standard	5 Pcs	1:5
6.	Hoes	Standard	10m	1:3
7.	Tray(rearing/feeding and seed)	Standard	5 Pcs	1:3
8.	Modern montage	Standard	10 Pcs	1:3
9.	Rearing and feeding stand	Standard	5 Pcs	1:5
10.	Cleaning net	Standard	5 Pcs	1:5
11.	Pruning scissor and saw	Standard	10 Pcs	1:3
12.	Measuring tape	Standard	5 Pcs	1:5
13.	Thermometer	Standard	5 Pcs	1:5
14.	Humidity recorder with chart	Standard	5 Pcs	1:5
15.	Hammer	Standard	5 Pcs	1:5
16.	Saw	Standard	3 Pcs	1:9
17.	Nail	Standard	3kg	1:9
18.	Forceps	Standard	5 Pcs	1:5
19.	Hand lens	Standard	5 Pcs	1:5
20.	Egg counter	Standard	10 Pcs	1:3
21.	Chopping knife and chopping board	Standard	5 Pcs	1:5
22.	Hand sprayer	Standard	5 Pcs	1:5
23.	Hydrometer	Standard	5 Pcs	1:5
24.	Plano-meter	Standard	5 Pcs	1:5
25.	Leaf chamber	Standard	5 Pcs	1:5
26.	Electric heater or charcoal	Standard	5 Pcs	1:5
27.	Ventilator	Standard	5 Pcs	1:5
28.	Water bath	Standard	3 Pcs	1:9

29.	Centrifuge	Standard	2 Pcs	1:13
30.	Incubator	Standard	2 Pcs	1:13
31.	Microscope	Standard	2 Pcs	1:13
32.	Moth crushing set	Standard	3 Pcs	1:13
33.	Local reeling machine	Standard	3 Pcs	1:13
34.	Stop watch	Standard	3 Pcs	1:13
35.	Ants well	Standard	5 Pcs	1:5
36.	Feeding basin	Standard	5 Pcs	1:5
37.	Hygrometer	Standard	5 Pcs	1:5
38.	Mounting board	Standard	5 Pcs	1:5
39.	First aid kit	Standard	5 Pcs	1:5
40.	Filter paper	Standard	5 Pcs	1:5
41.	Candle box	Standard	5 Pcs	1:5
42.	Pesticide applicators	Standard	2 Pcs	1:13
43.	Killing jar	Standard	5 Pcs	1:5
44.	Overalls	Standard	25Pcs	1:1
45.	Nose protector	Standard	25Pcs	1:1
46.	Gloves	Standard	25Pcs	1:1
47.	Safety goggles	Standard	25Pcs	1:1
48.	Plastic boots/shoes	Standard	25Pcs	1:1
49.	Sunhats	straw made	25Pcs	1:1

LEARNING MODULE 09

TVET-PROGRAMME TITLE: Animal Production Level II

MODULE TITLE: Conducting Crop Residues Treatment and Urea Molasses Block

MODULE CODE: AGR ANP2 M09 0422

NOMINAL DURATION: 30 hours

MODULE DESCRIPTION: This module covers the knowledge, skills and attitude required to conduct crop residues treatment and Urea molasses block making for different types of crop residues and ingredients. It required the ability to determine the type of crop residues, determine the method of treatment, prepare appropriate packing material for treatment, complete treatment and store and prepare urea-molasses block (UMB).

LEARNING OUTCOMES

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

- LO1. Determine the type of crop residues**
- LO2. Determine the method of treatment**
- LO3. Prepare appropriate packing material for treatment**
- LO4. Complete treatment and store**
- LO5. Prepare urea-molasses Block (UMB)**

MODULE CONTENTS:

LO1. Determine the type of crop residues

- 1.1. Identifying types of crop residues
- 1.2. Selecting suitable personal protective equipment (PPE)
- 1.3. Determining the amount of crop residues

LO2. Determine the method of treatment

- 2.1. Advantage of treatments
- 2.2. Selecting appropriate type of treatment
- 2.3. Preparing treatment ingredients

LO3. Prepare appropriate packing material for treatment

- 3.1. Determining the amount crop residue
- 3.2. Preparing packing materials and equipment

Lo4. Complete treatment and store

- 4.1. Maintaining clean and safe area
- 4.2. Performing treatment of the crop residue
- 4.3. Determining treated crop residue
- 4.4. Storing treated crop residue properly

LO5. Prepare urea-molasses block (UMB)

- 5.1. Preparing ingredients and materials
- 5.2. Calculating proportion
- 5.3. Undertaking mixing procedures
- 5.4. Undertaking molding, drying and storing
- 5.5. Carrying out feeding
- 5.6. Cleaning material, tool and equipment

LEARNING METHODS:

- Lecture and Discussion
- Démonstration/practical
- Group work
- Video show

ASSESSMENT METHODS:

- Written test
- Oral questioning
- Practical evaluation
- Exam

ASSESSMENT CRITERIA:

LO.1 Determine the type of crop residues

- The types of crop residues that are consumed by different species of livestock but are less palatable and digestible are identified.
- The amount of crop residues to be treated is determined and prepared.
- Suitable personal protective equipment (PPE) is selected, used and maintained in accordance with OHS requirements

LO. Determine the method of treatment

- The comparative advantage of the different types of treatments is assessed.
- The appropriate type of treatment that suits the industry requirement is selected
- The appropriate ingredients used for treatment are prepared

LO.3 Prepare appropriate packing material for treatment

- The type of packing materials and equipment used for crop residue treatment is determined in relation to the amount of crop residue to be prepared.
- The packing materials and equipment are prepared

LO4. Complete treatment and store

- Treatment of the crop residue is performed according to the procedures and the industry guideline.
- The treated crop residue is properly stored for a recommended time before use based on the type of treatment and weather condition
- Livestock groups to be fed the treated crop residue are determined according to treatment types.
- A clean and safe area is maintained during and on treating of the crop residues in accordance with OHS and industry requirements.
- The treated crop residue is properly stored for a recommended time before based on the type of treatment weather condition

LO. 5. Prepare urea-molasses Block (UMB)

- Ingredients and materials are prepared according to their requirements
- Proportion is calculated carefully to meet production plan
- Mixing procedures are undertaken based on industry guideline
- Molding, drying and storing are undertaken
- Feeding is carried out according to animal species and status
- Material, tool and equipment are cleaned according to manufacturer's instructions, OHS and industry guideline

Annex: Resource Requirements

AGR ANP2 M09 0422 Conducting Crop Residues Treatment and Urea Molasses Block				
Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
A.	<i>Learning Materials</i>			
1.	TTLM	Prepared by the trainer	25	1:1
2		Modern Livestock & Poultry Production, 9th, Student Edition,2009	7	1:4
		Sheep and goat production Handbook for Ethiopia, Alemu Yami and R.C.Merkel,2008	7	1:4
3	Journals/Publication/Magazines	Aulakh,DT,American,1991	7	1:4
B.	<i>Learning Facilities & Infrastructure</i>			
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, storage 1TB	1	1:25
C.	Consumable Materials			
1	Molasses	Liquid form	2 Liter	1:15
2	Urea		2 Kg	1:15
3	Salt	NaCl	1 Kg	1:25
4	Water		10 Liter	1:3
5	Cement		5kg	1:5
6	Steel bar	Steeliness steel	1	1:25
7	Hay	Crop residue	10 Kg	1:3
8	Maize Straw	Crop residue	10 Kg	1:3
10	Wheat straw	Crop residue	10 Kg	1:3
11	Barly straw	Crop residue	10 Kg	1:3
12	Millet straw	Crop residue	10 Kg	1:3
8	Legume crop residue	Left over legume, Bagasse	10kg	1:3
9	Effective Microorganisms		2 Liter	1:13

	(Ems)			
10	Industrial by product	Wheat bran	5kg	1:5
		Rice bran	5kg	1:5
D. Tools and Equipment's				
1	Sack		10pcs	1:3
2	Pit/Bunker	Plastic made	1 pcs	1:25
		Concrete	1pcs	1:25
3	Plastic sheet	Plastic	2 roll	1:15
4	Weighing balance/scale	Digital (100kg)	2 pcs	1:15
5	Stirrer	Wood made	7 pcs	1:4
6	Pail	Steelness steal	7 pcs	1:4
7	Graduated jug	Glass	7 pcs	1:4
8	Water container	Steelness steal	7 pcs	1:4
E PPE				
1	Plastic boots/shoes	Plastic	25pcs	1:1
2	Overalls	Cotton	25 pcs	1:1
3	Gloves	Plastic	25 pcs	1:1
4	Apron	Syntetic	25	1:1
6	Sun hat	Straw sun hat	25 pcs	1:1
9	Face mask	Standard	25 pcs	1:1
10	Ear protectors	Standard	25 pcs	1:1

LEARNING MODULE 10	
TVET-PROGRAMME TITLE: Animal Production Level II	
MODULE TITLE: Undertaking quarantine procedures for livestock farm	
MODULE CODE: AGR ANP2 M10 0422	
NOMINAL DURATION: 30 hours	
<p>MODULE DESCRIPTION : This module covers the knowledge, skills and attitude required to undertake quarantine procedures of livestock farm and respond to problem that are designed to reduce the likelihood of pathogenic organisms entering the site. It required the ability to prepare for quarantine site activities, carryout quarantine site activities/work, follow quarantine site procedures and respond to quarantine site breach or problem</p>	
<p>LEARNING OUTCOMES At the end of the module the trainee will be able to:</p> <p>LO1. Prepare for quarantine site activities LO2. Carryout quarantine site activities/work LO3. Follow quarantine site procedures LO4. Respond to quarantine site breach or problem</p>	
<p style="text-align: center;">MODULE CONTENTS:</p> <p>LO1. Prepare for quarantine site activities</p> <ol style="list-style-type: none"> 1.1. Prerequisites of quarantine site 1.2. Identifying and reporting potential contaminants 1.3. Storing appropriate clothing and footwear and other products <p>LO2. Carryout quarantine site activities/work</p> <ol style="list-style-type: none"> 2.1. Handling and storing chemicals and medications 2.2. Identifying and reporting pest or parasite infestation cases 2.3. Identifying OHS hazards and taking appropriate action 2.4. Disposing waste products 2.5. Designing and implementing animal quarantine plans 2.6. Recording observations 2.7. Taking measures on sick or exposed animals <p>LO3. Follow quarantine site procedures</p> <ol style="list-style-type: none"> 3.1. Quarantine procedures for visitors 3.2. Providing visitors with appropriate clothing and footwear 3.3. Locking gates and keeping doors 3.4. Maintaining security fencing 3.5. Checking of vehicle decontamination, unloading and receipt and storage of stock and/or supplies <p>LO4. Respond to quarantine site breach or problem</p> <ol style="list-style-type: none"> 4.1. Identifying the specific problem and reporting its location 4.2. Cleaning and disinfecting quarantine site and location of breach 4.3. Isolating and monitoring livestock, plant stock and other items 	

4.4. Recording information about the breach or problem
LEARNING METHODS:
<ul style="list-style-type: none"> • Lecture and Discussion • Demonstration • Role playing
ASSESSMENT METHODS:
<ul style="list-style-type: none"> • Written test with Oral questioning • Practical demonstration

ASSESSMENT CRITERIA:

LO1. Prepare for quarantine site activities

- Personal and/or work vehicles are ensured to be decontaminated before entering the quarantine site.
- Contact with potential contaminants is reported according to industry requirements.
- Hands are washed before livestock, feed, plant stock or other products are handled.
- Appropriate clothing and footwear are put on before commencing work and 'street clothing' is securely stored away from livestock, feed or other products.

LO2. Carryout quarantine site activities/work

- Chemicals and/or medications are handled and stored appropriately.
- Where relevant to the production activities of the industry, different feed mixes, soils and/or growing media and/or other products are kept separate and appropriately marked according to industry procedures.
- Any cases of pest or parasite infestation are identified and reported to supervisor.
- Any OHS hazards are identified and appropriate action taken according to industry policy and OHS legislation and codes.
- All waste products are disposed of according to industry procedures.
- Animal quarantine plans are designed and implemented following the industry guidelines.
- Observations are recorded according to organizational procedures.
- Measures on sick or exposed animals are taken according to organizational and environmental policies.

LO3. Follow quarantine site procedures

- All visitors are informed of the quarantine procedures and are provided with appropriate clothing and footwear, if required by industry procedures.
- Gates and doors are kept locked where required by industry procedures and supervisor instructions.
- Where installed, security fencing is maintained according to supervisor instructions.
- Deliveries to site are checked to ensure that established procedures for vehicle decontamination, unloading and receipt and holding or storage of stock and/or supplies are followed.

LO4. Respond to quarantine site breach or problem

- The specific problem and its location are identified and reported to supervisor to secure according to industry procedures.
- Quarantine site and location of breach are cleaned and disinfected as required according to the specific nature of the problem and industry procedures.
- Livestock, plant stock and other items suspected of being exposed to contaminants are isolated and monitored for evidence of contamination according to industry procedures.
- Information about the breach or problem is recorded according to industry procedures.

Annex: Resource Requirements

AGR ANP2 10 0422 Undertaking quarantine procedures for livestock farm				
Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
A.	Learning Materials			
1.	TTLM	TTTLM prepared by the trainer	25	1:1
2.	Reference Books	Livestock Isolation & Quarantine Areas, Iowa State University college of Vet Med, 2021	5	1:5
3	Journals/Publication/Magazines		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
C.	<i>Consumable Materials</i>			
22.	Organophosphates	diazinon	12000g	
23.	Savlon	Standard	1L	1:25
24.	Detergent	Omo	5Pcs	1:5
25.	Clean water		20000 L	
26.	Alcohol	Standard	1 L	1:25
D.	<i>Tools and equipment</i>			
1.	Sprayer	Standard	5Pcs	1:5
2.	Boots/shoes	Plastic	25Pcs	1:1
3.	Overalls	Standard	25Pcs	1:1
4.	Gloves	Standard	25Pcs	1:1
5.	Apron	Standard	25Pcs	1:1
6.	Sun hat	Straw made	25Pcs	1:1
7.	Sunscreen lotion	Standard	25Pcs	1:1
8.	Safety goggles	Standard	25Pcs	1:1
9.	Face mask and ear protectors.	Standard	25Pcs	1:1
10.	Sunscreen lotion	Standard	25Pcs	1:1
11.	First aid kit	Standard	25Pcs	1:1

LEARNING MODULE 11	
TVET-PROGRAMME TITLE: Animal Production Level II	
TVET-PROGRAMME TITLE: Apply Agricultural Extension for Rural Development	
MODULE TITLE: Applying Agricultural Extension for Rural Development	
MODULE CODE: AGR ANP2 11 0322	
NOMINAL DURATION: .36 hours	
MODULE DESCRIPTION: This module covers the knowledge, skills and attitudes required to promote the use of digital technology in agricultural extension, understand adult learning, integrate gender in agricultural extension and recognize indigenous knowledge.	
LEARNING OUTCOMES	
At the end of the module the trainee will be able to:	
LO1. Promote the Use of Digital Technology in Agricultural Extension	
LO2. Understand Adult Learning	
LO3. Integrate Gender in Agricultural Extension	
LO4. Recognize Indigenous Knowledge	
MODULE CONTENTS:	
LO1. Promote the Use of Digital Technology in Agricultural Extension	
1.1. Introduction of the use of digital technology in Agricultural extension	
1.2. BuildingSkills in using digital technology	
1.3. The role of digital technologies in agricultural extension services	
LO2.Understand Adult Learning	
2.1. The concept of adult learning	
2. 2. Determining principles of Adult learning	
2.3. The importance of Adult learning in Agricultural	
2.4. Adult learning methods	
2.5. Understanding the role of adult learning	
LO3. Integrate Gender in Agricultural Extension	
3.1. The concept of gender	
3.2. Creating gender awareness and sensitization	
3.3. The role of gender in agriculture	
3.4.Implementation of gender mainstreaming	

LO4. Recognize Indigenous Knowledge

- 4.1. The concept of indigenous knowledge
- 4.2. Understanding Characters of indigenous knowledge
- 4.3. Promoting Exchange of indigenous knowledge
- 4.4. The importance of indigenous knowledge
- 4.5. Studying the controversial issues of the debate on indigenous knowledge

LEARNING METHODS:

- Lecture and Discussion
- Demonstration
- Simulation
- Roleplaying
- Community Service

ASSESSMENT METHODS:

- Quiz, Written test, Oral questioning, Written exam (assessment)
- Individual and group assignment
- Practical demonstration

ASSESSMENT CRITERIA:

LO.1. Promote the use of digital technology in Agricultural Extension

- The use of Digital technology in Agricultural extension is introduced to familiarize its importance
- Skills in using digital technology is built to strengthen agricultural extension services
- The role of digital technologies in agricultural extension services is understood to enhance agricultural development.

LO.2. Understand Adult Learning

- The concept of adult learning is understood to bring behavioural changes
- Principles of Adult learning is determined for the implementation of extension services
- The importance of Adult learning in Agricultural Extension is understood to enhance agricultural extension services
- Adult learning methods are understood to enhance the knowledge and skills of extension beneficiaries
- The role of adult learning is understood to allow farmers develop knowledge and skills

LO.3. Integrate Gender in Agricultural Extension

- The concept of gender is understood to provide inclusive agricultural extension services
- Gender awareness and sensitization is created to increase the contribution of gender in agricultural development
- The role of gender in agriculture is determined to enhance agricultural development.
- Gender mainstreaming is implemented for effective outcome of extension services

LO4. Recognize Indigenous Knowledge.

- The concept of indigenous knowledge is understood to strengthen the service of agricultural extension
- Characters of indigenous knowledge are understood to promote local experience
- Exchange of indigenous knowledge is promoted to enhance community development
- The importance of indigenous knowledge is understood to facilitate its contribution to the development processes.
- The controversial issues of the debate on indigenous knowledge are further studied to propose the urgent need, to document, learn, preserve, and exchange indigenous knowledge

Annex: Resource Requirements

AGR APN2 M011 0422: Applying Agricultural Extension for Rural Development				
Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
A.	Learning Materials			
1.	TTLM	Prepared by trainer	25 pcs	1:1
2.	Reference Books			
2.1	Rural Extension: Basic Issues and Concepts	Hoffman, V., <i>etal.</i> 2009. Vol. I 3 rd edition	5 pcs	1:5
2.2	Rural Extension: Basic Issues and Concepts	Hoffman, V., <i>etal.</i> 2009. Vol. II 3 rd edition	5 pcs	1:5
2.3	Rural Extension: Basic Issues and Concepts	Hoffman, V., <i>etal.</i> 2009. Vol. III 3 rd edition	5 pcs	1:5
2.4	Communication for Rural Innovation	Lewis, C., 2004 3 rd edition	5 pcs	1:5
2.5	Concepts and Practices in Agricultural Extension in Developing Countries: A Source Book	Ananadayasekeram, P., <i>et al.</i> 2008.	5 pcs	1:5
2.6	Agricultural Extension in Developing Countries	Adams M. E., 1992	5 pcs	1:5
2.7	Agricultural Extension	FAO, ...	5 pcs	1:5
3.	Journals/Publication/Magazines			
3.1	Community Service Guideline		25 pcs	1:1
3.2	Sustainable Agricultural Extension Manual for Eastern and Southern Africa	IIRR, 1998	5 pcs	1:5

B. Learning Facilities and Infrastructure				
1.	Lecture Room	56m ²		1:25
2.	Library	1.7 m ² per trainee		
3.	Audio Visual Center			1:15
4.	Smart Class	At least 1 in each Department		1:25
C. Consumable Materials				
1	Paper	A4 - Rim	25	1:1
2	Chalk	Pack	1	1:25
3	Board cleaners	No	2	1:13
4	Marker	Pack	2	1:13
5	Flip Chart	Pad	2	1:13
D. Tools and Equipments				
1	Audio and Video recorder	No	1	per Department
2	Desktop Computer	No	25	1:1
3	LCD	No	1	per class
4	A DVD/VHS combination	No	1	per smart class
5	RCA video and audio input cable	No	1	per smart class
6	Laptop VGA and audio input cable	No	1	per smart class
7	Network connectivity		1	per smart class
8	An amplifier and speakers	No	1	per smart class
9	A high-powered projector (3,000 lumens)	No	1	per smart class
10	Whiteboard	No	1	1:25
11	Blackboard	No	1	1:25
12	Flip Chart Stand	No	1	1:25
13	Projection screen	No	1	1:25

LEARNING MODULE 12	
TVET-PROGRAMME TITLE: Animal Production Level II	
MODULE TITLE: Preventing and Eliminating MUDA	
MODULE CODE: AGR APN2 M012 0422	
NOMINAL DURATION: 35 hours	
MODULE DESCRIPTION: This module covers the knowledge, skills and attitude required by a worker to prevent and eliminate MUDA/wastes in his/her workplace by applying scientific problem-solving techniques and tools to enhance quality, productivity and other kaizen elements on continual basis. It covers responsibility for the day-to-day operation of the work and ensures Kaizen Elements are continuously improved and institutionalized.	
<p>LEARNING OUTCOMES</p> <p>At the end of the module the trainee will be able to:</p> <p>LO1. Prepare for work</p> <p>LO2. Identify MUDA and problem</p> <p>LO3. Analyze causes of a problem</p> <p>LO4. Eliminate MUDA and Assess effectiveness of the solution</p> <p>LO5. Prevent occurrence of wastes and sustain operation</p>	
<p>MODULE CONTENTS:</p> <p>Lo1. Prepare for Work</p> <ol style="list-style-type: none"> 1.1. Using work instructions 1.2. OHS requirements 1.3. Selecting tools, equipment and material <p>LO2. Identify Muda and Problem</p> <ol style="list-style-type: none"> 2.1 Preparing plan 3.1 Listing causes of a problem 2.1 Identifying and measuring wastes <p>LO3. Analyze causes of a problem</p> <ol style="list-style-type: none"> 3.2 Analyzing causes by using 4M1E 3.3 Eliminating the root cause 	
<p>LO4. Eliminate MUDA and Assess Effectiveness of the Solution</p> <ol style="list-style-type: none"> 4.1 Adopting the basic principles for improvement 4.2 Reducing and eliminating wastes 4.3 Recording results. <p>LO5.Prevent Occurrence of Wastes and Sustain Operation</p> <ol style="list-style-type: none"> 5.1. Preparing standards 5.2. Preventing occurrences of wastes 5.3. Creating waste-free workplace 	

ASSESSMENT CRITERIA:

LO.1 Prepare for work

- Work instructions are used to determine job requirements, including method, material and equipment.
- Job specifications are read and interpreted following working manual.
- OHS requirements, including dust and fume collection, breathing apparatus and eye and ear personal protection needs are observed throughout the work.
- Appropriate material is selected for work.
- Safety equipment and tools are identified and checked for safe and effective operation.

LO.2 Identify MUDA and problem

- Plan of MUDA and problem identification is prepared and implemented.
- Causes and effects of MUDA are discussed.
- All possible problems related to the process /Kaizen elements are listed using statistical tools and techniques.
- All possible problems related to kaizen elements are identified and listed on Visual Management Board/Kaizen Board.
- Tools and techniques are used to draw and analyze current situation of the work place.
- Wastes/MUDA are identified and measured based on relevant procedures.
- Identified and measured wastes are reported to relevant personnel.

LO.3 Analyze causes of a problem.

- All possible causes of a problem are listed.
- Cause relationships are analyzed using 4M1E.
- Causes of the problems are identified.
- The root cause which is most directly related to the problem is selected.
- All possible ways are listed using creative idea generation to eliminate the most critical root cause.
- The suggested solutions are carefully tested and evaluated for potential complications.
- Detailed summaries of the action plan are prepared to implement the suggested solution procedures.

LO. 4 Eliminate MUDA and Assess effectiveness of the solution.

- Plan of MUDA elimination is prepared and implemented by medium KPT members.
- Necessary attitude and the ten basic principles for improvement are adopted to eliminate waste/MUDA.
- Tools and techniques are used to eliminate wastes/MUDA based on the procedures and OHS.
- Wastes/MUDA are reduced and eliminated in accordance with OHS and organizational requirements.

- Tangible and intangible results are identified.
- Tangible results are compared with targets using various types of diagrams.
- Improvements gained by elimination of waste/MUDA are reported to relevant bodies.

LO.5 Prevent occurrence of wastes and sustain operation.

- Plan of MUDA prevention is prepared and implemented.
- Standards required for machines, operations, defining normal and abnormal conditions, clerical procedures and procurement are discussed and prepared.
- Occurrences of wastes/MUDA are prevented by using visual and auditory control methods.
- Waste-free workplace is created using 5W and 1Hsheet.
- The completion of required operation is done in accordance with standard procedures and practices.
- The updating of standard procedures and practices is facilitated.
- The capability of the work team that aligns with the requirements of the procedure is ensured and trained on the new Standard Operating Procedures (SOPs).

Annex: Resource requirement

AGR APN2 M011 0422: Preventing and Eliminating MUDA				
No.	Category/Item	Description/ Specifications	Qty.	Recommended Ratio (Item: Trainee)
A.	<i>Learning Materials(Disability inclusive learning guide)</i>			
1.	TTLM	TTTLM prepared by the ministry of labor & skill	25 Pcs	1:1
2.	Reference Books			
2.1	Gemba Kaizen	2nd Edition Masaaki Imai	5 Pcs	1:5
3.	Journals/Publication/Magazines	Published/unpublished	2 Pcs	1:12
B.	<i>Learning Facilities & Infrastructure</i>			
1.	Lecture room	1.2*25	1	
2.	Workshop	4*25	1	
3.	Store		1	
4.	Library	105 – 180 m2 area Needed Per Trainee	1	1:25
5.	Instructional Audio video	Library/classroom location	It depends	1:1
6.	Visual training Media	LCD, Laptops	1 Pcs	1:25
7.	Teaching boards	White board ,Flip chart ,Smart board	1 Pcs	1:25
8.	Arm chair	55 Cm *74 Cm *100Cm	25 Pcs	1:1
9.	Notice board	120*100 Cm	1 Pcs	1:25
10.	White board	240 Cm *120 Cm	1 Pcs	1:25
C.	<i>Consumable Materials</i>			
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.	<i>Tools and equipment</i>			
1.	Ruler	Scale	1 Pcs per shop	1:25

APPENDEX-1

Learning Methods:				
For none impaired trainees	Reasonable Adjustment for Trainees with Disability (TWD)			
	Low Vision	Deaf	Hard of hearing	Physical impairment
Lecture-discussion	<ul style="list-style-type: none"> ❖ Provide large print text ❖ Prepare the lecture in Audio/video ❖ Organize the class room seating arrangement to be accessible to trainees ❖ Write short notes on the black/white board using large text ❖ Make sure the luminosity of the light of class room is kept ❖ Use normal tone of voice ❖ Encourage trainees to record the lecture in audio format ❖ Provide Orientation on the physical feature of the work shop ❖ Summarize main points 	<ul style="list-style-type: none"> ❖ Assign sign language interpreter ❖ Arrange the class room seating to be conducive for eye to eye contact ❖ Make sure the luminosity of the light of class room is kept ❖ Introduce new and relevant vocabularies ❖ Use short and clear sentences ❖ Give emphasis on visual lecture and ensure the attention of the trainees ❖ Avoid movement during lecture time ❖ Present the lecture in video format ❖ Summarize main points 	<ul style="list-style-type: none"> ❖ Organize the class room seating arrangement to be accessible to trainees ❖ Speak loudly ❖ Ensure the attention of the trainees ❖ Present the lecture in video format ❖ Ensure the attention of the trainees 	<ul style="list-style-type: none"> ❖ Organize the class room seating arrangement to be accessible for wheelchairs users. ❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note ❖ Provide Orientation on the physical feature of the work shop

<p>Demonstration</p>	<ul style="list-style-type: none"> ❖ Conduct close follow up ❖ Use verbal description ❖ Provide special attention in the process of guidance ❖ facilitate the support of peer trainees ❖ Prepare & use simulation 	<ul style="list-style-type: none"> ❖ use Sign language interpreter ❖ Use video recorded material ❖ Ensure attention of the trainees ❖ Provide structured training ❖ Show clear and short method ❖ Use gesture ❖ Provide tutorial support (if necessary) 	<ul style="list-style-type: none"> ❖ Illustrate in clear & short method ❖ Use Video recorded material ❖ Ensure the attention of the trainees ❖ Provide tutorial support (if necessary) 	<ul style="list-style-type: none"> ❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines ❖ Assign peer trainees to assist ❖ Conduct close follow up ❖ Provide tutorial support (if necessary)
<p>Group discussion</p>	<ul style="list-style-type: none"> ❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member ❖ Brief the thematic issues of the work 	<ul style="list-style-type: none"> ❖ Use sign language interpreters ❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member 	<ul style="list-style-type: none"> ❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member ❖ Inform the group members to speak loudly 	<ul style="list-style-type: none"> ❖ Introduce the trainees with their peers

Exercise	<ul style="list-style-type: none"> ❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process 	<ul style="list-style-type: none"> ❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/practical training ❖ Introduce new and relevant vocabularies 	<ul style="list-style-type: none"> ❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/ practical training 	<ul style="list-style-type: none"> ❖ Assign peer trainees ❖ Use additional nominal hours if necessary
Individual assignment	<ul style="list-style-type: none"> ❖ prepare the assignment questions in large text ❖ Encourage the trainees to prepare and submit the assignment in large texts ❖ Make available recorded assignment questions ❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy 	<ul style="list-style-type: none"> ❖ Use sign language interpreter ❖ Provide briefing /orientation on the assignment ❖ Provide visual recorded material 	<ul style="list-style-type: none"> ❖ Provide briefing /orientation on the assignment ❖ Provide visual recorded material 	

ASSESSMENT METHODS:				
Interview		<ul style="list-style-type: none"> ❖ Use sign language interpreter ❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter ❖ Use short and clear questioning ❖ Time extension 	<ul style="list-style-type: none"> ❖ Speak loudly ❖ Using sign language interpreter if necessary 	<ul style="list-style-type: none"> ❖ Use written response as an option for the trainees having speech challenges
Written test	<ul style="list-style-type: none"> ❖ Prepare the exam in large texts ❖ Use interview as an option if necessary ❖ Prepare the exam in audio format ❖ Assign human reader (if necessary) ❖ Time extension 	<ul style="list-style-type: none"> ❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers ❖ Avoid essay writing ❖ Time extension 	<ul style="list-style-type: none"> ❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary. 	<ul style="list-style-type: none"> ❖ Use oral response as an option to give answer for trainees having severe upper limb impairment ❖ Time extension for trainees having severe upper limb impairment
Demonstration /Observation	<ul style="list-style-type: none"> ❖ Brief the instruction or provide them in large text ❖ Time extension 	<ul style="list-style-type: none"> ❖ Use sign language interpreter ❖ Brief on the instruction of the exam ❖ Provide activity-based/ practical assessment method ❖ Time extension 	<ul style="list-style-type: none"> ❖ Provide activity based assessment ❖ Brief on the instruction of the exam ❖ Use loud voice ❖ Time extension 	<ul style="list-style-type: none"> ❖ Provide activity based assessment ❖ Conduct close follow up ❖ Time extension

Acknowledgement

Page 90 of 92	Author/Copyright : Ministry of Labor and Skills	Animal production Level II.	Version - I
			April, 2021

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

N o	Name	Qualificati on	Educational background	Region	College	Mobile numbe r	E-mail
1	Workeneh Asmamaw	Master's, curriculum expert	Food Security and Development Studies	AA	MINISTRY OF LABOR AND SKILL	095520 5855	workasmamaw@gmail.com
2	Micheal Temesgen	Master's	Animal Production and Health	Amhara	Kombolcha	091102 7056	liyuwork2010@gmail.com
3	Shimels Hailemarkos	Master's	Animal Production	Oromia	Agarfa	091331 3977	Shimelshailemarkos@gmail.com
4	Hailu Assefa	Master's	Animal Production	SPRS	Mizan	091742 0339	hailuhh2007@gmail.com
5	Abenet Getahun	Master's	Animal Production	AFar	Gewane	094023 6673	Abenetgetahun@gmail.com
6	Alemu Alehegn	BSC	Animal Production & Technology	Fedral	Alage	092067 8329	alehegnalemu246@gmail.com