ABOUT THE COURSE

Agriculture forms a quintessential part of Indian culture and contributes the lion's share of Indian economy. About 20 per cent of Indians depend on livestock farming for their primary livelihood. Animal products viz., milk, meat and egg form the staple diet of Indians and with the advent of sophisticated machinery the sector is rapidly evolving from small scale/individual ventures into high tech farming systems.

In the wake of this industrialization, live stock management (LSM) course provides students many employment opportunities in Government, Private and co-operative sectors, in addition to the enormous self employment potential of the field. In Kerala, currently many Government jobs are reserved for LSM students as Livestock Inspectors/Farm assistants in Animal Husbandry Department, Vocational Instructor/Laboratory Technical Assistant in VHSE department etc. It also enables students for a snatch of many blue collar/ mid tier jobs in dairy, poultry and food processing industries. Even though the main aim of VHSE is to generate self employment, vertical mobility is also reachable with this course as five super numerary seats are reserved for LSM students for B.V.Sc & A.H course at College of Veterinary and Animal Sciences, Kerala Veterinary and Animal Sciences University (KVASU) with effect from 2015. After completion of this course students can also undergo many diploma courses related to Dairy and Poultry Industry, available with KVASU, which will further enhance their chances of getting a job all over India and abroad.

It is imperative for our educational system to create awareness and generate increased interest in livestock farming leading to a self sufficient and proud community rooted in our culture, staying balanced with nature and contributing to the progress of our nation.

JOB ROLES (CAREER PATH)

Introduction

Livestock management course provides huge employment opportunities in Government, Private and cooperative sectors. In addition, it also enables the students to explore the possibilities of self employment which is the main aim of vocational education and thus opening various avenues to the learner. All this helps in the upliftment of the community both by providing income and generating quality food products leading to self sustainability. With the escalating unemployment problem and decreasing food availability, the relevance of LSM course is more than ever and the efficient utilization of the skilled labor generated with this course needs to be looked upon. Job

roles related to this course are amenable to all sections of people especially women who forms the backbone of every home and community.

Government/ Semi-Government	Private	Self Employment
Livestock Inspector	Artificial Insemination Assistant	Artificial Insemination Assistant
Vocational Instructor	Chick Sexer	Pet Animal Groomer
Lab Technical Assistant	Poultry Hatchery Supervisor	Pet Animal Breeder
Dairy Farm Supervisor	Dairy Farm Supervisor	Livestock Product Processing and Marketing
Farm Labourer	Farm Labourer	Dairy Farm
Chick Sexer	Poultry Farm Supervisor	Broiler Farm
Lab Animal Handler	Poultry Hatchery Assistant	Layer Farm
Feed Plant Supervisor	Vaccinator	Egger Nursery
Dairy Plant Assistant	Pet Animal Groomer	Rabbitry
	Lab Animal Handler	Aviary
	Feed Plant Supervisor	Kennels
	Veterinary Public Health Worker	Goat farm
	Veterinary Extension Worker	Piggery
	Field Assistant in Banking and Insurance	
	Dairy Plant Assistant	
	Meat Plant Assistant	

SUBJECT APPROACH

Livestock Management

Introduction

Nature provides us everything and is the best teacher available to man. We co-habit this universe along with animals, birds and other fellow beings who contribute to our sustenance in this world, being a part of the web of life. Agriculture and livestock management provides the biggest connection with nature for us and exploring that connection to

the fullest becomes the utmost aim of human beings. Science is the sum of all experiences gained by humans and every piece of knowledge thus constructed is a window for further enquiry. Logical thinking becomes effective through precise observation, asking logical questions, collecting relevant information and conducting comprehensive analysis. Livestock management encompasses this very concept of bridging science and nature and very much complementary to agriculture, both of which contribute to the well being of human kind.

OBJECTIVES

The main objectives of livestock management are,

- To create awareness and make the youth get interested in rearing livestock management
- To cultivate eco-friendly attitude and identify inter-dependence with nature
- To instill confidence by enhancing life skills
- To find a livelihood through self employment
- To contribute in achieving food safety and self reliance
- To develop scientific perspective
- Use assimilated knowledge for the welfare of all living beings
- Extend the concept of sustainable development

LEARNING APPROACH

A learner centered and activity based learning approach is to be adopted. The many sided intelligence of the students should be explored to gain in depth knowledge. The teacher has to create an atmosphere that encourages the learner to discover ideas and facts of his own. For example, the teacher can assign the student to identify the characteristics of different breeds. This gives an opportunity for the learner to observe different breeds in their surroundings or they can collect information from different sources like internet and print media. Their observations can be consolidated in to the product. Peer learning is also relevant in this era of inclusive education as the learners learn by helping each other. In collaborative learning students contribute their part to a common goal. Teacher can direct the students to collect different varieties of feeding materials of animals and study their characteristics. Their observations can be consolidated and presented in the class. Socio-cultural related learning is also pertinent in the case of Livestock management. For example: there are taboos associated with some meat like pork and beef as they are traditionally and culturally abhorred by Muslims and Hindus of North, respectively. Such aspects are very important in the marketing of meat and thriving of meat related industries. So a survey for assessing the needs of the community and understanding the social background is of utmost importance.

The following are the domains livestock management course should lay emphasis on,

- **Knowledge domain:** students are expected to know scientific principles and available scientific facts. Knowledge can be created through observations, discussions, debates, projects, activities, referring standard text books etc.
- **Process domain:** process is a chain of procedures for achieving a particular aim. Process skills enable students to identify concepts, analyze and draw conclusions. The important process skills are observing, classifying, preparing charts, engaging in experiments, collecting and recording data, inferring, interpreting data, identifying solutions / problems, decision taking, handling instruments etc.
- **Creativity domain:** All science education should enable the student to deviate from the conventional path and think differently. Livestock management is also not an exception to this fact. Some skills pertaining to this domain are, visualizing, formulating and identifying alternative uses of technology / objects, finding solutions for problems, designing instruments and machines. For eg., the traditional ways of identifying animals are by classical methods like branding, tattooing, tagging etc. but each of these methods has many limitations. With the advent of technology, micro chips / tranponders were introduced which revolutionized the field of animal identification especially in case of wild animals. So students should be able to dream and come up with new technologies and thereby contribute to the field of livestock management.
- **Application domain:** the concepts, processes and values should be applied in daily life or anywhere possible and then only the education is complete. A livestock management student can apply what all studied in the course under real field conditions. The student will be able to evaluate the events or developments happening in animal husbandry sector.

LEARNING STRATEGIES

In the modern era of globalization the introduction of new technologies will ensure the survival of the fittest. So it becomes a necessity to equip the learners to face the growing challenges in the competitive world. Hence the traditional approach to learning is no more relevant in the present context. The teacher should use instructional techniques that motivate the students to construct his / her own knowledge. Instructional strategies should be viewed as a social skill which is part of educational environment and not as a technique to be mastered. They are considered to be as important components of teacher-student interaction and not as teacher activities alone. The important instructional strategies which can be employed for livestock management course are described below.

ASSIGNMENT

Assignment is some specific work assigned to the students as a part of their academic enrichment. There are learning activities undertaken as a continuation of class room activities to realize the curriculum objectives to a broader extent. They should be completed in time bound manner. They help to lead learner to higher level of learning from the present status. Challenging assignment can motivate the students to involve in group dynamics and achieve fruitful results. The teachers may act as a guide. Assignment may be given on individuals or group basis. Assignment includes preparation of notes, preparation of charts, models, collection of materials from institutions etc. Assignments develop skills of reference, observation, enquire, reporting etc. It ensures the effective utilization of leisure time of the students.

SEMINAR

Seminar is a learning strategy involving an in-depth analysis of specific topic, preparation of a paper and presentation. The paper is presented by either a student or a group of students. After the presentation, there will be a discussion/ interaction in which all the students can participate. The students get an opportunity to clear their doubts and make clarifications. Seminar helps to develop communication skill and overcome stage fright.

PROJECT

Project is a self-learning strategy which can exert great influence on the overall development of the learner. Project as learning strategy is to be selected where a problem arises in any part of the curriculum. The students may be divided into groups and assigned different aspects of the problem. Each group works independently. Specific aspects of the problem such as data collection, classification, analysis, report preparation and presentation is to be undertaken by each of the members. Even though the work is divided among the members, it must be ensured that the execution of each and every activity is done with the active participation of all. After analyzing data collected from different sources, the learner arrives at a conclusion that can help to solve the problem. The advantage of these learning activities is that it helps the learner to scientifically handle any problematic situation. It helps in the development of scientific thinking and thereby builds up the students' aptitude for the subject.

DEBATE

Debate is an interesting learning activity. A debate can be organized only on a topic on which there is difference of opinion. Therefore a topic suitable for debate has to be chosen. Debate can be on relevant topic that is different and interesting to the students and relevant to society.

Students with different opinions have to be identified for discussion. Those who have similar opinion should join together to form a side. Those who hold the opposite view will form the other side. It would be ideal to write down the topic of the debate and displayed in advance. There should also a person to control debate. Students should be given opportunity to absorb the ideas obtained from discussion and debate, develop the idea through reading and study, and to express them through writing or other means.

CASE STUDY

A case may be a person, institution or a community. Case study is an in-depth analysis of an actual event or situation. It presents real pictures of situation with facts, objective information or data. Learners analyze the case to interpret, predict and resolve issues associated with it. The case study provides the learner an opportunity to analyze and apply concepts, data and theory taught from the class. Learners can work individually or in groups. By studying realistic cases in the classroom, students develop new insights into the solution of specific on - the - job problem and also acquire knowledge of the latest concepts and principles used in problem solving. Case may be presented by the teachers or may be provided in print form.

BRAIN STORMING

This is the best method for solving creative problems. It facilitates generation of ideas quickly. Rules for conducting Brain storming include (1) No response is wrong (2) Welcome as many responses as possible (3) No criticism is allowed (4) Allow working on others' idea.

DISCUSSION

Discussion is essential for the student to share new finding, idea and conclusion at each stage of learning with fellow students and teachers. In general discussion the teachers should guide the discussion through questioning and summarizing. The teacher introduces some lead points and follows up the interaction and summarizing.

GROUP DISCUSSION

Group discussion is an ideal method to develop co-operation, democratic attitude, friendliness and compromising attitude which are the ultimate aims of education. During group discussion the teacher may observe each group and if needed help them to channel the discussion towards the common objectives. All students may be given opportunity to take part and express their ideas within a time limit. The conclusion reached may be entered by each student. A group representative must present this during consolidation in which the teacher may correct or add information to ensure that all the relevant ideas have been covered.

COLLECTION

Collection is a continuous learning activity, which ensures complete participation of students. The collected items may be specimens, pictures, charts, ideas, data etc. Collection provides direct experience to learn. An exhibition of collected materials will help to strengthen the concept.

PRACTICAL WORKS

Experimentation contains the process skill in an integrated way. The objective of doing an experiment is to explore new ideas though investigation only. Its main purpose is to verify some principles associated with theory. In the case of 'Vocational Practical', the ultimate goal is to generate skill through continuous practice along with investigation and invention. Continuous practice transforms the unskilled to the skilled. This is the significance and importance of practical in the Vocational stream. Hence it is very crucial that Vocational teachers as well as instructors should understand the importance of vocational practical and act accordingly.

QUIZ

Quiz programmes can be used as an interesting class room tool for transaction of curriculum objectives as well as to evaluate the effectiveness of transaction and achievement of students. For conducting a quiz programme a topic should be selected based on the above objective. The students are asked to prepare questions based on the topic individually. Next day / next hour the students are grouped into 3-4 groups randomly. A question is raised by a particular team and the other teams to answer them if they can answer the question they get points for that if all other teams fail to answer the question raised by the 1st team. The 1st team answer the question and explain the background if necessary. All the teams get equal number of chances to ask the question. Time limit is also prescribed for the conduction of the programme. The team who scores maximum points wins. All the participants can make notes on the questions asked, answers and their explanations which help them in learning.

MODELS

Models are used in learning process. It enhances the learning experience. This is based on the 'seeing is believing". It helps the learner a chance to see and feel the model presented. Working models help the students to understand the structure, working principles, actual operation etc.

SURVEY

This strategy involves collection of data from the group under study (book, person, materials etc.). It develops the social interaction and

communication ability of the learner. It also provides a scope for discovery learning. Steps involved in survey,

- Objective of survey
- Selection of area for survey / sampling frame
- Selection of survey method
  - Direct method
  - With help of questionnaire / schedule
- Tabulation and analysis
- Consolidation and Presentation

EXHIBITION

It is a learning strategy by which the learner gets a chance to show the skill developed. It provides the intrinsic motivation and exposure. Exhibition item can be conducted either individually or as a group task. It can be conducted at school / Regional / State / National level. Necessary publicity and other arrangements can be provided. Presentation, documentation, participation and innovative skills of the learner can be evaluated.

In vocational higher secondary education, **production cum-training centre (PTC)** provides various avenues for showcasing the skills of students and products prepared by the students. In addition it also gives students opportunities' to provide their services to public and create awareness on various aspects of vocational courses. PTC not only enriches the skill of students, but improves their entrepreneurship abilities and instills confidence to venture into a successful business after their school tenure.

OUT DOOR LEARNING

Field/farm/hospital visit: field visit is an inevitable vocational tool to be implemented in Vocational Higher Secondary Education. This helps the students to familiarize with the modern technologies and new situation in a different atmosphere. It provides learning though viewing. It is based on the principle that seeing is better than having. It enables the learning to retain the learned information longer and to make the subject more interesting. The facilitator should identify suitable center / institution / site. Get prior permission from the authorities before conducting the field visit. Give instructions to the learners for collection of data / information / materials / specimens. Teacher may assign different duties to learners by working them in different groups. Each learner should take utmost care and interest during the visit. He / she should observe and interact at the center / institution where the field visit is conducted. After the visit, learner should acquire the ability to apply the ideas / concepts in his future carrier. Each learner should submit a detailed report about the field visit. Field visit is of utmost interest in

the case of livestock management course as many of the practicals cannot be transacted fully at school conditions.

On-the-job training (OJT) is a unique programme of VHSE where students get industrial exposure in their respective fields. In case of livestock management, students get training in various livestock farms, veterinary hospitals and dairy plants where they will get abreast with modern technologies and advances happening in the sector. Students can interact with farmers and get awareness of the problems faced in the sector. In addition, it also improves the soft skills of the student, a necessary pre-requisite in the industrial field.

DEMONSTRATION

Though demonstration we can present an item / product and emphasize its features very effectively.

Eg: - To identify the body parts of a cow

1. Live animal
2. Demonstration
3. Venue - open area around school / field
4. Additional requirements - necessary personnel for handling the animal

Demonstration Process

1. Introduction about approaching the animal and purpose of identification
2. Procedure - facilitator first demonstrates the body parts of cattle
3. Practice - students practice under the monitoring of facilitator
4. Evaluation - based on the performance during demonstration

CHART DISPLAY

It is also one of the important teaching aids. It can be used in every activity of a learning process. Chart display is a written or pictorial representation of idea or concept. It is cheap, brief and clear. The learner can retain the ideas in his mind for longer periods and a complicated idea can be simplified though a chart.

POULTRY CLUB

Poultry clubs can be implemented in schools in association with Kerala Animal Husbandry Department. Day old chicks / grower birds will be provided to students from veterinary hospitals and students can rear the birds in their homes, keep a record of their observations and thereby get a hands-on experience in rearing birds. Students and their family will develop an interest in livestock rearing and such ventures will enhance the interest of the community as such. Students will be given support in the form of training, supply of free feed and free treatment.

ICT ENABLED EDUCATION

With the development of modern technology, ICT enabled education serves a pivotal role in efficient transaction of concepts to students. Concepts will get imprinted in students' minds if the ICT aids like videos, simulations and power-point presentations were employed. Computer simulations are particularly useful for those topics which cannot be demonstrated on live animals like dissections, artificial insemination methods and painful procedures like branding. Power point presentations can be prepared for almost all topics especially for topics like breeds of animals and animal anatomy. Various milk and meat products can be prepared with the help of videos.

INCLUSIVE EDUCATION

Livestock management course has very much importance in inclusive education system. Researchers have proved that caring and playing with animals especially pet animals and birds shall gradually improve the overall mental and physical performance of differently abled students. ICT enabled education can help a lot in proper transaction of concepts and increase the interest of students in the course. Livestock rearing may help to improve the living standards of the students from poor backgrounds by generating income through livestock rearing. Livestock management course is suitable for all sections of students in terms of skill, knowledge, mental, physical, social and financial development.

APPRENTICESHIP TRAINING

After the completion of LSM course, students get the opportunity for undergoing apprenticeship training in suitable institutions/schools as per Central Government norms which will polish their already learnt skills and knowledge besides getting some remuneration. This will also ennoble students for getting permanent jobs in the same institutions if they perform satisfactorily.

SYLLABUS

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES

Unit 1 : Introduction to Animal Husbandry (40 periods) (4 scores)

Livestock statistics

- Current population status of cattle, buffalo, goat, sheep, pig, chicken, duck, turkey, quail.

Contribution of livestock to Indian Economy

- Current production status of livestock sector
- Impact of livestock sector on Indian economy

Common terminologies of Animal Husbandry

- Different terms associated with the husbandry of cattle, buffalo, goat, sheep, pig, chicken, duck, turkey and quail

Farming systems

- Farming systems and types of Dairy farming

Livestock farming

- merits and demerits
  - Advantages of rearing animals and birds
  - Disadvantages of rearing animals and birds

Unit 2 : Breeds of Livestock (60 periods) (6 scores)

Introduction to breeds

- Definition of breed , class, variety and strain
- Comparison of Indian and exotic breeds of cattle
- Classification and comparison of breeds according to origin and utility

Breeds of cattle

- Origin, breed characteristics and salient features of Sahiwal, Red Sindhi, Gir, Deoni, Hallikar, Kangayam, Amrit Mahal, Kankrej, Hariana, Tharparkar, Vechur, Kasaragod dwarf, Jersey, Holstein Friesian, Brown Swiss

Breeds of buffalo

- Origin, breed characteristics and salient features of Murrah, Surti, Jaffarabadi and Mehsana, Nili Ravi

Breeds of goats and sheep

- Origin, breed characteristics and salient features of Malabari, Attapady black, Beetel, Jamunapari, barbari, Saanen, Alpine, Boer, Kashmeeri, Marwari, merino etc.

Breeds of pigs

- Origin, breed characteristics and salient features of large white Yorkshire, Landrace, Duroc, Berkshire, Hampshire

Breeds of chicken

- Origin, breed characteristics and salient features of White leghorn, Black Minorca, RIR, New Hampshire, Australorp, Plymouth rock, Cornish, Brahma, Cochin, Aseel, Kadaknath, Naked neck, Austro-white, Gramapriya, Athulya, Giriraja

Breeds of duck, turkey, quail

- Origin, breed characteristics and salient features of Muscovy, White Pekin, Indian runner, Khakhi Campbell, Chara, Chemballi, Broad breasted bronze, Beltsville small white, Japanese quail, Bobwhite quail

Unit 3 : Restraining of Animals (50 periods) (7 scores)

Approaching the animal

- Animal behaviour
- Precautions while approaching the animal

Restraining of head and limbs

- Purpose of restraining
- Method of Restraining of head and neck
- Method of Restraining of fore and hind limbs

Whole body restraining

- Precautions for casting
- Reuff's method of casting
- Alternate method of casting

Instruments used for controlling animals

- Instruments used for controlling head, limbs and whole body
- The method of use of selected instruments like anti-cow kicker, milk man's rope, trevis and mouth gags

Unit 4 : Identification of Animals and Age Determination of Cattle (50 periods) (6 scores)

Introduction to identification of animals

- Purpose of identification
- Comparison of different methods of identification commonly used in animals

Commonly used methods of identification in animals and birds

- Hot iron branding, Chemical branding, Freeze branding, Tattooing, Tagging, Ear notching, Wing/leg band s, wing badges for birds, Electronic chips/transponders

Determination of age in cattle

- Importance of age determination in cattle
- Dental formula in cattle (permanent and deciduous)
- Age determination by looking at dentition
- Age determination by looking horn rings

Unit 5 : Anatomy and Physiology (100 periods) (12 scores)

Basics of anatomy and physiology with special reference to anatomical peculiarities of cattle, goat, pig, dog

- Definitions
- Anatomical Peculiarities (bone, RBC, liver, kidney, spleen, stomach)

Body parts of cattle

- Different body parts (regions, body cavities, joints, bones)

Normal physiological values of animals

- Significance of normal physiological values
- Normal range of values in cattle, buffalo, goat, pig, dog and chicken(temperature, pulse, respiration, age of puberty, rumen motility, gestation period, life span)

Measuring the most important normal physiological values of cattle

- Measuring Pulse
- Recording Respiration
- Recording rectal temperature
- Rumen motility
- Different conditions in which the normal values change

Structure and function of ruminant stomach

- Structure of ruminant stomach
- Process of ruminant microbial digestion

Structure and function of reproductive system of cattle

- Detailed structure and function of bovine female reproductive System
- Detailed structure and function of bovine male reproductive system
- Structure of bovine spermatozoa

Hormonal regulation of reproduction and oestrus cycle

- Hormonal interplay of female reproduction
- Hormonal interplay of male reproduction
- Sexual maturity and puberty
- Estrus cycle and heat signs

Structure and function of mammary gland

- Structure of udder
- Mechanism of milk production
- Hormonal role in lactation
- Peak production and drying up
- Milking methods
- Machine milking

Unit 6 : Rearing and Housing of Livestock (45 periods) (5 scores)

Establishment of livestock farm

- Requirements for dairy and poultry farms
- Systems of rearing for cattle

- Free range system
- Intensive system
- Semi-intensive system

- Systems of rearing for poultry
  - Free range system
  - Intensive system (deep litter and cage system)
  - Semi-intensive system

Housing of cattle and poultry

- Requirements and dimensions of a standard cattle shed and poultry house
- roofing, flooring, sidewalls
- Hi tech dairy farm / Milking parlour
- Mechanization of cattle farm
- Tail-to-tail system
- Head-to-head system

Manure and waste disposal

- Collection, storage and disposal of manure
- Vermi-composting
- Structure of Biogas plant

Module 2 : DAIRY AND MEAT ANIMAL MANAGEMENT

Unit 1 : Breeding and Reproduction in Animals (80 periods) (15 scores)

Basic concepts in breeding

- Genotype and phenotype

Selection and breeding methods

- Random selection, Individual selection, Family selection, Pedigree selection, Progeny testing, In-breeding, Out-breeding, Methods of cross breeding

Artificial insemination (A.I) in animals

- Purpose of A.I
- Semen collection and examination
- Semen extenders and preservation
- Familiarization of equipment used for A.I
- Heat detection
- Technique of A.I in cattle (Recto vaginal method)
- Speculum method for small animals

Pregnancy and parturition

- Basic concepts of gestation period, fertilization and placentation
- Pregnancy diagnosis
- Stages of parturition and signs of calving

- Difficult calving (dystocia)
- Involution of uterus, service period, inter-calving period, dry period

Embryo transfer technology

- Uses of embryo transfer technology
- Method of embryo transfer Technology

Infertility in cattle

- Concepts of infertility and sterility
- Causes of infertility

Unit 2 : Care and Management of Cattle (50 periods) (7 scores)

Care and management of new born calves

- Importance of colostrum feeding
- Artificial respiration
- Cutting of umbilical cord
- Weaning
- Feeding of calves
- Dehorning
- Deworming
- Castration

Effect of climate on animals

- Homeostasis
- Critical temperature
- Summer management

Herd replacement

- Culling and replacement
- Methods of culling and replacement

Unit 3 : Principles of Feeding (50 periods) (4 scores)

Important nutrients required for animals -

- Water, Protein, Carbohydrates, Lipids, Vitamins, Minerals

Important concepts of feed formulation

- Proximate principles like Digestible crude protein (D.C.P), metabolizable energy (M.E), total digestible nutrients (T.D.N) etc.
- B.I.S specifications of feed
- Feed mixing

Different feed ingredients and preservation of fodder

- Concentrate feed ingredients
- Roughages
- Unconventional feed stuff

- Leguminous fodder (cow pea, subabul)
- Cultivation details of different fodder grasses (Guinea, Napier, para, congo signal)
- Preserved fodder (Silage, Hay, Straw)
- Nutrient enrichment of straw using urea
- Commercial feed for cattle (TMR feed, by pass protein feed)

Thumb rules for feeding animals

- Maintenance ration for each category of animals
- Production ration for lactating animal
- Pregnancy ration
- Ration for draught animals

Unit 4 : Health Care (80 periods) (7 scores)

Health assessment

- Definition of health and disease
- Signs of health

Natural defense mechanisms

- Functions of different body parts in preventing disease

Routes of infection and classification of diseases

- Different ways in which micro-organisms enter animal body
- Types of diseases

Common diseases of animals

- Etiology, Important symptoms and control measures of
  - Bacterial diseases
  - Viral diseases
  - Metabolic diseases
  - Parasitic diseases
- Phyto and chemical toxicity in cattle

Control of diseases

- Treatment
- Disinfection
- Vaccination
- Quarantine
- Disposal of dead animals

Unit 5 : Husbandry of Goats (40 periods) (4 scores)

Introduction to goat rearing

- Advantages of goat rearing

Care and management of different age groups of goats

- Housing requirements of goats

- Feeding of goats
- Care and management of kids
- Care and management of does and bucks
- Care and management of pregnant does
- Care and management of lactating does

Breeding and selection of dairy goats

- Selection methods
- Breeding methods

Diseases of goats

- A brief awareness on common bacterial, viral, metabolic diseases of goats and control measures

Unit 6 : Swine Husbandry (40 periods) (3 scores)

Introduction to swine rearing

- advantages and disadvantages of pig farming

Housing requirements of swine

- general guidelines of housing
- space requirements for housing piglets, boar, sow, breeding animals

Age wise management of pigs (breeding boar, sow and piglets)

- Selection criteria for breeding boar
- feeding and management of boar
- feeding and management of female pigs (gilts, pregnant sows, farrowing sow)
- feeding and management of piglets

LEARNING OUTCOMES

After the end of first and second modules, the learner will be able to:

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES

Unit No. 1 : Introduction to Animal Husbandry

1.1.1. Conduct surveys about animal husbandry sector and analyze collected data

1.1.2. Explain the contributions of livestock sector in Indian economy and prepare reports/charts

1.1.3. Correlate and differentiate the basic terminologies of animal husbandry

1.1.4. Select suitable farming system for varied farming situations

1.1.5. Analyze and understand merits and demerits of livestock farming

1.1.6. Solve the problems of livestock farming

Unit No 2 : Breeds of livestock

1.2.1. Differentiate Indian and exotic breeds of cattle

1.2.2. Classify and choose appropriate breeds according to purpose

1.2.3. Identify different breeds of cattle and choose the suitable breed according to purpose

1.2.4. Identify different breeds of buffalo and choose the suitable breed according to purpose

1.2.5. Identify different breeds of goat/sheep and choose the suitable breed according to purpose

1.2.6. Identify different breeds of chicken and choose the suitable breed according to purpose

1.2.7. Identify the duck/turkey/quail breeds and choose the suitable breed according to purpose

Unit No 3 : Restraining of animals

1.3.1. Approach the animal properly after observing the behavior of animals

1.3.2. Control the head and limbs of cattle for various field purposes

1.3.3. Control the whole body of animal for various field purposes

1.3.4. Select suitable instrument for controlling the animal

1.3.5. Handle the instrument properly for restraining the body part

Unit No 4 : Identification of animals and age determination in cattle

1.4.1. Choose suitable identification method for animals -age wise and species wise

1.4.2. Perform different identification methods in cattle

1.4.3. Determine the age of cattle based on dentition or horn rings

Unit No 5 : Anatomy and Physiology

1.5.1. Differentiate organs of different species

1.5.2. Identify the body parts and apply the knowledge for various procedures

1.5.3. Describe the normal physiological parameters

1.5.4. Measure the normal values using respective instruments/methods

1.5.5. Assess the variation and draw the inference

1.5.6. Illustrate the structure and explain the function of ruminant stomach

1.5.7. Illustrate the structure and explain the function of reproductive systems of cattle

1.5.8. Explain anatomy and physiology for procedures viz., artificial insemination, heat detection, pregnancy diagnosis

1.5.9. Chart out the interplay of hormones in bovine reproduction

1.5.10. Efficient detection of heat in animals and determine the correct time for insemination

1.5.11. Milk the animal properly

1.5.12. Sketch and label the parts of milking machine

Unit No 6 : Rearing and housing of livestock

1.6.1. Select the suitable farm site

1.6.2. Choose the appropriate rearing system

1.6.3. Prepare layout of farms

1.6.4. Sketch the layout of a cattle shed / poultry shed with dimensions

1.6.5. Assist in the construction of standard cattle sheds and poultry houses

1.6.6. Appraise the importance of Hi-tech dairy farming

1.6.7. Narrate the waste disposal mechanisms that can be implemented in a farm

1.6.8. Illustrate the basic structure and function of modern biogas plant

Module 2 : DAIRY AND MEAT ANIMAL MANAGEMENT

Unit No. 1 : Breeding and reproduction in animals

2.1.1. Describe the important concepts of breeding animals

2.1.2. Differentiate the breeding methods and apply the knowledge for selecting suitable animals.

2.1.3. Prepare semen extenders like egg yolk citrate

2.1.4. Prepare the appropriate instruments for A.I

2.1.5. Explain the basic concepts of gestation, stages of pregnancy, dystocia

2.1.6. Enlist important steps of embryo transfer technology

2.1.7. Analyze the prevalence and causes of infertility in a locality from hospital records

Unit No. 2 : Care and Management of cattle

2.2.1. Care a new born calf under field conditions

2.2.2. Perform basic procedures of calf management

2.2.3. Provide appropriate care for animals during summer season

2.2.4. State the basic concepts of herd replacement

Unit No. 3 : Principles of feeding

2.3.1. Recognize the important components of feed materials

2.3.2. Describe the proximate principles in feed formulation

2.3.3. Differentiate and categorize various feed ingredients

2.3.4. Describe the Preservation methods of fodder

2.3.5. Calculate the feed required for different categories of cattle

Unit No. 4 : Health care

2.4.1. Differentiate healthy and diseased animals by monitoring the physical signs

2.4.2. Explain inherent immune mechanisms of animal body in preventing diseases

2.4.3. List out the routes of infection

2.4.4 Classify diseases according to etiology

2.4.5. Analyze of hospital data and find out the prevalence of diseases in a locality

2.4.6. Make tentative diagnosis of common diseases of cattle based on symptoms

2.4.7. Control/take preventive measures of animal diseases under field conditions

2.4.8. Perform vaccinations in livestock

Unit No. 5 : Husbandry of goats

2.5.1. Compare the advantages of goats and cattle

2.5.2. Perform routine activities in a goat farm

2.5.3. Detection of heat by observing heat signs and determine the correct time for breeding

2.5.4. Make tentative diagnosis of common diseases of goats based on symptoms

Unit No. 6 : Swine Husbandry

2.6.1. Enlist the advantages of pig farming

2.6.2. Prepare layout of pig sties with reference to basic requirements

2.6.3. Perform routine operations in a pig farm

SCHEME OF WORK (MODULE 1 AND 2)

Month	Module	Unit	Period
June	1	Introduction to animal husbandry Breeds of livestock	80
July	1	Breeds of livestock Restraining of animals	80
August	1	Identification of animals Anatomy and physiology	80
September	1	Anatomy and physiology Rearing and housing of animals	80
October	1	Rearing and housing of animals	20
	2	Breeding and reproduction in animals	60
November	2	Breeding and reproduction in animals Care and management Principles of feeding	80
December	2	Principles of feeding Health care	80
January	2	Health care Husbandry of goats Swine husbandry	80
February	2	Swine husbandry	40

COURSE STRUCTURE FOR TWO YEARS

The course will have four modules viz.,

Sl. No.	Name of Module	Periods
1	Basic Animal Husbandry Practices	340
2	Dairy and Meat Animal Management	340
3	Poultry, Pet and Lab Animal Management	340
4	Livestock Products Processing and Food Safety	340

CLASS ROOM ACTIVITIES

General discussion, debate, brainstorming, chart preparation, model preparation, demonstration, spotting, power point presentation, video analysis, live animal demonstration, seminars, album preparation, quiz, role play etc.

PRACTICAL ACTIVITIES

Field / farm visit, surveys, farm layout preparation, hands-on training in animal farms, field data collection, interview with farmers, specimen / sample collection, simulated experiments, processing of livestock products, microscopic examinations

ON- THE-JOB TRAINING

On the job training is an integral part of vocational education system. It provides hands-on experience and awareness about latest field level trends related to each vocational course which cannot be taught in class room situations. OJT helps the students to understand the application of their vocational knowledge and skill in different field level situations properly. Also students can understand the nature of their job roles in different institutions and fields, interaction with different groups, job prospects etc. Able students shall get jobs in the OJT centers regularly. OJT boost the confidence of the students to achieve jobs or pursue higher studies in the respective vocation.

Four modules of livestock management course need one month OJT programme. It may be conducted as 2 weeks in first year and 2 weeks in second year. Flexibility should be given for each course on the time of conducting OJT. Normally it can be conducted at the time of second and fourth module in each year.

In case of livestock management (LSM) course OJT is mainly conducted in Government or Semi-Government institutions as private firms in this area are rare in Kerala. So the VHSE department can make MOU with these Government firms for smooth and proper conduct of OJT in LSM course.

CERTIFICATION

Skill certificate shall be given for each module after the successful completion of all four modules. The respective skills acquired by the student shall be mentioned in the concerned certificate.

1. Certificate in Basic Animal Husbandry Practices
2. Certificate in Dairy and Meat Animal Management
3. Certificate in Poultry, Pet and Lab Animal Management
4. Certificate in Livestock Products Processing and Food Safety

MODULE 1 (BASIC ANIMAL HUSBANDRY PRACTICES)

Overview: This module provides all the fundamental concepts of animal husbandry which serve as a platform for the rest of modules. The module is comprised of topics which introduce the student to basic terminologies of animal husbandry, current status of the livestock sector in Kerala and India, salient features for distinguishing various breeds of livestock, measures for controlling animals for different purpose,

preliminary knowledge of animal anatomy/physiology, rearing practices of cattle and methods for identification.

Skills: The module envisages imparting the following skills,

- Conduct surveys about animal husbandry sector and analyze collected data
- Identify, differentiate and categorize breeds of livestock
- Control and restrain domestic animals for various purposes
- Implement suitable and species specific identification methods
- Application of knowledge of anatomy and physiology during procedures
- Recording various physiological parameters of cattle
- Implement appropriate rearing systems for livestock

PERIODS : 340

UNITS

Unit No.	Name of the unit	Periods
1.1	Introduction to Animal Husbandry	40
1.2	Breeds of Livestock	60
1.3	Restraining of animals	50
1.4	Identification of animals and age determination in cattle	45
1.5	Anatomy and Physiology	100
1.6	Rearing and housing of animals	45
	Total periods	**340**

30 % periods for theory and 70 % for practicals

SPECIFIC ELEMENTS OF UNITS

Unit No. 1.1

Name of the unit: Introduction to Animal Husbandry

Unit Element No.	Name of the unit	Periods
1.1.1	Livestock statistics	10
1.1.2	Contribution of livestock to Indian Economy	5
1.1.3	Common terminologies of Animal Husbandry	10
1.1.4	Farming systems	8
1.1.5	Livestock farming - merits and demerits	7
	Total periods	**40**

Unit No. 1.2

Name of the unit: Breeds of Livestock

Unit Element No.	Name of the unit	Periods
1.2.1	Introduction to breeds	5
1.2.2	Breeds of cattle	20
1.2.3	Breeds of buffalo	5
1.2.4	Breeds of goats and sheep	5
1.2.5	Breeds of pigs	5
1.2.6	Breeds of chicken	15
1.2.7	Breeds of duck, turkey, quail	5
	Total periods	**60**

Unit No. 1.3

Name of the unit: Restraining of Animals

Unit Element No.	Name of the unit	Periods
1.3.1	Approaching the animal	5
1.3.2	Restraining head and limb	10
1.3.3	Whole body restraining	15
1.3.4	Instruments used for controlling animals	20
	Total periods	**50**

Unit No. 1.4

Name of the unit: Identification of Animals and Age Determination of Cattle

Unit Element No.	Name of the unit	Periods
1.4.1	Introduction to identification of animals	5
1.4.2	Commonly used methods of identification in animals and birds	30
1.4.3	Determination of age in cattle	10
	Total periods	**45**

Unit No. 1.5

Name of the unit: Anatomy and Physiology

Unit Element No.	Name of the unit	Periods
1.5.1	Basics of anatomy and physiology with special reference to anatomical peculiarities of cattle, goat, pig, dog	5
1.5.2	Normal physiological values of animals	10
1.5.3	Measuring the most important normal physiological values of cattle	30
1.5.4	Structure and function of ruminant stomach	15
1.5.5	Structure and function of reproductive system of cattle	20
1.5.6	Hormonal regulation of reproduction and oestrus cycle	10
1.5.7	Structure and function of mammary gland	10
	Total periods	**100**

Unit No. 1.6

Name of the unit: Rearing and Housing of Livestock

Unit Element No.	Name of the unit	Periods
1.6.1	Establishment of livestock farm	5
1.6.2	Housing of cattle and poultry	30
1.6.3	Manure and waste disposal	10
	Total periods	**45**

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES **Unit 1.1 : INTRODUCTION TO ANIMAL HUSBANDRY**

Ideas/Concepts/Skill	Learning Outcomes	Suggested Activities	Assessment
Livestock statistics • Current population status of cattle, buffalo, goat, sheep, pig, chicken, duck, turkey, quail. **SKILLS:** • Communication skill • Data collection skill • Observation skill • Analytical skill	*The learner will be able to:* • Conduct surveys about animal husbandry sector and analyze collected data	• General discussion • Data collection/ Assignment • Field visit • Survey	• Participation in discussion and content of prepared notes • Collection • Field visit report • Survey report
Contribution of livestock to Indian Economy • Current production status of livestock sector • Impact of livestock sector on Indian economy **SKILLS:** • Communication skill • Data collection skill • Observation skill • Analytical skill	• Explain the contributions of livestock sector in Indian economy and prepare a report or charts	• General discussion • Chart preparation by students • Data collection from internet	• Participation in discussion and content of prepared notes • Report/Chart • Seminar
Common terminologies of Animal Husbandry - Different terms associated with the husbandry of cattle, buffalo, goat, sheep, pig, chicken, duck, turkey, quail **SKILLS:** • Observation skill • Classification skill • Skill of charting	• Correlate and differentiate the basic terminologies of animal husbandry	• General discussion • Chart preparation by students • Referring standard text books • Quiz	• Participation in discussion and content of prepared notes • Performance during Quiz • Perfection of prepared Chart

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES **Unit 1.1 : INTRODUCTION TO ANIMAL HUSBANDRY**

Ideas/Concepts/Skill	Learning Outcomes	Suggested Activities	Assessment
Farming systems • Farming systems and types of Dairy farming **SKILLS:** • Communication skill • Data collection skill • Observation skill • Selection skill	• Select suitable farming system for varied farming situation	• General discussion • Field visit • Power point presentation	• Participation in discussion and content of prepared notes • Field visit report
Livestock farming • merits and demerits • Advantages of rearing animals and birds • Disadvantages of rearing animals and birds **SKILLS:** • Communication skill • Charting skill • Consolidation • Problem solving	• Analyze and understand merits and demerits of livestock farming • Solve the problems of livestock farming	• Debate • Brain storming • Chart preparation • Case study	• Performance in debate • Performance in brain storming • Perfection of prepared chart • Unit test • Case study report

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES **Unit 1.2 : BREEDS OF LIVESTOCK**

Ideas/Concepts/Skill	Learning Outcomes	Suggested Activities	Assessment
Introduction to breeds • Definition of breed , class, variety and strain • Comparison of Indian and exotic breeds of cattle • Classification and comparison of breeds according to origin and utility **SKILLS:** • Communication skill • Selection skill • Skill for classification • Charting skill	*The learner will be able to:* • Differentiate Indian and exotic breeds of cattle • Classify and choose appropriate breeds according to purpose	• General discussion • Debate • Charts/Assignment preparation • Picture collection or album preparation • Power point presentation • Brainstorming	• Participation in discussion and content of prepared notes • Contribution in debate • Perfection of chart/ assignment • Comprehensiveness of prepared album • Participation in brain storming
Breeds of cattle • Origin, breed characteristics and salient features of Sahiwal, Red Sindhi, Gir, Deoni, Hallikar, Kangayam, Amrit Mahal, Kankrej, Hariana, Tharparkar, Vechur, Kasargod dwarf, Jersey, Holstein Friesian, Brown Swiss **SKILLS:** • Communication skill • Identification skill • Skill for choosing • Charting skill • Differentiating skill	• Identify different breeds of cattle and choose the suitable breed according to the situation or purpose	• General discussion • Preparation of Charts/Assignment • Picture collection or album preparation • Power point presentation • Quizzing • Seminar • Spotting using photographs	• Participation in discussion and content of prepared notes • Perfection of chart/ assignment • Comprehensiveness of prepared album • Performance in Quiz • Comprehensiveness of seminar report • Performance in spotting

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES **Unit 1.2 : BREEDS OF LIVESTOCK**

Ideas/Concepts/Skill	Learning Outcomes	Suggested Activities	Assessment
Breeds of buffalo • Origin, breed characteristics and salient features of Murrah, Surti, Jaffarabadi and Mehsana, Nili Ravi **SKILLS:** • Communication skill • Identification skill • Skill for choosing • Charting skill • Differentiating skill	*The learner will be able to:* • Identify different breeds of buffalo and choose the suitable breed according to the situation/purpose	• General discussion • Preparation of charts/Assignment • Picture collection or album preparation • Power point presentation • Quizzing • Seminar • Spotting using photographs	• Participation in discussion and content of prepared notes • Perfection of chart/ assignment • Comprehensiveness of prepared album • Performance in Quiz • Comprehensiveness of seminar report • Performance in spotting
Breeds of goats and sheep • Origin, breed characteristics and salient features of Malabari, Attapady black, Beetel, Jamunapari, Barbari, Saanen, Alpine, Boer, Kashmiri, Marwari, Merino etc. **SKILLS:** • Communication skill • Identification skill • Skill for choosing • Charting skill • Differentiating skill	• Identify different breeds of goat/ sheep and choose the suitable breed according to the situation or purpose	• General discussion • Preparation of Charts/Assignment • Picture collection or album preparation • Power point presentation • Quizzing • Seminar • Spotting using photographs	• Participation in discussion and content of prepared notes • Perfection of chart/ assignment • Comprehensiveness of prepared album • Performance in Quiz • Comprehensiveness of seminar report • Performance in spotting

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES **Unit 1.2 : BREEDS OF LIVESTOCK**

Ideas/Concepts/Skill	Learning Outcomes	Suggested Activities	Assessment
Breeds of pigs • Origin, breed characteristics and salient features of large white Yorkshire, Landrace, Duroc, Berkshire, Hampshire **SKILLS:** • Communication skill • Identification skill • Skill for choosing • Charting skill • Differentiating skill	*The learner will be able to:* • Identify different breeds of pig and choose the suitable breed according to the situation or purpose	• General discussion • Preparation of Charts/Assignment • Picture collection or album preparation • Power point presentation • Quizzing • Seminar • Spotting using photographs	• Participation in discussion and content of prepared notes • Perfection of chart/ assignment • Comprehensiveness of prepared album • Performance in Quiz • Comprehensiveness of seminar report • Performance in spotting
Breeds of chicken • Origin, breed characteristics and salient features of White leghorn, Black Minorca, RIR, New Hampshire, Australorp, Plymouth rock, Cornish, Brahma, Cochin, Aseel, Kadaknath, Naked neck, Austro-white, Gramapriya, Athulya, Giriraja **SKILLS:** • Communication skill • Identification skill • Skill for choosing • Charting skill • Differentiating skill	• Identify different breeds chicken and choose the suitable breed according to the situation or purpose.	• General discussion • Preparation of Charts/Assignment • Picture collection or album preparation • Power point presentation • Quizzing • Seminar • Spotting using photographs	• Participation in discussion and content of prepared notes • Perfection of chart/ assignment • Comprehensiveness of prepared album • Performance in Quiz • Comprehensiveness of seminar report • Performance in spotting

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES	Unit 1.2 : BREEDS OF LIVESTOCK		
Ideas/Concepts/Skill	**Learning Outcomes**	**Suggested Activities**	**Assessment**
Breeds of duck, turkey, quail • Origin, breed characteristics and salient features of Muscovy, White Pekin, Indian runner, Khakhi Campbell, Chara, Chemballi, Broad breasted bronze, Beltsville small white, Japanese quail, Bobwhite quail **SKILLS:** • Communication skill • Identification skill • Skill for choosing • Charting skill • Differentiating skill	*The learner will be able to:* • Identify different breeds of duck/ turkey/quail and choose the suitable breed according to the situation/ purpose	• General discussion • Preparation of Charts/Assignment • Picture collection or album preparation • Power point presentation • Quizzing • Seminar • Spotting using photographs	• Participation in discussion and content of prepared notes • Perfection of chart/ assignment • Comprehensiveness of prepared album • Performance in Quiz • Comprehensiveness of seminar report • Performance in spotting • Unit test
Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES	**Unit 1.3 : RESTRAINING OF ANIMALS**		
Approaching the animal • Animal behaviour • Precautions while approaching the animal **SKILLS:** • Communication skill • Observation skill • Skill for demonstration • Performance skill • Analysis skill	• Approach the animal properly after observing the behaviour of animals.	• General discussion • Live animal demonstration and practice • Spot viva • Video analysis	• Participation in discussion and content of prepared notes • On site observation while practice • Performance in spot viva voce • Performance during video analysis

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES **Unit 1.3 : RESTRAINING OF ANIMALS**

Ideas/Concepts/Skill	Learning Outcomes	Suggested Activities	Assessment
Restraining of head and limbs • Purpose of restraining • Method of Restraining of head and neck • Method of Restraining of fore and hind limbs **SKILLS:** • Communication skill • Observation skill • Skill for demonstration • Performance skill • Analysis skill	*The learner will be able to:* • Control the head and limbs of cattle for various field purposes	• Live animal demonstration and practice • Spot viva • Power point presentation • Video analysis	• Onsite observation while practice • Performance in spot viva voce • Performance during video analysis
Whole body restraining • Precautions for casting • Reuff's method of casting • Alternate method of casting **SKILLS:** • Communication skill • Observation skill • Skill for demonstration • Performance skill • Analysis skill	• Control the whole body of animal for various field purposes	• Live animal demonstration and practice • Spot viva • Power point presentation • Video analysis • Practicing on a "dummy cow"	• Onsite observation while practice • Performance in spot viva voce • Performance during video analysis

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES	Unit 1.3 : RESTRAINING OF ANIMALS		
Ideas/Concepts/Skill	**Learning Outcomes**	**Suggested Activities**	**Assessment**
Instruments used for controlling animals • Instruments used for controlling head, limbs and whole body • The method of use of selected instruments like anti-cow kicker, milk man's rope, trevis and mouth gags **SKILLS:** • Communication skill • Observation skill • Skill for demonstration • Performance skill • Analytical skill	*The learner will be able to:* • Select suitable instrument for controlling the animal • Handle the instruments properly for restraining the body part	• Spotting using models of instruments • Picture collection • Power point presentation • Demonstration on live animal and practice • Spot viva • Video analysis • Practicing on a "dummy cow" • Field visit	• Performance in spotting • Onsite observation while practice • Performance in spot viva voce • Field visit report • Unit test • Performance during video analysis
Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES	**Unit 1.4 : IDENTIFICATION OF ANIMALS AND AGE DETERMINATION IN CATTLE**		
Introduction to identification of animals • Purpose of identification • Comparison of different methods of identification commonly used in animals **SKILLS:** • Selecting skill • Comparing skill • Skill of charting	• Choose suitable identification method for animals - age wise and species wise	• General discussion • Chart preparation	• Participation in discussion and content of prepared notes • Perfection of prepared chart

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES Unit 1.4 : IDENTIFICATION OF ANIMALS AND AGE DETERMINATION IN CATTLE

Ideas/Concepts/Skill	Learning Outcomes	Suggested Activities	Assessment
Commonly used methods of identification in animals and birds • Hot iron branding, Chemical branding, Freeze branding, Tattooing, Tagging, Ear notching, Wing/leg band s, wing badges for birds, Electronic chips/ transponders **SKILLS:** • Observation skill • Performing skill • Skill of presentation • Analytical skill	*The learner will be able to:* • Perform different identification methods in cattle	• General discussion • Power point presentation. • Field visit • Flash card preparation • Video analysis • Spotting of instruments	• Participation in discussion and content of prepared notes • Field visit report • Perfection of flash cards • Performance in spotting • Performance during video analysis
Determination of age in cattle • Importance of age determination in cattle • Dental formula in cattle (permanent and deciduous) • Age determination by looking at dentition • Age determination by looking at horn rings **SKILLS:** • Observation skill • Communication skill • Skill of charting • Skill of presentation • Skill of calculation	• Determine the age of cattle based on dentition or horn rings	• General discussion • Chart/ Assignment preparation • Field visit • Power point presentation • Live animal practical • Spot viva • Referring standard books	• Participation in discussion and content of prepared notes • Prepared Chart/Assignment • Field visit report • Onsite observation during live demo • Performance in spot viva • Unit test

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES		Unit 1.5 : ANATOMY AND PHYSIOLOGY	
Ideas/Concepts/Skill	**Learning Outcomes**	**Suggested Activities**	**Assessment**
Basics of anatomy and physiology with special reference to anatomical peculiarities of cattle, goat, pig, dog • Definitions • Anatomical Peculiarities (bone, RBC, liver, kidney, spleen, stomach) **SKILLS:** • Skill of collection • Classification skill • Skill of charting	*The learner will be able to:* • Differentiate organs of different species	• General discussion • Chart preparation • Referring standard text books • Mounting slaughter house specimens • Organ models • Pictures/power point presentation • Spotting using the specimens and models	• Participation in discussion and content of prepared notes • Perfection of prepared chart • Based on collected specimens and its preservation • Performance in spotting
Body parts of cattle • Different body parts (regions, body cavities, joints, bones) **SKILLS:** • Observation skill • Skill to perform • Skill of modeling	• Identify the body parts and apply the knowledge for various procedures	• General discussion • Live animal demonstration • Spot viva • Demonstration with dummy/model • Power point presentation	• Participation in discussion and content of prepared notes • Onsite observation while practice • Performance in Spot viva voce
Normal physiological values of animals • Significance of normal physiological values • Normal range of values in cattle, buffalo, goat, pig, dog and chicken (temperature, pulse, respiration, age of puberty, rumen motility, gestation period, life span) **SKILLS:** • Understanding skill • Recollection skill • Skill of charting	• Describe the normal physiological parameters	• General discussion • Chart preparation • Referring standard text books • Quizzing	• Participation in discussion and content of prepared notes • Perfection of prepared chart • Performance in Quiz

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES		Unit 1.5 : ANATOMY AND PHYSIOLOGY	
Ideas/Concepts/Skill	**Learning Outcomes**	**Suggested Activities**	**Assessment**
Measuring the most important normal physiological values of cattle • Measuring Pulse • Recording Respiration • Recording rectal temperature • Rumen motility • Different conditions in which the normal values change **SKILLS:** • Measuring skill • Demonstrating skill • Analytical skill • Skill of diagnosing	*The learner will be able to:* • Measure the normal values using respective instruments/methods • Assess the variation and draw the inference	• General discussion • Charts • Referring standard text books • Live animal demo and practice • Hospital visit • Quizzing	• Participation in discussion and content of prepared notes • Perfection of prepared chart • Performance during live animal practical • Field visit report • Performance in Quiz
Structure and function of ruminant stomach • Structure of ruminant stomach • Process of ruminant microbial digestion **SKILLS:** • Drawing skill • Skill of collection • Skill of preservation • Skill of identification	• Illustrate the structure and explain the function of ruminant stomach	• General discussion • Slaughter house specimens • Power point presentation	• Participation in discussion and content of prepared notes • Based on collected specimens and its preservation • Spotting

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES		Unit 1.5 : ANATOMY AND PHYSIOLOGY	
Ideas/Concepts/Skill	**Learning Outcomes**	**Suggested Activities**	**Assessment**
Structure and function of reproductive system of cattle • Detailed structure and function of bovine female reproductive System • Detailed structure and function of bovine male reproductive system • Structure of bovine spermatozoa **SKILLS:** • Understanding skill • Skill of collection • Skill of preservation • Skill for application • Skill of identification	*The learner will be able to:* • Illustrate the structure and explain the function of reproductive systems of cattle • Describe the anatomy and physiology for procedures viz., artificial insemination, heat detection, pregnancy diagnosis	• General discussion • Charts • Referring standard text books • Mounting slaughter house specimens • Preparing organ models • Microscopic examination	• Participation in discussion and content of prepared notes • Perfection of prepared chart • Based on collected specimens and its preservation • Based on the prepared models
Hormonal regulation of reproduction and oestrus cycle • Hormonal interplay of female reproduction • Hormonal interplay of male reproduction • Sexual maturity and puberty • Estrus cycle and heat signs **SKILLS:** • Understanding skill • Skill of charting • Analytical skill • Skill of calculation	• Chart out the interplay of hormones in bovine reproduction • Efficient detection of heat in animals and determine the correct time for insemination	• General discussion • Chart preparation • Referring standard text books • Observing live animal and drawing inferences • Hospital visit • Role play	• Participation in discussion and content of prepared notes • Perfection of prepared chart • Observations from live animal • Performance in role play

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES	Unit 1.5 : ANATOMY AND PHYSIOLOGY		
Ideas/Concepts/Skill	**Learning Outcomes**	**Suggested Activities**	**Assessment**
Structure and function of mammary gland • Structure of udder • Mechanism of milk production • Hormonal role in lactation • Peak production and drying up • Milking methods • Machine milking **SKILLS:** • Understanding skill • Skill of collection • Skill of preservation • Skill for application • Skill of identification	*The learner will be able to:* • Milk the animal properly • Sketch and label the parts of milking machine	• General discussion • Chart preparation • Model preparation • Live animal demonstration • Milking machine familiarization • Farm visit	• Participation in discussion and content of prepared notes • Perfection of prepared chart • Comprehensiveness of farm visit report • Performance during milking of animal • Unit test
Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES	**Unit 1.6 : REARING AND HOUSING OF LIVESTOCK**		
Establishment of livestock farm • Requirements for dairy and poultry farms • Systems of rearing for cattle Free range system Intensive system Semi-intensive system • Systems of rearing for poultry Free range system Intensive system (deep litter and cage system) Semi-intensive system	• Select the suitable farm site • Choose the appropriate rearing system • Prepare layout of farms	• General discussion • Farm visit • Video analysis • Chart preparation • Periodicals and magazines • Lay out preparation	• Participation in discussion and content of prepared notes • Comprehensiveness of farm visit report • Performance during video analysis • Quality of the prepared chart • Perfection of prepared lay-out • Performance during video analysis

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES		Unit 1.6 : REARING AND HOUSING OF LIVESTOCK	
Ideas/Concepts/Skill	**Learning Outcomes**	**Suggested Activities**	**Assessment**
SKILLS: • Observation skill • Analytical skill • Skill of drawing • Skill of selection			
Housing of cattle and poultry • Requirements and dimensions of a standard cattle shed and poultry house • Roofing, flooring, sidewalls • Hi tech dairy farm/ Milking parlour • Mechanization of cattle farm • Tail-to-tail system • Head-to-head system **SKILLS:** • Observation skill • Skill of supervising • Analytical skill • Skill of charting • Skill of drawing	• Sketch the layout of a cattle shed/ poultry shed with dimensions • Assist in the construction of standard cattle sheds and poultry houses • Appraise the importance of Hi-tech dairy farming	• General discussion • Farm visit • Video analysis • Chart preparation • Model preparation • Power point presentation	• Participation in discussion and content of prepared notes • Performance during video analysis • Comprehensiveness of farm visit report • Quality of the prepared chart/model • Perfection of prepared lay-out • Performance during video analysis

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES		Unit 1.6 : REARING AND HOUSING OF LIVESTOCK	
Ideas/Concepts/Skill	**Learning Outcomes**	**Suggested Activities**	**Assessment**
Manure and waste disposal • Collection, storage and disposal of manure • Vermi-composting • Structure of Biogas plant • Composition of biogas • Uses of biogas **SKILLS:** • Observation skill • Communication skill • Skill of charting • Skill of modeling	• Narrate the waste disposal mechanisms that can be implemented in a farm • Illustrate the basic structure and function of modern biogas plant	• General discussion • Farm visit • Video analysis • Chart preparation • Model preparation • Power point presentation	• Participation in discussion and content of prepared notes • Comprehensiveness of farm visit report • Performance during video analysis • Quality of the prepared chart/model • Unit test

DETAILING OF THE FIRST UNIT OF MODULE 1

Name of Module : Basic Animal Husbandry Practices

Unit : Introduction to Animal Husbandry

Overview of the Unit

India being an agrarian country from a long time back, agriculture determines the future and development of our country. Livestock sector and agriculture are complementary and there is huge contribution from livestock sector to Indian economy. Currently India is on global stage as far as milk production and poultry production are considered. More and more youngsters are turning to livestock sector and agriculture, especially in Kerala, as the reports of escalated use of pesticides and harmful chemicals on agricultural produce are increasingly getting surfaced. Livestock provides human-kind both nutritive products for consumption and manure for crops. Animal husbandry can be a full-time or part-time business. This chapter provides students an introduction to livestock farming stating its merits and demerits, the different farming systems, current status of animal husbandry with special reference to statistics and familiarization of key concepts.

SYLLABUS

Ideas/Concepts/Skill	Learning Outcomes	Suggested Activities	Assessment
Livestock statistics • Current population status of cattle, buffalo, goat, sheep, pig, chicken, duck, turkey, quail. **SKILLS:** • Communication skill • Data collection skill • Observation skill • Analytical skill	• Conduct surveys about animal husbandry sector and analyze collected data	• General discussion • Data collection/Assignment • Field visit • Survey	• Participation in discussion and content of prepared notes • Collection • Field visit report • Survey report • Participation in discussion and content of prepared notes
Contribution of livestock to Indian Economy • Current production status of livestock sector • Impact of livestock sector on Indian economy **SKILLS:** • Communication skill • Data collection skill • Observation skill • Analytical skill	• Explain the contributions of livestock sector in Indian economy and prepare a report or charts	• General discussion • Chart preparation by students • Data collection from internet	• Participation in discussion and content of prepared notes • Report/Chart • Seminar

SYLLABUS

Ideas/Concepts/Skill	Learning Outcomes	Suggested Activities	Assessment
Common terminologies of Animal Husbandry • Different terms associated with the husbandry of cattle, buffalo, goat, sheep, pig, chicken, duck, turkey, quail **SKILLS:** • Observation skill • Classification skill • Skill of charting	• Correlate and differentiate the basic terminologies of animal husbandry	• General discussion • Chart preparation by students • Referring standard text books • Quiz	• Performance during Quiz • Perfection of prepared Chart
Farming systems • Farming systems and types of Dairy farming **SKILLS:** • Communication skill • Data collection skill • Observation skill • Selection skill	• Select suitable farming system for varied farming situation	• General discussion • Field visit • Power point presentation	• Participation in discussion and content of prepared notes • Field visit report
Livestock farming • Merits and demerits • Advantages of rearing animals and birds • Disadvantages of rearing animals and birds **SKILLS:** • Communication skill • Charting skill • Consolidation • Problem solving	• Analyze and understand merits and demerits of livestock farming • Solve the problems of livestock farming	• Debate • Brain storming • Chart preparation	• Performance in debate • Performance in brain storming • Perfection of prepared Chart • Unit test

I. Topic: Livestock statistics

Suggested activities

1. Field Visit and Data Collection: Students can be taken to either a veterinary hospital or dairy / poultry farms. There they will get involved in data collection from the workers / farmers who come there or by studying the farm records. They can also collect the data from the farmers in their own locality. After collecting data they can analyze the data, species wise and get aware of the status of livestock in each locality. Additionally, facilitator can also provide data in the form of graphs / charts and then make the learners analyze the data to get a complete picture.

Consolidation: Status of animal husbandry, the species of animals commonly reared and their population.

Learning outcome: Conduct surveys about animal husbandry sector and analyze collected data.

Evaluation: Assess the performance of learners during the field visit. Students should prepare the field visit report which will be used for evaluation.

II. Topic: Contribution of livestock to Indian Economy

Suggested activities

1. **General discussion with student interaction:** The preliminary knowledge of learners can be tested by asking questions like,

- Do you have any livestock in your home?
- Which all species of domestic animals have you seen?
- Which all products are obtained from livestock?

Discussion points

- Significance of animal husbandry sector
- The interdependence of agriculture and livestock rearing.
- Gross domestic products and contribution of livestock to GDP
- Milk production status

2. **Chart preparation:** Students will be given a task for collecting current details of milk / meat / egg production and the incomes generated from those products and represent the collected data as a chart.

Learning outcome: Explain the contributions of livestock sector in Indian economy and prepare a report or charts.

Evaluation: based on the perfection of prepared charts.

III. Topic: Common terminologies of Animal Husbandry

Suggested activities

1. **Quiz:** a Quiz can be conducted either on individual basis or as groups on different terminologies related to different terms associated with the husbandry of cattle, buffalo, goat, sheep, pig, chicken, duck, turkey, quail etc.

Learning outcome: Correlate and differentiate the basic terminologies of animal husbandry

Evaluation: The scores obtained by each student when conducted individually or a common score on team basis can be used for evaluation.

IV Topic: Farming systems

Suggested activities

1. **Field Visit and Data Collection:** Students can be taken to various dairy / poultry farms employing different farming systems. They should observe all the details, understand the peculiarities of various farming systems as a means for differentiation. They should interact with farmers and gather as much information as possible. The students can be divided into groups assigning respective tasks.

Consolidation: Facilitator or student group leaders should consolidate the information gathered by students / all groups.

Learning outcome: Correlate and differentiate the basic terminologies of animal husbandry

Evaluation: The scores obtained by each student when conducted individually or a common score on team basis can be used for evaluation.

V. Topic: Livestock farming - merits and demerits

Suggested activities

1. **Debate:** students can be divided into two groups and each group can be given the topic - Group A: merits of livestock farming and Group B: demerits of livestock farming. Class should be arranged properly. A moderator and group leaders need to be selected. After the debate, the facilitator will consolidate the ideas evolved in the debate and learners must prepare the notes, which will be utilized for evaluation.

2. **Brain storming**: a brain storming session can be conducted on the topic - problems of livestock farming or significance of animals in human life.

Consolidation: Facilitator should outline the general ideas emerged from the brain storming which could possibly bring forth some solutions/ideas applicable under field conditions.

Learning outcome:

(1) Analyze and understand the merits and demerits of livestock farming

(2) Solve the problems of livestock farming

Evaluation: Assess the performance of learners during the field visit. Students should prepare the field visit report which will be used for evaluation.

Interactive general discussion and power point presentations prepared by the facilitator can be used wherever applicable to transact the ideas more effectively.

REPOSITORY OF CONTINUOUS EVALUATION POSSIBILITIES

Sl. No.	Assessment		
	Process	Portfolio	Unit Based
1	Performance in Field visit and Survey	Field/Survey report/Project	Unit test/Quiz
2	Participation in group discussion	Notes	Unit test/Quiz
3	Comprehensiveness in chart preparation	Charts/Assignment	Unit test/Quiz
4	Performance in debate	Consolidated report	Unit test/Quiz
5	Contribution in brainstorming	Notes	Unit test/Quiz

TERMINAL EVALUATION SAMPLE QUESTIONS FOR THE UNIT

1. As per the livestock census 2003, cattle population in Kerala was found to be 21 lakh while the cattle population during 2007 census revealed it to be 17 lakh. Analyze the situation and substantiate. (4 scores)

2. A friend of yours residing in city with less available land wants to start a farm. Suggest a suitable farming system for him and substantiate your choice. (3 scores)

3. Study the relationship of the first pair of animals and fill up the blanks. (3 scores)

   a) Bull - Cow

   b) Ram - ……..

   c) Boar - …….

   d) Buck - …….

List of Practicals

Module 1 (Basic Animal Husbandry Practices)

Sl. No.	Unit name	Practical
1	Introduction to Animal Husbandry	• Conducting a Survey at student's own locality on current population of livestock and analysis of collected data • Analysis of statistical data relevant to livestock farming
2	Breeds of livestock (cattle, buffalo, goats, pigs, chicken, duck, turkey, quail)	• Identification of different breeds from the photographs presented (Spotting)
3	Restraining of animals	• Observation of presented animal • Practicing the method of approaching animal • Restraining the head of live animal • Restraining the limbs of live animal • Practicing Reuff's and alternate methods on live animal/dummy animal • Identification of available instruments for restraining (Spotting) • Application of selected devices on the presented animal/dummy animal
4	Identification of animals and age determination in cattle	• Simulation of identification methods • Determination of the age of the presented animal using dentition and horn rings
5	Anatomy and Physiology	• Study of different organs collected and preservation of specimens • Identification of body parts of cattle • Measuring the physiological parameters of the presented animal and making inferences • Preparation of heat expectancy chart of cattle practice of milking methods
6	Rearing and housing of livestock	• Making the lay-out of cattle farm • Making the lay-out of cattle shed • Making the lay-out of poultry farm • Making the lay-out of poultry shed • Maintenance of various records in a cattle farm

MODULE 2 (DAIRY AND MEAT ANIMAL MANAGEMENT)

Overview: This module deals with management of dairy cattle and goats. It includes basic principles of animal breeding, care and management of different age groups, feeding principles, health care and awareness about the important diseases of cattle. The module also includes husbandry of swine

SKILLS:

The module envisages imparting the following skills,

- Prepare appropriate instruments for artificial insemination, diluents for semen and preliminary evaluation of semen.
- Involve in routine farm operations of calf and dairy cattle management
- Differentiate and categorize various feed ingredients and apply the knowledge in feed formulation
- Calculate the feed requirement for different categories of cattle
- Assess the health status of animals
- Tentative diagnosis of selected diseases of livestock
- Awareness of routine activities in goat and pig farms

UNITS

PERIODS: 340

Unit No.	Name of the unit	Periods
2.1	Breeding and reproduction in animals	80
2.2	Care and management of cattle	50
2.3	Principles of feeding	50
2.4	Health care	80
2.5	Husbandry of goats	40
2.6	Swine Husbandry	40
	Total periods	**340**

30 % periods for theory and 70 % for practicals

SPECIFIC ELEMENTS OF UNITS

Unit No. 2.1

Name of the unit: Breeding and reproduction in animals

Unit Element No.	Name of the unit	Periods
2.1.1	Basic concepts in breeding	5
2.1.2	Selection and breeding methods	5
2.1.3	Artificial insemination (A.I) in animals	40
2.1.4	Pregnancy and parturition	15
2.1.5	Embryo transfer technology	5
2.1.6	Infertility in cattle	10
	Total periods	**80**

Unit No. 2.2

Name of the unit: Care and management

Unit Element No.	Name of the unit	Periods
2.2.1	Care and management of new born calf	35
2.2.2	Effect of climate on animals	10
2.2.3	Herd replacement	5
	Total periods	**50**

Unit No. 2.3

Name of the unit: Principles of feeding

Unit Element No.	Name of the unit	Periods
2.3.1	Important nutrients required for animals	5
2.3.2	Important concepts of feed formulation	10
2.3.3	Different feed ingredients and preservation of fodder	25
2.3.4	Thump rules for feeding animals	10
	Total periods	**50**

Unit No. 2.4

Name of the unit: Health care

Unit Element No.	Name of the unit	Periods
2.4.1	Health assessment	5
2.4.2	Natural defense mechanisms	5
2.4.3	Routes of infection and classification of diseases	10
2.4.4	Common diseases of animals	40
2.4.5	Control of diseases	20
	Total periods	80

Unit No. 2.5

Name of the unit: Husbandry of goats

Unit Element No.	Name of the unit	Periods
2.5.1	Introduction to goat rearing	10
2.5.2	Care and management of different age groups of goats	10
2.5.3	Breeding and selection of dairy goats	10
2.5.4	Diseases of goats	10
	Total periods	**40**

Unit No. 2.6

Name of the unit: Swine Husbandry

Unit Element No.	Name of the unit	Periods
2.6.1	Introduction to swine rearing	10
2.6.2	Housing requirements of swine	10
2.6.3	Age -wise Management of pigs	20
	Total periods	**40**

Module 2 : DAIRY AND MEAT ANIMAL MANAGEMENT **Unit 2.1 : BREEDING AND REPRODUCTION IN ANIMALS**

Ideas/Concepts/Skill	Learning Outcomes	Suggested Activities	Assessment
Basic concepts in breeding • Genotype and phenotype **SKILLS:** • Recollection skill • Communication skill	*The learner will be able to:* • Describe the important concepts of breeding animals	• General discussion • Referring standard text books	• Participation in discussion and content of prepared notes and prepared notes
Selection and breeding methods - • Random selection, Individual selection, Family selection, Pedigree selection, Progeny testing, In-breeding, Out-breeding, Methods of cross breeding **SKILLS:** • Skill to differentiate • Selection skill, Charting skill	• Differentiate breeding methods and apply the knowledge for selecting suitable animals.	• General discussion • Chart preparation • Referring standard text books	• Participation in discussion and content of prepared notes • Perfection of prepared chart
Artificial insemination (A.I) in animals • Purpose of A.I • Semen collection and examination • Semen extenders and preservation • Familiarization of equipment used for A.I • Heat detection • Technique of A.I in cattle (Recto vaginal method) • Speculum method for small animals **SKILLS:** • Skill for choosing • Assembling skill • Performance skill • Observation skill	• Prepare semen extenders like egg yolk citrate • Prepare the appropriate instruments for A.I	• General discussion • Video analysis • Demonstration and practice using slaughter house specimens • Seminar • Farm/A.I centre visit/Hospital visit	• Participation in discussion and content of prepared notes • Performance in video analysis • Performance during practice • Comprehensiveness of Comprehensiveness of seminar report • Comprehensiveness of farm visit report

Module 2 : DAIRY AND MEAT ANIMAL MANAGEMENT **Unit 2.1 : BREEDING AND REPRODUCTION IN ANIMALS**

Ideas/Concepts/Skill	Learning Outcomes	Suggested Activities	Assessment
Pregnancy and parturition • Basic concepts of gestation period, fertilization and placentation • Pregnancy diagnosis • Stages of parturition and signs of calving • Difficult calving (dystocia) • Involution of uterus, service period, inter-calving period, dry period **SKILLS:** • Collection skill, Communication skill • Observation skill, Charting skill	*The learner will be able to:* • Explain the basic concepts of gestation, stages of pregnancy, dystocia.	• General discussion • Chart preparation • Models preparation • Slaughter house specimens collection • Video analysis	• Participation in discussion and content of prepared notes • Perfection of prepared chart • Performance during practice using slaughter house specimen • Performance in video analysis
Embryo transfer technology • Uses of embryo transfer technology • Method of embryo transfer Technology **SKILLS:** • Recollection skill • Communication skill, Observation skill	• Enlist important steps of embryo transfer technology	• General discussion • Video analysis • Power point presentation	• Participation in discussion and content of prepared notes • Performance in video analysis
Infertility in cattle • Concepts of infertility and sterility • Causes of infertility • Prevention of infertility **SKILLS:** • Observation skill • Analytical skill • Classification skill • Data collection skill, Charting skill	• Analyze the prevalence and causes of infertility in a locality from hospital records	• General discussion • Chart preparation • Analysis of Hospital records	• Participation in discussion and content of prepared notes • Perfection of prepared chart • Unit test

Module 2 : DAIRY AND MEAT ANIMAL MANAGEMENT **Unit 2.2 : CARE AND MANAGEMENT OF CATTLE**

Ideas/Concepts/Skill	Learning Outcomes	Suggested Activities	Assessment
Care and management of new borne calves • Importance of colostrum feeding • Artificial respiration • Cutting of umbilical cord • Weaning • Feeding of calves • Dehorning • Deworming • Castration **SKILLS:** • Observation skill • Analytical skill • Classification skill • Data collection skill • Communication skill	*The learner will be able to:* • Care a new born calf under field conditions • Perform basic procedures of calf management	• General discussion • Referring leaflets and Farm Magazines • Seminar • Flash card preparation • Farm visit • Video analysis	• Participation in discussion and content of prepared notes • Comprehensiveness of seminar report • Comprehensiveness of farm visit report • Performance during practice on dummy calf • Quality of flash cards • Performance in video analysis
Effect of climate on animals • Homeostasis • Critical temperature • Summer management **SKILLS:** • Observation skill • Management skill • Reporting skill	• Provide appropriate care for animals during summer season	• General discussion • Farm visit • Seminar	• Participation in discussion and content of prepared notes • Comprehensiveness of farm visit report • Comprehensiveness of seminar report

Module 2 : DAIRY AND MEAT ANIMAL MANAGEMENT		Unit 2.2 : CARE AND MANAGEMENT OF CATTLE	
Ideas/Concepts/Skill	**Learning Outcomes**	**Suggested Activities**	**Assessment**
Herd replacement • Culling and replacement • Methods of culling and replacement **SKILLS:** • Observation skill • Analytical skill • Choosing skill	*The learner will be able to:* • State the basic concepts of herd replacement	• General discussion • Analysis of Farm records	• Participation in discussion and content of prepared notes • Comprehensiveness of farm visit report • Unit test
Module 2 : DAIRY AND MEAT ANIMAL MANAGEMENT		**Unit 2.3 : PRINCIPLES OF FEEDING**	
Important nutrients required for animals • Water, Protein, Carbohydrates, Lipids, Vitamins, Minerals **SKILLS:** • Identification skill • Recollection skill, Charting skill	• Recognize the important components of feed materials	• General discussion • Flash cards preparation • Referring standard text books • Chart preparation	• Participation in discussion and content of prepared notes • Perfection of Flash cards • Perfection of charts
Important concepts of feed formulation • Proximate principles like Digestible crude protein (D.C.P), metabolizable energy (M.E), total digestible nutrients (T.D.N) etc. • B.I.S specifications of feed • Feed mixing **SKILLS:** • Recollection skill • Skill of collection • Analytical skill • Skill of charting	• Explain the proximate principles in feed formulation	• General discussion • Chart preparation • Referring standard text books • Specimen collection and mounting • Feed factory visit	• Participation in discussion and content of prepared notes • Perfection of prepared chart • Performance during Feed factory visit • Perfection of mounted specimens • Comprehensiveness of feed factory visit report

Module 2 : DAIRY AND MEAT ANIMAL MANAGEMENT **Unit 2.3 : PRINCIPLES OF FEEDING**

Ideas/Concepts/Skill	Learning Outcomes	Suggested Activities	Assessment
Different feed ingredients and preservation of fodder • Concentrate feed ingredients • Roughages • Unconventional feed stuff • Leguminous fodder (cow pea, subabul) • Cultivation details of different fodder grasses (Guinea, Napier, para, congo signal) • Preserved fodder (Silage, Hay, Straw) • Nutrient enrichment of straw using urea • commercial feed for cattle (TMR feed, by pass protein feed) **SKILLS:** • Identification skill • Differentiation skill • Skill of charting, Observation skill	*The learner will be able to:* • Differentiate and categorize various feed ingredients • Describe the Preservation methods of fodder	• General discussion • Chart preparation • Referring standard text books • Farm visit • Spotting	• Participation in discussion and content of prepared notes • Perfection of prepared chart • Performance during farm visit • Performance in spotting
Thump rules for feeding animals • Maintenance ration for each category of animals • Production ration for lactating animal • Pregnancy ration • Ration for draught animals **SKILLS:** • Consolidation skill • Mathematical skill • Recollection skill • Skill of charting	• Calculate the feed required for different categories of cattle	• General discussion • Chart preparation • Referring standard text books • Calculation of feed requirement	• Participation in discussion and content of prepared notes • Perfection of prepared chart • Efficiency in calculation • Unit test

Module 2 : DAIRY AND MEAT ANIMAL MANAGEMENT **Unit 2.4 : HEALTH CARE**

Ideas/Concepts/Skill	Learning Outcomes	Suggested Activities	Assessment
Health assessment • Definition of health and disease • Signs of health **SKILLS:** • Observation skill • Differentiation skill • Analytical skill • Communication skill	*The learner will be able to:* • Differentiate healthy and diseased animals by monitoring the physical signs	• General discussion • Seminar • Flash card preparation • Farm visit • Video analysis • Observation on live animal	• Participation in discussion and content of prepared notes • Comprehensiveness of seminar report • Comprehensiveness of farm visit report • Performance during practice • Quality of flash cards • Performance in video analysis
Natural defense mechanisms • Functions of different body parts in preventing disease **SKILLS:** • Communication skill • Observation skill • Analytical skill • Application skill	• Describe the inherent immune mechanisms of animal body in preventing diseases	• General discussion • Power point presentation • Video analysis	• Participation in discussion and content of prepared notes • Performance in video analysis
Routes of infection and classification of diseases • Different ways in which micro-organisms enter animal body • Types of diseases **SKILLS:** • Observation skill • Classification skill • Analytical skill • Data collection skill	• List out the routes of infection • Classify diseases according to etiology • Analysis of hospital data and find out the prevalence of diseases in a locality	• General discussion • Chart preparation • Power point presentation • Hospital visit	• Participation in discussion and content of prepared notes • Perfection of prepared chart • Performance during hospital visit • Comprehensiveness of Hospital visit report

Module 2 : DAIRY AND MEAT ANIMAL MANAGEMENT **Unit 2.4 : HEALTH CARE**

Ideas/Concepts/Skill	Learning Outcomes	Suggested Activities	Assessment
Common diseases of animals • Etiology, Important symptoms and control measures of - Bacterial diseases - Viral diseases - Metabolic diseases - Parasitic diseases • Phyto and chemical toxicity in cattle **SKILLS:** • Observation skill • Analytical skill • Classification skill • Diagnosis skill	*The learner will be able to:* • Make tentative diagnosis of common diseases of cattle based on symptoms	• General discussion • Chart preparation • Power point presentation • Hospital visit • Album preparation	• Participation in discussion and content of prepared notes • Perfection of prepared chart • Perfection of prepared album • Performance during hospital visit • Comprehensiveness of Hospital visit report
Control of diseases • Treatment • Disinfection • Vaccination • Quarantine • Disposal of dead animals **SKILLS:** • Management skill • Practical skill	• Control/make preventive measures of animal diseases under field conditions • Perform vaccinations in livestock	• General discussion • Hospital visit	• Participation in discussion and content of prepared notes • Performance during hospital visit • Unit test • Comprehensiveness of Hospital visit report

Module 2 : DAIRY AND MEAT ANIMAL MANAGEMENT **Unit 2.5 : HUSBANDRY OF GOATS**

Ideas/Concepts/Skill	Learning Outcomes	Suggested Activities	Assessment
Introduction to goat rearing • Advantages of goat rearing **SKILLS:** • Comparing skill • Charting skill • Communication skill	*The learner will be able to:* • Compare the advantages of goats and cattle	• General discussion • Chart preparation • Referring standard text books • Seminar	• Participation in discussion and content of prepared notes • Perfection of prepared chart • Comprehensiveness of seminar report
Care and management of different age groups of goats • Housing requirements of goats • Feeding of goats • Care and management of kids • Care and management of does and bucks • Care and management of pregnant does • Care and management of lactating does **SKILLS:** • Application skill • Observation skill • Analytical skill • Performance skill • Communication skill	• Perform routine activities in a goat farm	• General discussion • Referring leaflets and farm magazines • Seminar • Flash card preparation • Farm visit • Video analysis	• Participation in discussion and content of prepared notes • Comprehensiveness of seminar report • Comprehensiveness of farm visit report • Quality of lay-out • Quality of flash cards • Performance in video analysis

Module 2 : DAIRY AND MEAT ANIMAL MANAGEMENT	Unit 2.5 : HUSBANDRY OF GOATS		
Ideas/Concepts/Skill	**Learning Outcomes**	**Suggested Activities**	**Assessment**
Breeding and selection of dairy goats • Selection methods • Breeding methods **SKILLS:** • Observation skill • Selection skill • Application skill • Analysis skill	*The learner will be able to:* • Detection of heat by observing heat signs and determine the correct time for breeding	• General discussion • Farm visit	• Participation in discussion and content of prepared notes • Comprehensiveness of Comprehensiveness of farm visit report
Diseases of goats • A brief awareness on common bacterial, viral and metabolic diseases of goats and control measures . **SKILLS:** • Application skill • Observation skill	• Make tentative diagnosis of common diseases of goats based on symptoms	• General discussion • Farm visit • Power point presentation • Referring standard text books	• Participation in discussion and content of prepared notes • Comprehensiveness of Comprehensiveness of farm visit report • Unit test
Module 2 : DAIRY AND MEAT ANIMAL MANAGEMENT	**Unit 2.6 Swine Husbandry**		
Introduction to swine rearing • Advantages and disadvantages of pig farming **SKILLS:** • Comparison skill • Communication skill	• Enlist the advantages of pig farming	• General discussion • Seminar • Debate	• Participation in discussion and content of prepared notes • Comprehensiveness of seminar report • Performance in debate

Module 2 : DAIRY AND MEAT ANIMAL MANAGEMENT **Unit 2.6 Swine Husbandry**

Ideas/Concepts/Skill	Learning Outcomes	Suggested Activities	Assessment
Housing requirements of swine • General guidelines of housing • Space requirements for housing piglets, boar, sow, breeding animals **SKILLS:** • Drawing skill • Observation skill • Analytical skill • Communication skill	*The learner will be able to:* • Prepare layout of pig sties with reference to basic requirements	• General discussion • Power point presentation • Chart preparation • Video analysis • Farm visit	• Participation in discussion and content of prepared notes • Comprehensiveness of farm visit report • Perfection of prepared chart • Performance in video analysis
Age wise management of pigs (breeding boar, sow and piglets) • Selection criteria for breeding boar • Feeding and management of boar • Feeding and management of female pigs (gilts, pregnant sows, farrowing sow) • Feeding and management of piglets . **SKILLS:** • Observation skill • Analytical skill • Performance skill • Management skill • Communication skill	• Perform routine operations in a pig farm	• General discussion • Farm visit • Seminar • Power point presentation • video analysis	• Participation in discussion and content of prepared notes • Comprehensiveness of farm visit report • Comprehensiveness of seminar report • Performance in video analysis • Unit test

List of Practicals

MODULE 2 (DAIRY AND MEAT ANIMAL MANAGEMENT)

Sl. No.	Unit name	Practical
1	Breeding and reproduction in animals	• Judging of dairy cattle by Score card (Individual selection) • Demonstration of instruments used for A.I • Demonstration of Rectal palpation of reproductive tract and Recto-vaginal technique of A.I using slaughter house specimens and practice • Preparation of Artificial Vagina • Preparation of semen extender (Egg Yolk Citrate) • Microscopic evaluation of semen
2	Care and Management of calves	• Deworming in calves
3	Principles of feeding	• Identification and categorization of various feed ingredients • Calculation of maintenance and production ration for different category of animals and at various production levels (Analytical problems)
4	Health care	• Observation of live animal for different signs of health • Observation of hospital records and find out the prevalence of various diseases
5	Husbandry of goats	• Identification of different breeds of goats • Layout preparation of goat shed
6	Swine husbandry	• Identification of different breeds of pigs • Layout preparation of pig sty

LIST OF TOOLS/EQUIPMENT/MATERIALS REQUIRED FOR FIRST YEAR

Sl. No	Name of Item	Number Required	Remark
1	Refrigerator with maximum freezer capacity	1	
2	Binocular microscope (with inbuilt light source)	1	
3	Dummy/Model of cow	1	
4	Colour charts showing different breeds of cattle	1	
5	Colour charts showing different breeds of buffalo	1	
6	Colour charts showing different breeds of goat	1	
7	Colour charts showing different breeds of sheep	1	
8	Colour charts showing different breeds of chicken	1	
9	Colour charts showing different breeds of pigs	1	
10	Chart showing body parts of cattle	1	
11	Chart showing layout of cattle shed	1	
12	Chart showing layout of dairy farm	1	
13	Three dimensional model of a dairy farm	1	
14	Mouth gag for cattle	1	
15	Mouth gag for goat	1	
16	Anti cow kicker	1	
17	Casting rope (8 m long)	1	
18	Bull nose ring	1	
19	Bull holder	1	
20	Branding iron set	1	
21	Ear tag and ear tag applicator (set)	1	
22	Tattooing set	1	
23	Clinical/Rectal thermometer	5	
24	Atmospheric Thermometer	2	
25	Stethoscope	3	
26	Artificial insemination gun	3	
27	Vaginal speculum for goat	1	
28	Artificial vagina for cattle (set)	5	
29	Test tubes (10 ml)	20	
30	Test tube stand	2	
31	Measuring cylinder (100 ml)	5	
32	Beaker (250 ml)	3	
33	Conical flask (250 ml)	2	
34	Conical flask (500 ml)	2	
35	Funnel	5	
36	Electronic weighing balance	2	
37	Sodium citrate 2.9% (500 g)	1	
38	Syringe (2 ml) and needle (24 G)	10	
39	Specimen jars (250 ml)	10	
40	Specimen jars (500 ml)	5	
41	Specimen jars (1000 ml)	5	
42	Formalin (40 %) (1000 ml)	2	

LIST OF REFERENCE BOOKS AND INSTRUCTIONAL MATERIALS

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7. Moran, J. 2009. Business Management for Tropical Dairy Farmers. Landlinks Press, CSIRO publishing, Australia. P. 280
8. Package of Practices published by Kerala Veterinary and Animal Sciences University