

Department of Livestock Production and Management
NU, SASRD, Medziphema

SYLLABI - M.Sc (Ag.)

LPM 501: CATTLE AND BUFFALO PRODUCTION AND MANAGEMENT **3(2+1)**

Objective

To acquaint students on basic aspects of dairying in India compared with developed countries, problems and prospectus of dairying, detailed aspects of care and management of different classes of dairy cattle and buffaloes.

Theory

UNIT I

Introduction – Development of Dairy Industry in India and world – Present status and future prospects of livestock development in India

UNIT II

Important breeds of cattle and buffalo, traits of economic importance and their inter-relationships - Selection of high quality animals - Role of management in improving the reproduction efficiency in farm animals. - Housing and rearing systems.

UNIT III

Breeding Management: System of breeding Economic traits. Methods of Breeding - Prenatal and postnatal care and management of cattle and buffalo - Care of neonate and young calves - Management strategies for reducing mortality in calves, age at first calving and calving interval in cattle and buffaloes.

UNIT IV

Management of labour, Milking management, Machine milking and hand milking, Different laws governing the livestock sectors to produce quality products on par with international standards - Technique of harvesting clean and hygienic livestock products, transportation of animals, health management. Wallowing in buffaloes- Management of draught animals and summer management

UNIT V

Feed and fodder resources used for feeding of cattle and buffaloes– Scientific technique of feeding, watering – Computation of practical and economical ration, supply of green fodder around the year and enrichment of poor quality roughages.

Practical

Visits to cattle farms and critical analysis of various types of managerial practices - Study of breeding management in the farm- Analysis of practical feeding management- Disease control- Housing – milking - calf, heifer and adult management- Dairy Cattle and Buffalo judging - Project preparation for external funding and commercial farms and enterprises for dairy products – marketing strategies for milk and milk products and meat.

LPM 502: SHEEP AND GOAT PRODUCTION AND MANAGEMENT

3(2+1)

Objective

To acquaint students on status of sheep and goat farming in India, importance of record keeping, principles of housing and feeding, breeding management to improve the reproductive efficiency and detailed account on care and management of different classes of sheep and goat.

Theory

UNIT I

Introduction - Population structure and importance- Advantages and disadvantages of sheep farming under different systems of management – type of housing and equipments- Important sheep and goat breeds- Advantages and disadvantages of sheep and goat farming.

UNIT II

Breeding Management: Breeding seasons - fitness of purchase for first breeding - methods of detection of heat - Natural Service and artificial insemination - Care of the pregnant Animals - Breeding stock - Use of teaser - Culling.

UNIT III

Feeding Management: Feeding methods - Principles to be followed in feeding and watering- feeder space, waterer space, Designing feeders and waterers. - Range management - Stocking rate and pasture improvement and utilization; management under stall fed conditions, Transportation of sheep and goat.

UNIT IV

Disease Management: Role of management in the prevention and control of diseases. Special Management: Deworming - Dipping and spraying- shearing - Avoidance of goatry odour in milk, Topping.

UNIT V

Wool: Importance of wool - Fiber structure- Fleece characters - Goat fibers - Characters of mohair and pashmina, fur and Angora - Marketing of goat fibers / wool.- Planning of sheep and goat farm of various sizes - Economics of sheep and goat farming.

Practical

Visit to sheep and goat farms and critical analysis of various managerial practices under different conditions. Study of practical housing management - Analysis of practical diseases control management - Shearing management - Record keeping. - Preparation of project for commercial farming - Characterization of sheep and goats; handling of sheep and goat; daily and periodical operations for sheep and goats - Methods of identification of sheep and goat. Cost of rearing sheep and goat for mutton and wool - Housing plans for various age and categories of sheep and goat - Dipping; Vaccination of sheep and goat - Shearing of wool.

LPM 503: SWINE PRODUCTION AND MANAGEMENT

2(1+1)

Objective

To impart knowledge on various aspects of swine farming in India, principles of housing, breeding, feeding and health care of pigs, management practices at different stages of growth and economic pig production systems.

Theory

UNIT I

Introduction - Population and importance - Economic contribution of pigs - Advantages and disadvantages of swine keeping - Systems of management - Problems in pig farming.

UNIT II

Breeds of pigs - Selection of breeding stock - Breeding seasons - Age and weight at first services - Methods for detection of heat – Natural service and artificial insemination - Care of pregnant sows, piglets and growers - Care of breeding boar.

UNIT III

Housing, sanitation and hygiene, disease prevention measures - Housing and equipment – Wallowing - Sanitation and hygiene - Role of management in the prevention and the control of diseases.

UNIT IV

Feeding and management of new born, weaner and finishers, dry, pregnant and farrowing sows - Feeding principles to be followed - Methods of watering – Feeder space – Water space, etc - Marketing: Methods of marketing in swine production - Record keeping.

Practical

Visits to piggeries and critical Analysis of various types of managerial practices - Analysis of the trend and structures of pig population - Analysis of practical breeding management methods, practical disease control management - special management methods - Ageing and identification – Judging - Constraints and remedial measures in pig farming - Economics of production - Project preparation for research and commercial farms.

LPM 504 LABORATORY ANIMAL PRODUCTION AND MANAGEMENT **2(1+1)**

Objective

To educate the students become familiarize with various aspects of rabbit farming, problems and prospectus, principles of housing, breeding, feeding and health care of rabbits, rats, mice and guinea pigs, measures to reduce the mortality in young ones at different seasons.

Theory

UNIT I

Introduction - Importance of rabbit for meat and fur production, rats, mice and guinea pigs, - Common breeds and strains.

UNIT II

System of housing – Common diseases and their control measure. Management of specific pathogen free and gnotobiotic animals, concepts to related to welfare of laboratory animals

UNIT III

Breeding - Age at maturity, litter size - Weaning – Feeding of growers – Selection of replacement stock, transportation of rabbit.

UNIT IV

Transportation of Laboratory animals – marketing of meat and fur.

Practical

Handling and restraining of laboratory animals - Visits to small animal farms and critical analysis of various types of managerial practices- Analysis of the trend and structures of Laboratory animals population - Analysis of practical breeding management methods - practical disease control management and special management methods - Ageing and identification – Judging - Economics of production.

LPM 505: SHELTER MANAGEMENT

2(1+1)

Objective

To familiarize students with type of houses suited for different livestock under varying climatic conditions.

Theory

UNIT I

General principles in planning animal houses- farmstead and animal houses - Selection of site and planning; layouts for livestock farm of different sizes in different climatic zones in India - Farm structures - General principles of construction of enclosures, floor and road.

UNIT II

Housing requirements of different classes of Livestock - Preparation of layouts, plans, arrangement of alleys- Fitting and facilities in the houses for horses, dairy cattle, calves, bulls, work cattle, dogs, pigs, sheep, goats, and poultry.

UNIT III

Improvement of existing buildings; water supply; feed and fodder delivery systems - Economics of Livestock housing.

UNIT IV

Housing - Disease control measures and sanitation of all classes of livestock.

Practical

Score card for animal houses - Time and motion study in Animal houses - Preparation of plans for Animal houses for horses, cattle, sheep, pigs, goats, and other livestock - Dogs and other pet animals - Economics of livestock housing - Preparation of plan for animal houses of different sizes and climatic zones of India.

LPM 506: PRINCIPLES OF ENVIRONMENTAL HYGIENE AND WASTE MANAGEMENT **2(2+0)**

Objective

To familiarize students on principles of air and water hygiene with reference to impurities and inclusions of water, collection and disposal of waste from the animal house, modern techniques in manure disposal and biosecurity measures to be adapted for hygienic production of livestock products.

Theory

UNIT I

Animal air hygiene: Definition - Composition of air - Air pollution – Factors affecting outdoor and indoor pollution - Assessment of these factors on animal health and production - Methods to control these factors.

UNIT II

Water Hygiene: Importance of water - Impurities and inclusions – Sterilization - Examination of water and water supplies - Collection of samples- Topographical physical, chemical, bacteriological and microscopic examination of water - Hygienic requirements and standards for drinking water - Quantity of water required by domestic animals - Methods of watering.

UNIT III

Manure - Quantity of manure voided by domestic animals - Animal excreta a factor in spread of disease - Hygienic and economic disposal of farm waste - Modern techniques used in automation / semi-automation in disposal of farm waste.

UNIT IV

Environmental protection act, Air (Prevention and control of pollution) act and water (Prevention and control of pollution) act - Biosecurity measures to be adapted for efficient and healthy production

UNIT V

Effect of environmental pollution on livestock and its products directly and indirectly - Controlling environmental pollution - Different factors affecting the quality of livestock and its products meant for human consumption.

LPM 507: POULTRY FARM AND HATCHERY MANAGEMENT

2(2+1)

Objective

To acquaint students on basic aspects of housing, feeding, breeding and health care of poultry and comparing the performance under cage and floor system of management of poultry, biosecurity measures to be followed to reduce

Theory

UNIT I

Poultry housing systems- Cage Vs floor system, litter management and lights for mortality and efficient hatchery management to produce healthy young ones. Poultry, rearing turkey, duck and quails.

UNIT II

Management of chicks, growing, laying and breeding flocks, broiler production, selection and culling of laying flocks.

UNIT III

Procuring, care and pre-incubation storage of hatching eggs - Method of incubation, sanitation disinfection and management of hatchery.

UNIT IV

Embryonic development and factors effecting fertility and hatchability of eggs.

UNIT V

Chick sexing, packing and hatchery business - Transporting management of farm and hatchery waste.

Practical

Poultry Farm management - Brooding of chicks; selection of laying flocks - Disease preventive measures - Selection and care of hatching eggs; incubator operation, fumigation and candling setting and hatching, packaging of chicks - Waste management - Marketing of products.

LPM 508: CLIMATOLOGY AND ANIMAL PRODUCTION

1(1+0)

Objective

To familiarize students on climate, weather, various climatic factors and their role in production and health of animals in both temperate and tropics, micro and macroclimatic conditions of animal house and assessing the heat tolerance of bovines.

Theory

UNIT I

Definition of climate-Classification of climatic regions-Climatic factors-Assessment of climate-Study of climatic factors in relation to animal production.

UNIT II

Light, natural and artificial light-mechanism of light action-photo and light responses-Applications-Importance of light in production of animals and birds.

UNIT III

Introduction of breeds into different climatic regions-Agro meteorology and weather forecasting for Animal Husbandry activities-Micro climate modification in animal houses.

UNIT IV

Estimation of microclimatic conditions in Animal house-Management of Temperature, Relative Humidity, Air Velocity and Mean temperature of the surrounding, measurement of intensity of light in animal houses-Construction of climographs hythergraphs-Estimation of cooling power of atmosphere-heat tolerance test in bovines.

LPM 509: INTEGRATED LIVESTOCK FARMING SYSTEM

3(2+1)

Objective

To familiarize on various aspects viz., scope and limitations of integrated livestock farming system, recent approach and economic feasibility of different integration models for sustainable production.

Theory

UNIT I

Scope and limitation of integrated farming systems - Sustainability of integrated Livestock Farming Systems and their economic importance.

UNIT II

Integration of fish, arable farming and different livestock enterprises vis-à-vis gobar gas plant, FYM, solar and wind energy utilization, cattle, buffalo sheep, goat, pig, poultry, rabbit, silk worm, bee keeping etc.

UNIT III

New approach for changing farming systems in present energy crises.

UNIT IV

Project formulation and evaluation of various livestock enterprises.

Practical

Various livestock farming units and their economic analysis - Evaluation of different farming systems and their economic importance – Preparing feasibility report for various farming projects.

LPM 510: PRINCIPLES OF ANIMAL NUTRITION

3(2+1)

Theory

Importance of nutrients in animal production and health. Composition of animal body and plants. Nutritional terms and their definitions. Importance of minerals (major and trace element) and vitamins in health and production, their requirements and supplementation in feed. Common feeds and fodders, their classification, availability and importance for livestock production. Measures of food energy and their applications- gross energy, digestible energy, metabolizable energy, net energy, total digestible nutrients, starch equivalent, food units, physiological fuel value. Direct and indirect calorimetry, carbon and nitrogen balance studies. Proteins evaluation of feed- measurement in protein quality in ruminants and non-ruminants, biological value of protein, protein equivalent, digestible crude protein. Calorie protein ratio. Nutritive ratio. Various physical, chemical and biological methods of feed processing for improving the nutritive value of inferior quality roughages. Preparation, storage and conservation of livestock feed through silage and hay and their uses in livestock feeding. Harmful natural constituents and common adulterants of feeds and fodders. Feed additives in the rations of livestock; Antibiotics and hormonal compounds and other growth stimulants, and their uses.

Practical

Familiarization of various feed stuff, fodders and their selection. Preparation and processing of samples for chemical analysis-herbage, faeces, urine and silages. Weende's System of analysis- Estimation of dry matter, total ash, acid insoluble ash, crude protein, ether extract, crude fibre, nitrogen free extract, Calcium and phosphorus in fed samples. Demonstration of detergent methods of forage analysis. Qualitative detection of undesirable constituents and common adulterants of fed. Demonstration of laboratory ensiling of green fodders. Silage pit preparation.

Theory

Introduction to blood; Properties of blood a body fluid, metabolism and fate of R.B.C; Hemoglobin-chemical structure, synthesis, physiological function, derivatives of hemoglobin; Anemia; plasma proteins, origin and function, coagulation of blood volume and regulation of haemostasis; fibronolosis; anticoagulation mechanism. Blood pH, blood volume and their determination. Osmotic fragility, erythrocyte sedimentation rate, haemtocrit and heamilysis; Leucocyte-phagocyte and immugenic functions.

Heart – morphological characteristic, systematic excitability conduction & transmissions processes. Cardiac Cycle: - Regulation of cardiac output; coronary circulation; properties of pulse; metabolism & energetic of working myocardial cell, extrinsic and intrinsic regulation; Egg and its significance in veterinary Sciences-Echocardiography.

Haemodynamics of circulation, circulatory mechanics resistance to flow, vasoconstriction, nervous and circulating fluid volume controls of blood pressure, neurohormonal control of vascular smooth muscles. Circulatory control-shocks stresses, regional and fetal circulations. Capillary exchange, control of blood pressure. Adjustments of circulation during exercise.

Kidney;- Functional morphology of nephron, factors determining filtration pressure, determination of glomerular filtration rate (GFR) and renal plasma flow- Reabsorption mechanisms for glucose, protein, amino acids, electrolytes; ammonium mechanism, glomerulotubular balance, methods of studying renal functions; urine concentration; micturition, uraemia.

Fluid, water balance, fluid therapy, dehydration, water concentration mechanisms. Acid base balance and H⁺ regulation, correction and evolution of imbalances, total osmotic pressure, potassium balance, electrolyte and water imbalances, thirst. Formation and excretion of urine in Birds.

Cerebrospinal fluid, synovial fluids-composition, formation and flow; joints. Regulation of bone metabolism and homeostasis.

Practical

Collection of blood samples –Separation of serum and plasma- Preservation of defibrinated blood –enumeration of erythrocytes, leucocytes- Differential leucocytic count-platelet count-estimation of hemoglobin- haematocrit-enthrocyte sedimentation rate – packed cell volume-coagulation time- bleeding time- Erythrocyte fragility and viscosity- blood grouping-recording of ECG -measurement of arterial blood pressure(sphygmomanometry). Recording of cardiogram of frog heart- study the effect of heat and cold on heart- effect of vagus stimuli on heat- vagal escape- factor affecting blood flow through blood vessels- urine analysis- physiological constituents, pathological determinates, determined of GFR. Titerable acidity, determination of inorganic phosphorus, urine ammonia and creatinine in urine.

Theory

History of Genetics, Chromosome number and types in livestock. Mitosis, Meiosis and gametogenesis. Overview of Mendelian principle; Modified Mendelian inheritance gene interaction; multiple alleles; lethals; sex-linked, sex limited and sex influenced traits; linkage and crossing over, Mutation, Chromosomal aberrations. Heritability, repeatability, genetic and phenotypic correlations.

History of Animal Breeding. Breeding/ Selection Techniques for optimal production. Selection: Response to selection and factors affecting it; Bases of selection individuals, pedigree, family, sib, progeny and combined; indirect selection. Classification of mating systems; Inbreeding and out breeding-genetic and phenotypic consequences viz., Inbreeding depression and heterosis; Systems of utilization of heterosis.

Practical

Solving problems on inheritance of Mendelian traits, Linkage and Crossing over. Calculation of gene and genotype frequencies. Estimation of heritability, repeatability. Genetic and phenotypic correlations. Description and measurement of economic trait of livestock & Poultry. Standardization of performance record, Construction of selection index; sire indices, Measurement of inbreeding and relationship coefficients; Estimation of heterosis.