

ANIMAL HUSBANDRY AND VETERINARY SCIENCE

(UG DEGREE STANDARD)

SUBJECT CODE:396

UNIT – I: GENERAL

Livestock Population Census in the nation and state, - Role of livestock and their products in the Indian economy and human health, current livestock programs and policies of State and Nation Policy note on Animal Husbandry, Government of Tamil Nadu – Economics of dairy, sheep, goat, poultry, pig and rabbit farming; Livestock project preparation, constraints to the livestock development programs, common offenses against animals – SPCA, Animal Welfare Board of India, NGOs. Livestock marketing and Livestock entrepreneurship.

UNIT – II: LIVESTOCK PRODUCTION MANAGEMENT

Common terms used in Animal Husbandry – Dentition and ageing of animals – Livestock and poultry breeds and breed characters, housing systems for different classes of livestock, and requirements of space, ventilation, water, sanitation, and waste disposal. Management of milk, meat, egg, and wool-producing livestock, management of calves and heifers, management of breeding bulls, draught animal power, rearing buffaloes for meat, organic livestock production, small ruminant production systems, economic traits of cattle, sheep and goat. Farm records and their maintenance, strategies for livestock improvement for enhancing productivity. Systems of swine production in India, Exotic and indigenous breeds of pigs, Housing condition requirements for different classes of swine, feeding management for different classes of swine, breeding sow and boar management, piglet management, fattener management. Indian breeds of horses, Equine housing, feeding and breeding management. Importance and significance of laboratory animal production and management, Wild animals in captivity and management.

UNIT – III: ANIMAL NUTRITION

Nutritional terms and definitions – Role of nutrition in health and production- Feeds and fodder classification, composition, anti-nutritional factors, and toxins- Requirements of nutrients for different categories of livestock/poultry and formulation of least cost rations- Feeding of pet animals- BIS specifications for livestock and poultry feeds -Nutritional deficiency and its influence on livestock performance -Feed supplements and additives- Conservation and preservation of feed and fodders – Economic utilization of agro-industrial by-products for feeding livestock – Utilization of unconventional feeds – Feeding of captive wild animals and birds - Quality control of feed - Feed milling technology- Feed block/baling- By-Pass Proteins and by-pass Fat - Feeding livestock during scarcity - Metabolic disorders in Livestock and Poultry- Processing of feeds and forage to improve nutritive value - Use of NPN compounds for ruminants.

UNIT – IV: LIVESTOCK BREEDING AND GENETICS

Important breeds of cattle, buffalo, sheep, goat, pig, and poultry with special reference to economic characters - Principles of Genetics, Cytogenetics, and Basis of Population Genetics, Genetic parameters - Nature of DNA and RNA, their models and functions - Selection of livestock for production, reproduction, and disease resistance traits - Response to selection - Mating systems including Nucleus Breeding Schemes - Current livestock and poultry breeding policies and programs in the state and country - Applications of Recombinant DNA technology, Cloning, Transgenesis, and Marker-Assisted Selection - Conservation of Animal Genetic Resources.

UNIT-V:VETERINARY ANATOMY, PHYSIOLOGY, AND BIOCHEMISTRY

Gross study of bones of Ox and differences in Horse, Dog, Pig and Fowl, Joints and Muscles of Skeleton of Ox, Gross study of Heart and Conduction system, General plan of Pulmonary and systemic circulation, Gross anatomy of Brain and Spinal cord, the Gross study of organs of the digestive, respiratory, urinary and reproductive system of Ox, Horse, Dog, Pig and Fowl, Systemic histology.

Mechanism of respiration. General functions of blood (blood cells, plasma & serum) coagulation, cardiac cycle, Blood circulation, Blood pressure, renal function Hormonal control of Lactogenesis. Environmental factors affecting animal production - Environmental stress on animal performance - Green Houses Gases - Role of ruminants. Endocrine System-Functional aspects of hormones in Systemic Physiology. Renal system-Counter Current Mechanism-Acid Base Balance.

Enzymes: Definition and classification. Clinical Enzymology - Diagnostic importance of non-functional plasma enzymes and Isoenzymes; Carbohydrate metabolism and its disorders: Glycolysis, Krebs' cycle, Carbohydrate fermentation pathway. Disorders - Diabetes mellitus, Bovine Ketosis, Pregnancy toxemia, Lactic acidosis and Bloat in ruminants; Lipid metabolism and its disorders: Beta oxidation of fatty acids, ketone body formation, Disorders- Bovine Ketosis, Pregnancy toxemia; Lipid Profile in disease diagnosis; Protein metabolism and its disorders: Urea cycle and Urea poisoning in ruminants. Utilization of NPN compounds by ruminants; Organ Function tests: Liver function and Renal function tests - Biochemical tests for differential diagnosis.

UNIT – VI: VETERINARY MICROBIOLOGY, PUBLIC HEALTH, AND PREVENTIVE MEDICINE

General and Systematic Veterinary Bacteriology - Bacterial Diseases of Veterinary Importance in relation to Isolation, Culture, Morphology, Biochemical and Antigenic Characteristics, Pathogenesis, Diagnosis, and control. Veterinary Mycology - Important Pathogenic Fungi in relation to Isolation, Culture, Morphology, Biochemical and Antigenic Characteristics, Pathogenesis, Diagnosis, Prevention, and Control. General and Systematic Veterinary Virology - Structure, Viral Replication, Viral Pathogenesis, Viral

Interaction, and Oncogenesis – Important Veterinary Viral Diseases – RNA and DNA Viruses, Cultivation, Pathogenesis, Clinical Sciences, and Diagnosis. Veterinary Immunology – Antigen – Types of Immunity, Antigen and Antibody, Concepts of Immunity and Microbes, Vaccine and other Biologicals – Antigen and Antibody-based Diagnostic Test and Microbial Biotechnology.

Epidemiology – definitions, terms, triad, concept, scope, objectives, and uses. Monitoring and surveillance, epidemiological disciplines, methods, mode and route of disease transmission, rates, ratios, the occurrence of disease, properties of diagnostic tests, the gradient of infection, and pattern of diseases. Epidemiology, treatment, prevention, and control of common bacterial, viral, fungal, rickettsial, protozoan, ectoparasitic and endoparasitic diseases () of livestock, poultry, companion animals, and wildlife species, regional - emerging and re- emerging important diseases. Allergic skin tests, modern diagnostic techniques, and vaccination protocol for infectious diseases.

Role of Veterinarians in public health, one health concept - Milk Hygiene, Meat Hygiene - Foodborne diseases and Food Safety, Zoonoses - Classification, Zoonotic diseases of bacterial, viral, fungal, parasitic and rickettsial origin - Prevention and control of Zoonotic Diseases - Emerging and Re-Emerging Zoonoses -Biodiversity -Environmental contaminants in the food chain - Air, water, Thermal, radiation and land pollution - water purification, Chlorination - Sanitation and disinfection of farm and hospital - Management of waste from animal industries - Role of Pollution Control Board in India - Disaster Management - Vector control and reservoir control.

UNIT – VII: PATHOLOGY, PARASITOLOGY, AND PHARMACOLOGY

General concepts and etiology of diseases in animals; Common pathological conditions seen in domestic, wild, zoo, and laboratory animals and birds. Veterinary clinical pathology methods (with special reference to hematology, urinalysis, biopsy, and cytology) as rapid diagnostic methods. General oncology and pathology of various types of tumors in domestic animals. General principles and procedures of necropsy; Collection, preservation, and dispatch of morbid materials for laboratory diagnosis; Vetero-legal necropsy procedures.

Classification of Parasites – Parasite and parasitism in animals; important morphological features, life-cycles, mode of transmission, pathogenesis, diagnosis, chemotherapy, prophylaxis, and general control measures of parasites associated with disease in animals, birds, captive and free range wild animals.

Drug action – Pharmacokinetics (absorption, distribution, metabolism, and excretion), Pharmacodynamics – (types and structure of receptors. Dose-response curve)- Anaesthetics (local and general), analgesics, sedatives – drugs for euthanasia of animals - Chemotherapy (general principles including resistance, antibacterials, anthelmintics, antiprotozoals) – Toxicology (toxicity of pesticides, herbs, venoms, and toxins) –pharmacy (pharmaceutical calculations, prescription writing) –

useful herbal preparations.

UNIT - VIII: EXTENSION EDUCATION

Farming and types of farming in India. Early extension efforts in India. Extension Education - Principles, philosophy, objectives, dimensions. Extension Educational Process. Teaching and learning process. Rural development programs. Panchayati Raj. Sociology and Rural sociology in animal husbandry extension - culture, tribal, rural and urban communities, social control, social stratification, social institutions, social change, leadership. Adoption and diffusion of innovations - innovation-decision process, attributes of innovations, adopter categories, factors affecting adoption and diffusion process, and the role of change agents. Extension program planning and evaluation. Livestock and poultry development programs in India. TOT Projects of ICAR. Communication - Process, elements, theories, and methods. ICTs and their application in the livestock sector. Gender and animal husbandry. Sustainable livestock production.

UNIT - IX: VETERINARY CLINICAL MEDICINE, VETERINARY GYNAECOLOGY AND OBSTETRICS AND VETERINARY SURGERY AND RADIOLOGY

General and special clinical examination - General systemic state - etiology, clinical signs, pathogenesis, diagnosis and differential diagnosis, treatment and management of diseases of the digestive system, cardiovascular, respiratory, urinary, nervous, musculoskeletal, hemopoietic, Mammary gland, skin and sense organs - zoo and wild animal diseases - etiology, clinical signs, pathogenesis, diagnosis, prevention and control of metabolic, deficiency diseases - Ethics and jurisprudence and animal welfare in domestic and wild animals.

Female reproductive physiology, Puberty and sexual maturity, Aberrations of estrus and their clinical management, Problems in estrus detection and estrus detection aids, Follicular dynamics, Ovulation and its aberrations, Fertilization, Embryonic mortality, Anoestrus and repeat breeding syndrome, Diagnostic procedures in infertility investigation in female animals, Clinical uses of hormones and drugs in the management of infertility, Assisted reproductive techniques - Synchronization of estrus and ovulation, Multiple ovulation and embryo transfer technology in livestock and zoo animals, *In vitro* fertilization, Maternal recognition of pregnancy, Pregnancy diagnosis and factors affecting gestation length, Implantation, Placentation and its classification, Abortion, Accidents of gestation, Pre, peri and postpartum complications, Parturition and its stages, Dystocia and obstetrical interventions, Obstetrical anesthesia, Male sexual behavior and libido, semen collection techniques, semen evaluation, semen extenders and cryopreservation, Artificial insemination techniques in farm and pet animals, Forms of male infertility, Breeding soundness evaluation of bull, Medical and surgical procedures for population control of the reproduction.

Reproductive physiology; hormones and reproduction; Accidents of gestation, livestock fertility and infertility; artificial insemination; semen

characteristics of different species of livestock and cryopreservation. Multiple ovulation and embryo transfer technology in livestock and zoo animals Reproductive disorders and their management.

General surgical principles - pre-and post-operative considerations, anesthesia, asepsis and anti-sepsis and sterilization; scope, history and development of veterinary radiology; Imaging pathology of different parts of body-surgical emergencies - Intensivacare- Physiotherapy - Diathermy. Aural Hematoma in dogs- Small Animal GI tract surgical affections- Esophageal foreign Body- GDV- Intussusception-Foreign body syndrome- Megacolon-Ophthalmic affections in small animals-Amputation of tail-Large Animal GI tract affections-Choke-Rumenotomy-Abomasal Affections-Cecal Dilation and Torsion- Atresia Ani-Urogenital affections in small and large animals-Cystotomy-Urethrotomy-Pernieal Urethrostomy-Tube Cystotomy. Orthopaedic Examination of Small Animals-Principles of Internal Fixation-Osteoarthritis and Hip Dysplasia-Patellar luxation in small animals. Conformation of Horses-Lameness examination in large animals-Hoof affections on horses and cattle- musculoskeletal diseases.

UNIT- X: LIVESTOCK PRODUCTS TECHNOLOGY

Layout and management of rural, urban, and modern abattoirs. HACCP concepts in abattoir management. Animal welfare and pre-slaughter care of meat animals. Significance of Meat Inspection in Wholesome Meat Production Procedures of antemortem and post-mortem examination of meat animals. Slaughtering and dressing of meat animals and birds. Importance of evaluation of meat animals and grading their carcasses. Utilization of abattoir byproducts, rendering, and treatment of condemned meat and carcasses. Management of effluent emanating from abattoir. The prospect of the meat industry in India. Structure and composition of muscle. Conversion of muscle to meat. Nutritive value of meat. Fraudulent substitution of meat. Preservation of meat and poultry; drying, salting, curing, smoking, chilling, freezing, canning, irradiation, and chemicals. Aging of meat. Modern processing technologies of meat and meat products. Concept of value addition - Importance of value addition in the meat industry. Physico-chemical and microbiological quality of meat and its products. Nutritive value of egg. FSSAI, Codex Alimentarius Commission rules, and regulations pertaining to meat.

Retrospect and prospects of milk industry in India - Layout of milk processing plant and its management - Composition and nutritive value of milk - factors affecting milk composition. Physico-chemical properties of milk. Collection, chilling, standardization, pasteurization, UHT treatment, homogenization, and bactofugation. Preparation of cream, butter, ghee, channa, paneer, khoa, ice cream, dahi, lassi, mozzarella cheese, and dairy by-products - Dried, dehydrated and fermented milk - Introduction to functional milk products - Organic milk products. Common defects of milk products and their remedial measures - Microbiological deterioration of milk and milk products - Packaging, transportation, storage and distribution of milk and milk products - Good manufacturing practices and implementation of HACCP in milk plant - Food safety

standards for milk and milk products - Cleaning and sanitation in milk plant - Dairy effluent management - Sampling of milk - Platform tests - Estimation of fat, solid not fat (SNF) and total solids - Cream separation - Detection of adulteration of milk - Determination of efficiency of pasteurization.

Note: - Medium of Instruction only in English