

UPSC CSE Animal Husbandry and Veterinary Science Syllabus 2024

The UPSC Civil Services Mains exam offers Animal Husbandry & Veterinary Science as an optional subject. The UPSC Animal Husbandry and Veterinary Science Syllabus 2024 comprises Paper I and Paper II. Paper I covers animal nutrition, physiology, reproduction, livestock production, management, genetics and breeding.

Paper II includes anatomy, pharmacology, hygiene, animal diseases, veterinary public health, milk products and related technology, meat hygiene and associated technology. The syllabus tests conceptual knowledge and applied skills relevant for civil service roles related to animal welfare and veterinary domains.

UPSC CSE Animal Husbandry and Veterinary Science Syllabus 2024 Paper 1

1. Animal Nutrition

1.1 Partitioning of Food Energy Within the Animal:

- Direct and indirect calorimetry
- Carbon-nitrogen balance and comparative slaughter methods
- Systems for expressing energy value of foods in ruminants, pigs, and poultry
- Energy requirements for maintenance, growth, pregnancy, lactation, egg, wool, and meat production

1.2 Latest Advances in Protein Nutrition:

- Energy-protein inter-relationships
- Evaluation of protein quality
- Use of NPN compounds in ruminant diets
- Protein requirements for maintenance, growth, pregnancy, lactation, egg, wool, and meat production

1.3 Major and Trace Minerals:

- Sources, physiological functions, and deficiency symptoms
- Toxic minerals
- Mineral interactions
- Role of fat-soluble and water-soluble vitamins in the body, their sources, and deficiency symptoms

1.4 Feed Additives:

- Methane inhibitors, probiotics, enzymes, antibiotics, hormones, oligosaccharides, antioxidants, emulsifiers, mold inhibitors, buffers, etc.
- Use and abuse of growth promoters like hormones and antibiotics—latest concepts

1.5 Conservation of Fodders and Feed Analysis:

- Storage of feeds and feed ingredients
- Recent advances in feed technology and feed processing
- Anti-nutritional and toxic factors present in livestock feeds
- Digestibility trials—direct, indirect, and indicator methods
- Predicting feed intake in grazing animals

1.6 Advances in Ruminant Nutrition:

- Nutrient requirements and balanced rations
- Feeding strategies for different stages of the lactation cycle
- Effect of feeding on milk composition
- Feeding of goats for meat and milk production
- Feeding of sheep for meat and wool production

1.7 Swine Nutrition:

- Nutrient requirements and ration formulations for different stages of growth
- Feeding of pigs for lean meat production
- Low-cost ration strategies for swine

1.8 Poultry Nutrition:

- Nutrient requirements for meat and egg production
- Ration formulation for different classes of layers and broilers

2. Animal Physiology

2.1 Physiology of Blood and Circulation:

- Blood constituents, properties, and functions
- Cardiac physiology, blood pressure, and circulation regulation

2.2 Respiration and Excretion:

- Mechanism of respiration, gas exchange, and neural control
- Kidney structure, function, and urinary regulation

2.3 Endocrine Glands and Growth:

- Hormonal regulation and growth factors
- Physiology of milk production, reproduction, and digestion

2.4 Environmental Physiology:

- Regulatory mechanisms and adaptation to environmental factors
- Effects of stress on health and production

3. Animal Reproduction

3.1 Semen Quality and Artificial Insemination:

- Preservation techniques and insemination strategies
- Detection of estrus and management of reproductive disorders

4. Livestock Production and Management

4.1 Commercial Dairy Farming:

- Dairy farm organization and management
- Feeding regimes, milk production, and pricing policies

4.2 Commercial Meat, Egg, and Wool Production:

- Ration formulation and management practices for various livestock species
- Production enhancement strategies and socioeconomic considerations
- Management during natural calamities

5. Genetics and Animal Breeding

5.1 Animal Genetics and Population Genetics:

- Fundamental principles of genetics and breeding
- Techniques for selection, breeding value estimation, and genetic improvement
- Breeding systems and strategies for different livestock breeds

6. Extension

6.1 Principles and Methods of Agricultural Extension:

- Technology transfer and farmer education
- Animal husbandry programs for rural development

UPSC CSE Animal Husbandry and Veterinary Science Syllabus 2024 Paper 2

1. Anatomy, Pharmacology, and Hygiene

1.1 Histology and Histological Techniques:

- Paraffin embedding technique of tissue processing and H.E. staining
- Freezing microtomy
- Microscopy: Bright field microscope and electron microscope
- Cytology: Structure of cell organelles and inclusions; cell division; cell types
- Comparative histology of organs

1.2 Embryology:

- Embryology of vertebrates with special reference to Aves and domestic mammals
- Gametogenesis, fertilization, germ layers, foetal membranes, and placentation
- Teratology, twins, and twinning organogenesis

1.3 Bovine Anatomy:

- Regional Anatomy: Paranasal sinuses of Ox; surface anatomy of salivary glands
- Regional anatomy of nerves, cranial nerves, structures involved in epidural anesthesia
- Surface anatomy of visceral organs; locomotor apparatus and biomechanics

1.4 Anatomy of Fowl:

- Musculo-skeletal system: Functional anatomy in relation to respiration, flying, digestion, and egg production

1.5 Pharmacology and Therapeutics Drugs:

- Cellular level of pharmacodynamics and pharmacokinetics
- Drugs acting on fluids and electrolyte balance, autonomic nervous system
- Modern concepts of anaesthesia, antimicrobials, hormones, chemotherapy

1.6 Veterinary Hygiene:

- Assessment of pollution of water, air, and soil
- Importance of climate in animal health; relationship between industrialization and animal agriculture
- Animal housing requirements; stress, strain, and productivity in relation to animal habitation

2. Animal Diseases

2.1 Infectious Diseases:

- Etiology, epidemiology, pathogenesis, symptoms, diagnosis, and control

2.2 Production Diseases:

- Etiology, epidemiology, symptoms, diagnosis, treatment

2.3 Deficiency Diseases

2.4 Non-specific Conditions

2.5 Neurological Disorders

2.6 Immunisation and Chemoprophylaxis

2.7 Anaesthesia and Surgical Interference

2.8 Disease Investigation Techniques

3. Veterinary Public Health

3.1 Zoonoses

3.2 Epidemiology

3.3 Veterinary Jurisprudence

4. Milk and Milk Products Technology

4.1 Market Milk:

- Quality, testing, grading, processing, packaging, storing, distribution, marketing
- Preparation of various types of milk

4.2 Milk Products Technology:

- Selection of raw materials, processing, storing, marketing of various milk products
- Testing, grading, quality control, packaging, operational control

5. Meat Hygiene and Technology

5.1 Meat Hygiene:

- Ante-mortem care, stunning, slaughter, dressing operations
- Hygienic handling, spoilage control, regulatory provisions

5.2 Meat Technology:

- Characteristics of meat, preservation methods, processing, formulations

5.3 By-products Utilisation

5.4 Poultry Products Technology

5.5 Rabbit/Fur Animal Farming