

Objectives

1. Provide basic knowledge to the students about scientific livestock and poultry rearing practices
2. Introduction to the principles and practices of Indian Knowledge Systems (IKS) in livestock and poultry management.
3. Entrepreneurship development through Livestock/poultry and Agriculture Integrated Farming System

Theory

Role of livestock in the national economy. Livestock in Indian Knowledge Systems (IKS): Cultural, Ecological and Sustainable Perspectives. Important Indian and exotic breeds of cattle, buffalo, sheep, goat, swine and poultry. Conservation of Indigenous Livestock and Poultry Breeds through Indian Knowledge Systems (IKS). Improvement of farm animals and poultry. Reproduction in farm animals and poultry. Housing principles, space requirements for different species of livestock and poultry. Application of Indian Knowledge Systems in Sustainable Livestock and Poultry Housing Practices. Management of calves, growing heifers and milch animals. Management of sheep, goat and swine. Incubation, hatching and brooding. Management of growers and layers. Digestion in livestock and poultry. Classification of feedstuffs. Proximate principles of feed. Nutrients and their functions. Feed ingredients for ration for livestock and poultry. Feed supplements and feed additives. Feeding of livestock and poultry. Traditional Feeding Strategies for Livestock and Poultry: An IKS Perspective. Introduction of livestock and poultry diseases. Indian Knowledge System (IKS) in livestock and poultry disease management. Integration of Indian Knowledge System (IKS) with Modern Veterinary Practices for prevention and control of important diseases of livestock and poultry.

Practical

External body parts of cattle, buffalo, sheep, goat, swine and poultry. Handling and restraining of livestock. Identification methods of farm animals and poultry. Visit to ID and IPF to study breeds of livestock and poultry and daily routine farm operations and farm records. Judging of cattle, buffalo and poultry. Culling of livestock and poultry. Planning and layout of housing for different types of livestock. Computation of rations for livestock. Formulation of concentrate mixtures. Clean milk production, milking methods. Hatchery operations, incubation and hatching equipment. Management of chicks, growers and layers. Debeaking, dusting and vaccination. Economics of cattle, buffalo, sheep, goat, swine and poultry production

Suggested Readings

1. A Textbook of Animal Husbandry by G. C Banerjee
2. A text Book of Livestock Production management in Tropic by D. N. Verma
3. Traditional Knowledge in Agriculture by Mishra, Anupam, Singh, S.R.K., Raut, A.A. (2020).

Division of Agricultural Extension, ICAR, New Delhi.

4. Ethnoveterinary medicine in India by Jarra Koteswara Rao and T.V.V. Seetharami Reddi

Objectives

Develop skills in poultry farming practices, including housing, feeding, and health management. Apply principles of poultry nutrition, breeding, and management to optimize production. Examine modern advancements in poultry production technologies and their environmental impact.

Practical

Overview of poultry industry. Major species and breeds of poultry. Visit to a local poultry farm to observe different production systems. Identifying common poultry breeds and their characteristics. Anatomy and physiology of poultry (digestive system, reproductive system, respiratory system). Behavioral aspects of poultry (social structure, feeding behavior, mating behavior). Principles of poultry housing (ventilation, lighting, space, temperature control). Types of poultry houses (deep litter, battery cages, free-range). Equipment for egg production, brooding, feeding and watering systems. Designing poultry housing. Nutritional requirements for poultry (protein, carbohydrates, fats, vitamins, minerals). Feed formulation and ingredients. Feeding systems and practices for broilers and layers. I Nutritional disorders and deficiencies. Formulation of balanced poultry diets (broilers/layers) based on nutrient requirements. Breeding systems and selection for production traits (egg production, growth rate, disease resistance). Hands-on selection of breeding stock. Hatchery management and egg handling. Hands-on experience in incubator and hatchery management. Egg handling, grading, and packaging. Identifying symptoms of common poultry diseases (Bacterial, viral, fungal, parasitic diseases). Preventative health management (vaccination, biosecurity measures). Post-mortem examinations and disease diagnosis. Hands-on vaccination techniques and biosecurity practices. Conducting a disease outbreak investigation. Broiler performance metrics (weight gain, feed conversion ratio). Hands-on demonstration of poultry slaughtering and processing.4. ICAR. Handbook of Animal Husbandry. ICAR. Practical application of sanitation and hygiene protocols. Visit to a poultry processing plant. Demonstrating waste management techniques (composting, manure handling). Cost of production, profitability, and financial management of poultry farming. Record keeping in poultry farms (production, health and financial). Setting up farm records and financial statements. Use of farm management software tools. Demonstration of automation in poultry production systems. Opportunities for small-scale poultry producers. Case study analysis on poultry marketing and pricing.

Suggested Readings

1. Jadhav N.V. and Siddiqui M.F. Handbook of Poultry Production and Management. Kalyani Publishers, New Delhi.
2. Shreenivashaiah P.V., Scientific Poultry Production. IBH
3. Prasad Jagadish, Poultry and Rabbit Production. Kalyani Publishers, New Delhi.
4. ICAR. Handbook of Animal Husbandry, ICAR.

Objectives:

Develop skills for effective breeding and genetic selection. Formulate pig nutrition programs based on dietary needs. Apply knowledge of swine health management practices. Design and manage appropriate housing for pigs. Understand the economics of pig farming. Implement bio-security measures in pig production systems.

Practical

Overview of pig farming. Key characteristics of pigs: breeds, types, and purposes. Farm visit to observe different pig breeds and farm setup. Selection of breeding stock. Reproductive physiology of pigs. Breeding systems: Natural breeding vs. Artificial Insemination. Demonstration of artificial insemination techniques. Design and construction of pigsties (temperature, ventilation, lighting, and space requirements). Bio-security and disease prevention in housing systems. Design a model of a pigsty, including ventilation and waste management systems. Nutritional requirements of pigs at different growth stages. Types of feeds and feeding systems. Water management. Feed formulation exercise and practical feeding demonstration. Common diseases in pigs and their symptoms. Vaccination and parasite control programs. Veterinary care and medication administration. Health assessment and disease diagnosis simulation; administering vaccines. Stages of growth: Weaning, fattening, finishing. Growth monitoring tools and performance indicators. Hands-on measurement of growth rates and feed conversion efficiency. Farrowing demonstration and piglet care practices. Postnatal management and early piglet nutrition. Creep feeding and transitioning to solid feeds. Weaning exercise and management of piglets post-weaning. Pig slaughtering and carcass evaluation. Quality control standards in pork production. Visit to a slaughterhouse and carcass evaluation. Manure and waste disposal methods. Setting up a small-scale composting or biogas unit. Value addition in piggery products (sausages, bacon, etc.). Case study of a piggery farm's financial performance. Discussion of innovative pig farming practices. Simulated outbreak response and crisis management. Solutions to common challenges in pig farming. Practical Component: Group discussion and presentation on sustainable pig farming.

Suggested Readings

1. Banerjee GC, 2020, A Textbook of Animal Husbandry, Oxford and IBH Publication.
2. ICAR. Handbook of Animal Husbandry. ICAR
3. Prasad Jagadish, Animal Husbandry and Dairy Science. Kalyani Publishers, New Delhi.
4. Prasad Jagadish, Sheep, Goat and Swine Production. Kalyani Publishers, New Delhi.
5. Sastry, N.S.R. and Thomas, C.K., Livestock Production Management. Kalyani Publishers, New Delhi.

Objectives

- To provide students with hands-on experience in goat farming practices.
- To develop skills in breeding, feeding, health management, and marketing of goats.
- To enhance understanding of goat behavior, housing requirements, and farm management.

Practical

Overview of the goat industry: Importance and economic value. Identification of goat breeds. Farm visit to observe different breeds of goats, their characteristics and behavior. Goat breeding systems and selection criteria. Hands-on session on selecting goats based on physical characteristics (conformation, age, health, etc.). Judging for meat, milk, and fiber production. Principles of goat housing and biosecurity measures. Construction and design of goat shelters. Types of goat housing systems (small-scale vs. commercial). Installation of feeding and water systems. Nutritional needs of goats: feed types, supplements, and feeding schedules. Practical feeding of goats based on age, breed, and production stage. Common goat diseases and their management. Vaccination protocols and deworming. Veterinary intervention and first aid for goats. Reproductive physiology of goats and breeding management techniques. Demonstration of artificial insemination (AI) and natural mating techniques. Pregnancy diagnosis and care of pregnant does. Care of newborn kids. Milk production systems and the dairy goat industry. Milking techniques and handling of milk. Goat meat production systems and processing techniques. Post-slaughter hygiene and processing. Introduction to meat grading and quality standards. Record-keeping for feed intake, growth performance, breeding, health, and production data. Creating a goat farm business plan. Budgeting and cost-benefit analysis of goat farming. Sustainable farming practices in goat production. Implementing sustainable practices on a goat farm. Waste management and composting. Demonstration of a diversified goat farm with crop-livestock integration.

Objectives

Understand the principles and values of organic livestock farming. Assess and implement organic practices for livestock management. Design integrated organic livestock systems that promote animal welfare, ecological health, and sustainable food production. Critically evaluate the challenges and opportunities of organic livestock systems in contemporary agriculture.

Theory

Overview of organic agriculture and livestock farming. Principles of organic farming and its regulatory framework. Benefits of organic systems for sustainability. Organic certification processes and requirements. National and international organic standards. Record keeping and compliance for organic livestock producers. Understanding non-GMO, hormone-free, and antibiotic-free practices. The ethics of livestock farming in organic systems. Animal behavior, psychology, and welfare standards. Approaches to disease prevention and veterinary care. Principles of organic animal feed Sourcing and managing organic feed ingredients. Balancing nutrients in organic livestock diets. Grazing and pasture management for optimal nutrition. Benefits of integrating livestock with crop production. Manure management and composting. Preventive health measures in organic systems. Strategies for disease management without synthetic chemicals. Maintaining biosecurity on organic farms. Alternative medicine and holistic approaches to animal health. Organic breeding programs. Ethical considerations in animal breeding. Economic viability of organic livestock production. Concept of organic product markets and consumer trends. Pricing, marketing, and selling organic livestock products. Opportunities for innovation and growth in the organic sector. Policy for organic livestock systems. Emerging technologies and their impact on organic livestock systems. The role of organic farming in climate change mitigation. Consumer demand and its influence on organic livestock practices.

Practical

Introduction to an organic livestock farm. Identification of livestock breeds commonly used in organic farming. Assessing suitability of livestock breeds for organic systems. Overview of farm operations. Preparing organic feed rations. Identification of common health issues in organic livestock. Hands-on demonstration of administering herbal treatments and organic supplements. Visit to an organic livestock housing system. Building a small-scale organic livestock shelter using sustainable materials. Organic certification: documentation and record-keeping techniques. Practical demonstration of pest control methods. Identifying parasites in livestock and organic deworming techniques. Record-keeping exercises for livestock health, breeding, and production. Creating a marketing plan for organic livestock products. Case studies of successful organic livestock businesses. Ethical evaluation of livestock handling and management practices. Field trip to an organic processing plant. Demonstration of processing and packaging of organic products.

Suggested Readings

1. Practical Guide to Organic Animal Husbandry by R.D. Singh, Agrobios (India).
2. Manual on Organic Farming and Integrated Crop-Livestock Management by Indian Council of Agricultural Research (ICAR).
3. Organic Farming for Sustainable Livestock Production by K.V. Subrahmaniyan, Springer.

Objectives

Understand the effects of climate change on livestock production systems, including impacts on animal health, welfare, and productivity. Analyze the role of livestock in greenhouse gas emissions and the potential for mitigation. Identify and apply climate adaptation strategies for improving livestock resilience, including nutrition, breeding, and management practices.

Theory

Overview of climate change science. Key climate change impacts on agriculture and livestock. Effects of temperature extremes and weather events. Livestock behavior and welfare in changing climates. Adaptation measures for animal health. Effects of climate on feed availability and quality. Climate-induced stress and reduced reproductive performance. Impacts on meat, milk, and wool production. Livestock and their role in global warming. Emission mitigation strategies. Policy frameworks: Carbon footprints, offsets, and emissions regulations. Role of livestock in sustainable food systems. Risk management and disaster preparedness in livestock farming. Breeding strategies for heat tolerance, disease resistance, and drought resilience. Genetic improvement of livestock for climate adaptation. Sustainable feed sourcing and supplementation strategies. Climate-smart feeding systems to enhance livestock resilience. Water stress and its effects on livestock productivity. Grazing systems and their role in soil carbon sequestration. Adaptive grazing practices for climate resilience. Land management for improved pasture quality under climate stress. Designing and managing climate-resilient livestock housing. Infrastructure planning for extreme weather events. Innovations in livestock shelters for reducing heat stress and improving animal welfare. Government policies for promoting climate-resilient livestock systems. Climate finance and funding for adaptation and mitigation. Digital tools for monitoring climate impacts on livestock. Role of biotechnology in improving livestock resilience. Vulnerabilities of livestock supply chains to climate change. Risk assessment and management in supply chains. Adapting supply chains for sustainability and resilience. Holistic approach to climate-resilient livestock systems. Integrating climate adaptation across livestock enterprises. Farm-level strategies for improving resilience to climate variability.

Practical

Field tour of a livestock farm affected by climate change. Discussion on observed climate impacts on livestock productivity. Hands-on exercise using climate data to assess livestock vulnerability. Measuring temperature and humidity levels in livestock housing. Designing heat stress mitigation systems. Monitoring livestock behavior for signs of heat stress. Installation and maintenance of rainwater harvesting systems for livestock. Practical demonstration of water-efficient irrigation and drinking systems. Evaluation of alternative feed resources. Setting up biosecurity measures on the farm to prevent outbreaks. Hands-on construction of a simple climate-smart livestock shelter. Evaluating existing farm infrastructure for climate resilience. Use of renewable energy for farm operations. Breeding selection exercises based on climate adaptability traits. Evaluating livestock for climate resilience attributes. Fieldwork in rotational grazing and its benefits for soil and pasture health. Analysis of local and international climate policies for livestock producers. Role-playing and group discussion on advocacy and policy formation.

Suggested Readings:

1. Climate Change and Livestock: Impacts, Adaptation, and Mitigation by Fiona E. O'Mara & Philip J. McIntosh
2. Climate Change and Livestock Production: Impacts, Adaptation and Mitigation", R. R. S. Ranjan, Springer, 2020
3. Sustainable Livestock Production in the Tropics, S. R. Swaminathan, Springer, 2019.
4. Indian Agriculture and Climate Change: A Comprehensive Approach to Livestock and Crop Systems, R. S. Khurana, Cambridge University Press, 2020.

Objectives

Understand the principles and components of Integrated Farming Systems. Be able to design and evaluate IFS models based on different agro-ecological zones. Gain insights into the economic, environmental, and social aspects of IFS. Application of modern technologies to improve the efficiency of IFS.

Theory

Introduction to Integrated Farming Systems (IFS). Key components of IFS. Livestock integration: role of cattle, poultry, small ruminants, and other livestock. Crops and livestock synergy. Diversification benefits in IFS. Resource cycling in IFS. Matching livestock and crops to the local agro-ecology. Crop residue management and livestock feeding. Livestock's role in pest and weed control. Use of organic fertilizers and bio-pesticides. Manure management systems in livestock-based IFS. Biogas production and its integration into farm operations. Vermicomposting. Wastewater reuse for irrigation and aquaculture. Role of small ruminants in integrated systems. Poultry farming integration with crops and agroforestry. Integrated pest management (IPM) with poultry and small ruminants. Diversification strategies for risk management. Animal disease control and prevention in integrated systems. Integrating health management with other components of IFS. Biocontrol agents and herbal medicines for livestock health. Integration of aquaculture with crop and livestock systems. Integration of trees with crops and livestock for enhanced farm productivity. Cost-benefit analysis and profitability of IFS. Assessing environmental sustainability of IFS. Commonly practiced IFS models. Selection of appropriate IFS models based on regional and farm-specific needs. Government policies and support programs for IFS. Role of digital tools and farm management software in improving IFS efficiency. Identifying barriers to IFS adoption. Climate change and its implications on IFS. Adoption of climate-smart practices and technologies in IFS. Technological advancements and their potential impact on IFS. The future of IFS in the context of sustainable global food systems.

Practical

Field visit to a model farm with an integrated system to observe different components. Identifying and assessing livestock for integration. Case study: Evaluating livestock performance on integrated farms. Preparation of animal feed formulations and feeding plans for different livestock species. Visit to a feed mill or fodder production unit. Preparation and application of organic fertilizers using farmyard manure. Observing and monitoring fish and livestock interactions. Field visit to assess pest and disease management strategies on an integrated farm. Practicing integrated pest management (IPM) techniques and biological control methods. Preparation of farm plans integrating crops and livestock. Preparing economic feasibility reports for various integrated farming scenarios. Market analysis for livestock and crop products in integrated systems. Designing a model integrated farm layout. Practice on maintaining farm records for crops, livestock, and finances.

Suggested Readings:

1. Integrated Farming Systems by B. L. Reddy & P. V. Venkataramana
2. Sustainable Agriculture and Integrated Farming Systems by S. K. Gupta & V. R. S. Raju
3. Agroecology: The Ecology of Sustainable Food Systems by Stephen R. Gliessman
4. Integrated Farming Systems for Livelihood Security by M. L. Paroda