

**ANIMAL HUSBANDRY & DAIRYING**

**(Subject Code-92)**

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- Unit-1:** Present-status & future prospects of livestock and poultry production in India, History and development of livestock industry, significance of livestock in relation to Agriculture, human health and national economy, animal production systems in different agro-climatic zones. Population dynamics of Indian livestock and national programmes for improvement of cattle, buffaloes, sheep, goats, pigs, equine, camel, rabbits, poultry and swine. Importance of Indian and exotic breeds and their conservation.
- Unit-2:** Problems in improvement of cattle breeds, inheritance of livestock traits. Reproduction behaviours of various species of livestock and poultry, livestock, production system, approaches and methods of breeding and application of biotechnology in animal improvement, maintenance of breeds and breeding records, gene frequency analysis, heritability estimation, semen evaluation, preservation dilution and artificial insemination.
- Unit-3:** Nutritional requirements and feeding programmes for ruminants. Physiology and functions of digestive system of ruminants, Nutrients requirement for milk, meat and wool metabolism of proteins, carbohydrates and fats, in ruminants. Role of vitamins and minerals in Nutrition. Processing storage of conventional and non-conventional feed ingredients, feeds formulation and balanced diets. BIS standards of feeds and marketing.  
Forage crop production and conservation, cultivation of irrigated grass & management of range grass, composition of forage and grasses and role in growth, health, milk production and reproduction. Nutritional Improvement of various Agricultural by products and non-conventional feeds and their utilization. Analysis of feeds and fodders.  
Animals Housing systems and planning and layout of poultry and animal houses.
- Unit-4:** Nutritional requirements and feeding for non-ruminants. Physiology and functions of digestive systems of non-ruminants. Nutrients requirements for egg and meat production in poultry and swine. Protein quality, systems of proteins and energy, metabolism of carbohydrates, proteins and fats in non-ruminants. Vitamins and Mineral nutrition in poultry and swine, feed formulation and balanced diets for various stages in poultry and swine. Use of enzymes and feed additives in poultry & swine rations.
- Unit-5:** Animal health and diseases, causes, symptoms diagnosis and preventive measures, livestock and poultry acts and zoonotic diseases, quarantine maintenance management of hygiene and sanitation on animal farm house, vaccination to animal and poultry.
- Unit-6:** Compositions of milk from different species of animals. Status of dairy industries in India, various national programmes for milk production and dairy development. Technology mission on dairying, national policy of GATT, WTO, MMPO, concepts of GMP, TQM, HACCP, Methods for detection of milk adulteration. Structure of dairy foods representing emulsions, foams and gels; physical structure of fat rich, concentrated, fermented, coagulated and dried products.

- Unit-7:** Composition of cream, butter, condensed milk, dried milk, cheese, flavoured milk, Paneer, Peda, Channa, Ice creams. PFA and BIS standard for milk and milk products. Properties of whey proteins (WPC & WPI), casein, co-precipitates and UF milk retentate. Types of traditional dairy products. Packaging of dairy products (Modified atmosphere packaging, controlled atmosphere packaging, shrink and stretch packaging).
- Unit-8:** Microbial rennet and recombinant chymosin, characteristics and application in cheese making. Technological requirement of modified microorganisms for production of cheese and fermented milk products; Technological innovations in the development of functional dairy foods with improved nutritional therapeutic and pro-biotic attributes.
- Unit-9:** Processing technology for different milk products, quality aspects, and storage for better shelf life and good quality, factors affecting the quality of milk and milk products, homogenization, pasteurization, sterilization, bacto-fugation, Ultra-filtration, Reverse osmosis Nanofiltration, ultra-high temperature (UHT) of milk, filling, packaging, storage, transportation and marketing of milk and milk products. Application of membrane technology; microwave heating for industrial production of traditional dairy products.
- Unit-10:** Design of multiple-effect evaporator. System and devices, design of screw, belt, flight, apron conveyors, bucket elevators, power requirements, and applications, feeders and feeding mechanism. Cleaning and sanitization of dairy equipments Demand analysis Determinants of demand of dairy products. PERT in dairy industry. Rheological and textural properties of dairy products.