

DEPARTMENT OF ANIMAL HUSBANDRY & DAIRYING

Maa Vindhyavashini University, Mirzapur, UP.

Semester wise Course Distribution to be offered in M.Sc. (Ag.)

ANIMAL HUSBANDRY & DAIRYING

M.Sc. (Ag.), Animal Husbandry & Dairying Major Courses

IST Semester

| Sl. No. | Course Code | Course Title | Credits | Semester |
|-----------|-------------|--|---------|----------|
| 1. | AHD-501 | Management of sheep, Goat, Pig and Poultry | 3(2+1) | I |
| 2. | AI-ID-502 | Breeding and Reproductive Management | 3 2+1 | I |
| 3. | AHD-503 | Livestock and Poultry Housing Management | 3(2+1) | I |
| 4. | AGR-506 | Agronomy of Major cereals and Pulses | 3 (2+1) | I |
| 5. | PGS-501 | Library and Information Service | 1(0+1) | I |
| 6. | PGS-504 | Basic Concept in Laboratory Techniques | 1(0+1) | I |
| Sub Total | | | 14 | |

IInd Semester

| Sl.No. | Course Code | Course Title | Credits | Semester |
|--------|-------------|--|---------|----------|
| 1. | AHD- 504 | Nutrients Requirements of Ruminant and Non ruminants | 3 (2+1) | II |
| 2. | AHD- 505 | Market Milk | 3 (2+1) | II |
| 3. | AHD- 506 | Dairy Products Technology | 3 (2+1) | II |
| 4 | AGR-511 | Cropping System | 2(1+1) | II |

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| 5. | PGS-503 | Intellectual Property and its Management in Agriculture | 1(0+1) | II |
| 6. | PGS-505 | Agriculture Research ethics and Rural Development Programme | 1(0+1) | II |
| 7. | AHD-599 | Thesis | 5(0+5) | II |
| | | Sub-Total | 18 | |

IIIrd Semester

| Sl.No | Course Code | Course Title | Credits | Semester |
|-------|-------------|--|-----------|----------|
| 1. | AHD-507 | Dairy Microbiology | 3 (2+1) | III |
| 2. | AGR-507 | Agronomy of Oilseed, Fiber and Sugarcane Crops | 3 (2+1) | III |
| 3. | STAT-501 | Agricultural Statistics | 3(2+1) | III |
| 4. | AHD-591 | Seminar | 1(0+1) | III |
| 5. | PGS-502 | Technical Writing | 1(0+1) | III |
| 6. | PGS-506 | Disaster Management | 1 (0+1) | III |
| 7. | AHD-599 | Thesis | 08 | III |
| | | Sub- Total | 20 | |
| No. | Course Code | Course Title | Credits | Semester |

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IVth Semester

| Sl.No | Course Code | Course Title | Credits | Semester |
|-------|-------------|--|---------|----------|
| 1. | AHD-508 | Fermented, coagulated, concentrated, and dried Milk Products | 3 (2+1) | IV |
| 2. | AHD-599 | Thesis | 17 | IV |
| | | Sub- Total | 20 | |
| | | Total Credit Score | 72 | |

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AHD-501: Management of Sheep, Goat, Pig and Poultry 3(2+1) Theory:

UNIT-1

Livestock and poultry development program currently in operation in the country, important breed of Sheep, Goat, Pig and poultry. Their Characteristics classification and distribution.

Unit-2

Management of Sheep, Goat, Pig and Poultry during growth, reproduction and production. Rearing breed sires and tie heifers, their marking for identification, grazing, docking, dehorning, dubbing and sterilization.

UNIT-3

Selection and disposal of culled animals. Different records of management of related animals. Economics of Sheep, Goat, Pig and poultry farming.

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Selection and disposal of culled animals. Different records of management of related animals. Economics of Sheep, Goat, Pig and poultry farming.

Practical:

Preparation of management calendar for Sheep, Goat, Pig and Poultry, judging of poultry identification, debeaking, canonization. Maintenance records at the farm, calculation of the coat of meat, egg, wool, hair and milk.

AHD-502: Breeding and Reproduction Management 3(2+1)

Theory:

UNIT 1

Functional morphology of male and female reproductive organs of farm animals. Management strategies for attaining early maturity. Heat detect methods associated problems and their management.

UNIT -2

Artificial management. Artificial Breeding and its economic importance, post A. Management pregnancy development and diagnosis. Management of down calves postmortem care, factors influencing reproductive efficiency in buffaloes and crossbreed cattle and measures for improvement.

UNIT -3

Management of breeding bulls, methods of semen collection, factors affecting of the quality semen production, evaluation processing and preservation of semen. Merits and demerits of different extenders.

UNIT -4

Maintenance of records for artificial breeding. Basic principle of inheritance, concept of heritability and repeatability importance, methods of selection and system of breeding in animals. Blood and its composition, properties and function.

Practical:

Examination of reproductive organs at various stages of reproductive cycle. Heat detection in cattle buffaloes. Preparation of heat expectancy chart. Calculation of heat detection index of herd. Artificial insemination by recto vaginal and spectrum method. Pregnancy diagnosis by per rectum method. Calculation of breeding efficiency, heritability and repeatability of the herd preparation of bull semen collection.

Evaluation of semen, preparation of extenders dilution and preservation of semen, maintenance and handling of liquid semen. Cell count, cell volume hemoglobin, Blood sugar and blood serum.

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AHD-503: Livestock and Poultry housing management 3(2+1)

Theory:

UNIT -1

Principles of construction of farm building selection of site. Types and designs for various livestock and poultry. Space requirements of different categories of livestock and poultry under different housing systems.

UNIT -2

Requirements of various housing components viz. ventilation, humidity and temperature control. Types of floors, walls, gates, roofs, stalls, manure collecting devices and food storage.

UNIT-3

Housing for experimental animals' methods of drainage and sewage disposal treatment and classification. Various types of septic and sedimentation tanks digestion tanks, sewage filtration. Sludge and lagoon, recycling of waste and sludge farming and Biogas, common disinfectants, detergents and sanitizers used on farm premises, method of application and factors affecting their efficiency.

UNIT -4

Construction of auxiliary buildings like bull exerciser. Wallowing tank, and feed processing unit.

Practical:

Drawing of environmental profiles in different agro-climatic regions, layout plans including cost kl for different size units and categories of animals. Design and construction of different types of shades. Cleaning disinfection of sanitation of dairy farm. Equipment, Layout plans for waste/sewage disposal and sewage plant management.

AHD-504: NUTRIENT REQUIREMENTS OF RUMINANTS & NON-RUMINANTS- 3(2+1)

Theory:

UNIT -1

Energy system starch equivalent, Scandinavian feed units. Total digestible nutrients, digestible energy, net energy.

UNIT-2

Protein system- crude protein, digestible crude protein, protein equivalent rumen degradable, nondegradable protein.

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UNIT -3

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Methods of determining energy requirements, basal metabolism, digestion trial. Direct and indirect calorimetric.

UNIT -4

Energy and protein requirement for maintenance, growth, reproduction, milk production, work, meat and wool for production of different ruminant species. Mineral and vitamin requirement, water requirement.

UNIT -5

Comparative gastro-intestinal physiology of Pig, Poultry. Feed sources for non-ruminants and their equivalent. M.E. and N.E. concept.

UNIT -6

Feeding standard for pig and poultry, protein evaluation true digestibility. Biological value, net dietary protein value.

UNIT-7

Egg replacement value chemical score EAAI. Energy, protein essential amino acid, mineral & vitamin for poultry and pig.

Practical:

Analysis of feed for crude protein, crude fat, fiber. Dry matter & mineral like Ca, P and Mg.

Computation of least cost rations. Computation of ration for cattle, buffalo, goat, sheep for different production traits. Ration composition for starter grower and layer birds. Ration composition for starter grower and finisher pigs.

AHD-505: MARKET MILK AND MILK PROCESSING 2(1+1)

UNIT 1:

Dairy industry: Status of Dairy industry in India, Operation flood programme. Technology Mission on Dairying. National milk grid. Marketing federation, their concepts, achievements, limitations and impact on the Dairy industry in India. Milk production trends & Dairy Development through successive National plans. Recent policy changes to Dairy Sector (MMPO, GATT) and their impact on dairy industry in the country.

UNIT -2

Processing: Importance of various milks in milk processing. Methods of milk processing like Preheating, Filtration, Clarification, Pasteurization, UHT, Sterilization, Bactofugation, Centrifugation, and Standardization. Impact of processing on major

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and minor constituents of milk. Methods of milk procurements, payments, quality assessment, handling and transportation of milk to processing dairies

UNIT-3

Milk preservation methods of chilling milk, centrifugal separation, clarification and Bactofugation and factors affecting their efficiency. Automatic desludging separators and clarifiers. Homogenization process and its significance in Dairy processing, theories of Homogenization and factors affecting it.

1. Unit IV:

Thermal processing of milk: Principles and methods of thermization, pasteurization and sterilization.

UNIT-4

Special milks: Principles of production, processing and marketing of toned, double toned, reconstituted recombined, sterilized flavored and filled milk.

PRACTICAL:

Assembling and disassembling of cream separator and separation of milk. Study of parts of LTLT and HTST Pasteurizers and preparation of reports. Preparation of special milks like toned milk, double toned milk, Standardized milk, chocolate milk, sterilized milk, flavored and filled milk. Visit to milk plants and Milk products factories and submission of the reports.

AHD-506: Dairy Products Technology 3(2+1)

Theory-

UNIT-1

Indigenous milk products: Significance and role of indigenous dairy products in Indian dairy industry and economy. Characteristics and composition of various indigenous products, their prospects and constraints.

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status of organized and unorganized sectors in the manufacture of these products. Methods of production, physical-chemical changes during manufacture, quality attributes shelf life, preservation, packaging and latest processing innovation of khoa, chhana and paneer.

UNIT -2

Cheese and fermented milk products: Technology of cheese, status and scope of cheese in dairy industry. Definition, classification and standards of cheese. Milk in relation to modern cheese making process. Treatment of cheese manufacture and their consequences. Manufacture of cheddar, Gouda, Mozzarella, Swiss, cottage and Processed cheese. Physical chemical changes during cheese ripening. Manufacturing, storage and packaging of Dahi, Yoghurt, Shrikhand, Lassi, Misti Dahi, acidophilus and bifido milk.

UNIT-3

Fat-rich Dairy products: Basic principles of processing and quality, aspect of different cream-table half and half, sterilized and high fat cream. Quality aspect and shelf—life. Overrun in butter quality, storage and packaging of table butter, shelf-life defects and remedies. Methods of Ghee making. Innovation in Ghee production, procedure, packaging, preservation, composition, changes during manufacture, shelf-life and defects in Ghee.

UNIT -4

Frozen milk products: definition, classification composition of ice-cream and other frozen desserts, status, trends and projection for frozen milk products industry in India. Technological aspect of ice-cream manufacture. Recent advances in ice-cream industry and their impacts. Indigenous frozen desserts- Kulfi Malai ka Braf, filled and imitation ice-cream, their production and quality.

UNIT -5

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Concentrated and Dried milk products: Principles and method of unmanufactured, packaging and storage defects in Sweetened condensed milk (SCM) and Evaporated milk (EM and dried milk\$,,) WMP, SMP and instant milk powder, Special problems in handling buffalo milk for manufacture of concentrated and dried milk and infant milk foods.

UNIT -6

Utilization of milk-by products: Status availability and utilization of dairy by-products. Associated economic and pollution problems. Manufacture of casein whey protein concentrate and whey beverages, Use of buffer milk.

Practical:

Preparation of Khoa, chhana and paneer and their judging for market quality. Cream separation, cleaning and sterilization of cream separators. Preparation of Ghee and its judging. Preparation of ice cream and kulfi and their judging. Preparation of production reports of various milk products. Manufacture of protein rich spreads and cottage cheese and their judging for market quality. Manufacture of Dahi, Yoghurt, Shrikhand, Lassi, Misti Dahi, and judging for their market quality. General study of evaporators.

AHD-507: Dairy Microbiology and Quality control- 3(2+1)

Theory:

UNIT-1- General Microbiology: Introduction and scope of bacteriology, principles of classification and taxonomy of micro-organisms. Bacterial cell and its gross cell structure, principles of bacterial nutrition. Nutritional groups of bacteria. Principles of intermediary metabolism, Growth phases factors affecting growth of bacteria Microbiology of fluid milk; micro flora present in raw milk. Clean milk production.

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UNIT -2

Mastitis milk; pathogen in raw and their control. Bacteriological aspects of boiling, pasteurization, sterilization UHT and Bactofugation of milk; Heat resistant organisms in milk and their role in spoilage:

UNIT -3

Microbiology of milk products: Microbiology of butter, ice-cream, concentrated milks and evaporated milk, milk powder and cheese. Fermented milks and Indian dairy products (like khoa, Burfi, peda, chhana, paneer etc.)

UNIT -4

Microbiology of starter culture: Bacteriology of starter culture, single and multiple strain culture, trend in the use of starters, propagation, production and preservation of lactic cultures by various methods including freeze drying, judging and activity rating of cultures.

UNIT -5

Legal standard for market milk and other designated milk. Procedure of sampling, Examination and testing for chemical and bacteriological qualities. Preservation of milk and quality control of ghee and its grading under AGMARK, PFA and BIS. Legal aspects of various indigenous milk products. Milk preservatives and their detection. Adulterants of milk and milk products and their detection. Rapid platform tests and tests for detection and control of bovine mastitis.

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Practical:

General familiarities with dairy bacteriology laboratory equipments. Cleaning and sterilization of laboratory glass ware. Microscopic, its construction, function of different parts, use and care. Preparation of straining solutions and other reagents needed in microbiological work. Staining methods: Simple, Gram's spore and acid fast staining. Preparation of common selected media and dilution banks. Sampling of milk for bacteriological examination. Enumeration of no. of bacteria in milk and milk products as cream, butter, khoa, Chhena and ice-cream by S.P.C and D.M.C and judging bacteriological quality by dye-reduction test, presumptive coli form test enumeration coli form, yeasts yeasts and moulds. Enumeration of psychrophilic,

thermophilic, thermoduric, lipolytic, proteolytic and enteric pathogenic bacteria in milk and milk products isolation and identification or lactic acid bacteria from milk and dahi and maintenance of pure culture. Analysis of milk for chemical and bacteriological quality at various stages of production, processing and ng. Assessment or the contamination of handling equipment's. Detection of adulteration of milk and milk Products with various adulterants including Urea. Detection of preservatives in milk and milk products.

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AHD-508- Fermented, coagulated, concentrated, and dried Milk Products – 3 (2+1)

Theory:

UNIT-1

Manufacture of Swiss, cheddar, Brick, Dacca, Bandal and Gouda Cheese and.

UNIT-2

Manufacture of indigenous milk products like chhena, curd, cultured buttermilk, Shrikhand. Manufacture of casein Yoghurt.

UNIT-3

Manufacturing, packaging, storage and marketing of dried milk, baby milk formula, dried ice cream mix and lactose.

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Manufacturing, packing, storage and marketing of sweetened milk.

UNIT-5

Freeze drying of milk. Preparation of Khoa, Rabari etc.

Practical-

Estimation of requirements for setting up milk condensory and dried milk factory, handling various quantities of milk. Freeze drying of milk. Preparation of Khoa and Rabri. Marketing reports related to sale of concentrated and dried milk. Manufacture of different kinds of cheese. Preparation of Shri Khand. Preparation of Dahi, cultured buttermilks, and Yoghurt. Preparation of casein and Chhena.

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| 1- AHD- (501) Agricultural Statistics | 3 (2+1) Credit |
| 2- AHD- (591) Seminar | 01 Credit |
| 3- AHD- (599) Thesis | 30 Credit |

*It should be compulsory for all M.Sc. (Ag.) Students.

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