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M.J.P. Rohilkhand University, Bareilly (U.P.)

Course Structure Under Semester System

For

M.Sc. (Ag) Animal Husbandry & Dairying
Semester wise course Programme & Syllabus

Under


Faculty of Agriculture

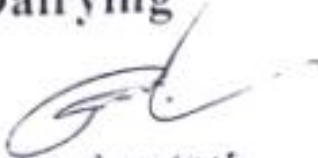
Enclosed -
1. 10 courses
2. Semester wise course Programme
3. 17 courses/papers AND-2' 12' 17
Total Page - 19 pages.

Session : 2020-21

Board of Studies

Animal Husbandry & Dairying


Dr. S. K. Singh
(Secretary)


Dr. Anand Kumar
Member

M.J.P. Rohilkhand University, Bareilly (U.P.)

M.Sc. (Ag.) Animal Husbandry & Dairying
Courses Structure Under Semester System

| Paper | Course No. | Course Title | Credit Course |
|---|------------|--|---------------|
| 1 | AHD 101 | A.H. & Dairying - An Introduction | 2(1-1) |
| 2 | AHD 102 | Management of Sheep, Goat, Pig and Poultry | 3(2+1) |
| 3 | AHD 103 | Dairy Chemistry | 3(2+1) |
| 4 | AHD 201 | Animal Breeding and Reproduction | 3(2+1) |
| 5 | AHD 202 | Animal Nutrition | 3(2+1) |
| 6 | AHD 203 | Dairy Microbiology | 3(2+1) |
| 7 | AHD 301 | Live stock & Poultry Housing Management | 3(2+1) |
| 8 | AHD 302 | Live Stocks Health Management | 3(2+1) |
| 9 | AHD 303 | Technology of Milk Products | 3(2+1) |
| 10 | AHD 401 | Dairy Plant Management & Quality Control | 3(2+1) |
| 18 | AHD 404 | Master Seminar | (10+1) |
| Supporting Courses | | | |
| 16 | AST 101 | Fundamental & Statistics & Computer Application | 3(2+1) |
| 17 | AST 201 | Statistical Method & Experimental Design | 3(2+1) |
| Special Paper (Following Course may be taken to full fill the requirement) | | | |
| 11 | AHD 104 | Dairy Cattle Production | 4(3+1) |
| 12 | AHD 204 | Elementary Food Science | 4(3+1) |
| 13 | AHD 304 | Traditional And Value Added Milk Products | 4(3+1) |
| 14 | AHD 402 | Technology of Functional Food | 4(3+1) |
| 15 | AHD 403 | Banking, Marketing & Cooperation for A.H. Dairying | 4(3+1) |
| Or | | | |
| 19 | AHD 405 | Master Research (Thesis) | 20 |

M.J.P. Rohilkhand University, Bareilly (U.P.)
M.Sc. (Ag.) Animal Husbandry & Dairying
Semester Wise Course Distribution Programme Course
Course Curriculum – Wef

| Semester | P | Course No. | Course Title | Credit Course | Marks | | | |
|----------|----|--------------------|--|---------------|-----------------------------|-----------|--------|-------|
| | | | | | Mid Term | Practical | Theory | Total |
| Sem. I | 1 | AHD 101 | A.H. & Dairying – An Introduction | 2(1-1) | 20 | 30 | 50 | 100 |
| | 2 | AHD 102 | Management of Sheep, Goat, Pig and Poultry | 3(2-1) | 20 | 30 | 50 | 100 |
| | 3 | AHD 103 | Dairy Chemistry | 3(2-1) | 20 | 30 | 50 | 100 |
| | 11 | AHD 104 Special | Dairy Cattle Production | 4(3-1) | 20 | 30 | 50 | 100 |
| | 16 | AST 101 | Fundamental of Statistics & Computer Application | 2(1-1) | 20 | 30 | 50 | 100 |
| Sem. II | 4 | AHD 201 | Animal Breeding and Reproduction | 3(2-1) | 20 | 30 | 50 | 100 |
| | 5 | AHD 202 | Animal Nutrition | 3(2-1) | 20 | 30 | 50 | 100 |
| | 6 | AHD 203 | Dairy Microbiology | 3(2-1) | 20 | 30 | 50 | 100 |
| | 12 | AHD 204 Special | Elementary Food Science | 4(3-1) | 20 | 30 | 50 | 100 |
| | 17 | AST 201 | Statistical Method & Experimental Design | 3(2-1) | 20 | 30 | 50 | 100 |
| Sem. III | 7 | AHD 301 | Live stock & Poultry Housing Management | 3(2-1) | 20 | 30 | 50 | 100 |
| | 8 | AHD 302 | Live Stocks Health Management | 3(2-1) | 20 | 30 | 50 | 100 |
| | 9 | AHD 303 | Technology of Milk Products | 3(2-1) | 20 | 30 | 50 | 100 |
| | 13 | AHD 304 Special | Traditional And Value Added Milk Products | 4(3-1) | 20 | 30 | 50 | 100 |
| Sem. IV | 10 | AHD 401 | Dairy Plant Management & Quality Control | 3(2-1) | 20 | 30 | 50 | 100 |
| | 14 | AHD 402 Special | Technology of Functional Food | 4(3-1) | 20 | 30 | 50 | 100 |
| | 15 | AHD 403 Special | Banking, Marketing & Cooperation for A.H. Dairying | 4(3-1) | 20 | 30 | 50 | 100 |
| | 18 | AHD 404 | Master Seminar | (0-1) | 20 | 30 | 50 | 100 |
| | 19 | AHD 405 | Master Research (Thesis) Or Special Paper | 20 | Satisfactory Unsatisfactory | | | |

Total = 56

Compulsory for Master's Programmes

M.Sc. (Ag) Animal Husbandry & Dairying : Semester I
AHD - 101 A.H. & DAIRYING - AN INTRODUCTION 3(2+1)M.M.: 50
Paper - Ist

Theory

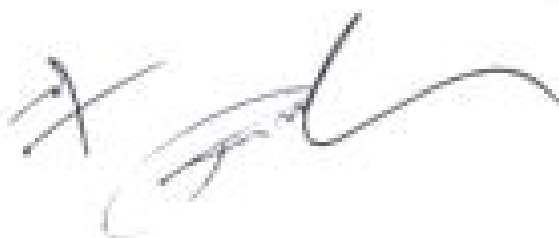
Present status and future prospects of livestock production development in India. Production trends of cattle, buffalo, sheep, goat, swine and poultry in last two decades and factors affecting them. Elements of livestock production and management - a general idea. Management of livestock in Indian agro-climatic and socio economic condition. General behaviour and handling practice of different categories of livestock.

Brief history of dairy development and cooperative movement in India. Principles of cooperatives. Organization and functioning of milk cooperatives since beginning to end in India & Uttar Pradesh. Present status of dairy Industry in India, current milk production and their trends. Operation flood programmes, technology mission on dairying, National milk grid and marketing federations - their concepts, achievements, limitation and impact on dairy Industry. Method of milk procurement, payments, storage handling, transportation packaging, distribution and vending. Recent policy related to dairy sector & their impact on dairy industry in the country.

Practical

M.M.:30

Present and global and Indian status of livestock dairy industry, livestock products and dairy products. Milk utilization, consumption, import and export. Survey of plans and policies of central and state government and development agencies for livestock and dairy industry development in country.



Paper - 3rd

Theory

Chemistry of milk constituents, milk lipid - various milk lipid and their composition. Factor affecting composition of butter fat quality. Butter fat interm of its physico chemical constant. Deterioration of butter fat oxidation. Development of free fatty acid and ketonic rancidity, phospholipid and their composition.

Lactose : General physical and chemical properties of lactose, hydrolysis of lactose, fermentation of lactose. Milk protein - composition and general properties and classification of milk protein amino acid composition of casien, Lactalbumin and lact globulin and their general properties. Inorganic constituents of milk, composition of ash of milk. Major, minor and trace elements. Factor associated with variation in salt composition. Salt Balance and its importance in processing of milk. Milk vitamin and Enzymes. Fat and water soluble vitamins in milk, their level in milk and milk products and their biological significance. Milk enzymes and their importance in relation to various milk constituents. Chemistry of milk products - composition and physical and chemical changes. During manufacturing and storage of important milk products, cream, dahi, butter, renovated butter and ghee.

Practical

M.M.:30

Specific gravity of milk by lactometer. Determination of freezing point depression. Determination of fat by gravimetric and volumetric method in milk and milk products. Estimation of lactose by lactometric and fehling solution method in milk and milk products. Detection of common adulterants & preservative in milk and ghee. Determination of RM value reflecto index, P value and iodine value of ghee. Determination of moisture percentage in milk and milk products.



M.Sc. (Ag) Animal Husbandry & Dairying : Semester I
AHD - 104 DAIRY CATTLE PRODUCTION 4(3+1) M.M.: 50
Paper - 11th

Theory

Dairy Industry : Its scope and potential, taxonomical classification of dairy animals, animal behavior, direct and indirect effect of temperature, humidity, solar radiation and light on productivity of dairy animals. *

Breeding : System of animal breeding, breeding policies for cattle and buffaloes, strategies for genetic improvement of cow and buffalo for productive and reproductive performance, artificial inseminations and its role in animal breeding.

Housing : Types and planning of building/sheds for various age groups in dairy cattle, site selection and foundation, water-its quality and supply, cleaning and disinfection of barns and sheds.

Nutrition : Nutrient requirement for growth, reproduction and production; formulation and consumption of economic ration, composition of ration for different dairy animals for growth, milk production and draft.


Management : Care and management of dairy livestock during pregnancy and parturition, care of newly born - weaned and suckling calves.

Labour Management : Selection of labour, milking practices and problems, farm records and their upkeep.

Clean Milk Production : Constraints and strategies, Good Animal Husbandry Practices.

Practical

M.M.:30
Layout of cattle sheds, feed storage stacks, ensuring of green fodder, hay making. Identifications of common feeds and fodders. Formulation of ration for dairy animals. Vaccination and deworming programme formulation for dairy livestock. Demonstration of semen collection, processing and insemination of female.



M.Sc. (Ag) Animal Husbandry & Dairying : Semester I
AST - 101 FUNDAMENTALS OF STATISTICS
AND COMPUTER APPLICATIONS (2: 1) M.M.:50
Paper - 16th

Theory

Processing of Data : Introduction to statistics, classification and tabulation of statistical data, frequency distribution, diagrammatic and graphical representation of data-bars, circles, rectangles, histogram, frequency polygon, frequency curve and cumulative frequency curves.

Measures of Central Tendency and Dispersion : Mean, median, mode, quartiles and calculation of median, mode and quartiles by graphs; range, quartile deviation, mean deviation, standard deviation, variance, coefficient of variation and standard error of mean.

Probability and Distribution : Random experiment, events-exhaustive, mutually exclusive, equally likely, independent and favorable, definition of probability (with simple exercises) law of addition and law of multiplication of probability (with simple exercises), modom variable - discrete and continuous, definitions of Biomial, Person and Normal distributions sample properties of the above distributions (without derivation)

Correlation and Regression : Bivariate data, bivariate frequency distribution, simple correlation, Karl pearson's correlation coefficient rand correlation, Spearman's rank correlation coefficient, linear regression resources lines, regression coefficients and their relation with correlation coefficient, multiple regression, multiple and partial correlation coefficients (for three variables only).

Computer Application :

Introduction to computer : Definition, History, generation of development, characteristics of computers, benefits and application of computers.

Organisation of computer – Hardware : Inputs devices, output devices, CPU, storage unit, Software : Types of software, application of software, system software, utility software, general purpose software.

Binary number system and its conversion, Introduction to statistical packages. (Excel, SPSS, SYSTAT, Sigma Stat)

M.M.:30

Practical

Exercises related with course content



M.Sc. (Ag) Animal Husbandry & Dairying : Semester II
AHD - 201 ANIMAL BREEDING & REPRODUCTION

(201) M.M.:50

Paper - 4th

Theory

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. Artificial Breeding and its economic importance, post A.I management pregnancy development and diagnosis. Management of down calves postpartum care, factors influencing reproductive efficiency in buffaloes and crossbred cattle and measures for improvement. Management of breeding bulls, method of semen collection, factors affecting quality semen production, evaluation processing and preservation of semen. Merits and demerits of different extendors. 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 :

M.M. : 30

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 rectovaginal and spectrum method. Pregnancy diagnosis by hand per rectum method. Calculation of breeding efficiency, heritability and repeatability of the herd preparation of bull semen collection. Evaluation of semen, preparation of extendors dilution and preservation of semen, maintenance and handling of liquid semen. Examination of sperm count, semen volume, Haemoglobin, Blood sugar and blood serum.



M.Sc. (Ag) Animal Husbandry & Dairying : Semester II

VIII 202 ANIMAL NUTRITION

(2+1) M.M. : 50

Paper - 5th

Theory

Constituents of Animal Body, Principle of feeding, feeding standards for livestock, feeds, fodder and concentrate, classification of feeding stuff, composition and nutritive value of feed stuffs, characteristics of feeds, roughages and concentrate, use of unconventional livestock feed in India, evaluation of feeding stuffs, Nutrients require for livestock.

Digestive organs and system of live stock : Digestive process in ruminant and non-ruminant, digestion, absorption and metabolism of carbohydrate, protein and lipids, use of urea as a protein replacer. Analysis of feeding stuffs and faeces. Energy & Protein requirement for maintenance, growth, reproduction, milk production, work, meat and wool of different ruminant species, mineral and vitamin requirement, water requirement, evaluation of digestibility, biological value, egg replacement value. Protein essential amino acids, mineral & vitamins for cattle, poultry and pigs.

M.M. : 30

Practical :

Anatomical study of digestive system of ruminant and non-ruminant. Estimation of ration for cattle, buffalo, goat and poultry.

Preparation of standard solutions feeding stuffs analysis (a) Moisture (b) Dry Matter (c) Total ash (d) CaO (e) P₂O₅ and crude protein

Faeces analysis (a) Total Nitrogen (b) CaO (c) P₂O₅

Demonstration of procedure used in determination of ether extract and crude fibre in feeding stuffs & faeces.



M.Sc. (Ag) Animal Husbandry & Dairying: Semester I

AHD - 102 MANAGEMENT OF SHEEP, GOAT, PIG & POULTRY

3(2+1) M.M.: 50

Paper - 2nd

Theory

Livestock and Poultry development programme currently in operation in country, important breed of sheep, goat, pig and poultry. Their characteristics classification and distribution. Management of sheep, goat, pig and poultry during growth, reproduction and production. Rearing breedable and youngstock heifers, their marking for identification, Grazing, docking, dehorning, dubbing, clipping and sterilization of equipment. Selection and disposal of culled animals. Different records of management of related animals. Economics of Dairy, Sheep, Goat, Pig and Poultry farming.

Practical :

M.M. : 30

Preparation of management calendar for sheep, goat, pig and poultry, judging of poultry identification, debeaking, caponization. Maintenance of farm records at the farm, calculation of cost of meat, egg, wool, hair and milk.

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Theory

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; Microflora present in raw milk, clean milk production, mastitis milk, pathogen in raw milk and their control. Bacteriological aspects of boiling, pasteurization, sterilization UHT and bactofugation of milk; Heat resistant organisms in milk and their role in spoilage. Microbiology of milk products : Microbiology of butter, ice-cream, Concentrated milks (condensed and evaporated milk), milk powder and cheese. Fermented milks and Indian dairy products (like khoa, Burfi, Peda, Chhana, Paneer etc.) 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.

M.M. : 30

Practical

General familiarities with dairy bacteriology laboratory equipments. Cleaning and sterilization of laboratory glass ware. Microscope, its construction, function of different parts, use and care. Preparation of staining 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 blanks. Sampling of milk for bacteriological examination. Enumeration of no. of bacteria in milk and milk products as cream, butter, khoa, Chhana, and ice-cream by S.P.C. and DMC and judging bacteriological quality by dye-reduction test, presumptive coliform test enumeration coliform, yeasts and moulds. Enumeration of Psychrophilics, thermophilic, thermotolerant, lipolytic, proteolytic and enteric pathogenic bacteria in milk and milk products, isolation and identification of lactic acid bacteria from milk and dahi maintenance of pure culture.



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M.Sc. (Ag) Animal Husbandry & Dairying : Semester II
AHD - 201(Special) ELEMENTARY FOODSCIENCE - 40-1) M.M.: 50
Paper - 4th

Theory

Introduction : Food production-significance of agriculture (crops and live stock), food constituents, specific nutrients in foods, functions of foods, Basic food groups, energy giving, body building and protective foods, Status, prospects and constraints in development of food industry in India, World food problem and role of food processing industry in solving it.

Post Harvest Management of foods : Harvesting indices, bio-chemical and physical change during ripening of fruits and vegetable, role of ethylene in accelerated ripening, climacteric and non climacteric fruits and vegetables extension of shelf life of fresh produce and minimizing post harvest losses.

Food Preservation : Food spoilage, principles of food preservation, temperature in relation to bacterial life, thermal death time (F 0 value), Principles involved in heating, chilling, freezing and drying; change during cold storage and drying of food products; advance drying process-freeze drying, infrared drying and micro wave drying; use of sugar, salt, chemical preservatives and smoke in food preservation.

Food Fermentation : Role of acid fermentation, alcoholic fermentation and flavor producing fermentation in food industry; technology of pickled vegetable and production of vinegar, wine and beer 5 hours.

Meat Preservation : Freezing, canning and smoking of meat, fermented sausages.

Food Additives : Stabilizer, emulsifier, anti-oxidant and preservatives for formulated foods.

Bakery Products : Solvent extractive milling of rice and turbo milling of wheat, role of ingredients in bakery products; change during processing of breads, biscuits pizza bases and cake.

Packaging : Packaging of food products sensitive to oxygen, light and moisture; package of convenience foods, fruits, vegetable, meat products and egg products; controlled atmosphere packaging, shrink and stretch packaging; biodegradable and edible packages.

M.M.:30

Practical

1. Manufacture of bread, biscuits, pizza base and cake.
2. Preparation of squash, cordial, nectar and whey based drinks.
3. Clarification of fruit juices.
4. Preparation of soya milk and tofu.
5. Drying of fruits and vegetables.
6. Computation cost of production of prepared food products.
7. Visit of food industry.



Paper - 1st

Theory

Theory of Sampling : Concept of sampling, sampling Vs complete enumeration, simple random sampling, stratified sampling, systematic sampling, cluster sampling and multi-stage sampling (methods, advantages and disadvantages only).

Testing of Hypothesis : Null and alternative hypothesis, two types of error, level of significance, power of the test, one tailed and two tailed tests.

Test of Significance : Z and t-test for testing equality of two means, chi-square test for testing goodness of fit, independence of attributes (contingency table) with Yates correction and testing for the variable of population, F-test for testing the equality of two variances and homogeneity of means (analysis of variance).

Analysis of Variance : Analysis of variance with one way and two way classification (one observation per cell)

Design of Experiments : Basic principles of design of experiments, uniformity trials, shape and size of the plots and blocks, completely randomized, randomized block and Latin square designs and their analysis, Missing plot technique in R.B.D, simple factorial experiments of the 2^2 and 2^3 . Confounding in factorial experiments, split-plot experiments (Layout only).

M.M.:30

Practical

Exercises related with course content.



M.Sc. (Ag) Animal Husbandry & Dairying : Semester III
AHD - 301 LIVE STOCK & POULTRY HOUSING MANAGEMENT
3(2+1) M.M.: 50

Theory

Paper - 7th

Principles of construction of farm building selection of site. Types of designs for various livestock and poultry. Space requirements of different categories of livestock and Poultry under different housing systems. Requirements of various housing components viz. ventilation, humidity and temperature control types of floors, walls, gates, roofs, stalls manger stying devices and food storage. Housing for experimental animals, methods of drainage and sewage disposal sewage treatment and classification. Various types of septic and sedimentation tanks digestion tanks, sewage filtration. Sludge and lagoons, 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, Construction of auxillary buildings like bull exercise. Wallowing tank and feed processing unit.

M.M. : 30

Practical :

Drawing of environmental profiles in different agro-climatic regions, Layout plans of animal shed including calves, poultry, pig, in different size units. Design and construction of different types of shades. Cleaning disinfection of sanitation of diary farm equipment, Layout plans for waster / sewage disposal and sewage plant management.



M.Sc. (Ag) Animal Husbandry & Dairying : Semester III

AHD - 302 LIVE STOCK HEALTH MANAGEMENT (32+1) M.M.: 50

Paper - 8th

Theory

Health and production interrelationship. General approach to plan animal health programme. Emerging diseases problems in India and their management. Major reproductive disorders their prevention and control Maintenance of herd reproductive health, mastitis, H.S. FMD, B.O. Bloat, milk fever control. Specific disease problems in calves and their management. Sign of disease outbreak and procedure for early diagnosis. Predisposing factors of diseases immune status of neonates. Zoonosis concept and classification. Epidemiology of bacterial and viral diseases.

M.M. : 30

Practical :

General examination of animals for signs of health status. Package of practical for control and prevention of calf diseases, immunization against different diseases. Collection preservation and transportation of clinical material for diagnosis purpose collection preservation and examination of blood and blood smear for protozoa parasites. Examination of urine and faecal material. Preparation and use of insecticide solution. Procedures for autopsy and carcass disposal maintenance of health record. Data base animal health surveillance.



M.Sc. (Ag) Animal Husbandry & Dairying : Semester III

AHD - 303 TECHNOLOGY OF MILK PRODUCTS (M2-1) MLM: 50
Paper - 9th

Theory

Basic principles & Technology of manufacturing, packaging and storage of different categories of milk products - (i) Fatrich milk products - Cream, butter oil and ghee. (ii) Frozen milk products - Ice - cream, frozen desserts kulfi & malai-ice-baraf, Filled and imitation ice-cream (iii) Cheese & Fermented milk products - Cheddar, Gouda, mozzarella, swiss, processed cheese, cheese spread, process cheese food, dahi, shrikhand, lassi & misti dahi. (iv) Concentrated and dry milk products - SCMs, EM, RSCM, REM, UHT Sterilized concentrated milk WMP, SMP, Instant milk powder, infants food, weaning foods, cream powder, butter powder, cheese powder, ice-cream mix powder and malted milk powder (v) indigenous milk products - Khoa, Chhana, Paneer and sweets based on its. (vi) Milk by products - Casein, Na & Ca-Caseinates, edible casein, hydrolysate, co-precipitate, whey protein concentrate, whey beverages, whey syrup, lactose, use of butter milk.

MLM : 30

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 Cheddar and cottage cheese and their judging for market quality. Manufacture of Dahi, Yoghurt, Shrikhand, Lassi and Misti Dahi and judging for their market quality. General study of evaporators. Manufacture of various types of casein. Preparation of whey drinks.

(16)

M.Sc. (Ag) Animal Husbandry & Dairying : Semester IV

AHD - 401 DAIRY PLANT MANAGEMENT & QUALITY CONTROL

M(2+1) M.M.: 50

Paper - 10th

Theory

Brief outlines of organizing, developing and financing a dairy scheme, factors determining as which product to manufacture. Methods of pricing and payments. Programming raw material supplies, spare parts, utilities of lab and plant operations. Security of storages, plants and equipment. inventory control. Operational and technical management. Maintenance of financial records, cost accounting personal management, contracts and sales agreement tenders. Credit and cash sales and collection. Requirements, specifications, arrangement operations and maintenance of equipments, floor space requirements, equipment layout and floor plans. General requirements of steam, refrigeration and water. Products losses and their control in Dairy. Plants Waste conservation and methods and cost treatment. Laws affecting dairy industry insurance of plants and personnel and various tax structure applied to dairy industry.

Legal standard for market milk and other designated milk procedure of sampling, Examination and testing for chemical and bacteriological qualities. LP System and its use in preservation of milk 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 and products and their detection, rapid platform tests and tests for detection and control of bovine mastitis.

Practical

M.M. : 30

Collection of different types of packaging used in the packaging of various milk products. Preparation of Dairy Schemes. Calculations on economy of machines used in dairy plant. Assembling and disassembling of Dairy plant equipments. Visit to Dairy plants and factories and submission of visit reports.

Analysis of milk for chemical and bacteriological quality at various stages of production, processing and handling. Assessment of the contamination of milk handling equipments. Detection of adulteration of milk and milk products with various adulterants including water, urea, starch and other. Detection of preservatives in milk and milk products.



M.Sc. (Ag) Animal Husbandry & Dairying : Semester IV

AHD - 402 TECHNOLOGY OF FUNCTIONAL FOODS 4(3+1) M.M.: 50

Paper - 14th**Theory**

Food nutrition and health. Infant nutrition and dietary formulation for meeting normal and special needs. Special food formulation for lactose intolerant and diabetics. Therapeutic diet for patients suffering from acute gastritis, flatulence, peptic, ulcers, jaundice, viral hepatitis etc. Low fat, low energy and slimming foods for the obese. Low cholesterol and low sodium foods. Geriatric and probiotic foods and nutritional management of the elderly. Food formulation for the sport persons and growing children. Special dietary foods-Infant foods, weaning foods, high energy foods and slow residue diets.

M.M.:30

Practical

Production of various formulated foods-low and high energy foods, high fibre content foods, probiotic foods. Measurement of dietary fiber contents in dairy foods.

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M.Sc. (Ag) Animal Husbandry & Dairying : Semester IV

AHD - 403 (Special) BANKING, MARKETING AND COOPERATION FOR A.H. & DAIRYING 4(3+1) M.M.: 50

Paper - 15th

Theory

Banking : Organization and functions of Indian Banking systems. Scope and significance of live stock and dairy industry finance. Credit need in Animal Husbandry & Dairying. Credit Agencies.

Marketing : Importance of Agricultural Marketing. Market classification. Marketing functionaries and services. Marketing charges and margins. Marketing cost and price spread over.

Cooperation : Meaning and importance of cooperation. Basic principles of cooperation. Growth of different types of cooperative societies. Growth of cooperative institutions. Infrastructure of national and international of milk cooperative societies, dairy & live stock federations. Assessment of dairy & live stock cooperative organization.

M.M.:30

Practical

Working out credit needs of farmers. Visit to credit institutions and study of their working. Study of working of cooperative society. Survey of local Agricultural market. Estimation of price spread over and marketing cost of two important live stock and dairy commodities. Survey of a village milk producer cooperative society & district milk unions and state dairy federations.