

SCHEME OF STUDIES

FOR

M. Phil. Livestock Management

(Master of Philosophy Livestock Management)

Department of Livestock Production and Management

Faculty of Veterinary and Animal Sciences

Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi

Summary

M.Phil in Livestock Management

Course Code	Course Title	Credit Hrs
LM-701	Dairy Production	3(2-2)
LM-702	Behavior and Welfare of Farm Animals	3(2-2)
LM-703	Livestock Industry	3(3-0)
LM-704	Range Livestock Management	3(2-2)
LM-705	Draught Animal Management	3(2-2)
LM-706	Advanced Wool and Hair Science	3(2-2)
LM-707	Advances in Sheep and Goat Production	3(2-2)
LM-708	Recent Trends in Milk and Meat Production	3(3-0)
LM-709	Managing Livestock under Stress Conditions	3(2-2)
LM-710	Livestock Enterprises for Rural Development	3(2-2)
LM-719	Special Problem	1(1-0)
LM-720	Seminar	1(1-0)
LM-799	Thesis	06(0-12)

Theory

Brief history and development of dairying in the world and Pakistan; establishing a modern dairy enterprise; world famous dairy breeds (exotic/ local/ cross bred); welfare and behavior of dairy animals, buffalo as major dairy animal; housing systems; basic management of dairy animals during winter and summer; Heat stress management, fresh cow problems; replacements heifers; selection and culling guide; improving reproductive efficiency; hygienic milk production; mastitis control program; Parlor management; Marketing of animals, milk and milk products, common ailments in dairy animals and its prevention, farm bio security, bio-safety and waste management, farm records and economic appraisal of a dairy farm.

Practical

Dairy breed characteristics and their body condition scoring; selection and purchase guide; design and layout of a modern dairy enterprise; practice of manual and machine milking; adoption of hygienic measures in milking parlours and at milking time; post milking teat dipping and dry period therapy; measurement of milk flow rate; feeding practices; visits to dairy enterprises, Sanitation and biosecurity measures in dairy farm; Mastitis and udder problems/ Diseases, Milk quality and adulteration Tests.

Books Recommended

1. John, W. 2020. Understanding the Dairy Cow, 3rd Edition. ISBN: 978-1-119-55022-8. Wiley-Blackwell.
2. Bennet, G., C. J. Hernandez-Sanchez. 2020. Breeding of Dairy Cattle (Agricultural Science). Scitus Academics LLC Publishers. ISBN-13:978-1642242768.
3. Julius, V. D. Werf; J.E.Pryce. 2019. Advances in Breeding of Dairy Cattle. Publisher Burleigh Dodds Science .
4. Christian, S. 2016. Dairy Farming: Animal Husbandry and Welfare. Syrawood Publishing House; 1st edition.
5. Claudia, K. and W. Steeneveld. 2016. Precision Dairy Farming. Wageningen Academic Publishers, Netherland

Theory

Scope and importance of animal behavior; role of hormones and pheromones; organization and variations among groups; contributions of animals to Society; practices and programs to assess animal welfare; patterns of behavior; understanding and managing cattle welfare; cattle sensibility; Transportation and slaughtering of beef and dairy animals; optimal human animal interactions for improving handling; environmental influence; selection for behavioral characteristics; age and living space in relation to behavior; comparative behavior of animals; five freedoms of animals; unnecessary beating/ torturing; avoiding stress; necessary facilities for animals at marketing places; review of society for the prevention of cruelty to animals (SPCA) act, experimentation on animals.

Practical

Demonstration about social behavior, hierarchy system in animals, parental care, mating behavior and communication; assignments on behavioral observations on various species of farm animals; assessment of animal welfare during rearing and transportation of farms animals, pulling carts, slaughter and at marketing places; review of current advances in behavior studies; group presentation on related scientific papers.

Books Recommended

1. Silvana, M. 2020. Positive Aspects of Animal Welfare. MDPI AG. ISBN-13 : 978-3039285327.
2. Ingvar, E., and S. Gunnarsson. 2018. Farm Animal Behaviour. Characteristics for Assessment of Health and Welfare. 2nd Edition. ePub 9781786391414. CABI publishers.
3. Blokhuis, H.J., M. Miele, I. Veissier and B. Jones. 2013. Improving farm animal welfare (Science and society working together: the Welfare Quality approach). Wageningen Academic Publishers. ISBN 978-90-8686-770-7. DOI-10.3920/978-90-8686-770-7.
4. Wilson G. F. Pond, W. B. Bazer and E. Rollin. 2011. Animal Welfare in Animal Agriculture: Husbandry, Stewardship and Sustainability in Animal Production. 1st Edition. ISBN 9781439848425. CRC Press.
5. Temple, G. 2008. Temple Grandin's Guide to Working with Farm Animals: Safe, Humane Livestock Handling Practices for the Small Farm. Kindle Edition. Storey Publishing, LLC.

LM-703

Livestock Industry

3(3-0)

Theory

Structure of livestock and meat sectors. Business methods of livestock production systems, USDA's GIPSA (The Grain Inspection, Packers and Stockyards Administration) Rule on livestock and poultry marketing; current and critical biological, ecological, financial, and marketing issues of beef industry; contribution of livestock sector to national economy and food security; factors governing animal production and industry, milk and beef processing, value chain analyses of different components of livestock industry, SWOT analysis; prevalent production systems and changing trends; establishment of economical sustainable livestock production entities; links between livestock and allied industries, development of livestock markets, role of private sector in livestock industry, case studies.

Books Recommended

1. James, R. S. 2021. The Economics of Livestock Systems In Developing Countries: Farm and Project Level Analysis. CRC Press; 1st edition. ISBN-13 : 978-0367307028.
2. Temple, G. 2017. Temple Grandin's Guide to Working with Farm Animals: Safe, Humane Livestock Handling Practices for the Small Farm Kindle Edition. Storey Publishing, LLC.
3. USDA's "GIPSA Rule" on Livestock and Poultry Marketing Practices (CRS Report). 2015. Create Space Independent. Publishing Platform; R41673 edition.
4. Bardhan, D. 2012. Textbook on Livestock Economics Marketing and Business. AuSatish Serial Publishing House.
5. Benjamin, R. E. Perry, J. Henderson. 2012. Livestock Marketing and Competition and the USDA's "GI SPA" Rule. Nova Novinka; UK ed. Edition.

Theory

History of livestock production on ranges; ecological zones; geographical distribution of rangelands; rangelands of Pakistan and climatic zones; problems and concepts of various agro-ecological zones; world wise AEZ and rangelands distribution; various biomes of the world; range livestock industry; principles of range livestock production; range animals; range vegetation, supplementary feeding on ranges, range inventories and grazing plans; agro-pastoral systems; use of GIS in grazing management; mechanisms of controlling animal population; carrying capacity and stocking rates; calculating carrying capacity; selection and handling of livestock on ranges; grazing behavior of various species of range livestock; range resources sustainability; conservation of water resources; range management and range development operations; Agro grazing; ailments of range animals; range policy and research.

Practical

Range terminology; identification of range vegetation (grasses, shrubs, herbs and forage trees); native and exotic forage species; animal units and animal equivalents; calculating carrying capacity matching with stocking rates, seasonal variations in body condition; practical demonstration of grazing system management; corrective measure to improve rangeland productivity in Pakistan; feeding management for better performance; observations on grazing habits of buffaloes, cattle, sheep, goats and camels; visits to rangelands.

Recommended Books

1. Robert, H.F. 2020. Free Grass to Fences: The Montana Cattle Range Story. Barakaldo Books Publishers.
2. Berlinger B. 2018. The Barn: Range and Pasture Management. Colorado state University.
3. David, D. B. 2017. Rangeland Systems: Processes, Management and Challenges. Springer International Publishing AG, Switzerland.
4. Jerry, L. H., D. P. Rex and H. H. Carlton. 2011. Range Management: Principles and Practices. 6th Edition. Pearson publishers.
5. Rai, M. K. 2012. Livestock Production and Management. Oxford Book Co. India.

Theory

Draught resources of the world and Pakistan and their contribution; draught power versus mechanization; husbandry and management of draught animals; selection of ideal animal ;animal traction; nutrition and feeding of draught animals working under various conditions; measuring the animal performance under different working conditions; importance of draught oxen; comparative efficiency of farm animals; Nitrogen balance and animals; role of draft animals in small scale farming; draught animals welfare, types of harnesses and equipment for draught power; communication, training and facilitations; common ailments of draught animals.

Practical

Identification of draught breeds, breaking and training of draught animals, measuring draught animal power, use of different harnesses and equipment, measuring physical norms during work.

Books Recommended

1. Mina, C.G.D.M. 2020. Equine Reproductive Physiology, Breeding and Stud Management. 5th Edition. Aberystwyth University, UK. ISBN: 9781789242249. CABI Publishers.
2. Debbie, S. 2019. From the Horse's Point of View: A Guide to Understanding Horse Behavior and Language with Tips to Help You Communicate More Effectively with Your Horse. ISBN-13 978-0578602462. Perigan Press.
3. Colin, G. S. and S. R. Toukhsati. 2018. Animals and Human Society. Academic press.
4. Ambayeba, M. K. 2018. Food Crop Production by Small holder Farmers in Southern Africa. Challenges and Opportunities for Improvement.
5. Patil, N.V. B.K. Mathur, A.K. Patel, M. Patidar and A.C. Mathur. 2012. Feeding and management of livestock during drought and scarcity. ISBN: 9788172336479. Scientific Publishers.

LM-706

Advanced Wool and Hair Science

3(2-2)

Theory

Importance and utilization of wool and hair; high quality and quantity wool and hair producing breeds of the world; hair and wool production and consumption; microscopic structure of skin, wool & hair and their physico-chemical characteristics; gross composition of raw wool; production, identification and testing of a range of cotton, bast, silk and wool fibres; shearing and wool finishing process; histological development of hair; properties of wool as a textile fiber; types and classification of fibers; comparison of different animal fibers; growth and development of the medullated and non-medullated wool fibers; effect of different factors on wool quality; handling, grading and marketing of wool and hairs; factors affecting wool/hair yield and quality; fiber and carpet industry of Pakistan, recent trends in animal fiber science.

Practical

Wool and hair sampling from different sheep and goats breeds; major fibers and properties; microscopic structure of animal fibers; measurements of fiber length and diameter; detection of extractable matter; handling, Shearing, sorting, scouring, grading, packing, labeling and storage of animal fiber; measurement of crimp, staple length, wool fat, suint and ash; different wool defects; visual grades of wool; visit to woollen mills and carpet industry and wool/hair test house; use of optical fiber diameter analyzer (OFDA); visit to animal fiber markets.

Books Recommended

1. Ryszard, K.M. and M. Talarczyk. 2020. Volume 1: 2nd Edition. Types, Properties and Factors Affecting Breeding and Cultivation. Handbook of Natural Fibres. Woodhead Publishing. ISBN: 9780128183984.
2. Chris McLaughlin. 2019. Raising Animals for Fiber: Producing Wool from Sheep, Goats, Alpacas, and Rabbits in Your Backyard (Companion House Books) Livestock Health, Grooming, Housing, Breeding, & Shearing, from Angora to Suri. Companion House Books Publishers.
3. Janet G. 2019. The Good Living Guide to Keeping Sheep and Other Fiber Animals: Housing, Feeding, Shearing, Spinning, Dyeing, and More. Good Books Publishers.
4. Cottle, D. J. 2010. The International Sheep and Wool Handbook. 2nd edition. Nottingham University Press Publisher. ISBN-13 : 978-1904761860.

5. Carol E., D., Robson. 2011. The Fleece & Fiber Source book: More Than 200 Fibers, from Animal to Spun Yarn. 1st Edition. Storey Publishing, LLC. ISBN-13 : 978-1603427111.

LM-707 Advances in Sheep and Goat Production 3(2-2)

Theory

Worldwide sheep and goat importance; Economic importance of sheep and goats and their role in economy of Pakistan; small ruminant production in various ecological regions; modern sheep/goat enterprise; feeding systems of small ruminants; sheep versus goat; feeding and breeding; importance of pedigreed stud rams/bucks in upgrading the flock; off season breeding for enhanced production of lambs; handling facilities for sheep and goats; management of small ruminants during inclement weather, improvement programs and recent developments in sheep and goat production; small ruminant production and the global environment; common ailments; economic analysis of sheep and goat farming; wool versus synthetic fibers; recent advances in production of goats and sheep for meat; marketing small ruminants and their products.

Practical

Important breeds/types of sheep and goats around the globe; various meat qualitative and quantitative tests for mutton; milk analyses of ewe and doe milk; range land grazing management; kids feeding and management; shepherd calendar; assessing sheep/goat production problems; preparing feed calendars, disease calendars; analyzing small ruminant business; budget in sheep /goat business; Preparing feasibility reports; computerized record keeping.

Books Recommended

1. Karim, S. A., A. Joshi. 2020. Climate Change & Stress Management in Sheep & Goat Production. Satish Serial Publishing House. ISBN: 818930481X.
2. Ashok, K.P., K. Rout. B. K. Behera. 2019. Goat Production and Supply Chain Management in the Tropics. CABI, Nosworthy Way, Wallingford, Oxfordshire, UK.
3. Mahgoub, O., I. T. Kadim and E.C. Webb. 2012. Goat Meat Production and Quality. CAB International, UK.
4. Sandra, G. S. 2010. Goat Science and Production. Wiley Blackwell Publishers, UK
5. Court, J., J. W. Ware and S. Hides. 2010. Sheep Farming for Wool and Meat. CSI

LM-708 Recent Trends in Milk and Meat Production 3(3-0)

Theory

Trends of milk and meat production in Pakistan and other leading countries; constraints and remedies; factors underlying productivity; total milk and meat production in Pakistan and per capita availability; trends of milk and meat production, food security through livestock; strategies and policies for sustainable livestock production; role of private sector in establishing large dairy farms and modern slaughter houses; production of halal meat for export, participatory rural livestock development; role of women in livestock production; milk and meat production in relation to human population; world food problems; animal production versus crop production; plans for efficient production of milk and meat; establishment of dairy and meat enterprises; increasing shelf life of milk and meat through their processing and refrigeration; price structure and marketing trends; scope of processing industry.

Books Recommended

1. Prafullakumar V. P., Patil. 2020. Milk Production Management. 1st Edition. ISBN 9780367627379. CRC Press.
2. Joseph W. H., W. Jianping. 2019. Red Meat Science and Production. Vol. 1. The Consumer and Extrinsic Meat Character. Springer Singapore.
3. Charis M. G., 2018. Sustainable Meat Production and Processing 1st Edition. Academic Press.
4. John M., P. Chamberlain. 2017. Blueprints for Tropical Dairy Farming: Increasing Domestic Milk Production in Developing Countries. CSIRO Publishing.
5. Perumal P., 2017. Organic Milk Production System: Organic Dairy Animal Husbandry. LAP LAMBERT Academic Publishing.
6. OECD—FAO. Agricultural Outlook (2011-2020).

LM-709

Managing Livestock under Stress Conditions

3(3-2)

Theory

Livestock, environment and their interaction; suitability of livestock to varying climates; farms animals in hot and cold environments; homeostasis and its bases; thermoregulation for dairy and range animals; factors influencing livestock production in cold and warm climates; consequences of thermal stress on livestock; productive and reproductive performance under stress conditions; air temperature and humidity relationships; effective ambient temperatures (EAT) and temperature humidity index (THI) affecting the farm animal's productivity; effect of production level on animal performance in hot environments; production and metabolic response and behavior of dairy animals; mitigating heat stress using various mechanisms (modification of the environment, shade, shelter, fans, mist and cooling measures); water requirements; feeding management during hot/cold climates; susceptibility of hyper-thermic animals to various ailments; improving welfare and performance of farm animals; reducing environmental contaminations; effect of short- and long term cooling on some physiological parameters

Practical

Observations and recording of climatic data including temperature; relative humidity; Photoperiods and precipitations; using computer for physiological measurements; demonstration of effects of weather on feed consumption; production and general activity; measurements of environmental influences on productive, reproductive performance; housing innovations; mitigating devices; various types of sheds, shelters, space requirements per animal; layout plans for modern farms in hot climates; using panting scores to assess heat load in farm animals; visits to livestock farms located in different agro-ecological zones

Books Recommended

1. Monte, R., G. E. Aiken. 2020. Management Strategies for Sustainable Cattle Production in Southern Pastures. ISBN-978-0-12-814474-9. Elsevier Inc.
2. Dale, S., 2019. Managing Pasture: A Complete Guide to Building Healthy Pasture for Grass-Based Meat & Dairy Animals. Storey Publishing, LLC.
3. Veerasamy, S., J. Gaughan, L. Baumgard and C. Prasad. 2015. Climate Change Impact on Livestock: Adaptation and Mitigation. Springer India Private Ltd.
4. Aggarwal, Anjali, Upadhyay, Ramesh. 2013. Heat Stress and Animal Productivity. Springer India.
5. Sejian, V., S. M. K. Naqvi, T. Ezeji, J. Lakritz and R. Lal (Ed.). 2012. Environmental Stress and Amelioration in Livestock. Springer India.

LM-710 Livestock Enterprises for Rural Development 3(3-2)

Theory

Role of livestock production in rural development, Importance of livestock production systems; day-to-day management and health improvement of rural livestock; characteristics and constraints of rural-based small-scale livestock farming; raising animals for sacrificial purposes, profitable dairying and sheep and goat farming for poverty alleviation; forage conservation for profitable small holder milk production; crop–livestock integration; appraisal of different types of livestock farms; financing various types of livestock enterprises; role of livestock as alternate energy source for rural development; technical feasibility for biogas plant; biogas production for small villages; gender role in livestock enterprises; livestock farming through self-help groups; business insight and communication for establishing livestock enterprise; livestock for livelihood security of farming community; role of information technology in entrepreneurship development; potential role of food supply chains in sustainable; policy issues on animal agriculture; Impact of micro credit on livestock enterprise development; problems in rural sector towards rural development; bottlenecks and SWOT Analysis in rural development.

Practical

Survey of livestock in various localities; preparation of feasibilities for various classes of livestock as rural enterprises; feasibility for establishing a community biogas plant; plans for provision of forage throughout the year; visit to rural livestock enterprises; comparative studies for small and commercial enterprises; review of policies on animal agriculture and livestock production. SWOT Analysis exercise in rural areas.

Books Recommended

1. Daniel B. 2021. Advances in precision livestock farming (Burleigh Dodds Series in Agricultural Science). ISBN-13: 978-1786764713. Burleigh Dodds Science publishing.
2. Monte R., Jr. and G. Aiken. 2019. Management Strategies for Sustainable Cattle Production in Southern Pasture. 1st Edition. Academic Press.
3. Ezeji, T., J. Lakritz and R. Lal. 2012. Environmental Stress and Amelioration in Livestock Production. 2nd edition. Springer Publishing Co. New York, USA.
4. Mishra, B. K. 2012. Livestock Production and Rural Development. Biotech Books, New Delhi, India.
5. Khandaker Md., M. Rahman. 2011. Demand for livestock enterprises in Bangladesh: Employment creation and food security for farm households in vulnerable regions. LAP LAMBERT Academic Publishing. ISBN-13: 978-384651190

LM-719 Special Problem 1(1-0)

LM-720 Seminar 1(1-0)

LM-799 Thesis 06 (0-12)