Livestock Production and management (LPM)

1. Ruminant Production and their Management
   1.1 Introduction; historical background of ruminant production; scope, importance and present situation of ruminant and their production; common terminology, zoological classification and constraints of ruminants production in Nepal.
   1.2 Breeds and their characteristics
      1.2.1 Exotic cattle breeds and their characteristic: jersey, Holstein Friesian, Brown Swiss, Ayrshire
      1.2.2 Indigenous cattle breeds and their characteristics: Hariyana, Sahiwal, Red Sindhi, Siri, Achame,Yak, Nak and chauri
      1.2.3 Indigenous buffalo breeds and their characteristics: Murrah, Surti, Jaffarabadi, Nili-rabi Lime, Parkote and Gaddi
      1.2.4 Exotic and indigenous sheep breeds and their characteristics: Merino, Rambullet, Romney, Damascus, Kage, Baruwal, Lampuchre, Bhyanglung
      1.2.5 Common breeds of goats and their characteristics: Sannan, Barbari, Beetle, Jamunapari, Kasmiri, Khari, Chyngra, Anglo-nubion, and Boar
   1.3 Housing management of large ruminants
      1.3.1 Housing system: merit and demerit of housing system; provision of housing system
      1.3.2 Housing for small ruminants: sheep and goat
   1.4 Care and management
      1.4.1 Care and management of pregnant cattle/buffalo/sheep/goat
      1.4.2 Care management of animal during giving birth
      1.4.3 Management of newly born calf
      1.4.4 Weaning and raising young calf artificially
      1.4.5 Management of lactating cow/buffalo
      1.4.6 Dry cow buffalo management
      1.4.7 Heifer management
      1.4.8 Managing lambs/kids from weaning to market
      1.4.9 Bull and buck management
      1.4.10 Use of draft animal in Nepalese agriculture system
   1.5 Nature and grading of wool and factors affecting the value/quality of wool shearing care, storing and marketing of wool
   1.6 Judging and selection of ruminants
2. Pig and Poultry Production

2.1 Introduction and Terminology related to pig and poultry
2.2 Present status, scope and importance of pig and poultry industry in Nepal.
2.3 Care and management of new born piglet, gilt and sow, pregnant and breeding boar
2.4 Housing and housing system of pig and poultry: needs of housing, site selection, housing requirement, housing equipment; system of housing.
2.5 Nomenclature and breeds of fowl; classification of fowl and their characteristics (Aseel, white leghorn, Rhode Island Red, Plymouth Rock, Australorp, Sussex, New Hampshire).
2.6 Common breeds of pig (Nepali local; Berkshire, Yorkshire, Duroc Jersey Hampshire, Landrace, Tamworth)
2.7 Brooding and rearing chicks: System of brooding (advantage and disadvantage); management of chicks in brooder
2.8 Care of the chicks during summer; effective management practices (Housing, water management feed and nutrition, medication and other managerial practices)
2.9 Formation, structure, food value and chemical composition of eggs.
2.10 Collection, handling, grading and egg quality parameters (Quality parameters; exterior quality factors; interior egg quality)
2.11 Hatching of egg (selection and care of good hatching egg, abnormal egg, Methods of hatching; natural and artificial; advantage and disadvantage. Factors effecting hatching Management of incubator during incubation
2.12 Selection and culling of chickens: The points consider during disqualifying the birds, meat production standards, egg production standards, additional standards of good strains, culling the growing stock:
2.13 Care and management of broiler, pullet, breeding and laying hen.
2.14 Maintenance of bio - security in commercial farm; management options and Bio-security measures

3. Animal Housing and Sanitation

3.1 Housing: Type of housing for farm animals and poultry; selection of site, type of buildings, building materials and quality; conventional and traditional animal housing; systems of housing-head to head and tail to tail system; their advantages and disadvantages.
3.2 Housing for swine
3.3 Housing for poultry (deep litter, cage system, battery brooding)
3.4 Requirement of water for various species of farm animals and poultry birds
3.5 Sanitation: Drainage, disposal of cow dung, urine and farm animal washings
3.6 Ventilation: Importance of ventilation and its types and requirements
3.7 Diseases associated with water, poor housing and ventilation.
4. **Bee Pet and Lab Animal Management**
   4.1 Introduction of apiculture and its prospects in Nepal
   4.2 Common bee races, its morphology and anatomy
   4.3 Management -seasonal management of honey bees
   4.4 Honey bee products and its extraction
   4.5 Diseases, insects and other enemies of honey bee and their control
   4.6 Introduction and importance of pet animals in Nepal
   4.7 Common breeds of pet animals (dogs, cats) and birds
   4.8 Pet animals, restraining and controlling of pet animals
   4.9 Care and management, selection of pup, habitat, food and feeding of pet.
   4.10 Common diseases and parasites of pets with their control.
   4.11 Introduction and importance of lab animals.
   4.12 Care and housing system and space requirement for lab animals.
   4.13 Computation and compound of balanced diet for lab animals
       (mice, rats, guinea-pig)

5. **Wild Life Production and Management**
   5.1 Introduction, definition and values of wild life
   5.2 Present and future status of wild life population and management in Nepal
   5.3 Wild life law enforcement
   5.4 Distribution, habitats and housing of various classes of wild lives
   5.5 Care of various classes of wild lives.
   5.6 Feeding habits, feeds and feeding system of wild life.
   5.7 Methods of restraint, capture, handling and physical examination of wild animals.
   5.8 National park, reservoir and other protected areas in Nepal.
   5.9 International organizations concerning wild life conservation.

6. **Abattoir Practices and Animal Product Technology**
   6.1 History, definition, and present situation of abattoir and slaughter slab in Nepal.
   6.2 Handling and care of slaughter animal and birds at lairage.
   6.3 Inspection of slaughter animals and birds (Ante and postmortem).
   6.4 Slaughter procedure and methods of stunning.
   6.5 Location and layout of abattoir.
   6.6 Water supply, ventilation and light.
   6.7 Hygiene practices.
   6.8 Abattoir environment impact and mitigation.
   6.9 Bio-security and slaughter house and meat inspection Act 2055.
   6.10 Fabrication and preservation of meat.
   6.11 Facilities required for health safety and by products utilization.
7. **Milk and Milk Product Technology**
   7.1 Definition milk and diagrammatic representation of milk constituents.
   7.2 Composition of milk: fat, lactose, protein, energy, vitamin and minerals.
   7.3 Nutritive value of milk.
   7.4 Physical and chemical properties of milk.
   7.5 Factors affecting the composition of milk.
   7.6 Natural flavor and off-flavor of milk; way to manage natural flavor.
   7.7 Milk processing: receiving weighing, sampling, platform test, straining, filtration and clarification.
   7.8 Cooling system, transportation, emulsification and homogenization.
   7.9 Pasteurization, sterilization, packaging, distribution and storage of milk and products.
   7.10 Products processing: Methods of preparation, type, flow diagram, nutritive values and uses of following dairy products- cream, butter, ghee, khoa, chhena, dahi (yogurt), ice-cream, powder milk, condensed milk and cheese.
   7.11 Sweets prepared from chhena and khoa.

8. **Meat and Meat Product Technology**
   8.1 Definition, prospects and problems of meat industry in Nepal.
   8.2 Pre-slaughter care and handling effect on meat quality.
   8.3 Structure and growth of muscles.
   8.4 Chemical and biochemical constitution of muscles.
   8.5 Eating quality of meat.
   8.6 Meat preservation and maintenance of quality.
   8.7 Edible and inedible carcass and their utilization and handling.
   8.8 Conversion of muscle to meat.
   8.9 Microbiology, deterioration and contamination of meat; safe meat production.
   8.10 Comminuted and emulsified meat products common of Nepal.
   8.11 Curing methods and ingredients.