

# **Animal Nutrition**

## **1. Basics of Animal Nutrition-Ruminants**

- 1.1 Introduction about Animal Nutrition; plant and animal cell composition
- 1.2 Feed stuff and feeding guidelines and nutrient contents
- 1.3 Energy rich feed ingredients
- 1.4 Protein rich feed ingredients
- 1.5 Classification, function and food source of protein, carbohydrate and lipids
- 1.6 Function and deficiency symptoms of macro and micro minerals
- 1.7 Function and deficiency symptoms of fat soluble vitamins
- 1.8 Digestion and metabolism of ruminant food nutrition
- 1.9 Nutritional and physiological behaviors of ruminants
- 1.10 Role of high fiber and low fiber in ruminant diet
- 1.11 Rumen fermentation pattern and milk production
- 1.12 Role of non-protein nitrogen feedstuffs in ruminant diet.
- 1.13 Factor affecting urea utilization, methods of feeding urea
- 1.14 Guidelines for using urea in feeds, use of unconventional feeds in ruminants diets (vegetable protein source, animal protein sources, energy source and other unconventional feeds)
- 1.15 Evaluation of animal feed quality, chemical analysis, digestibility trial, estimation by digestion trail, digestibility by different indicators method, digestibility methods, in-vitro digestibility methods
- 1.16 New concepts to determine requirements of proteins in ruminants, by pass protein, degradable and non- degradable protein computation of ration for cattle and buffaloes

## **2. Nutrients digestion, metabolism, measurement and feeding nutrients**

- 2.1 Measurement of digestibility
- 2.2 Determination of TDN and DCP
- 2.3 Factor affecting digestibility
- 2.4 Feeding standard for maintenance, growth, reproduction, lactation and wool production
- 2.5 Various methods of feeding standards-NRC, ARC, Indian Feeding Standard
- 2.6 Feeding young calves, kids and lambs
- 2.7 Feeding ruminants during scarcity season-Urea-molasses liquid feed; Urea-molasses-mineral blocks; straw treatment by urea
- 2.7 Feed additives used in ruminants feeding
- 2.8 Preparation of hay and silage; advantages and disadvantages

### **3. Non-ruminant nutrition**

- 3.1 Poultry nutrition, basics and principles for different types and species of poultry birds
- 3.2 Nutrient requirements and feeding of broilers and layers
- 3.3 Nutrient requirements and feeding of ducks and quails; turkeys and ostrich
- 3.4 Piglet rearing and feeding; milk replacer and weaning management
- 3.5 Nutrient requirements and feeding of pregnant and lactating sow
- 3.6 Feeding requirements for breeding stocks-boars, sow and gilt
- 3.7 Principle and practices of equine feeding
- 3.8 Principles and practices of rabbit feeding
- 3.9 Feed additives used in non-ruminant feeding

### **4. Principles and practices of fodder production and pasture management**

- 4.1 Feeds and feeding situation in Nepal
- 4.2 Edaphic factors (climate and soil) affecting pasture and fodder crops
- 4.3 Factors associated with fodder production-chemical composition and nutritive value
- 4.4 Fodder plant growth, development and yield
- 4.5 Morphology of forage grasses, vegetative grass tiller and reproductive growth
- 4.6 Principle of grass seed production
- 4.7 Cultivation practices of Oats, Jowar, Bajra, Teosinte, Maize
- 4.8 Cultivation practices of Napier, Blue panic, Siratro, Centrocema, Molases and Mulato
- 4.9 Cultivation practices of Berseem, Lucerne, Joint vetch, Desmodium, Stylosanthes, Forage peanut, Glycine and Butterfly peas
- 4.10 Cultivation, establishment and yield of common pasture species-Perennial ryegrass, White clover, Red clover, Lotus, Cocksfoot, Phalaris,
- 4.11 Pasture establishment, seed quality, sowing and soil environment
- 4.12 Nutrition of grazing animal; nutritive value of pasture, herbage intake and composition
- 4.13 Pasture and soil fertility; nutrient cycling
- 4.14 Silvi-pastoral system concept and practices and limitation

### **5. Feed stuff analysis and quality control**

- 5.1 Characteristics of feedstuffs, concentrate energy source-nutritive value
- 5.2 Special properties, processing methods and deleterious factors, disorders associated with grain used for feed.
- 5.3 Protein sources, important features of common protein supplements
- 5.4 Deleterious factors and methods to inactivate them
- 5.5 Macronutrients, mineral and vitamin supplements
- 5.6 Feed manufacturing and properties of feed
- 5.7 Feed additives that modify animal growth
- 5.8 Feed efficiency, metabolism and performance

- 5.9 Feed flavors, digestion modifiers, enzymes butters, ion-exchange compounds, anaphors and methane inhibitors, hormones, repartitioning agents, antibiotics
- 5.10 Measurements of diet and ingredient nutrient quality (Proximate analysis, NDF and ADF)
- 5.11 Estimation of metabolizable energy, amino acid analysis, vitamin analysis
- 5.12 Quality control of feed stuffs preliminary inspection of raw materials, chemical tests

## **6. Rangeland pastoral development, silvipasture, and grazing ecology**

- 6.1 Introduction to rangelands
- 6.2 Relation of animal husbandry and pastoral development.
- 6.3 Ruminant animal production from forages
- 6.4 Pastures and their nutritional.
- 6.5 Factors affecting the natural grasslands productivity characteristics and rangeland management.
- 6.6 Small and large ruminants production in the ranges.
- 6.7 Problems in pasture/range and methods to management.
- 6.8 Government's policy and programmes and role of NGOs/NARC in range development and management.
- 6.9 Conservation of biological diversity in the HKH- Tibetan plateau rangelands.
- 6.10 Strategies of managing deteriorated rangelands
- 6.11 Managing the terai grassland in Nepal, and climate change: adapting tropical and sub-tropical grasslands
- 6.12 Feedstuff and animal production; chemical composition and nutrient content of common feed;
- 6.13 Concept and importance of Agroforestry system.
- 6.14 Status of forest covering agroforestry situation in Nepal.
- 6.15 Silvipastoral systems as a basic type of agroforestry.
- 6.16 Pasture under trees.
- 6.17 Shelter, woodlots and silvipastoral blocks.
- 6.18 Tree/crop interface.
- 6.19 Productivity under tree.
- 6.20 Silvipastoral nursery techniques, choice of trees species.
- 6.21 Indigenous fodder trees of Nepal for silvipasture development
- 6.22 Plant growth and development.
- 6.23 Tissue flows in grazed plant communities.
- 6.25 Assessing and interpreting grass-woody plant dynamics.
- 6.26 Foraging strategies of grazing animals.
- 6.27 Ingestive behavior.
- 6.28 Complexity and stability in grazing systems.
- 6.29 Management of grazing systems.