Unit 5: Animal Feeds and Feeding Practices

Feed Resources in Ethiopia: An Overview

Animal Nutrition: Animal nutrition is the science of preparing and feeding animals to ensure they grow and produce efficiently. Feed quality and quantity directly impact animal performance and farm profitability, as feed costs can range from 50% to 80% of livestock production expenses. It's crucial for farmers to provide the correct amount of feed; too much or too little can reduce productivity and profitability.

Types of Feed Resources: Ethiopia has various feed resources, which are essential for livestock nutrition:

1. **Natural Pasture**:
    - Natural pastures consist of grasses, shrubs, and tree forages that grow naturally.
    - They provide over 60% of livestock feed, particularly during the wet season when the quality is high.
    - Pasture quality declines during the dry season, making feed management crucial.
2. **Crop Residues**:
    - These are the leftovers from crops after harvesting, such as straws and stovers.
    - Crop residues are low in protein and energy, so they often need supplementation to meet animal nutritional needs.
3. **Forage Crops**:
    - Forage crops are plants cultivated specifically for animal feed, including grasses like Rhodes grass and legumes like Alfalfa.
    - They can be fed fresh or preserved for use during the dry season.
4. **Agro-Industrial By-products**:
    - By-products from industries, like wheat bran from flour milling or oilseed cakes, are rich in nutrients and often used to supplement other feeds.
    - Examples include molasses from sugar production and brewer's grains from breweries, which are high in protein and energy.

Classification of Feed Resources: Feed resources are categorized into two main groups:

1. **Roughages**:
    - High in fiber, low in energy, and less digestible, roughages include hay, straw, and silage.
    - They are essential for herbivores and make up a significant portion of livestock diets.
2. **Concentrates**:
    - Concentrates are nutrient-dense feeds with high energy and protein content.
    - They are further divided into energy-rich (like cereals) and protein-rich (like oilseed cakes) concentrates.

Nutrient Requirements: Animals require various nutrients to maintain health, grow, and produce. These include:

- **Water**: Essential for all body functions.
- **Carbohydrates**: The main energy source, found in grains and crop residues.
- **Fats**: Provide energy and help absorb certain vitamins.
- **Proteins**: Crucial for growth and reproduction, sourced from plant and animal origins.
- **Minerals and Vitamins**: Required in small amounts but vital for maintaining health and supporting bodily functions.

Ensuring animals receive a balanced diet with all necessary nutrients is key to maintaining their productivity and overall well-being.

Feed Conservation and Compound Feed Manufacturing

5.5.1. Feed Conservation

Explanation: Livestock must be fed all year round, but green or fresh feed is only available during certain times of the year. During dry periods, forage production decreases, leading to a shortage of feed. To address this, forage can be conserved to feed livestock during times when fresh feed is not available. Feed conservation helps to maintain animal productivity by ensuring they receive adequate nutrition year-round. The two common methods of feed conservation are hay making and silage making.

5.5.1.1. Hay Making

- **What is Hay?**
  Hay is forage that is harvested during the growing period and preserved by drying. The goal is to reduce the moisture content of green crops from 70-90% to 15-20%. This drying process is called curing, which is usually done using sunlight and wind.
- **Storage of Hay:**
  Hay can be stored in bales or in a tripod system. Baling compresses the hay into compact bundles, reducing storage space. Bales can be stored outside or in a barn. The tripod system is a three-legged stand that helps drain rainwater.
- **Advantages and Disadvantages of Hay:**
  Hay is an important and cost-effective way to conserve feed. It is easy to transport, store, and feed to animals. However, its nutrient content can vary depending on the weather and the timing of the harvest.

5.5.1.2. Silage Making

- **What is Silage?**
  Silage is preserved feed produced by the controlled fermentation of green crops under anaerobic (without oxygen) conditions. This process, known as ensilage, helps preserve succulent feeds for use during periods of scarcity.
- **Process of Silage Making:**
  Good silage can be made from grasses, grass-legume mixtures, or fodders like maize and sorghum. The crop should be harvested at the right stage, wilted, chopped, and stored in a silo. The fermentation process takes 2-4 weeks.
- **Steps in Silage Making:**
  1. Prepare materials and chop the forage.
  2. Fill the silo, packing it tightly to remove air.
  3. Seal the silo to prevent air from entering.
  4. After 2-3 weeks, the silage is ready for feeding.

5.5.2. Compound Feed Manufacturing

- **What is Compound Feed?**
  Compound feed is made by blending various raw feed ingredients into a homogenous mixture that meets the nutrient requirements of a specific species. In Ethiopia, cereals and agro-industrial by-products are commonly used in compound feeds, along with additives like salt, limestone, and premixes.

- **Manufacturing Process:**
  The process involves several operations, including mixing, grinding, and quality control. The sequence of operations and the equipment used may vary depending on the output required.
- **Key Term:**
  Premixes are complex mixtures of vitamins, minerals, trace elements, and other feed additives used in small amounts in compound feed to provide balanced nutrition for animals.

In summary, feed conservation through hay and silage making ensures livestock have adequate nutrition throughout the year. Compound feed manufacturing further supports animal nutrition by providing a balanced diet tailored to specific needs.