

# Unit B

# Understanding Animal Body Systems

## Lesson 2

### Meeting the Nutritional Needs of Animals

# Terms

- Animal Proteins
- Basal Maintenance Requirement
- Concentrates
- Feed
- Feedstuff
- Fetus
- Forages
- Free Access
- Gestation
- Growth
- High-Energy Concentrates
- High-Protein Concentrates
- Lactations
- Legume

# Terms

- Maintenance
- Nodules
- Nonlegume Roughages
- Palatability
- Roughages
- Scheduled Feeding
- Supplement
- Tankage
- Vegetable Proteins

# What are the functions of Feed?

- I. *The nutritional needs of animals change throughout the animal's life. The amount and type of feed depends on the stage of life and use of the animal.*



These functions can be categorized into the following groups:

A. **Maintenance** is the keeping the body at a constant state.

- ❖ Every second an animal is alive it requires energy.
- ❖ The amount of energy needed by an animal for maintenance is known as the **basal maintenance requirement**.

# Maintenance Diet

- ❖ A maintenance diet is usually high in carbohydrates and fats.
- ❖ A maintenance diet should contain a small amount of protein, minerals, and vitamins.
- ❖ On average, about 50 percent of an animal's diet is used for maintenance.



**Carbohydrates**



**Fats**

# Growth Diet

B. **Growth** is defined as the increase in size of the muscles, bones, internal organs, and other parts of the body.

- ❖ Animal growth requires mostly energy.
- ❖ Very high levels of carbohydrates and fats in the animal's diet provide this energy.



# Reproduction Diet

C. **Reproduction** - Proper nutrition is the key to successful and efficient reproduction in animals.

- ❖ Most reproductive failures are caused by poor nutrition in the female.



# Reproduction Diet

- ❖ A proper reproduction ration typically includes higher levels of protein, minerals, and vitamins.
- ❖ This is especially needed in the last three months of gestation (pregnancy) because this is when the fetus or unborn offspring experiences the most growth.
- ❖ Poor nutrition also affects males.
- ❖ A lack of proper nutrients can lower sperm production and fertility rates.

# Lactation Diet

D. Lactation is the production of milk.

- ❖ A lactation ration requires even higher levels of protein, calcium, and phosphorus than reproduction.

Protein

Calcium

Phosphorus

# Work Diet

E. Work - A work ration is needed by animals that are expected to conduct all types of work and activity for the operation.

- ❖ Examples could include draft animals.
- ❖ These animals require increased carbohydrates and fats.



# What are the various feed types?

II. A feedstuff is an ingredient used in making the feed for animals.

- ❖ Feed is what animals eat to get nutrients.
- ❖ Feedstuffs can be added to feed to provide flavor, color, or texture to increase palatability.
- ❖ Palatability is how well an animal likes a feed.



Feeds can be placed into three basic categories:

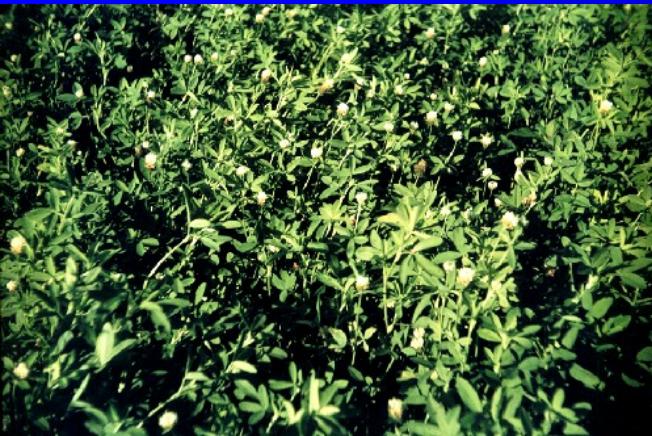
A. **Roughages** Livestock feeds that contain more than 18 percent crude fiber when dry are called *roughages*.

- ❖ This type of feed is mostly leaves and tender stems of plants. These plants are also known as forages.
- ❖ Forages can be grouped into two general classes:

# Forages

1. A legume is a plant that can take nitrogen from the air.
  - ❖ These plants have specialized root parts called **nodules**, contain bacteria that aid in this process.
  - ❖ All of the clovers (shaftal or berseem), as well as lucerne, soybeans, trefoil, lespedeza, peas, and beans are legumes.

# Legumes



Berseem



Lucerne



Shaftal

# Forages Continue:

2. *Nonlegume roughages* cannot use the nitrogen from the air.
  - ❖ They are usually lower in protein than the legume roughages.
  - ❖ Some examples of this type of roughage are: corn silage, fodders, bluegrass, timothy, redtop, bromegrass, orchard grass, fescue, and prairie grasses.



# Concentrates

B. **Concentrates** - livestock feeds that contain less than 18 percent crude fiber when dry are called **concentrates**.

- ❖ This type of feedstuff is high in energy.
- ❖ Higher producing animals need more nutrients from concentrates.

# Concentrates

1. **High-energy concentrates** are feeds that contain less than 20 percent crude protein.
  - ❖ Some common sources of high-energy concentrates are maize, wheat, sorghum, barley, rye, and oats.
2. **High-protein concentrates** are feeds that contain 20 percent or more protein.
  - ❖ Examples of high-protein concentrates are soybean meal, cottonseed meal, and sunflower meal.

# Concentrates



Cottonseed  
Cake



Barley



Maize

# Supplements

- c. **Supplements** - A ***supplement*** is a feed material high in a specific nutrient.
- ❖ Supplements are often added to feeds to increase protein content.
  - ❖ Protein supplements can be divided into two groups based on the source of the protein.
1. ***Animal proteins*** - Protein supplements that come from animals or animal by-products.

# Supplement

- ❖ Common animal proteins are tankage, meat scraps, meat and bone meal, fish meal, and blood meal.
- ❖ Tankage is animal tissues and bones from animal slaughterhouses and rendering plants that are cooked, dried, and ground.

## 2. Vegetable Proteins - Protein supplements that come from plants.

- ❖ Common vegetable proteins are soybean oil meal, cottonseed oil meal, peanut oil meal, and corn gluten feed.

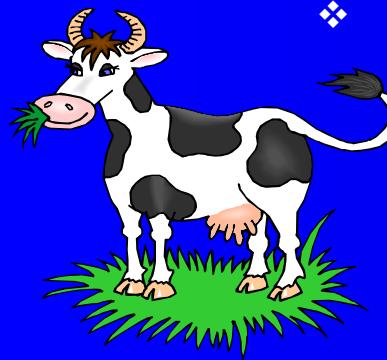
# What are some ways to feed animals?

How and when animals are fed is an important component of animal production. This affects the growth and development of the animal.

There are two basic methods in which feed can be provided to animals: free access and scheduled feeding.

# Free Choice

- A. Free access or free choice is allowing animals to eat feed when they want feed.
- ❖ The feed is available to the animal at all times.
  - ❖ This method is good for some species and with some feedstuffs but not others.
    - ❖ For example, poultry can be fed concentrates free access because they will not overeat.
    - ❖ However, cattle should not be fed concentrates free access because they will overeat and could possibly founder and die.



# Scheduled Feeding

- B. *Scheduled feeding* is providing feed at certain times of the day.
- ❖ Feeding times and regularity should be based on the needs of the animal or management practices.



# Review / Summary

1. What are the functions of feed?
2. What are the various feed types?
3. What are some ways to feed animals?