Introduction

• Many health, reproductive and production problems can be prevented with good nutrition.

• Poor nutrition results in:
  – Poor conception rates
  – Lower calf crop
  – Poor weaning weights
  – Difficult births
  – Higher feed bills because of over feeding
  – More infectious disease due to decreased immune system protection
Introduction

- A lot of research has gone into the development of feeds that give animals exactly what they need to remain healthy and to perform at their peak.
- As animals grow and mature, their nutritional needs change.
- Younger animals need diets high in protein.
- As the animal matures, the animal needs a diet higher in carbohydrates.
- Breeding animal’s nutritional needs change according to their production cycle.
Introduction

Stage of Production

- Calving to breeding
- Breeding to weaning
- Mid Gestation
- Late Gestation

Nutritional Requirements

- Highest
- Moderate
- Lowest
- High
Six Major Classes of Nutrients

- Water
- Protein
- Carbohydrates
- Fats
- Vitamins
- Minerals
Water

- Water is the cheapest nutrient. It provides the basis for all fluid in the animal’s body.
- Water is used in the blood supply.
- Digestion requires moisture for the breakdown of nutrients.
- Water is needed in the movement of feed through the digestive track and in flushing the animal’s body of waste.
- Water is needed to produce milk.
- It helps regulate the animal’s body temperature.
Water

- Over 80% of the animals body is composed of water.
- A loss of 20% will result in death of the animal.
- Animals generally need about 3 pounds of water for every pound of solid feed they consume.
- The average cow will consume 12 gallons of water per day.
- Some water comes in the feed itself, such as in succulent green pasture forages and silage.
Water

• Animal’s water needs change.
• A horse working hard in hot weather will need more water intake to replenish water lost.
• A animal that is lactating requires a lot more water to produce milk for its young.
Protein

• Protein is composed of compounds called amino acids.
• Amino Acids are used to build muscle, skin, hair, bones, and body tissues.
• All of the enzymes and many hormones in the bodies of animals are composed of proteins.
Protein

- As is the case with water, some animals need more protein in their diets than do others.
- Young rapidly growing animals need more protein than do mature animals.
- A cow that is giving large amounts of milk needs more protein than an animal that is not lactating.
- There are over 20 different types of amino acids.
- There are ten that are essential that the animal must obtain from its feed.
Carbohydrates

• The main source of energy from animals comes from carbohydrates.
• They include sugars, starches and cellulose.
• Carbohydrates come from plants. By weight, plants are composed of about 75% carbohydrates.
Sources of Carbohydrates

• The most important source of carbohydrates for animals is grain.
• Grain is also known as concentrates because of the high concentration of carbohydrates which are high in energy.
• Forages fed to animals are called roughages because of the amount of fiber in the diet. Roughages are generally low in net energy.
Fats

• Fats are found in both plants and animals.
• They contain about 2.25 times the energy of carbohydrates.
• They serve as concentrated storage places for excess energy.
• When the body does not take in enough energy to perform the normal functions, these reserves of fat are used.
Fats

• Certain acids referred to as essential fatty acids are also derived from fats.
• These acids are necessary for the production of some hormones.
• The most important sources of fats in feed for agriculture animals are the grains that contain oil, such as corn and soybeans.
Minerals

- Although they provide only a small portion of the total feed intake, they are vitally important.
- Bones are formed by a combination of calcium and phosphorus.
- Minerals aid in the construction of muscles, blood cells, internal organs and enzymes.
- Animals with a deficiency in minerals never develop properly and are more susceptible to disease.
Minerals

• Minerals are also divided up into two categories:
  – Macro minerals: Required in larger amounts in the diet.
  – Micro minerals or trace minerals: Required in very small amounts in the diet.
Macro Minerals

• There are seven essential macro minerals:
  – Calcium
  – Chlorine
  – Magnesium
  – Phosphorus
  – Potassium
  – Sodium
  – Sulfur
Micro Minerals

• There are nine essential micro minerals:
  – Cobalt
  – Copper
  – Fluorine
  – Iron
  – Iodine
  – Manganese
  – Molybdenum
  – Selenium
  – Zinc
Minerals

- Minerals make up 3-5% of the body.
- Of that 3-5%, calcium makes up one-half of the body’s minerals.
- Phosphorus makes up about one-fourth of the body’s minerals.
- Calcium and phosphorus make up the largest portion (75%) of the total mineral content in the body.
Minerals

- Minerals are often fed free choice. Animals are given free access to the minerals and allowed to eat all they want.
- This is done in a mineral box or trough or by using salt blocks.
- Essential minerals are in the block and the animals take in the minerals as they lick the block for salt.
Vitamins

• Vitamins are used in small amounts but are essential for life.
• They are used in the normal body processes of growth, production, and reproduction.
• They are vitally important in providing the animal with the ability to fight stress, disease and maintain good health.
Vitamins

• There are 16 known vitamins.
• The B vitamins and vitamin C are water soluble.
• Fat soluble vitamins are A, D, E, and K.
General Considerations of Nutrition

• Natural forage eaters
• Forages (pasture/hay) first line of meeting nutritional requirements
• Balanced diet dependent on increased physical demands
Body Condition Scoring

3.5

7
# Requirements

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<th>Body Wt. (Lb.)</th>
<th>Daily Feed (Lb.)</th>
<th>Protein</th>
<th>TDN</th>
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- **Mares, Last 90 Days of Pregnancy**
- **Mares, Peak of Lactation**
# Nutrients of Hay

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<td>Timothy</td>
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<td>Ryegrass</td>
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Critical Factor

ENERGY!
Is there a difference in hay quality?

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<td><strong>Bermuda</strong></td>
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<td>Poor</td>
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Other differences

- Blister Beetles – Mostly in Alfalfa Hay
- Mold
- Poisonous Plants
- Fescue Toxicity
Poisonous Plants

- G4970-Plants Poisonous to Livestock
Any Questions?