Types of Forages/Roughages

- Hays
- Silages
- Grazed forages
Hay

Dried forage comprised of grass or legume
Nutrient composition of Hay depends upon:

- Crop type (grass, legume, etc.)
- Crop condition (fertilizer, weeds, etc.)
- Handling, baling practices
Nutrient composition of Hay depends upon:

- Weather damage

- Maturity
  - More maturity; lower quality
  - Trade off between yield and quality

- Storage
Types of Hay found in Colorado

- Alfalfa
- Timothy
Types of Hay found in Colorado

- Wheatgrass
- Smooth brome
Types of Hay found in Colorado

- Orchardgrass
- Oat
Types of Hay found in Colorado

- Clovers
Silage

Fermented forages stored under anaerobic conditions
Silage Characteristics

- Stored under high moisture conditions
  - Anaerobic conditions
  - Preserved through an acid fermentation process that prevents mold and other spoilage
More Silage Characteristics

- Most common is corn silage or haylage
  - Corn silage is 60-75% moisture
  - Haylage is 40-55% moisture
More Silage Characteristics

- Allows for use of entire plant
More Silage Characteristics

- Allows for stable storage

Corn silage in a bunker
Concentrates

Feeds that are fed primarily to increase energy intake

Oats
Two categories of Concentrates

- Carbonaceous feeds
  - Less than 20% CP

- Nitrogenous feeds
  - More than 20% CP
  - Used as protein supplements as well
Characteristics of Carbonaceous Concentrates

- High in energy
- Low (less than 18%) CF
- Less than 20 % CP
More Characteristics of Carbonaceous Concentrates

- **Mineral content**
  - Fair in P (better than forages)
  - Low in Ca

- **Vitamin levels**
  - Low in A and D (except yellow corn)
  - High in Thiamine and Niacin
    - Niacin in grain is unavailable to pigs
  - Low in riboflavin, B12 and pantothenic acid
  - Fair in vitamin E
Types of Concentrates

- Cereal grains
- High Moisture Grains
- By-products
- Fats and Oils
1. Cereal Grains

Members of the grass family grown primarily for their seeds

Milo  Corn  Oats
Wheat  Barley
Millet  Rye
Sorghum
Cereal Grains .... Nutrient trends

- 8-14% CP

- Amino acid content
  - Moderately low to deficient in Lysine, tryptophan (corn) and threonine (sorghum and rice) and in methionine for poultry

- Fat content
  - Ranges from Oats at 6% to wheat at 1%
More on Cereal Grains

- Minerals & Vitamins
  - Low in Ca; High in P
  - Except for yellow corn; low in carotene

- Highly digestible
  - Hulls of the seed has a substantial effect on feeding value
  - Rolled, flaked, ground to break hulls
2. High Moisture Grains

- Grain that contains 22 to 40% moisture

- Grain harvested that is high moisture with addition of 1-1 ½ % acid as a preservative
3. By-Product Feeds

- Wheat middlings
- Brewers dried grains
- Corn Gluten
- Beet pulp
- Citrus pulp
- Potatoes, Turnips
4. Fats and Oils

- Frequently found in commercial feed formulas

- Highly digestible energy source!
  - 2.25 times as much energy

- High fat feed can go rancid
Conversion factors for Concentrates

- Wheat, Soybeans: 60 lbs/Bu
- Corn, Sorghum
- Flaxseed, Rye: 56 lbs/Bu
- Barley: 48 lbs/Bu
- Oats: 32 lbs/bu
- Corn (ear): 70 lbs/bu