An Overview of Feedstuffs and Terminology Used for Livestock Diets

Concentrates vs. Roughages

- **Concentrates**
  - Feeds that generally are high in energy, low in fiber, and usually are highly digestible
  - High-concentrate diets also referred to as “high-energy” or “high-grain” diets.
  - Produce rapid gains
  - Include cereal grains (corn, milo or sorghum grain, wheat, oats, barley), oil meals (soybean meal, cottonseed meal, linseed meal), molasses, dried milk products

- **Roughages**
  - Feeds that generally are higher in fiber (cellulose), less digestible, and lower in energy
  - Animals consuming high-roughage diets (usually ruminants) do not gain as fast as those consuming high concentrate diets.
  - Include legume hays, grass hays, straws (from production of seed and grain), silage, stover, and fresh grass

International Nomenclature

- Feeds classified into 8 categories having similar feeding values based on nutrient composition:
  1. dry forages or dry roughages
  2. pasture and range plants
  3. silages and haylages
  4. energy feeds
  5. protein supplements
  6. mineral supplements
  7. vitamin supplements
  8. additives

Examples of Feed Names

- **Corn (or Maize), dent yellow**
  - grain, grade 2
  - aerial part with ears, sun-cured (fodder)
  - aerial part without ears, sun-cured (stover)
  - silage, well eared
- **Alfalfa**
  - hay, sun-cured, early bloom
- **Soybean, Glycine max**
  - Seeds, meal, solvent-extracted

Int'l Feed Nomenclature

- Every feed has International Feed No. (IFN)
  - 1st digit indicates which of the 8 categories
- Each feed name contains 1 or more descriptors based on...
  - Origin (species, common name, chemical formula)
  - Part fed to animals (grain, seed, aerial part)
  - Processing (ground, steamed, fresh, silage, hay)
  - Stage of maturity (pre-bloom, mature)
  - Cutting (Cut 1; Cut 2)
  - Grade (44% protein; grade 2; chemically pure)
1. Dry Forages and Roughages

Characteristics
- High in fiber
- Lower digestibility (low in digestible nutrients)
- Low in energy
- >18% crude fiber (by Int'l feed definition)

Examples: hay, straw, fodder (also called stover), hulls, shells, pasture & range crops (fresh grass), some silages

Terms used interchangeably, but forage = vegetative part of plant; roughage = a coarse, bulky feed

2. Pasture and Range Plants

- Includes all forage feeds either not cut (including feeds cured on the stem) or cut and fed fresh (greenchop or soilage)
- Grazed plants either growing or dormant
- Quality depends on species and stage of maturity.

3. Silages and Haylages

- Fermented forages stored under anaerobic conditions
- Microbial fermentation
- High moisture: Silage 60-65% H₂O; Haylage 40-60% H₂O
- Entire aerial part of plant is used
- More digestible than original forage

4. Energy Feeds (Concentrates)

- Feeds high in energy and low in fiber
  - (more starch; less cellulose)
  - Highly digestible
  - >70% TDN; <18% crude fiber; <20% protein (by Int'l feed definition)
- Examples: cereal grains (corn, wheat, oats, barley, sorghum grain, rye) mill by-products (corn gluten, bran), whole cottonseeds, fats and oils

Technically, protein supplements are “concentrates,” but we normally do not include them here as an energy feed.
5. Protein Supplements
- Feeds containing more than 20% protein or protein equivalent
  - (high in nitrogen content)
- Highly digestible
- Examples: soybean meal, cottonseed meal, linseed meal, peanut meal, meat meal, fish meal, feather meal, urea, brewers grains
- Most contain 20 – 50% protein; thus, half or more is a source of energy. Why not consider them an energy feed?

6. Mineral Supplements
- Of the macrominerals, only NaCl, Ca, and P routinely added to livestock rations
  - Sometimes Mg and S
- Trace minerals most likely to be deficient: Cu, Fe, I, Mn, Zn, Co, and Se
- Providing mineral supplements to animals:
  - self-fed (most common)
  - incorporate into diet

6. Mineral Supplements (cont.)
- Commercial mineral mixtures
  - Frequently do not meet the needs when used (One size does not fit all.)
  - Often have excesses of some minerals but deficient in others
  - BUT...
    - most people do not have the equipment (or knowledge) to mix minerals properly
    - May interrelationships among minerals
    - Commercial mix usually best

7. Vitamin Supplements
- Vitamins required in minute amounts
- Feed content varies
  - Affected by species, part of plant, harvesting, storage, processing
  - Easily destroyed by heat, sunlight, oxidation, mold growth
- Ruminants
  - Vitamins A, D, E, main concern
  - Rumen microorganisms synthesize K, C, and the B vitamins

7. Vitamin Supplements (cont.)
- Swine
  - Main concern for Vitamins A, D, E, riboflavin, niacin, pantothenic acid, B12, and choline
- Horses
  - Not much research data
  - Vitamin A
    - No problem with green grass and good quality hay, otherwise supplementation advised
  - Vitamin D
    - Supplement if horse kept indoors or sunlight erratic

7. Vitamin Supplements (cont.)
- Horses (cont.)
  - Vitamin E
    - No problem with fresh forages and quality hay
    - Grains are low
  - Vitamins C and K synthesized by cecal microorganisms
  - B vitamins
    - Normally not needed as in ruminants
    - Riboflavin and niacin suggested for horses under stress or heavy work
8. Additives

- Nonnutritive substances which when added to feed will improve feed efficiency and or production of animals.
- Examples
  - Ionophores (Rumensin, Bovatec)
  - Bloat control (poloxalene)
  - Anthelmintics
  - Drugs / Antibiotics
  - Hormones
  - Flavoring agents

Implants

- A substance that is implanted into the body for the purpose of growth promotion or controlling some physiological function.
- Examples
  - Compudose (estradiol-17 beta)
  - Ralgro
  - Synovex-S, Synovex-H, Synovex-C

Implants (cont.)

- All must be approved as safe and effective by the FDA
- Read and follow the label.

More...