Feeds and Feeding for Ruminants and Horses

Clinical Medicine I

Feeds and Feeding for Ruminants and Horses

Clinical Medicine I

Foregut fermenters:

- include true ruminants (cattle, sheep, goats), deer, camels, hippos, kangaroos …
- they have one or more large organs before the gastric (true) stomach.

Hindgut fermenters:

- include horses, guinea pig, rat, elephants, porcupine, beaver, rabbit …
- production of VFA in these animals occurs after the gastric stomach, usually in the cecum and/or large intestine.

Feed for Ruminants and Horses

- What is this?

Feed for Ruminants and Horses

- **Straw**
  - The stem of grain plant after harvest
    - the grain (seed) has been removed
    - most commonly from the cereal (small) grains
      - Barley, oats, wheat
    - It is typically used for bedding

Feed for Ruminants and Horses

- **Hay** (forage, roughage)

Why can a cow, horse, sheep, goat, survive at maintenance on hay and water – but not straw?

Feed for Ruminants and Horses

- **Hay** (forage, roughage)
  - Form base diet for “fermenters”
  - Stem (cell wall, structural part of plant)
    - Main fiber source
      - Limited source of energy and protein
      - Digested by microbial fermentation
  - Leaves and Seeds
    - More nutrient dense source of energy and protein
      - Also digested by microbial fermentation

Feed for Ruminants and Horses

- **Grass Hay**
  - Timothy, orchard, brome
  - Taller, more stem relative to leaves and seeds
- **Legume hay**
  - Alfalfa, clover ...
  - Shorter, more leaves and seeds relative to stem
  - More “nutrient dense”

Feed for Ruminants and Horses

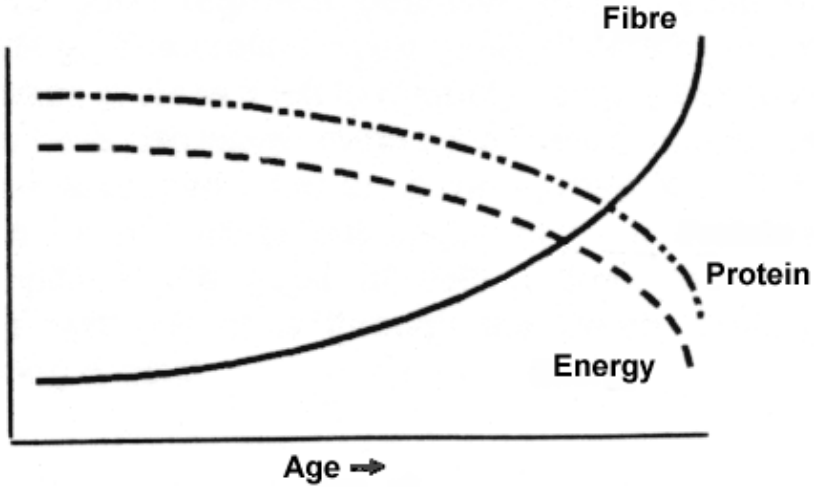
- **Corn Silage**
  - Typically fed to ruminants (can be fed to horses)
  - Consists of the whole plant
    - stalk, leaves, cob, grain
    - Harvested once per year (in the fall)
    - Chopped and stored as a fermented feed i.e. silage

Feed for Ruminants and Horses

- **Grains**
  - They are the seed of the plant
  - Mostly starch CHO, which is readily digestible
  - Fed as supplemental source of energy and protein
  - Amount fed based on needs of the animal
  - Most common are **Barley, Oats, Wheat, Corn**

Feed for Ruminants and Horses

- **Hay – harvesting**
  - Decreased nutrient content with increased maturity



  - Cut to optimize nutrients
    - 1st cut ~ June, grass and legume ("mixed" hay)
    - 2nd cut ~ July, less volume, mostly legume, more nutrients
    - 3rd cut ~ August, maybe ...
    - Depends where you live ...

Feed for Ruminants and Horses

- **Hay – storage** (why?)
  - **Bales**
    - dry (10 -12 % moisture)
    - square (in hay mows) or round (in sheds or outside)
  - **Silage**
    - Fermented (anaerobic)
    - ~ 50 % moisture
    - Removed from field sooner, more nutrients
    - *Baleage* = full length hay, bales wrapped in plastic to exclude air
    - *Haylage* = chopped hay, stored in silos
    - Is a form of storage, not variety of hay or cutting

Feed for Ruminants and Horses

- **Hay – storage**
  - **Bales**

Feed for Ruminants and Horses

- **Hay – storage**
  - **Bales**

Feed for Ruminants and Horses

- Hay – storage

  Silage

Feed for Ruminants and Horses

- **Grains – storage**
  - **Dry** (10 -12 %)
    - Bins

  - **High moisture** (~ 40%)
    - Silos, often “sealed”

Feed for Ruminants and Horses

- **Supplements**
  - Provide additional energy, protein, vitamins and minerals
  - Amount fed based on activity above maintenance
  - Purchased as commercial products
    - Protein source mostly = soybeans
    - Energy source mostly = grains

Specific points for ruminants

- **Feeding Systems**
  - **Component fed rations**
    - Typical of tie-stall barns

    - Grain/supplements fed separately from forages
    - Forages should always be available and grains/supplements fed 2 – 4 times per day
  - **Total mixed rations** (TMR's)
    - Typical of free-stall and loose housing barns
    - All feeds mixed together daily and fed free-choice at a bunk feeder
    - forages are fed as silage (wet)

Specific points for ruminants

- **Order of feeding**
  - Ruminants depend on microbes to digest feed
  - Microbes require fiber and a consistent slightly acidic environment to survive
  - Roughages stimulate chewing and salivation to buffer rumen
  - Roughages should be fed before grains
  - Grains should be fed in small amounts several times per day
  - TMR's optimize rumen pH

Specific points for ruminants

- **Intake**
  - All intake is measured as “dry matter”
  - Intake is referred to as “dry matter intake” (DMI)
  - At maintenance DMI ~ **2%** of body weight (BW)
    - An all forage diet
  - With growth/production demands, DMI intake increases and requires energy/protein supplements to forage
  - Water is critical
    - At maintenance a 650 kg cow drink about 40/lites/day
    - Milk production requires about 3 litres of water per litre of milk produced

Specific points for horses

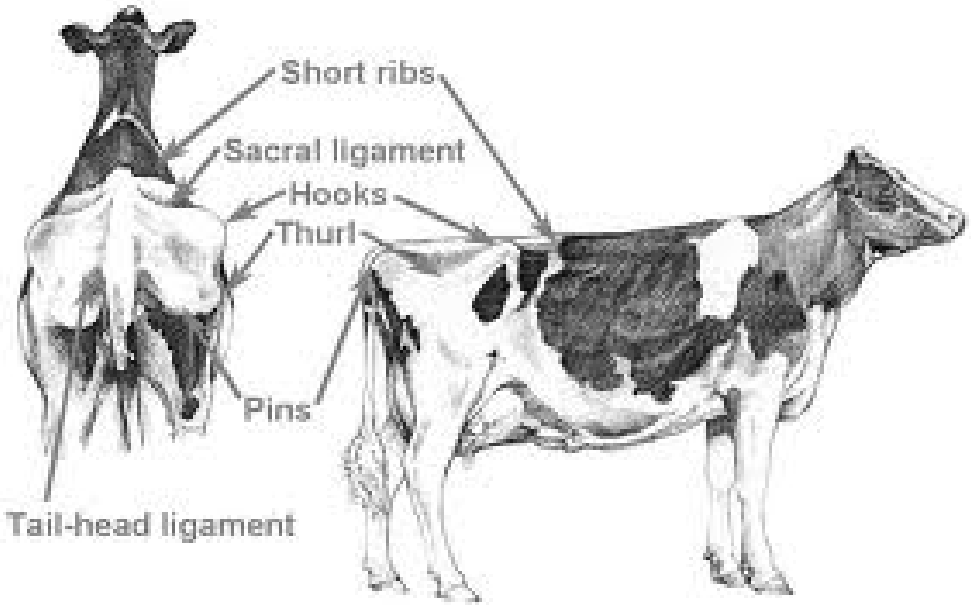
- **Intake**
  - At maintenance, hay requirement is about **2%** of BW
  - An 450 kg inactive horse will drink about 20 -30 lites per day
  - Hay is best fed on the ground
    - Commonly hay is fed as dry bales
    - Hay cubes – purchased, convenient and low dust
    - Hay can be wetted (soaked for 10 min.) if dusty
    - Uncommon to feed silage - concern about botulism

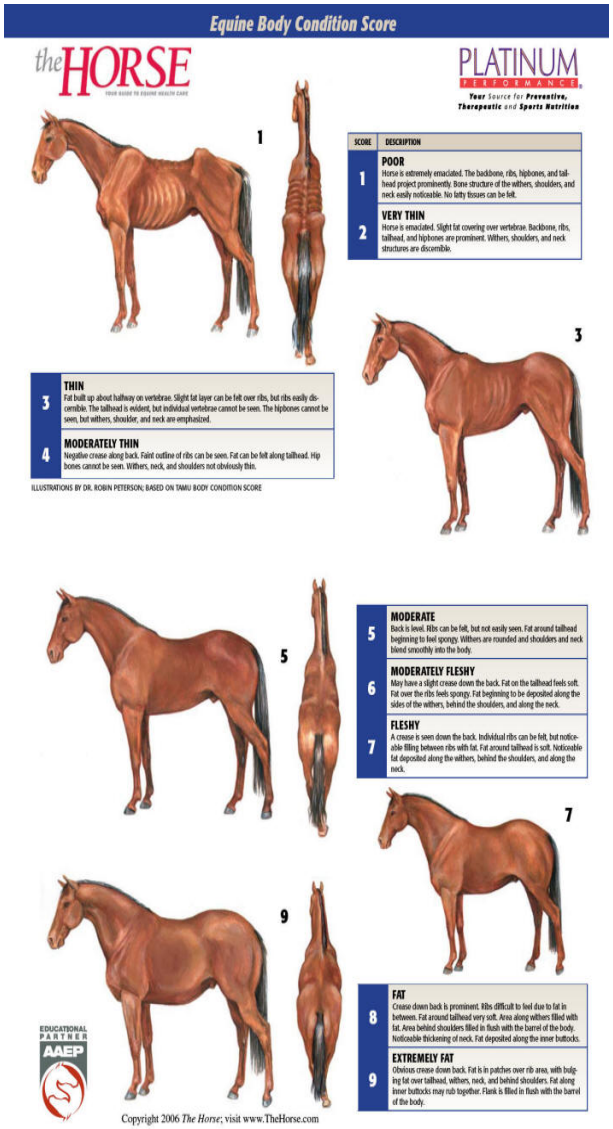
Specific points for horses

- **Intake**
  - Grains often purchased as commercial feeds
  - Many, many different kinds available
    - Dependant on type and activity of horse

Body Condition Scoring

- What is it?





Body Condition Score - Sheep

http://news.bbc.co.uk/cbbcnews/hi/pictures/galleries/newsid_3666000/3666903.stm