

Feeds and Feeding for Ruminants and Horses

Clinical Medicine I

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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**

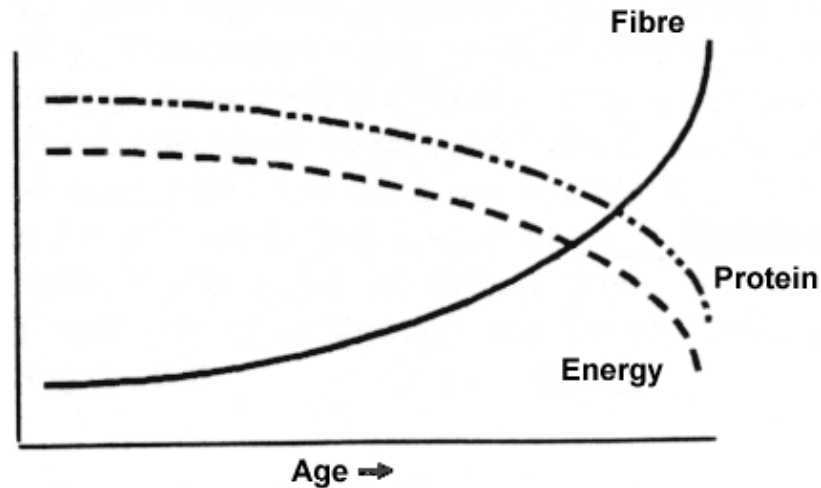
- They are the seed of the plant
- Mostly starch CHO, which is readily digestible
- Fed as supplemental source of energy and protein
- Amount fed based on needs of the animal
- Most common are **Barley, Oats, Wheat, Corn**



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

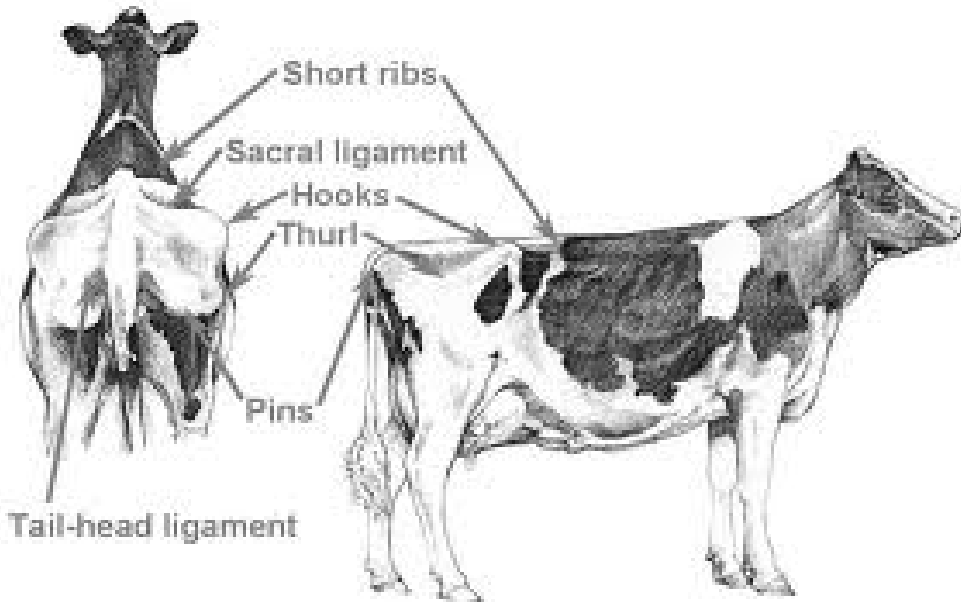
- **Intake**

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



Body Condition Scoring

- What is it?



Equine Body Condition Score

the **HORSE**
FROM OWNER TO EQUINE HEALTH CARE

PLATINUM
PERFORMANCE
Your Source for Preventive,
 Therapeutic and Sports Nutrition

1

SCORE	DESCRIPTION
1	POOR Horse is extremely emaciated. The backbone, ribs, hipbones, and tail-head project prominently. Bone-structure of the withers, shoulders, and neck easily noticeable. No fatty tissues can be felt.
2	VERY THIN Horse is emaciated. Slight fat covering over vertebrae. Backbone, ribs, tailhead, and hipbones are prominent. Withers, shoulders, and neck structures are discernible.

3

3	THIN Fat built-up about halfway on vertebrae. Slight fat layer can be felt over ribs, but ribs easily discernible. The tailhead is evident, but individual vertebrae cannot be seen. The hipbones cannot be seen, but withers, shoulder, and neck are emphasized.
4	MODERATELY THIN Negative crease along back. Fairly outline of ribs can be seen. Fat can be felt along tailhead. Hip bones cannot be seen. Withers, neck, and shoulders not obviously thin.

ILLUSTRATIONS BY DR. ROBIN PETERSON, BASED ON FFA/MSU BODY CONDITION SCORE

5

5	MODERATE Back is level. Ribs can be felt, but not easily seen. Fat around tailhead beginning to feel spongy. Withers are rounded and shoulders and neck blend smoothly into the body.
6	MODERATELY FLESHY Hips have a slight crease down the back. Fat on the tailhead feels soft. Fat over the ribs feels spongy. Fat beginning to be deposited along the sides of the withers, behind the shoulders, and along the neck.
7	FLESHY A crease is seen down the back. Individual ribs can be felt, but noticeable filling between ribs with fat. Fat around tailhead is soft. Noticeable fat deposited along the withers, behind the shoulders, and along the neck.

7

8	FAT Crease down back is prominent. Ribs difficult to feel due to fat in between. Fat around tailhead very soft. Area along withers filled with fat. Area behind shoulders filled in flush with the barrel of the body. Noticeable thickening of neck. Fat deposited along the inner buttocks.
9	EXTREMELY FAT Obvious crease down back. Fat is in patches over ribs areas, with tubing fat over tailhead, withers, neck, and behind shoulders. Fat along inner buttocks may rub together. Flank is filled in flush with the barrel of the body.

9

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Body Condition Score - Sheep



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