

## Forage Quality

Vol 2 Ch. 6, pg 83-96

Vol 2 Ch. 7, pg 104-110

Vol 2 Ch. 8, pg 111-120 (NIR)

### *Why?*

- High animal production can only be achieved with .....
  - ❖ Negative relationship between ..... (pg 86)
  - ❖ ..... with better quality forage
  - ❖ At ..... most livestock are constrained by  
....., higher intake (.....) is only possible with .....
- Yield is not enough
- Quality determines .....
- Maximum yield does not always coincide with maximum quality

### *Forage factors affecting quality*

- ..... (esp legumes)
- .....
- .....
- .....
- .....

### *Components of quality*

- Energy
- Protein
- Vitamins
- Minerals/nutrients
- Anti-quality factors

### *Energy flow*

## Cellular Components

### 40:30:20 NAP Rule

- 40% .....
- 30% .....
- 20% .....

### ***Protein***

- Crude protein accounts .....
  - typically measured as .....
- Typical levels
  - Range .....
  - .....
  - ..... for high animal production
- 80% of forage protein is Rubisco
  - hence .....
- Higher in .....

### **A. Rumen** protein digestion

1. Protein is ..... (poor N efficiency)
2. A small proportion .....
3. A small proportion .....  
.....  
“By-pass protein

**B. Lower digestive tract** digestion

- 4. Protein is degraded to ..... (high N efficiency)

**Minerals**

- In general plants reflect the levels of soil minerals – ..... (soil or herbage testing can be used)
- Animal requirements can be greater than plant requirements, so plants can grow adequately but be ..... (e.g .....).
- Some minerals are not required by plants e.g. ....
- Mg grass tetany or hypomagnesaemia
  - Caused by .....
  - Occurs in most ruminants but most common in ..... (and consequent loss of Mg)
  - Cows respond rapidly to .....

**Antiquality factors**

- ♣ Bloat – ..... (saponins) in the rumen which prevents passage of digesta (prevented by tannins in .....)
- ♣ Endophyte – alkaloids
- ♣ Estrogens produced by ..... (hay appears to be safe)
- ♣ Molds and other mycotoxins in hay
- ♣ Sweet clover poisoning, Coumarin (harmless) is converted to dicoumarol during heating & spoilage of hay.
  - Dicoumarol is the active ingredient of wafarin, an anti-coagulant used in a rat poison and heart surgery
- ♣ Nitrate poisoning & Prussic acid
  - Warm season grasses (.....) and in rare cases ....., can have toxic levels of nitrate .....
  - Nitrate converts to .....
  - Especially regrowth after rain or following drought
  - .....
  - Remedy is .....

Reed canarygrass alkaloids (pg 336-338)

- Reduced palatability, diarrhea, death especially .....
- Remedy - .....
- .....
- .....

*Measuring quality*

- Animal performance

.....  
.....

- Visual appraisal

Leafiness .....

Color .....

Plant staging .....

.....

- Lab analysis

Proximate analysis (Vol. 1 fig 8.5)

Van Soest analysis

ADF .....

NDF .....

NIR

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