

Forage Quality – part 2

Introduction

- Protein
- Minerals
- Vitamins
- Anti-quality components

Protein and Quality

- 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)
- Most forages (alfalfa, red clover and grasses)
 - containing legumes (.....)
binds to protein,
protein absorption
 - Somebypass
protein
 - Excess tannin (e.g.) can decrease intake

Minerals

- In general, – soil mineral deficiencies deficiencies (soil or herbage testing can be used)
- Animal requirements can, so plants can grow adequately but for livestock (e.g. Cu, Mg) some minerals are not required by plants e.g.
- Only in rare cases do plants have excess mineral levels for livestock (e.g. mine reclamation)
- Some weeds and be sought by stock (e.g. plantain, chicory, dandelion)

Grass tetany or hypomagnesaemia

1. Caused by or
2. Occurs in most ruminants but most common in cattle because
3. Cows respond rapidly to Mg treatment

Vitamins

- No commonly accepted
- In general of vitamins to suit livestock requirements
- No major deficiency problems

Anti-quality factors

- Bloat – foaming of legume protein (saponins) in the rumen which prevents passage of digesta (prevented by tannins in birdsfoot trefoil and sainfoin)
- Endophyte – alkaloids produced by fungi in ryegrass and tall fescue (pg 348-349)
- Estrogens produced by old red clover varieties (hay appears to be safe)
- Molds and other mycotoxins in hay

Sweet clover poisoning (rare)

- Coumarin (harmless) in sweet clover is converted to dicoumarol during heating & spoilage of hay
- Dicoumarol is the active ingredient of warfarin – 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 nitrite and interferes with hemoglobin
- Especially regrowth after rain or following drought
-
- Remedy is

Reed canarygrass alkaloids

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

Zearalenone

- Caused by.....especially during specific climate conditions (.....)
- Causes.....in horses
- Also occurs when grazing wheat (grain)