



Protein digestibility of tannin-containing forages in the rumen and the abomasum as determined *in vitro*

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Background

- The Centro Internacional de Agricultura Tropical identified a range of tropical shrub legume species with high crude protein (CP) content and good growth characteristics.
- The feeding value of certain species may be limited by high concentrations of tannins.
- Tannins decrease the ruminal degradation of crude protein.
- A significant proportion of this rumen-protected protein could be liberated and degraded in the abomasum.

Materials and Methods

Experimental diets

- Thirteen legume supplemented diets.
- Basal substrate: *Brachiaria humidicola* 6133.
- Legume supplement (1/3 of dietary dry matter [DM]) either one of the following legumes alone
 - Cratylia argentea* 18516
 - Leucaena leucocephala* 734
 - Flemingia macrophylla* 17403
 - Calliandra calothyrsus* 22310
 - C. calothyrsus* 22316
- or combinations of the non-tanniniferous *Cratylia* with the other legumes in proportion of 2:1 and 1:2.

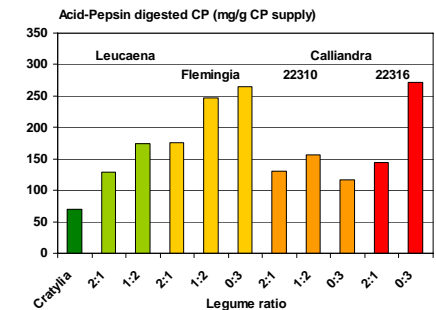
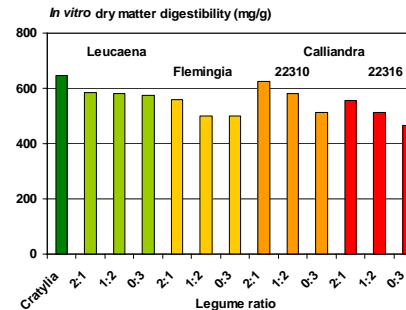
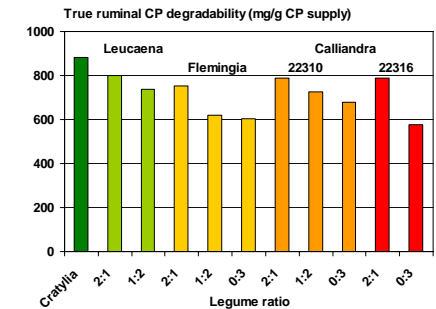
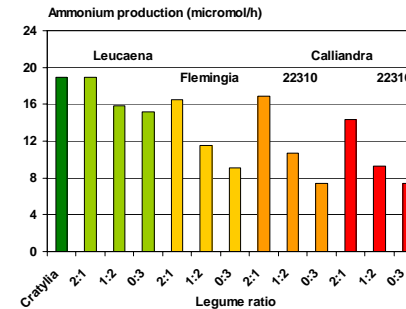


In vitro fermentation systems are an important tool in assessing the feeding value of tanniniferous legumes.

In vitro technique

- Digestibility technique modified to determine ruminal and abomasal degradability of CP.
- Nine samples per diet incubated in ruminal fluid and McDougall buffer (1:4) for 48 h.
- Determination of ammonium concentration in fermentation fluid after 0, 6, 12 and 48 h.
- Three samples filtered for estimation of apparent degradability of DM.
- Three samples treated with neutral detergent solution for estimation of true ruminal DM and CP degradation.
- Three samples further incubated with HCl-pepsin for estimation of apparent abomasal digestibility of the rumen-undegraded DM and CP.

Results



Conclusions

- Tanniniferous legumes decreased ruminal CP degradation and ammonium production and increased the proportion of dietary CP degraded during acid-pepsin incubation.
- A major part of the tannin-bound protein, which is protected from microbial degradation in the rumen, is available for acid-pepsin digestion in the abomasum.
- The use of mixtures of legumes with and without tannins could effectively improve the supply of metabolically available protein to the animal.

A joint project with:

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