The effect of supplementation with press extracted canola meal on feed intake and ruminal ammonia concentration

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Protein-enriched supplementary feeds are essential for ruminants to ensure that nutrient requirements of both the ruminal microorganisms and their host animal are met, and in balanced proportions (Leng, 1992). Press extracted canola meal is a protein enriched feed source, which has become available in Western Australia due to expansion in processing by the canola industry. Research into the feeding value of press extracted canola meal for ruminants is limited.

Using a cross-over experimental design, the effect of supplementation with 2 kg/day press extracted canola meal (35.4% CP, 12.9 MJ ME/kg DM, 8% oil) on feed intake and ruminal ammonia concentration was determined in four Holstein steers (with well established rumen cannulae) fed a basal diet of pasture hay (9.6% CP, 8.8 MJ ME/kg DM). Animals were allowed a period of two weeks to adapt to the diet after which ruminal fluid samples (ca. 100 mL) were obtained every 3 h for 24 h using a core sampling suction probe via the rumen cannula. The centrifuged ruminal fluid samples were analysed for ammonia-N concentration using a phenol/ nitroprusside assay. The results are given in Table 1.

Supplementation with press extracted canola meal had no effect on the intake of the basal diet, although the animals fed the supplement had a higher total feed intake than the unsupplemented animals. The slight reduction in the intake of the basal diet with supplementation may be due to substitution, given that press extracted canola meal contains a relatively high level of energy.

Ruminal ammonia concentrations were significantly higher (P<0.001) in steers supplemented with press extracted canola meal, indicating that part of the protein contained in the supplement is highly degradable in the rumen. Mehrez et al. (1977) reported that a ruminal ammonia concentration of 200-270 mg N/L is required for maximal DM fermentation, which corresponds with the ruminal ammonia concentrations of the animals fed the press extracted canola meal supplement. Animals fed the basal diet had ruminal ammonia concentrations below 50 mg N/L, which is considered the minimum amount required to support maximum microbial growth and protein synthesis (Satter and Slyter, 1974; Slyter et al. 1979). Results from this study suggest that press extracted canola meal is a useful protein and energy supplement for ruminants, however, the level of feeding used in this study may be excessive given the lack of response in intake of the basal diet (possibly due to a substitution effect).

References


Table 1 The effect of supplementing 2 kg/day press extracted canola meal (PECM) on feed intake and mean daily ruminal ammonia concentration.

<table>
<thead>
<tr>
<th>Diet</th>
<th>Pasture Hay Intake (kg/day)</th>
<th>Mean Ammonia Concentration (mg N/L)</th>
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<tbody>
<tr>
<td>Pasture Hay</td>
<td>10.42</td>
<td>48</td>
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<tr>
<td>Pasture Hay + PECM</td>
<td>10.18</td>
<td>260</td>
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