

**Effect of roughage to concentrate ratio on ruminal fermentation  
and protein degradability in dairy cows**

**by**

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## SUMMARY

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Published research suggests that it might be beneficial to increase the amount of rumen undegradable protein (RUP) that passes out of the rumen, through manipulation of rumen fermentation to establish a lower rumen pH. To test this hypothesis, a study was conducted in which three ruminally cannulated Holstein cows, 722 kg  $\pm$  25.6 kg fed three different diets (treatments) were used in a Latin square design experiment to determine effects of increasing levels of dietary concentrate on some rumen parameters and ruminal crude protein (CP) degradability. The *in situ* method was used to determine the ruminal protein degradability of sunflower oilcake, cottonseed oilcake and roasted soya. The three treatments differed in roughage:concentrate ratio, being 60:40 (Treatment UP 60), 45:55 (Treatment UP 45) and 30:70 (Treatment UP 30). Intake of dry matter (DM) (kg/day) did not differ between treatments. The mean rumen pH in cows receiving the three experimental diets differed and was 6.00, 6.27 and 6.44 for treatments UP 30, UP 45 and UP 60 respectively. The time (hours) below pH 5.8, which is considered to be the pH where fibre degradation is substantially negatively affected, was approximately 2.5 hours, but only on treatment UP 30. Mean rumen ammonia nitrogen (N) and total volatile fatty acid (VFA) concentrations did not differ among cows receiving different treatments but, cows fed treatment UP 30 had a lower ruminal acetic acid:propionic acid (A:P) ratio compared to the other treatments. There were no differences in ruminal CP degradation within the three feedstuffs when incubated in cows fed diets with different roughage:concentrate ratios. Results suggest that roughage:concentrate ratios ranging from 60:40 to 30:70, which

resulted in mean pH values ranging from 6.4 to 6.0, did not affect ruminal CP degradation of sunflower oilcake, cottonseed oilcake and roasted soya.