

## RESPONSE OF RUSA DEER YEARLINGS TO FORAGE AND FORAGE/CONCENTRATE DIETS

M. PUTTOO<sup>A,B</sup> and G. McL. DRYDEN<sup>A</sup><sup>A</sup> Department of Animal Production, The University of Queensland, Gatton College, Qld 4345<sup>B</sup> Present address: Food and Agricultural Research Council, Réduit, Mauritius

There is very little information on the nutritional physiology of the rusa (*Cervus timorensis*) deer, and consequently little on which to base feeding systems for this species which is commercially important in Queensland (Sinclair 1997). This experiment investigated the intake and digestion of a legume and a cereal hay by yearling rusa deer, and the effects of supplementing these with a concentrate.

Twelve male rusa yearlings (liveweight  $46 \pm 3.2$  kg; mean  $\pm$  s.d.) were housed in metabolism cages and given lucerne (17.8% protein in DM) or barley hay (12.3% protein), with or without a milled barley grain/cottonseed meal/mineral concentrate (17.8% protein) at 20% of the ration as-fed, in a 2 x 2 factorial treatment design. The diets were offered at 3% of liveweight daily. Each experimental period was 26 days, including a seven day digestibility trial. Feed intake, digestibility and N balance were measured by total collection. Rumen fluid samples were collected at 1300 (six hours after feeding) at the end of each experimental period and analysed for  $\text{NH}_3$  by distillation after making alkaline with MgO and for VFA by gas/liquid chromatography.

Intakes, digestibilities, N balances and VFA concentrations are given in Table 1. The dry matter digestibilities of unsupplemented lucerne and barley hays were similar. Addition of concentrate increased whole-diet digestibility when given with barley, but not lucerne, hay. Protein digestibility was greater in both supplemented diets, and was higher in lucerne than barley hay.

**Table 1. Intake and utilisation of hay and hay/concentrate diets by rusa yearlings**

	Lucerne hay plus concentrate	Lucerne hay	Barley hay	Barley hay plus concentrate	s.e.
Intake (g DM/d)	1187 <sup>c</sup>	1124 <sup>b</sup>	1074 <sup>a</sup>	1127 <sup>b</sup>	9.7
Digestibility (%):					
Dry matter	65.3 <sup>a</sup>	65.8 <sup>a</sup>	65.7 <sup>a</sup>	71.3 <sup>b</sup>	0.65
Protein	76.4 <sup>b</sup>	80.7 <sup>c</sup>	68.0 <sup>a</sup>	74.6 <sup>b</sup>	0.69
N balance (g/d)	8.8 <sup>b</sup>	3.9 <sup>a</sup>	5.8 <sup>a,b</sup>	2.8 <sup>a</sup>	0.62
Total VFA (mmol/L)	79 <sup>b</sup>	84 <sup>b</sup>	53 <sup>a</sup>	85 <sup>b</sup>	4.9

Within rows, means with different notations are significantly different ( $P < 0.05$ )

The molar proportion of acetate was significantly higher for the barley hay plus concentrate diet (70%) than for barley hay alone (64%), the lucerne diets were intermediate (67%) and differed from the other diets. The mean acetate:propionate ratio was 4.2. Iso-butyrate and iso-valerate increased in the rumen fluid of deer given concentrate. Rumen ammonia ranged from 131 to 150 mg  $\text{NH}_3$ /L and there were no differences between the diets. Urine N excretion was highest in those diets with concentrate and/or lucerne and was always the major route of N loss.

The higher intake of lucerne than barley hay, and the intake response to concentrate supplementation of barley hay conform to expectations based on the classification of rusa deer as intermediate browsers/ grazers (Hofmann 1985). DM and N digestibilities increased with addition of concentrate as would be expected in conventional ruminants, and the rumen VFA profiles and  $\text{NH}_3$  contents were similar to those expected from other domestic ruminants eating this type of food. High urinary N excretions have previously been reported for deer (Freudenberger *et al.* 1994).

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