

Dietary Energy Intake and Growth of Rusa Stags During and After the Rut

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The demand for animals for the export venison trade peaks between September and December (Tuckwell 2007), so high growth rates are desirable during winter and spring. This coincides with low pasture growth in Queensland, and with the breeding season of the Javan rusa deer (*Cervus timorensis rusa*). Red deer (*C. elaphus*) are well known for inappetance and weight loss during the rut (Barry *et al* 1991), but the effect of season on growth in rusa deer has not been fully investigated. In this experiment we investigated the response to 3 levels of feed, to simulate variations in feed supply from pasture, provided during and after the rut.

Three entire, mature (42 months old) rusa stags (liveweight 103.0 ± 13.0 kg, mean \pm SD) were used in this preliminary study. The stags were housed in individual metabolism pens at the Deer Research Unit, The University of Queensland, Gatton. Pens were provided with feeding troughs and automatic nipple waterers. Urine and faeces were collected through a mesh floor. The pelleted diet contained 25% lucerne hay, 45.5% barley grain, 10.4% cottonseed meal, 14.5% millrun and molasses and minerals, and was formulated to provide 16.4% protein (DM basis) and 11.0 MJ ME/kg DM. The 3 levels of metabolisable energy (ME) intake (Table 1) were based on that reported for the related sambar (*C. unicolor*) deer (Semiadi *et al* 1995) and were imposed in a 3×3 latin square design (rows = periods, columns = stags) to avoid confounding stags and periods within seasons. Each experimental period was 28 d. There was sufficient time between treatments to reduce carry-over effects. The observations were made twice, during the rutting (breeding) period (July 1997 to October 1997) and after the rut (October 1997 to January 1998). ME intake was the difference between the total energy consumed (adiabatic bomb calorimetry) and the energy lost in faeces, urine and methane (estimated from the dry matter (DM) intake; Li *et al* 1996).

Stags lost liveweight during the rut (Table 1) although, at each level of feeding, there was little effect of season on feed intake. There was a tendency for digestible energy (DE) to be converted less efficiently to ME during the rut.

Table 1. Dry matter intake and liveweight change in mature rusa deer stags offered a pelleted diet at 3 levels of metabolisable energy intake during and after the rut

Parameter	During the rut			After the rut		
	1 M	1.4 M	1.8 M	1 M	1.4 M	1.8 M
Initial liveweight (kg)	101.7 ^a	100.0 ^{ab}	98.0 ^{abc}	98.3 ^{abc}	95.2 ^c	95.8 ^{bc}
Final liveweight (kg)	96.0 ^b	96.5 ^b	98.0 ^b	98.0 ^b	99.0 ^{ab}	101.8 ^a
Liveweight change (g/kg ^{0.75} .day)	-6.3 ^c	-3.8 ^d	0.0 ^c	-0.4 ^c	4.5 ^b	7.0 ^a
DM intake (g/kg ^{0.75} .day)	44.5 ^d	52.3 ^{cd}	63.7 ^{ab}	44.8 ^d	58.7 ^{bc}	68.1 ^a
ME intake (MJ/kg ^{0.75} .day)	0.507 ^d	0.593 ^{dc}	0.723 ^{ab}	0.507 ^d	0.667 ^{bc}	0.773 ^a
ME (% of DE)	84.4 ^{bc}	85.2 ^{ab}	83.1 ^c	85.1 ^b	85.9 ^a	87.0 ^a

M = maintenance ME intake

^{a,b,c} within rows, means with similar notations are not different (P<0.05)

In contrast to the effect of the rut on the temperate red deer, yearling (Sookhareea and Dryden 2004) and mature (this study) rusa stags do not reduce their food intake during the breeding season. However, rusa stags have a higher ME requirement for maintenance during the breeding season (Dryden *et al* 2002) and this probably explains the reduced growth rate of the stags during the rut in the present experiment. Farmers should take care to avoid underfeeding rusa stags destined for slaughter in late spring/early summer, when the effects of the rut will exacerbate those of poor winter pasture quality.

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