

## Deer Feeding and Management

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**ABSTRACT:** When available pasture is greater than 5.5 kg DM/day/100 kg liveweight or post grazing pasture mass is greater than 6-8 cm in height there is no significant increase in liveweight gain in young deer. Feed quality is a problem for summer lactation and it has been shown that the proportion of green leaf in the pasture is closely related to calf liveweight gain. Red clover and the chicory are forages that can increase deer calf growth rate during lactation by about 20% when compared with white clover. Chicory breaks down rapidly in the rumen leading to increased voluntary feed intake. Condensed tannins and lactones in chicory inhibit worm larvae and may lead to a reduction in the requirement for anthelmintic drenching. Dramatic seasonality in the annual cycle of deer antler growth has major consequences for feed requirements. Priority times for maximum feeding are in the spring, late autumn and late winter.

**Key Words:** Deer, Feeding, Pasture

### INTRODUCTION

Deer farming in New Zealand has come a long way in 25 years and a key to successful progress has been an increasing knowledge of feeding for performance. Apart from the Chinese who have been able to develop deer management systems in virtually feedlot conditions, other countries are finding that the farm management of deer is best done in "natural" pastoral systems. Research into the physiology of temperate deer has shown that the animals are extremely seasonal in their growth and development. This is reflected in their feed requirements and growth. The three papers in this contract cover the field of pastoral grazing systems with deer or permanent pasture and on some other forages for venison and velvet antler production.

### THE PRODUCTIVITY OF DEER GRAZING PERMANENT PASTURE

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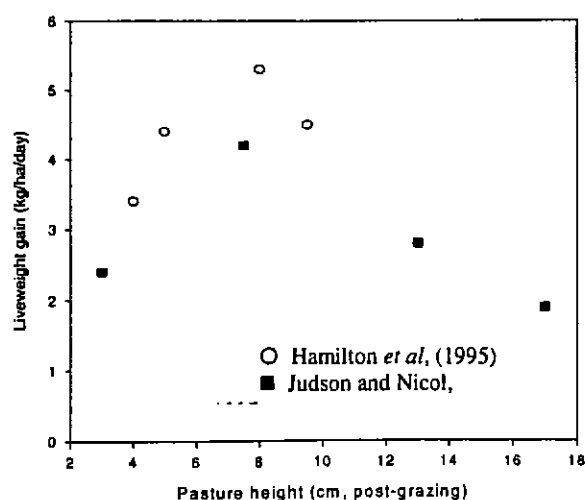
### INTRODUCTION

Permanent pasture (2 years and over), grazed in-situ is the basic forage resource on deer farms. Features of these pastures, such as the seasonality of pasture growth and nutritive value, establishes the potential animal production and the level of utilisation by the grazing animal in determining the output per head and per ha.

Since the recognition that decreasing pasture availability reduces feed intake, but increases the proportion of the pasture utilised by the grazing animal experimental data establishing the specific relationships

between various measures of pasture availability and animal production have been generated for most classes of domestic ruminants (Hodgson, 1982; Rattray and Clark, 1984). Although there is less information for deer than for sheep or cattle, some useful published data exist (Nicol, 1996). In reports where more than two levels of pasture availability have been compared, there has been no significant increase in liveweight gain per head at pasture allowances above about 5.5 kg DM/day/100 kg liveweight (Adam and Asher, 1986, Judson and Nicol, 1997) or at post-grazing pasture mass much over 8 cm (Judson and Nicol, 1997) or as a continuously stocked pasture height of 6 cm (Hamilton *et al* 1995).

Highest output (kg liveweight gain) per ha has been achieved at a pasture height of between 6 and 8 cm for continuous stocking (Hamilton *et al*, 1995) and post-grazing pasture height under rotational stocking (Judson and Nicol, 1997) (Figure 1).



**Figure 1.** Effect of sward height on output of deer liveweight per ha.

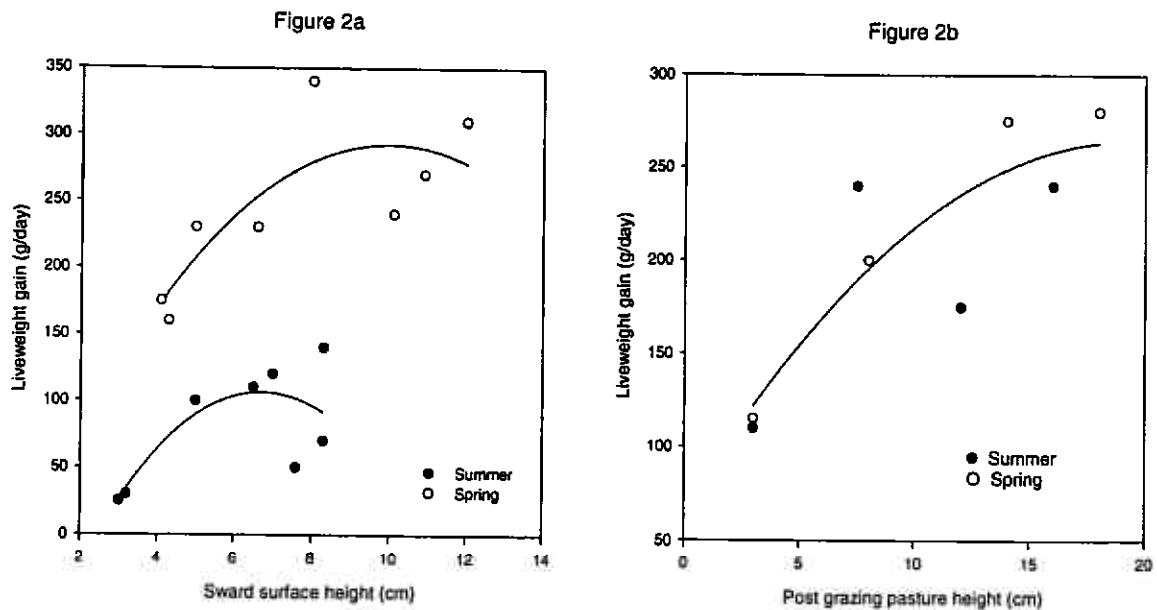
There is some evidence of an effect of deer genotype on the animal response to pasture availability

particularly in spring. In their comparison of red and hybrid (¼ elk, ¾ hybrid) yearling stags, Judson and Nicol (1997) observed that higher (by 30%) pasture allowance of 8 kg DM/100 kg liveweight was required to obtain maximum liveweight gain in hybrids compared with red deer (6 kg DM/100 kg liveweight). These authors found less difference between the genotypes in winter than spring/summer and at low (< 4 kg DM/10 kg liveweight) than high pasture availability.

Fennessy and Milligan (1987) have given recommended post-grazing masses (kg DM/ha) for red deer grazing permanent ryegrass/white clover pastures and expected liveweight changes. These range from 600 kg DM/ha in winter for adult deer (nil weight gain) to 1500 kg DM/ha in spring and summer where yearlings grow at 200 - 300 g/day.

A feature of some of the relationships between pasture height and liveweight gain of young deer (Hamilton *et al*, 1995) was the markedly lower liveweight gain at any given pasture height in the second half of a 14 week grazing season (summer) compared with spring (Figure 2a). These authors comment on the presence of seedheads and build up of dead material in their pastures later in the season. A similar observation is not so apparent in Judson and Nicol (1997) (Figure 2b) but their pastures were topped and irrigated to maintain pasture quality.

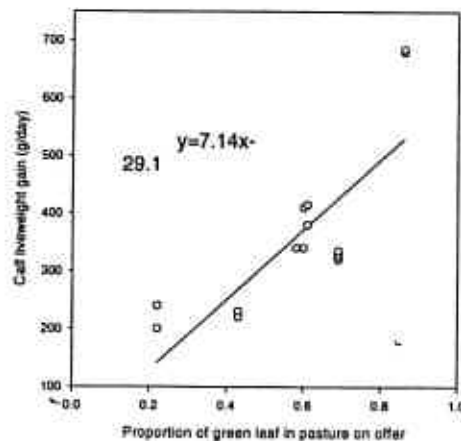
Figure 2: The relationship between pasture height and liveweight gain of young deer in spring and summer (a) Hamilton *et al*, 1995; (b) Judson and Nicol, 1997.



Another excellent example of the importance of pasture quality later in summer are the between-farm differences in the pre-weaning liveweight gain of fawns (Stevens, 1999) much of which can be explained by the proportion of green in the pasture on offer (Figure 3).

As the proportion of green leaf in the pasture increases from 0.4 to 0.8, calf gain almost doubles from 265 to 500 g/day. It is thought that this is a direct effect of pasture quality on intake of the fawn and not mediated through lactation.

Figure 3: The effect of the proportion of green leaf in the pasture on liveweight gain of deer fawns pre-weaning (from Stevens, 1999)



Finishing cattle which graze with the hinds in late spring/early summer but are sold to slaughter or removed from hind paddocks in January/February do help maintain pasture quality.

Equally popular is the policy of combined finishing and breeding of deer. The introduction of a significant proportion (> 25%) elk into the offspring significantly increases weaning weight, post-weaning liveweight gain and advances the slaughter date (minimum liveweight 96 kg) by 3 to 4 months (Pearse, 1992, Barry and Wilson, 1994). The utilisation of elk as terminal sires and even as a proportion (¼) of the female genotype, allows for slaughter at around 12 months of age. This means these animals are off the property before the subsequent lactation. A further benefit of this breeding structure is that a higher proportion of yearlings reach target weight at a time of year (September-November) when the price per kg carcass weight is high.

The use of supplementary feed as conserved pasture (silage and hay) or grain feature in deer production systems based on permanent pasture. Supplementary feeding is confined to periods where the rate of pasture growth is less than that required to meet energy requirements (winter for young deer and velvetting stags, and summer for hinds in drier summer areas and in 'drought' years). During winter, young deer tend to eat to a constant ME intake (Webster *et al.*, 1998), so considerable substitution between alternate energy sources occurs. This means supplementary feeding can be useful to 'save' pasture for spring, but is not very effective at raising winter liveweight gain.

As the farmed deer industry in New Zealand matures, there is greater development of regional specialisation of deer production systems. For example, the mixed cropping and dryland areas of Canterbury have the greatest density of specialised deer finishing properties. Weaners are purchased in March/May, often grazed on specialist winter forage crops and are sold for slaughter before the grazing areas are needed for seed production (Oct) or summer dry conditions develop (Nov/Dec).

There is also a trend to increase the number of breeding hinds held on large, hill country properties where the onset of spring growth is late (Nov) and where at low stocking rates (1 hind/ha), summer pasture production is sufficient to sustain lactation in a red deer hind. In this environment the energy demand on hinds better fits the pattern of pasture production.