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In the early days of deer farming in the U.K. there was a popular theory going the rounds that deer and particularly stags, could survive the winter literally on love and fresh air. Deer were, then, at an immense advantage over more conventional livestock as economies could be made on winter feeding supplements. There was some support for the theory from published work on North American deer and from studies on red deer at the Rowett Institute - even when fed to appetite high quality concentrated rations red deer stags voluntarily reduced their food intake in winter. Red deer were considered to be well adapted to open hill conditions, with cold harsh winters and short summers. However, even at that time Dr Anne Simpson, who worked on energy requirements of deer, particularly in relation to cold stress, came up with results that contradicted the theory. She considered that deer had high requirements for energy during the winter due to poor coat insulation and low body reserves of fat. Her studies received little attention from the farming community, possibly as they ran contrary to deep seated opinion. Recent research at Invermay has proved her correct and the others wrong. Much of what follows is taken from Dr Peter Fennessy's chapter in David Yerex's book "The Farming of Deer" (ISBN 0-959 7264-0-x, 1982), to which all serious deer farmers or would-be deer farmers are directed.

Fennessy divided the year up into four periods to simplify application of the seasonal energy requirement information as follows:

Autumn	- 65 days	September	- November (the rut)
Winter	- 100 days	November	- February
Spring	- 100 days	March	- June (antler growth and late gestation)
Summer	- 100 days	June	- September (lactation)

The values for maintenance requirement were corrected for animals outdoors and for antler growth, pregnancy and lactation. They are shown in Table 1.

Conspicuously the winter-spring requirements for stags are relatively high and certainly do not show any winter depression that might have been expected. The energy requirements for hinds are fairly constant except for lactation. The pattern of seasonal energy requirement is quite different for deer than sheep.

In practice this means that stags, who may enter winter with only 2-4% of their body weight as fat (against 25% before the rut), must be fed well to prevent mortality, guard against disease and maintain productivity. Young stock must also be fed well, particularly females, if they are to conceive at 15 months of age. Although there is a slowing of growth rate in winter for the younger age classes, weight loss must be prevented at all costs - the fastest growth is, energetically, the most efficient growth. From the point

of view of adult hinds, pasture must be managed very carefully during late spring to ensure that it is optimal for the heavy demands of lactation and has not become long and rank by late June and July. This may entail the use of cattle or sheep to graze down paddocks in May, to prevent seeding.

In essence, stags have far higher energy requirements during winter than may hitherto have been realised. Shelter can significantly reduce these energy requirements by cutting down heat loss. Hinds have high energy requirements in summer.

TABLE 1: Metabolisable Energy (ME) Requirements for Red Deer expressed as MJ ME/day.

<u>Stags</u>	<u>Autumn</u>	<u>Winter</u>	<u>Spring</u>	<u>Summer</u>
3 - 15 months	16	19	27	26
15 - 27 months	24	28	31	30
Older	19	35	42	38
<u>Hinds</u>				
3 - 15 months	15	18	22	21
Older	23	22	24	47
<u>Ewe (for comparison)</u>				
Rearing 1.1 lambs during spring.	13	10	28	11