Good nutrition is as good as gold

Trials used protected protein diets 501

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ALMOST SINCE deer farming began there has been controversy about stag nutrition.

Although early on it was felt stags could live on next to nothing during winter because deer appetite fell, producers rapidly formed the opinion that good management equalled good feeding.

The pendulum continued to swing and farmers and scientists pondered the question: Could increased winter and spring nutrition increase velvet antler yield?

In a key article in The Deer Farmer, page 27 April 1990, Peter Fennessy of MAF Invermay concluded that stags would produce their genetic potential antler yield if fed well during winter and spring, but the question of whether super yields could be produced by super feeding would require more research.

In that article, results were presented from one trial where a high level of winter protein increased hard but not velvet antler weight in 2-year old stags.

The identity of the winter protein is very important: Protein sources can be classified on the basis of their 'level of protection' — the availability for digestion by the rumen organisms rather than directly to the animal itself.

So a protein source like pea meal which is easily attacked by rumen organisms has a low level of protection, while extruded cottonseed meal, which is fairly resistant to such digestion, has a high level of protection.

If much of the protein is used by the micro-organisms, there is not much left of the original dietary protein to feed the deer and consequently the deer's major protein source is the microbes themselves; if most escapes breakdown in the rumen, then there is a lot of dietary protein to nourish the deer as well as the microbial protein.

In Peter Fennessy's trial the protein used was linseed meal, which is a highly protected protein source. So the question remained: Could a diet containing high levels of protected protein, if fed to stags in a commercial context during winter, increase velvet antler yields in spring?

During the winter of 1990 at Invermay, we set out to investigate whether two diets containing either a low or high level of protected protein could increase velvet antler production in spring.

The low protected protein (LPP) diet comprised mainly barley and broll (bran and pollard) with 5 per cent extruded cottonseed meal. The remainder of the extra protein was supplied by pea meal.

The high protected protein (HPP) diet contained the same quantities of barley and broll, but 20 per cent extruded cottonseed meal. The barley itself contained about 10 per cent protein which is unprotected, but only a quarter of the extra protein source was protected in the LPP diet while all the extra protein was protected in the HPP diet. Otherwise the diets were identical in the amount of energy (11.5 MJME/kg DM) and DCP — 16 per cent.

The diets were fed daily at the rate of 2 kg/head. Meadow hay was always available in excess of appetite. Fifty two 2 and 3 year-old stags were randomly allocated within age group to either the LPP or HPP diet, with 26 animals per group.

From May 30 until August 31 the animals were kept in sheltered wintering pens with no fresh forage available. They were weighed at the start and finish of the experiment.

Button drop was recorded and velvet antler weight was recorded. The stags did not have their velvet cut on the same day relative to casting and this has been accounted for in the analysis.

Although there were significant differences between the age groups, there were no positive effects of the increased quantity of protected protein. All stags grew well and there were no health or palatability problems. However, we were impressed at the liveweight gains in both age groups, averaging about 145 g/day.

On the basis of this result we decided to repeat the trial during winter 1991. In case the LPP was too good we included a diet which contained all easily digested protein (NPP) and a diet which contained all protected protein in the form of lupins, fishmeal and extruded cotton (LFC).

In addition, several claims had been made (TDF April 1990, p25) that Enerpro, a supplement formulated for race horses in Australia, had impressive effects on velvet antler growth.

Enerpro contains extruded peanut meal as its principal protected component with high energy, vitamin and mineral additives. We had two diets made up by the local feed companies which contained Enerpro at either 15 per cent or 20 per cent of the diet — E15 or E20 respectively.

The same group of stags (now 3 and 4 year-olds) as in 1990, less culls and animals selected as sires, were randomly allocated on the basis of age to be fed one of the four diets during the winter.

The conditions of the experiment were exactly the same as in 1990. The experiment began on June 12 and the animals were turned out to pasture on September 6.

After adjusting for age and starting

Effect of level of protected protein

	2-year-old		3-year-old	
	LPP	HPP	LPP	HPP
Liveweight (kg) 30th May	89.9	88.8	133.2	133.4
Liveweight (kg) 31st August	103.2	102.6	149.0	143.4
Liveweight gain (kg)	13.3	13.8	15.8	10.0
Antler weight (kg)*	1.04	1.06	1.68	1.72

* Data are adjusted for date of velvet antler cutting.

Effect of diet on winter growth and velvet

	No protected protein	Lupin, fishmeal cottonseed	Enerpro 15	Enerpro 20
Liveweight (kg) 12th June	137.6	137.3	136.6	137.7
Liveweight (kg) 6th September	143.5	145.6	141.4	145.4
Liveweight gain (g/day)	71	102	57	94
Antler weight (kg)*	2.07	1.86	1.58	1.97

* Data are adjusted for the effects of age and velvet antler cutting date.

live weight, there were no significant good or bad effects of any high protein diet compared with the NPP group. Although the E15 appeared to reduce weight gain and antler growth, this effect was not significant.

We conclude on the basis of these two experiments that well-nourished, well-managed stags will achieve their genetic potential velvet antler weight.

Feeding luxury, high protein rations or high levels of protected protein do not have an additive effect over good breeding and good management.

That is not to say that such diets have no place in deer farming: Animals which have been underfed due to drought conditions for example, may very well respond to protected protein rations by increasing production.

It may well be a sound economic decision to purchase protected protein supplemented diets in such circumstances, because it is clear that reduced nutrition reduces production.

However, this does not mean super nutrition will boost production. This is probably because the system for transporting nutrients to the growing antler is flat out during early velvet growth. The transport system, presumably controlled by the genes, limits production, not the amount of nutrients.

The feeding regimen we have studied is to feed high quality rations in winter and look for an effect on antler weight in spring. Our data do not preclude the possibility that high protein rations in spring may have a beneficial effect on antlers, but this is when the deer have abundant high quality pasture and may find this more to their taste after a winter of hard feed.

Peter Fennessy's earlier protein studies on penned deer strongly suggest that super nutrition over the spring period is unwarranted. In associated outdoor trials, there has also been no response to extra protein in the spring.

Good nutrition allows genetic potential to be achieved but super nutrition doesn't increase growth.

Bad news for the velvet farmer? I don't think so. These experiments have highlighted the fact that good all round management is better than shock tactics — and who didn't know that? □