

QUALITY MEAT FROM FARMED DEER

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The management objective in any pastoral meat farm system is to produce as much meat as possible per unit area of land of the highest possible value and the lowest possible cost. The New Zealand deer farm promises much when considering these criteria.

We already have some idea that venison production per hectare can be considerably more than that from beef over a similar period. Invermay experiments some years ago gave 730 kg venison carcass weight per hectare during the spring – summer growing period and this was some 60% better than the four average from beef cattle recorded over the same period. It has been observed "that first class meat obtained from a lean young deer carcass is 33% of its empty body weight. In a sheep of similar size the amount of first class meat obtained is only 18% of empty body weight" (Blaxter et al 1974).

We do not intend to deal with the "lowest possible cost" part of the objective because there are better qualified people to discuss this important topic.

The present paper will deal mainly with factors in venison production that influence the quality of the final product and therefore the saleability and price.

ANIMAL MANAGEMENT TO SLAUGHTER

There is no profit in a venison operation which allows animals to arrive at the stunning box in a bruised and battered condition. It seems unwise to kill stags which are older than two years of age any later in the season than mid February. Fighting is common once the animals are left alone in yards before slaughter even when they are retained in yards with animals from their own farm groups. We have seen and heard of incidents where some animals have been found dead or injured when groups have been held in the yards overnight. After slaughter up to 50% can be found to be severely bruised. If it is necessary to withhold deer from feed for a period before slaughter the best arrangement to do so is at the farm in a bare enclosure near the yards. The area should be large enough to prevent harassment among deer. On the other hand it may be perfectly practical to slaughter animals immediately on arrival at the deer slaughter premises. Our very limited experience at Invermay is that deer will move quite well within a yard and that no special precautions are necessary to get individual stags into a stunning box. We have used a tame hand as an "attractant" ahead of the stunning box. This arrangement worked well but was not essential. The stunning box is 1.72m x 0.52m and 1.82 metres high and is covered by a rope mesh net which provides ready access for the stun gun but prevents injury if the animals jump. Because of the rapid clotting time for the deer blood it is necessary to bleed the animals quickly and completely after stunning. Dirty deer can be washed in yards without undue stress but there is still a tendency for dirty water to run down the front legs during dressing and onto the exposed carcass. Removal of all hocks before skinning alleviates most of this problem.

Much more will be learned about successful yard management procedures during the next year.

GROWTH PATTERN IN STAGS

Growth in deer is a very seasonal thing and figure 1 (Fennessy, 1981) shows the typical pattern from six months to six years. It is obvious that a farmer will be interested in picking a slaughter time at the end of a spring-summer growing period to get maximum carcass weight. In practise this means 1 $\frac{1}{4}$, 2 $\frac{1}{4}$, 3 $\frac{1}{4}$ etc. years of age. For each extra year that a stag is kept an analysis must be done on the cost of feeding the animal during weight loss or maintenance over the autumn and winter in comparison with the extra carcass weight and value acquired in the subsequent spring-summer period. In most situations stags should not be kept past two years of age if they are reared for meat production. Those stags kept for specialist velvet production should really be written off for meat production and when they are finally slaughtered the carcass can be considered as a useful "by-product". Reasons for this judgement will be given in the next section.

FATNESS IN STAGS

Fatness is likely to be the single most important consideration in the marketing and sale of venison game meat. The venison industry has the great advantage over traditional meat exports such as lamb, of being able to start some sort of carcass grading system which recognises lean meat and penalises fat right from the beginning. A quote from a recent article by Alan Frazer of the Meat Board on the subject of lamb fatness is worth repeating. "There has been a dramatic change in the amount of fat cover now allowed on prime lamb carcasses. It is now about 6mm over the rib eye area – less than half the upper limit of the late 1940's". ("A Century of Meat Exports", Otago Daily Times Supplement; February 15, 1982). The clear message is that nobody wants fat.

No yearling deer and very few two year olds will ever have problems of overfatness. Let's look at older stags. Figure 2 is based on recent information from Invermay and Coringa in which six to seven year old stags have been slaughtered at various times of the year. Carcass fat has been measured by mincing an entire side and measuring the chemical fat. Winter and summer live weights of 160 and 200 kg respectively correspond to carcass weights of about 93 and 125 kg respectively. Figure 2 shows the carcass "growth" of about 34 kg during the spring and summer, but also shows that the pattern of carcass fat closely follows carcass gain. It can be seen that in this age class of stags the animals have something like 15-20% of their carcass weight as pure fat even by the time of velvetting. Although the stags are grossly overfat by the end of the summer most of it has been laid down as a pad over the rump and back and can be fairly readily trimmed. There is relatively little marbling fat in any stags.

An analysis of spring-summer carcass growth in yearlings, two year olds and "aged" stags is given in Table 1. Sixty three percent of the carcass gain over the entire spring-summer period in "aged" stags is fat while in yearlings the gain is only 14% fat. The two year old stags are quite low at 23% of the gain as fat. To emphasise this point in another way the growth phase in an old stag is only about 37% lean meat while in young stags it is 75-85%.

Quite clearly the producer must be persuaded that to get a good price of his old stags he should slaughter them in winter when fat has largely been mobilised. Even with slaughtering in late November two weeks after velvetting there is a risk of overfatness.

An accurate objective means of assessing carcass fatness at the deer slaughter premises is required and we are looking at various fat depth measurements; of these a tissue depth measurement on the 12th rib similar to the "GR" measurement in lambs looks promising. Every effort must be made with all venison to preserve the "lean meat" image.

EATING QUALITY IN VENISON

The most important factor in the eating quality of meat is tenderness and this is greatly influenced by what happens to the carcass between killing and freezing. The effects of ageing and conditioning lamb and beef carcasses are well known and we now have the process of accelerated conditioning. The use of these techniques has not yet been evaluated in deer but it is a "fair bet" that tough meat will be found if carcasses are frozen less than 16-24 hours after slaughter. The use of accelerated conditioning machinery might eliminate this holding time in a chiller before freezing, it can't be expected to tenderise old or stressed deer carcasses. In the interests of developing new outlets for a new venison game meat product careful attention must be paid to factors influencing tenderness.

Severe stress on the animal before slaughter can lead to high pH meat which has poor storage qualities and possibly an unattractive flavour.

CONCLUSIONS

The handling of stags from the farm to a deer slaughter premises and subsequent slaughter is proving to be possible although there are behavioural problems with older stags resulting in carcass damage if animals are slaughtered after the middle of February. Spring-summer growth in old stags is shown to be 2/3 fat and as such is not wanted. There are few problems from overfatness in yearling and two year old stags.

ACKNOWLEDGEMENT

We wish to thank the staff of the Coringa Game Farm for assistance with some of the stag slaughter work.

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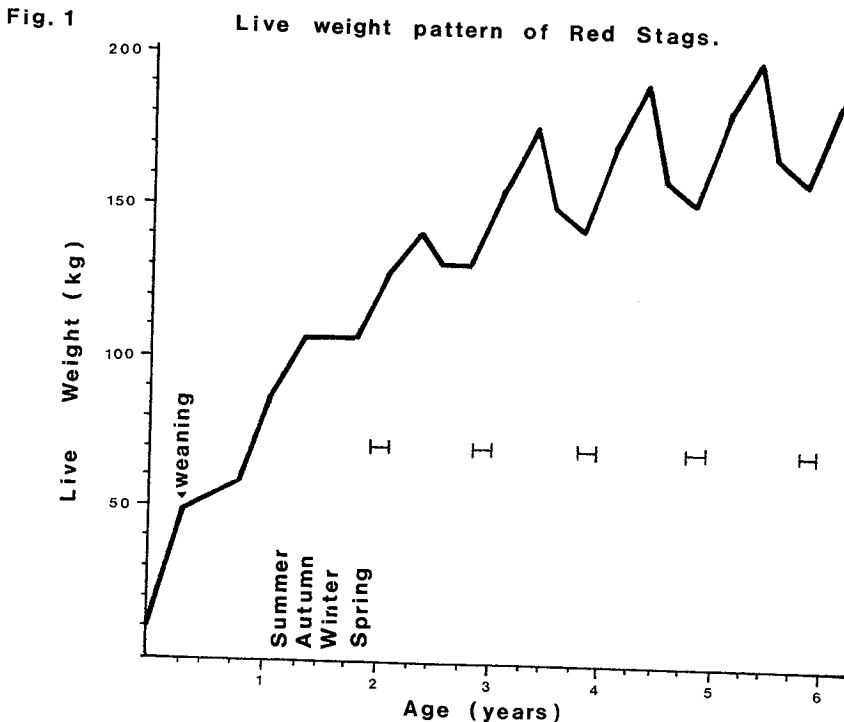
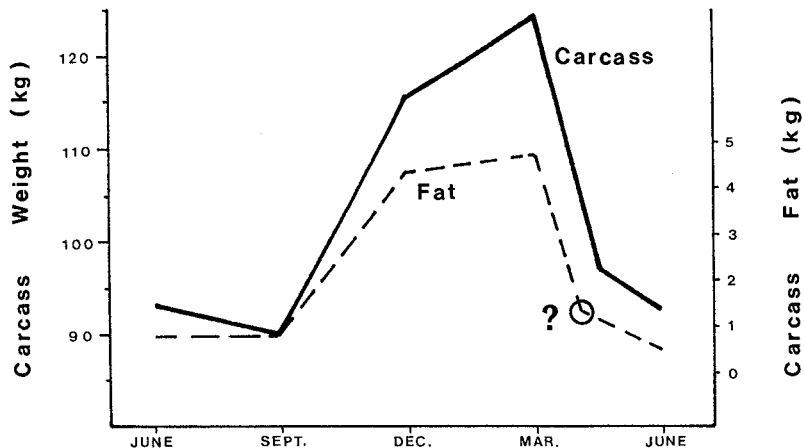


Fig. 2 Carcass weight and fatness (Aged stags)



The question mark on Figure 2 is explained by Dr. Drew.

"When the paper was written the point was unavailable because we had only just slaughtered the stags in May. Fat content in that group was 3.6% of carcass weight so that at 96 kg. carcass weight the fat weight = 3.5 kg. My data point was a bit high at about 6 kg."

TABLE 1: ANALYSIS OF CARCASS GAIN IN STAGS OCCURRING BETWEEN SEPTEMBER AND MARCH.

	Carcass Gain (Kg)	Carcass Fat Gain (Kg)	% Carcass Gain which is fat	Carcass "Lean" Gain (Kg)	% Carcass Gain which is lean
Yearlings	26.4	3.8	14.4	22.6	85.6
2 year olds	21.5	5.0	23.2	16.5	76.8
"Aged"	33.9	21.5	63.4	12.4	36.6