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It is generally agreed that the international venison market is under-supplied and that this is due to:

- reduced NZ production from a 1992 high point.
- reduced supply from countries previously known as the “Eastern block”.

The chrystall ball indicates that it is likely to be the end of the decade before NZ achieves the 1992 level of venison production.

The predominant breeding female in the NZ deer farming industry is, and will continue to be, the red hind. The quality of this animal is being continuously upgraded by better performing NZ red and European stags. Progress is not easy because it largely depends on certainty of identification of progeny to mother - a contentious matter but where mis-matching does occur. It is certain that persistent use of European red sires to breed herd replacements will eventually increase the mature body weight of the breeding hinds and appropriate feeding adjustments must be made. For every 30% increase in hind body weight feed requirements will need to be increased by about 20%.

Much easier breeding progress for venison production is possible through the male mainly because certainty of parentage is straight forward and many calves/sire can be evaluated.

Objectives in breeding for venison

- Increase “weight-for-age” performance in the growing deer.
- Increase the proportion of the carcass which is high in value.
- Decrease or minimise carcass fat.

Variation in growth performance

New Zealand red stags for venison production should achieve a 15 month weight of around 107 kg from a 100 day weaning weight of 48-50 kg. The red sire evaluation scheme of 1992/3 in which progeny from 10 top red sires of English, Hungarian or Yugoslavian origin were

evaluated in North Island and South Island properties gave a 15 month performance average from ½ bred animals of 104.2 kg with the top figure being 108 kg. These figures are not high even in a difficult summer given good weaning weights ranging from 54.8 kg to 62.5 kg (average 59 kg). Other information on Hungarian and German deer suggests that pure-bred yearlings are about 40% heavier than yearling reds and that half bred progeny are 15-20% heavier than comparable reds. More information is needed about the growth rate of European hybrids because some will be grown for venison.

The situation with wapiti hybrids is clearer because many people are now using hybrid bulls as terminal sires to generate heavy, fast growing progeny for venison. The use of a 50% wapiti bull as a terminal sire will give ¼ bred progeny that are 15-20% heavier as yearlings than NZ Reds. The specialised use of "pure" wapiti bulls over the bigger NZ reds (> 100 kg liveweight) will give ½ bred progeny about 40% bigger as yearlings than NZ reds. The advantage will be greater in females for venison production.

Quarter bred Pere David deer are now showing performance advantages over NZ reds of about 20% as yearlings which puts them on about a par with ¼ wapiti. The problem with this deer is that it has proved to be very difficult to generate the half bred sires. The Invermay programme with this interesting animal, however, is mainly aimed at using the ¼ bred for studies to establish genetic markers of economic importance to the deer industry in future breeding programmes.

Carcass composition

In the traditional livestock industries it has been shown that breeds which differ greatly in physical appearance do not show much difference when examined in the carcass form. Breeding to change the proportion of primal cuts is a difficult if not impossible task.

Typical bone-in prime cuts as proportion of cold carcass - Yearling Red deer

Shoulder	18.6%	
Saddle	11.6%	51.4%
Hind leg	39.8%	

The value of chilled striploins and denver leg cuts to the export venison trade is at least 75% of the entire carcass. Wapiti hybrid carcasses are not greatly different in cut proportions than red deer but preliminary analysis of ¼ Pere David animals show 9-10% more of the carcass in the

rib/loin part than red deer. On the other hand, and unlike wapiti hybrids, as the Pere David hybrids grew rapidly to heavy weights at 2 years of age they did become over fat.

Market requirements and breeding

Putting aside an under supplied international market there is still a strong demand for 50-65 kg carcasses and this is reflected in the schedule. As an increasing amount of product is shipped as chilled cuts there is going to be a greater year round demand for prime weight carcasses. Breeding some hinds to heavy weight sires will give the industry much more flexibility in providing year round supply of young prime venison. Wapiti hybrids can achieve a marketable weight 6-8 weeks earlier than most red deer. There are niche markets for very large (but still young and low in fat) carcasses and these can be serviced at prices to farmers that are as good as the best for red deer by letting some wapiti hybrids grow out through the summer to more than 85 kg carcass weight. The finisher that is in the market to buy in weaners needs to be very clear about plans for later slaughter and would be wise to be protected through a contract with an exporter.