RED DEER AND WAPITI: DIVERSITY AND HYBRIDIZATION

Peter Fennesy and Peter Dratch
Invermay Agricultural Centre
Mosgiel

Red deer are members of an incredibly diverse group of cervids, ranging in size from the Japanese sika deer to the North American wapiti. The red deer, because it is intermediate in size, can interbreed with other members of the group, and produce fertile hybrids. With a carefully thought out program of breeding and performance recording, a farmer can use these growth genes to produce animals suited to his conditions, and a product that is both lean and biologically clean.

EFFICIENCY

The potential to breed red deer of different sizes is evident from the hind weights of interbreeding animals listed in Table 1. This potential carries with it the temptation to breed deer simply for size — stimulated by the value of velvet in past years. There are several sources of animals with great growth potential: exceptional New Zealand reds, European imports from countries such as Sweden, Germany and Britain, and wapiti from Fiordland and Canada.

Table 1: Female adult weights for members of the red deer group which can be bred with a larger terminal sire.

Deer Type	Adult female weight (kg)
New Zealand sika	75
New Zealand red	100
European red	100-150
Fiordland wapiti	170
Canadian wapiti	240

As the deer industry develops, and particularly as the emphasis shifts from the sale of live animals and velvet to venison, it will be more profitable to focus on efficiency rather than size. There will certainly still be a place for large sires and the females than can produce them. The most efficient system however, will utilize the smallest hinds which can breed with large stags to produce offspring which reach desired weaning and slaughter weights.

There are several benefits to the large male/small female combination, such as the wapiti bull over red hinds. Smaller females are easier to handle, requiring both less equipment and manpower. They require less feed in winter, when pasture can be at a premium. In extreme cases, they can reach reproductive maturity a year earlier. Lastly, the greater the size difference between partners which readily interbreed, the greater the hybrid vigour — that is, the superiority of the progeny over the average of the parents.

There are several possible large stag/small hind systems with the deer stock in the country. The wapiti bull X red hind is the extreme example and a great deal of managerial skill is required to achieve a satisfactory reproductive rate. If wapiti are to be used as the terminal sire, the red hinds will need to be larger than they are now. The hinds which make up breeding herds will be small only in relation to the sires put across them. They still could be large by current New Zealand farm standards, averaging as much as 130 kg. To achieve hinds of this weight (megareds) will require systematic upgrading. Another option is the mating of average New Zealand red hinds (about 100 kg) to wapiti X red hybrid stags. The large male/small female system would just operate at a different level. If hybrids make up a component of his breeding system, the farmer could use such techniques as artificial insemination and blood-typing which are currently being developed.

BLOOD-TYPING

At last year's conference, we reported the use of a haemoglobin difference which enabled the detection of red deer wapiti hybrids. During this year we have found several additional markers in blood (Table 2). This means that instead of merely identifying hybrids, we now have the potential to quantify the degree of hybridization. This again opens up several possibilities — for example a farmer may choose to keep only 1/4 wapiti females, and use blood-typing to aid in their selection.

Table 2: Predominant blood-types for markers used in the laboratory to determine the degree of hybridization in a particular red-wapiti cross.

Blood Protein	Red	Wapiti	Hybrids
Haemoglobin	AA	BB	AB
Superoxide dismutase	SS	FF	SF
Haptoglobin	22	11	12
Transferrin	OK, KK	OO	OK

Previous work has shown that there are also protein differences in some of the European red deer populations which are currently being imported. Whether they are used to verify particular strains or in standard paternity and maternity testing, it is now up to the deerfarmers to decide whether they want blood-typing to be developed as a commercial service.

NZDFA 11th Annual Conf. 1986.

A NEW ANIMAL

Anyone who has watched and listened to wapiti, red deer and hybrids at the rut realizes that there are substantial differences between the three not only in physical characteristics, but in behaviour. The experience at Invermay is that hybrids can sometimes be difficult to handle in the yards. The libido of wapiti bulls seems lower than red deer stags, perhaps the result of smaller harem sizes in their native habitat.

Fast growing hybrids put such milk demands on their mothers, it is quite possible that they get different social cues from their mother than straight red calves. These differences need to be investigated experimentally. When the subtleties of hybrid behaviour are better understood, it could not only identify situations of potential peril for farmers, but ways in which hybrid behaviour might be moulded to help fully domesticate these animals.

The utilization of hybrids has benefits beyond their capacity for rapid growth. With hybrids, we are creating a new animal with no wild population outside of New Zealand. Though these can benefit from deer genes elsewhere, new consumers need not associate them with animals they would prefer to see wild.

Moreover, through hybridization we can create the size of cuts which any market demands. Instead of the age of slaughter being the crucial variable, the genes for growth are identified at birth. With advanced breeding programs, we can provide animals to size. It is for the marketers and the Game Industry Board to inform the farmer what size suits which markets. By wise use of the deer strains available, there is the scope for providing lean animals covering a great range of sizes.