How the best-dressed deer are faring

Wapiti trail slightly in carcase comparison, but all deer breeds a good 10 per cent higher in DP than sheep or cattle

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A COMPARISON of growth rate and carcase composition of Fallow, Reds, NZ Wapiti and some hybrids has shown that NZ Wapiti had a slightly lower dressing percentage (DP) than the other breeds, but that all the deer were at least 10 per cent higher in DP than sheep.

Although young deer (up to 2 yrs) are much leaner than traditional livestock, older animals across breeds are very fat at the end of summer.

The young hybrid Elk/Red deer (rising 1 year) and Fallow deer have a particularly high proportion in the highly priced saddle and hind leg components.

But our research also found that castration decreases growth rate and increases fatness in comparison with entire males.

The background

VENISON, VELVET antler, skins and other minor components are all valuable but in the long term the production of venison is likely to be the main feature of deer farming.

The essential feature of the production of meat is that male deer are very seasonally growing animals which gain weight rapidly in the spring/summer and lose most of their fat during autumn/winter.

While considerable information is now available about Red and Fallow deer carcase production, very little has been written about the Wapiti and hybrids with Red deer.

The North American Elk or Wapiti was introduced into New Zealand early in the 20th century and established in the south west of New Zealand. Being of the same species as Red deer, which had been introduced earlier, the Wapiti interbred with them and today the feral Fiordland herd can best be called New Zealand Wapiti.

The animals are a wide genetic mix of pure Wapiti and Red deer. The Invermay Agriculture Centre acquired a small herd of captured Fiordland New Zealand Wapiti (NZW); these animals have been interbred for a number of years, and a blood test has shown that the Invermay NZW herd has on average 56 per cent of pure Wapiti blood.

Table 1 *Carcase as a proportion of liveweight in stags (%)*

Breed		Animal age (yrs) One	Two	Mature[1]
Fallow	carc. wt (kg)	24.5	30.6	-
	DP[2]	55	55	-
Red deer	carc. wt (kg)	54.9	76.0	112.0
	DP	57.9	56.4	57.1
NZ Wapiti	carc. wt (kg)	-	87.9	115.3
(NZW)	DP	-	52.5	56.4
Hybrid	carc. wt (kg)	-	85.4	115.5
(NZW/Red)	DP	-	56.0	58.0
Hybrid	carc. wt (kg)	67.6	-	-
(Elk/Red)	DP	58.1	-	-

[1]*Red deer = 8 yrs of age. Hybrids & NZW = 4 and 5 yrs of age*
[2]*Dressing percentage*

Bulls from the Invermay herd were mated to Red deer and the progeny evaluated some years ago for growth rate and carcase characteristics (Drew 1986).

More recently Invermay imported some pure bred Canadian Wapiti (Elk), Cervus elaphus manitobensis, and has a research programme which mates bulls to Red deer. The progeny are 50:50 Elk/Red animals.

Carcase sizes

THE DRESSING percentage or hot carcase weight as a percentage of farm liveweight in sheep and cattle ranges from 40 to 50 per cent, whereas Red and Fallow deer have DPs in the 55-57 range (Drew 1985).

Table 1 shows DP at several ages of Fallow, Red, Wapiti and hybrids. The NZW animals have a lower DP than Red deer at 2 years and mature, while the hybrids have very similar percentages to Red deer. The Elk/Red animals had a high DP as rising

Table 2 *Carcase grading for fatness in deer (Gr mm) (summer slaughter)*

Species	Age	(n)	Carcase weight kg	GR (mm)	(SD)
Fallow	16 mo	(9)	33.9	12	(4.0)
Red 15 mo	(28)	56.0	8.6	(2.7)	
	27 mo	(38)	59.5	7.1	(3.5)
	5 yrs	(4)	106.1	29	(0.5)
NZ Wapiti	27 mo	(4)	87.9	6.4	(2.9)
	4 & 5 yrs	(5)	115.3	15.6	(6.4)
Hybrid	27 mo	(4)	85.4	8.5	(1.4)
NZW/Red	4 & 5 yrs	(10)	115.5	22.9	(6.5)
Elk (Canadian)[1]	Mature	(1)	175.2	11	
Hybrid	11 mo	(8)	68.0	4.7	(1.4)

[1]*Winter death*

yearlings and the figures would be expected to increase with age.

For various health and management reasons, the carcase weights for the NZW at 4-5 years of age are about 20 per cent lighter than expectation. Still, all the deer breeds show a significantly higher DP than sheep and cattle.

A GR system, similar to that used in sheep, defines overfatness in deer. The tissue depth is measured over the 12th rib, 16 cm from the mid line. Although venison companies do show some variation, an overfatness penalty payment is incurred in the following way:

Over 50 kg carcase weight, 10 mm GR allowable before penalty; 50-70 kg, 12 mm GR; under 70 kg, 14 mm GR.

GR varies widely at different ages and between breeds (Table 2). The mature Red deer are grossly overfat, showing 29 mm GR for summer slaughter. Since most of the fat is mobilised during the rut, winter slaughter of mature stags never produces any overfat animals.

NZW have much lower GR figures than Red deer of the same age. This is understandable at 2 years of age because the NZW is a later-maturing breed.

At 4 and 5 years of age the NZW had a GR of 15.6 mm compared with 5 year old Red deers' 29 mm. This is probably because the NZW did not achieve their potential weight (and fatness) when aged 4 and 5. The hybrid (NZW/Red) is fatter than NZW and close to the same weight at both 2 and 4-5 yrs of age.

The fact that GR is a 'tissue' and not fat measurement is well illustrated with the winter death of an Elk bull with a GR of 11 mm yet no visible fat. The hybrid (Elk/Red) animals have a very superior carcase at a very young age. The 68 kg carcases at 11 months of age had a GR of just 4.7 mm.

Commercial cuts

THE NZ venison industry has developed a cutting procedure for export product with five major components.

In recent years the hind leg is frequently boned out into boneless vacuum packed 'denver' leg cuts.

Table 3 shows information about the proportions of the carcase in the five primal cuts. Fallow deer show little difference between one and two year old animals. Saddle (high value) proportion is high in Fallow when compared with Red deer. Red deer, however, show a significant increase in the neck component and proportional reduction in ribs during the second year of growth.

Mature Red stags increase greatly in the neck as the rut commences, and this is reflected in a proportional reduction in both hind leg and shoulder.

The mature NZW seems to show minimal increase in neck development as the rut approaches and has a small proportion of the carcase in the saddle.

The hybrid (NZW/Red) has a high yield in saddle and shows clear neck hypertrophy at 4 and 5 years of age. As with the mature Red stag, the hind leg cut in this hybrid is proportionately reduced with increasing age.

The young Elk/Red hybrid has a very high proportion (58 per cent) of the carcase in the high value saddle/leg cuts, and a small fraction (22.3 per cent) in the neck and ribs which must be boned out to give low value meat.

Carcase composition

SEPARATION OF carcases in lean, fat and bone is one way of measuring composition.

Table 4 compares and contrasts several deer breeds with some data from Angus cattle (bulls). It is clear that young deer of all breeds are lean and low in fat compared with cattle.

The ratio of lean/fat is 8-10 in young (up to 2 yrs) Fallow and Red deer, 14-17 in young NZW and hybrids and 3-5 in mature Red, Wapiti and hybrid. The cattle at 2.9 were similar to the mature deer.

Because Fallow deer have a low proportion of bone, their lean/bone ratio of 5.4 is higher than any other group.

The lowest ratio of lean/bone is in the 2 year NZW and mature NZW/Red, but for different reasons. The ▶

Table 3 *Primal commercial cuts from deer breeds*

			Carcase cuts (% carc. wt)				
Species	Age	(n)	Saddle	Hind	Shoulder	Neck	Ribs
Fallow	1 yr	(7)	17.6	39.5	17.7	11.3	13.9
	2 yrs	(7)	17.4	40.5	17.0	12.5	11.6
Red	1 yr	(5)	15.5	39.4	19.0	10.6	15.5
	2 yrs	(53)	14.4	38.2	18.9	16.1	11.4
	9 yrs	(9)	18.6	33.1	16.5	23.7	8.1
NZ Wapiti	2 yrs	(4)	16.6	39.9	19.7	12.5	11.3
(NZW)	4 & 5 yrs	(4)	13.1	39.9	18.8	14.6	13.6
Hybrids	2 yrs	(4)	16.0	39.6	20.3	13.2	10.9
(NZW/Red)	4 & 5 yrs	(4)	17.8	33.5	16.1	18.6	14.0
Hybrid	11 mo	(8)	17.9	40.3	19.5	14.0	8.3
(Elk/Red)							

Table 4 *Carcase composition of deer and cattle carcases*

Species	Age	Weight	Lean	Fat	Bone	Lean/Fat	Lean/bone
	kg	% Carcase	weight				
Fallow[1]	13-25 mo	24-40	73.9	9.1	13.6	8.1	5.4
Red	26 mo	62.6	72.7	7.0	20.3	10.4	3.6
	9 & 10 mo	129.5	70.9	14.2	14.9	5.0	4.8
NZ Wapiti	26 mo	83.0	72.7	4.2	23.5	17.3	3.1
(NZW)	4 & 5 yrs	115.3	66.8	14.7	18.5	4.5	3.6
Hybrid	26 mo	78.0	73.8	5.4	22.0	13.7	3.3
(NZW/Red)	4 & 5 yrs	115.5	60.9	19.7	19.4	3.1	3.1
Hybrid	11 mo	67.6	76.0	4.7	19.3	16.2	3.9
(Elk/Red)							
Angus cattle[2]	2 yrs	250.0	62.0	21.5	14.0	2.9	4.4
(bull)							

[1]*Gregson & Purchas 1985*
[2]*Maiga 1974*

young NZW is low in fat (therefore high in lean) yet has a high proportion of bone. The NZW/Red mature hybrid is very high in fat (therefore low in lean) yet has a smaller proportion of bone.

Data from the yearling Elk/Red confirms the early stage of maturity at slaughter and the consequent 3.9 lean/bone ratio. The cattle show a high lean/bone ratio because of the relatively small amount of bone.

Castration effects

CASTRATION IN male animals has been widely shown to reduce growth rate and increase fatness (Rhodes 1969).

Table 5 shows the effects of castration in Fallow and Red deer at one and two years of age. At one year of age the penalty in growth rate is small (5-7 per cent).

Castrates were considerably fatter than entire stags and, with correction to equal carcase weight, the yearling Fallow bucks were 10 per cent and the Red deer 21 per cent fatter than the entires.

Castrate Fallow deer gained a small amount of weight during their second year and this appears to be reflected in carcase fatness, which fell to 3.7 per cent.

In Red deer there is a 17 per cent reduction in weight and 16 per cent increase in fatness as a penalty for castration (Drew et al. 1978).

In the management of deer for venison production, there seems to be no case for castration; this will decrease growth rate and increase fatness. □

Table 5 *Effects of castration on carcase weight and chemical composition*

		Species & age			
		Fallow (n)		Red[1] (n)	
		1 year(8)	2 year(7)	16 mo(10)	27 mo(5)
Entires	(Carc. wt (kg)	24.5	30.3	43.8	67.6
	(% protein	21.6	21.0	20.9	20.2
	(% fat	5.6	6.0	6.9	12.5
Castrates	(Carc. wt (kg)	23.3	26.5	40.6	55.8
	(% protein	22.1	21.0	21.0	20.6
	(% fat	6.2	3.7	8.4	11.5

[1]*Drew et al. 1978*

Note: This is an edited version of a paper prepared by Ken Drew and Barry Hogg