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A comparison of the composition and carcass quality of Kelly and Russian castrate, ram, wether and ewe lambs

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ABSTRACT

The carcass weight, composition and meat quality of entire rams, Kelly and Russian castrates, wethers and ewes under 6 months old were compared. Wether lamb carcasses averaged 0.6 kg heavier than those of the ewes and the Russian (0.4 kg), Kelly (0.6 kg) and ram (0.8 kg) carcasses were heavier than those of the wethers slaughtered at the same mean age. The rams and partial castrates were less fat than the wethers (2.4 to 3.3%) which in turn were 2.7% less fat than the ewes. There were no practical differences in percentage carcass cuts between the rams, partial castrates or castrates. A consumer taste panel in which 48 participating families cooked and tasted a ram and wether leg roast detected no difference between the two types of meat.

INTRODUCTION

Ram lambs give better feed conversion, faster growth and leaner carcasses than wether or ewe lambs (Field, 1971). The animal slaughter and meat processing industry is still concerned that ram lamb carcasses have excessive forequarters and the meat carries a sex taint in comparison with wethers. A major threat discouraging ram lamb production is concern that additional killing charges are required from such animals or that they may be downgraded to the ram grade which receives only token payment (Rennie, 1980). Many farmers prefer to castrate ram lambs to prevent unwanted matings.

Carcass data from entire rams, Russian and Kelly partial castrates, wethers and ewes from the experiment described by Clarke (1965) provide information on some of these problems.

MATERIALS AND METHODS

The design of the experiment and methods of castration were described by Clarke (1965). The Russian method of partial castration involves the removal of the sperm-producing tissue and is intended to retain the androgen-producing tissue (Baiburtcjan, 1963). In the Kelly method of partial castration, the epididymal tail is removed leaving the testes intact but eliminating sperm transport. Lambs in the trial were slaughtered in representative samples from the 'sex' groups taken at either 15 or 23 weeks of age. Carcass composition, cut-out (Kirton *et al.*, 1967) and palatability (Kirton, 1968) were determined by standard methods.

RESULTS AND DISCUSSION

Means for the lambs in the different sex and castration groups are given in Table 1. At the same

age, the wether carcasses were 0.59 kg (4%) heavier than the ewe carcasses and in turn the Russian (0.44 kg), the Kelly (0.63 kg) and the ram (0.81 kg) carcasses were heavier than the wethers.

When compared at the same carcass weight, the wether carcasses had less fat (2.7%) and more protein and water indicative of a higher muscle content than the ewes. In turn, the partial castrates and the ram lamb carcasses had 2.4 to 3.3% less fat than the wethers and a higher protein and water content. Noting that measurement J is similar in location and magnitude to GR used in export grading of lamb carcasses (Kirton and Johnson, 1979), the means in Table 1 show that the rams and partial castrates had an advantage over the wethers in J which in turn had a J 2 mm lower than the ewes. Male and castrate carcasses were therefore less likely to grade overfat (F-grade) for export. Similar rankings, but smaller differences, were found between sex groups in C, another fat thickness measurement considered for carcass grading in some countries.

Although some of the differences between sex groups in carcass cut-out were highly significant, the means show that the actual differences in the proportions of the various cuts are small, being in all cases less than 1% between extremes. The largest difference in the totals for the primal cuts (leg, loin, ribs and shoulder) was 0.35% in favour of the ewe. While the ram and wether carcasses did not differ in shoulder, the rams had slightly more neck (ns), a higher proportion of breast and shank and a higher proportion of leg (ns) than the wether carcasses. Differences of this size could never justify downgrading ram lamb carcasses to the ram grade which carries less than 10% of the financial return to the farmer of the lamb grades.

TABLE 1 Least squares means for carcass weight and carcass composition for ewe, ram, and male castrate lambs.

Character	Ewe	Castrates			Entire ram	Sig. sex diff.	SE diff.
		Wether	Russian	Kelly			
No. carcasses	78	53	52	52	52		
Hot carcass ¹ (kg)	14.57	15.16	15.60	15.79	15.97	**	0.392
% fat (HC) ²	31.5	28.8	26.4	25.5	25.6	***	0.70
% water (HC)	51.5	53.5	55.3	55.8	55.9	***	0.57
% protein (HC)	13.7	14.3	14.7	15.1	14.9	***	0.17
Metacarpal dry (g)	22.3	24.2	24.0	24.7	24.9	***	0.50
Measurement J (mm)	12.0	10.1	9.1	8.4	8.5	***	0.47
Measurement C (mm)	3.84	3.63	3.39	3.02	3.36	**	0.239
Carcass cut-out							
% neck	4.33	4.56	4.71	4.81	4.68	**	0.146
% shoulder	21.42	21.99	22.04	22.14	22.02	ns	0.311
% breast and shank	8.39	8.67	9.16	8.84	9.15	***	0.205
% ribs	12.17	11.72	11.80	11.78	11.53	+	0.228
% flap	6.19	6.09	6.05	6.01	6.15	ns	0.167
% leg	31.96	31.92	32.04	32.03	32.29	ns	0.264
% loin	12.05	11.79	11.37	11.60	11.50	*	0.224
% kidney	0.67	0.68	0.74	0.71	0.74	***	0.016
% perirenal fat	2.54	2.18	1.79	1.78	1.71	***	0.117

¹ Covaried for differences in birth date. The carcass includes the kidney and perirenal fat.

² This and remaining data covaried for differences in hot carcass (HC) weight.

Model: Birth/rearing rank, grazing group, slaughter group.

Taste panel comparisons of roast ram or wether lamb legs (Table 2) showed no palatability differences, once again emphasising the acceptability of ram lamb meat in comparison with wether meat for which flavour problems have never been suggested. Thus the palatability data provide no grounds for downgrading ram lamb carcasses to the ram grade. Some experiments have however suggested that older rams, especially around the yearling stage, may be slightly tougher than wethers (Field, 1971).

TABLE 2 Mean family taste panel scores between 48 roast legs each of entire rams and wethers on hedonic scale¹

	Wethers	Entire rams	SE diff.	Sig.
Overall preference	7.75	7.57	0.14	ns
Tenderness	7.74	7.70	0.12	ns
Flavour	7.48	7.48	0.17	ns
Juiciness	6.95	6.71	0.18	ns

¹ 9-point scale where the higher the score the better the meat is liked.

Thus the main reasons for castrating ram lambs intended for meat production would appear to be:

1. To avoid unwanted matings.
2. To avoid having store lambs for sale in stockyards or carried over to the yearling stage when they are classified as lower valued ram meat.
3. To avoid possible increases in killing charge which may be applied to individual farmer's ram lambs by some works.

The Kelly and Russian methods of castration offer little advantage because the work at docking is not saved (Clarke, 1965). Indirect evidence also suggests the Russian method to be unreliable for preventing unwanted matings (Clarke, 1965) and it is not known whether lambs castrated by this method would be classified as ram or wether lambs at an export works. The Kelly method is likely to still incur the ram lamb killing charge but should reliably remove the problem of unwanted matings (Clarke, 1965).

The main problem discouraging ram lamb production would be overcome if the freezing companies would remove the additional killing charge for ram lambs from the industrial slaughter awards. There is little justification for the 80 to 90 c/ram lamb paid to slaughtermen (but not necessarily charged to individual farmers—Rennie, 1980), and if charged this removes most of the incentive for farmers to produce ram lambs. Automatic depelting, if implemented, will largely remove any justification for the increased killing charge.

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