Lamb live weights at slaughter and carcass grades

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ABSTRACT

Live weights, carcass weights and GR measurements from 566 Coopworth lambs were used to retrospectively establish criteria that would have directed carcass production away from discounted grades into those receiving premium payments.

Greatest financial returns would have been achieved by slaughtering lambs when they approached fatness limits, before penalties applied. When live weights were the only means of selection, returns were greater at weights that resulted in production of some carcasses penalised for fatness and/or heavy weights than at weights that avoided discounted grades.

Keywords Lambs; live weight; carcass weight; leanness; carcass values

INTRODUCTION

Lamb carcasses are primarily graded on weight and leanness, using standards established by the New Zealand Meat Producers Board (Kirton, 1983). Prices differ between grades depending on market demands and processing costs. In the current season, premiums are being paid for carcasses in the 'Medium' weight range (13 to 16 kg) and penalties are applied to those with excessive fat (> 15 mm GR).

Where the price differential between carcass grades is substantial it is important that carcass fatness and weight can be predicted in the live animal so that production can be directed away from penalised grades to the premium ones. This paper investigates the use of live-weight measurements and leanness criteria for that purpose.

MATERIALS AND METHODS

Two experiments with weaned Coopworth lambs grazed on irrigated grass-clover pastures have been examined. There were 211 ewe lambs, 72 wether lambs and 72 ram lambs in Experiment 1, and 104 wether lambs and 104 ram lambs in Experiment 2. Half of each sex group were fed on a high plane of nutrition and achieved an average live-weight rate of gain of 157 g/head/d in Experiment 1 and 154 g/head/d in Experiment 2. The remaining lambs were fed on a low plane of nutrition (a lower allowance of the same pasture offered to the high plane groups) and grew at 77 and 84 g/head/d in Experiments 1 and 2 respectively. Experiment 1 lasted 14 weeks and Experiment 2 6 weeks. All lambs in both experiments were slaughtered in late March 1983 at a mean age of 24 weeks.

Live weights were recorded 1 hour after removal from pasture. Slaughter took place at a commercial meat works 24 hours later. GR measurements (tissue depth 11 cm from centre of backbone along 12th rib) and carcass weights were recorded on hot carcasses. Cold carcass weights were calculated by subtracting 4.5% from the weight of the hot carcass. Carcasses were graded according to the New Zealand Meat Producers Board standards operating during the 1983-84 lamb production season (Kirton, 1983).

Wool pull at slaughter was assessed 1.6 kg/head for high plane groups in Experiment 1 and 1.5 kg/head for all other groups in Experiments 1 and 2. Carcass values do not include wool and pelt payments and so represent bare meat values only.

Relationships between live weight and the weight, fatness, grading and value of carcasses have been examined. Live weight and leanness criteria that could be used to select lambs for slaughter have been compared by calculating the average values of carcasses that would have been produced had the criteria applied to the experimental animals.

RESULTS AND DISCUSSIONS

At the same live weight, ewe lambs in Experiment 1 had heavier and fatter carcasses than rams ($P < 0.01$) with wethers intermediate. As a consequence, ewe lambs entered heavier and fatter carcass grades at lightest weights.

Carcasses in the 2 fattest grades (T and F) were produced in Experiment 1 by ewe lambs over 30 kg, wethers over 35 kg and rams over 38 kg (Fig. 1). In Experiment 2 the corresponding live weight for wethers was 35 kg and rams 40 kg.

The proportion of carcasses falling into the premium priced grades of the 'Medium' weight range was greatest for ewe and wether lambs of 35 kg and rams of 37 kg in Experiment 1 (Fig. 2) and for 36 kg wethers and 37 kg rams in Experiment 2. At these

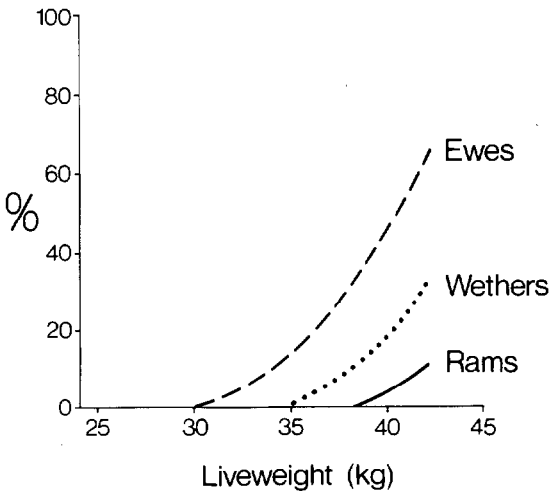

FIG. 1 Influence of preslaughter live weight on the percentage of carcasses entering T and F grades, Experiment 1.

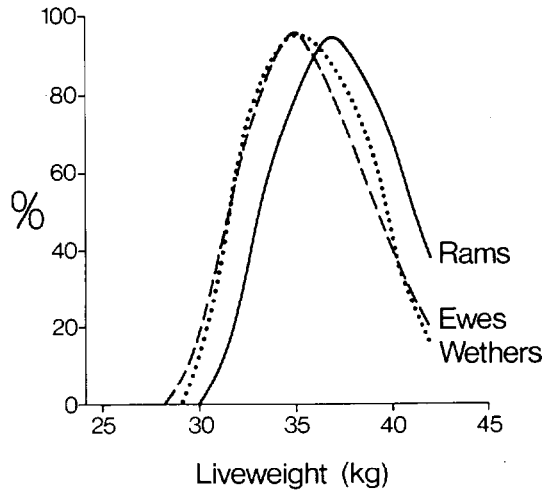

FIG. 2 Influence of preslaughter live weight on the percentage of carcasses entering the Medium carcass weight range (13 to 16 kg), Experiment 1.

weights less than 5% of carcasses entered the 'Light' weight range.

If it is assumed that the relationship established between live weight and carcass grading following slaughter at one point in time indicates the path along which the individuals developed, then it is possible to establish live-weight criteria that would have directed carcass production away from penalised grades into premium priced ones. The effects of application of selected criteria on the average value of carcasses produced is illustrated in Fig. 3, for the ewe lambs in Experiment 1 using meat prices in the export lamb schedule of December 9, 1983.

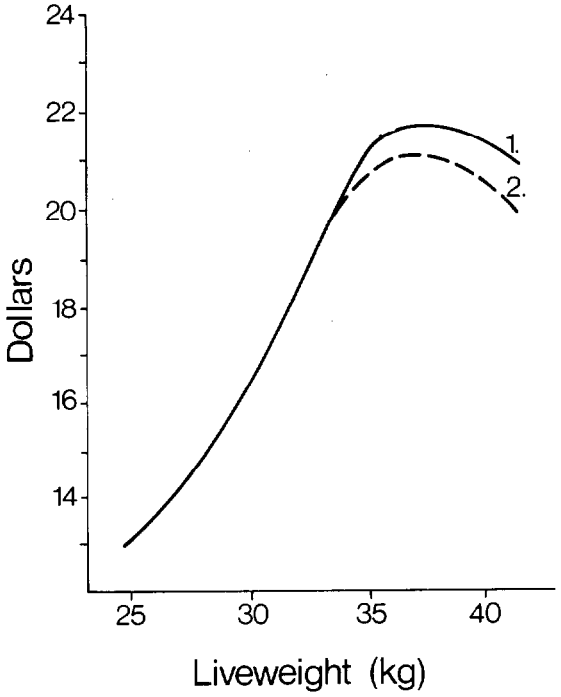

FIG. 3 Influence of preslaughter live weight on bare meat carcass values for ewe lambs in Experiment 1.
1. values calculated using price schedule of December 9, 1983.
2. as for 1., except T grade carcasses penalised 20 cents/kg.

If only ewe lambs at 30 kg had been slaughtered, so as to avoid T and F carcass grades, the average carcass value would have been $16.30 (Fig. 3). Slaughter at 35 kg to maximise the proportion of carcasses entering the 'Medium' weight range, while limiting the proportion in the 'Light' weight range to less than 5%, would have given an average value of $20.90. By slaughtering at 37 kg returns would have been still higher at $21.80, even though approximately 20% of carcasses were graded TM and TH, 5% FH and 5% PX. Up to that point the gains made from increased weight on the majority of carcasses exceeded the discounts on the smaller proportion of carcasses with excess fat and/or classed in the 'Heavy' weight range. Even when the T grade carcasses were penalised 20c/kg carcass weight, as expected in the 1984-85 lamb production season, maximum returns were still achieved at 37 kg (Fig. 3). Thus, if live-weight criteria had been the only criteria used to select lambs for slaughter, returns would have been greater at weights which resulted in some carcasses being discounted for fatness and for being in the 'Heavy' weight range than at weights which avoided them.

Application of fatness criteria indicated that best returns would have been achieved by slaughtering lambs as they approached grades penalised for excess

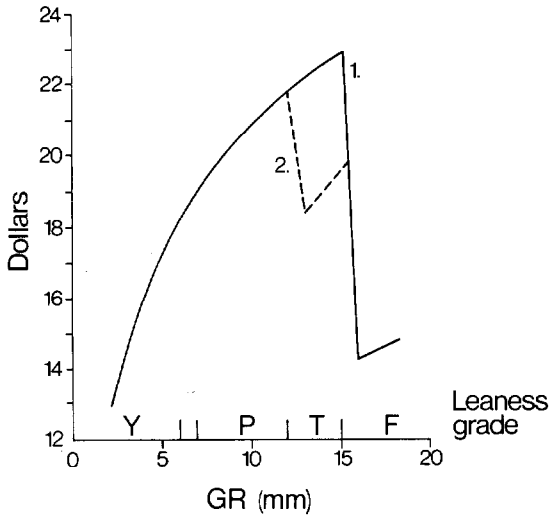

FIG. 4 Influence of GR measurements on bare meat carcass values for ewe lambs in Experiment 1.
1. values calculated using price schedule of December 9, 1983.
2. as for 1., except T grade carcasses penalised 20 cents/kg.

fat. With the current schedule structure, lambs slaughtered just before they entered F grades would have averaged $22.40 per carcass (Fig. 4), $0.60 in excess of the maximum achieved using live-weight criteria. For this approach to be successful a reliable and accurate method of identifying fatness limits is required. Live weight was not highly correlated with GR measurement ($r = 0 - 0.35$ for individual mobs and sexes) so live-weight criteria were not suitable for identifying fatness limits. However they can be used to direct carcass production into a particular weight range (Fig. 2).

In conclusion, it should be noted that the live-weight guidelines established for the animals in the present experiments do not necessarily apply to other genotypes and in other environments. The main factors that influence relationships between live weight and grading criteria have to be identified and quantified before it will be possible to establish similar criteria for individual farm flocks, each with its own particular mix of genetic and environment influences.

ACKNOWLEDGEMENTS

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