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Dressing percentages of lambs

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ABSTRACT

Dressing percentage (DO%), the dressed carcass expressed as a proportion of live weight, is markedly influenced by the particular definition used. Farmers usually want to estimate cold (works) carcass weights (CCW) from live weights taken on lambs recently removed from pasture (FLW). Gut fill plays a major role in DO%. As lambs empty out after removal from pasture, DO% increases until this effect is offset by loss of carcass and organ weights from increasing periods of starvation.

Data on 2207 weaned and shorn lambs ranging from 10 to 46 kg FLW and slaughtered over 3 seasons could be described by the regression: $CCW \text{ (kg)} = 0.473 \text{ FLW (kg)} - 1.92$, $RSD = 0.67 \text{ kg}$, $r = 0.95$.

DO% calculated from this regression for lambs slaughtered close to the New Zealand mean CCW of 13 kg averaged 41% and increased as FLW increased. Shorn lambs of similar weight sired by longwool breeds had lower DO% than lambs sired by Down breeds. Lamb DO% dropped following weaning. Lambs with carcasses in the leaner A and Y grades dressed lower than lambs in the fatter pre 1983-84 P grade when compared at the same live weight, illustrating that DO% increases as lambs get fatter.

Keywords Dressing percentage; definition; weight effect; sire breed; weaning; fatness; sex

INTRODUCTION

As more farmers acquire sheep scales, the ability to predict the carcass weight of lambs from their measured live weight will become an increasingly important management skill. Carcass weight and fatness are the main factors which influence the financial return of lambs slaughtered for meat; both may be approximately predicted from live weight. This report documents the magnitude of some of the factors (e.g., Harris, 1983; Wood *et al.*, 1983) which influence lamb dressing percentage (DO%) defined as $(\text{carcass weight} \times 100) / \text{live weight}$.

MATERIALS AND METHODS

Animals

Live weights off pasture (full; FLW) and after overnight fasting (empty; ELW), hot carcass weight (HCW; kidneys and kidney fat out) and works-estimated cold carcass weight ($HCW - 4\frac{1}{2}\% = CCW$) were available on a total of 2207 shorn weaned lambs (565 in 1970-71, 842 in 1971-72 and 800 in the 1972-73 seasons) from the Ruakura progeny trial (Carter *et al.*, 1974). They averaged 27.7 kg FLW (range 10.0 to 46.3 kg). Rams of the Romney, Southdown, Poll Dorset, English Leicester, Ryeland, Merino, Dorset Horn, Suffolk and Hampshire breeds were mated to Romney ewes in single sire mating groups to provide lambs on which birth rank, sex, periodic live weights, export grade and carcass composition were recorded. Data from animals in other trials (Kirton *et al.*, 1965,

1968, 1971, 1978) are also used to illustrate the effect of various factors on DO%.

Biometrical Analysis

Regressions of carcass weight on live weight were fitted with different fixed effects being progressively added. Slope of the relationship was not significantly affected by sex or birth rank.

RESULTS AND DISCUSSION

Definition of DO%

DO% is dependent on definition as well as many other factors. Based on the mean DO% of 2207 lambs weighed over 3 years the following estimates were obtained:

- (1) $HCW \times 100 / FLW = 42.2$
- (2) $CCW \times 100 / FLW = 40.3$
- (3) $HCW \times 100 / ELW = 45.4$
- (4) $CCW \times 100 / ELW = 43.3$

This illustrates the importance of clearly defining DO%. Because most farmers wish to predict works carcass weight (CCW), the main basis for payment, from lambs weighed after only a short period off pasture (FLW), definition (2) is preferred in this presentation. This definition gives the lowest estimate.

Effect of Live weight, Sex and Birth Rank

Lamb DO% increases with increasing live weight. For

the 2207 lambs, the following overall regression was computed ignoring breeds and years:

CCW (kg) = 0.473 (± 0.0032) FLW (kg) - 1.92,
RSD = 0.67 kg, $r = 0.95$

For single wether lambs the appropriate regression was:

CCW (kg) = 0.470 (± 0.0032) FLW - 1.82

Fixed effect

correction: Ewes + 0.12 ± 0.029 ($P < 0.001$)

Twins - 0.21 ± 0.031 ($P < 0.001$)

There was no evidence of any sex \times twin interaction effect.

The equation predicts that the DO% of a single wether lamb increases by 3 units as live weight increases from 20 to 30 kg, by 1.5 units going from 30 to 40 kg and by 1 unit as live weight increases from 40 to 50 kg. Weight is associated with greatest changes in DO% at low live weights. Lambs with a FLW of 32 kg were predicted to have a CCW of 13.2 kg—close to the New Zealand average in recent years—and a DO% of 41. The sex and birth rank differences recorded for carcass weights at the same live weight are smaller than some previously published figures of 0.41 and 0.27 kg respectively (Kirton *et al.*, 1965).

Breed

The slope of the pooled (within birth rank and breed) regression predicting carcass weight from live weight was 0.464 and the breed intercepts (difference; $P < 0.001$) were: -1.44 (flock Southdown), -1.47 (stud Southdown), -1.55 (Poll Dorset/Dorset Horn), -1.73 (Hampshire), -1.84 (Reyland), -1.88 (Suffolk), -1.99 (Border Leicester), -2.02 (Romney), -2.05 (Lincoln), -2.09 (English Leicester), -2.15 (Merino); RSD = 0.604. Thus from this regression Merino cross lambs are predicted to have carcasses weighing 0.7 kg less than flock Southdown cross lambs of the same live weight.

Wool Weights

Lamb wool weights at around 100 days of age in the present trial (Carter *et al.*, 1974) ranged from means of 0.8 kg for various Down cross lambs to 1.1 kg for Romney and English Leicester cross lambs and 1.2 kg for Lincoln cross lambs. If these lambs had been slaughtered woolly instead of shorn, the DO% would have been reduced by just over 1 unit with the reduction being greater for longwool crossbreds than Down cross lambs.

Fat Cover

After adjusting for breed and sex differences, the effects on carcass weight of pre 1983-84 P, Y and A export carcass grade lambs of the same live-weight were:

$P - Y = 0.59 \pm 0.030$ kg ($P < 0.001$).

$P - A = 0.94 \pm 0.057$ kg ($P < 0.001$)

Thus lean A grade lambs have lighter carcasses than Y grade lambs which in turn are lighter than the fatter P grade lambs of the same live-weight. These results illustrate that fatter lambs have higher DO% (also see Harris, 1983)

Gut Fill

Short-term live-weight fluctuations mainly reflect changes in gut fill. Live-weight fluctuations of up to 2 kg have been observed within a week (Kirton *et al.*, 1968). Such changes will influence DO% and are affected by different feeding conditions. Similar weights of stomach contents have been observed in very "full" lambs after 24 hours starvation (Kirton *et al.*, 1968) as were found in other groups of lambs (Kirton *et al.*, 1971) slaughtered only 3 to 4 hours off pasture.

The lambs in the present trial lost 1.96 kg live weight (range = 0 to 5.0 kg) between being weighed off pasture and again just before slaughter after an overnight fast. As carcass weight losses during the first 24 hours of fasting are low (Kirton *et al.*, 1968, 1971), the mainly gut fill loss of live weight over this period would be responsible for the 3 units rise in DO% between definitions (2) and (4) or (1) and (3) noted earlier.

Milk Weaned Lambs

Lamb DO% drops following weaning. Applying definition (2) the DO% of 11-week-old, 13.3 kg CCW milk lambs was 49.6%, of 13-week-old, 13.9 kg CCW milk lambs was 49.3%, and of weaned 14.1 kg CCW lambs of the same breed from the same farm slaughtered the following March was 45.4% (data from Kirton *et al.*, 1971). This 4 units lower DO% of the weaned lambs was not explained by an increased proportion of stomach contents.

In another experiment (Kirton *et al.*, 1978) where the data were in a form which permitted calculation of DO% (definition (4)), 12-week milk lambs dressed out at 47.4% whereas similar groups of lambs from the same mob weaned at the same age and slaughtered 3 weeks later dressed out at 44.6% and 45.5% respectively (2 to 3% lower) for moderately well fed and very well fed groups respectively.

These results indicate DO% drops 2 to 4 units following weaning.

CONCLUSIONS

The effects of some factors influencing lamb DO% have been shown. Because of these, the precise relationships between live weight and carcass weight need to be determined for individual farm circumstances before live weights can confidently be used for predicting carcass weights other than as a guide for ranking animals which have been managed similarly.

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