

CARCASS COMPOSITION AND MEAT QUALITY ATTRIBUTES IN YOUNG SHEEP FED PROTEIN SUPPLEMENTS

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Consumer preference for larger and leaner meat cuts has increased producer interest in feeding strategies for high quality lamb production (Thatcher 1993). The present practice of feeding high energy grain diets prior to slaughter increases carcass fatness (Datta et al. 1992). This study examined the potential for manipulating carcass weight, composition and meat quality characteristics using a range of protein supplements.

Four month old, Dorset Horn x Merino wether lambs (n = 43) were blocked by liveweight (22-28 kg) and within blocks allocated at random to one of five treatment groups. All lambs were offered oaten chaff ad libitum plus 15% lucerne, fed alone (BAS) or supplemented with either barley grain fortified (7.2% w/w) with urea and sodium sulphate (5:1; USB, 1.8 kg/wk), lupins (LUP, 1.8 kg/wk), cottonseed meal (CSM, 1.2 kg/wk) or fish meal (FM, 0.75 kg/wk). Supplements were offered twice weekly in approximately isonitrogenous amounts (11 g N/day) and all were consumed. Lambs were slaughtered after 10 weeks and the carcasses analysed for water, fat and protein content. Samples of the M. longissimus dorsi (LD) were obtained from between the 12th and 13th rib and assessed for meat colour (lightness; L*-value), eye muscle area (EMA), tenderness (Warner-Bratzler method, WB) and intramuscular fat (IMF).

| | BAS | USB | LUP | CSM | FM | SEM | Prob |
|------------------------|-------------------|--------------------|--------------------|--------------------|--------------------|------|------|
| n | 10 | 8 | 8 | 8 | 9 | - | - |
| Carcass weight (kg) | 13.1 ^a | 13.4 ^{ab} | 14.5 ^c | 13.8 ^{bc} | 13.8 ^{bc} | 0.25 | * |
| Meat colour (L*-value) | 32.0 | 33.2 | 32.8 | 33.8 | 33.5 | 0.51 | NS |
| WB shear force (kg) | 4.7 | 3.8 | 3.5 | 4.6 | 4.1 | 0.29 | NS |
| IMF (%) | 2.58 | 2.16 | 2.31 | 2.88 | 1.82 | 0.33 | NS |
| Protein (%) | 16.5 | 17.5 | 17.6 | 17.3 | 17.9 | 0.32 | NS |
| Fat (%) | 26.5 ^a | 20.9 ^{bc} | 21.7 ^{bc} | 22.3 ^b | 18.8 ^c | 1.2 | * |
| Water (%) | 54.1 ^a | 58.8 ^{bc} | 57.9 ^{bc} | 57.6 ^b | 60.2 ^c | 0.87 | ** |

Different letters indicate statistical significance, NS not significant, *P<0.05, **P<0.01

Increasing the protein:energy ratio of the diet of lambs through protein supplementation significantly increased the carcass weight from lambs fed the control diet. When compared at the same empty body weight, supplemented lambs had lower carcass fat content (P<0.05) and higher water (P<0.01) and protein content (P<0.09) than the lambs fed the basal diet alone. The increase in muscle content and reduction in fat content with supplementation did not adversely affect meat colour, tenderness or IMF. These results suggest that protein supplements can be used to manipulate carcass composition to produce leaner carcasses of high eating quality.

DATTA, F.U., GRAHAM, R.W. and SOEHARTONO, R.H. (1992). Proc. Aust. Soc. Anim. Prod. 19: 170.

THATCHER, L.P. (1993). Proc. Lamb Marketing Seminar: July 1993.