# PRODUCTION RESPONSES AND QUALITY OF MEAT OF SHEEP FED LUPINS OR FISH MEAL WITH OR WITHOUT THE ADDITION OF BARLEY GRAIN

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Health conscious consumers are establishing a year round demand for large, lean lambs (McLaughlin 1992). A high market value for carcass weights of 22 kg and above with carcass fatness 6-15 mm changes production targets and strategic research objectives. Although expensive, protein supplements fed over a nine week period prior to slaughter may provide a means for altering the relative rates of lean to fat deposition in lambs (Ponnampalam and Hosking 1994). We therefore investigated an effect of lupins (LUP) or fish meal (FM) supplements on finishing live weight (LW), carcass weight (HCW), carcass fatness (GR) at target LW and quality of meat with or without barley (BAR) as a supplement, as a basis for evaluation of efficiency of energy utilisation, and of economic benefits of production.

Crossbred cryptorchid lambs (n=38) approximately nine months age (LW range 35-50 kg) were allocated to six treatment groups by stratified randomisation and fed according to a 2x3 factorial design. A basal diet consisting of oaten hay: lucerne hay 4:1 (w/w) was offered ad libitum alone (BAS), or supplemented with either LUP (400 g/d), FM (184 g/d), BAR (400 g/d), BAR+LUP (BL, 200+200 g/d) or BAR+FM (BFM, 200+92 g/d) throughout an eight week period. Supplements (S) were offered at two day intervals. At the end of the feeding period lambs were slaughtered after an overnight fast and weights of carcass and non-carcass components recorded. At 24 hr post-mortem samples of M. longissimus dorsi (LD) were taken from chilled carcasses over the 12th rib and meat colour (L*-value), tenderness (WB shear force), eye muscle area (EMA) and muscle fat % were assessed.

| | BAS | LUP | FM | BAR | BL | BFM | SEM |
|---|---|---|---|---|---|---|---|
| n | 6 | 6 | 8 | 6 | 6 | 6 | - |
| Final LW (kg) | 49.8 a | 53.9 b | 54.3 b | 49.4 a | 53.1 b | 53.9 b | 0.91 |
| HCW (kg) | 20.9 a | 25.8 c | 23.5 b | 21.2 a | 24.9 bc | 23.6 b | 0.63 |
| GR (mm) | 10.3 ab | 15.7 b | 10.0 a | 10.4 ab | 13.6 b | 10.2 a | 1.13 |
| Meat colour (L*-value) | 30.9 | 30.4 | 32.8 | 31.9 | 32.4 | 31.0 | 0.68 |
| WB shear force (kg) | 3.9 | 5.7 | 3.9 | 4.8 | 4.6 | 4.1 | 0.53 |
| EMA (cm2) | 13.7 | 14.9 | 13.6 | 13.2 | 15.0 | 14.9 | 0.71 |
| S cost/kg HCW gain ($) | 0 | 1.15 | 3.20 | 9.30 | 0.98 | 1.95 | - |

Within rows, means with different superscripts are significantly different (P<0.05)

Lambs fed the LUP and FM with and without BAR supplement had heavier slaughter weights (P<0.01) and HCW (P<0.01) than sheep fed the BAS or BAR diet when initial LW was used as a covariate. LUP supplementation resulted in carcasses significantly (P<0.01) heavier than those from FM and BFM animals. With GR as an indicator, FM and BFM fed lambs produced leaner (P<0.01) carcasses than LUP and BL supplemented lambs. Although the LUP, FM, BL and BFM fed lambs had larger carcasses with different fatness, all were within the range of Meat Research Corporation's Elite specifications (carcass >22 kg, GR 6-15 mm) for larger and leaner carcasses. There were no differences between treatments in meat colour, tenderness, EMA and muscle fat content. From these results it is concluded that large, lean lambs with high market value can be produced with BL or BFM at lower supplementary feeding cost per unit carcass gain than using LUP or FM alone respectively while maintaining meat quality.

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PONNAMPALAM, E.N. and HOSKING, B.J. (1994). Proc. Nutr. Soc. Aust. 18:173.

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