

EFFECT OF DIET ON CARCASS COMPOSITION AND MEAT QUALITY OF LOT FED LAMBS

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Lotfeeding, using a range of grain based diets, provides the means for producers to finish lambs to market specifications. The effect of different grain based diets on carcass and meat quality attributes were investigated in this trial.

Sixty 7-month-old second cross ewe lambs (27-41 kg) were randomly allocated to 1 of 5 diet groups (Table 1). All diets were supplemented with a vitamin-mineral premix. All lambs were individually penned in an animal house and fed *ad libitum* after 21 days acclimatisation. Each animal was slaughtered at 45 kg, or after they had been in the pens for 110 days. Fasted liveweight (FLW), hot carcass weight (HCW), tissue depth over the 12th rib 110 mm from the midline (GR) were measured. The *M. longissimus dorsi* (LD) was dissected from the right side of each carcass 48 hours after slaughter. Meat colour and muscle pH were determined on the LD and a sample frozen for tenderness measurement (Bouton *et al.* 1971).

Table 1. Percentage of components, metabolisable energy (ME) and crude protein (CP) in diets

Diet	Pasture hay	Lupins	Oats	Wheat	ME (MJ/kg)	CP (%)
1	70	30	-	-	9	16
2	30	34	-	36	11	16
3	30	-	-	70	11	12
4	30	16	54	-	10	12
5	30	5	65	-	10	10

Table 2. Effect of diet on fasted liveweight (FLW), hot carcass weight (HCW), fat depth (GR) and tenderness, meat colour and pH of the *M. longissimus dorsi*

	1	2	3	4	5	LSD
FLW (kg)	36.3 ^{aA}	40.9 ^b	40.5 ^b	41.3 ^b	39.0 ^c	0.95
HCW (kg)	18.5 ^a	21.7 ^b	21.3 ^{bc}	20.8 ^c	19.4 ^d	0.56
GR (mm)	11.7 ^a	18.0 ^b	17.3 ^b	15.8 ^c	15.0 ^c	1.55
Warner-Bratzler shear force (kg)	2.6	2.7	2.7	2.6	2.5	0.28
Meat colour ^B Lightness	33.4 ^a	35.1 ^{bc}	34.9 ^{bc}	34.7 ^c	35.0 ^{bc}	0.65
Saturation	16.7 ^a	16.8 ^a	17.2 ^{ab}	17.1 ^{ab}	17.5 ^b	0.49
Muscle pH	5.5	5.5	5.5	5.5	5.5	0.02

^A Within rows values followed by different letters are significantly different at $P < 0.05$.

^B Higher values associated with brighter meat.

Lambs fed diet 1 were significantly leaner ($P < 0.05$) than other diets, but they did not reach 45 kg liveweight within 110 days (Table 2). Lambs on the high energy, high protein diets (2 and 3), with an average GR of 17.6mm, were significantly fatter ($P < 0.05$) than lambs on all other diets.

Diet had no significant effect on muscle pH or shear value of the LD. Tenderness and pH were within acceptable limits, shear force value < 5 kg (Shorthose *et al.* 1986) and < 5.7 pH (Bouton *et al.* 1971). The meat colour of the lambs feed on diet 1 was significantly darker ($P < 0.05$) than lambs fed on other diets.

Overall, lambs fed grain based diets produced very tender meat with good muscle pH. Lambs fed diet 1 had problems finishing and had a darker coloured meat, which may be less acceptable to consumers. Lambs fed high energy, high protein wheat based diets had greater fat deposition, and it may suggest other techniques should be investigated to produce heavy weight lean carcasses.

BOUTON, P.E., HARRIS, P.V. and SHORTHOSE, W.R. (1971). *J. Food Sci.* 37: 435.

SHORTHOSE, W.R., POWELL, V.L. and HARRIS P.V. (1986). *J. Food Sci.* 51: 889.