

# SENSORY CHARACTERISTICS OF SHEEP FED HIGHER LEVELS OF BROILER LITTER AS A SURVIVAL FEEDING STRATEGY IN SOUTHERN AFRICA

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## BACKGROUND

This research forms part of a series of investigations on the evaluation of poultry litter as a survival feed for ruminants subsequent to droughts and veld fires. These natural disasters occur frequently in Southern Africa, forcing stock farmers to resort to emergency feeding measures to maintain their animals. Poultry waste emerged as an alternate source of nitrogen for ruminant animals, as early as the 1950's. Although residues may occur in poultry litter, no harmful effects were reported in humans consuming meat or milk from animals fed poultry litter (Fontenot & Webb, 1975). Carcass quality was not significantly affected in lambs fed creep rations containing 25 or 50% broiler litter (Fontenot *et al.*, 1971). However, an increase in copper levels was reported in sheep fed more than 50% broiler litter (Fontenot *et al.*, 1971; Olson *et al.*, 1984).

## OBJECTIVE

In this trial the effect of feeding higher levels of broiler litter (i.e. from 28% up to 85%) on the sensory characteristics of mutton was evaluated.

## METHODS

Broiler litter was fed at 0% (control diet), 28%, 56% and 85% to 36 SA Mutton Merino wethers. Wethers were fed from an initial body mass of 41 kg to a final live mass of 55 kg, slaughtered and the carcasses chilled overnight (4°C). The left loin (*M. longissimus dorsi et. lumborum*) was removed from each carcass, vacuum packed and stored (-20°C) until evaluated.

## RESULTS AND DISCUSSION

High sensory scores (e.g.  $\geq 7.0$  on a scale of 1 to 10) were obtained for all treatments, which concurs with results obtained in wethers fattened on normal diets (Webb *et al.*, 1994 & 1997). Wethers fed the 28, 56 and 85% broiler litter diets, contained significantly more fat ( $P < 0.005$ ; Table 1) compared to those fed the control diet. Wethers fed the broiler diets tended to score lower for fat firmness ( $P = 0.065$ ) compared to the control diet. A similar decline in fat firmness scores were reported for wethers fed diets containing medium (10.2 MJ ME/kg DM) and high (11.8 MJ ME/kg DM) levels of dietary energy (Webb *et al.*, 1997). Although the taint of samples from treatments C, B1 and B2 were typical, 6.3% of the samples from treatment B3 were atypical. The taint of these samples were described as "sour".

Table 1

Fat firmness, fat/muscle ratio and taint of *M. Longissimus dorsi et. lumborum* samples obtained from wethers fed higher levels of broiler litter.

Loin Characteristic	Inclusion level of broiler litter				Significance
	0%	28%	56%	85%	
Fat firmness	a	b	b	b	P=0.065
Firm	89%	67%	67%	78%	
Soft	11%	33%	33%	22%	
Fat/muscle ratio	a	b	b	b	P=0.005
Little	56%	22%	22%	22%	
Medium	44%	67%	78%	56%	
Abundant	0%	11%	0%	22%	
Taint					NS
Typical	100%	100%	100%	93.7%	
Atypical	0%	0%	0%	6.3%	



Scores for aroma-intensity also tended to be lower ( $P<0.09$ ; Table 2) for samples from treatment B3, as opposed to those from treatments C, B1 and B2. Flavour scores were significantly lower ( $P<0.05$ ; Table 2) for samples from treatment B3, compared to those from treatments C and B1. The overall-acceptability of sensory samples from treatment B3 were significantly lower compared to treatments C, B1 and B2 ( $P<0.01$ ).

Table 2

Sensory characteristics of *M. longissimus dorsi* et. *lumborum* of SA Mutton Merino fed higher levels of broiler litter.

Sensory Characteristic	Inclusion level of broiler litter			
	0%	28%	56%	85%
Aroma-intensity	7.613 $\pm$ 0.459	7.584 $\pm$ 0.381	7.520 $\pm$ 0.565	7.411 $\pm$ 0.520
Juiciness	7.782 $\pm$ 0.500 <sup>a</sup>	7.656 $\pm$ 0.556 <sup>a</sup>	7.581 $\pm$ 0.646 <sup>a</sup>	7.241 $\pm$ 0.599 <sup>b</sup>
Tenderness	7.481 $\pm$ 0.672 <sup>ab</sup>	7.614 $\pm$ 0.708 <sup>a</sup>	7.695 $\pm$ 0.776 <sup>a</sup>	7.267 $\pm$ 0.934 <sup>b</sup>
Flavour	7.707 $\pm$ 0.429 <sup>a</sup>	7.643 $\pm$ 0.454 <sup>a</sup>	7.575 $\pm$ 0.454 <sup>ab</sup>	7.454 $\pm$ 0.516 <sup>b</sup>
Overall acceptability	7.650 $\pm$ 0.440 <sup>a</sup>	7.611 $\pm$ 0.527 <sup>a</sup>	7.552 $\pm$ 0.505 <sup>a</sup>	7.225 $\pm$ 0.573 <sup>b</sup>

## CONCLUSIONS

Diets containing 28 or 56% broiler litter did not significantly affect the flavour or overall-acceptability of sensory samples from wethers. Broiler litter fed at a higher level (e.g. 85% inclusion level) significantly reduced the flavour and overall-acceptability of sensory samples. It is concluded that the inclusion of up to 56% broiler litter in diets for sheep will not adversely affect the sensory characteristics of the meat, while higher inclusion levels may result in lower sensory scores.

## REFERENCES

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