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Meat Quality of Sheep Grazed on a Saltbush-based Pasture

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ABSTRACT

Weaner and hogget wethers were grazed on either a saltbush-based pasture or in a stubble/dry pasture paddock for 14 weeks on one of two farms. The sheep were also supplemented with up to 200 g/d of barley grain. At the end of the experiment all sheep were slaughtered and both carcass characteristics and eating quality of the meat assessed. There were no differences in eating quality associated with consumption of saltbush but the carcasses from saltbush fed sheep were leaner at the same carcass weight.

AIMS

Forage halophytes such as saltbush (*Atriplex spp.*) are being widely used to revegetate saline land and provide a medium quality fodder source for sheep. However, little research has been done to determine the effects of grazing saline pastures on the carcass and eating quality of sheep meat. There is widespread anecdotal evidence to suggest that saltbush improves eating quality, furthermore previous work by Hopkins et al. 1999 has shown increased aroma strength of meat from animals fed a saltbush-lucerne (*Medicago sativa*) or saltbush-grain diet versus lucerne alone. In addition, saltbush contains high concentrations of sodium chloride and high salt diets have been shown to reduce the overall fat content of the carcass. The aim of this study is to determine if grazing saltbush-based pastures would influence meat eating quality and carcass characteristics.

METHODS

Two studies were conducted, one on a property 20km from Goomalling and the second 25km from Wickepin in Western Australia. On the Goomalling property fifty (2 x 25) 6 month old Merino lambs (average starting liveweight 38kg) were used while fifty (2 x 25) 18 month old Merino hoggets (average starting liveweight 45kg) were used at Wickepin. On both properties the sheep were grazed on either a saltbush-based saline pasture or a barley stubble/pasture plot. Both groups were supplemented with approximately 200g/d.hd of barley grain adjusted weekly depending on the liveweight gain of the animals. Following 14 weeks grazing, the sheep were commercially slaughtered.

Carcass quality

Immediately following slaughter all carcasses were weighed and GR depth determined. Ultimate pH and colour of the *Longissimus dorsi* (LD) were measured 24 hours post slaughter. To determine the carcass composition, half of each carcass was scanned by an X-Ray Bone Densitometer to yield estimates of the relative fat, lean and bone content of the animal.

Eating quality

A single loin (from 12th rib to chump) was collected from each animal and cut into six (6 cm x 2.5 cm) samples from the 12th rib end with muscle fibres running longitudinally. Each sample was cooked on a silex flat top grill set at 200°C for 2 minutes and 15 seconds and served within 2 minutes to individual taste panellists. Samples were allocated to panellists and runs in a latin square design. The panellists were randomly allocated one meat sample per run, completed 6 runs per session and were not informed of the origin of the specific sample evaluated. The panellist's assessed odour, flavour, tenderness, juiciness, residual fat and overall acceptance on a continuous 10 cm scale. Separate panels were run for both properties.

RESULTS

Comparisons were made between treatments within farm only for both carcass and eating quality. Saltbush grazed animals from Goomalling had a significantly lower fat content and sheep from both properties displayed a lower GR depth compared to the stubble grazed animals (Table 1). Grazing saltbush had no significant effect on any of the eating quality attributes (Table 2), carcass weight, colour or ultimate pH for either property.

Table 1. Carcass quality attributes (mean \pm standard error of the mean).

Attribute	Goomalling		Wickepin	
	Saltbush	Stubble	Saltbush	Stubble
PRESLAUGHTER LIVEWEIGHT (KG)	34.6 \pm 0.8	35.7 \pm 0.7	47.4 \pm 0.5	47.9 \pm 0.5
Hot carcass weight (kg)	14.5 \pm 0.3	14.8 \pm 0.4	18.8 \pm 0.3	19.4 \pm 0.3
Fat content (% fat on carcass)	12.4 \pm 0.4 ^{a*}	14.3 \pm 0.3 ^b	na	na
Lean content (% lean on carcass)	84.4 \pm 0.4 ^a	82.3 \pm 0.3 ^b	na	na
GR fat depth (mm)	1.4 \pm 0.2 ^a	2.1 \pm 0.1 ^b	1.9 \pm 0.3 ^a	4.1 \pm 0.3 ^b
Colour L	34.3 \pm 0.4	34.9 \pm 0.4	33.5 \pm 0.6	32.3 \pm 0.6
Ultimate pH	5.6 \pm 0.02	5.6 \pm 0.04	5.8 \pm 0.03	5.7 \pm 0.03

na- Not available at time of printing

* Within rows and farms- numbers with a different superscript are significantly different (P < 0.05)

Table 2. Eating quality attributes on a score out of ten (mean \pm standard error of the mean).

Attribute	Goomalling		Wickepin		Scale
	Saltbush	Stubble	Saltbush	Stubble	
ODOUR STRENGTH	5.0 \pm 0.9*	5.0 \pm 0.9	4.8 \pm 1.2	4.7 \pm 1.2	0=weak, 10=strong
Liking of odour	5.4 \pm 0.6	6.1 \pm 0.6	6.0 \pm 0.9	6.3 \pm 0.9	0=dislike, 10=like
Flavour strength	4.2 \pm 0.7	5.6 \pm 0.7	5.6 \pm 0.9	5.7 \pm 0.9	0=weak, 10=strong
Liking of flavour	5.9 \pm 0.6	5.7 \pm 0.6	6.7 \pm 0.9	6.6 \pm 0.9	0=dislike, 10=like
Tenderness	5.4 \pm 0.8	5.4 \pm 0.8	6.7 \pm 0.9	6.7 \pm 0.9	0=tough, 10=tender
Juiciness	5.8 \pm 0.8	5.4 \pm 0.8	6.5 \pm 0.9	7.1 \pm 0.9	0=dry, 10=juicy
RESIDUAL MOUTH FEEL	4.0 \pm 0.7	3.9 \pm 0.7	2.8 \pm 0.9	3.3 \pm 0.9	0=weak, 10=strong
Overall acceptance	5.5 \pm 0.7	5.9 \pm 0.7	6.5 \pm 0.8	7.2 \pm 0.8	0=dislike, 10=like

* Within rows and farms- numbers with a different superscript are significantly different (P < 0.05)

CONCLUSION

There was no detectable improvement or decline in eating quality resulting from feeding saltbush. Sheep that had grazed saltbush for 14 weeks had significantly less fat in the carcass.

KEYWORDS

Saltbush, carcass quality, eating quality, sheepmeat, fatness

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