Effects of ageing method (dry vs wet), time, and animal factors on moisture loss in mutton loin

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Dry ageing is a novel application that can add value to sheep meat. Beef research has demonstrated yields are considerably reduced by the dry ageing process, with moisture loss driving much of the yield reduction (Galletly, 2016: Laster et. al. 2008)). There is very little data available on the effects of dry ageing, ageing period or animal factors (carcase characteristics and ASBV values) on dry aged sheepmeat yields. This experiment compared the effects of ageing method (dry vs wet), ageing period, and animal factors on loin moisture loss %. Bone-in loin primal cuts obtained from 96 multipurpose merino cull ewes were allocated to either wet or dry ageing treatments, then aged for 14, 28, 42 or 56 days. Moisture loss % was determined for each loin at the completion of its assigned ageing period. Data analysis consisted of fitting a parsimonious ASREML model to predict the effect of ageing treatments and carcase covariates on loin moisture loss (the model is described in Table 1).

	Moisture loss (%)	
	Coefficient (SED)	P-value
Constant (AM = dry, AP =14 days)	32.58 (3.270)	
AM (wet) -coefficient is the difference from the Constant (AM = dry, AP =14 days)	-12.23 (0.899)	<0.001
AP = 28 days (dry) -coefficient is the difference from the Constant (AM = dry, AP =14 days)	4.93 (0.906)	<0.001
AP = 42 days (dry) -coefficient is the difference from the Constant (AM = dry, AP =14 days)	8.40 (0.906)	<0.001
AP = 56 days (dry) -coefficient is the difference from the Constant (AM = dry, AP =14 days)	9.21 (0.906)	<0.001
AP*AM (wet) @ 28 days -coefficient is the difference from AP=28 days (dry)	-3.71 (1.296)	<0.001
AP* AM (wet) @ 42 days -coefficient is the difference from AP=42 days (dry)	-7.70 (1.296)	<0.001
AP*AM (wet) @ 56 days -coefficient is the difference from AP=56 days (dry)	-9.14 (1.296)	<0.001
HCWT kg (AM = dry, AP =14 days)	-0.40(0.127)	<0.001
Fat score (AM = dry, AP =14 days)	-2.16 (0.468)	<0.001
PFAT mm (AM = dry, AP =14 days)	-1.93 (0.571)	0.001
HCWT*AM (wet) -coefficient is the difference from HCWT (AM =dry, AP =14 days)	0.54 (0.171)	0.002
Fat score*AM (wet) -coefficient is the difference from Fat score (AM =dry, AP=14 days)	1.74 (0.640)	0.008

Table 1; Effect of ageing method (AM; dry, wet), ageing period (AP; 14, 28, 42 or 56 days), the interaction of AP and AM, and animal factors (hot carcase weight HCWT, fat score[1], post weaning fat depth PFAT[2]) on moisture loss % of loin. Regression coefficients are shown with respective standard error of difference (SED) in parentheses and level of significance; P-value.

[1]Fat score - estimates the depth of subcutaneous fat at the GR measurement site (located 110 mm from the carcase midline over the 12th rib). Fat score 1 = 0-5mm, fat score 2 = 6-10mm, fat score 3 = 11-15mm, fat score 4 = 16-20mm, fat score 5 = 20+mm (AUSMEAT, 2000).
[2]PFAT- indicates the depth of subcutaneous fat at the GR site at 45 kg liveweight; an animal that is more negative in this trait will be leaner than more positive animals of the same liveweight ("Sheep genetics," 2019).

Unsurprisingly, dry ageing had increased moisture loss % compared to wet ageing (P<0.001), and this difference increased with ageing period (P<0.001). Moisture loss was, however, also influenced by hot carcase weight, fat score and their interactions with ageing method, and post weaning fat depth (P<0.05 for all). Increases in these attributes were associated with reduced moisture loss, and reduction in moisture loss due to fat score and HCWT was most evident in the dry aged treatment. For instance, using a carcase with fat score 5 rather than fat score 2 reduced predicted moisture loss in dry aged loins from 24.0% to 17.5% respectively at 42 days of ageing. Similarly, after 28 days of dry ageing, loins from a carcase of 40 kg would be subject to 13.8% moisture loss while a 23 kg carcase would be subject to 20.5% moisture loss. This study has demonstrated there is potential to improve dry aged yield through the management of ageing period and animal factors.

References

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