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ON FARM TREATMENT OF LAMBS PRIOR TO SLAUGHTER HAS A DETRIMENTAL EFFECT ON MEAT ULTIMATE pH

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Adverse pre-slaughter handling of animals will affect meat quality, but the factors involved are often overlooked by producers preparing animals for the sale yards or delivery to meat processors. Stressors such as crutching, extended handling (e.g. weighing and sorting for sale) and even sale through sale yards all involve extra animal handling and ultimately affect meat quality through its effects on ultimate pH (pH_u) where values of $5.8 > pH_u < 6.1$ produce tough meat (Devine *et al.* 1994). This paper examines the relationship between the little-documented effects of normal on-farm handling stressors and the time required for recovery before transport to slaughter on meat pH_u of prime lambs.

During July 2001 269 first cross lambs averaging 47.7 ± 5.72kg were slaughtered on four separate days over a two week period. Four days prior to the first slaughter, all lambs were weighed, structurally assessed the following day and then returned to ryegrass/white clover pasture. From this point, lambs had one, three, eight or ten days recovery before being yarded again, kept off feed for 24 hrs and transported for slaughter at a commercial abattoir. All lambs were in lairage for 16-20 hrs prior to slaughter and carcasses were electrically stimulated within 60 min post mortem for 60 s using 800V RMS (current 2 A) (half sine wave pulses, 10 ms duration) at an alternating pulse frequency of 14.28 pulses s^{-1}. The right *longissmus dorsi* (LD) from the rump to just above the 13th rib was then removed, wrapped in cling film and rapidly cooled to 15°C in water and aged at this temperature. The pH_u was measured 24 hours after *rigor*. Data was analysed using ANOVA (Microsoft Excel 97).

The pH_u of the LD from animals slaughtered after one and three days of recovery was significantly higher ($P<0.0001$) than for those slaughtered after an eight or ten day recovery period (Table 1). There were also significantly ($P<0.0001$) more animals with pH_u less then 5.70 in the groups that had the longest recovery time (Figure 1).

Table 1: Number of lambs (N), mean LD pH_u and standard deviation (s.d.) of lambs with increasing length of recovery from on-farm handling

Recovery Days	N	Mean pH_u	s.d.
1	66	5.68[a]	0.17
3	70	5.66[a]	0.11
8	67	5.58[b]	0.10
10	66	5.56[c]	0.04

Values with the same superscript are not significantly different at P=(0.05)

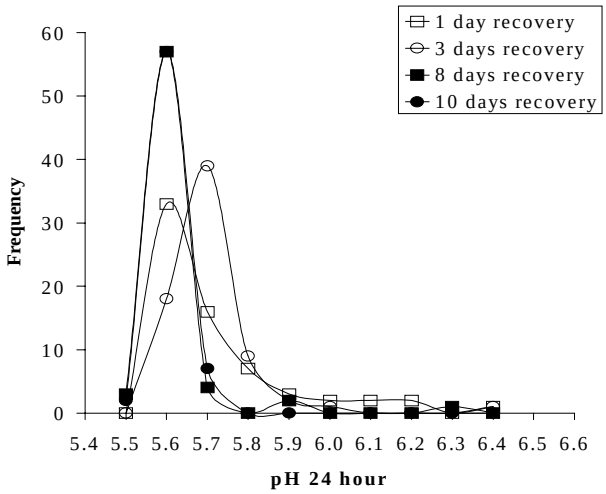

Figure 1: Frequency distribution of pH_u of LD from animals with increasing length of recovery from on-farm handling

Over 10% of animals slaughtered with only one day to recover after handling and 4.3% of those with 3 days to recover fell within the pH_u range corresponding to tough meat, whereas none of the animals with 10 days to recover fell within this range. These results show that for optimum meat quality, any extensive on-farm handling of lambs should take place as long as possible prior to slaughter to ensure there is time for recovery. The present results suggest that recovery takes longer than three days and can take up to eight days. This work was supported and funded by the prime lamb industry through Meat and Livestock Australia.

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