MUSCLE pH OF LAMB GENOTYPES

D.L. HOPKINS\textsuperscript{a}, N.M. FOGARTY\textsuperscript{b} and D. J. MENZIES\textsuperscript{c}

\textsuperscript{a}NSW Agriculture, PO Box 242, Cowra, N.S.W. 2794
\textsuperscript{b}NSW Agriculture, Forest Road, Orange, N.S.W. 2800

In a recent study Young \textit{et al.} (1993) reported that Merino lambs produced meat with a significantly higher pH than Coopworth lambs. However all breeds exhibited high mean values, it seems, due to the pre-slaughter washing of the lambs. Meat with a pH above 5.80 tends to be tougher, darker and also has a reduced shelf life (Hopkins and Kajons 1994), and so it is of importance to quantify whether particular genotypes produce meat with a higher pH. The preliminary data presented in this paper detail the pH of 2 groups of lambs representing 6 different lamb genotypes, where both groups were managed differently pre-slaughter.

One hundred and eighty one ewe lambs representing 6 genotypes (Texel x Merino (TM), Poll Dorset x Merino (PDM), Texel x Border Leicester x Merino (TBM), Poll Dorset x Border Leicester x Merino (PDBM), Border Leicester x Merino (BLM) and Merino x Merino (M)) were yarded off pasture at 0080 hrs on day 1 (maximum ambient temperature 29°C). The lambs were trucked 320 km under dry, still conditions commencing at 0090 hrs and unloaded at 1500 hrs (ambient temperature 29°C). Sixteen of the lambs were selected on the basis of liveweight as the heaviest from each genotype (TM = 2, PDM = 2, TBM = 2, PDBM = 2, BLM = 4 and M = 4) and given access to pasture and water for 1 hour (ambient temperature 23°C).

A mob of cryptorchid lambs (n=87) representing the 6 genotypes (TM = 14, PDM = 11, TBM = 11, PDBM = 18, BLM = 13 and M = 20) were also fasted in separate pens for 15 hours and treated thereafter in an identical way to the ewe lambs until slaughter. All lambs had access to water at the abattoir and were held in sex groups in covered pens. On day 3 (ambient temperature 27°C) the lambs were slaughtered under commercial conditions at approximately 0090 hrs. Hot carcass weight and GR were obtained at slaughter, where GR is the total tissue depth at the 12th rib, 110 mm from the backbone. Ewe carcasses were held at approximately 5°C for 5 days and cryptorchid carcasses at the same temperature for 24 hours. The carcasses were quartered at the 12th/13th rib and the pH of \textit{M. Zongissimus thoracis et Zumborum} measured using a Jenco 6009 meter with temperature compensation and an Ionode IJ42 spear electrode.

Analysis of the data showed no difference between pH values for TM and PDM carcasses or TBM and PDBM carcasses within both sex groups, so the data were pooled to give 2 groups (1st cross and 2nd cross). The mean (±SD) weight, GR and pH of the ewe and cryptorchid carcasses was 17.5 ± 1.43 kg, 10.4 ± 4.11 mm, 5.85 ± 0.20 and 26.4 ± 3.49 kg, 15.7 ± 3.56 mm and 5.57 ± 0.13 respectively. A significant (P<0.05) difference in pH was found between genotypes within both sex groups (Table 1) and between sex groups. Differences between genotypes were greater within the ewe group and the mean values were higher.

<table>
<thead>
<tr>
<th>Group</th>
<th>1st Cross</th>
<th>2nd Cross</th>
<th>BL x M</th>
<th>M x M</th>
<th>SED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ewes</td>
<td>5.77\textsuperscript{a}</td>
<td>5.63 \textsuperscript{a}</td>
<td>6.03 \textsuperscript{a}</td>
<td>5.98 \textsuperscript{b}</td>
<td>0.092</td>
</tr>
<tr>
<td>Cryptorchids</td>
<td>5.52 \textsuperscript{a}</td>
<td>5.56 \textsuperscript{b}</td>
<td>5.65 \textsuperscript{c}</td>
<td>5.59 \textsuperscript{a}</td>
<td>0.037</td>
</tr>
</tbody>
</table>

\textsuperscript{a}Means with different letters differ significantly (P < 0.05) within rows.

The management of the ewes pre-slaughter was similar to that experienced by lambs sold through the saleyard system and this was associated with a higher pH. In particular the BLM and Merino lambs had higher pH's than the other crosses. Since a number of exporters utilise Merino and BLM lambs to satisfy the chilled primal market these results require further validation, as they indicate particular care may be required when managing these lambs prior to slaughter. The physiological reason for the genotype effect is worthy of investigation.


347