

Colour display life of chilled lamb

Katja Rosenvold & Eva Wiklund
MIRINZ Meat Science
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Farming, Food and Health. **First**

Te Ahuwhenua, Te Kai me te Whai Ora. Tuatahi

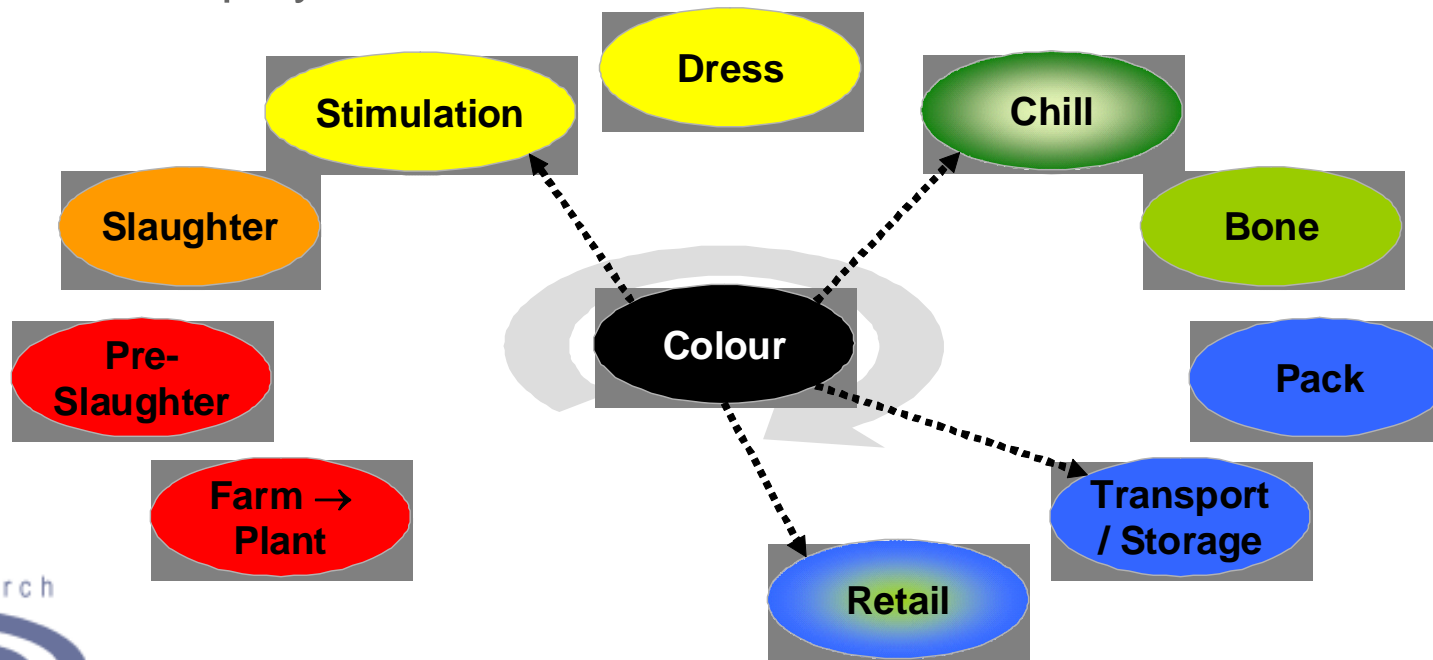
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Relevance

- Chilled NZ export lamb competes with locally produced lamb with longer colour display life (e.g. 6 days vs 8 days)
- Increasing shipping time due to port congestion and 'slow steaming' will extend required storage times and put pressure on colour display life



Materials & methods

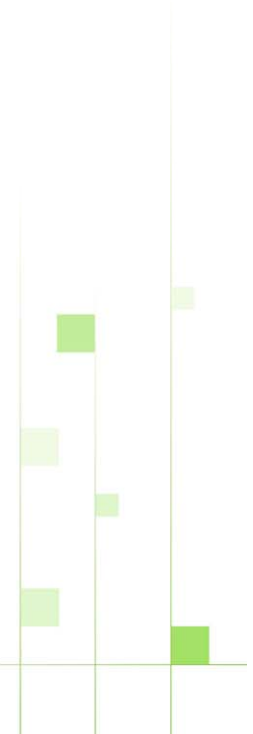
This study investigated how processing conditions (electrical stimulation or chilling) and temperature during transport and wholesale affects colour display life.

Processing conditions

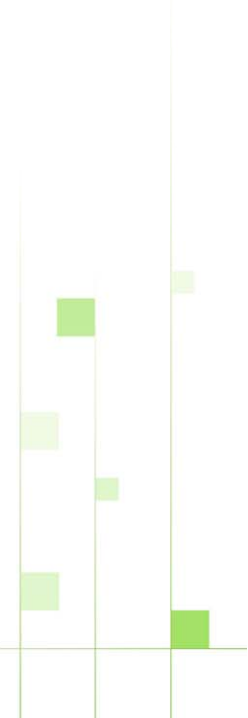
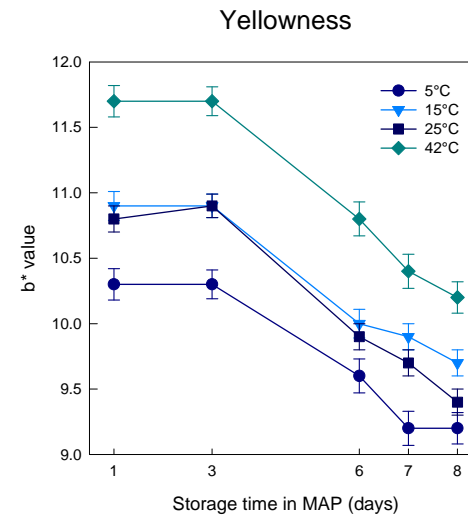
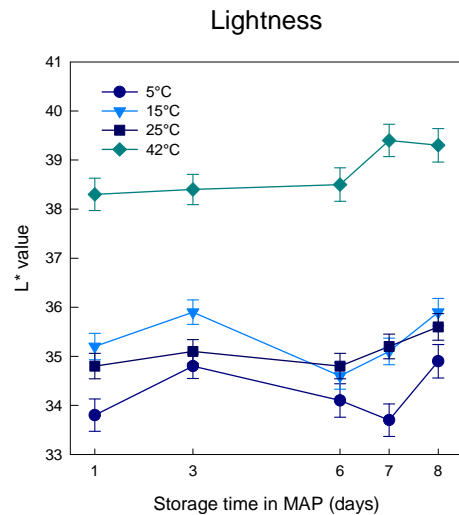
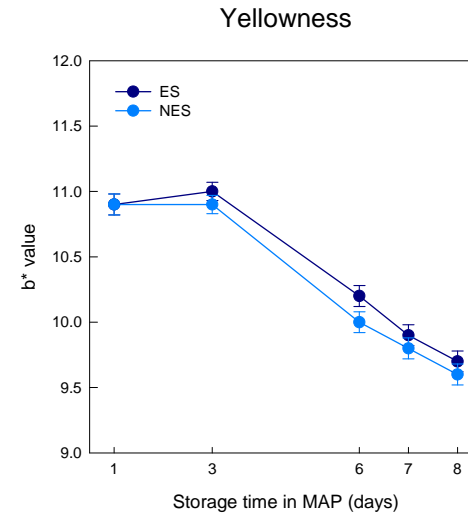
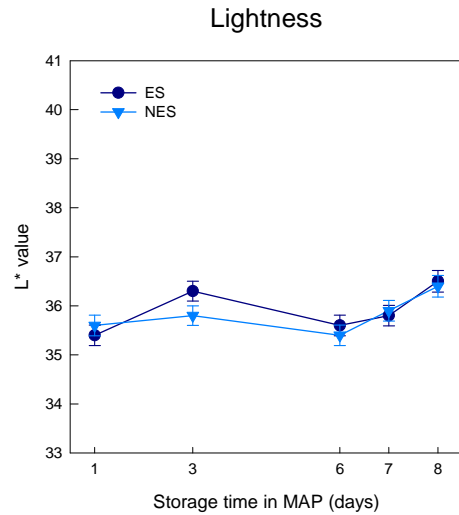
- low voltage electrical stimulation vs non-electrically stimulated lamb carcasses
- *pre rigor* temperatures of 5°C, 15°C, 25°C and 42°C
- then vacuum packed and stored at -1.5°C for 7 wks, retail packaged in 80% O₂/20% CO₂ and stored at 4°C

Temperature during transport and wholesale

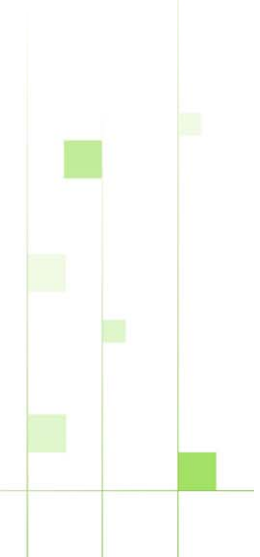
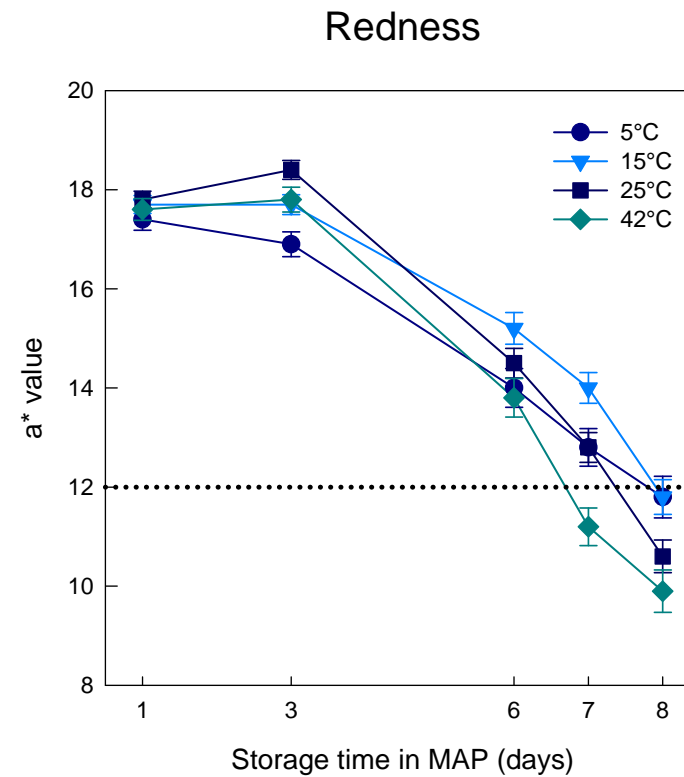
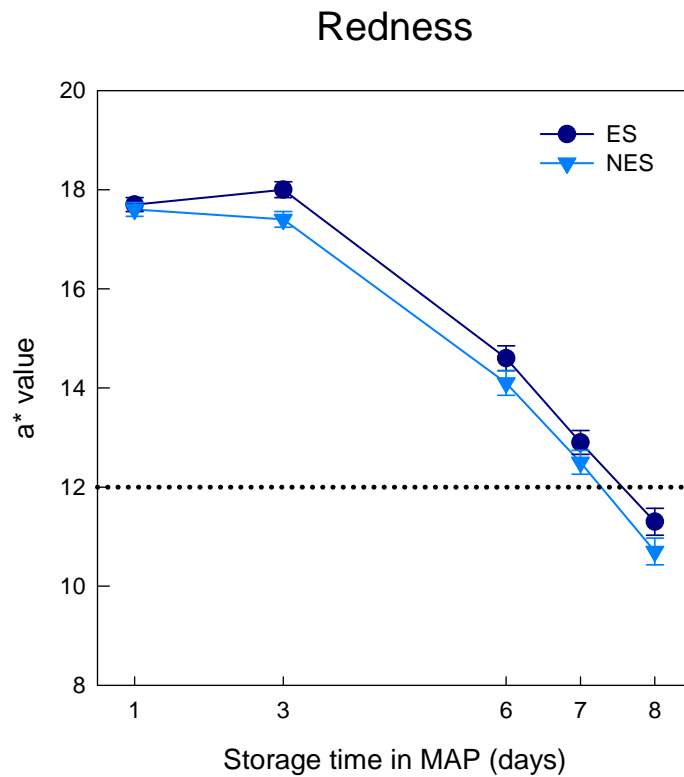
- Lamb loins were vacuum packed and stored at
 - -1.5°C for 7 wks
 - +2°C for 7 wks
 - -1.5°C for 6 wks then 2°C for 1 wk
- retail packaged in 80% O₂/20% CO₂ and stored at 4°C



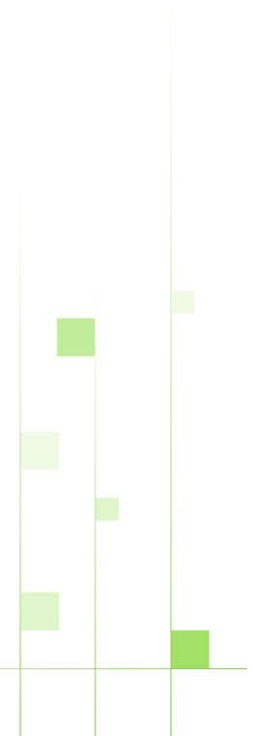
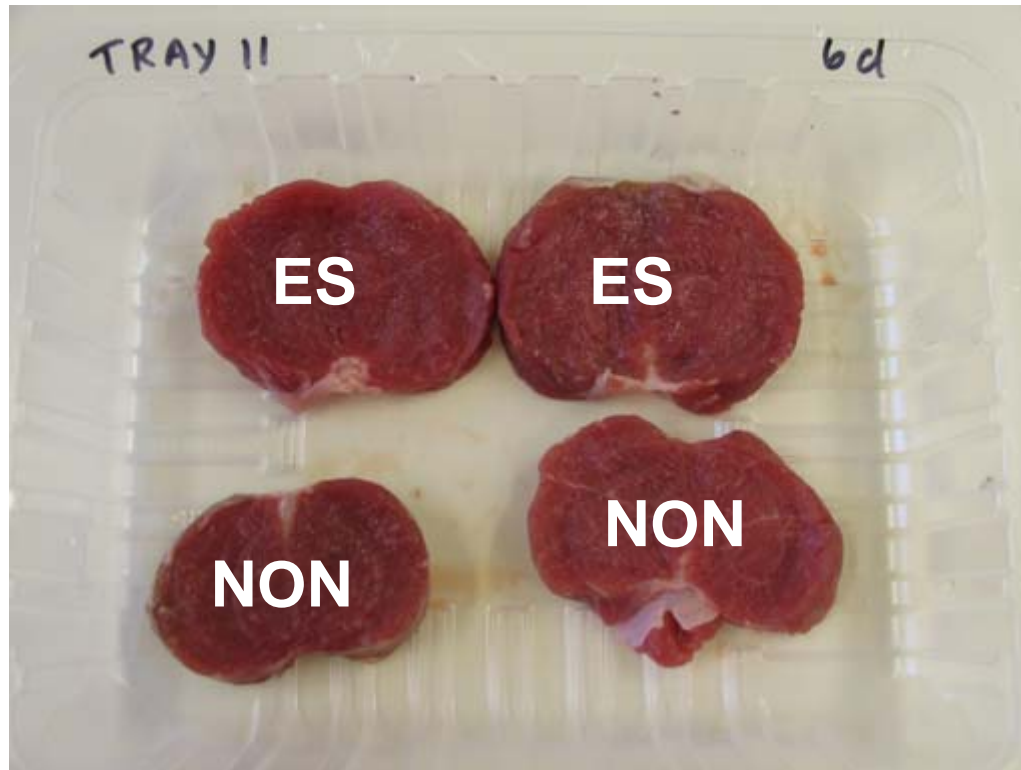
Impact of electrical stimulation and *pre rigor* temperature on colour display life



Impact of electrical stimulation and *pre rigor* temperature on colour display life



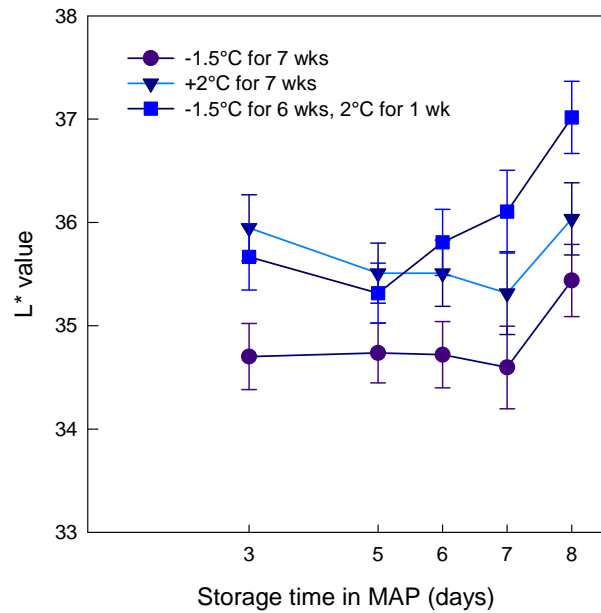
Colour of lamb samples (-1.5°C for 7 weeks) from stimulated (ES) and non-stimulated (NON) carcasses after 6 days display in high O₂ MAP



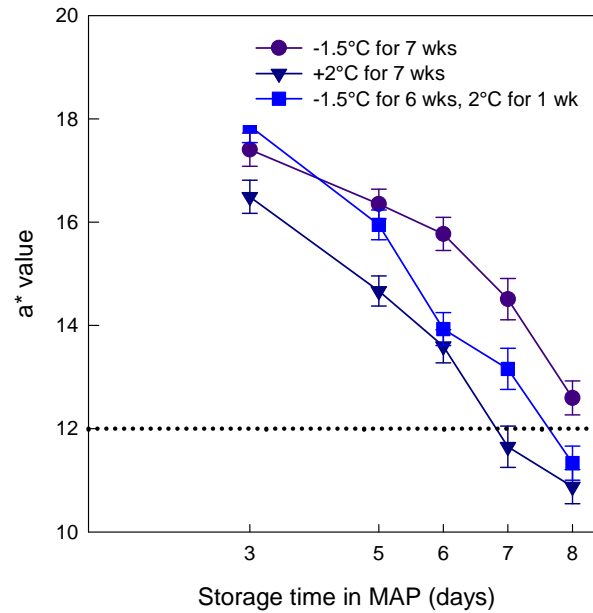
Temperature abuse during transit or wholesale storage



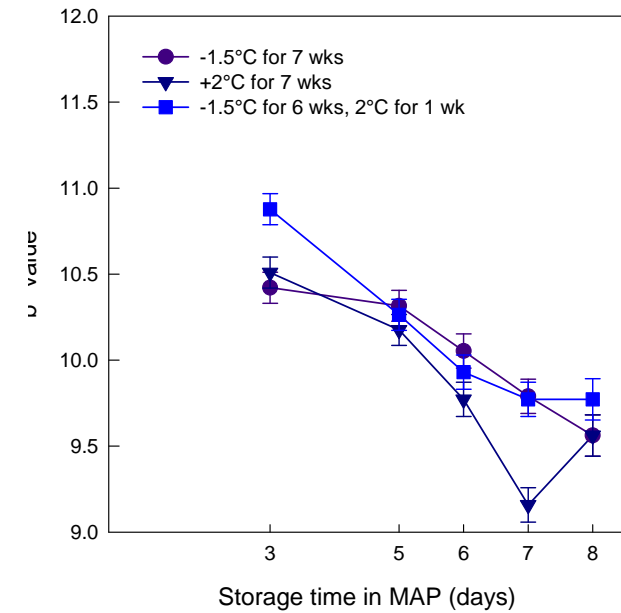
Lightness



Redness



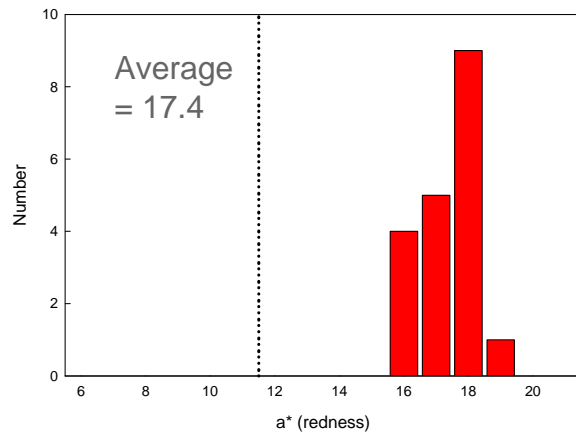
Yellowness



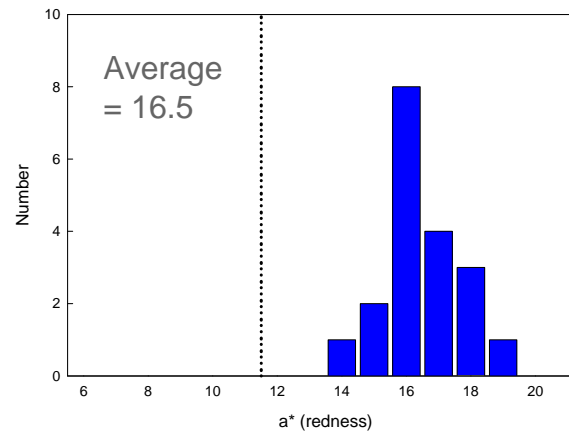
Redness (a^*) variability in retail MAP packages after 3 days storage at 4°C



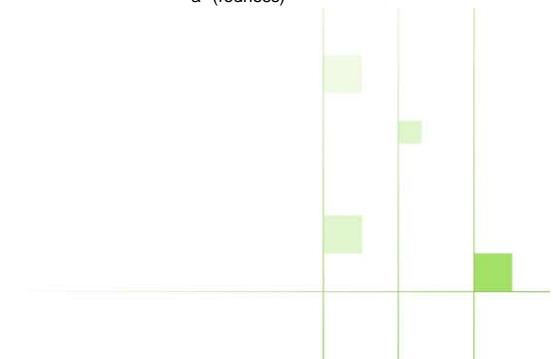
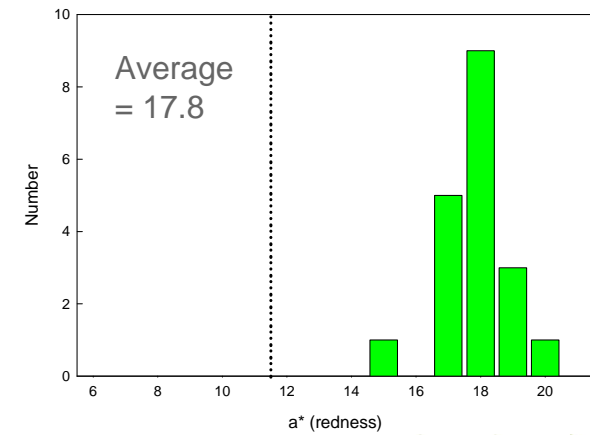
-1.5°C for 7 wks
MAP, 4°C for 3 days



+2°C for 7 wks
MAP, 4°C for 3 days



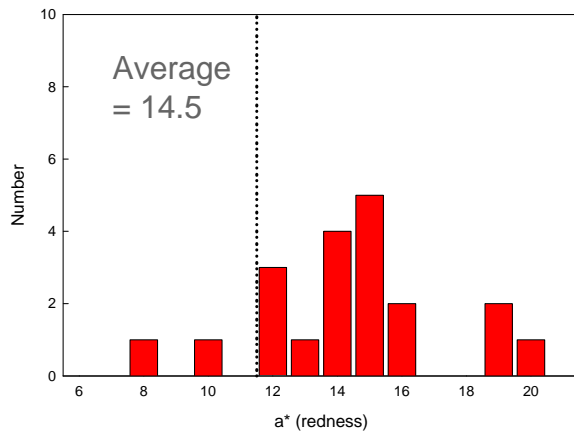
-1.5°C for 6 wks, +2°C for 1 wk
MAP, 4°C for 3 days



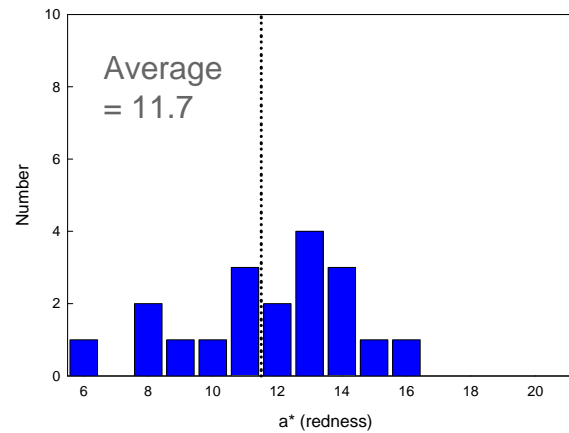
Redness (a^*) variability in retail MAP packages after 7 days storage at 4°C



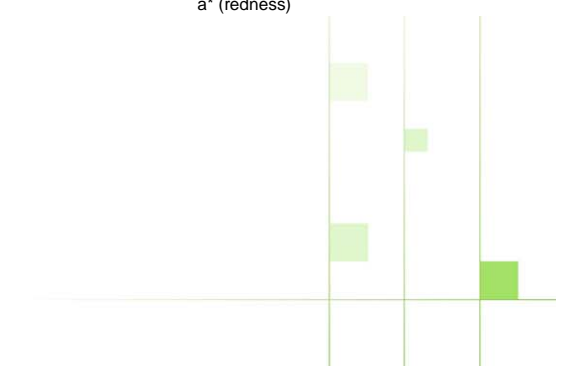
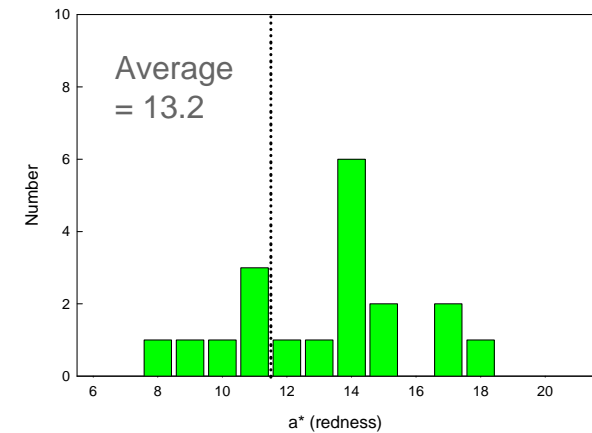
-1.5°C for 7 wks
MAP, 4°C for 7 days



+2°C for 7 wks
MAP, 4°C for 7 days



-1.5°C for 6 wks, +2°C for 1 wk
MAP, 4°C for 7 days



Conclusions



Processing conditions

Pre rigor temperatures have a significant effect on colour display life of chilled lamb

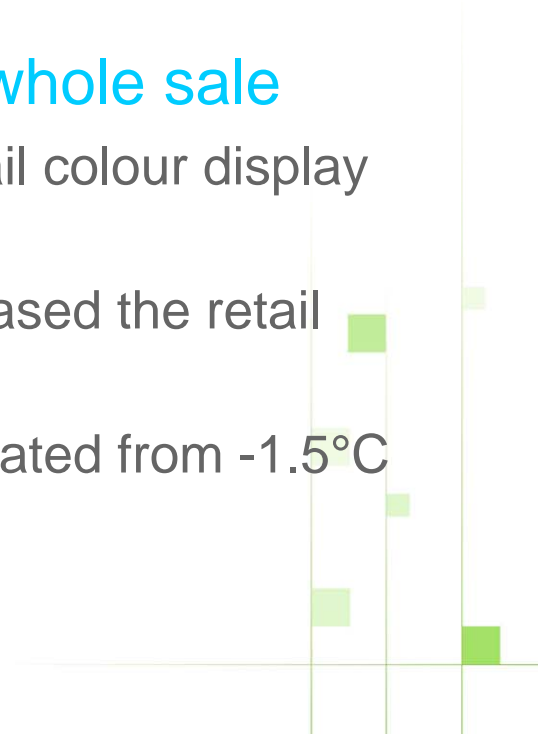
Electrical stimulation has minimal effect

Temperature abuse during transport and whole sale

Temperature abuse during transport decrease retail colour display life

Even short temperature abuse at wholesale decreased the retail colour display life significantly

The colour variability increases if temperature deviated from -1.5°C



Acknowledgements



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Project team:

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