

Shelf-life of Australian beef and lamb

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Outline

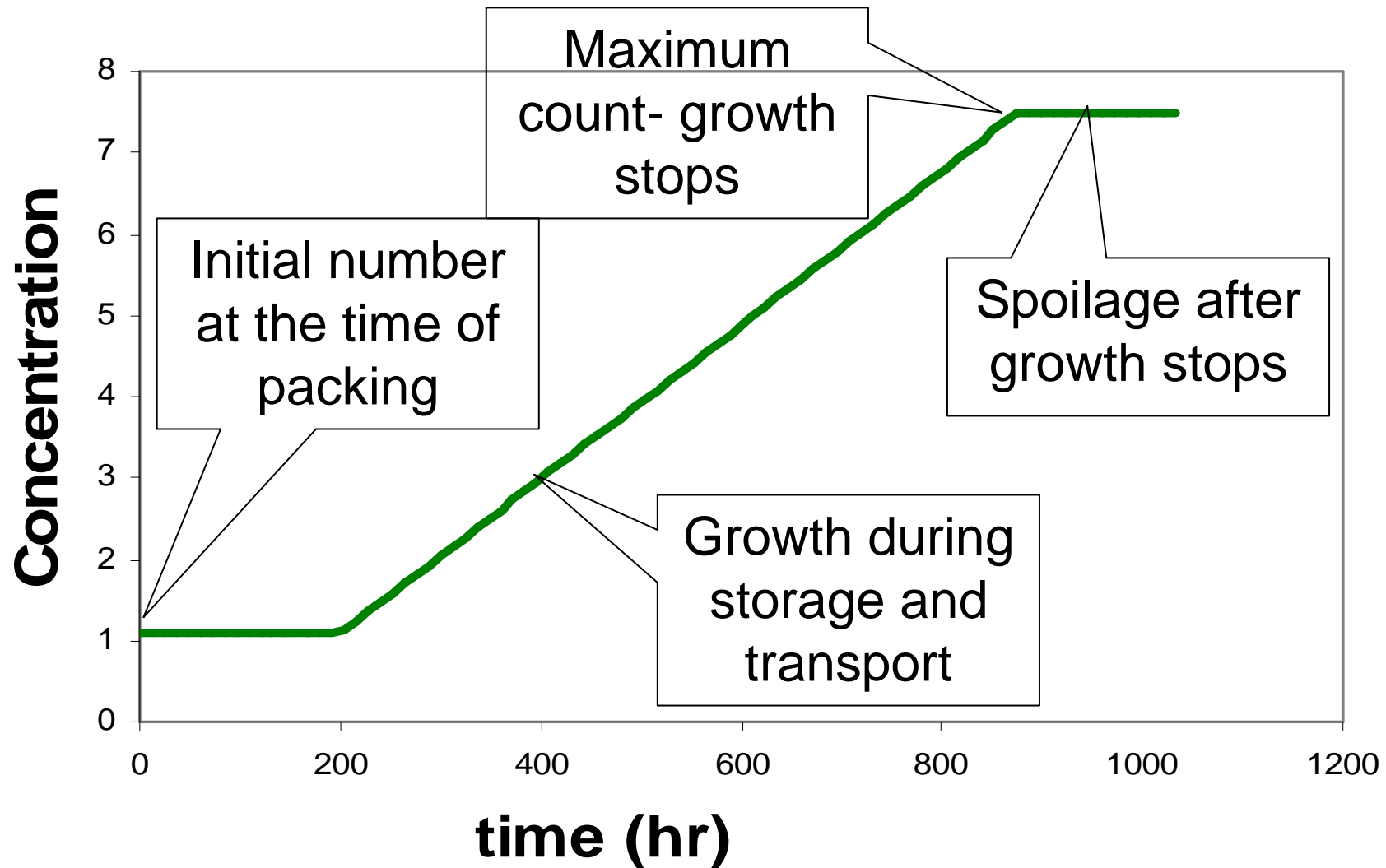
- Bacterial growth and shelf-life
- What is the shelf-life of vacuum packed beef?
- What is the shelf-life of vacuum packed lamb?
- Temperature in supply chains

Typical shelf-life: textbooks

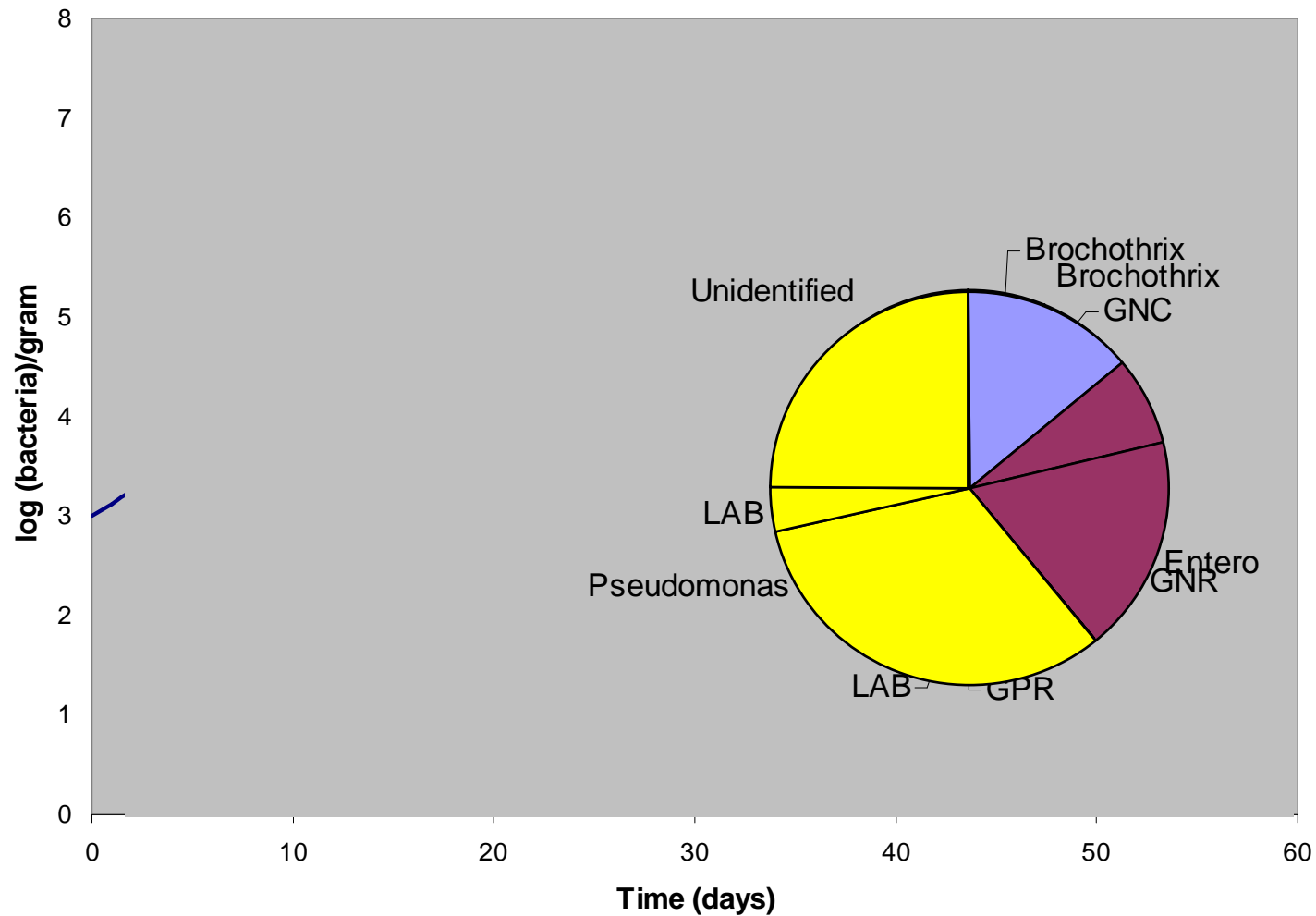
- In oxygen- 5 days
- In vacuum pack
 - Beef primals 84 days at 0°C
 - Lamb primals 60 days at 0°C



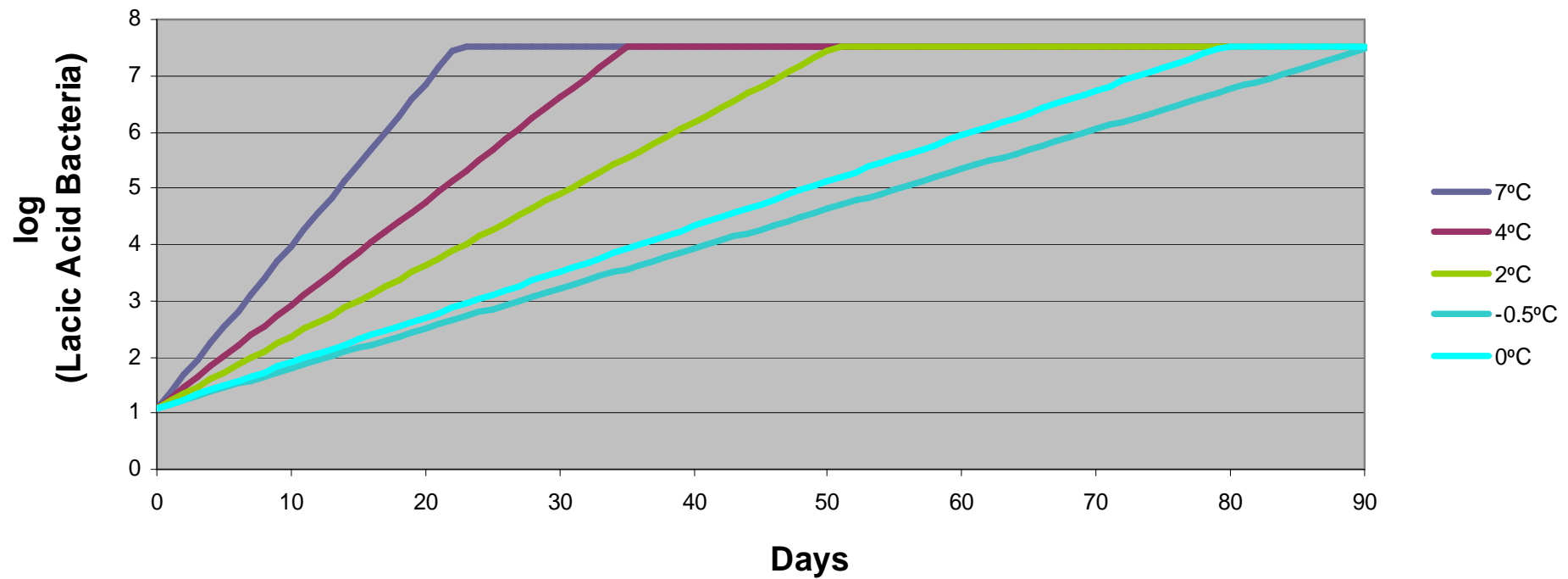
Growth of bacteria



Growth and bacterial types in vacuum packed beef



Growth of LAB in vacuum packed beef- effect of temperature

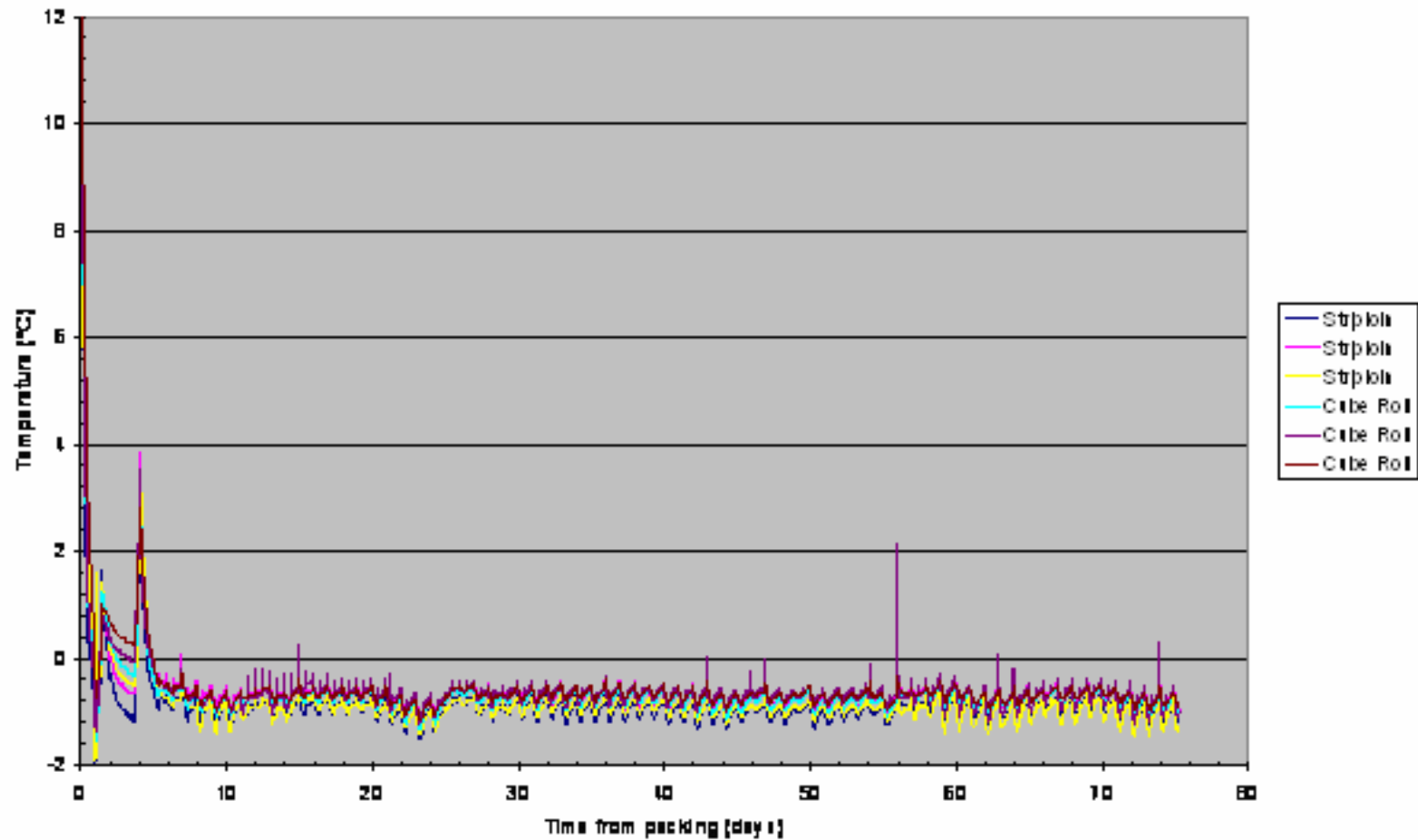


Shelf-life trials- vacuum packed beef

Materials and Methods

- Four processors (A, B, C, D)
- Two products (striploin, cube roll)
- One of each sampled at each time point
 - Every 2 weeks from week 6 to week 20
- Sensory evaluation
 - Appearance, odour, post-bloom appearance
- Sliced and packed for 3 days display
 - Appearance, colour, lipid oxidation

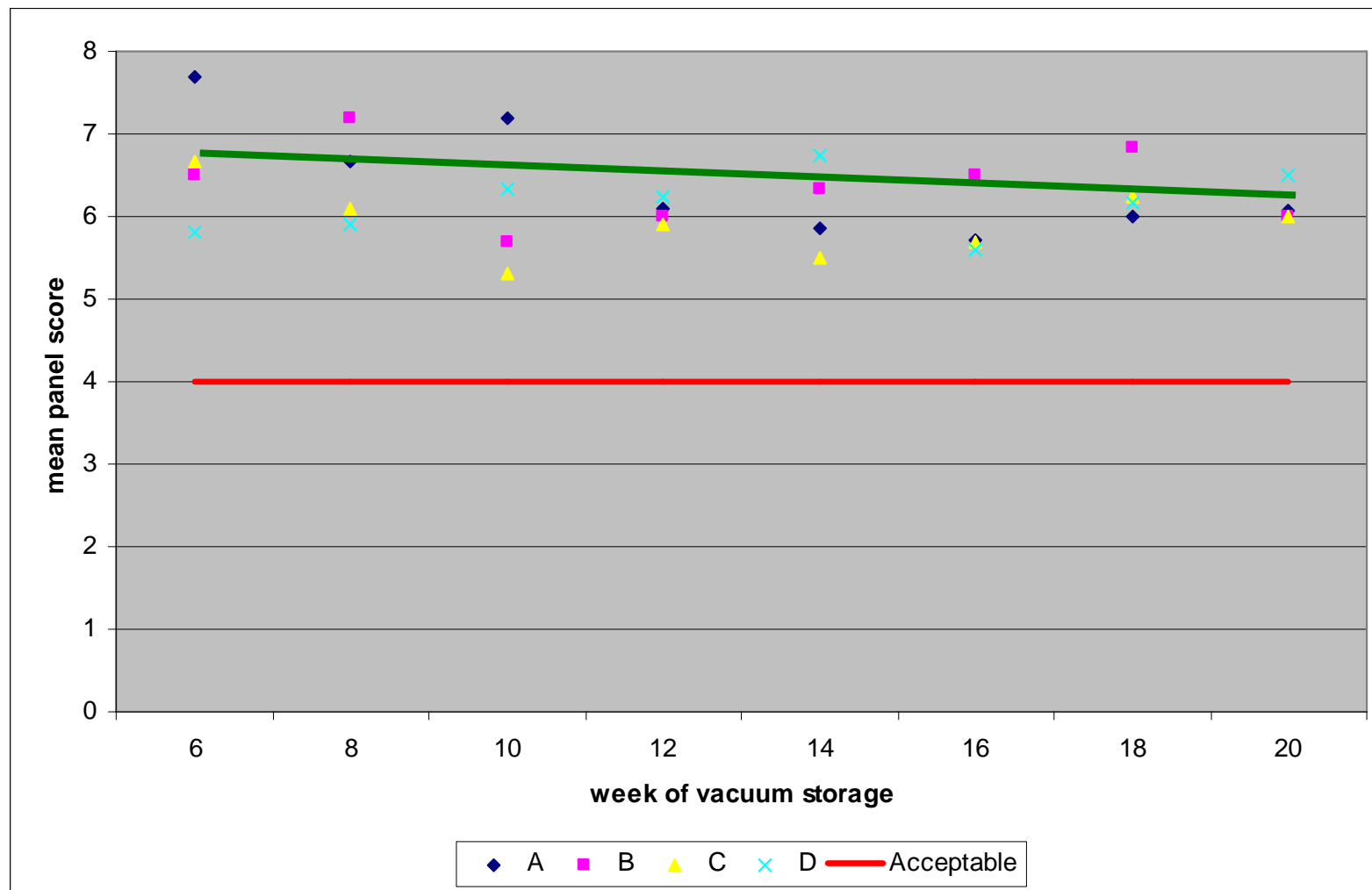
Product Handling



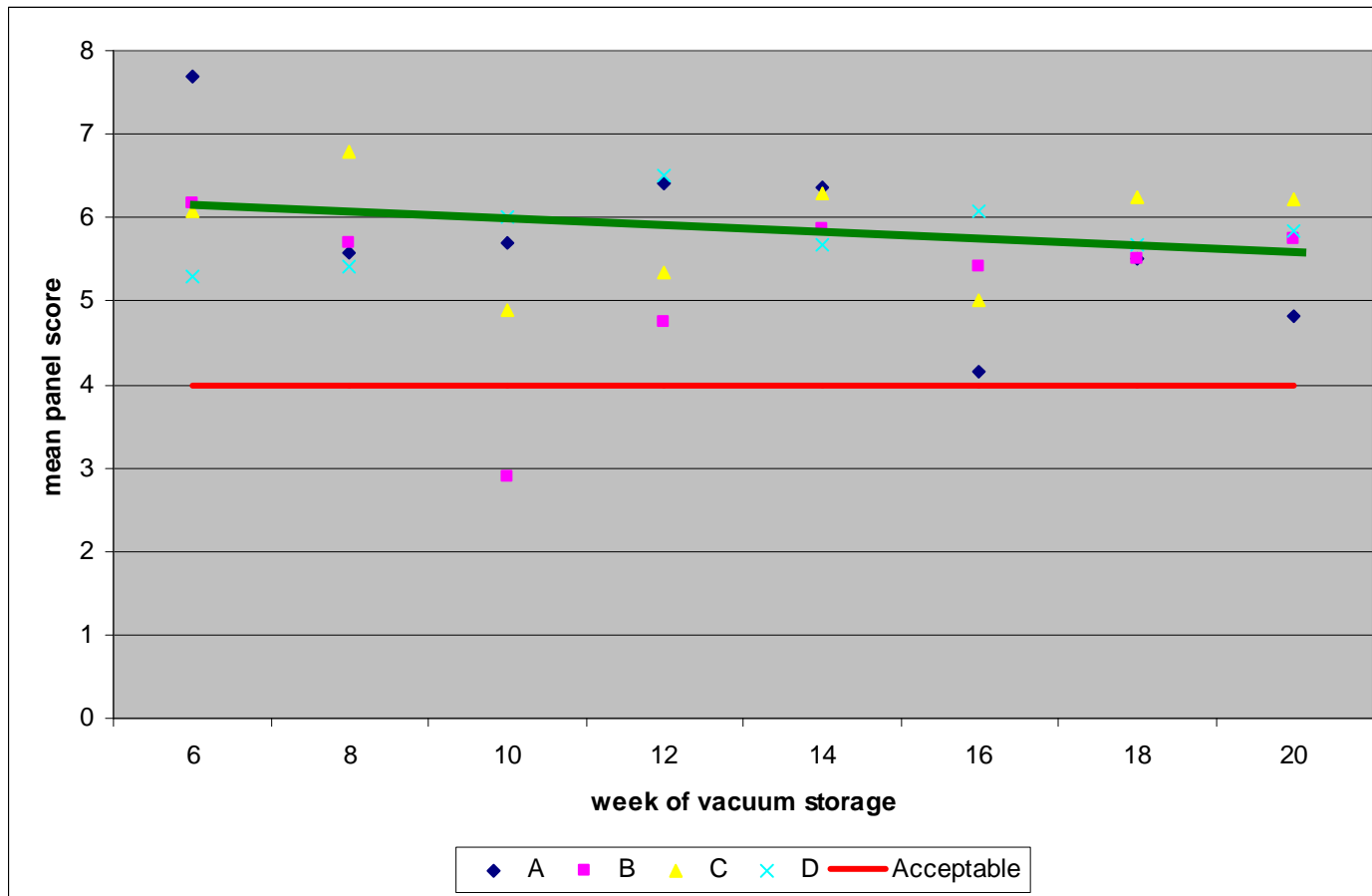
Visual and Odour Evaluation



Intact Pack Visual Assessment



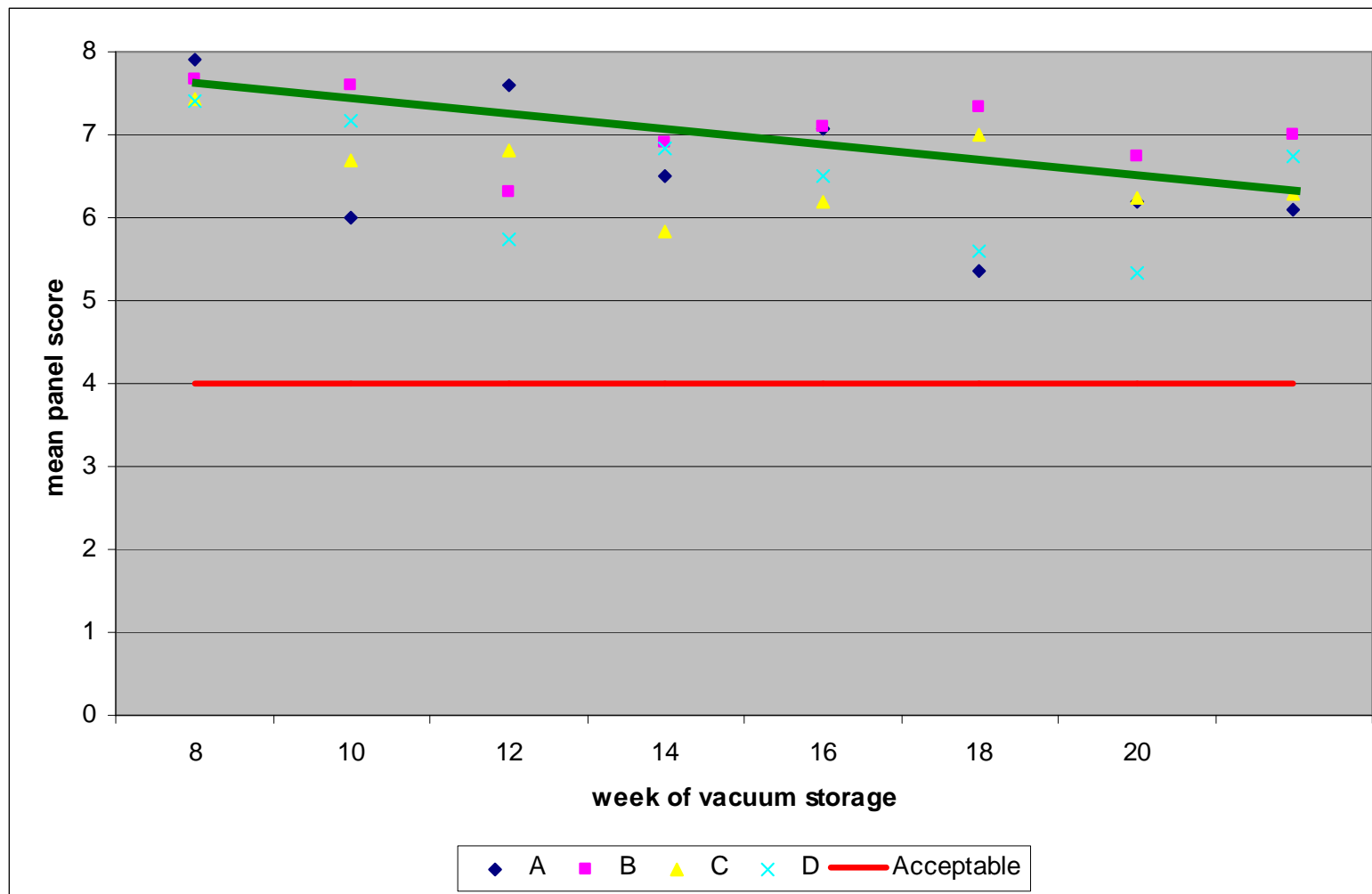
Odour Evaluation



Post Bloom, week 20



Bloomed Primal Visual Appearance



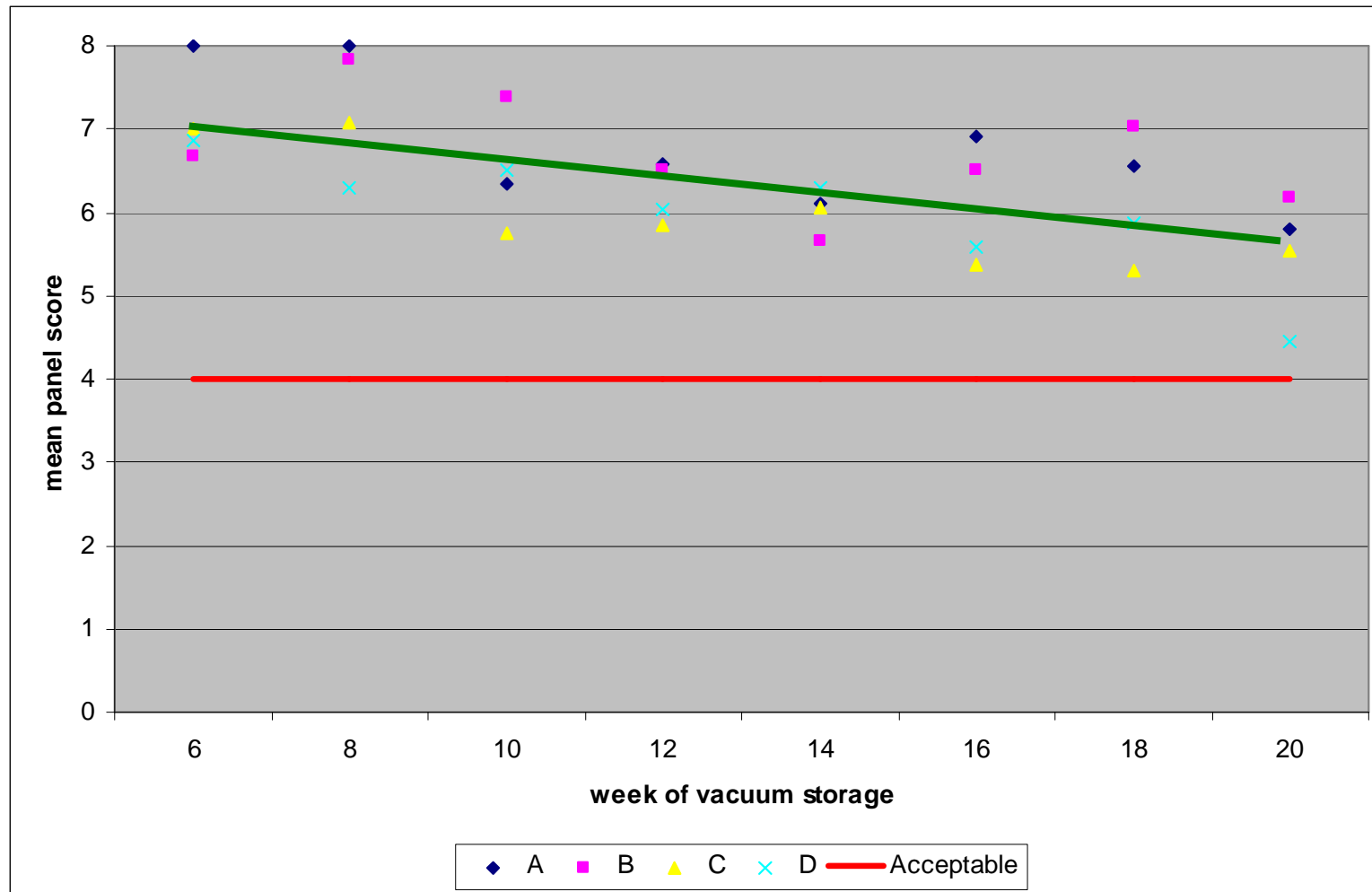
Retail Display, day 3



- TBARS overall increase
 - Maximum 1.714 (A striploin week 14) and 1.153 (D striploin week 18)
- Striploin generally higher than cube roll



Appearance, retail display, day 3



Conclusions

- Sensory evaluations suggest that Australian vacuum packed beef primals can confidently be stored for 20 weeks or more
- Second study confirmed this result – some product 26 weeks

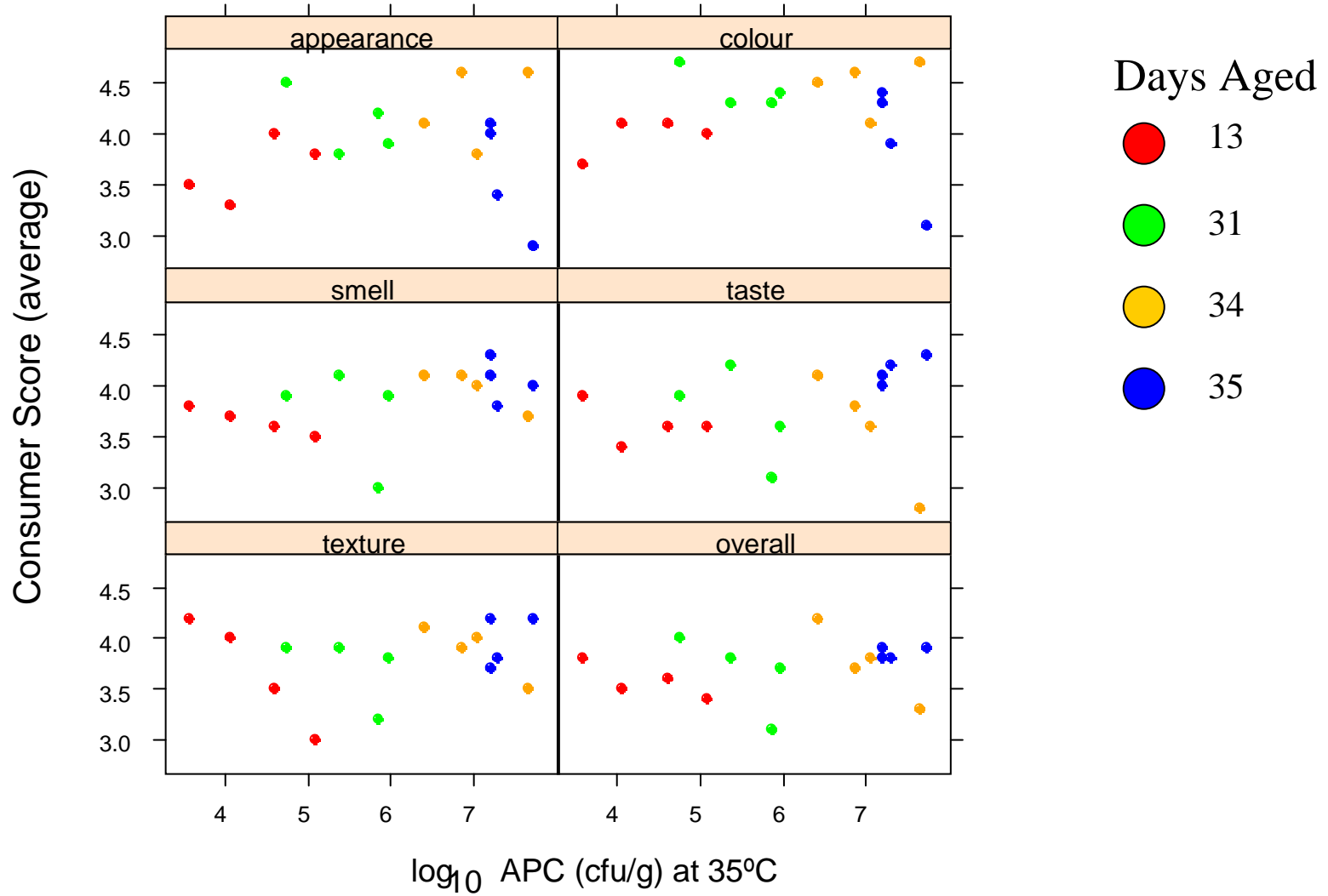
Lamb shelf-life: consumer study

- Micro counts v. Consumer acceptance
- Retail display life
- Vacuum packed lamb shoulders
- Two studies
 - 0-35 days correlation with microbiological counts
 - 20-80 days how long can lamb be stored after maximum count?

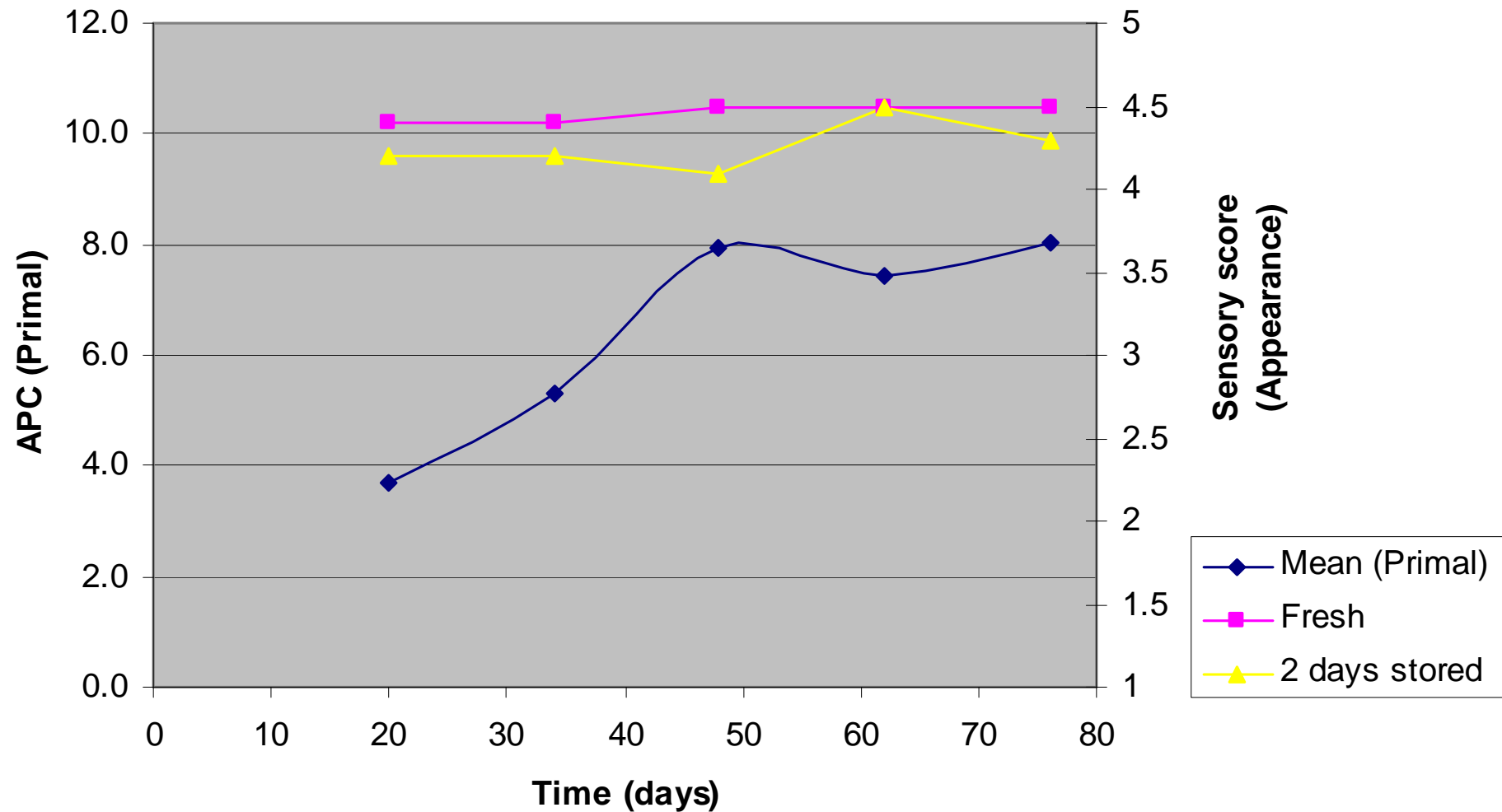




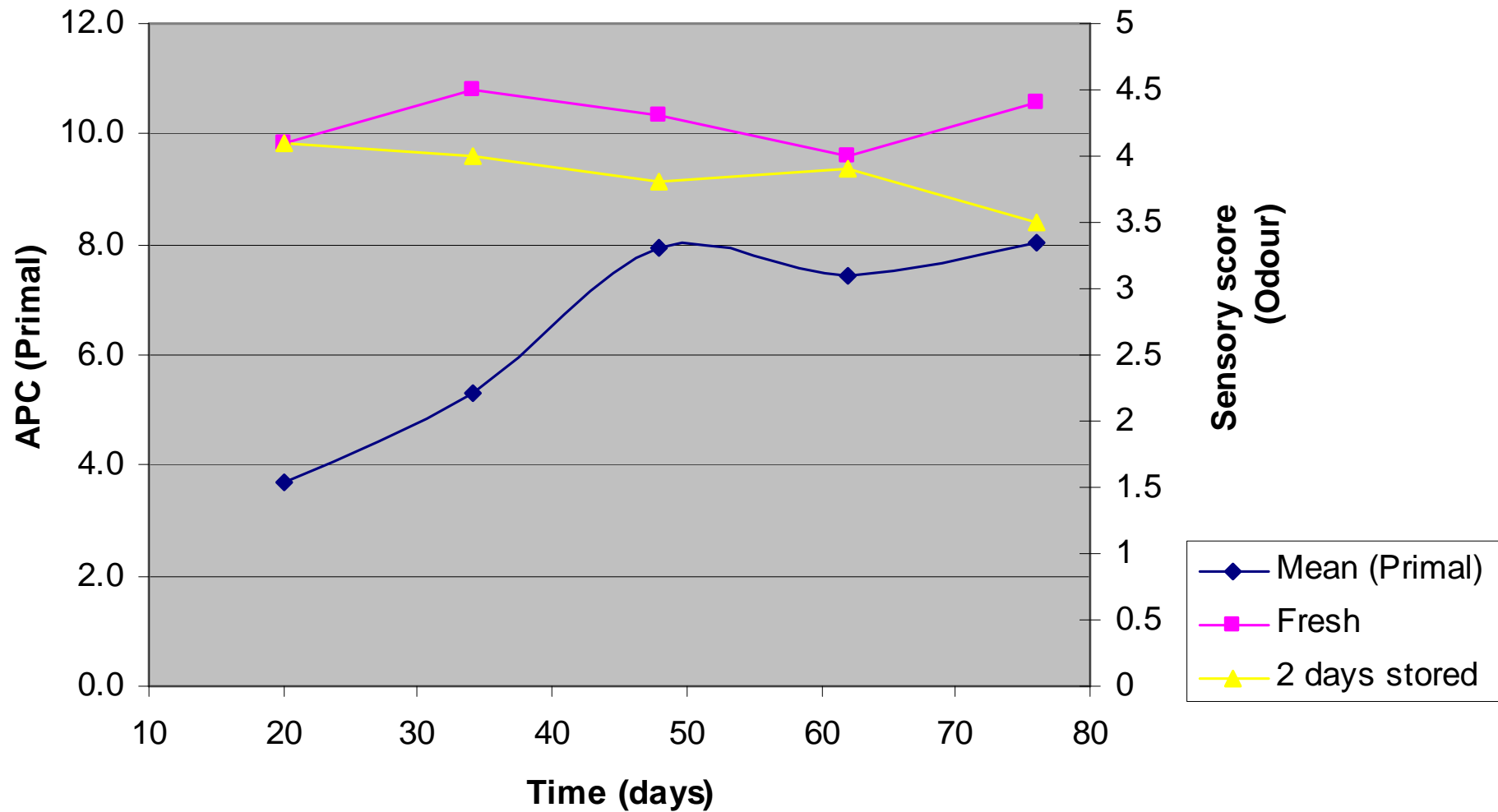
Japanese consumer perception



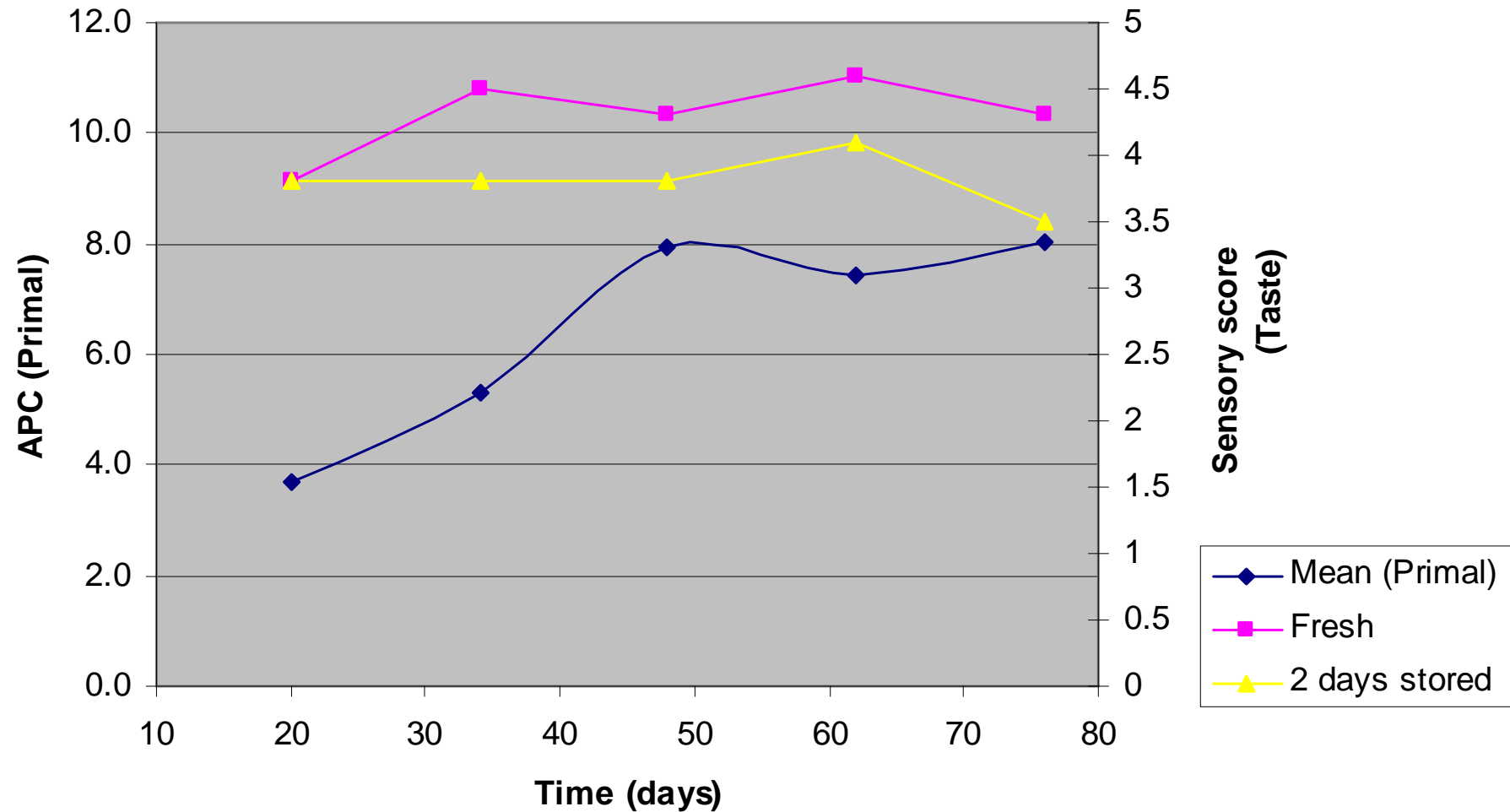
Microbial Count against Appearance over time



Microbial Count against Odour over time



Microbial Count against Taste over time



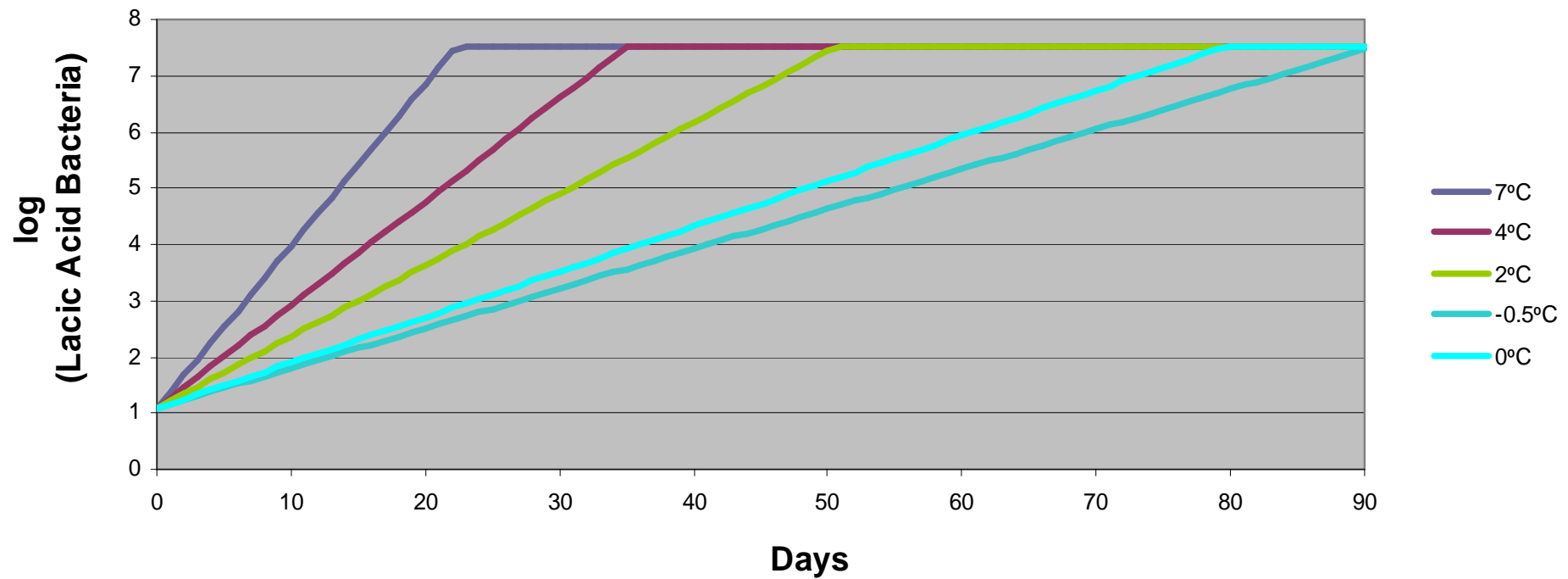
Conclusion

- Japanese consumers did not perceive differences in appearance, colour, smell, taste, or texture in lamb with different APC/LAB counts
- **Japanese consumers did not perceive differences in 2 day old lamb until 4 weeks after the APC count reached the maximum**

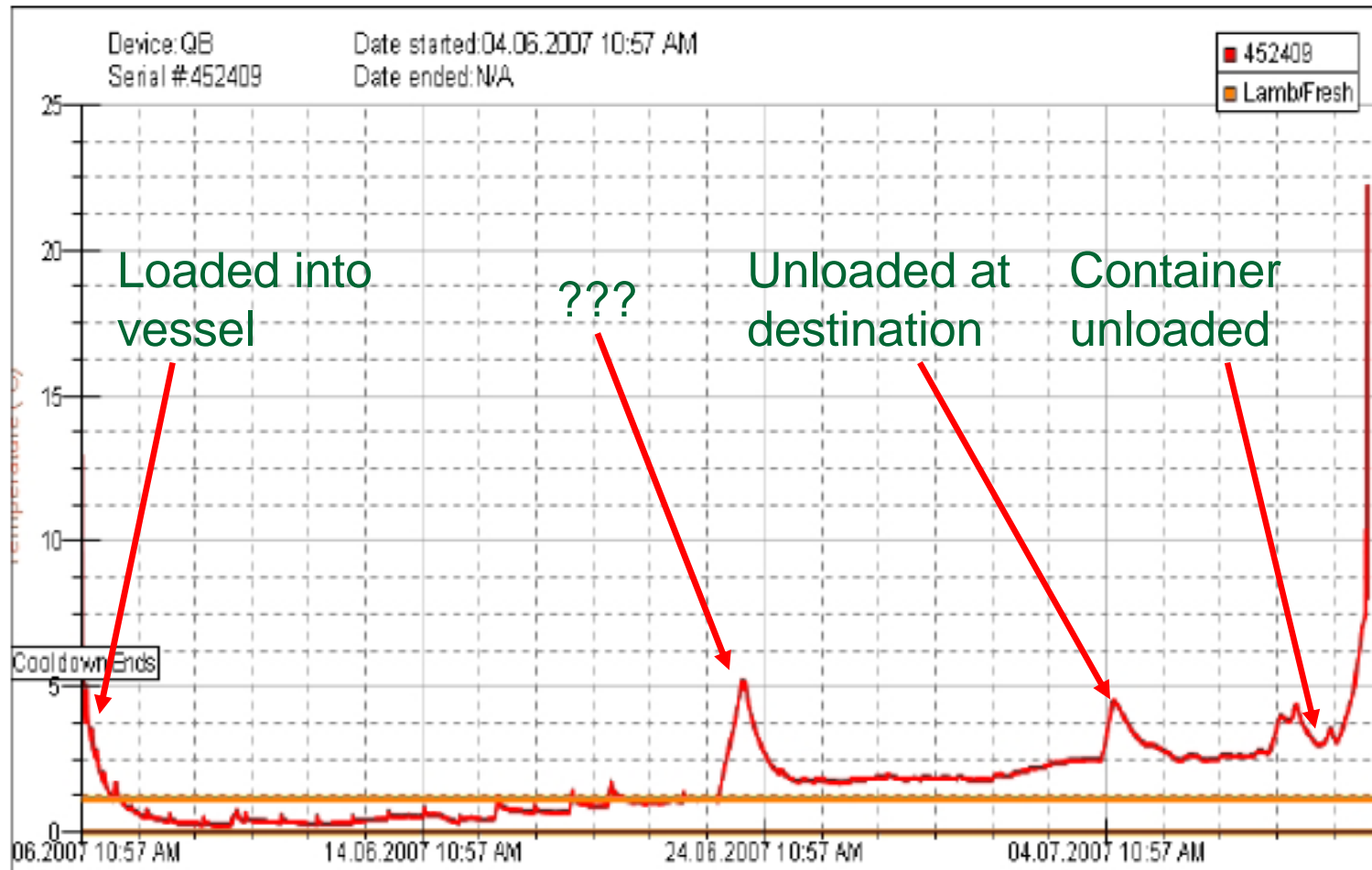
Temperature in supply chains

- Temperature is the most important parameter
- We don't usually know the temperature history of product when we receive it
- Predictive model?

Growth of LAB in vacuum packed beef- effect of temperature



On-board shipping vessel



Professor Mark Tamplin, University of Tasmania

Dr Andreas Kiermeier, South Australian Research and Development Institute

Dr Alison Small, Commonwealth Scientific and Industrial Research
Organisation

Dr John Sumner, Meat & Livestock Australia



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