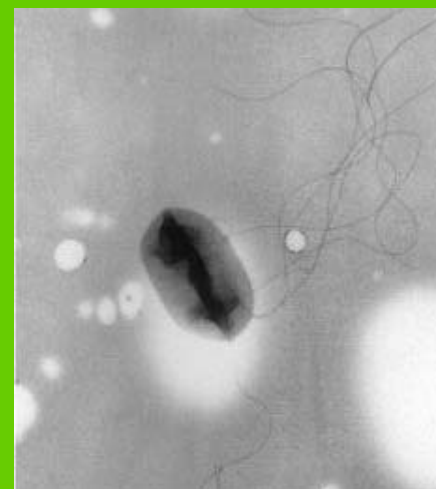


# Post-slaughter control of *Escherichia coli* O157:H7 in New Zealand bobby-veal

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16/10/2007

Acknowledging contributions from all of the AgResearch  
Food Safety Team, Roger Cook and Graeme Jarvis.

[www.agresearch.co.nz](http://www.agresearch.co.nz) or [www.mirinz.co.nz](http://www.mirinz.co.nz)



Farming, Food and Health. **First**

Te Ahuwhenua, Te Kai me te Whai Ora. **Tuatahi**

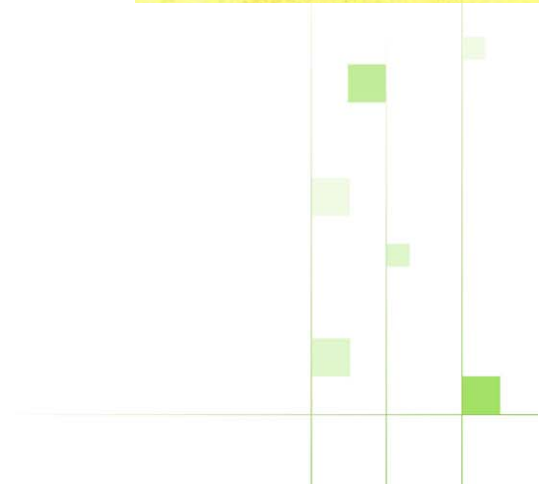
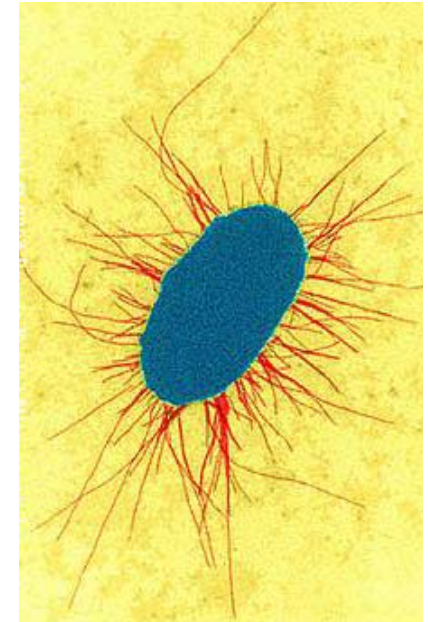


MEAT & WOOL  
NEW ZEALAND

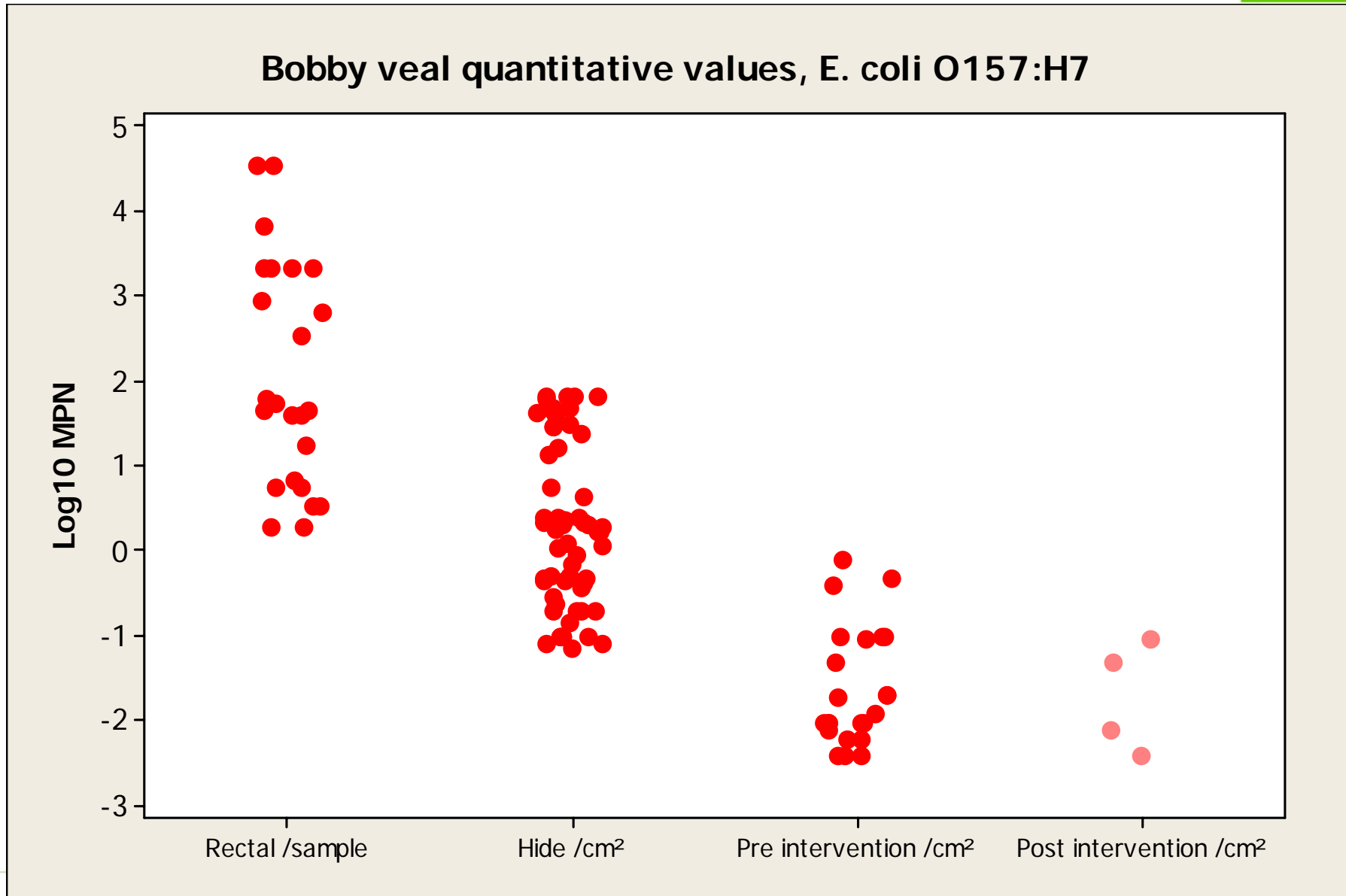
# Escherichia coli O157:H7



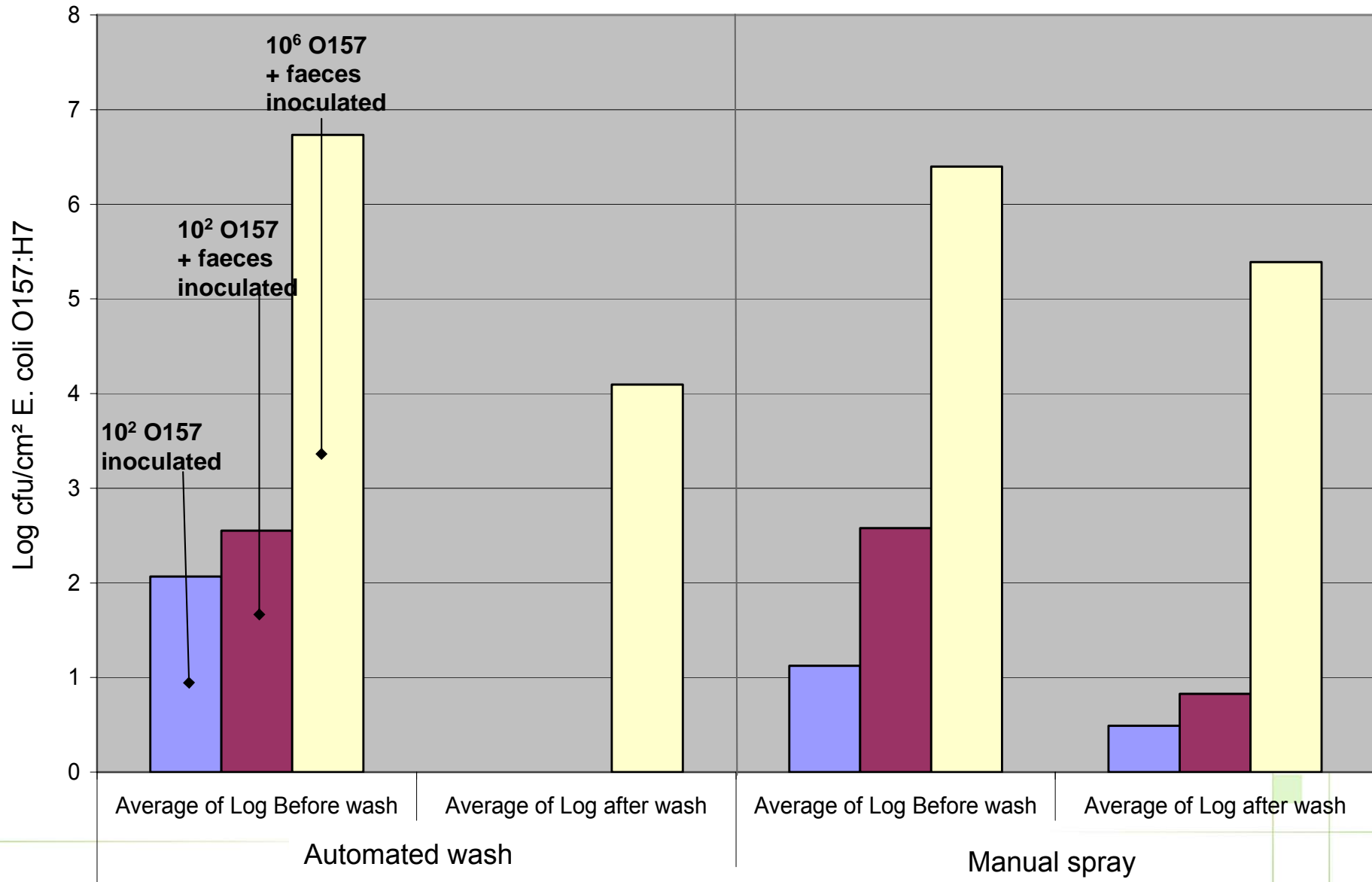
- Shiga-toxigenic *E. coli* (STEC, a.k.a. VTEC, EHEC)
- Declared an adulterant in the US, therefore nil tolerance.
- Do not sporulate, yet display marked resistance to acidity, starvation and cold.
- Infectious dose  $\geq 10$  cells.
- A number of recent outbreaks, recalls of ground meat has increased awareness in U.S. market.
- NZ assurance that beef & veal is free of *E. coli* O157:H7 is currently based on use of antimicrobial interventions and analysis of product.



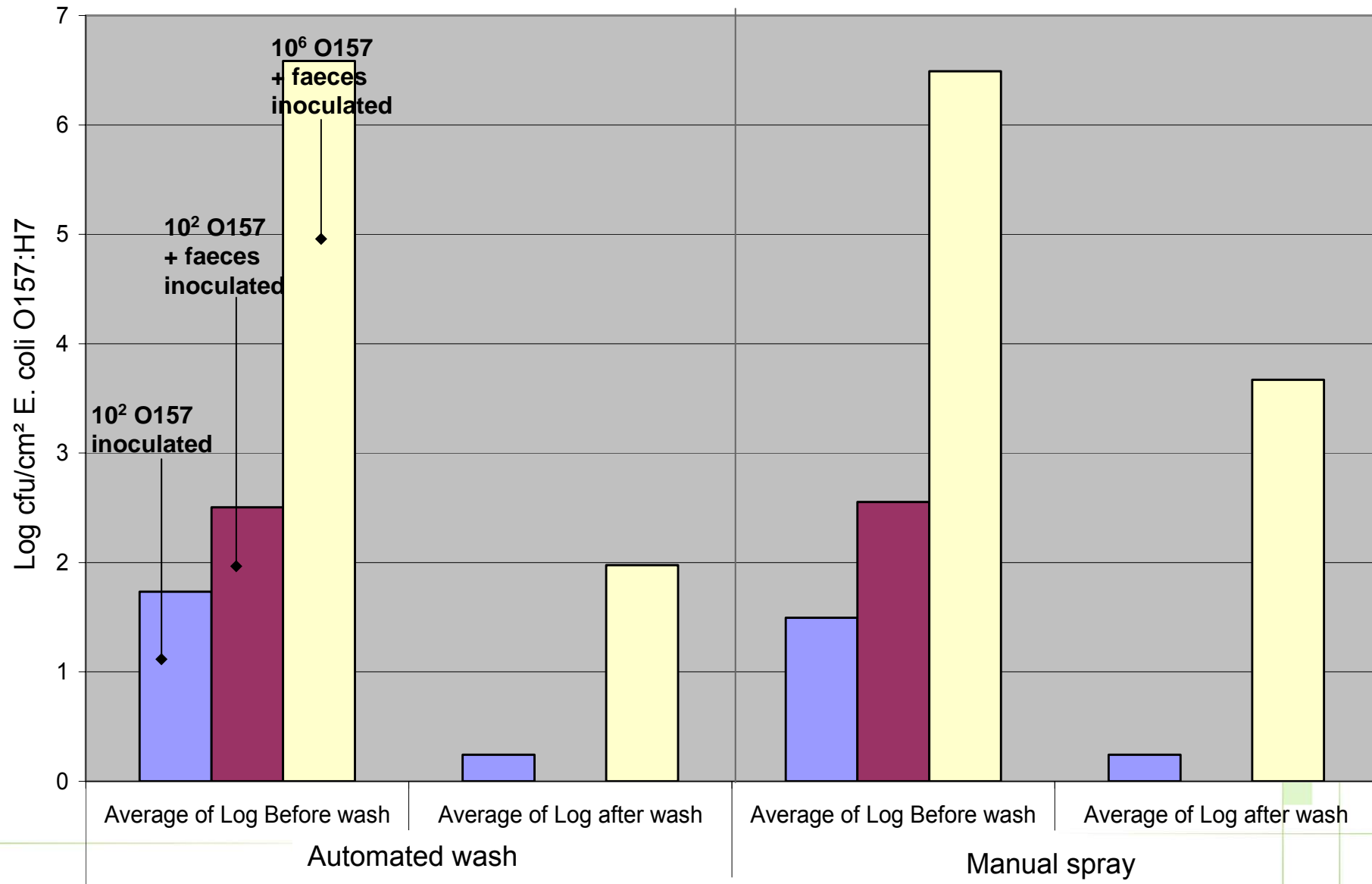
# *E. coli* O157 concentration in industry



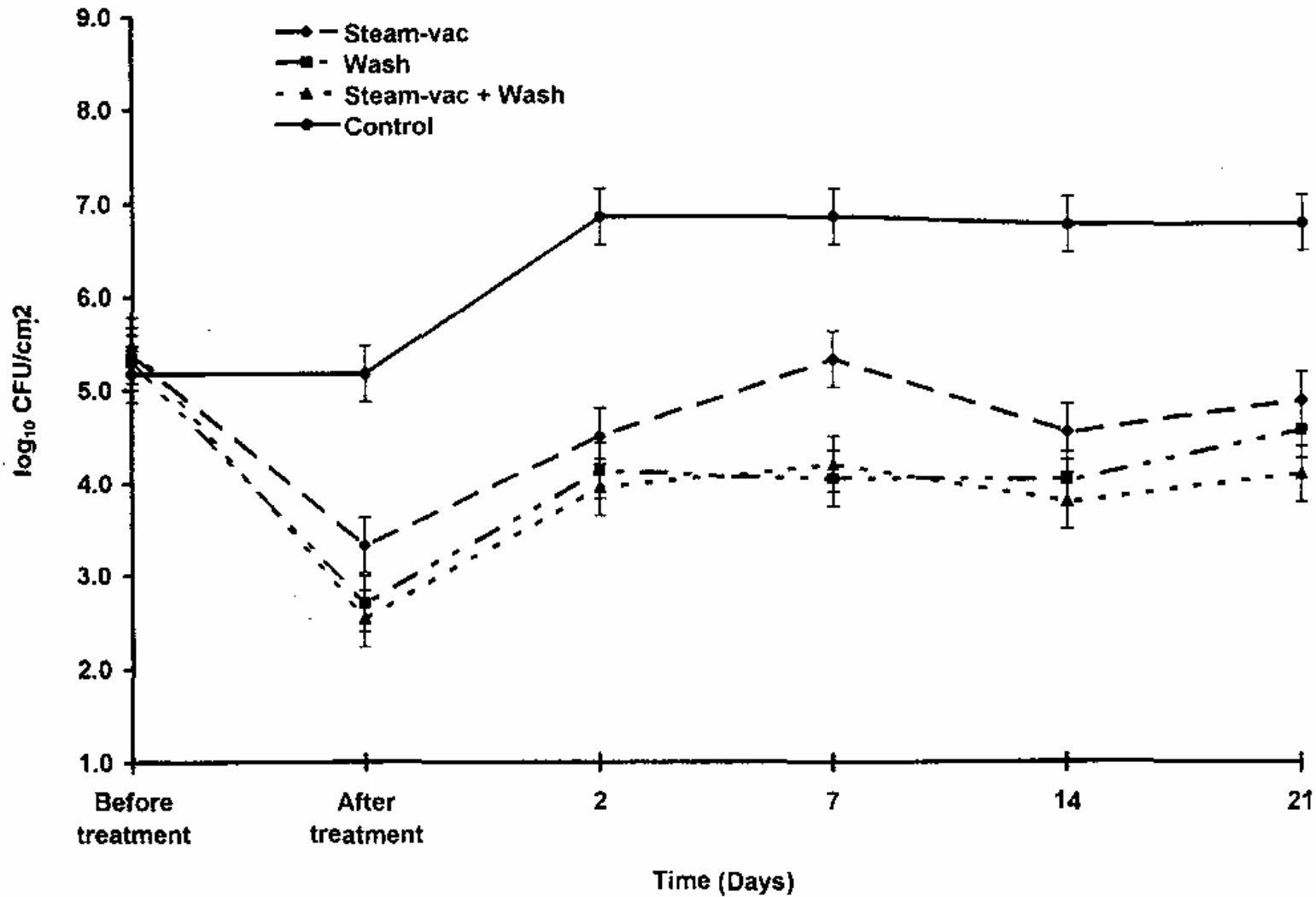
# Peroxy - Acetic Acid (PAA) 180ppm wash



# Acidified Sodium Chlorite (ASC) ~1200ppm



# Steam-vac

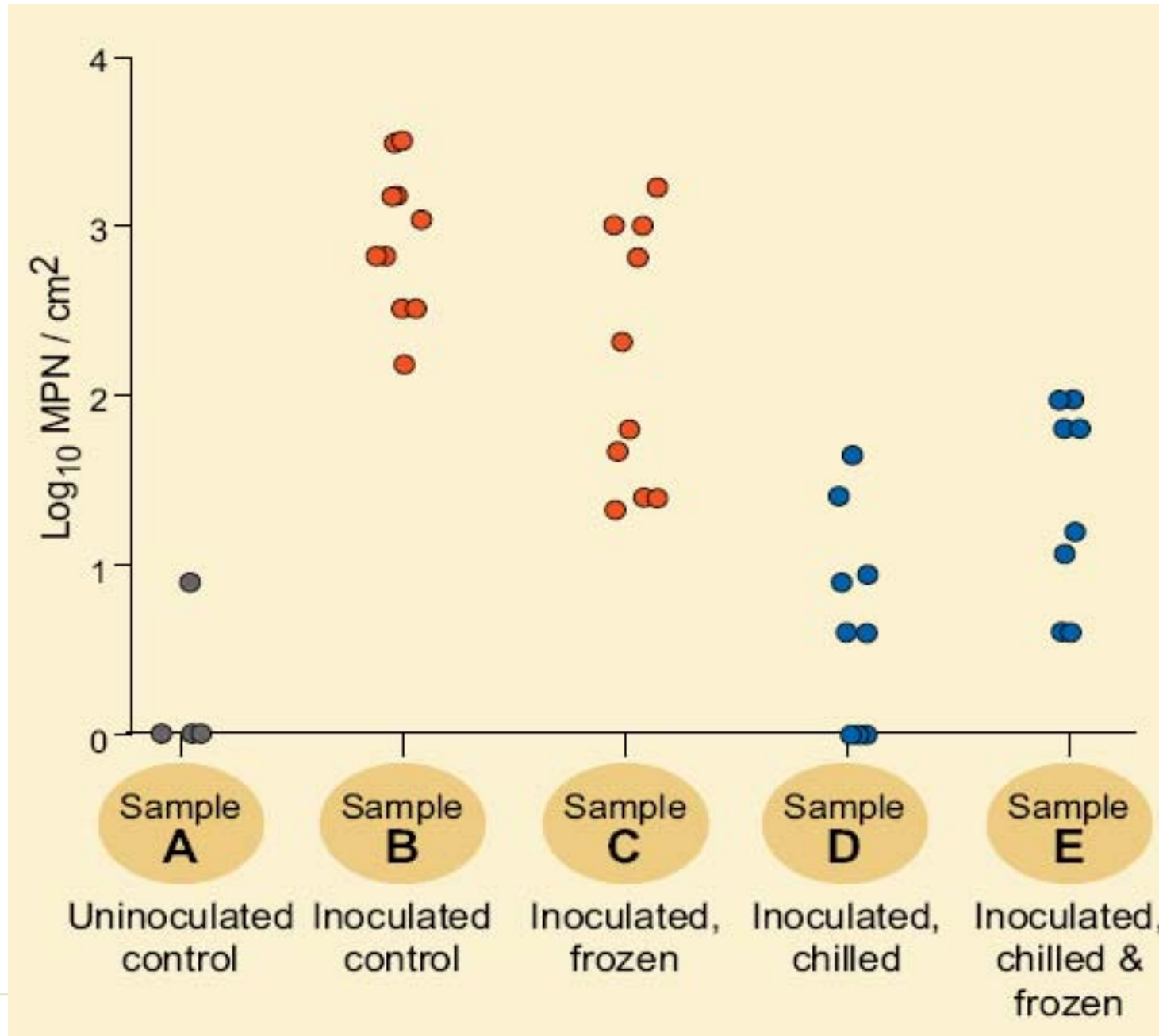


Effects of moist heat interventions on initial levels & subsequent outgrowth/survival of *E. coli* O157:H7.

(Dorsa et al., Journal of Food Protection 60:114-119, 1997)

# Effect of Refrigeration on recovery of E. coli O157:H7

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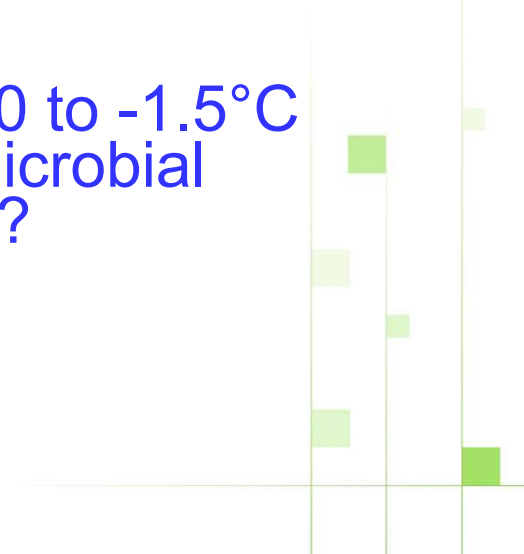


## Effects of refrigeration (2)



1. Work to date considered the effects of starvation (during hide transmission) on the bacteria, but **not chemical interventions prior to refrigeration**.
2. Dykes G.\* found that extended plateaus during freezing were more damaging to *E. coli* O157:H7 cells on meat than shorter ones.
  - Would conditioning hot-boned veal at 0 to -1.5°C prior to freezing induce a similar antimicrobial effect to that observed for cold-boning?

\* (J. Micro Methods 64:266-274, 2006)



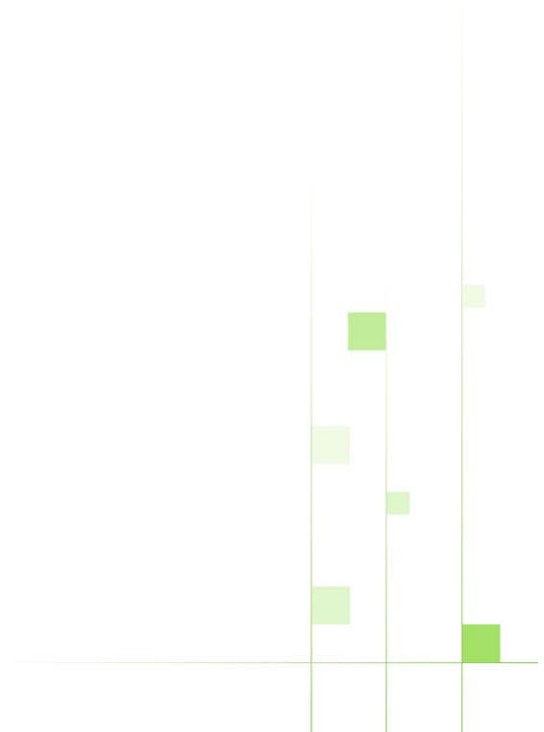


## Other Interventions



### Additional hurdles:

- Hide washing post-slaughter
- Hot water deluge / spray
- Other chemicals:
  - Lactic acid
  - Ozone (water / gas)
  - Chlorine
  - Hydrogen peroxide
- Steam pasteurisation
- BioControl & Biopreservatives



# Conclusions



- Assurance that NZ bobby veal is free of *E. coli* O157:H7 is based on product analysis
- Despite current antimicrobial interventions, industry still faces lost production and delayed shipments through positive results
- Refrigeration may offer a control point for improved assurance
- Further interventions - “multiple hurdles” – are being investigated to reduce the number of positive samples
- DNA technologies may offer greater specificity & reduce the number of “false positives”

