



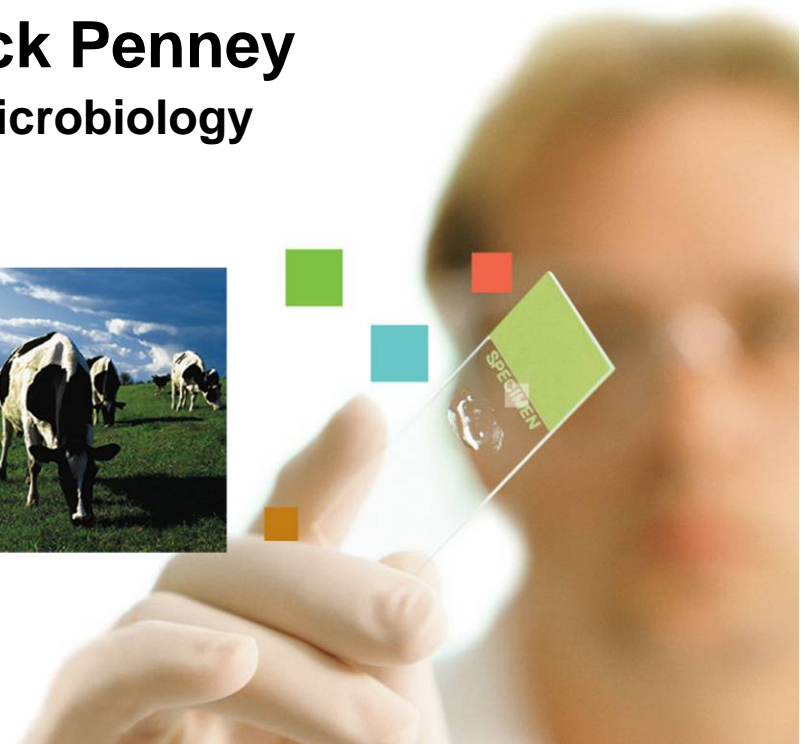
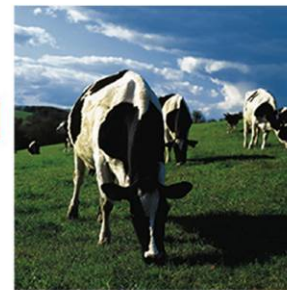
Farming, Food and Health. **First**

Te Ahuwhenua, Te Kai me te Whai Ora. Tuatahi



Antimicrobial interventions on bobby calf carcasses

Guill le Roux & Nick Penney
Food, Metabolism & Microbiology



Summary

- Background
- Interventions summary
- Project Objectives
- Survey results
- Best practice
 - GMP
 - Chemical interventions
 - Steam-vacuum



EQRA - Background



- FSIS and NZ processors detect *E. coli* O157 in bobby veal.
- Introduction of antimicrobial intervention by NZ processors.
- ***E. coli* O157 still detected- MIRINZ Inc/NZFSA funded project**
 - NZ prevalence/numbers for *E. coli* O157 on bobby veal before and during processing and after interventions.
 - Conducted longitudinal risk assessment in collaboration with ESR
 - **Samples check effect of faecal spikes on carcass contamination**
 - **Auditing how plants use interventions**
 - **to evaluate efficacy and use of current interventions**



Interventions used in New Zealand

- **Chemical** (Generic)
 - Peroxy acetic acid (PAA)
 - Acidified sodium chlorite (ASC)
- **Physical** (Targeted)
 - (Trimming)
 - (Water Washing)
 - Steam Vacuum



Project Objectives (MIRINZ Inc)

- **Visually identify** potential areas of contamination
- **Opening cuts** and likely foci for *E. coli* contamination;
- **Verify decontamination procedure** targeting those places,
- **Identify poor practice** against manufacturers instructions.
- Produce a **Best Practice Manual (BPM)**



Interventions used 2006 season

Intervention	Number of users
<i>PAA only</i>	6
<i>ASC</i>	1
<i>Steam-Vac only</i>	7
<i>Combination (SV +PAA)</i>	4
Total	18



Good Manufacturing Practice

- On farm
- Pre-slaughter
- Slaughter & dressing chain
- Faecal containment
- Opening cuts
- Hide removal
- Umbilical & urine
- Inspection & detain



On Farm

- **Weather**
 - Cold / wet affect health
 - mud aids microbial transfer
- **Strip grazing-** muddy conditions
- **Inducing cows** to manage birth timing
 - Calves are smaller and weaker
- **Natural colostrum** withheld from calves
 - No transferred immunity from mother
 - more susceptible to disease & scouring



Pre-slaughter handling

- **Age/size of calves**
- **Induced calves** - smaller and immune compromised
- **Transportation** and on-farm
 - conditions of yards and
 - period held prior to slaughter
- **Pens** and **holding** periods
- **Presentation**
 - **Scours**
 - **mud**



Slaughter & Dressing chain

- **Chain speed** - 4 to 7 per minute
- **Chain length** - short to very long
- **Design**- brand new to old
- **Procedural differences at stations**
- **Knife sterilization**
- **Washing**
 - neck
 - carcass
- **Trimming**- those flaps!



Faecal containment

hides & anal leakage

Blocking anus with:

- **Plastic cones**
- **Paper cones**
- **Towels**
- **Combination cones/towels**
- **None**





Fortunately we handle bobbies!



Opening cuts

The amount of workup and the methods will affect product

- Only opened to brisket
- Opened to belly
- Use of knives vs Flaymaster



Roll back

Workup and skill levels

Use of Paper

Placement on brisket

Wide spreaders to stretch skin on forelegs



Hide removal

Hide puller can include combinations

- Nose roller
- Shoulder puller
- Final puller
- Some manual handling

Some exert pressure on the abdomen, leading to faecal discharge; others create aerosols.



Umbilical & urine

- **Umbilical cord**

Removed potential source of bacteria

- after inspection prior to intervention
- after intervention

- **Urine containment**

Potential contamination of the product

- clip
- cauterize
- pads
- removal by Steam-Vac





Inspection & detain

- Trimming,
- Handling
- Hands on by MAF



Automated Wash with Inspexx 200

Best Performance

- Concentration 180 -200ppm
- Spray volume per carcass 5.0 – 8.0 litres
- Spray pressure 5.5 – 6.5 bar
- Solution temperature > 15oC *
- Spray dwell time (seconds of spray time per head)
4 – 5 seconds



Results with PAA

- Equipment and application
- Targeting correct area
- Correct distance of spray nozzle from carcass
- Spray pressure, timing and volume
- Records, maintenance
- Process failure and backup





Specific problems at some plants

- Flaps shadowing ribcage
- Doubling up of carcasses
- Timing of spray



Acidified sodium chlorite

- **Concentration** (ppm) 1140 - 1260ppm
- **pH** of activated ASC 2.3 to 2.9
- **Spray pressure** (bar) 4.7 bar at 10 - 15cm distance
- **Volume** applied per carcass 250 mL
- **Solution temperature** > 15°C *
- **Dwell time** (per carcass) 15 seconds



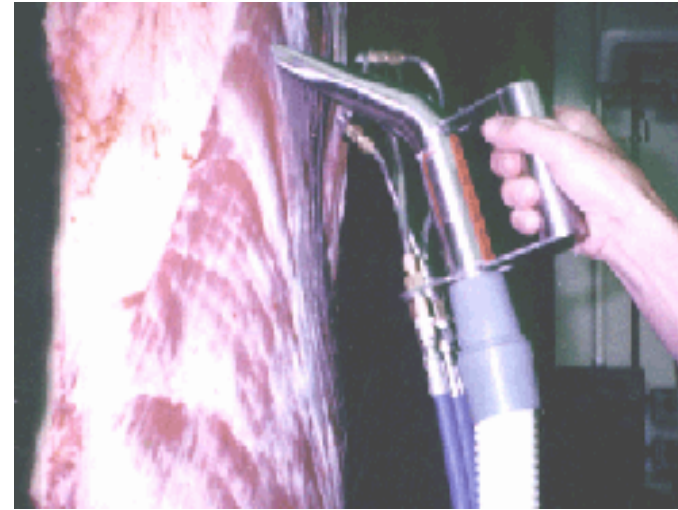
Results with ASC

- One plant only
- Only manual applications
- Handled correctly



Steam Vacuum

- Steam temperature **>125C**
- Steam pressure **3 bar**
- Vacuum at nozzle **< -5mm Hg**
- Water temperature at carcass **95oC**
- Dwell time (seconds per carcass) **15 seconds**



Important operating concerns

- **Not used to remove**
 - Faecal matter, ingesta or milk
 - defects such as open abscesses, septic bruises grease or parasitic lesions (See MAF OMAR).
- **Maintenance of optimal settings** is essential for maximal efficacy.
- **Efficiency depends on**
 - **Number of passes** and
 - total contact time
 - Area targeted

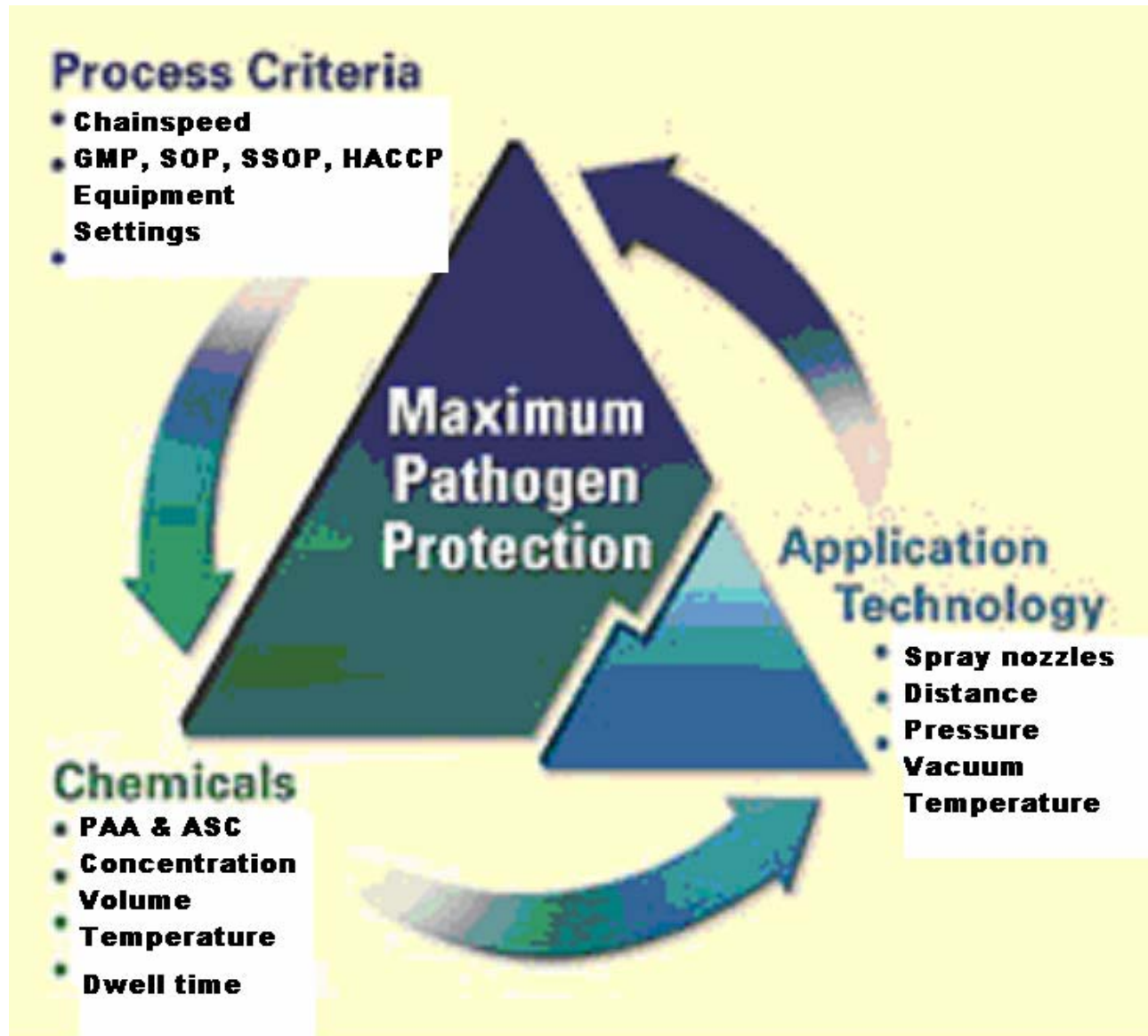




Specific problems at some plants

- NMD sites targeted and not y-cut and bung
- Chain speed too high to ensure prolonged contact
- Shape of vacuum head is incompatible with that of leg





Acknowledgements

- MIRINZ Inc for funding
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- All plants visited – thank you!
- Plant where we took photos
- Rest of team Yi, Katharine, Shelley, Ben, Helen
 - (the latter three not photographed)

