Birds, Bacteria & Baselines

Managing Contamination Through Chain to Improve Public Health Outcomes
Presentation Outline

• Who is Safe Food Production Queensland
• Poultry Meat Food Safety
• Background to Implementation
• Baselining and Benchmarking
• Testing the Baseline Model and Microbiological Surveys
• Public Health Outcomes
• Conclusions and Future Directions
Who is Safe Food Production Queensland?

- Based in Brisbane, Australia
- Established in October 2000 under the Food Production (Safety) Act 2000
- Statutory body reporting to the Queensland Minister for Agriculture, Fisheries and Forestry
- Aims to promote and protect food safety in QLD’s primary production sector
Who is Safe Food Production Queensland?

- State government food safety regulator responsible for meat, dairy, seafood and eggs.

- Vision:
  - Consumers, both at home and abroad will have confidence and trust in the integrity of the food safety control system and that the highest international standards are applied in the agri-food sector.
  
- SFPQ is as an influential agent for change putting a culture of food safety at the heart of every accredited food business in Queensland.
Poultry Meat Food Safety

- Microbiological contamination is the most significant public health risk associated with poultry meat.
- High mechanisation and large volumes may potentially translate to greater risk.
- Food businesses are responsible for maintaining effective food safety management systems.
- Traditionally, control of microbiological risk has been heavily reliant upon chemical interventions (e.g. chlorinated washing/chilling).
Poultry Meat Food Safety

Campylobacter jejuni

Salmonella enterica subsp.
National Standard 4.2.2

- Requirement for national regulatory framework to improve traceability and control of food safety hazards through the production and processing chain.
- Public health concerns noted over a steadily increasing rate of Campylobacteriosis/Salmonellosis linked to poultry meat over a prolonged period.
SFPQ’s Implementation of Standard 4.2.2

- Evaluate the effectiveness of current food safety control systems within this baseline.
- Engage with industry to develop best practise procedures and implement requirements under the new standard.
- Create a through-chain baseline that identifies most effective microbiological control measures.
- Evaluate and review the effectiveness of the implemented changes within the system.
Development of Baseline

- Mapping all of Production Points in the supply chain
- Develop specific standard operating procedures were developed around the four verification points based upon Std 4.2.2.
- Each SOP provided direction around:
  - Task descriptions
  - Relevant skills and knowledge required
  - Validation and monitoring of controls
  - Corrective actions required
Baseline Development

The Primary Production and Processing (PPP) Standard for Poultry Meat (Standard 4.2.2)

SOP 5
Washing and Chilling

SOP 6
Grading and product assessment
Further Processing Boning / Packing
Final inspection

SOP 7
Storage

VP 3
VP 4

CONSUMER

Distribution
Retail Sale

August 2015
Agreed Industry Targets

**SOP Industry-agreed targets:**

- Feed withdrawal – 8-12hrs
- Spin wash/chill overflow - >5ppm FAC; 4-7pH; temperature <4°C
- Microbiological targets - <4 $\log_{10}$ CFU/carcase *Campylobacter*; <100 MPN/carcase *Salmonella*
Managing the front of the system

EXAMPLE – SOP for Bird Receival

- Ante-mortem Inspection of Poultry
- Removal of unhealthy or diseased poultry
- Control of medication or organic or inorganic residues
- Approved Suppliers
- Feed withdrawal parameters
- Welfare
Managing de-contamination

EXAMPLE – SOP for Carcase Wash Spin Chill

• Monitor free chlorine levels at spin chiller outlet
• Monitor pH levels
• Monitor ORP Levels
• Product temperature
• Monitor water temperature
Managing Systems (cont.)

SOPs should also include:

• Monitoring of compliance - what, how, when and by who
• Training
• Validation
• Corrective Action
Verification of Baseline by Microbiological Sampling

• To examine the effectiveness of the developed baseline, a microbiological study was undertaken to assess industry performance.

• A quantitative measure of the implementation process
  • Microbiological control barriers
  • Verify industry targets in developed SOPs
Methodology

- 8 processors who process 98% of the product in Queensland
- Four points along the processing chain sampled:
  - Caecal samples
  - Post-evisceration
  - Post-washing
  - Final product
- One sample per shift per day
- Birds from same farm/shed collected from each point
Results

• All plants sampled
• Birds entering plants carried significant loads of pathogenic bacteria in their gastrointestinal tract:
  • *Campylobacter* – 98.7%
  • *Salmonella* – 18%
• Although 6 of 8 plants had a reduction in *Campylobacter* at various points;
• The reduction could not be maintained
Results (cont.)

• Implementation
  • Reduction maintained through-chain; 4 of 8 plants achieved >97% through-chain reduction in *Campylobacter*
  • Consistent reduction of *Campylobacter* - average final concentration of *Campylobacter*; 4.16 log\(_{10}\) CFU/carcase (vs. FSANZ national mean 4.79 log\(_{10}\) CFU/carcase)
  • Two plants achieved <4 log\(_{10}\) CFU/carcase *Campylobacter* - not previously obtained
  • Five plants achieved <100 MPN/carcase *Salmonella* which was within target.
  • Improvements noted around process controls at strategic verification points through the processing chain.
Results to Date

• All facilities in most instances can now demonstrate levels that are less than, or equal to the industry target of 4 $\log_{10}$ CFU/carcase on final product. There are some exceptions to the rule.
• All plant facilities can demonstrate mean carcage counts that met or exceeded the indicated industry target of 100 MPN/carcage.
Campylobacter notifications / 100,000 population in QLD, 1991-June 2015
Salmonella notifications in QLD, 1991-June 2015

Implementation of Standard 4.2.2
Conclusions

• Poultry meat production in Queensland demonstrates improvement in levels of *Campylobacter* and *Salmonella* to those reported previously but there exists a high degree of variability between facilities.

• Much of this variability may be accounted for in the differential processing methods employed post-evisceration, such as washing or chilling processes. Additionally, chickens for processing also may be sourced from a number of properties, or farms supplying more than one processor.

• Continued engagement with industry and improved food safety culture within their facilities has shown that the industry targets can be achieved.

• However there is a need to maintain consistent monitoring; with the introduction of the agreed electronic reporting across the agreed targets, this should give more confidence with the system.
Thank you