

## Use of Process Mapping in Poultry Slaughter Systems to Support Multiple Hurdle Approach to Achieve Microbiological Reductions



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## What is a Hurdle?

Microbiologically, a hurdle is a barrier to microbial growth or, in this case, a way of removing or killing microorganisms



## What is a Hurdle?

Multiple hurdles is what you do when a single intervention or hurdle doesn't get you where you need to go!

(Lone Ranger is the only one with Silver Bullets and he doesn't work in the chicken industry!)



## Hurdle vs. Intervention (my view)

- **Intervention:** A treatment designed to produce a measurable level of reduction in population of a target microorganism.
- **Hurdle:** A step in the process that minimizes contamination, reduces, or prevents situation from getting worse!

**Process Mapping, or Line Profiling:**  
**(poultry)**

**Sampling at selected points in the process where contamination levels can be assessed for the purpose of measuring microbiological status of birds against a specific target organism or class of organisms.**

**The information presented is based on data gathered by multiple companies in multiple facilities with multiple lines per facility (total 17 plants).**

**The Data is derived from studies with different sampling frequencies, sampling points, interventions and target organisms.**

## Potential Sampling Points (the process)

- Pre Scald
- Post Scald
- Post Pick
- Post Wash
- Post Rehang
- Post Evisc
- Pre Cropper
- Pre IOBW
- **Post IOBW (1 & 2)\***
- **Post OLR\***
- **Post Chill\***
- Chiller water
- After Post Chill Intervention

\* Common sites for all plants

## Organisms:

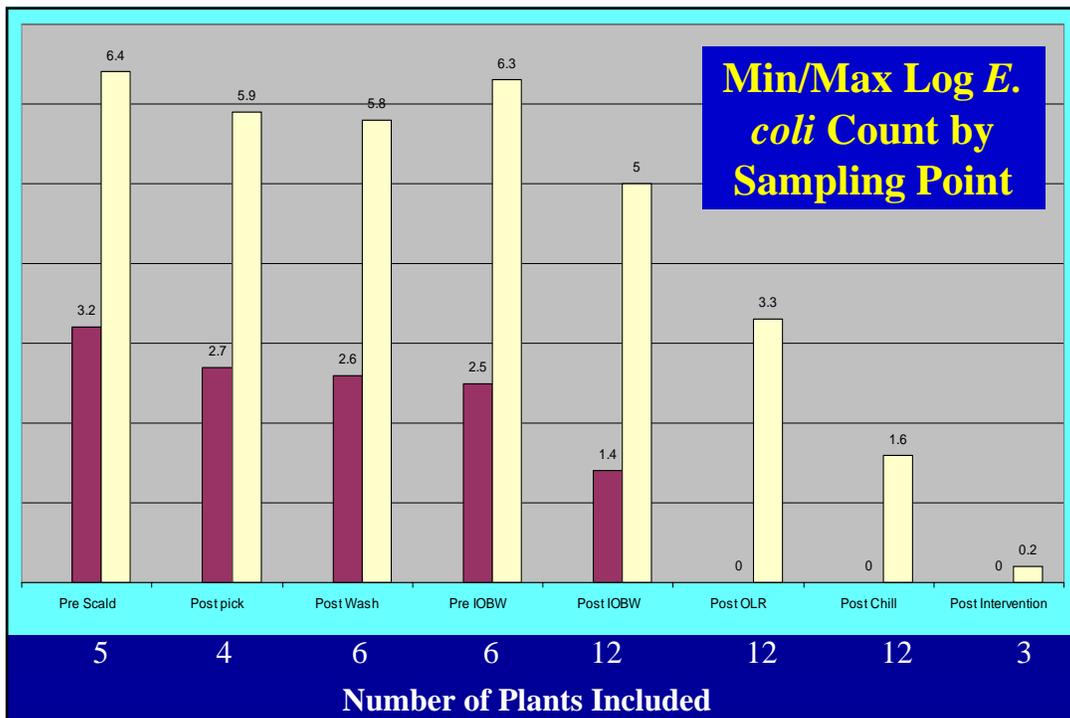
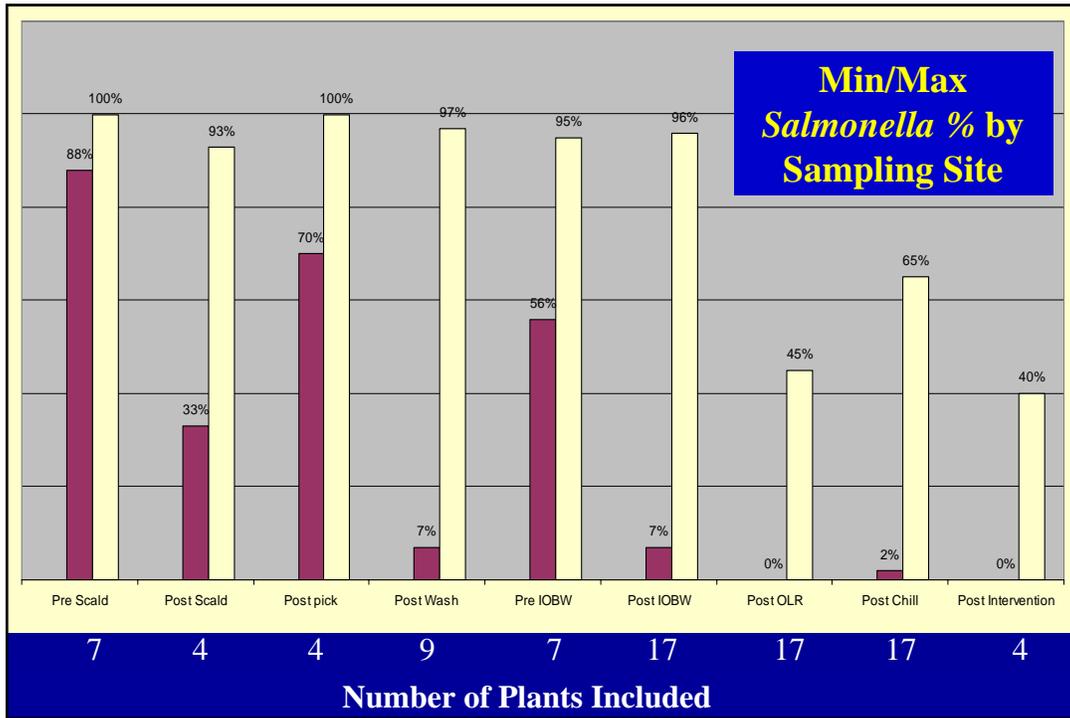
- ***Salmonella (+/-)\****
  - ***E. coli\****
  - Total Coliforms
  - APC
  - ***Campylobacter***
- \* Common to all

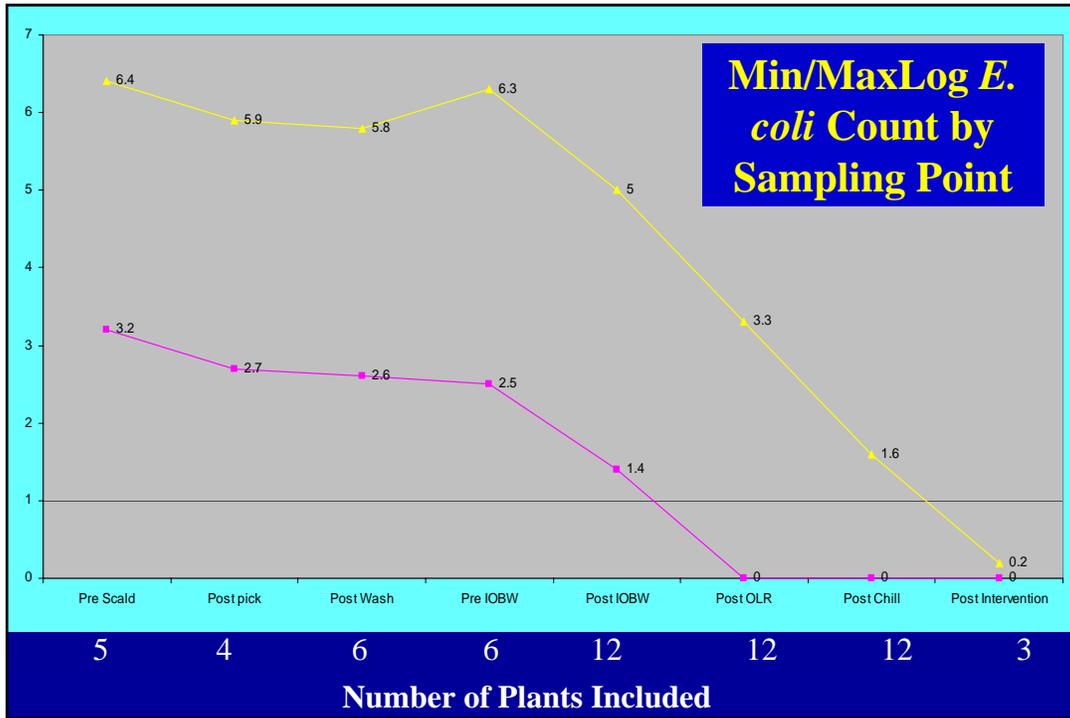
## **Interventions Used Included:**

- **FreshFx<sup>®</sup>**
- **Chlorine Dioxide**
- **Cecure<sup>®</sup> (Cetylpyridinium Chloride)**
- **Sanova<sup>®</sup> (Acidified Sodium Chlorite)**
- **Inspexx<sup>®</sup> (Peroxyacetic acid-based)**
- **Chlorine (20-50 ppm)**
- **Sodium Acid Sulphate (pH < 6.5) + 3-5 ppm FACL<sub>2</sub>**

**So, with such differences plant to plant, I won't attempt to draw any overall conclusions regarding process capabilities.**

**BTW, no data was submitted regarding quality aspects of using any one particular antimicrobial**





## So why go to all this trouble?

- Process Mapping provides the baseline for assessing microbiological impact of anticipated changes
- Will show areas where immediate improvements can be made
- Will provide basis for judging the effect of individual process adjustments.

## Summary

- **Some preliminary observations**
  - No one intervention was universally effective
  - Still have a good deal of unexplained (unexplainable??) variation in processed birds
    - Is this due to the birds?
    - Process variables not yet defined?

## Summary

In general, *Salmonella*, *E. coli*, Coliforms, *Campy* and APC declined throughout the slaughter process with two notable exceptions!

**Opportunities:**

- Picking
- Chilling

## Summary

- Caution is urged when comparing *Salmonella* prevalence to reductions in counts of other indicators
- WE NEED AN INEXPENSIVE WAY TO ENUMERATE SALMONELLA !

