

Peroxyacids in Meat and Poultry Processing

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Peroxyacid Use In Meat and Poultry Processing

- **Topics:**
 - **Chemistry**
 - **Environmental impact**
 - **Regulatory approvals**
 - **Affect on meat and poultry**
 - **Application areas**
 - **Application results**

Peroxyacid Basics

- **What is it?**
 - Antimicrobial solution for use on meat, poultry and food contact surfaces.
 - Mixed peroxyacid chemistry
 - Derived from acetic acid, octanoic acid and hydrogen peroxide



Peroxyacid Environmental Impact

- **What is the environmental impact?**
 - **Peroxyacids**
 - reduced to parent acids (acetic and octanoic) and oxygen
 - **Hydrogen Peroxide**
 - reduced to water and oxygen

Peroxyacid Regulatory Approvals

- **What is Government's view?**
 - **Direct Application to Meat and Poultry as a secondary direct food additive.**
 - **21 CFR 173.370**
 - **Processing aid - does not become a component of food**
 - **USDA exemption from labeling**
 - **Food Contact Surface Sanitizer**
 - **21 CFR 178.1010**

Peroxyacid Affects on Meat and Poultry

- **Thiobarbituric Acid Value (TBA)**
 - no affect on TBA values for raw or cooked meat.
- **Fatty Acid Lipid Profile**
 - no affect on fatty acid distributions for raw or cooked meat.
- **Organoleptic**
 - no impact on flavor, odor, color

Peroxyacid Application Areas

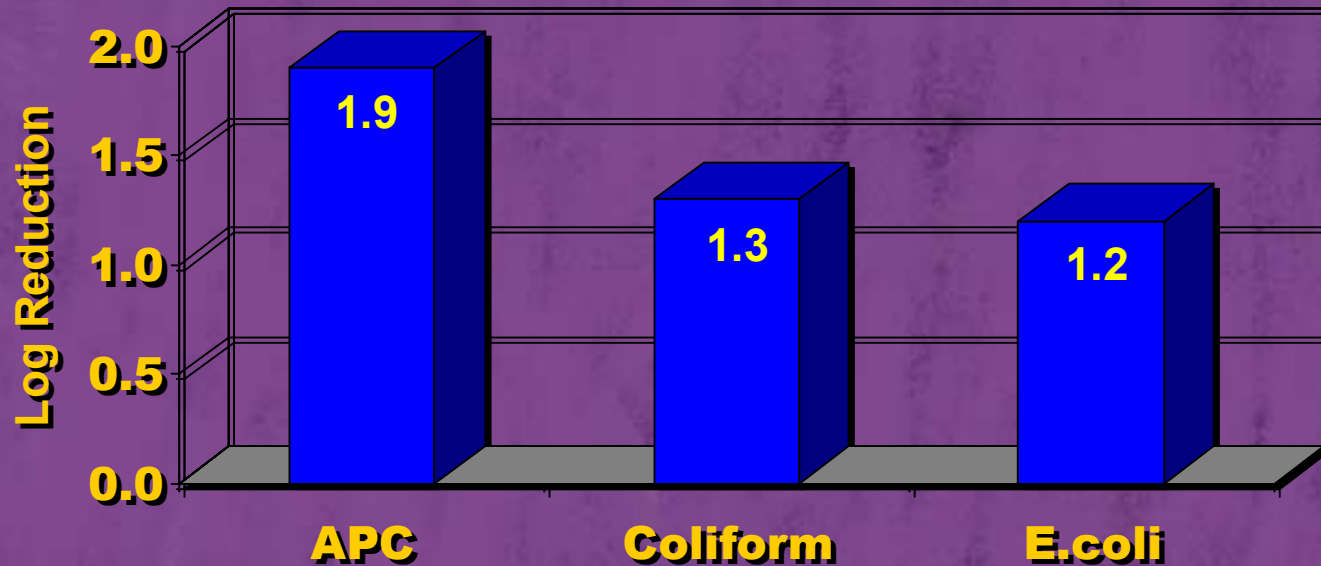
- **Where can peroxyacids be applied?**
 - **Meat and Poultry**
 - **Spray cabinets (hot or cold carcasses)**
 - **Chillers (poultry)**
 - **Spray chill systems (meat)**
 - **Parts, trim and organs**
 - **Food Contact Surfaces**
 - **Conveyor belt treatment**

Peroxyacid Treatment - Pork

Cold Side Application (Pork study)

200 ppm Peroxyacids; 110F;

**Log Reductions Versus Species
(Untreated - Peroxyacid Treated)**

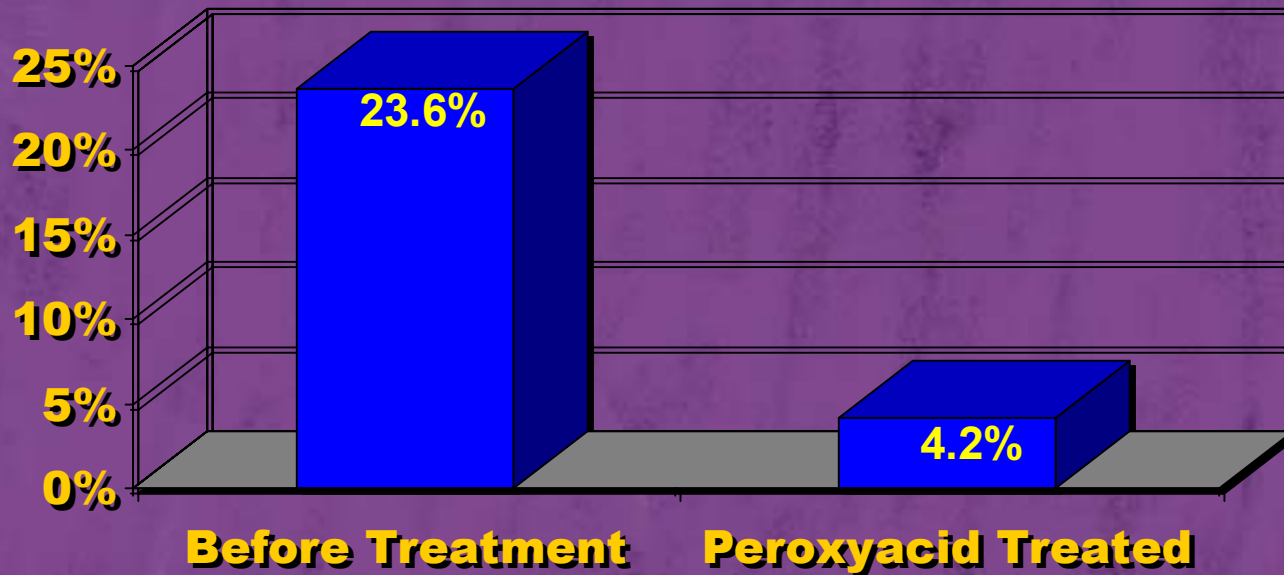


Peroxyacid Treatment - Pork

Cold Side Application (Pork study)

200 ppm Peroxyacid; 110F;

Percentage of Confirmed Salmonella Positives

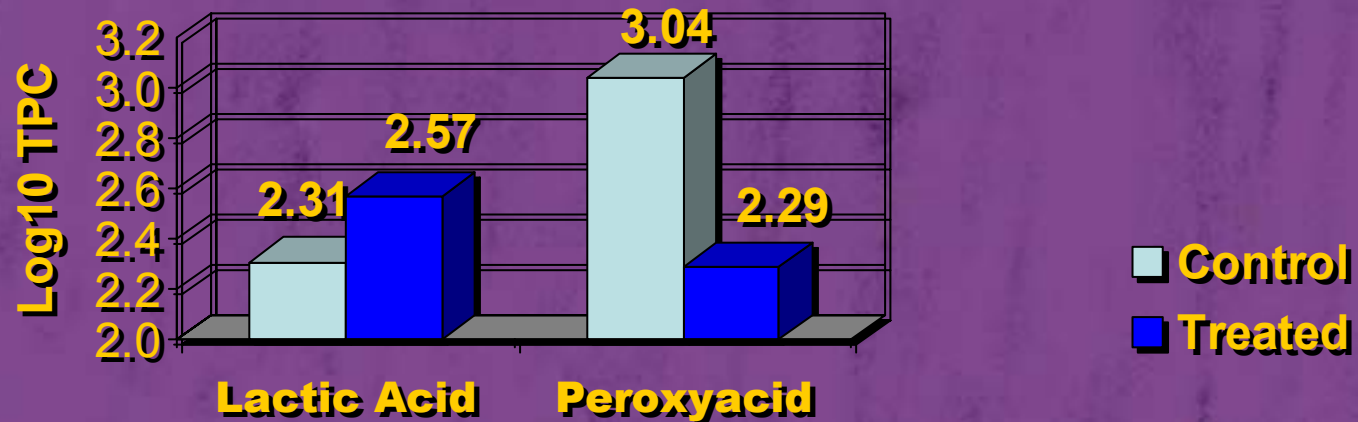


Peroxyacid Treatment - Beef

Hot Side Application (Beef study)

200 ppm Peroxyacid; 110F;
2.0% Lactic Acid; 70F;

Log₁₀ Total Plate Counts



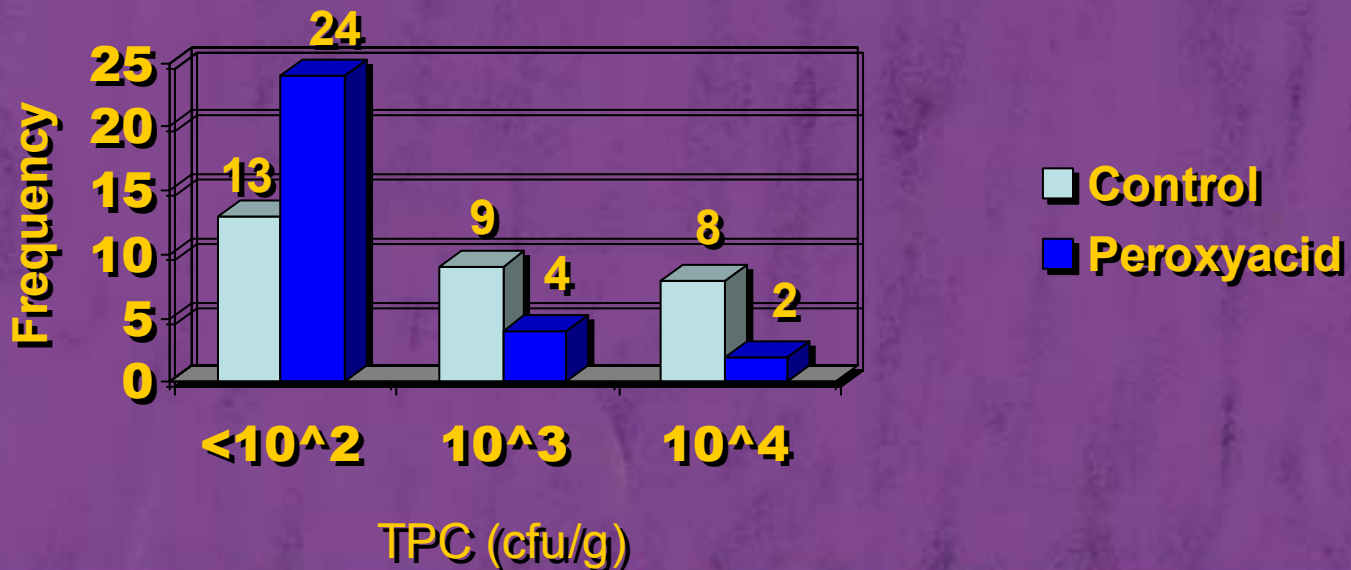
Lactic Acid Results Not Statistically Significant

Peroxyacid Treatment - Beef

Hot Side Application (Beef study)

200 ppm Peroxyacid; 110F;
2.0% Lactic Acid; 70F;

Frequency Plot

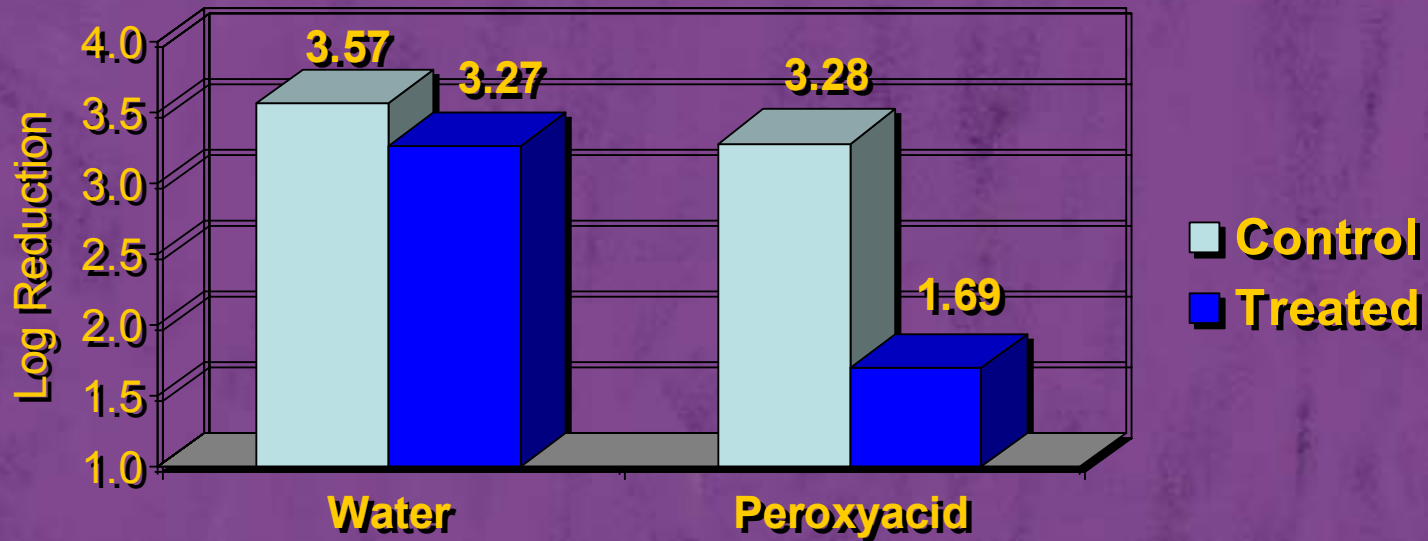


Peroxyacid Treatment - Beef

Parts (Beef Tongue Study)

200 ppm Peroxyacid; 110F;
Water; 110F

Log Reduction Aerobic Plate Count (APC)

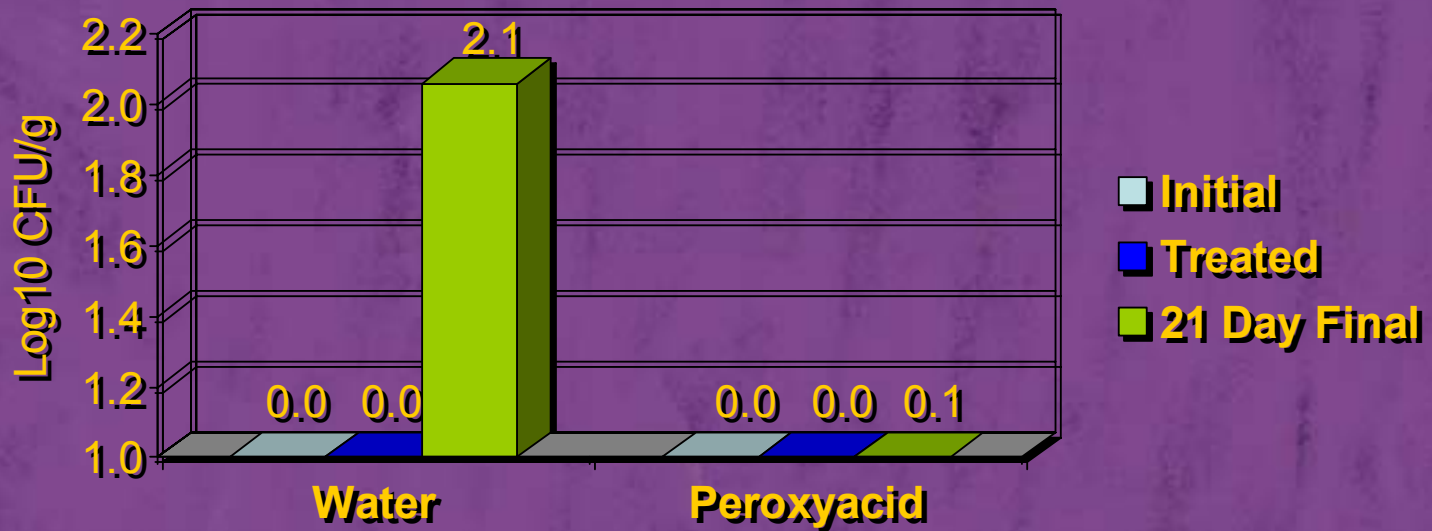


Peroxyacid Treatment - Beef

Parts (Beef Tongue Study)

200 ppm Peroxyacid; 110F;
Water; 110F

Total Coliform Counts

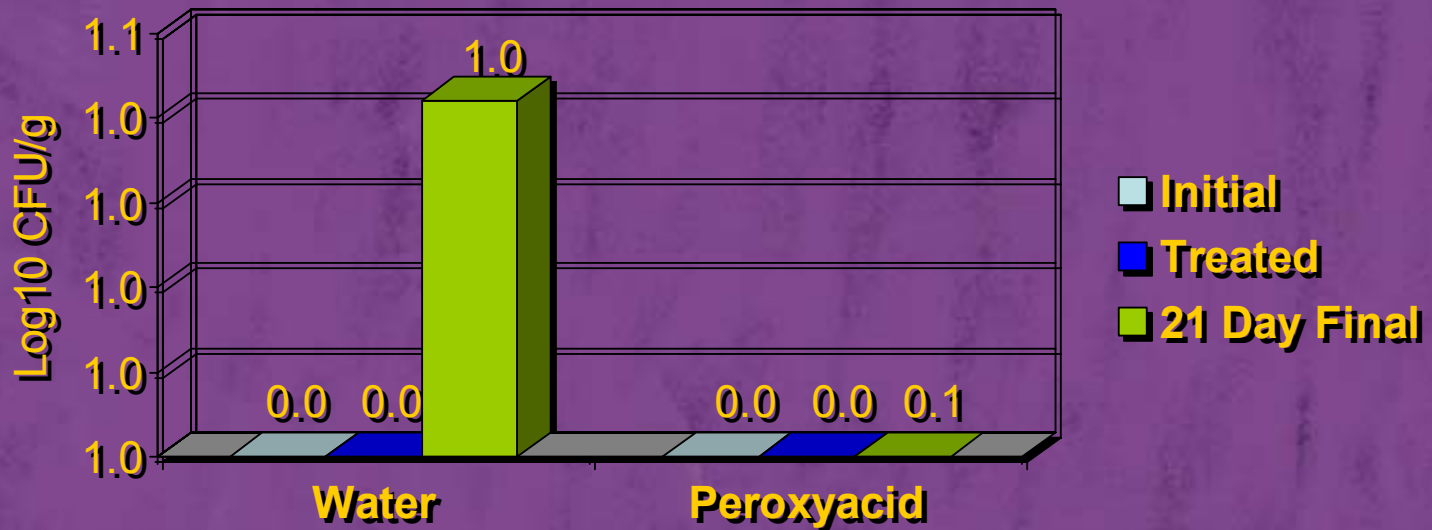


Peroxyacid Treatment - Beef

Parts (Beef Tongue Study)

200 ppm Peroxyacid; 110F;
Water; 110F

Generic E. coli Counts

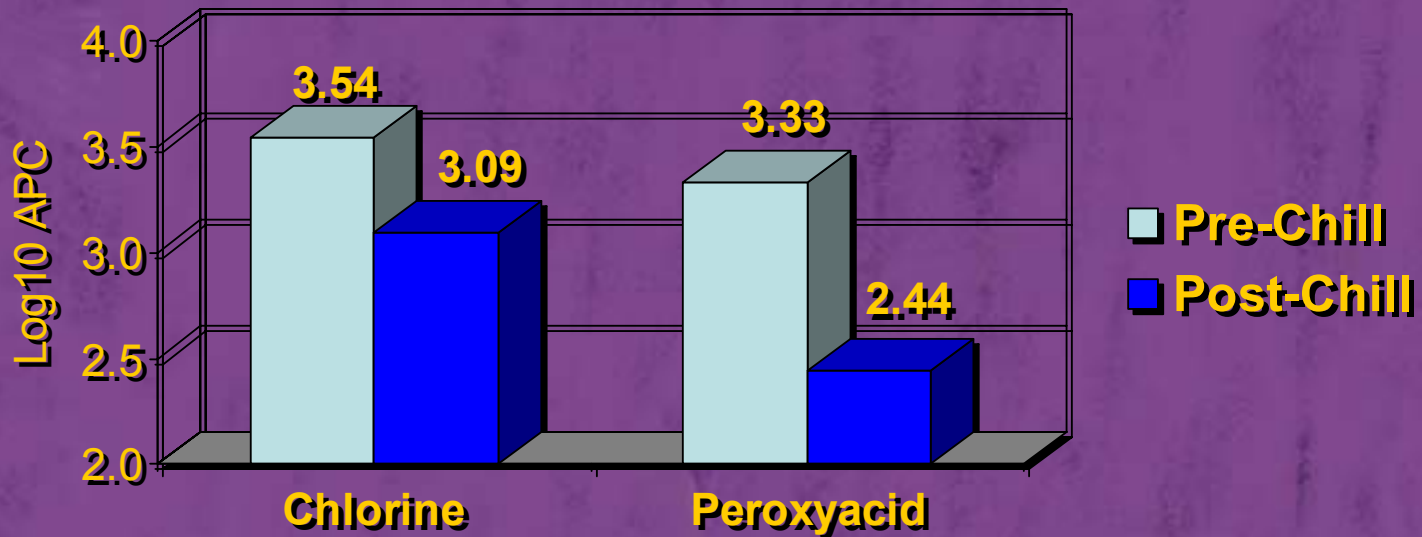


Peroxyacid Treatment - Poultry

Poultry Chiller Treatment - Study "A"

8 ppm Peroxyacid; 25 ppm Chlorine;

Log₁₀ APC (CFU/mL)

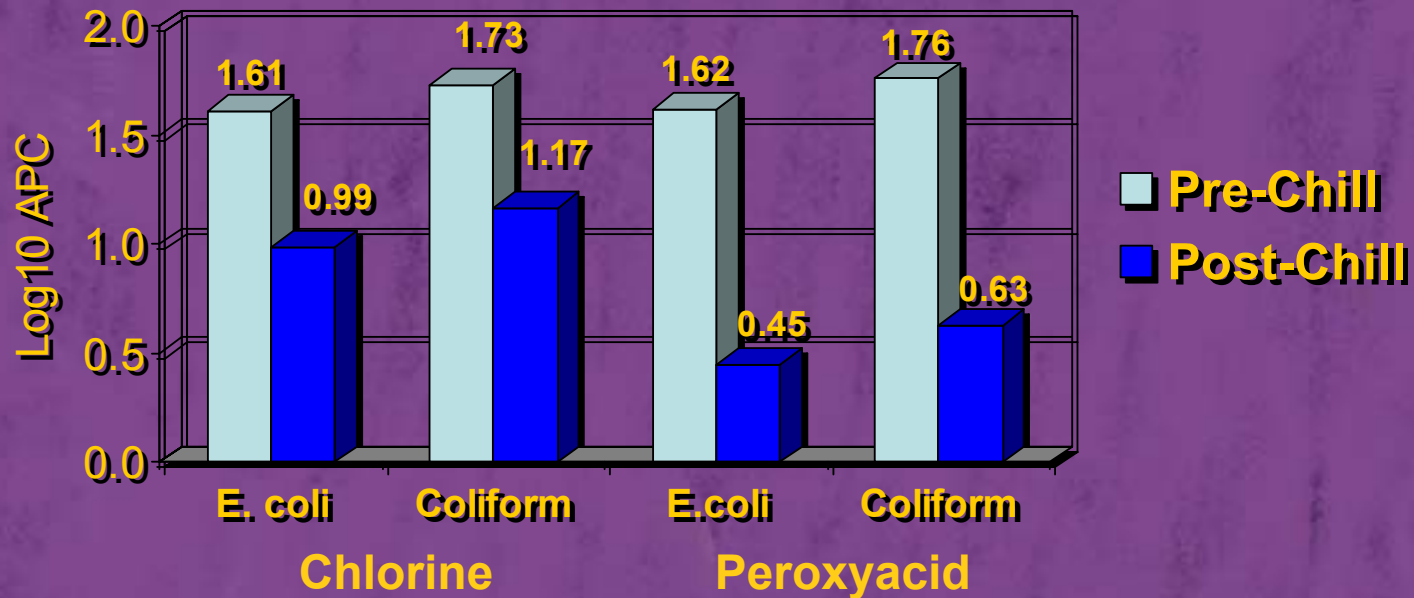


Peroxyacid Treatment - Poultry

Poultry Chiller Treatment - Study "A"

8 ppm Peroxyacid; 25 ppm Chlorine;

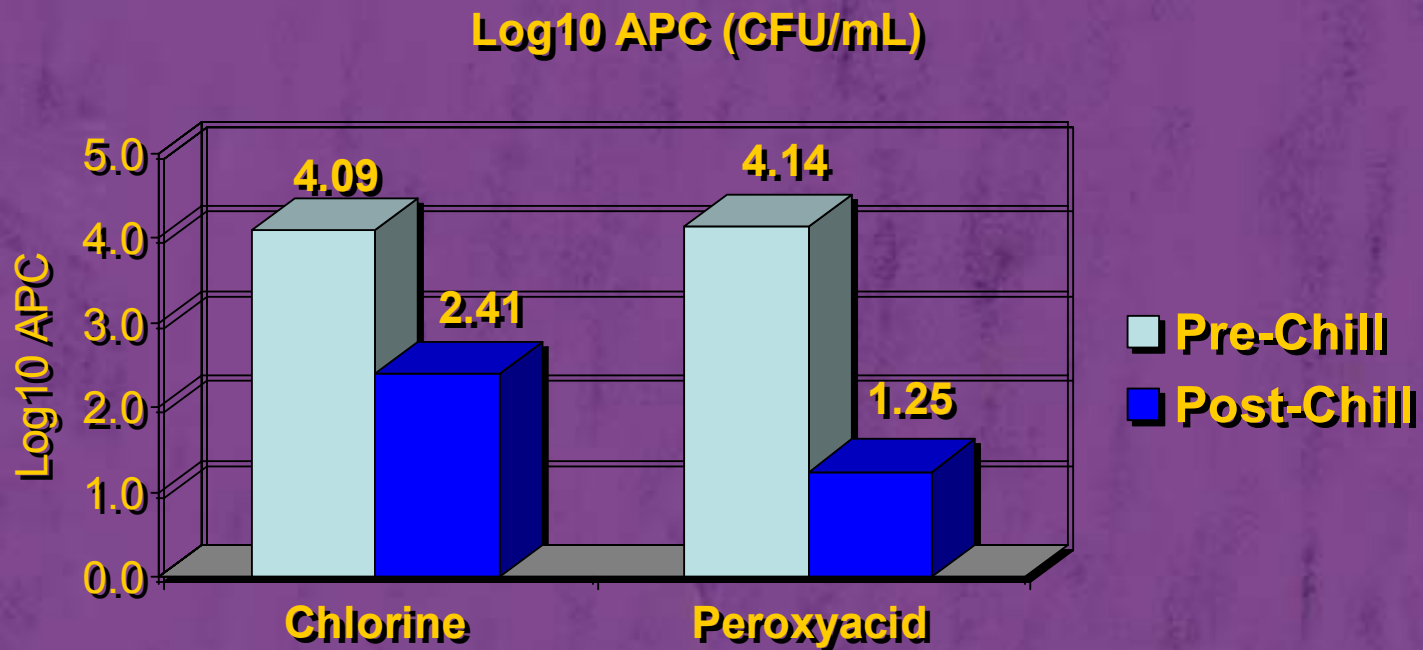
Log10 Total Coliform and E. coli (CFU/mL)



Peroxyacid Treatment - Poultry

Poultry Chiller Treatment - Study "B"

25 ppm Peroxyacid; 50 ppm Chlorine;

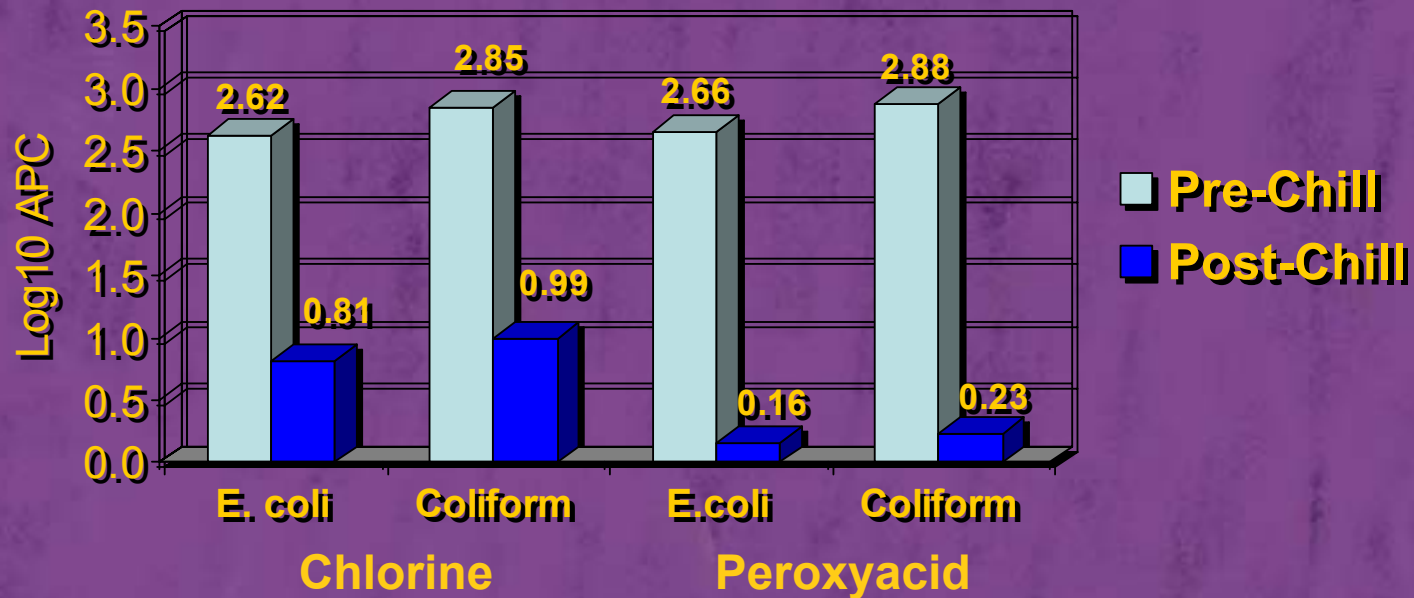


Peroxyacid Treatment - Poultry

Poultry Chiller Treatment - Study "B"

25 ppm Peroxyacid; 50 ppm Chlorine;

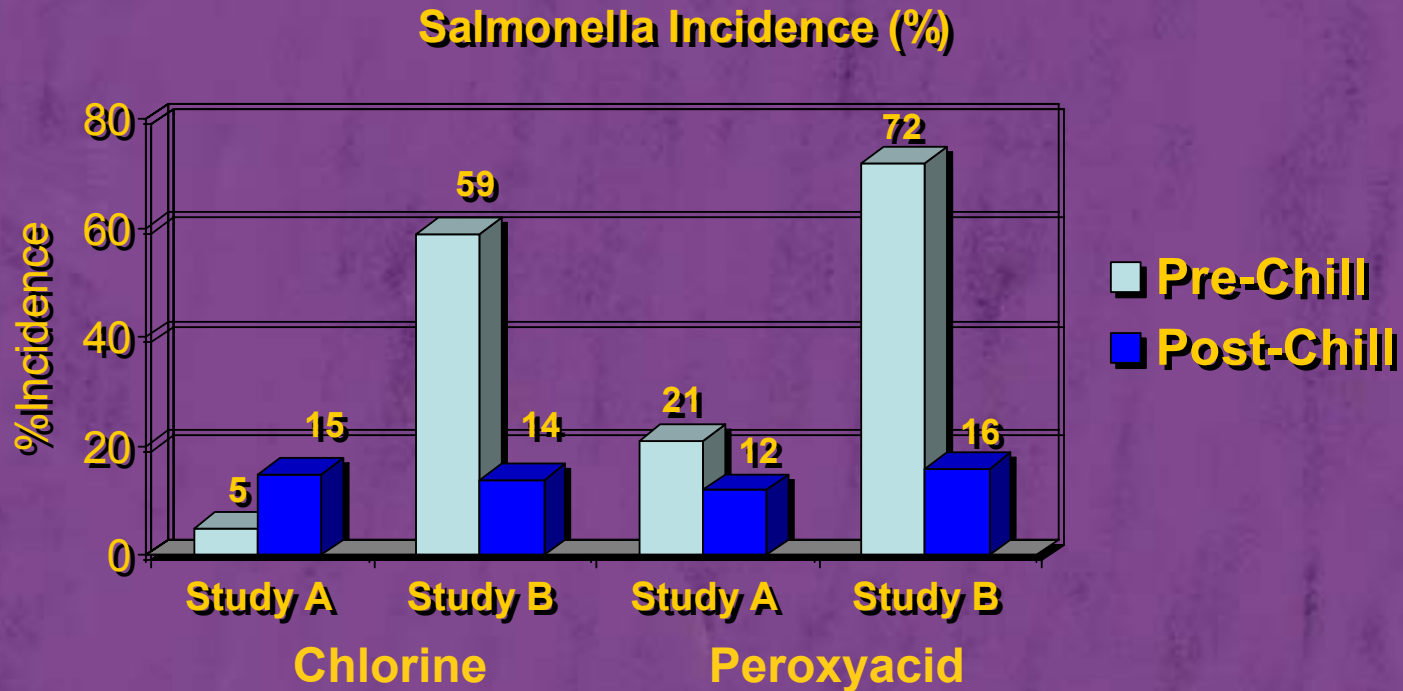
Log₁₀ Total Coliform and E. coli (CFU/mL)



Peroxyacid Treatment - Poultry

Poultry Chiller Treatment - Salmonella Incidence

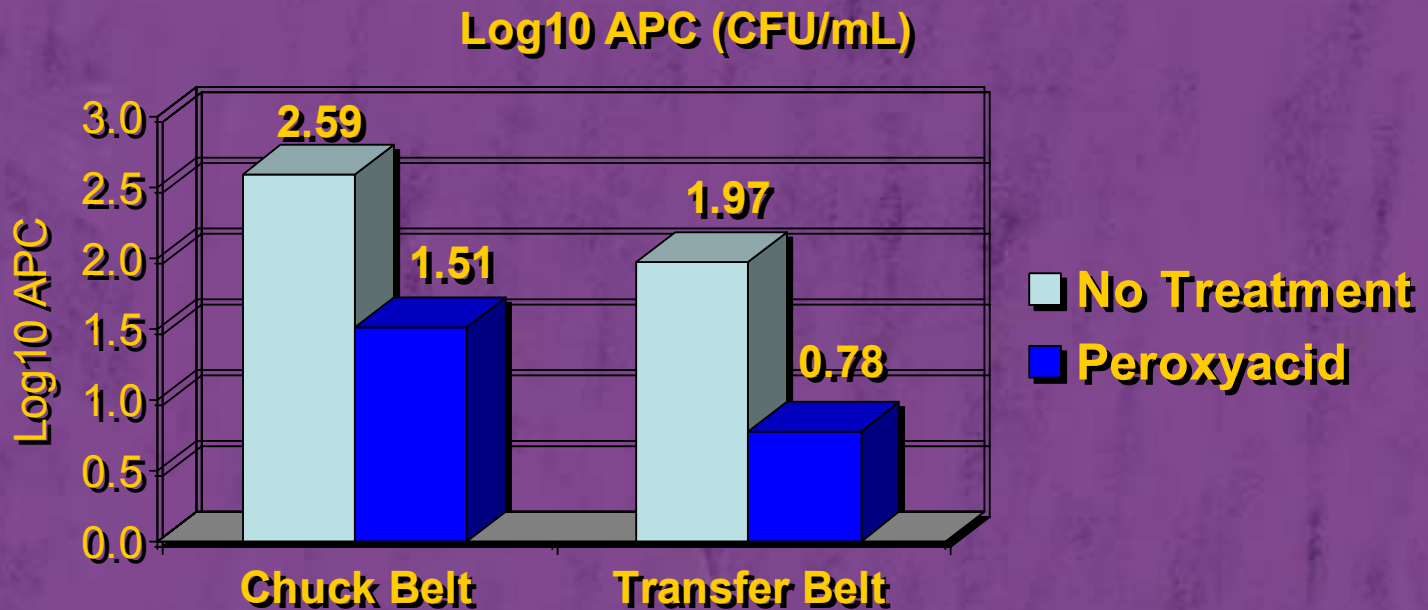
Study "A" and Study "B"



Peroxyacid Treatment of Conveyors

Conveyor Treatment - Study "A"

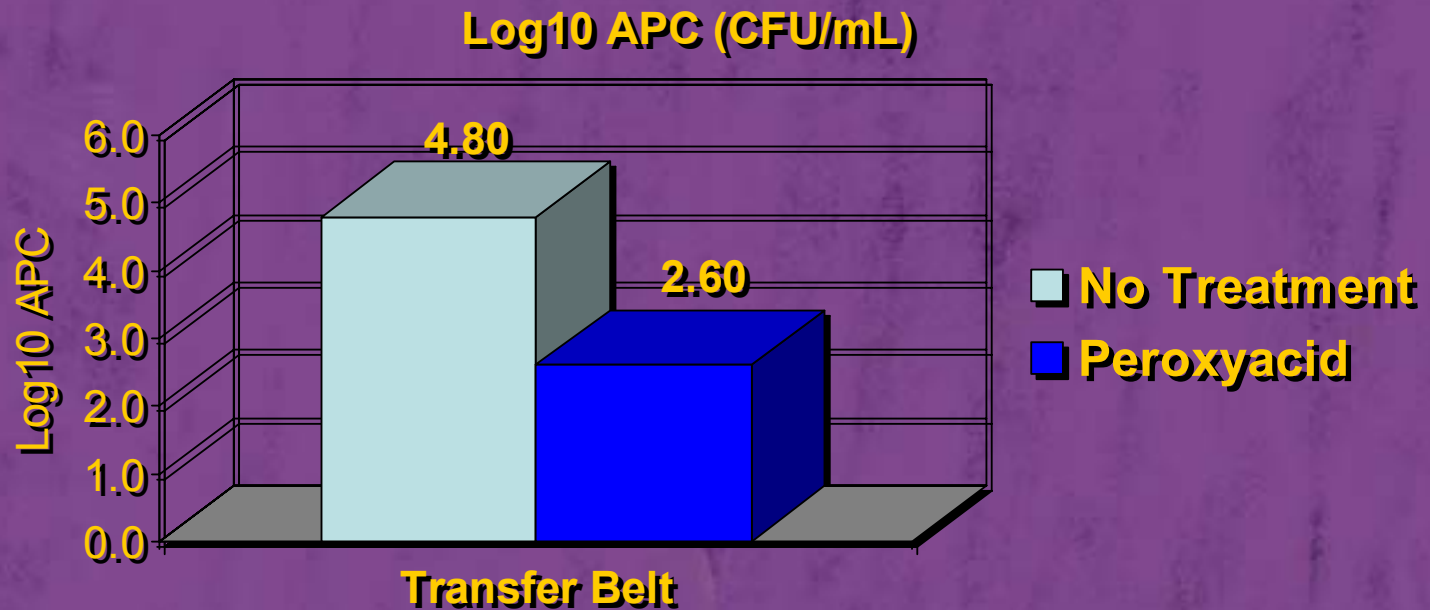
100 ppm Peroxyacid;
Treatment / No Treatment on Alternating Days



Peroxyacid Treatment of Conveyors

Conveyor Treatment - Study "B"

100 ppm Peroxyacid;
Treatment / No Treatment on Alternating Days



Peroxyacid Use In Meat and Poultry Processing

- **Peroxyacid Treatment:**
 - reduces bacterial contamination
 - reduces Salmonella incidence
 - improves quality of refrigerated product
 - decreases cross-contamination vectors

Peroxyacids

- **Questions?**