

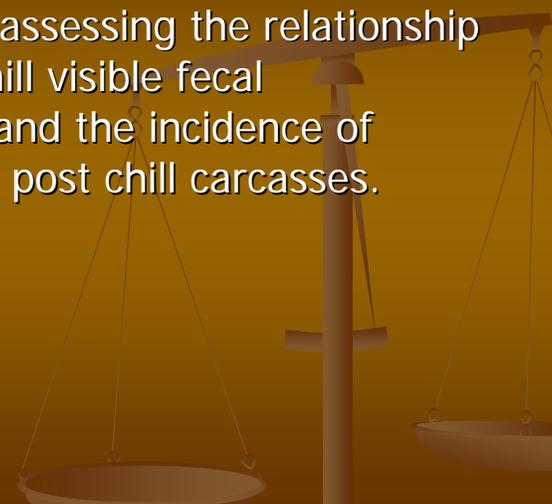
A Study of the Relationship Between Visible Fecal Contamination and Salmonellae Incidence in Broiler Slaughter Operations

Richard A. Roop, PhD

Chairman, National Chicken Council Salmonella Reduction Task Force
Senior Vice-President, Science and Regulatory Affairs

Tyson Foods, Inc.

This is:

- 
- A presentation assessing the relationship between pre chill visible fecal contamination and the incidence of Salmonellae on post chill carcasses.

This is NOT:

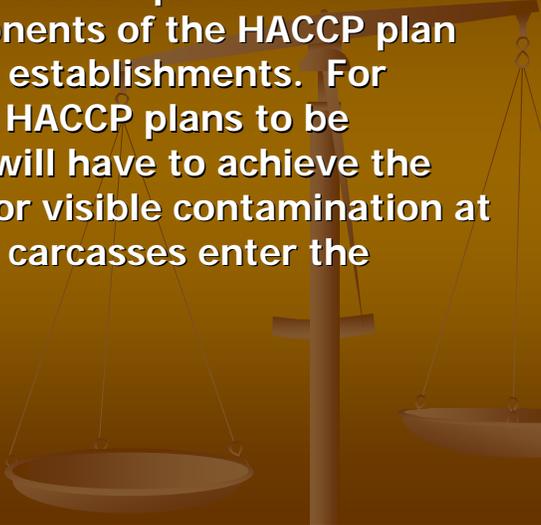
- A criticism of FSIS' original HACCP expectations/requirements relative to visible fecal material.
- A presentation recommending the elimination of the zero tolerance standard for visible fecal contamination.

- **May 5, 1997 – Revision of Finished Product Standards with Respect to Fecal Contamination**

- Federal Register: February 4, 1997 (Volume 62, Number 23), pp 5139 – 5143

"This zero tolerance policy for visible fecal contamination is an important food safety standard because fecal contamination is a major vehicle for spreading pathogenic organisms, such as Salmonella, to raw poultry."

"Fecal contamination is a reliable indicator of the likely presence of microbial pathogens, a food safety hazard which all slaughtering establishments will necessarily address in their HACCP plans."



“Critical control points to eliminate visible fecal contamination are predictable and essential components of the HACCP plan for all slaughter establishments. For establishments’ HACCP plans to be validated, they will have to achieve the zero tolerance for visible contamination at the point where carcasses enter the chiller.”

Historical Information

1975 – Comparison of the Microbiological Quality of Inspection-Passed and Fecal Contamination-Condemed Broiler

Carcasses Blankenship, et. al, USDA, ARS, *Journal of Food Science*, Volume 40, pp 1236 - 1239

Results and Discussion – “Our results also suggest that the salmonellae incidence associated with fecal contamination is no greater among contaminated carcasses processed through the final washer than it is for inspection-passed carcasses.”

Industry-Wide Broiler Study

Broiler integrators collaborated with Frank Jones, PhD, Center of Excellence for Poultry Science, University of Arkansas

- February – May, 1998; 14 Processing Plants; 3 Integrators
- Study of the Relationship of *E. coli* Counts (n = 11,026), Salmonellae Positives (n = 1889, 100 pos.) and Fecal Non-Compliance Citations (NRs; n = 178) in Broiler Processing Plants
- *E. coli* counts and Salmonellae isolation and identification conducted using USDA approved methods
- Data aggregated and analyzed by week
- SAS for Windows 6.11 used for Statistical Analysis

Industry-Wide Broiler Study

	<u>%SLM+</u>
NR	0.094
AvEc	0.102

Conclusion: “These data indicate the parameters have virtually no correlation with each other.” Dr. Frank T. Jones, *Poultry*, October / November, 1999 (Volume 7, Number 6).

Industry-wide Broiler Study

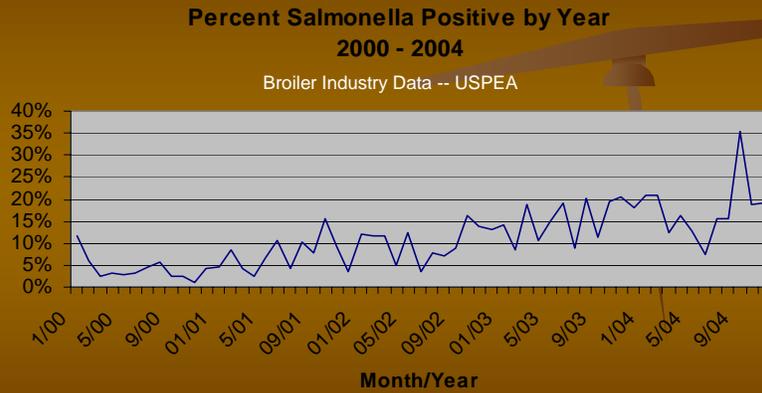
"In the Pathogen Reduction-HACCP Systems final rule (61 FR 38806, July 25, 1996), FSIS explained the reasoning underlying its position on fecal contamination, and at the beginning of this year, FSIS addressed the role of its zero tolerance for visible fecal material on poultry carcasses in the final rule that codified the standard under the PPIA (62 FR 5139, February 4, 1997). Preparation for implementation of the HACCP system regulations has not changed the Agency's conclusions about the appropriateness of this standard, under the FMIA as well as the PPIA."

(Federal Register 62, pp 63254 – 63255, November 28, 1997)

Zero Tolerance CCP's and Salmonella Incidence

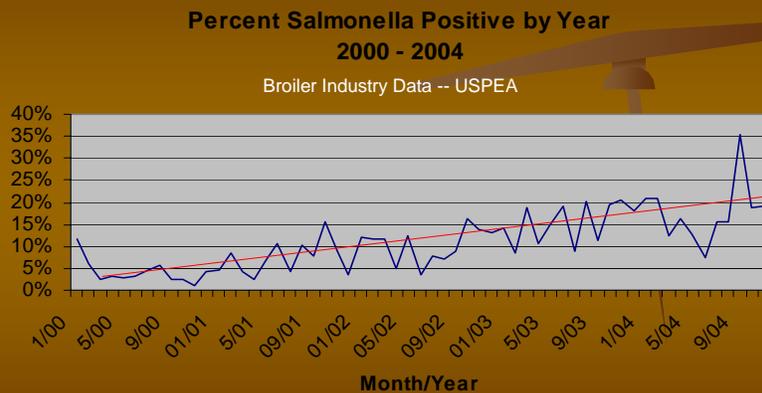
- January 1998, all large broiler slaughter establishments entered the HACCP era with a CCP for zero tolerance of fecal prior to the chiller...
- Salmonellae numbers across the industry appeared to be trending downward...
- Beginning in 1999, NRs for zero tolerance deviations appeared to be trending downward...
- People concluded that the enforcement of zero tolerance – the resulting regulatory enforcement actions and industry attention to control of visible fecal material -- was having the desired effect on broiler carcass contamination...

But Then – Something Happened...



- And, beginning in early summer of 2004, everyone started scrambling to find answers!

But Then – Something Happened...

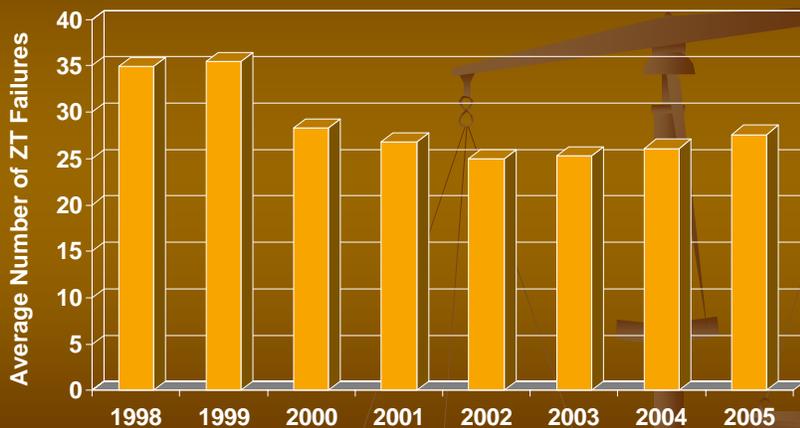


- And, beginning in early summer of 2004, everyone started scrambling to find answers!

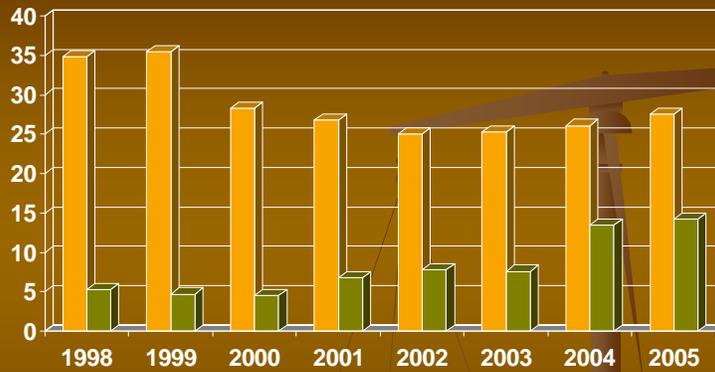
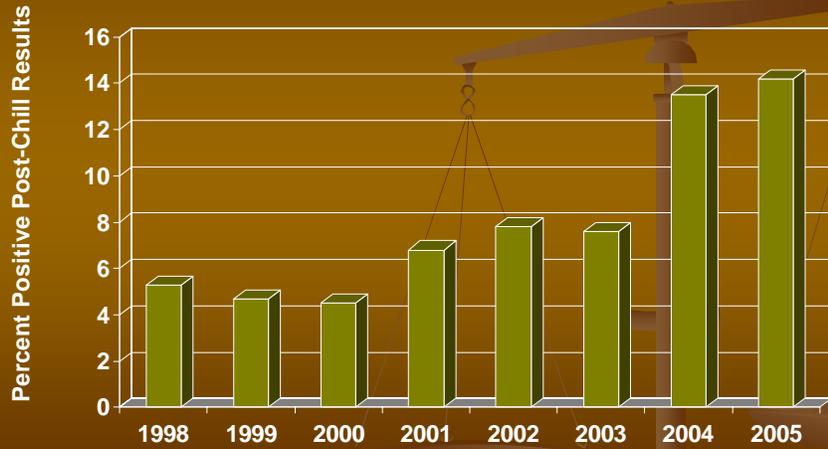
Recent Broiler Study 36 poultry plants

Fecal Zero Tolerance
Failures and Salmonellae
Percentages Post-Chill

Average number of USDA identified zero tolerance failures from Jan. 1998 through Dec. 2005 for 36 plants.



Average Percent Salmonellae positive results from Jan. 1998 through Dec. 2005 for 36 plants.



■ Average number of USDA identified zero tolerance failures from Jan. 1998 through Dec. 2005 for 36 plants
■ Average Percentage Salmonella spp. positive results from Jan. 1998 through Dec. 2005 for 36 plants

Number of facilities showing association and significance¹ level for the correlation between Salmonellae positives and the number of zero tolerance failures.

	Negative Significant	Negative not significant	Positive not significant	Positive Significant	Over all Significant
2001 To 2005	3	18	12	3	NS

¹ Significance means alpha level less than or equal to .05

Conclusions

- Zero tolerance failures have decreased an average of about 1 zero tolerances per plant per year from the time the standard was set.
- Salmonellae percentages have increased significantly since 2000.
- Salmonellae percentages and zero tolerance failures are not significantly positively related...

Conclusions

- "... bacterial counts on fecally contaminated carcass halves were not different from paired noncontaminated carcass halves after chilling, whether samples were from rinses of carcass halves or skin samples taken directly at the site of fecal contamination." *Effect of Prechill Fecal Contamination on Numbers of Bacteria Recovered from Broiler Chicken Carcasses Before and After Immersion Chilling*, J.A. Cason, et. al, USDA, ARS, Journal of Food Protection, Volume 67, Number 9, 2004, pp 1829-1833.

Take Home Message

- *Salmonella* can and does reside in broiler feces, but the level of contamination is not significant necessarily to increase *Salmonella* incidence, or process controls are sufficient to reduce the level to that of non-contaminated carcasses.
- It is important to focus on visible fecal contamination from a quality and regulatory standpoint, not just as a means to reduce *Salmonella*.