

# **Prevalence of *Salmonella* on young chicken carcasses in the U.S.: 1999-2000**

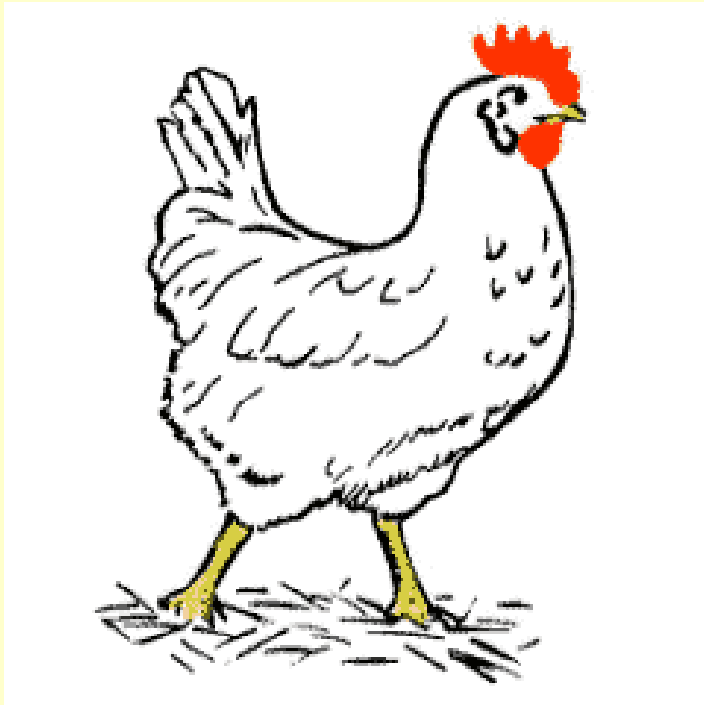
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# Abstract

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The U.S. Dept of Agriculture Food Safety and Inspection Service (USDA-FSIS) recently completed a one-year prevalence study of *Salmonella* spp. on young chicken carcasses from November 1999 to October 2000.

The prevalence of *Salmonella* was 8.7%; variables considered included plant size and geographical location.

# Background

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Data were extracted from a one-year prevalence study of *Salmonella* spp. on young chicken carcasses from November 1999 to October 2000, and from the Pathogen Reduction (PR) HACCP data collection program from the same period.

These programs were initiated by USDA-FSIS to estimate the prevalence of *Salmonella* on young chicken carcasses as currently produced, and to verify that establishments are meeting PR-HACCP standards, respectively.

# Objectives

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- ① To compile nationwide data that provide a profile of *Salmonella* prevalence in young chickens.
- ② To use the information and knowledge gained from these programs as a reference for further investigations and evaluation of new pathogen reduction programs.

# Program Design

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Data from two differently designed studies are included here.

- The *Nationwide Young Chicken Microbiological Baseline Data Collection Program* establishes an updated profile of *Salmonella* in young chickens as currently produced under Federal inspection. The results on the presence of *Salmonella* are expressed as a national average relative to slaughter volume. This approach is similar to the earlier FSIS Nationwide Microbiological Baseline Data Collection Programs for steers and heifers, cows and bulls, market hogs, broiler chickens, and young turkeys.

•*PR/HACCP Program*: To verify that industry PR/HACCP systems are effective in controlling the contamination of raw meat and poultry products with pathogens, the PR/HACCP rule sets *Salmonella* performance standards that slaughter establishments and establishments that produce raw ground products should meet. The performance of establishments under federal inspection was assessed by having federal inspection personnel collect randomly selected product samples, and sending them to FSIS laboratories for *Salmonella* analysis. The PR-HACCP data presented here represents data from “A” sample sets. The results from follow-up testing resulting from failed “A” sample sets (that is, the results from subsequent “B” and “C” sets) are not included because they do not represent a random sampling of establishments. Data for large and small plants only are included for 1999; HACCP was not introduced in very small plants until 2000.

# FSIS Definition of Establishment Size

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**Large:** 500 or more employees

**Small:** 10-499 employees, unless annual sales total less than \$2.5 million

**Very small:** Fewer than 10 employees, or annual sales of less than \$2.5 million.

# Methodology

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All samples were aseptically collected by FSIS Inspectors-in-Charge following the procedures in FSIS Directive 10,230.5 (2/4/98).

Briefly, for each sample, one randomly selected post-chiller whole young chicken carcass was aseptically placed into a sterile bag and shaken with 400 ml pre-chilled Buffered Peptone Water (BPW).

Once the contents of the bag were properly mixed, two sterile screw-cap containers with lids were each filled with 100 ml of rinse fluid, i.e. a total of 200 ml rinse was submitted for analysis.

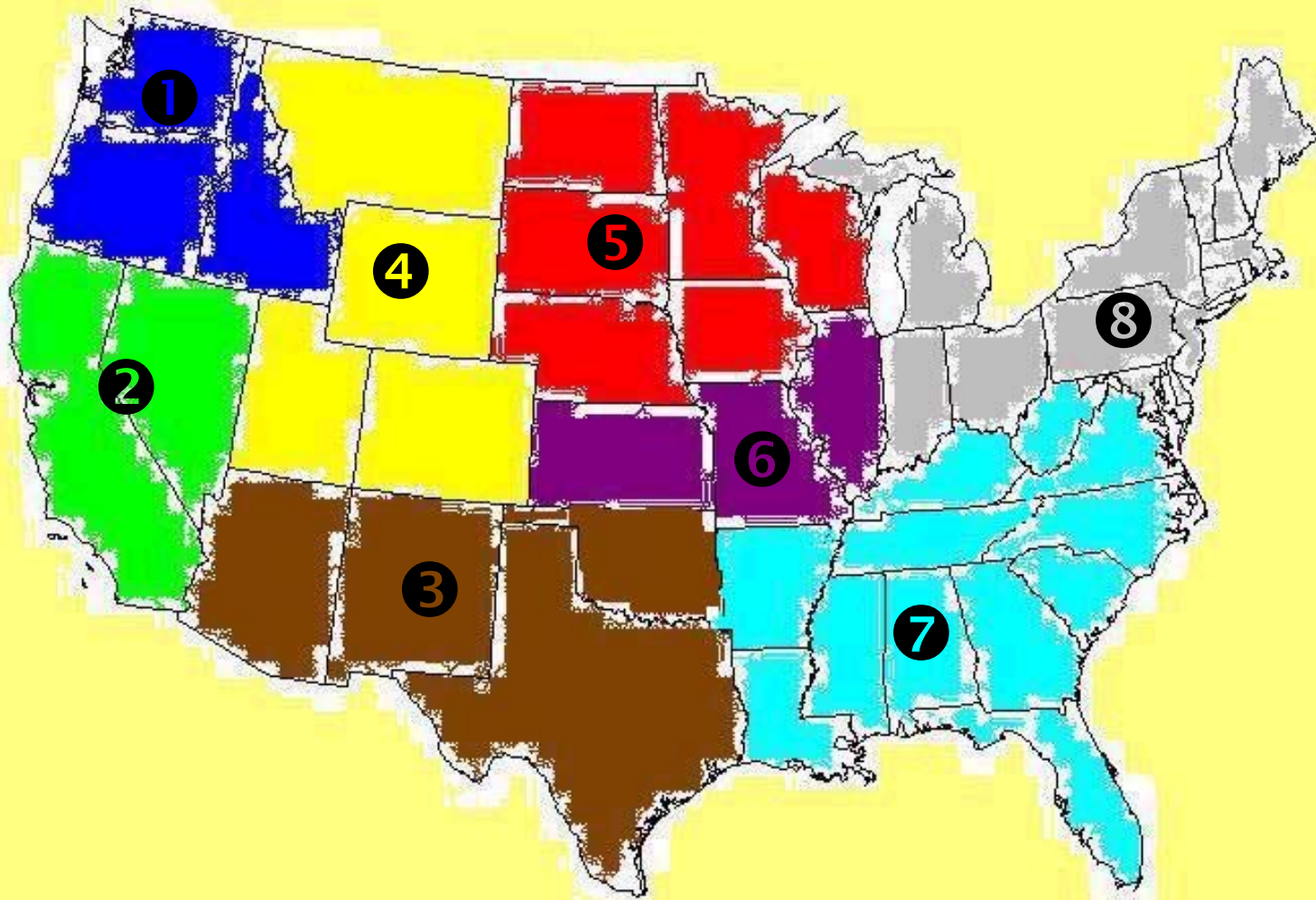


Duplicate portions of the carcass rinse were used for each of the ensuing microbiological analyses and were shipped to the designated laboratory via an overnight delivery service.

Thirty ml sterile single-strength BPW was added to 30 ml of carcass rinse fluid from the sample container to bring the total volume to 60 ml. Procedures for the qualitative analysis of *Salmonella* were followed according to the instructions in Chapter 4 of the FSIS Microbiological Laboratory Guidebook, beginning at Section 4.45c.

# Breakdown of US by geographical region

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⑨ - includes Alaska, Guam, Hawaii, Puerto Rico and the US Virgin Islands

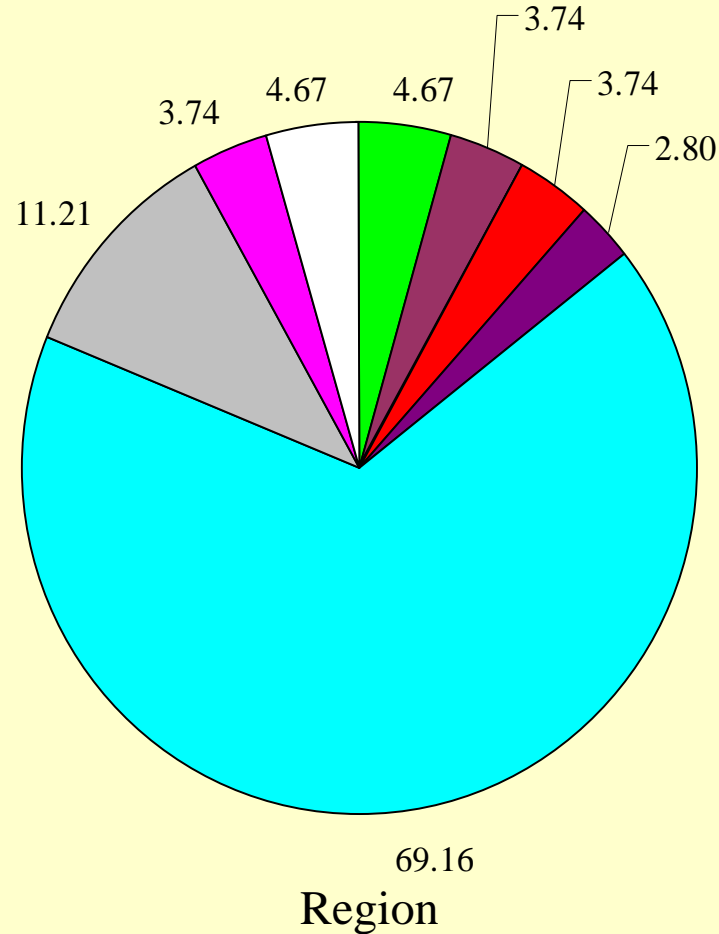
# Results

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*Prevalence of Salmonella (non-Typhi) in tested portions of young chicken carcass rinse fluids. Samples collected Nov 1999- Oct 2000.*

	<b>no. of establishments</b>	<b><i>n</i></b>	<b>no. positive</b>	<b>Prevalence (%)</b>
<b>Nationwide prevalence study</b>	205	1225	107	8.7
<b>PR-HACCP</b>	187	9302	813	8.7

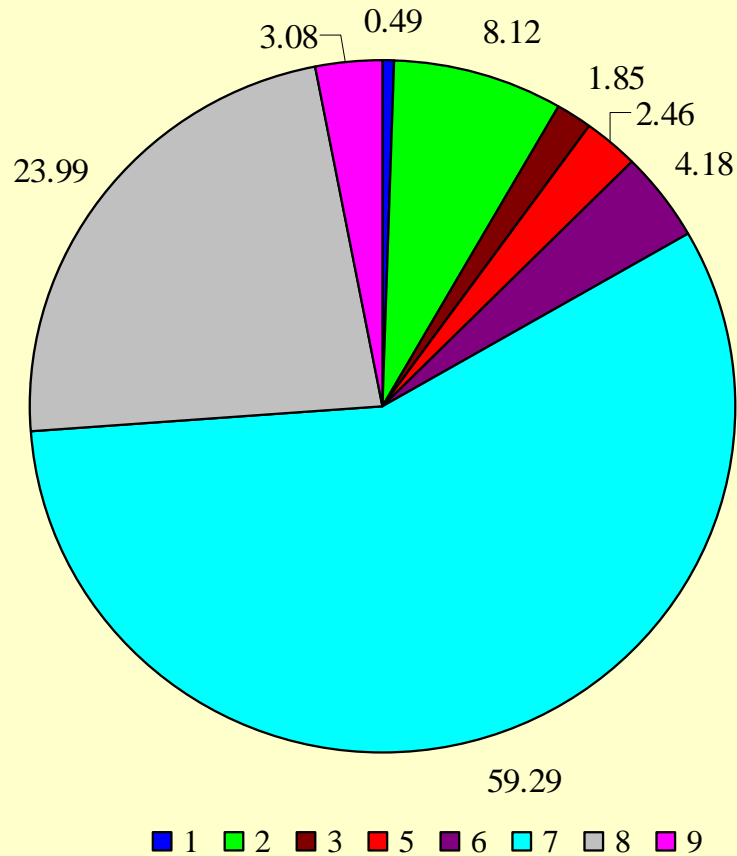
# Contribution of each region (%) to the overall no. of samples positive for *Salmonella*. Nationwide prevalence study data, Nov. 1999 - Oct. 2000.



$n = 1225$ ;  
samples positive  
for *Salmonella* = 107

As a result of the low production levels, no samples were collected in 4. No positive samples collected in region 1.

# Contribution of each region (%) to the overall no. of samples positive for *Salmonella*. PR-HACCP data, Nov. 1999 - Oct 2000.



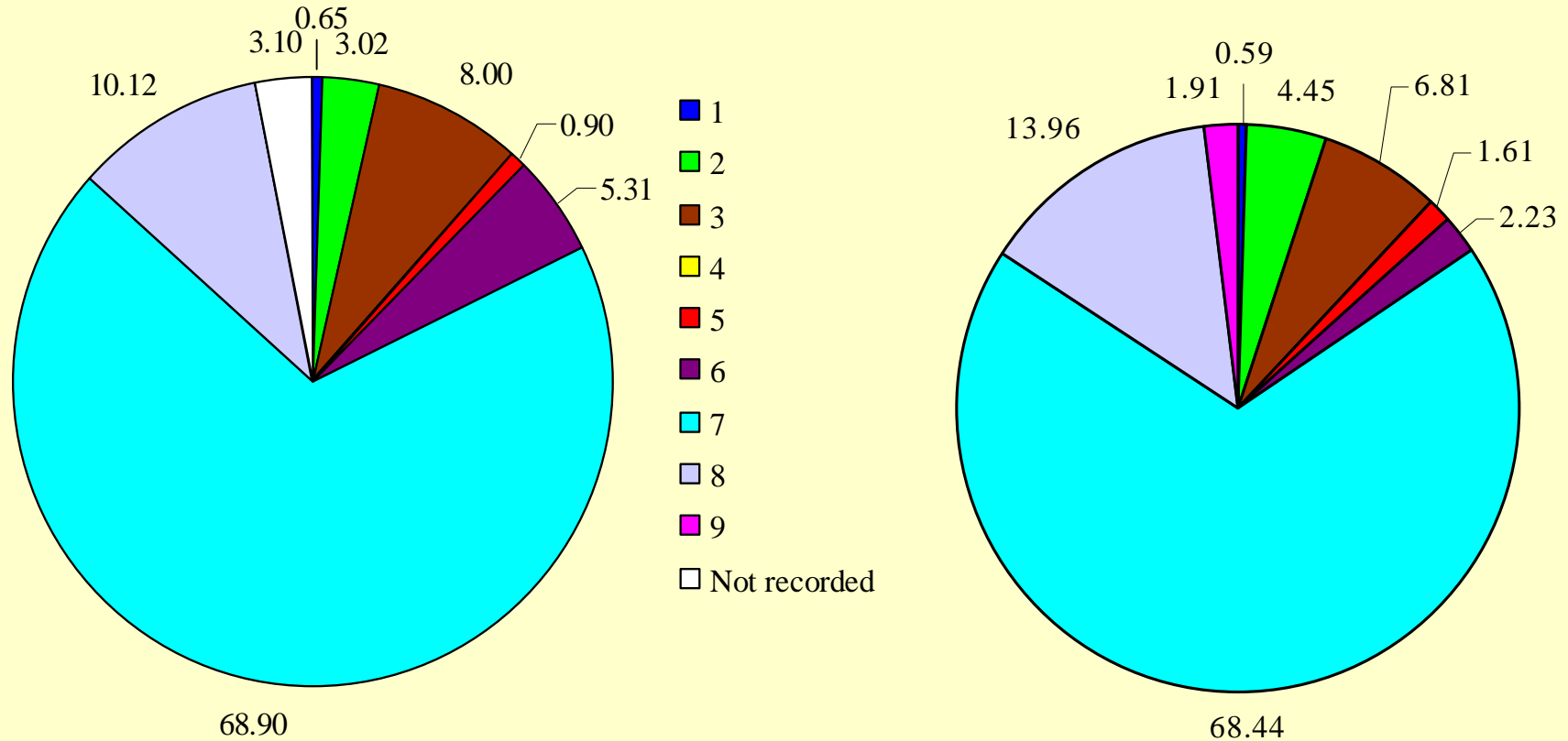
$n = 9302$ ;  
samples positive  
for *Salmonella* = 813

Region

As a result of the low production levels, no samples were collected in region 4

# Contribution of each region (%) to the overall no. of samples tested. Nov. 1999 - Oct 2000.

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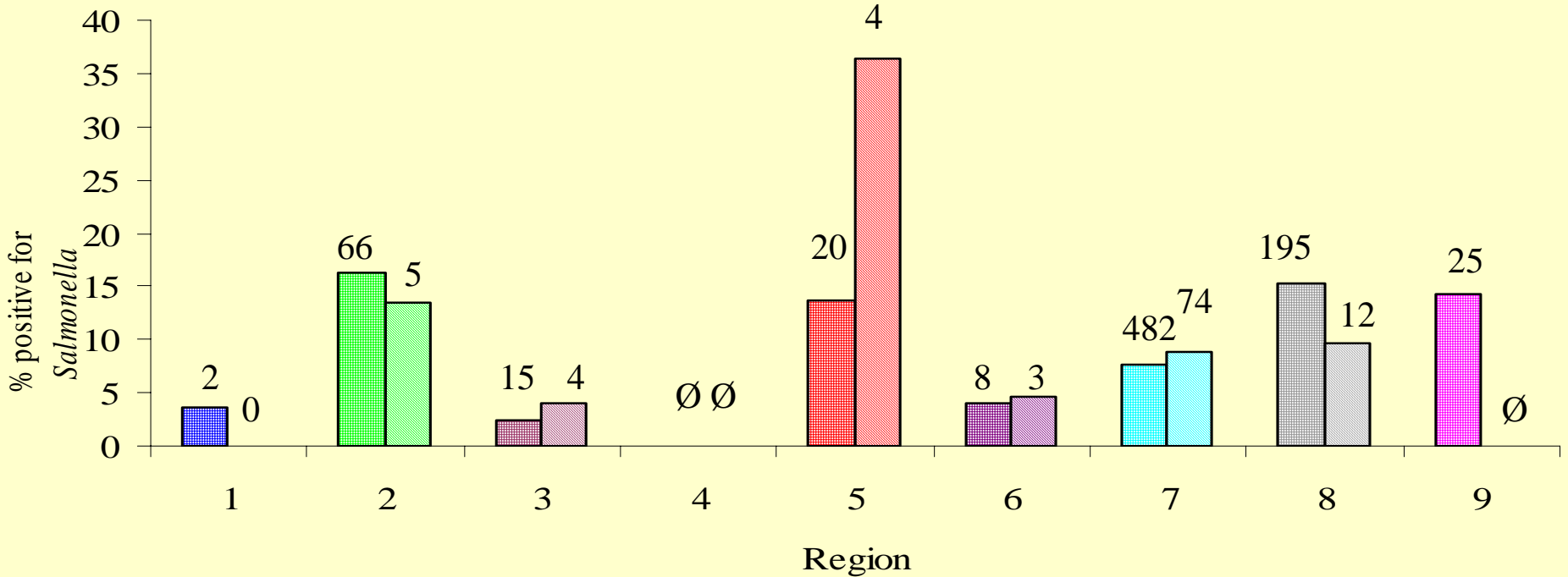


Nationwide prevalence study samples

PR-HACCP samples

As a result of the low production levels, no samples were collected in region 4

# Salmonella prevalence within regions

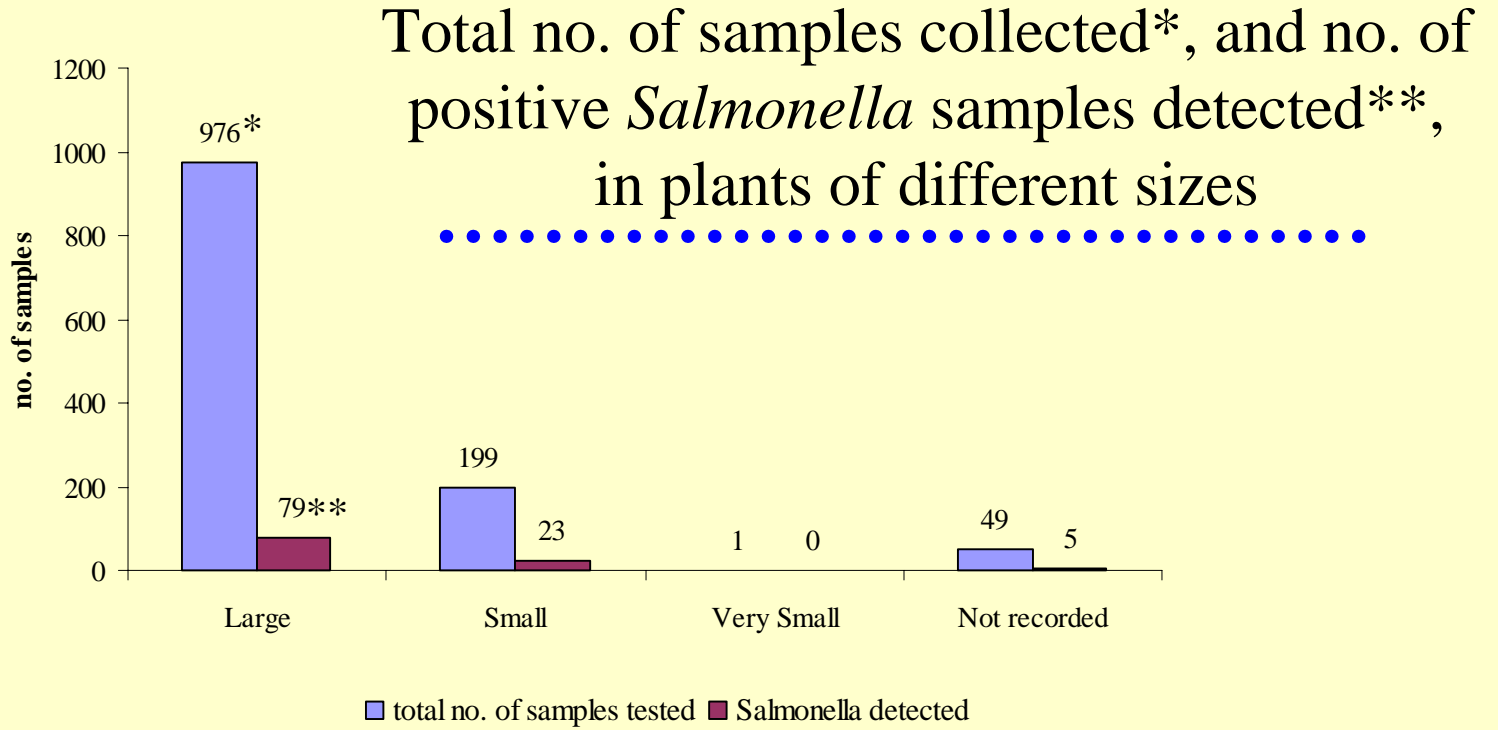


■ PR-HACCP data

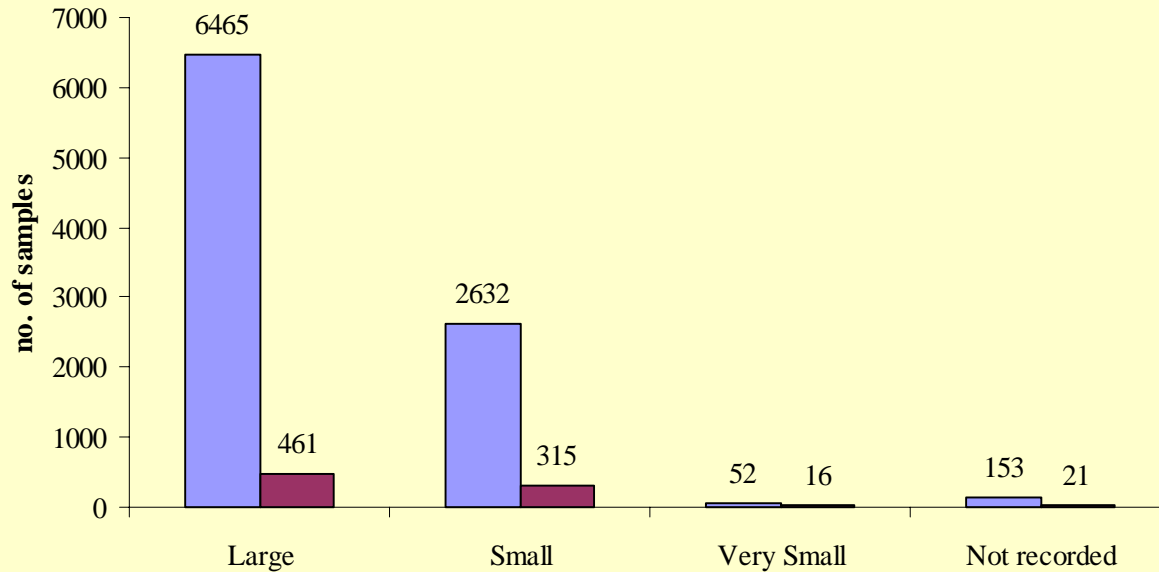
■ Nationwide prevalence study

Data presented are percentages of positive *Salmonella* samples expressed as a percentage of the total no. of samples collected in that region, with actual no. of positives indicated on the chart. Due to low production volume, no samples were collected in region 4 in either study, and no samples were collected in region 9 during the Nationwide baseline prevalence study (Ø).

# Nationwide prevalence study

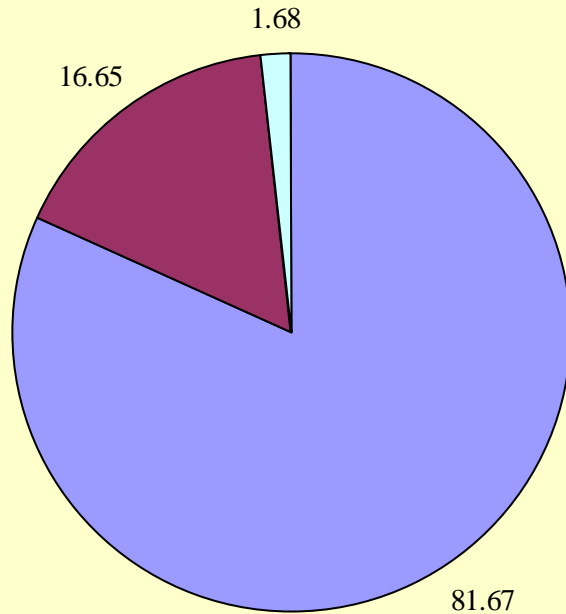


# PR-HACCP data

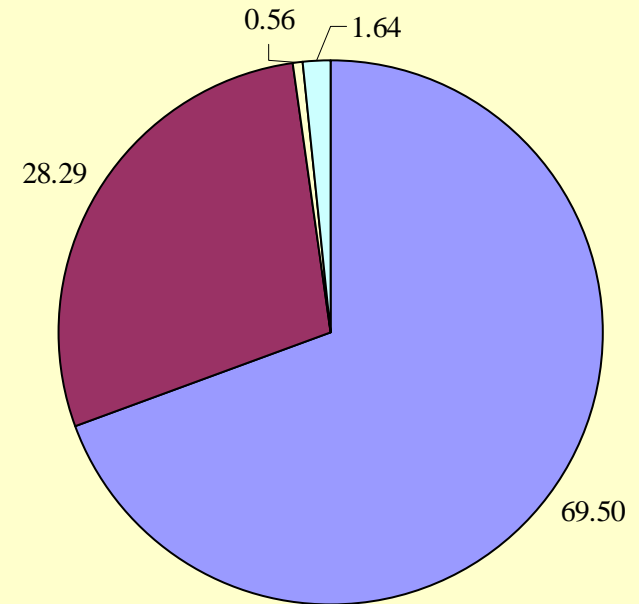




# Contribution of plant size (%) to the total no. of samples tested



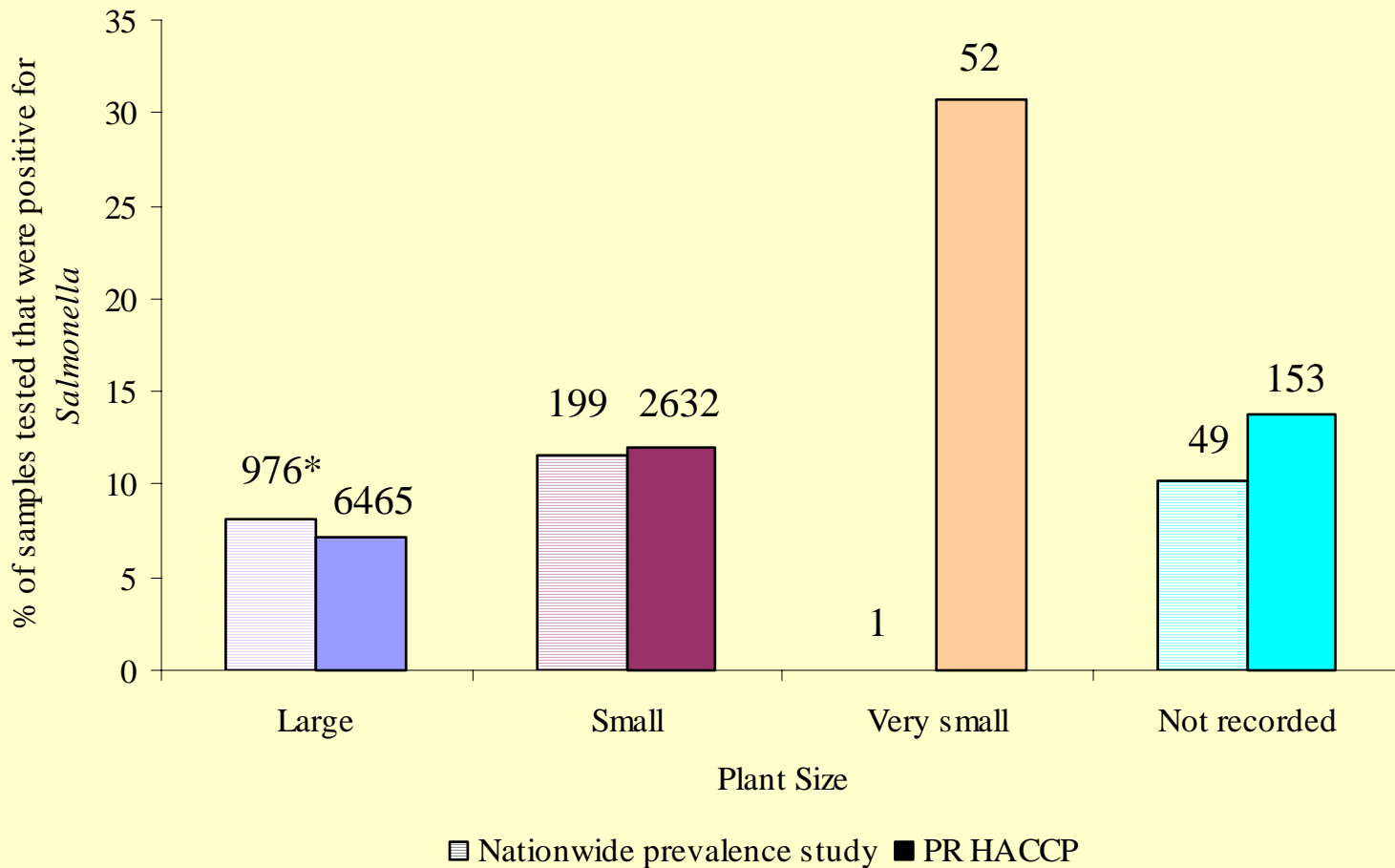
Nationwide  
prevalence  
study



PR-HACCP  
data

\*Only 1 very small plant (0.08% of total establishments visited) was included in the Nationwide prevalence study

# Percentage of samples, within plants of different sizes, which tested positive for *Salmonella*



\*total number of samples collected in each sized establishment

# Summary

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A news release (4-18-02) from USDA stated that the prevalence of *Salmonella* in young chickens has decreased in comparison to studies conducted prior to implementation of PR/HACCP implementation. This statement is supported by the data presented here.

Differences in pre- versus post-HACCP *Salmonella* prevalence, which was approx. 20% when measured in 1994-1995, may reflect changes due to HACCP implementation. This observed decrease in *Salmonella* prevalence correlates with reports from the Centers for Disease Control and Prevention indicating a decline in human illness linked to *Salmonella* during the same time period.

*Many thanks are due to the FSIS Inspectors-in-Charge, who were responsible for collecting the samples, and to the staff at the FSIS Field Service Laboratories in Athens, GA., St. Louis, MO and Alameda, CA, in particular the microbiologists who were responsible for sample analysis.*

*Sincere thanks to Bob Umholtz of LSDMS, OPHS, for assistance in compiling the data for this presentation.*

# Quotes

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*“..Salmonella prevalence levels (are) well below the product baselines set prior to HACCP. This indicates that HACCP has contributed to a reduction in the prevalence of Salmonella in the nation’s meat and poultry products”.*

*Ann Veneman, Secretary for Agriculture, April 18, 2002*

*“While the prevalence of Salmonella in meat and poultry products has declined, USDA is continuously working to further reduce the prevalence of pathogens in meat and poultry, and to improve food safety at each step of food production, from farm to table”.*

*Elsa Murano, Undersecretary for Food Safety, April 18, 2002.*