



Salmonella Categories I, II, and III

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Salmonella Categories

- I. Less than or equal to 50% of standard
- II. Above 50% without exceeding the standard
- III. Exceeded standard

***Salmonella* Verification Sample Result Reporting:
Agency Policy and Use in Public Health Protection**



Background - *Salmonella* Performance Standard

Establishments tested ~ once per year

One broiler rinse collected per day, 51 per set

Rinses tested for *Salmonella*

≤ 50% of standard	Less than 6 positive tests
> 50% of standard	7 to 12 positive tests
Exceed the standard	13+ positive tests



Every Category Tells a Story

- Category I: Consistent *Salmonella* control possible
- Category II: Can improve *Salmonella* control with assessment, guidance, verification
- Category III: Failed to meet the standard



Why these Categories?

- Category I is the norm
- Less than one quarter of sets in Category II
- Less than 10% of sets in Category III
- Category II, III: more *Salmonella*, serotypes of human illness



Large Broiler Plant 'A' Sets, 1998-2004

- FSIS has completed 762 *Salmonella* 'A' sets in ~135 large broiler establishments
 - Serotypes
 - Phage types (*Salmonella* Enteritidis)
 - Pulsed Field Gel Electrophoresis



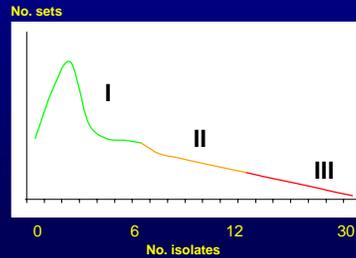
How often did 'A' sets fall into each category?*

Most sets in Category I, few in Category III

Category I 69% of sets

Category II 24% of sets

Category III 8% of sets



* 101% after rounding



Common *Salmonella* serotypes of human illness that are present in some FSIS poultry rinses

Heidelberg	Typhimurium	Enteritidis
4,5,12:i:-	Montevideo	Thompson
Newport	Infantis	Braenderup
Agona	Hadar	Saint-Paul

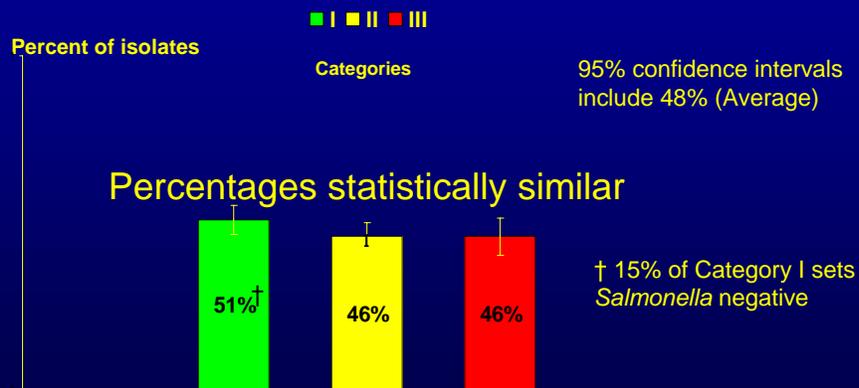


Categories & common serotypes of human illness

- Do these serotypes account for the same percent of isolates in Category I, II, III?
- Are they found more often in sets in Category I, II or III?
- Any category with the Lion's share of these serotypes?
- How many isolates of these serotypes are found per set?



Do these serotypes* account for the same percent of *Salmonella* isolates in each category?



*Heidelberg, Typhimurium, Enteritidis; I 4,5,12:i:-;
Montevideo, Thompson, Newport, Infantis, Braenderup, Agona,
Hadar, Saint-Paul



Were sets in any category more likely to test positive for these serotypes?*

Category	Human Serotype in Set?		OR*	(95% CI)*
	No	Yes		
I	182	342	1.0	(Referent)
II	8	172	9.8	(3.0, 31.6)
III	3	55	11.4	(5.5, 23.8)

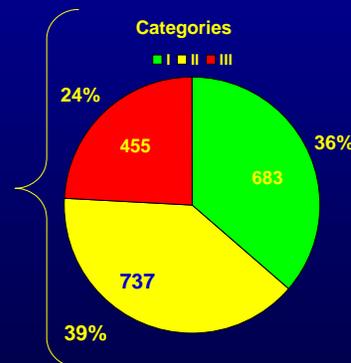
Common human serotypes significantly more likely to occur in Category II & III sets

* Odds ratio, confidence interval
*Heidelberg, Typhimurium, Enteritidis; I 4,5,12:i-;
Montevideo, Thompson, Newport, Infantis, Braenderup,
Agona, Hadar, Saint-Paul



Does any category account for the Lion's share of these serotypes?*

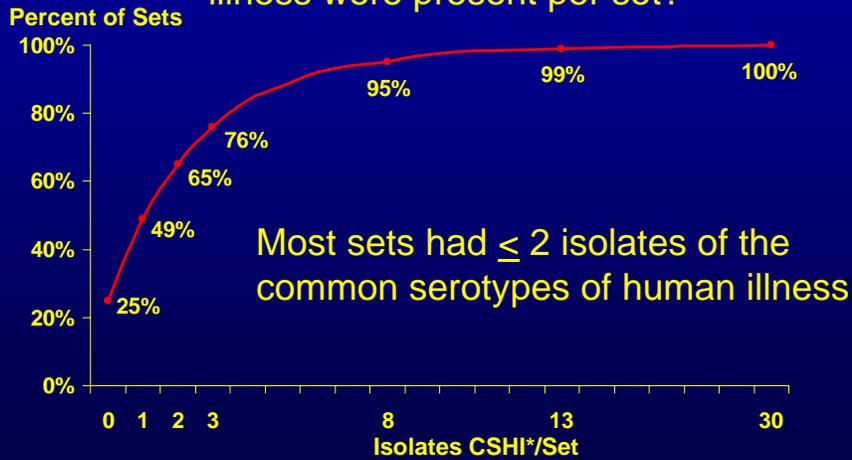
Categories II & III accounted for only 32% of sets but 63% of common serotypes of human illness



Serotypes Heidelberg, Typhimurium, Enteritidis;
4,5,12:i-; Montevideo, Thompson, Newport,
Infantis, Braenderup, Agona, Hadar, Saint-Paul



How many isolates of common serotypes* of human illness were present per set?



* Heidelberg, Typhimurium, Enteritidis; 4,5,12:i:-; Montevideo, Thompson, Newport, Infantis, Braenderup, Agona, Hadar, Saint-Paul



Summary - Large broiler 'A' sets, 1998-2004

- Most sets have no or very few common *Salmonella* serotypes of human illness
- Categories II & III: less than one third of sets; about two thirds of common serotypes of human illness



Historical Perspective, 1998-2004

FSIS has followed the performance of more than 100 large broiler establishments for 7 years. A quarter of these establishments had consistent control of *Salmonella* throughout the entire period.

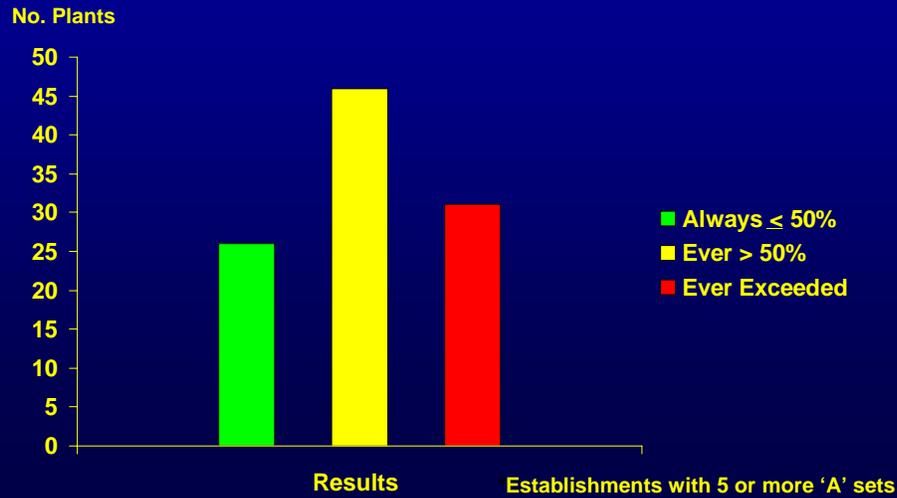


Large Broiler Establishments, 1998-2004

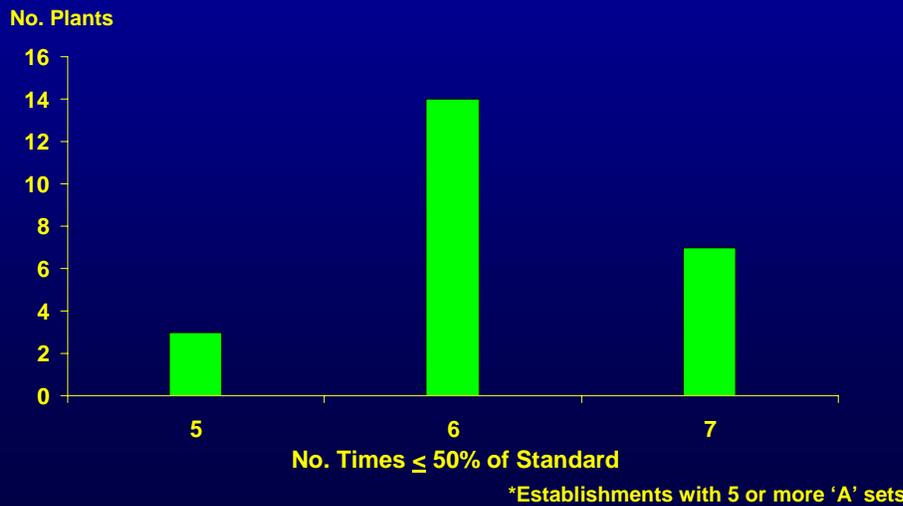
- Over 100 establishments, 5+ *Salmonella* 'A' sets
- 25% routinely demonstrated *Salmonella* control
 - Consistent with Category I
- Others were in Category II, III at least once
- Most over multiple sets
 - Exceeding half the standard
 - Failing to meet the standard



Salmonella 'A' set results, large broiler establishments,* 1998-2004



One quarter of establishments* were consistently at or below half the Salmonella standard, 1998-2004





Summary - Historical Experience

- Many large broiler establishments have repeated patterns of *Salmonella* control
 - Best control
 - Intermediate
 - Least



Every Category Tells a Story

- Category I: Consistent *Salmonella* control possible
- Category II: Can improve *Salmonella* control with assessment, guidance, verification
- Category III: Failed to meet the standard



Summary - FSIS *Salmonella* Policy

- Category II and III indicate a need for follow up
- Agency goal: 90% of establishments in Category I
- Reduce human exposure to *Salmonella*, with emphasis on common serotypes of human illness



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