



## Progress Report on *Salmonella* and *Campylobacter* Testing of Raw Meat and Poultry Products, 1998-2012<sup>1</sup>

### Executive Summary

In calendar year 2012, FSIS analyzed 30,686 verification samples across eight meat and poultry product classes with the following percent positive rate of *Salmonella* per product class: young chicken (4.3%), market hog (1.3%)<sup>2</sup>, cow/bull (0.0%), steer/heifer (1.1%), ground beef (1.9%), ground chicken (28%), ground turkey (11%) and turkey (2.2%). The Agency believes that the higher the percent positive rate, the greater the potential for the public to consume a product that can cause foodborne illness. FSIS schedules approximately 75 sample sets monthly using a risk-based algorithm to target establishments demonstrating variable or poor process control (i.e, establishments with high percent positive rates). Previous *Salmonella* Annual Reports can be found on the FSIS web site.

Since 2006, FSIS has focused sampling on raw carcass product classes believing that improvement in process control in these product classes will result in improvement in process control in raw ground product classes. As of December 2012, 79.77% of establishments are in Category 1. Based on five product classes, the following percentages of establishments are in Category 1: young chicken (73.14%), ground beef (82.86%), ground chicken (71.42%), ground turkey (90.9%), and turkey (82.35%).

The Agency established a revised Performance Standard for *Salmonella* for young chicken and turkey carcasses as of July 1, 2011, in addition to initiating the Performance Standard for *Campylobacter* on young chicken and turkey carcasses.

### 2012 Annual Report

The Food Safety and Inspection Service (FSIS) uses data from its regulatory testing programs to monitor the effectiveness of

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<sup>1</sup> All years listed are calendar years (CY)

<sup>2</sup> In the third quarter of 2011, new scheduling of sampling was discontinued until further notice for three product classes: market hog, cow/bull, and steer/heifer. The data, here, represents follow-through samples from sets previously scheduled for these product classes and carried to completion. See tables for samples analyzed for these product classes.

its Pathogen Reduction/Hazard Analysis and Critical Control Point Systems Final Rule, and to assess process control in individual establishments. The U.S. Department of Health and Human Services has incorporated the target of 11.4 cases of salmonellosis/100,000 persons into the Healthy People 2020 objectives aimed at a 25 percent reduction in human illnesses, which FSIS recognizes as appropriate guidance for the Agency's strategic planning to strengthen public health protection.

In 1996, FSIS established PR/HACCP to verify that establishments demonstrate consistent process control for preventing, eliminating, or reducing the contamination of raw meat and poultry products with disease-causing bacteria, by setting *Salmonella* performance standards that slaughter establishments and establishments that produce raw ground products should meet. Raw products with established performance standards or guidance include: carcasses of cows/bulls, steers/heifers, market hogs, young chickens and young turkeys. Processed products measured by performance standards include: ground beef, ground chicken, and ground turkey. The performance standards are based on the prevalence of *Salmonella* as determined from the Agency's nationwide microbiological baseline studies, which, except for the young chicken and turkey carcass product classes, were conducted prior to PR/HACCP implementation. The performance standards and guidance are expressed in terms of the maximum number of *Salmonella*-positive samples acceptable per sample set. The number of samples in a sample set varies by product, and the maximum number of positive samples acceptable in a set provides an 80% probability of an establishment passing when it is operating at the standard.

Prior to 2006, there were two phases of the FSIS regulatory program for *Salmonella* in raw products: non-targeted and targeted testing. Non-targeted or "A" set tests were collected at establishments randomly selected from the population of eligible establishments, with a goal of scheduling every eligible establishment at least once a year. Other codes (such as "B", "C", and "D") represented sample sets collected from establishments targeted for follow-up testing following a failed set. Beginning with the third 2006 quarterly report, reports have data summarized from all sets collected. (Note: Earlier reports have not been retrospectively changed). Consequently, under Table A1, the annual reports from 2005 and earlier reflect results from only the "A" set samples.

In February 2006, FSIS issued a federal register notice: "*Salmonella* Verification Sample Result Reporting: Agency Policy and use in Public Health Protection" announcing how FSIS would report and use results from its *Salmonella* verification sampling program for meat and poultry establishments. In this Notice, the Agency announced its intention to redirect its *Salmonella* verification sampling program and announced 11 new initiatives to encourage establishments to reassess their food safety systems to achieve and maintain consistent process control. As one of these new initiatives, FSIS increased testing frequency in establishments with variable or highly variable process control compared to those showing consistent process control.

Since June 2006, establishments have been scheduled based on risk-based criteria designed to focus FSIS resources on

establishments with the most samples positive for *Salmonella* and the greatest number of samples with serotypes most frequently associated with human salmonellosis, (relative to each product class) as defined by CDC.<sup>3</sup>

Furthermore, establishments are grouped into one of three categories. Category 1 includes establishments whose two most recent *Salmonella* set results are equal to or less than 50% of the performance standard or guidance. The Agency considers these establishments to demonstrate consistent process control. Category 2 includes establishments where at least one of their two most recent set results was greater than 50% of the performance standards or guidance without exceeding it, or they have passed their most recent set but failed the one prior to that one. These establishments are considered to have variable process control. An additional subcategory 2T was created in 2008 under Category 2 (reported in 2008 second quarterly report and onward). An establishment with its last set  $\leq$  50% of the performance standard or guidance and the prior set is not  $\leq$  50% of the performance standard is sub-categorized as 2T, with T standing for transitioning to Category 1. Category 3 includes establishments whose most recent *Salmonella* set result has exceeded the performance standard for its product class. The Agency considers these establishments to display highly variable process control.

## Results

This report presents percent positive *Salmonella* sample results and percent of sample sets meeting the *Salmonella* performance standards listed by product class and PR/HACCP establishment size for 2012 and previous years (Table A1 and A3). Data is presented in aggregate form for the periods 1998-2012 (Table A2 and A4).<sup>4</sup>

Individual sample results (Table A1) are counted in the year the sample is collected. Sample sets (Table A3) are counted in the year they are completed. For example, samples from a young chicken set collected in 2011 are counted in the 2011 results (Table A1). However if the sample set was completed in 2012, the set was counted in 2012 (Table A3). In Table A5, establishments are listed by product classes and percentage within categories 1, 2T, 2, and 3 for each product class. For young chicken and turkey carcasses, the categories are determined by the *Salmonella* Performance Standard which was in place at the time the verification set was scheduled.

Figure B1 compares *Salmonella* percent positive results from 2006 to 2012 with baseline prevalence by product class and year. Percentages of sample sets meeting *Salmonella* performance standards by product class from 2006 to 2012 are presented in Figure B2.

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<sup>3</sup> Restructuring how *Salmonella* sets are scheduled means that it would be inappropriate to compare results prior to 2006 to results after 2006.

<sup>4</sup> An establishment's HACCP size may change over time; these tables reflect the size of the plant at the time the sample was collected.

### **Young Chicken**

FSIS continues to direct resources toward testing young chicken establishments. In 2012 (Table A1), 10,933 *Salmonella* samples were analyzed from young chicken establishments. The total percentage of positive samples was 4.3% in 2012, down from 6.5%, 6.7%, 7.2%, and 7.3% in 2011, 2010, 2009, and 2008, respectively. In addition, of the 178 sets completed in 2012 at young chicken establishments, 89.33% met the *Salmonella* performance standard compared to 96% (100 sets completed) in 2011, 94.8 (134 sets completed) in 2010, and 95.7% (140 sets completed) in 2009 (Table A3).

At the end of 2012, 128 young chicken establishments eligible for federal testing were in Category 1, comprising 73.14% of all young chicken establishments (Table A5) which was down from 86.7% in 2011. Furthermore in 2012, thirteen young chicken establishments (7.42%) were in Category 2T. Nineteen young chicken establishments were in Category 2 (10.85%). Fifteen young chicken establishments were in Category 3, making up 8.57% of all young chicken establishments. In 2011, 86.7% of young chicken establishments eligible for *Salmonella* sampling were in Category 1 defined, in part, through the performance standard that existed prior to July 2011.

Summary information for *Salmonella Enteritidis* (SE) test results for Young Chicken (Figure C1) show a 0.84% positive rate among the samples taken in 2012, which is down from 1.78% for 2011.

### **Ground Beef**

In 2012, 14,665 ground beef samples were analyzed and 1.9% tested positive for *Salmonella*. This compares to 2011, when 13,161 samples were analyzed (2.4% positive), and to 2010 when 9,256 samples were analyzed (2.2% positive). Two hundred forty-four sets were completed with 95.9% meeting the performance standard, compared to 2011 when 205 sets were completed (94.1% met the performance standard), and 2010 when 175 sets were completed (96.6% met the performance standard).

82.86% (237 establishments) were in Category 1, 7.69% percent (22 establishments) were in Category 2T, 7.69% (22 establishments) in Category 2, and 1.74% (5 establishments) in Category 3. In 2011, 83% of ground beef establishments eligible for *Salmonella* testing were in Category 1.

### **Ground Chicken**

In 2012, 1,376 samples were analyzed, with a total of 28% percent positive as compared to 30.9% (466 samples) in 2011. The total percent of completed sample sets meeting the performance standard was 76.92%.

71.42% (5 establishments) of ground chicken establishments were in Category 1 at the end of 2012, with 1 establishment in category 2T, none in Category 2, and 14.28% (1 establishment) in Category 3. In 2011, 75% of ground chicken establishments eligible for *Salmonella* sampling were in Category 1.

### **Ground Turkey**

In 2012, 1,155 samples were analyzed with a total percent positive at 11%, compared to 12.3% in 2011 (511 samples) and 10.2% in 2010 (873 samples). Nineteen sets were completed and all 19 passed for 2012, similar to 2011, when all 14 sets completed passed, and to 2010 when all 9 sets completed passed.

90.9% (20 establishments) of ground turkey establishments were in Category 1, with 1 establishment in Category 2T, 1 in Category 2, and none in Category 3. In 2011, 100% of ground turkey establishments eligible for *Salmonella* sampling were in Category 1.

**NOTE:** Per Federal Register Notice FSIS-2012-0007, FSIS is currently redefining the sampling frames for ground poultry product eligible for testing as all raw comminuted chicken, turkey, or chicken/turkey/beef/lamb/pork mix including mechanically separated poultry produced at federally-regulated establishments that is not further processed into RTE product.

### **Turkeys**

In 2012, 2,183 turkey samples were analyzed, with a total percent positive at 2.2%, down from 2.4% positive in 2011. Of the 33 sets completed in 2012, 93.94% of these establishments met the *Salmonella* performance standard.

82.35% (28 establishments) were in Category 1, with 11.76% (4 establishments) in Category 2T, 2.94% (1 establishment) in Category 2, and 2.94% (1 establishment) in Category 3. In 2011, 82% of turkey establishments eligible for *Salmonella* testing were in Category 1.

**Table A1**  
**Percent Positive *Salmonella* Tests in the PR/HACCP Verification Testing Program**  
**By Product Class and Calendar Year, 1998 – 2012**

CY 2012											
Product	Baseline Prevalence (%)	Large		Small		Very Small		Unknown		All Sizes	
		# Samp	% Pos	# Samp	% Pos	# Samp	% Pos	# Samp	% Pos	# Samp	% Pos
Young Chicken	7.5	8,223	2.7%	2,171	8.2%	537	13.0%	2	0.0%	10,933	4.3%
Market Hogs	8.7	12	8.3%	0	0.0%	66	0.0%	0	0.0%	78	1.3%
Cows/Bulls	2.7	0	0.0%	26	0.0%	1	0.0%	0	0.0%	27	0.0%
Steers/Heifers	1.0	0	0.0%	116	2.6%	153	0.0%	0	0.0%	269	1.1%
Ground Beef	7.5	1,767	3.0%	8,987	1.8%	3,811	1.4%	100	3.0%	14,665	1.9%
Ground Chicken	44.6	273	34.0%	853	28.0%	144	29.0%	106	11.0%	1376	28.0%
Ground Turkey	49.9	689	12.0%	390	10.0%	10	30.0%	66	6.1%	1155	11.0%
Turkeys	1.7	1,318	1.3%	758	3.2%	75	9.3%	32	0.0%	2,183	2.2%

**NOTE:** The calendar year total for samples analyzed is not always the simple addition of the totals from all 4 quarters. On occasion, appealed sample results are removed from the totals for verification results.

**NOTE:** Sampling for three product classes (market hog, cow/bull, and steer/heifer) represents follow-through samples from sets previously scheduled for these product classes which were carried to completion.

<b>CY 2011</b>											
<b>Product</b>	<b>Baseline Prevalence (%)</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
		<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>
Young Chicken	20.0 / 7.5	3,255	3.0%	1,189	10.0%	300	30.3%	0		4,744	6.5%
Market Hogs	8.7	287	0.3%	904	4.1%	1,108	3.5%	0		2,299	3.3%
Cows/Bulls	2.7	47	0.0%	487	0.6%	298	1.3%	0		832	0.8%
Steers/Heifers	1.0	844	0.0%	1,015	0.8%	932	0.5%	0		2,791	0.5%
Ground Beef	7.5	1,294	4.7%	8,988	2.2%	2,826	1.9%	53	0.0%	13,161	2.4%
Ground Chicken	44.6	17	41.2%	400	24.8%	49	77.6%	0		466	30.9%
Ground Turkey	49.9	397	14.4%	84	4.8%	30	6.7%	0		511	12.3%
Turkeys	19.6 / 1.7	1,008	1.6%	489	3.3%	44	11.4%	0		1,541	2.4%

<b>CY 2010</b>											
<b>Product</b>	<b>Baseline Prevalence (%)</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
		<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>
Young Chicken	20.0	4,753	4.3%	1,956	11.5%	120	25.8%	0		6,829	6.7%
Market Hogs	8.7	1,290	1.7%	1,506	2.6%	1,428	2.8%	0		4,224	2.4%
Cows/Bulls	2.7	243	0.4%	1,366	0.4%	155	1.3%	0		1,764	0.5%
Steers/Heifers	1.0	1,623	0.0%	1,721	0.2%	1,574	0.2%	0		4,918	0.1%
Ground Beef	7.5	1,048	2.2%	6,786	2.1%	1,422	2.5%	0		9,256	2.2%
Ground Chicken	44.6	89	22.5%	312	16.3%	25	36.0%	0		426	18.8%
Ground Turkey	49.9	658	11.6%	154	7.8%	61	1.6%	0		873	10.2%
Turkeys	19.6	1,049	4.9%	395	3.8%	0		0		1,444	4.6%

<b>CY 2009</b>											
<b>Product</b>	<b>Baseline Prevalence (%)</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
		<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>
Young Chicken	20.0	4,605	5.0%	1,653	11.7%	181	21.0%	0		6,439	7.2%
Market Hogs	8.7	972	1.0%	1,780	2.5%	1,995	2.7%	0		4,747	2.3%
Cows/Bulls	2.7	406	0.2%	1,238	0.6%	392	0.8%	0		2,036	0.6%
Steers/Heifers	1.0	1,683	0.1%	1,484	0.4%	1,772	0.2%	0		4,939	0.2%
Ground Beef	7.5	902	3.0%	6,004	2.1%	1,635	0.7%	0		8,541	1.9%
Ground Chicken	44.6	46	30.4%	276	11.6%	52	42.3%	0		374	18.2%
Ground Turkey	49.9	423	11.8%	128	9.4%	57	5.3%	0		608	10.7%
Turkeys	19.6	931	3.5%	501	4.2%	0		0		1,432	3.8%

<b>CY 2008</b>											
<b>Product</b>	<b>Baseline Prevalence (%)</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
		<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>
Young Chicken	20.0	4,694	5.9%	1,644	10.0%	125	21.6%	51	7.8%	6,514	7.3%
Market Hogs	8.7	538	1.5%	1,686	3.8%	2,020	1.8%	0		4,244	2.6%
Cows/Bulls	2.7	33	0.0%	1,628	0.4%	640	0.9%	0		2,301	0.5%
Steers/Heifers	1.0	1,151	0.0%	1,504	0.1%	2,228	0.3%	82	0.0%	4,965	0.2%
Ground Beef	7.5	1,261	4.0%	10,673	2.2%	4,720	2.6%	109	0.0%	16,763	2.4%
Ground Chicken	44.6	145	32.4%	213	19.2%	53	32.1%	0		411	25.5%
Ground Turkey	49.9	764	16.9%	84	7.1%	28	0.0%	0		876	15.4%
Turkeys	19.6	77	3.9%	52	9.6%	0		0		129	6.2%

<b>CY 2007</b>											
<b>Product</b>	<b>Baseline Prevalence (%)</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
		<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>
Young Chicken	20.0	6,306	7.6%	2,657	9.6%	445	15.3%	0		9,408	8.5%
Market Hogs	8.7	1,614	1.2%	2,435	3.9%	3,259	2.8%	0		7,308	2.8%
Cows/Bulls	2.7	460	0.0%	2,214	1.4%	1,295	0.8%	0		3,969	1.1%
Steers/Heifers	1.0	1,755	0.0%	1,395	0.2%	1,205	0.5%	0		4,355	0.2%
Ground Beef	7.5	883	4.8%	7,659	3.1%	5,153	1.6%	0		13,695	2.7%
Ground Chicken	44.6	67	61.2%	373	19.6%	66	28.8%	0		506	26.3%
Ground Turkey	49.9	631	18.4%	153	17.0%	36	2.8%	0		820	17.4%
Turkeys	19.6	1,334	7.2%	410	2.9%	0		0		1,744	6.2%

<b>CY 2006</b>											
<b>Product</b>	<b>Baseline Prevalence (%)</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
		<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>
Young Chicken	20.0	6,856	10.4%	2,962	12.7%	388	19.8%	0		10,206	11.4%
Market Hogs	8.7	895	1.3%	2,091	4.9%	4,256	4.2%	0		7,242	4.0%
Cows/Bulls	2.7	235	0.0%	1,338	0.9%	673	1.0%	0		2,246	0.8%
Steers/Heifers	1.0	1,142	0.1%	1,277	0.6%	1,255	0.1%	0		3,674	0.3%
Ground Beef	7.5	605	3.3%	9,584	2.3%	7,660	1.4%	0		17,849	2.0%
Ground Chicken	44.6	89	60.7%	101	41.6%	32	12.5%	0		222	45.0%
Ground Turkey	49.9	296	19.9%	145	21.4%	3	0.0%	0		444	20.3%
Turkeys	19.6	2,024	7.7%	761	5.5%	0		0		2,785	7.1%

**“A” Set Samples**

<b>CY 2005</b>											
<b>Product</b>	<b>Baseline Prevalence (%)</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
		<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>
Young Chicken	20.0	6,853	14.7%	2,458	18.6%	280	32.9%	1	0.0%	9,592	16.3%
Market Hogs	8.7	1,410	2.2%	1,750	5.2%	3,488	3.6%	0		6,648	3.7%
Cows/Bulls	2.7	229	0.0%	975	1.5%	745	1.5%	0		1,949	1.3%
Steers/Heifers	1.0	788	0.0%	552	0.9%	750	0.9%	0		2,090	0.6%
Ground Beef	7.5	544	2.2%	9,070	1.4%	9,751	0.8%	0		19,365	1.1%
Ground Chicken	44.6	0		133	33.1%	12	25.0%	0		145	32.4%
Ground Turkey	49.9	799	24.8%	86	14.0%	40	12.5%	0		925	23.2%

<b>CY 2004</b>											
<b>Product</b>	<b>Baseline Prevalence (%)</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
		<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>
Young Chicken	20.0	5,023	11.7%	1,871	18.2%	178	17.4%	0		7,072	13.5%
Market Hogs	8.7	1,274	2.2%	1,989	4.8%	4,597	2.7%	0		7,860	3.1%
Cows/Bulls	2.7	522	0.0%	1,801	0.6%	852	1.5%	0		3,175	0.8%
Steers/Heifers	1.0	1,471	0.0%	1,287	0.3%	1,469	0.5%	0		4,227	0.3%
Ground Beef	7.5	840	2.4%	15,336	2.0%	14,808	1.2%	0		30,984	1.6%
Ground Chicken	44.6	53	5.7%	254	29.1%	81	27.2%	0		388	25.5%
Ground Turkey	49.9	835	20.7%	177	19.2%	32	3.1%	0		1,044	19.9%

<b>CY 1998-2003</b>											
<b>Product</b>	<b>Baseline Prevalence (%)</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
		<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>
Young Chicken	20.0	34,206	9.9%	12,102	13.7%	782	24.3%	0		47,090	11.2%
Market Hogs	8.7	8,763	3.2%	7,382	6.8%	13,723	3.7%	108	0.9%	29,976	4.3%
Cows/Bulls	2.7	1,276	0.4%	8,038	1.7%	3,570	2.9%	0		12,884	1.9%
Steers/Heifers	1.0	3,648	0.2%	3,995	0.6%	5,175	0.4%	17	0.0%	12,835	0.4%
Ground Beef	7.5	5,800	4.4%	79,251	3.3%	49,624	1.9%	113	7.1%	134,788	2.8%
Ground Chicken	44.6	567	16.2%	1,065	26.3%	90	16.7%	0		1,722	22.5%
Ground Turkey	49.9	4,367	28.0%	1,225	22.4%	199	17.1%	0		5,791	26.4%

**NOTE:** CY1998 through CY2003 are reported aggregately instead of individually because reliable annual data is not available.

**Table A2**  
**Percent Positive *Salmonella* Tests in the PR/HACCP Verification Testing Program**  
**Aggregated Results by Product Class, 1998 – 2012**

<b>All Years 1998 - 2012</b>										
<b>Product</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>
Young Chicken	84,774	8.5%	30,663	12.9%	3,336	21.5%	54	7.4%	118,827	10.0%
Market Hogs	17,055	2.4%	21,523	5.0%	35,940	3.3%	108	0.9%	74,626	3.6%
Cows/Bulls	3,451	0.2%	19,111	1.2%	8,621	1.9%	0		31,183	1.3%
Steers/Heifers	14,105	0.1%	14,346	0.5%	16,513	0.4%	99	0.0%	45,063	0.3%
Ground Beef	14,944	3.8%	162,338	2.7%	101,410	1.6%	375	2.9%	279,067	2.4%
Ground Chicken	1,346	27.6%	3,980	24.5%	604	31.6%	106	11.3%	6,036	25.7%
Ground Turkey	9,859	21.9%	2,626	17.2%	496	10.1%	66	6.1%	13,047	20.4%
Turkeys	7,741	4.8%	3,366	4.0%	119	10.1%	32	0.0%	11,258	4.6%

**NOTE:** HACCP classifications for a plant can change over time. This table reflects the sum of the individual tables, i.e. HACCP size at the time the samples were taken.

**Table A3**

**Percent of Sample Sets Meeting the *Salmonella* Performance Standards  
By Product Class and Calendar Year, 1998 – 2012\***

<b>CY 2012</b>										
<b>Product</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>
Young Chicken	134	95.52%	35	77.14%	9	44.44%	0	0.00%	178	89.33%
Market Hogs	1	100.00%	0	0.00%	4	100.00%	0	0.00%	5	100.00%
Cows/Bulls	0	0.00%	1	100.00%	0	0.00%	0	0.00%	1	100.00%
Steers/Heifers	0	0.00%	3	33.33%	5	100.00%	0	0.00%	8	75.00%
Ground Beef	30	93.33%	158	96.20%	54	96.30%	2	100.00%	244	95.90%
Ground Chicken	1	0.00%	8	75.00%	2	100.00%	2	100.00%	13	76.92%
Ground Turkey	12	100.00%	6	100.00%	0	0.00%	1	100.00%	19	100.00%
Turkeys	17	100.00%	12	91.67%	1	100.00%	3	66.67%	33	93.94%

\* Includes sample sets completed during the indicated calendar year (sample sets may have started during an earlier year).

<b>CY 2011</b>										
<b>Product</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>
Young Chicken	71	100.00%	25	92.00%	4	50.00%	0	0	100	96.00%
Market Hogs	5	100.00%	21	100.00%	24	100.00%	0	0	50	100.00%
Cows/Bulls	1	100.00%	8	100.00%	6	100.00%	0	0	15	100.00%
Steers/Heifers	16	100.00%	16	93.80%	19	94.70%	0	0	51	96.10%
Ground Beef	22	81.80%	138	95.70%	44	95.50%	1	100.00%	205	94.10%
Ground Chicken	1	100.00%	7	85.70%	1	0.00%	0	0	9	77.80%
Ground Turkey	11	100.00%	1	100.00%	2	100.00%	0	0	14	100.00%
Turkeys	19	94.70%	6	100.00%	0	0	0	0	25	96.00%

<b>CY 2010</b>										
<b>Product</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>
Young Chicken	94	98.9%	38	86.8%	2	50.0%	0		134	94.8%
Market Hogs	24	95.8%	30	96.7%	32	96.9%	0		86	96.5%
Cows/Bulls	4	100.0%	25	96.0%	3	66.7%	0		32	93.8%
Steers/Heifers	18	100.0%	23	91.3%	21	95.2%	0		62	95.2%
Ground Beef	23	100.0%	124	96.0%	28	96.4%	0		175	96.6%
Ground Chicken	2	100.0%	8	100.0%	1	100.0%	0		11	100.0%
Ground Turkey	9	100.0%	4	100.0%	1	100.0%	0		14	100.0%
Turkeys	22	95.5%	8	87.5%	0		0		30	93.3%

<b>CY 2009</b>										
<b>Product</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>
Young Chicken	102	99.0%	35	88.6%	3	66.7%	0		140	95.7%
Market Hogs	21	100.0%	33	97.0%	40	95.0%	0		94	96.8%
Cows/Bulls	7	100.0%	26	96.2%	9	88.9%	0		42	95.2%
Steers/Heifers	23	100.0%	17	88.2%	28	100.0%	0		68	97.1%
Ground Beef	20	95.0%	130	96.2%	45	95.6%	0		195	95.9%
Ground Chicken	2	50.0%	3	100.0%	1	100.0%	0		6	83.3%
Ground Turkey	9	100.0%	4	100.0%	1	100.0%	0		14	100.0%
Turkeys	15	100.0%	9	100.0%	0		0		24	100.0%

<b>CY 2008</b>										
<b>Product</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>
Young Chicken	105	99.0%	37	94.6%	6	83.3%	1	100.0%	149	97.3%
Market Hogs	12	66.7%	35	97.1%	43	97.7%	0		90	93.3%
Cows/Bulls	2	100.0%	32	96.9%	12	100.0%	2	100.0%	48	97.9%
Steers/Heifers	15	100.0%	24	91.7%	25	88.0%	0		64	92.2%
Ground Beef	26	92.3%	225	90.7%	109	78.9%	3	100.0%	363	87.3%
Ground Chicken	3	66.7%	5	100.0%	1	100.0%	0		9	88.9%
Ground Turkey	16	100.0%	1	100.0%	1	100.0%	0		18	100.0%
Turkeys	3	100.0%	2	100.0%	0		0		5	100.0%

<b>CY 2007</b>										
<b>Product</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>
Young Chicken	147	98.0%	63	96.8%	5	80.0%	0		215	97.2%
Market Hogs	29	100.0%	46	97.8%	72	95.8%	0		147	97.3%
Cows/Bulls	7	100.0%	34	94.1%	22	95.5%	0		63	95.2%
Steers/Heifers	24	100.0%	16	87.5%	17	94.1%	0		57	94.7%
Ground Beef	16	93.8%	144	95.1%	93	97.8%	0		253	96.0%
Ground Chicken	1	0.0%	7	100.0%	2	100.0%	0		10	90.0%
Ground Turkey	11	100.0%	4	100.0%	0		0		15	100.0%
Turkeys	35	100.0%	10	100.0%	0		0		45	100.0%

<b>CY 2006</b>										
<b>Product</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>
Young Chicken	126	92.9%	52	82.7%	6	50.0%	0		184	88.6%
Market Hogs	26	100.0%	45	93.3%	74	93.2%	0		145	94.5%
Cows/Bulls	5	100.0%	20	95.0%	9	77.8%	0		34	91.2%
Steers/Heifers	11	100.0%	11	81.8%	11	100.0%	0		33	93.9%
Ground Beef	12	91.7%	186	96.8%	173	98.8%	0		371	97.6%
Ground Chicken	1	0.0%	1	100.0%	0		0		2	50.0%
Ground Turkey	9	100.0%	2	100.0%	1	100.0%	0		12	100.0%
Turkeys	23	95.7%	10	90.0%	0		0		33	93.9%

**“A” Sets**

<b>CY 2005</b>										
<b>Product</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>
Young Chicken	121	86.0%	45	73.3%	5	40.0%	0		171	81.3%
Market Hogs	16	100.0%	24	83.3%	73	97.3%	0		113	94.7%
Cows/Bulls	3	100.0%	18	88.9%	17	100.0%	0		38	94.7%
Steers/Heifers	7	100.0%	8	87.5%	9	88.9%	0		24	91.7%
Ground Beef	11	100.0%	181	98.3%	199	98.5%	0		391	98.5%
Ground Chicken	0		5	80.0%	0		0		5	80.0%
Ground Turkey	12	100.0%	1	100.0%	0		0		13	100.0%

<b>CY 2004</b>										
<b>Product</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>
Young Chicken	106	94.3%	36	77.8%	2	100.0%	0		144	90.3%
Market Hogs	25	96.0%	35	85.7%	70	92.9%	0		130	91.5%
Cows/Bulls	9	100.0%	36	97.2%	16	81.3%	0		61	93.4%
Steers/Heifers	24	100.0%	19	94.7%	29	96.6%	0		72	97.2%
Ground Beef	16	93.8%	287	97.6%	268	97.0%	0		571	97.2%
Ground Chicken	1	100.0%	3	100.0%	1	100.0%	0		5	100.0%
Ground Turkey	18	94.4%	3	100.0%	0		0		21	95.2%

<b>CY 1998-2003</b>										
<b>Product</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>
Young Chicken	660	92.1%	229	84.7%	12	50.0%	0		901	89.7%
Market Hogs	156	94.9%	126	83.3%	202	91.1%	1	100.0%	485	90.3%
Cows/Bulls	22	95.5%	128	85.9%	49	77.6%	0		199	84.9%
Steers/Heifers	37	100.0%	40	95.0%	36	88.9%	0		113	94.7%
Ground Beef	105	88.6%	1,411	92.6%	813	97.3%	3	66.7%	2,332	94.0%
Ground Chicken	9	100.0%	18	88.9%	1	100.0%	0		28	92.9%
Ground Turkey	74	94.6%	20	90.0%	3	100.0%	0		97	93.8%

**NOTE:** CY1998 through CY2003 are reported aggregately instead of individually because reliable annual data is not available.

**Table A4**

**Percent of Sample Sets Meeting the *Salmonella* Performance Standards  
Aggregated by Product Class, 1998 – 2012**

<b>All Years 1998 - 2012</b>										
<b>Product</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>	<b># Sets</b>	<b>% Pass</b>
Young Chicken	1,666	94.24%	595	85.38%	54	57.41%	1	100.00%	2,316	91.11%
Market Hogs	315	95.56%	395	90.63%	634	94.16%	1	100.00%	1,345	93.46%
Cows/Bulls	60	98.33%	328	91.77%	143	86.71%	2	100.00%	533	91.18%
Steers/Heifers	175	100.00%	177	90.40%	200	94.00%	0		552	94.75%
Ground Beef	281	91.46%	2,984	94.30%	1,826	96.33%	9	88.89%	5,100	94.86%
Ground Chicken	21	76.19%	65	90.77%	10	90.00%	2	100.00%	98	87.76%
Ground Turkey	181	97.24%	46	95.65%	9	100.00%	1	100.00%	237	97.05%
Turkeys	134	97.76%	57	94.74%	1	100.00%	3	66.67%	195	96.41%

**NOTE:** HACCP classifications for a plant can change over time. This table reflects the sum of the individual tables, i.e. HACCP size at the time the samples were taken.

**Table A5  
Number of Establishments and Percentage in Each Category by Product, 2012**

Category	Young Chicken		Ground Beef		Ground Chicken		Ground Turkey		Turkeys		All Products	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1	128	73.14%	237	82.86%	5	71.42%	20	90.90%	28	82.35%	418	79.77%
2T	13	7.42%	22	7.69%	1	14.28%	1	4.54%	4	11.76%	41	7.82%
2	19	10.85%	22	7.69%	0	0	1	4.54%	1	2.94%	43	8.20%
3	15	8.57%	5	1.74%	1	14.28%	0	0	1	2.94%	22	4.19%
Total	175	100.00%	286	100.00%	7	100.00%	22	100.00%	34	100.00%	524	100.00%

**NOTE:** Only plants eligible for sampling (currently operating) and having at least 2 completed sets are included.

**Table A6**  
**Percent Positive Qualitative (1 ml) *Campylobacter* Tests in the PR/HACCP Verification Testing Program**  
**By Product Class and Calendar Year, 2011 - 2012**

<b>CY 2012</b>											
<b>Product</b>	<b>Baseline Prevalence (%)</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
		<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>
Young Chicken	10.4	8,222	3.70%	2089	15.00%	459	32.00%	0	0.00%	10,770	7.00%
Turkeys	0.79	1318	1.40%	736	3.70%	28	0.00%	32	6.30%	2,114	2.30%

**NOTE:** The calendar year total for samples analyzed is not always the simple addition of the totals from all 4 quarters. On occasion, appealed sample results are removed from the totals for verification results.

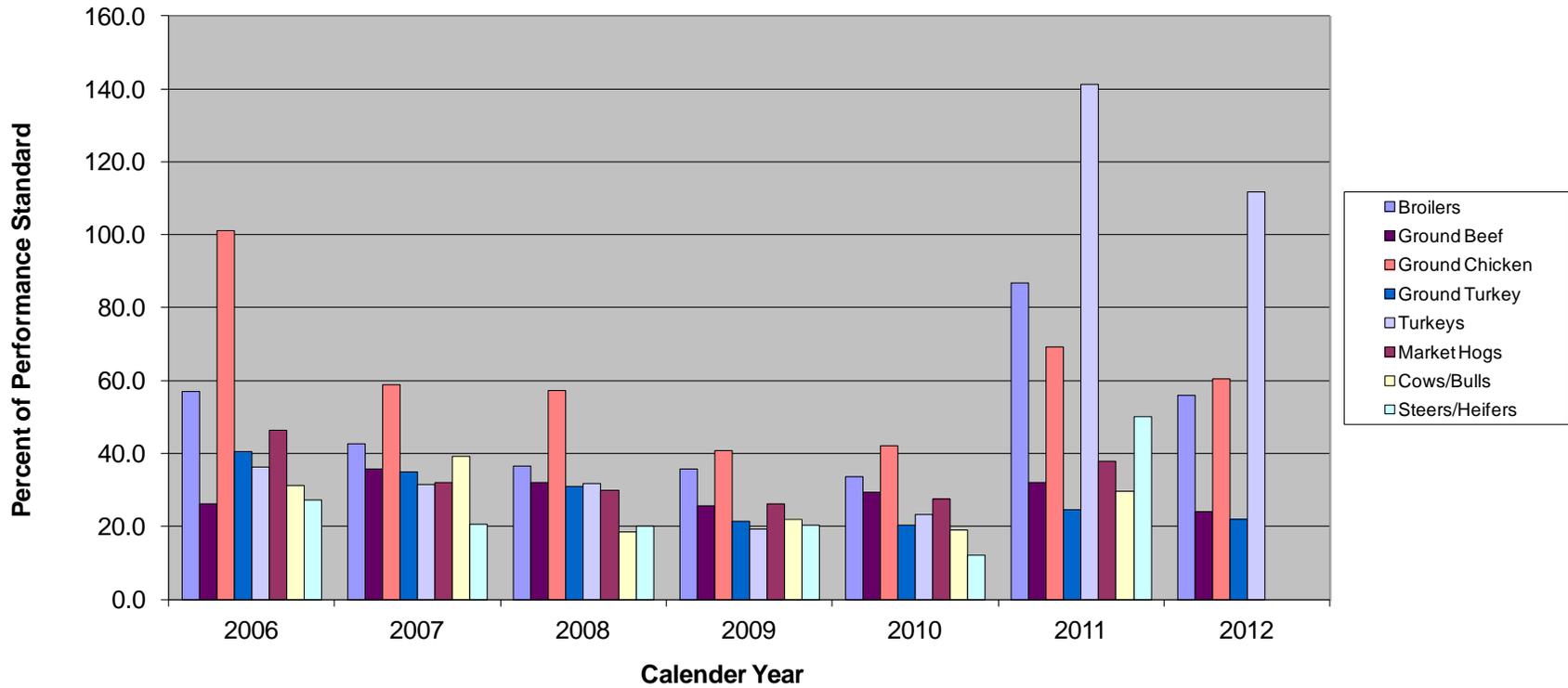
<b>CY 2011</b>											
<b>Product</b>	<b>Baseline Prevalence (%)</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
		<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>
Young Chicken	10.4	1,945	7.60%	448	16.30%	40	15.00%	0		2,433	9.30%
Turkeys	0.79	777	2.80%	309	7.80%	3	0.00%	0		1,089	4.20%

**Table A7**  
**Percent Positive Qualitative (1 ml) *Campylobacter* Tests in the PR/HACCP Verification Testing Program**  
**Aggregated Results by Product Class 2011 - 2012**

<b>All Years 2011 - 2012</b>										
<b>Product</b>	<b>Large</b>		<b>Small</b>		<b>Very Small</b>		<b>Unknown</b>		<b>All Sizes</b>	
	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>	<b># Samp</b>	<b>% Pos</b>
Young Chicken	10,167	4.46%	2,537	14.82%	499	30.46%	0		13,203	7.43%
Turkeys	2,095	1.96%	1,045	4.88%	31	0.00%	32	6.25%	3,203	2.93%

**NOTE:** HACCP classifications for a plant can change over time. This table reflects the sum of the individual tables, i.e. HACCP size at the time the samples were taken.

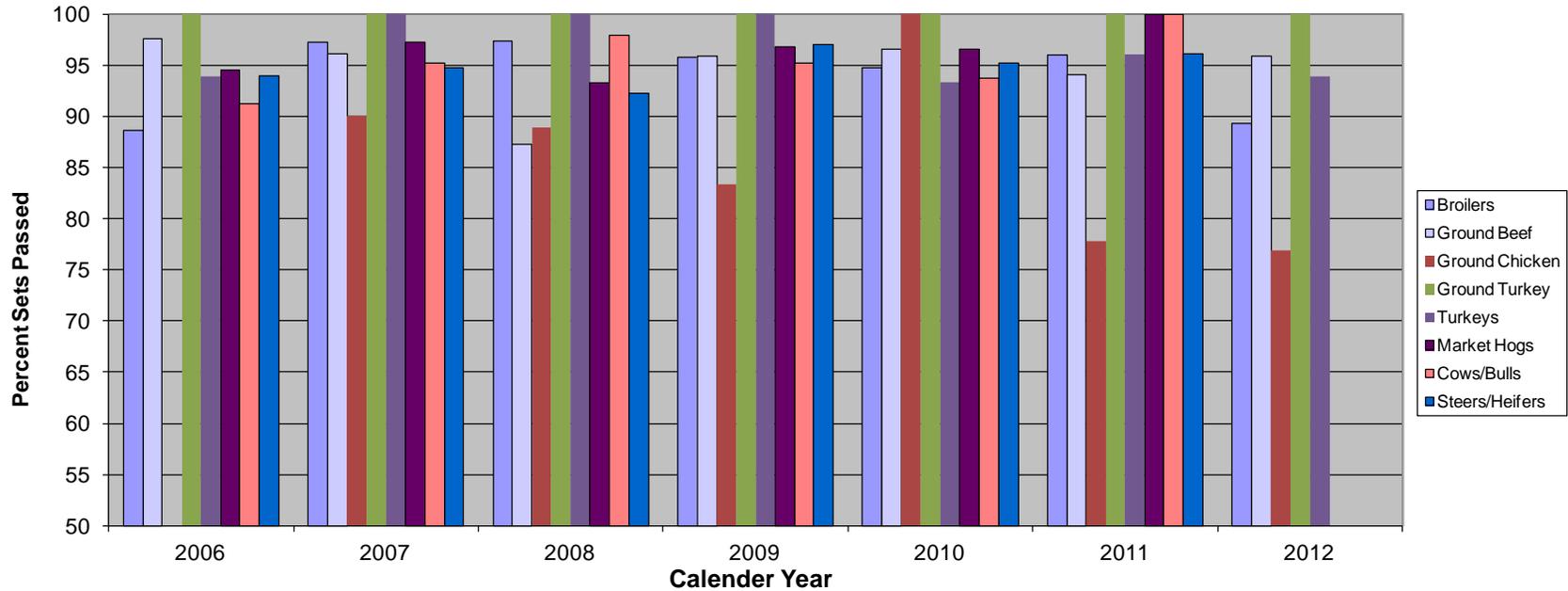
**Figure B1**  
**Comparison of Percent Positive *Salmonella* Tests in the PR/HACCP Verification Testing Program with Baseline Prevalence, by Calendar Year and Product Class, 2006 - 2012 \***



\* Bars represent percent positive *Salmonella* tests divided by product class-specific baseline *Salmonella* prevalence.

**NOTE:** 2011 uses new young chicken and turkey performance standards for entire year of data for purposes of this calculation. Also, cow/bull, steer/heifer, and market hog data are omitted in this calculation for 2012 because there were not enough samples taken for a valid comparison.

**Figure B2**  
**Overall Percentages of Sample Sets Meeting *Salmonella* Performance Standards**  
**By Calendar Year and Product Class, 2006 – 2012 \***



\* Includes sample sets completed during the indicated calendar year (sample sets may have started during an earlier year).

**NOTE:** In 2006 the percentage of sets passing the performance standard for ground chicken was 50%, which is why it is not visible on this graph. 2011 uses new young chicken and turkey performance standards for entire year of data for purposes of this calculation. Also, beef and hog carcass data are omitted in this calculation for 2012 because there were not enough samples taken for a valid comparison.

**Figure C1**  
**Young Chicken *Salmonella* Enteritidis (SE)**  
**Percent Positive by Calendar Year**

	Year						
	2006	2007	2008	2009	2010	2011	2012
<b>Positive Enteritidis (%)</b>	1.54	0.88	1.35	1.41	1.72	1.78	0.84
<b># Establishments</b>	155	180	146	133	146	74	181