

Progress Report on *Salmonella* Testing of Raw Meat and Poultry Products, 1998-2000

The Food Safety and Inspection Service (FSIS) issued the Pathogen Reduction; Hazard Analysis and Critical Control Point (HACCP) Systems; Final Rule on July 25, 1996: Federal Register, Vol. 61, No. 144, pp. 38805-38989 (http://www.fsis.usda.gov/OA/fr/haccp_rule.htm). To verify that industry Pathogen Reduction/HACCP (PR/HACCP) systems are effective in controlling the contamination of raw meat and poultry products with disease-causing bacteria, the PR/HACCP rule sets *Salmonella* performance standards that slaughter establishments and establishments that produce raw ground products must meet. These product-specific limits on *Salmonella* became effective in large establishments on January 26, 1998; in small establishments, on January 25, 1999; and in very small establishments, on January 25, 2000. FSIS verifies that establishments are meeting the standards by having federal inspection personnel collect randomly selected product samples and send them to FSIS laboratories for *Salmonella* analysis, according to procedures described in Appendix E of the PR/HACCP final rule: Federal Register, Vol. 61, No. 144, pp. 38917-38928 (http://www.fsis.usda.gov/OA/fr/haccp_rule.htm).

The *Salmonella* performance standards are based on the prevalence of *Salmonella* as determined from the agency's nationwide microbial baseline studies (<http://www.fsis.usda.gov/OPHS/baseline/contents.htm>) conducted before PR/HACCP was implemented. Raw products currently covered by performance standards are carcasses of cows/bulls, steers/heifers, market hogs, and broilers; and ground beef, ground chicken, and ground turkey. The performance standards are expressed in terms of the maximum number of *Salmonella*-positive samples that are allowed per sample set. The number of samples in a sample set varies by product, and the maximum number of positive samples allowed in a set provides an 80% probability of passing when the establishment is operating at the standard. An initial sample set or a set that follows a passed set is designated code "A"; other codes represent sample sets collected from establishments targeted for follow-up testing following a failed set. Code "A" sample sets are collected at randomly selected establishments.

The data analyzed for this report are from code "A" sample sets. The laboratory results from follow-up testing resulting from failed "A" sample sets are not included because they represent biased test results. Presenting the "A" set data provides the most direct comparison to the baseline estimates that were used to establish the performance standards. *Salmonella* prevalence estimates are based on all "A" set samples collected during the indicated year, with no consideration given as to whether a sample is part of a complete or an incomplete set. The percentages of sample sets meeting the *Salmonella* performance standards are based on "A" sets that were completed during the specified year, as defined by the collect date of the last sample in the sample set.

Salmonella prevalence in most of the product categories continues to be lower after PR/HACCP implementation than in agency baseline studies and surveys conducted before PR/HACCP (Table 1). Differences in pre- versus post-HACCP *Salmonella* prevalence may reflect changes due to HACCP implementation. After three years of testing in large establishments under HACCP, results show that the average *Salmonella* prevalence in code "A" samples is lower than the performance standard in all seven

product categories. After two years of testing in small establishments under HACCP, the average *Salmonella* prevalence in code “A” samples is lower than the performance standard in all product categories except market hogs. The *Salmonella* prevalence in code “A” market hog carcass samples from small establishments decreased from 18.0% in calendar year (CY) 1999 to 7.7% in CY 2000, compared to the 8.7% performance standard. The limited data available for very small establishments after approximately eight months of testing under HACCP show that the *Salmonella* prevalence is lower than the performance standard in all product categories except cows and bulls (3.5% prevalence compared to the 2.7% performance standard).

The results of three years of testing show that the majority of completed code “A” sample sets meets the *Salmonella* performance standard (Table 2). *Salmonella* compliance for all sizes of establishments and all years combined is: 90.7% for broilers, 80.8% for market hogs, 82.7% for cows/bulls, 94.4% for steers/heifers, 89.6% for ground beef, 100.0% for ground chicken, and 89.4% for ground turkey.

Achieving a reduction in pathogens reduces the risk of illness. However, all segments of the food chain and consumers should continue to properly handle, cook, and store all meat, poultry, and other food products in order to guard against foodborne illness.

A more detailed description of this program and the presentation of test results are being prepared and will be submitted for publication to a peer-reviewed journal.

For More Information:

- Media – (202) 720-9113
- Congressional – (202) 720-3897
- Constituent – (202) 720-8594
- Consumer inquiries – Call USDA’s Meat and Poultry Hotline at 1-800-535-4555. In the Washington, DC, area, call (202) 720-3333. The TTY number is 1-800-256-7072.
- Technical inquires – Dr. Walter Hill, Office of Public Health and Science, Biosciences Division, (202) 690-6369.
- FSIS Web Site: <http://www.fsis.usda.gov>

Table 1

Prevalence ^a of *Salmonella* in the PR/HACCP Verification Testing Program
By Calendar Year, 1998 - 2000

"A" Sets

		CY 2000							
Product	Perf Std (%)	Large		Small		Very Small		All Sizes	
		# Samp	% Pos	# Samp	% Pos	# Samp	% Pos	# Samp	% Pos
Broilers	20.0	7,175	7.5%	2,821	13.0%	61	18.0%	10,057	9.1%
Market Hog	8.7	1,919	4.1%	2,144	7.7%	1,107	7.2%	5,170	6.2%
Cows/Bulls	2.7	173	0.6%	1,593	2.1%	229	3.5%	1,995	2.2%
Steer/Heif	1.0	222	0.0%	693	0.6%	177	0.0%	1,092	0.4%
Grd Beef	7.5	1,373	5.4%	21,065	3.4%	10,406	2.7%	32,844	3.3%
Grd Chick	44.6	169	12.4%	233	15.0%	12	8.3%	414	13.8%
Grd Turkey	49.9	1,173	26.5%	377	23.3%	1	0.0%	1,551	25.7%

		CY 1999					
Product	Perf Std (%)	Large		Small		All Sizes	
		# Samp	% Pos	# Samp	% Pos	# Samp	% Pos
Broilers	20.0	4,530	9.3%	2,238	15.6%	6,768	11.4%
Market Hog	8.7	973	1.8%	950	18.0%	1,923	9.8%
Cows/Bulls	2.7	116	0.9%	1,405	2.3%	1,521	2.2%
Steer/Heif	1.0	272	0.4%	510	0.2%	782	0.3%
Grd Beef	7.5	765	6.7%	15,610	4.2%	16,375	4.3%
Grd Chick	44.6	125	15.2%	172	16.9%	297	16.2%
Grd Turkey	49.9	759	33.1%	291	27.8%	1,050	31.6%

		CY 1998					
Product	Perf Std (%)	Large		Small		All Sizes	
		# Samp	% Pos	# Samp	% Pos	# Samp	% Pos
Broilers	20.0	5,645	10.8%	14	7.1%	5,659	10.8%
Market Hog	8.7	1,390	5.8%	0		1,390	5.8%
Cows/Bulls	2.7	58	0.0%	121	1.7%	179	1.1%
Steer/Heif	1.0	214	0.0%	0		214	0.0%
Grd Beef	7.5	1,125	4.9%	171	16.4%	1,296	6.4%
Grd Chick	44.6	24	4.2%	0		24	4.2%
Grd Turkey	49.9	591	36.5%	0		591	36.5%

		All Years 1998 - 2000							
Product	Perf Std (%)	Large		Small		Very Small		All Sizes	
		# Samp	% Pos	# Samp	% Pos	# Samp	% Pos	# Samp	% Pos
Broilers	20.0	17,350	9.1%	5,073	14.1%	61	18.0%	22,484	10.2%
Market Hog	8.7	4,282	4.1%	3,094	10.9%	1,107	7.2%	8,483	7.0%
Cows/Bulls	2.7	347	0.6%	3,119	2.2%	229	3.5%	3,695	2.1%
Steer/Heif	1.0	708	0.1%	1,203	0.4%	177	0.0%	2,088	0.3%
Grd Beef	7.5	3,263	5.5%	36,846	3.8%	10,406	2.7%	50,515	3.7%
Grd Chick	44.6	318	12.9%	405	15.8%	12	8.3%	735	14.4%
Grd Turkey	49.9	2,523	30.8%	668	25.3%	1	0.0%	3,192	29.7%

^a Prevalence estimates include all samples collected during the indicated calendar year.

Table 2

Percent of Sample Sets Meeting the Salmonella Performance Standards^a
By Calendar Year, 1998 - 2000

"A" Sets

		CY 2000							
Product	Perf Std (%)	Large		Small		Very Small		All Sizes	
		# Sets	% Pass	# Sets	% Pass	# Sets	% Pass	# Sets	% Pass
Broilers	20.0	137	96.4%	53	79.2%	0		190	91.6%
Market Hog	8.7	32	93.8%	34	70.6%	0		66	81.8%
Cows/Bulls	2.7	2	100.0%	30	83.3%	0		32	84.4%
Steer/Heif	1.0	3	100.0%	8	87.5%	0		11	90.9%
Grd Beef	7.5	27	81.5%	344	91.9%	75	90.7%	446	91.0%
Grd Chick	44.6	3	100.0%	2	100.0%	0		5	100.0%
Grd Turkey	49.9	15	93.3%	2	50.0%	0		17	88.2%

		CY 1999					
Product	Perf Std (%)	Large		Small		All Sizes	
		# Sets	% Pass	# Sets	% Pass	# Sets	% Pass
Broilers	20.0	111	91.0%	40	85.0%	151	89.4%
Market Hog	8.7	26	100.0%	12	50.0%	38	84.2%
Cows/Bulls	2.7	2	100.0%	17	76.5%	19	78.9%
Steer/Heif	1.0	3	100.0%	3	100.0%	6	100.0%
Grd Beef	7.5	21	85.7%	252	87.3%	273	87.2%
Grd Chick	44.6	2	100.0%	3	100.0%	5	100.0%
Grd Turkey	49.9	18	94.4%	5	80.0%	23	91.3%

		CY 1998					
Product	Perf Std (%)	Large		Small		All Sizes	
		# Sets	% Pass	# Sets	% Pass	# Sets	% Pass
Broilers	20.0	77	90.9%	0		77	90.9%
Market Hog	8.7	16	68.8%	0		16	68.8%
Cows/Bulls	2.7	1	100.0%	0		1	100.0%
Steer/Heif	1.0	1	100.0%	0		1	100.0%
Grd Beef	7.5	9	88.9%	0		9	88.9%
Grd Chick	44.6	0		0		0	
Grd Turkey	49.9	7	85.7%	0		7	85.7%

		All Years 1998 - 2000							
Product	Perf Std (%)	Large		Small		Very Small		All Sizes	
		# Sets	% Pass	# Sets	% Pass	# Sets	% Pass	# Sets	% Pass
Broilers	20.0	325	93.2%	93	81.7%	0		418	90.7%
Market Hog	8.7	74	90.5%	46	65.2%	0		120	80.8%
Cows/Bulls	2.7	5	100.0%	47	80.9%	0		52	82.7%
Steer/Heif	1.0	7	100.0%	11	90.9%	0		18	94.4%
Grd Beef	7.5	57	84.2%	596	89.9%	75	90.7%	728	89.6%
Grd Chick	44.6	5	100.0%	5	100.0%	0		10	100.0%
Grd Turkey	49.9	40	92.5%	7	71.4%	0		47	89.4%

^a Includes sample sets that completed during the indicated calendar year (sample sets may have started during an earlier year).