



**DIOXIN FY2013 Survey:
Dioxins and Dioxin-Like Compounds
in the U.S. Domestic Meat and
Poultry Supply**

**Science Staff
Office of Public Health Science
Food Safety and Inspection Service
United States Department of Agriculture
May 2015**

Dioxin FY 2013 Survey: Dioxins and Dioxin-Like Compounds in the U.S. Domestic Meat and Poultry Supply

INTRODUCTION TO THIS REPORT

In Fiscal Year (FY) 2013, the U.S. Department of Agriculture (USDA) Food Safety and Inspection Service (FSIS) conducted a survey to gather information on dioxins, furans, and dioxin-like polychlorinated biphenyls (PCBs) in U.S. meat and poultry products. This survey is part of the agency's effort to monitor dioxin in FSIS-regulated products as a prudent public health practice. This survey provides insight on changes in human exposure to dioxin-like compounds through dietary components. USDA conducted previous surveys in the mid-1990s with the assistance of the U.S. Environmental Protection Agency (EPA) and more recently in 2002–2003 and 2007–2008 with assistance from the USDA Agricultural Research Service (ARS). The information presented in this report uses the same format as the most recent survey report entitled "Dioxin and Dioxin-Like Compounds in the U.S. Domestic Meat and Poultry Supply" available on the FSIS website at http://www.fsis.usda.gov/wps/wcm/connect/ad01c1f4-878e-4a37-9103-de67eb7729d7/Dioxin_Report_1009.pdf?MOD=AJPERES.

In this report, dioxins, furans, and dioxin-like PCBs are referred to as dioxin-like compounds (DLCs).

DIOXIN

DLCs are ubiquitous and persistent environmental contaminants. The majority of DLCs in the environment are byproducts of combustion and manufacturing processes, such as paper manufacturing, and municipal and medical waste incineration. Dioxin-like compounds accumulate in the fatty tissues of humans and food animals consumed by humans. It is generally believed that the most significant exposure to DLCs by humans is from the dietary intake of animal and fish products. For further information on dioxins and food safety, see the document *Questions and Answers about Dioxins* posted on the Food and Drug Administration's (FDA's) website <http://www.fda.gov/Food/FoodborneIllnessContaminants/ChemicalContaminants/ucm077524.htm>

DLCs have different levels of toxicity. Toxic Equivalency Factors (TEFs) are toxicity potency factors established by the World Health Organization (WHO) to characterize the relative potency of each DLC. The individual DLCs are generally summed to yield a single Toxic Equivalent (TEQ) value. The TEQ is the summation of the products of individual DLC concentrations and their TEFs.

In 2005, WHO re-evaluated the TEFs after the 2002–2003 survey. In preparation for the Dioxin 08 survey, the TEQs of the raw data from previous USDA surveys in the mid-1990s and 2002–2003 were recalculated using the WHO 2005 TEFs (see Table 1). FSIS will compare the recalculated data directly to the data collected in the Dioxin 2008 and 2013 surveys. All TEQs presented in this report are based on the 2005 WHO TEFs.

Samples collected for analysis are adipose tissue (fat) samples from carcasses. The percentage of carcass fat actually varies by species, thus all findings are converted to a 100% fat level. These results are referred to as fat-based or lipid-based results.

PREVIOUS SURVEYS: (Mid–1990s), (2002–2003) and (2007–2008)

In the mid-1990s, USDA and EPA conducted surveys of DLCs in beef, pork, and poultry from slaughter facilities across the United States. The surveys found low levels of dioxin in samples from approximately 50 steers/heifers, 50 market hogs, 41 young chickens, 15 young turkeys, and a small number of samples from minor marketing classes. A survey of 510 beef, pork, and poultry samples

was conducted in 2002–2003 and 2007–2008, and the data from three surveys were analyzed and compared.

These surveys were conducted by different laboratories nearly 10 years apart, so a direct comparison of the data was not straightforward. To accommodate these differences, we took two approaches: (1) comparison with non-detects set to zero and (2) comparison with non-detects set to half the limit of detection. Specific information on these approaches can be found in the report entitled “Dioxin and Dioxin-Like Compounds in the U.S. Domestic Meat and Poultry Supply” available on the FSIS website (see section *Introduction to this Report*).

After comparing the data from the current and previous surveys, the dioxin levels appear to have declined in three of the four slaughter classes—young chickens, market hogs, and young turkeys declining 20–80%. Any declines in cattle dioxin levels, if real, are less than those observed in the other slaughter classes.

To clarify data on cattle, we examined cattle TEQ values. Both surveys have a similar percentage of steers and heifers with total TEQ levels greater than 2 ppt (nominally the 90th percentile of the mid-1990s surveys). The value from the 2002–2003 survey was 11% (15 of 139) compared to 16% (8 of 51) in the mid-1990s survey. This value decreased even more during the 2007–2008 survey, 6.5% of steers/heifers. None of the other slaughter classes exhibited such a high percentage of TEQ values at the high end of their distribution curves. A comparison of congener profiles from the mid-1990s surveys with the 2002–2003 survey indicated few major changes: 1,2,3,7,8-PeCDD, 2,3,4,7,8-PeCDF, and PCB- 126 were the dominant congeners in both sets of data, with 1,2,3,6,7,8-HxCDD another significant contributor in cattle (10% of TEQ in mid-1990s and 19% of TEQ in 2002–2003). Because the basic congener profiles for each slaughter class appeared to remain reasonably constant since the mid- 1990s, the general sources of dioxin exposures may be the same, although the overall levels of these substances in these sources may have decreased.

The comparison of the mid-1990s and 2002–2003 surveys shed light on the changes in environmental levels and human exposure to dioxin compounds through dietary components; however, further study is necessary to examine factors that might explain the differences in dioxin levels and distribution profiles in the four slaughter classes.

The comparison of the 2007–2008 data with the data from the two previous U.S. surveys show that the most prevalent PCDD/Fs in each survey and slaughter class were OCDD and 1,2,3,4,6,7,8-HpCDD followed, in most cases, by 1,2,3,6,7,8-HxCDD. Both OCDD and HpCDD are the most common congeners found in the U.S. environment. The increased prevalence of 1,2,3,6,7,8-HxCDD along with OCDD and 1,2,3,4,6,7,8-HpCDD may indicate a possible link to pentachlorophenol that has continued over the 10-year span.

DIOXIN 13 SURVEY

The Dioxin 13 survey was conducted using the same methodology and instrumentation as the 2002–2003 and 2007–2008 surveys. The sample strategy was designed to obtain 510 samples across product classes as follows: 136 market hogs, 139 steers and heifers, 151 young chickens, and 84 young turkeys over the course of one year. FSIS used a probability-proportional-to-size design to select establishments for the survey. Using this design, FSIS sample collection mirrored the percent of product slaughtered nationally.

Inspectors collected approximately 250 g of back fat from cattle, 250 g of belly fat from hogs, and 250 g of abdominal fat from young chickens and turkeys. The poultry samples were composites from three birds in the same flock. Individual samples were homogenized and a subsample (5 g) was analyzed for 17 polychlorinated dibenzo-*p*-dioxins and dibenzofurans (CDD/Fs) and three coplanar polychlorinated biphenyls (cp-PCBs) (#77, 126, and 169) by a method based on EPA Method 1613 (“Tetra- through octa-chlorinated dioxins and furans by isotope dilution HRGC/HRMS”) modified to include the three cp-PCBs. A method blank was analyzed with each set of nine survey samples and used for blank subtraction. A known spiked sample was analyzed at least twice each month. TEQ values were calculated using the 2005 WHO TEFs and reporting non-detects (nd) as zero (nd=0) or half Detection Limit (DL) (nd=DL/2). In most cases, mid- range data (nd=DL/2) will be used for discussion purposes in this report. All values are expressed in picograms/grams (pg/g) lipid (ppt lipid weight) after gravimetric determination of the lipid content.

DIOXIN 13 SURVEY RESULTS

The mean total pg TEQ/g lipid values across all dioxin surveys (mid 1990s–2013) can be found in Table 1.

The median total pg TEQ/g lipid values across all dioxin surveys (mid 1990s–2013) can be found in Table 2.

The D/F/PCB TEQ Trends-based on Median pg TEQ/g Lipid % Percent Change can be found in Table 3.

The Dioxin 13 survey was designed to monitor dioxins and dioxin-like compounds levels in domestic meat and poultry. The results of the survey showed mean total TEQ levels for beef, turkey, chicken, and pork were 0.66, 0.35, 0.13, and 0.13 ppt lipid weight, respectively. In order to compare previous surveys, TEQs from all datasets were calculated using the most recent 2005 TEFs, Table 4.

Table 1: Mean Total pg TEQ/g Lipid Values Across All Dioxin Surveys (Mid 1990s–2013)

Animal Class	Mid-1990s Survey	2002–2003 Survey	2007–2008 Survey	2012–2013 Survey
Market Hogs	1.42	0.22	0.16	0.13
Steers-Heifers	1.31	0.84	0.66	0.66
Young Chickens	2.23	0.29	0.17	0.13
Young Turkeys	1.43	0.57	0.61	0.35

The average congener concentrations for each slaughter class: market hogs, steers-heifers, young chickens, and young turkeys in the Dioxin 13 survey are presented in Table 5. The mean, median, and

range of the TEQs for each production classes are presented in Table 6.

Tables 7 through 10 list the pg TEQ/g lipid values for dioxin/furans, dioxin-like PCBs, and the combined DLCs using $nd = 0$ and $nd = DL/2$ for all the individual 510 samples. Table 11 lists the detection limits for the twenty DLCs analyzed in the 2002–2003, 2007–2008, and Dioxin 13 surveys. The state where each animal was produced is also listed for each sample.

- Table 7: Market hogs samples
- Table 8: Steer/heifer samples
- Table 9: Young chicken samples
- Table 10: Young turkey samples

Additional data and information from the previous dioxin surveys are available by contacting the FSIS Congressional and Public Affairs office at (202) 720-9113.

COMPARING RESULTS FROM PREVIOUS SURVEYS

Overall TEQ median values for the slaughter classes have decreased in the last ten years (2002 to 2012) across all animal classes: Market hogs, Steer/heifer, Young Chickens, and Young Turkeys. See summary below:

Table 2: Median Total pg TEQ/g Lipid Values Across All Dioxin Surveys (Mid 1990s–2013)

Animal Class	Mid-1990s	2002–2003	2007–2008	2012–2013
Market Hogs	1.16	0.14	0.14	0.096
Steers-Heifers	1.01	0.49	0.42	0.38
Young Chickens	0.63	0.20	0.15	0.10
Young Turkeys	1.02	0.49	0.46	0.30
Sample Size N:	163	510	510	515

A statistical comparison of the 2002–2003, 2007–2008, and 2012–2013 survey data were possible, because the methodology and detection limits of the surveys were similar and had lower LODs (see Table 8). **Note:** Higher detection limits in the survey conducted in the mid-1990s make it difficult to compare directly these data with the later surveys. See summary below

Table 3: D/F/PCB TEQ Trends-based on Median pg TEQ/g Lipid % Percent Change

Animal Class	2002–2003 vs. 2007–2008 Surveys	2007–2008 vs. 2012–2013 Surveys
Market Hogs	0 %	- 31 %
Steers-Heifers	- 14 %	- 9.5 %
Young Chickens	- 25 %	- 33 %
Young Turkeys	- 6 %	- 35 %

Data from 2002 to 2008 shows that the median TEQs had declined by 14% for beef and 25% for chicken with nearly equal declines in both PCDD/F and PCB TEQs. The median TEQs for young turkey were relatively constant for the two surveys time periods (6% decreases in total TEQ). The TEQ data similarity between 2002–2003 and 2007–2008 for market hogs depended on the approach used for treating non-detects. Using $nd = DL/2$ for the hog TEQ data leads to the conclusion of median TEQs showing no change.

Data from 2008 to 2013 shows that the median TEQs had decreased by about 9.5% for beef, 31% for pork, 33% for chickens, and 35% for turkeys respectively. TEQ values for the slaughter classes appear to have decreased in the last five years. In general, turkeys and beef continued to have the highest median TEQ levels.

Both turkey and beef had a wide range of TEQs with one sample in each class exceeding 4.0 pg TEQ/g lipids in the 2007–2008 survey; however, only one beef exceeded 4.0 pg TEQ/g lipids in the 2013 survey. If outlier TEQ values from turkey samples, from an identified localized contamination, are excluded, steers and heifers generally had the widest range of pg TEQ/g lipid values. This is expected given that cattle in the U.S. graze on a wide variety of pastureland across the country, whereas poultry and pork production is typically confined and integrated with large feed suppliers.

In spite of the difficulties of comparing data from different laboratories and periods, data from three USDA surveys conducted in the same laboratory show a decreasing trend in pg TEQ/g lipid values over the past decade for domestic meat and poultry. The congener patterns remain relatively constant between 2002 and 2013 indicating similar animal exposures to dioxins and dioxin-like compounds during these periods.

Table 4. Mean and median pg TEQ/g lipid values for Dioxins/Furans and Dioxin-like PCBs in Previous USDA Dioxin Surveys

		Mid-1990s Survey			2002-2003 Survey			2007-2008 Survey		
		Number of Samples	Median TEQ	Mean TEQ	Number of Samples	Median TEQ	Mean TEQ	Number of Samples	Median TEQ	Mean TEQ
Steers/ Heifers	Dioxins/ Furans	51	0.73 (0.02)	0.94 (0.32)	139	0.36 (0.31)	0.71 (0.67)	139	0.31 (0.27)	0.55 (0.51)
	Dioxin- like PCBs		0.27 (0.27)	0.37 (0.37)		0.11 (0.11)	0.13 (0.13)		0.09 (0.09)	0.11 (0.11)
Market Hogs	Dioxins/ Furans	56	1.11 (0.03)	1.38 (0.39)	136	0.12 (0.03)	0.19 (0.11)	136	0.12 (0.02)	0.14 (0.04)
	Dioxin- like PCBs		0.02 (0.00)	0.04 (0.03)		0.02 (0.02)	0.03 (0.03)		0.01 (0.00)	0.02 (0.01)
Young Chickens	Dioxins/ Furans	41	0.45 (0.14)	2.04 (1.79)	151	0.13 (0.06)	0.21 (0.14)	151	0.11 (0.02)	0.12 (0.04)
	Dioxin- like PCBs		0.11 (0.11)	0.19 (0.19)		0.05 (0.05)	0.08 (0.08)		0.03 (0.03)	0.05 (0.05)
Young Turkeys	Dioxins/ Furans	15	0.56 (0.39)	0.97 (0.78)	84	0.29 (0.25)	0.38 (0.34)	84	0.31 (0.28)	0.36 (0.34)
	Dioxin- like PCBs		0.40 (0.40)	0.46 (0.46)		0.15 (0.15)	0.19 (0.19)		0.14 (0.14)	0.25 (0.25)

Note: Results are expressed in pg TEQ/g lipid. Data are blank subtracted. All results reported on a lipid basis with Non-Detects = Detection Limit /2 and Non-Detects = 0 in parentheses. Mean and median TEQs were calculated using 2005 WHO TEF values.

Table 5. Mean TEQ values for Dioxin-like Compounds by Congener for Each Slaughter class in the Dioxin 13 Survey (Includes 2005 WHO TEFs)

Dioxin-Like Compounds	Steers/Heifers <i>n</i> = 139	Market Hogs <i>n</i> = 137	Young Chicken <i>n</i> = 153	Young Turkey <i>n</i> = 85	WHO 2005 TEF
2378-TCDD	0.05 (0.03)	0.03 (0.00)	0.03 (0.00)	0.05 (0.03)	1
12378-PeCDD	0.17 (0.17)	0.03 (0.01)	0.03 (0.01)	0.12 (0.11)	1
123478-HxCDD	0.20 (0.19)	0.03 (0.02)	0.02 (0.01)	0.06 (0.04)	0.1
123678-HxCDD	1.04 (1.04)	0.07 (0.07)	0.11 (0.11)	0.25 (0.25)	0.1
123789-HxCDD	0.24 (0.23)	0.02 (0.00)	0.03 (0.02)	0.05 (0.03)	0.1
1234678-HpCDD	3.43 (3.43)	0.33 (0.33)	0.85 (0.85)	0.18 (0.17)	0.01
OCDD	4.17 (4.17)	2.12 (2.12)	4.56 (4.56)	0.37 (0.36)	0.0003
2378-TCDF	0.02 (0.01)	0.02 (0.01)	0.05 (0.04)	0.18 (0.17)	0.1
12378-PeCDF	0.02 (0.01)	0.02 (0.01)	0.03 (0.03)	0.04 (0.04)	0.03
23478-PeCDF	0.14 (0.13)	0.02 (0.02)	0.05 (0.02)	0.08 (0.08)	0.3
123478-HxCDF	0.46 (0.46)	0.04 (0.04)	0.04 (0.04)	0.06 (0.06)	0.1
123678-HxCDF	0.28 (0.28)	0.03 (0.02)	0.03 (0.02)	0.04 (0.04)	0.1
234678-HxCDF	0.22 (0.22)	0.02 (0.01)	0.02 (0.02)	0.02 (0.02)	0.1
123789-HxCDF	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)	0.1
1234678-HpCDF	0.95 (0.95)	0.11 (0.11)	0.12 (0.12)	0.04 (0.03)	0.01
1234789-HpCDF	0.06 (0.05)	0.02 (0.00)	0.02 (0.01)	0.01 (0.00)	0.01
OCDF	0.13 (0.13)	0.11 (0.10)	0.16 (0.16)	0.03 (0.02)	0.0003
PCB-77	6.43 (6.43)	9.28 (9.28)	8.14 (8.14)	7.78 (7.78)	0.0001
PCB-126	0.91 (0.91)	0.23 (0.23)	0.19 (0.18)	0.75 (0.75)	0.1
PCB-169	0.28 (0.28)	0.06 (0.04)	0.04 (0.02)	0.16 (0.16)	0.03

Note: Results are expressed in pg TEQ/g lipid. Data are blank subtracted. All results reported on a lipid basis with Non-Detects = Detection Limit /2 and Non-Detects = 0 in parentheses.

Table 6. Mean and Median TEQ Values for Dioxins/Furans, Dioxin-like PCBs, and Total DLCs TEQ Range by Slaughter Class in the Dioxin 13 Survey

	Steers/Heifers <i>N</i> = 139	Market Hogs <i>N</i> = 137	Young Chicken <i>N</i> = 153	Young Turkey <i>N</i> = 85
Mean Dioxins/Furans TEQ	0.56 (0.53)	0.10 (0.04)	0.11 (0.06)	0.26 (0.24)
Mean Dioxin-like PCBs TEQ	0.10 (0.10)	0.03 (0.03)	0.02 (0.02)	0.085 (0.08)
Median Dioxins/Furans TEQ	0.28 (0.27)	0.09 (0.02)	0.08 (0.03)	0.23 (0.21)
Median Dioxin-like PCBs TEQ	0.38 (0.36)	0.01 (0.01)	0.02 (0.02)	0.06 (0.06)
Total TEQ Range	0.09 – 6.47 (0.03 – 6.47)	0.03 – 2.14 (0.00 – 2.06)	0.03 – 1.85 (0.00 – 1.83)	0.05 – 1.31 (0.01 – 1.31)

Note: Results are expressed in pg TEQ/g lipid. Data are blank subtracted. All results reported on a lipid basis with Non-Detects = Detection Limit /2 and Non-Detects = 0 in parentheses

Table 7 . TEQ Values for Market Hog Samples (n=137) in the Dioxin 13 Survey

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBS, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBS, ND=LOD/2	Total TEQ DLCs, ND=0	Total TEQ DLCs, ND=LOD/2
1	IN	0.116	1.948	0.193	1.949	2.064	2.142
2	OH	0.231	0.042	0.255	0.042	0.273	0.297
3	PA	0.200	0.048	0.225	0.048	0.247	0.272
4	AK	0.204	0.021	0.237	0.022	0.225	0.259
5	MI	0.169	0.015	0.192	0.015	0.185	0.207
6	PA	0.132	0.021	0.153	0.021	0.153	0.173
7	NC	0.128	0.018	0.132	0.018	0.146	0.149
8	AR	0.109	0.017	0.111	0.017	0.126	0.127
9	IN	0.107	0.011	0.145	0.011	0.118	0.156
10	SD	0.108	0.008	0.147	0.009	0.116	0.156
11	MN	0.101	0.012	0.130	0.012	0.113	0.142
12	CA	0.103	0.010	0.226	0.011	0.113	0.238
13	WI	0.093	0.011	0.117	0.011	0.103	0.128
14	MO	0.085	0.011	0.088	0.011	0.095	0.099
15	MO	0.085	0.010	0.088	0.010	0.094	0.098
16	NC	0.066	0.022	0.159	0.022	0.089	0.182
17	IA	0.063	0.024	0.119	0.024	0.088	0.143
18	MO	0.068	0.018	0.204	0.020	0.086	0.225
19	OH	0.063	0.023	0.130	0.023	0.086	0.153
20	IA	0.075	0.008	0.098	0.008	0.083	0.106
21	IN	0.066	0.017	0.102	0.017	0.083	0.118
22	NC	0.062	0.011	0.094	0.011	0.073	0.105
23	IA	0.046	0.026	0.081	0.026	0.072	0.107
24	IN	0.049	0.023	0.078	0.023	0.072	0.101
25	MO	0.057	0.014	0.107	0.014	0.070	0.120
26	UT	0.055	0.014	0.091	0.014	0.069	0.105
27	NC	0.055	0.012	0.093	0.012	0.067	0.105
28	KS	0.062	0.005	0.085	0.005	0.067	0.090
29	CA	0.062	0.004	0.094	0.004	0.066	0.098
30	OH	0.057	0.006	0.125	0.006	0.063	0.131
31	NC	0.045	0.014	0.078	0.014	0.059	0.092
32	IA	0.049	0.010	0.112	0.011	0.058	0.122
33	UT	0.045	0.013	0.089	0.013	0.058	0.102
34	IN	0.028	0.029	0.074	0.029	0.056	0.103
35	OK	0.040	0.016	0.067	0.016	0.056	0.083
36	PA	0.044	0.011	0.075	0.011	0.055	0.086
37	MN	0.044	0.010	0.072	0.010	0.054	0.082
38	AR	0.017	0.037	0.133	0.038	0.054	0.171
39	IL	0.027	0.025	0.060	0.025	0.052	0.086
40	MO	0.043	0.009	0.161	0.009	0.052	0.170
41	MN	0.044	0.008	0.106	0.009	0.052	0.115

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBS, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBS, ND=LOD/2	Total TEQ DLCs, ND=0	Total TEQ DCLs, ND=LOD/2
42	AR	0.029	0.022	0.079	0.023	0.052	0.102
43	NC	0.037	0.015	0.071	0.015	0.052	0.086
44	MN	0.017	0.035	0.321	0.036	0.051	0.358
45	TX	0.040	0.011	0.069	0.012	0.051	0.080
46	IA	0.045	0.005	0.072	0.005	0.050	0.077
47	IA	0.042	0.007	0.135	0.009	0.049	0.144
48	NC	0.035	0.013	0.070	0.013	0.048	0.083
49	IA	0.042	0.006	0.065	0.006	0.048	0.070
50	IA	0.019	0.028	0.189	0.031	0.047	0.220
51	NC	0.036	0.012	0.160	0.012	0.047	0.172
52	KY	0.028	0.019	0.175	0.021	0.047	0.196
53	PA	0.027	0.019	0.080	0.019	0.046	0.098
54	IA	0.039	0.005	0.095	0.005	0.044	0.100
55	IA	0.037	0.007	0.084	0.007	0.044	0.091
56	IA	0.010	0.034	0.114	0.036	0.044	0.149
57	TX	0.028	0.013	0.167	0.013	0.042	0.181
58	NC	0.025	0.015	0.124	0.016	0.040	0.141
59	MN	0.035	0.004	0.053	0.004	0.039	0.057
60	MN	0.022	0.014	0.084	0.014	0.036	0.098
61	OK	0.031	0.005	0.051	0.005	0.036	0.056
62	IA	0.023	0.013	0.082	0.013	0.036	0.095
63	PA	0.015	0.020	0.086	0.020	0.035	0.106
64	IA	0.034	0.001	0.068	0.001	0.035	0.069
65	CA	0.030	0.003	0.060	0.003	0.033	0.063
66	IN	0.023	0.010	0.129	0.012	0.033	0.141
67	IA	0.025	0.008	0.076	0.009	0.033	0.085
68	IN	0.021	0.012	0.103	0.012	0.033	0.115
69	MN	0.012	0.021	0.138	0.022	0.033	0.160
70	KS	0.013	0.019	0.163	0.020	0.032	0.183
71	OK	0.023	0.009	0.144	0.009	0.032	0.152
72	IN	0.030	0.000	0.194	0.007	0.030	0.201
73	OH	0.025	0.005	0.062	0.005	0.030	0.067
74	TN	0.015	0.015	0.088	0.016	0.030	0.104
75	IA	0.022	0.007	0.102	0.009	0.030	0.110
76	SD	0.022	0.007	0.068	0.007	0.028	0.075
77	OK	0.017	0.011	0.073	0.011	0.028	0.084
78	NE	0.018	0.009	0.148	0.011	0.027	0.159
79	KY	0.011	0.016	0.056	0.016	0.027	0.073
80	MN	0.021	0.006	0.108	0.007	0.027	0.115
81	MN	0.015	0.011	0.047	0.011	0.026	0.058
82	NE	0.014	0.012	0.058	0.012	0.026	0.070
83	OK	0.018	0.008	0.088	0.009	0.026	0.097
84	OK	0.015	0.010	0.062	0.011	0.025	0.072

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBS, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBS, ND=LOD/2	Total TEQ DLCs, ND=0	Total TEQ DLCs, ND=LOD/2
85	IN	0.017	0.008	0.074	0.009	0.025	0.083
86	IA	0.011	0.013	0.053	0.013	0.023	0.065
87	IA	0.018	0.005	0.048	0.005	0.023	0.053
88	NE	0.017	0.005	0.065	0.006	0.022	0.070
89	IL	0.014	0.007	0.062	0.008	0.022	0.070
90	OH	0.010	0.011	0.083	0.011	0.021	0.094
91	NC	0.009	0.012	0.073	0.013	0.021	0.086
92	NE	0.012	0.009	0.101	0.010	0.020	0.111
93	IA	0.014	0.007	0.053	0.007	0.020	0.061
94	IA	0.009	0.011	0.058	0.011	0.020	0.069
95	MN	0.010	0.009	0.086	0.009	0.019	0.095
96	MI	0.016	0.001	0.053	0.002	0.017	0.054
97	OH	0.009	0.007	0.073	0.008	0.016	0.081
98	IA	0.006	0.010	0.049	0.011	0.016	0.060
99	IN	0.006	0.010	0.070	0.011	0.016	0.081
100	IL	0.013	0.002	0.064	0.003	0.015	0.067
101	SC	0.007	0.008	0.113	0.008	0.015	0.121
102	MO	0.004	0.009	0.068	0.010	0.013	0.078
103	MN	0.005	0.007	0.045	0.007	0.012	0.052
104	NE	0.011	0.001	0.099	0.001	0.012	0.100
105	TX	0.009	0.003	0.065	0.003	0.012	0.068
106	PA	0.004	0.007	0.131	0.008	0.011	0.140
107	IA	0.008	0.003	0.085	0.004	0.011	0.088
108	IL	0.008	0.003	0.092	0.004	0.011	0.096
109	IA	0.007	0.004	0.050	0.005	0.011	0.055
110	SD	0.008	0.003	0.091	0.004	0.011	0.095
111	MN	0.003	0.008	0.102	0.009	0.011	0.111
112	MS	0.006	0.005	0.051	0.005	0.011	0.056
113	IN	0.005	0.005	0.061	0.006	0.010	0.067
114	IN	0.003	0.007	0.194	0.009	0.010	0.203
115	IA	0.003	0.007	0.043	0.007	0.010	0.050
116	MN	0.006	0.004	0.083	0.005	0.010	0.087
117	IA	0.005	0.004	0.047	0.005	0.010	0.051
118	IL	0.006	0.003	0.045	0.004	0.009	0.049
119	TX	0.004	0.004	0.050	0.004	0.008	0.054
120	IA	0.006	0.002	0.034	0.003	0.008	0.037
121	MN	0.003	0.005	0.036	0.006	0.008	0.043
122	MN	0.003	0.005	0.049	0.005	0.008	0.054
123	OK	0.002	0.006	0.045	0.006	0.007	0.051
124	KS	0.003	0.004	0.041	0.005	0.007	0.045
125	IN	0.006	0.001	0.040	0.001	0.007	0.041
126	IN	0.006	0.001	0.065	0.001	0.007	0.067
127	NE	0.006	0.000	0.085	0.003	0.006	0.088

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBS, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBS, ND=LOD/2	Total TEQ DLCs, ND=0	Total TEQ DCLs, ND=LOD/2
128	IA	0.005	0.002	0.043	0.002	0.006	0.045
129	MN	0.004	0.001	0.061	0.002	0.005	0.062
130	OH	0.002	0.003	0.179	0.005	0.005	0.184
131	IA	0.003	0.001	0.051	0.001	0.004	0.052
132	NE	0.001	0.001	0.092	0.002	0.002	0.094
133	IA	0.001	0.001	0.145	0.003	0.001	0.147
134	IL	0.001	0.000	0.077	0.004	0.001	0.081
135	IN	0.001	0.000	0.045	0.001	0.001	0.047
136	IA	0.001	0.000	0.029	0.001	0.001	0.030
137	IA	0.000	0.000	0.092	0.005	0.001	0.097

Note: Results are expressed in pg TEQ/g lipid. Data are blank subtracted. All results reported on a lipid basis. The mean TEQ for all 20 DLCs may not equal the sum of the mean TEQs for dioxins/furans and PCBs due to rounding.

Table 8. TEQ Values for Steers/Heifers Samples (n=139) in the Dioxin 13 Survey

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBS, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBS, ND=LOD/2	Total TEQ DLCs, ND=0	Total TEQ DCLs, ND=LOD/2
1	IA	6.314	0.154	6.314	0.154	6.468	6.468
2	IA	3.602	0.057	3.602	0.057	3.659	3.659
3	NE	3.282	0.040	3.304	0.040	3.322	3.343
4	NE	2.623	0.188	2.623	0.188	2.811	2.811
5	IA	2.689	0.067	2.689	0.067	2.756	2.757
6	TX	2.529	0.052	2.531	0.052	2.581	2.583
7	IA	2.196	0.327	2.197	0.327	2.523	2.524
8	IL	1.358	0.452	1.359	0.452	1.810	1.811
9	MN	1.748	0.048	1.749	0.048	1.796	1.798
10	IN	1.572	0.195	1.572	0.195	1.766	1.767
11	NE	1.362	0.110	1.362	0.110	1.472	1.473
12	KS	1.285	0.135	1.286	0.135	1.420	1.421
13	TX	1.276	0.132	1.278	0.132	1.408	1.410
14	KS	1.267	0.104	1.316	0.104	1.371	1.420
15	TX	1.049	0.219	1.104	0.219	1.268	1.323
16	MN	1.186	0.038	1.187	0.038	1.224	1.225
17	IA	1.084	0.087	1.085	0.087	1.172	1.172
18	IA	1.049	0.108	1.080	0.108	1.156	1.187
19	TX	1.043	0.104	1.044	0.104	1.146	1.147
20	KS	0.946	0.159	0.947	0.159	1.104	1.106
21	NE	0.984	0.027	1.041	0.029	1.012	1.070
22	TX	0.881	0.053	0.883	0.053	0.934	0.936
23	IA	0.711	0.221	0.713	0.221	0.932	0.934
24	OH	0.760	0.166	0.760	0.166	0.925	0.925
25	CO	0.808	0.052	0.809	0.052	0.860	0.861
26	IA	0.778	0.043	0.805	0.043	0.821	0.848
27	KS	0.731	0.081	0.733	0.081	0.813	0.815
28	TX	0.715	0.090	0.834	0.090	0.805	0.924
29	KS	0.740	0.059	0.741	0.059	0.798	0.800
30	ID	0.244	0.527	0.383	0.527	0.771	0.910
31	KS	0.669	0.093	0.670	0.093	0.762	0.764
32	PA	0.436	0.324	0.439	0.324	0.760	0.762
33	NC	0.557	0.125	0.557	0.125	0.682	0.682
34	MD	0.436	0.236	0.467	0.236	0.672	0.703
35	KS	0.386	0.212	0.413	0.212	0.598	0.625
36	KS	0.408	0.184	0.409	0.184	0.592	0.593
37	TX	0.439	0.146	0.441	0.146	0.585	0.587
38	PA	0.353	0.230	0.357	0.230	0.583	0.587
39	NE	0.473	0.107	0.474	0.107	0.580	0.581
40	KS	0.438	0.140	0.440	0.140	0.578	0.580
41	IA	0.517	0.051	0.561	0.051	0.568	0.612

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBS, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBS, ND=LOD/2	Total TEQ DLCs, ND=0	Total TEQ DCLs, ND=LOD/2
42	IA	0.508	0.060	0.509	0.060	0.568	0.569
43	IA	0.430	0.125	0.432	0.125	0.556	0.557
44	NE	0.462	0.085	0.463	0.085	0.547	0.548
45	IN	0.426	0.107	0.428	0.107	0.533	0.535
46	IA	0.399	0.112	0.400	0.112	0.511	0.513
47	NE	0.458	0.043	0.459	0.043	0.501	0.502
48	TX	0.266	0.179	0.268	0.179	0.445	0.446
49	TX	0.363	0.075	0.364	0.075	0.438	0.439
50	NE	0.370	0.068	0.370	0.068	0.438	0.438
51	NE	0.386	0.049	0.387	0.049	0.436	0.436
52	IL	0.349	0.084	0.390	0.084	0.433	0.474
53	NE	0.269	0.162	0.270	0.162	0.431	0.432
54	AZ	0.363	0.063	0.412	0.063	0.426	0.475
55	KS	0.365	0.059	0.366	0.059	0.424	0.425
56	NE	0.350	0.072	0.388	0.072	0.422	0.460
57	TX	0.251	0.167	0.318	0.167	0.418	0.484
58	NE	0.209	0.202	0.254	0.202	0.411	0.456
59	CA	0.212	0.189	0.213	0.189	0.401	0.402
60	NE	0.198	0.202	0.198	0.202	0.400	0.400
61	ND	0.334	0.065	0.335	0.065	0.399	0.400
62	TX	0.235	0.162	0.236	0.162	0.397	0.397
63	KS	0.260	0.134	0.292	0.134	0.394	0.427
64	CO	0.351	0.030	0.385	0.031	0.381	0.416
65	CO	0.308	0.072	0.308	0.072	0.380	0.380
66	PA	0.270	0.107	0.271	0.107	0.377	0.378
67	NE	0.314	0.058	0.317	0.058	0.373	0.375
68	KS	0.218	0.150	0.248	0.150	0.368	0.398
69	KS	0.267	0.098	0.296	0.098	0.365	0.395
70	KS	0.268	0.093	0.269	0.093	0.361	0.362
71	KS	0.279	0.080	0.279	0.080	0.359	0.360
72	CO	0.255	0.102	0.257	0.102	0.356	0.359
73	TX	0.234	0.118	0.259	0.118	0.352	0.377
74	NE	0.334	0.016	0.378	0.018	0.351	0.396
75	CO	0.167	0.182	0.188	0.182	0.349	0.370
76	IA	0.304	0.040	0.316	0.040	0.344	0.356
77	NE	0.247	0.095	0.276	0.095	0.343	0.371
78	SD	0.223	0.115	0.268	0.115	0.338	0.384
79	TX	0.235	0.101	0.260	0.101	0.336	0.361
80	NE	0.297	0.036	0.336	0.036	0.333	0.372
81	TX	0.209	0.123	0.222	0.123	0.332	0.346
82	TX	0.231	0.101	0.233	0.101	0.332	0.334
83	KS	0.279	0.051	0.307	0.051	0.331	0.358
84	SD	0.271	0.059	0.340	0.059	0.329	0.399

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBS, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBS, ND=LOD/2	Total TEQ DLCs, ND=0	Total TEQ DCLs, ND=LOD/2
85	NE	0.277	0.047	0.278	0.047	0.324	0.325
86	KS	0.176	0.146	0.232	0.146	0.323	0.378
87	WI	0.277	0.045	0.324	0.045	0.322	0.369
88	IN	0.185	0.135	0.220	0.135	0.320	0.355
89	TX	0.221	0.090	0.223	0.090	0.312	0.313
90	KS	0.181	0.129	0.181	0.129	0.310	0.311
91	TX	0.216	0.092	0.217	0.092	0.308	0.309
92	KS	0.277	0.032	0.302	0.032	0.308	0.333
93	NE	0.258	0.049	0.261	0.050	0.307	0.310
94	SD	0.272	0.031	0.273	0.031	0.303	0.304
95	KS	0.256	0.047	0.266	0.047	0.303	0.312
96	TX	0.219	0.078	0.242	0.078	0.297	0.320
97	TX	0.169	0.126	0.170	0.126	0.295	0.296
98	KS	0.176	0.110	0.215	0.110	0.285	0.325
99	TX	0.197	0.085	0.263	0.085	0.283	0.349
100	NE	0.222	0.060	0.223	0.060	0.282	0.283
101	TX	0.177	0.098	0.214	0.098	0.275	0.312
102	CA	0.139	0.133	0.140	0.133	0.272	0.273
103	NE	0.220	0.049	0.269	0.049	0.270	0.319
104	MN	0.212	0.050	0.260	0.050	0.263	0.310
105	TX	0.176	0.085	0.217	0.085	0.261	0.302
106	PA	0.126	0.129	0.130	0.129	0.255	0.259
107	KS	0.220	0.033	0.270	0.035	0.253	0.304
108	TX	0.185	0.059	0.223	0.059	0.245	0.282
109	KS	0.138	0.106	0.143	0.106	0.244	0.249
110	KS	0.178	0.059	0.179	0.059	0.237	0.238
111	OR	0.157	0.075	0.159	0.075	0.231	0.234
112	TX	0.100	0.125	0.118	0.125	0.225	0.244
113	KS	0.163	0.061	0.204	0.061	0.224	0.265
114	TX	0.100	0.118	0.180	0.118	0.218	0.298
115	TX	0.149	0.057	0.240	0.057	0.205	0.297
116	NE	0.153	0.045	0.191	0.045	0.198	0.236
117	WA	0.162	0.033	0.165	0.033	0.196	0.199
118	IA	0.150	0.044	0.156	0.044	0.194	0.200
119	TX	0.108	0.085	0.148	0.085	0.194	0.233
120	NE	0.147	0.043	0.178	0.043	0.190	0.221
121	NE	0.143	0.045	0.166	0.045	0.188	0.211
122	CA	0.132	0.044	0.150	0.044	0.176	0.194
123	TX	0.100	0.061	0.127	0.061	0.162	0.188
124	TX	0.055	0.087	0.129	0.087	0.142	0.217
125	NE	0.102	0.040	0.189	0.040	0.142	0.229
126	KS	0.115	0.026	0.141	0.026	0.141	0.167
127	NE	0.055	0.086	0.211	0.086	0.141	0.297

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBS, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBS, ND=LOD/2	Total TEQ DLCs, ND=0	Total TEQ DCLs, ND=LOD/2
128	TX	0.080	0.058	0.184	0.058	0.137	0.241
129	CO	0.088	0.026	0.108	0.026	0.114	0.134
130	NE	0.042	0.072	0.366	0.076	0.114	0.442
131	TX	0.056	0.052	0.156	0.052	0.109	0.208
132	TX	0.059	0.047	0.182	0.047	0.106	0.229
133	SD	0.097	0.004	0.284	0.006	0.101	0.290
134	TX	0.034	0.064	0.171	0.064	0.098	0.235
135	SD	0.035	0.047	0.139	0.047	0.082	0.185
136	TX	0.026	0.054	0.236	0.054	0.080	0.290
137	KS	0.016	0.048	0.098	0.048	0.064	0.146
138	SD	0.022	0.025	0.129	0.025	0.047	0.154
139	AB	0.002	0.028	0.060	0.028	0.029	0.088

Note: Results are expressed in pg TEQ/g lipid. Data are blank subtracted. All results reported on a lipid basis. The mean TEQ for all 20 DLCs may not equal the sum of the mean TEQs for dioxins/furans and PCBs due to rounding.

Table 9. TEQ Values for Young Chicken Samples (n=153) in the Dioxin 13 Survey

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBS, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBS, ND=LOD/2	Total TEQ DLCs, ND=0	Total TEQ DCLs, ND=LOD/2
1	AL	1.822	0.012	1.835	0.013	1.834	1.847
2	TX	0.470	0.013	0.471	0.013	0.483	0.484
3	MN	0.328	0.040	0.329	0.040	0.368	0.369
4	NC	0.253	0.048	0.254	0.048	0.301	0.302
5	DE	0.216	0.042	0.218	0.042	0.258	0.259
6	VA	0.125	0.121	0.187	0.121	0.246	0.309
7	IN	0.185	0.049	0.186	0.049	0.235	0.235
8	MS	0.117	0.116	0.173	0.117	0.233	0.290
9	NC	0.167	0.049	0.220	0.049	0.215	0.269
10	TX	0.208	0.005	0.222	0.005	0.213	0.227
11	NC	0.175	0.020	0.176	0.020	0.195	0.196
12	PA	0.161	0.033	0.209	0.033	0.194	0.241
13	CA	0.139	0.041	0.140	0.041	0.180	0.181
14	NC	0.129	0.046	0.163	0.046	0.175	0.209
15	AR	0.143	0.026	0.144	0.027	0.169	0.170
16	NC	0.135	0.035	0.136	0.035	0.169	0.170
17	MS	0.146	0.022	0.147	0.022	0.168	0.169
18	MS	0.124	0.042	0.342	0.045	0.167	0.387
19	DE	0.111	0.047	0.125	0.047	0.158	0.172
20	GA	0.127	0.024	0.155	0.024	0.151	0.180
21	CA	0.112	0.034	0.112	0.034	0.145	0.146
22	MS	0.084	0.058	0.113	0.058	0.142	0.171
23	SC	0.107	0.034	0.129	0.034	0.141	0.164
24	NC	0.125	0.012	0.143	0.012	0.137	0.156
25	CA	0.103	0.034	0.120	0.034	0.137	0.155
26	MS	0.110	0.021	0.139	0.021	0.131	0.160
27	NC	0.112	0.014	0.120	0.014	0.127	0.134
28	NC	0.107	0.013	0.117	0.013	0.121	0.131
29	VA	0.076	0.032	0.079	0.032	0.108	0.111
30	NC	0.092	0.014	0.102	0.014	0.106	0.116
31	DE	0.085	0.020	0.114	0.021	0.106	0.135
32	AL	0.084	0.016	0.132	0.018	0.101	0.150
33	MD	0.064	0.036	0.079	0.036	0.101	0.116
34	AL	0.044	0.054	0.092	0.054	0.098	0.146
35	GA	0.066	0.027	0.102	0.028	0.092	0.130
36	TX	0.080	0.009	0.092	0.009	0.090	0.101
37	KY	0.080	0.004	0.095	0.004	0.084	0.099
38	MS	0.073	0.010	0.324	0.011	0.083	0.335
39	KY	0.049	0.028	0.110	0.028	0.077	0.137
40	AR	0.055	0.018	0.071	0.018	0.073	0.088
41	AR	0.058	0.014	0.148	0.015	0.072	0.163

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBS, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBS, ND=LOD/2	Total TEQ DLCs, ND=0	Total TEQ DLCs, ND=LOD/2
42	AL	0.049	0.023	0.133	0.024	0.072	0.158
43	DE	0.045	0.024	0.105	0.025	0.069	0.130
44	MO	0.052	0.015	0.132	0.016	0.067	0.148
45	AL	0.017	0.046	0.053	0.046	0.064	0.099
46	NC	0.036	0.026	0.200	0.028	0.062	0.229
47	AL	0.039	0.022	0.118	0.023	0.061	0.142
48	SC	0.044	0.017	0.105	0.017	0.060	0.122
49	MS	0.024	0.034	0.054	0.034	0.058	0.088
50	MS	0.048	0.010	0.108	0.010	0.058	0.118
51	TX	0.037	0.017	0.087	0.017	0.055	0.105
52	VA	0.017	0.037	0.091	0.038	0.054	0.129
53	NC	0.031	0.023	0.077	0.023	0.053	0.100
54	MS	0.038	0.015	0.065	0.015	0.053	0.080
55	Ar	0.035	0.018	0.095	0.018	0.053	0.114
56	AR	0.036	0.017	0.092	0.018	0.053	0.110
57	AL	0.030	0.023	0.086	0.024	0.052	0.110
58	MS	0.033	0.018	0.080	0.019	0.051	0.099
59	TX	0.039	0.011	0.116	0.012	0.050	0.129
60	VA	0.038	0.012	0.057	0.012	0.050	0.069
61	GA	0.040	0.010	0.066	0.010	0.050	0.076
62	MS	0.034	0.015	0.069	0.015	0.049	0.084
63	AL	0.016	0.031	0.057	0.032	0.048	0.089
64	MS	0.032	0.015	0.062	0.016	0.048	0.078
65	SC	0.025	0.022	0.109	0.023	0.047	0.132
66	LA	0.009	0.038	0.043	0.038	0.046	0.081
67	AL	0.028	0.018	0.123	0.020	0.046	0.143
68	MS	0.038	0.007	0.050	0.007	0.046	0.057
69	GA	0.027	0.019	0.071	0.019	0.045	0.090
70	AL	0.038	0.007	0.047	0.007	0.045	0.055
71	AL	0.012	0.032	0.037	0.033	0.044	0.069
72	AL	0.032	0.012	0.083	0.013	0.044	0.095
73	GA	0.033	0.010	0.077	0.011	0.044	0.088
74	MS	0.013	0.031	0.034	0.031	0.043	0.065
75	VA	0.015	0.028	0.040	0.028	0.043	0.067
76	WI	0.016	0.026	0.073	0.027	0.042	0.100
77	MS	0.027	0.015	0.088	0.016	0.042	0.104
78	TX	0.031	0.011	0.051	0.012	0.042	0.063
79	NC	0.011	0.031	0.067	0.032	0.042	0.099
80	NY	0.017	0.025	0.097	0.026	0.041	0.123
81	CA	0.032	0.008	0.081	0.009	0.040	0.090
82	MO	0.025	0.015	0.093	0.016	0.040	0.109
83	VA	0.024	0.016	0.060	0.017	0.040	0.076
84	KY	0.027	0.013	0.076	0.014	0.040	0.090

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBS, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBS, ND=LOD/2	Total TEQ DLCs, ND=0	Total TEQ DLCs, ND=LOD/2
85	AL	0.011	0.028	0.094	0.028	0.039	0.123
86	MS	0.024	0.014	0.083	0.015	0.039	0.098
87	NC	0.025	0.014	0.079	0.014	0.039	0.093
88	KY	0.012	0.027	0.074	0.027	0.039	0.101
89	LA	0.019	0.019	0.046	0.019	0.038	0.065
90	MS	0.032	0.006	0.082	0.006	0.038	0.088
91	AL	0.023	0.014	0.097	0.015	0.038	0.112
92	WV	0.019	0.018	0.104	0.019	0.037	0.123
93	AL	0.016	0.021	0.040	0.021	0.037	0.061
94	GA	0.018	0.019	0.097	0.020	0.037	0.117
95	AR	0.025	0.011	0.050	0.011	0.036	0.061
96	KY	0.005	0.031	0.243	0.034	0.036	0.277
97	DE	0.025	0.011	0.073	0.012	0.036	0.085
98	GA	0.007	0.029	0.045	0.029	0.035	0.074
99	AR	0.008	0.026	0.122	0.028	0.034	0.150
100	AL	0.013	0.020	0.079	0.020	0.033	0.100
101	AL	0.015	0.018	0.051	0.018	0.033	0.068
102	WV	0.023	0.010	0.059	0.010	0.033	0.069
103	MS	0.025	0.008	0.044	0.008	0.032	0.052
104	GA	0.022	0.011	0.048	0.011	0.032	0.059
105	SC	0.011	0.020	0.100	0.021	0.031	0.122
106	MS	0.022	0.009	0.292	0.009	0.031	0.301
107	TN	0.020	0.011	0.075	0.012	0.030	0.086
108	TX	0.020	0.010	0.114	0.011	0.030	0.126
109	AR	0.015	0.015	0.079	0.016	0.030	0.094
110	TX	0.021	0.008	0.058	0.008	0.028	0.067
111	OK	0.010	0.018	0.083	0.020	0.028	0.103
112	GA	0.004	0.024	0.097	0.024	0.028	0.122
113	MS	0.015	0.011	0.039	0.011	0.026	0.050
114	AR	0.015	0.011	0.047	0.011	0.026	0.057
115	GA	0.019	0.006	0.049	0.007	0.026	0.055
116	TX	0.001	0.025	0.048	0.025	0.025	0.074
117	TX	0.011	0.013	0.056	0.013	0.023	0.070
118	LA	0.013	0.010	0.084	0.011	0.023	0.095
119	GA	0.016	0.007	0.038	0.007	0.023	0.045
120	TX	0.012	0.010	0.604	0.012	0.022	0.615
121	MS	0.014	0.008	0.045	0.008	0.022	0.053
122	TN	0.013	0.008	0.049	0.009	0.021	0.058
123	AL	0.008	0.014	0.113	0.015	0.021	0.128
124	GA	0.012	0.009	0.067	0.010	0.021	0.077
125	TX	0.013	0.007	0.044	0.007	0.021	0.051
126	GA	0.007	0.014	0.094	0.015	0.020	0.108
127	NC	0.015	0.005	0.058	0.006	0.020	0.064

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBS, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBS, ND=LOD/2	Total TEQ DLCs, ND=0	Total TEQ DCLs, ND=LOD/2
128	AL	0.010	0.010	0.053	0.010	0.020	0.063
129	GA	0.006	0.014	0.038	0.014	0.020	0.052
130	AL	0.008	0.012	0.063	0.012	0.020	0.075
131	OK	0.003	0.016	0.042	0.017	0.019	0.059
132	MS	0.012	0.007	0.031	0.007	0.019	0.037
133	TX	0.004	0.014	0.080	0.014	0.018	0.095
134	AL	0.008	0.010	0.068	0.011	0.017	0.078
135	SC	0.012	0.005	0.066	0.006	0.017	0.072
136	PR	0.010	0.006	0.047	0.006	0.016	0.053
137	MO	0.003	0.013	0.075	0.014	0.015	0.089
138	GA	0.005	0.010	0.036	0.010	0.015	0.046
139	GA	0.003	0.011	0.069	0.012	0.014	0.081
140	NC	0.006	0.008	0.065	0.009	0.014	0.074
141	GA	0.003	0.011	0.129	0.013	0.014	0.142
142	GA	0.001	0.013	0.195	0.016	0.014	0.210
143	LA	0.006	0.008	0.029	0.008	0.014	0.037
144	DE	0.010	0.003	0.047	0.005	0.013	0.052
145	CO	0.010	0.003	0.090	0.004	0.013	0.093
146	DE	0.004	0.008	0.077	0.009	0.012	0.086
147	GA	0.003	0.009	0.073	0.010	0.012	0.083
148	OH	0.007	0.004	0.024	0.004	0.011	0.028
149	PA	0.006	0.004	0.028	0.004	0.010	0.032
150	DE	0.006	0.004	0.037	0.004	0.010	0.041
151	NC	0.005	0.003	0.038	0.003	0.008	0.042
152	MS	0.007	0.000	0.101	0.016	0.007	0.117
153	PA	0.001	0.002	0.045	0.002	0.002	0.047

Note: Results are expressed in pg TEQ/g lipid. Data are blank subtracted. All results reported on a lipid basis. The mean TEQ for all 20 DLCs may not equal the sum of the mean TEQs for dioxins/furans and PCBs due to rounding.

Table 10. TEQ Values for Young Turkeys Samples (n=85) in the Dioxin 13 Survey

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBS, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBS, ND=LOD/2	Total TEQ DLCs, ND=0	Total TEQ DCLs, ND=LOD/2
1	NC	0.816	0.489	0.818	0.489	1.305	1.306
2	NC	0.710	0.246	0.711	0.246	0.956	0.957
3	NC	0.653	0.242	0.653	0.242	0.894	0.895
4	NC	0.519	0.256	0.520	0.256	0.775	0.776
5	VA	0.589	0.083	0.590	0.083	0.672	0.673
6	CA	0.558	0.062	0.559	0.062	0.620	0.621
7	OH	0.509	0.104	0.510	0.104	0.613	0.614
8	KS	0.430	0.173	0.430	0.173	0.603	0.603
9	VA	0.379	0.207	0.382	0.207	0.586	0.589
10	IA	0.438	0.112	0.443	0.112	0.549	0.554
11	IN	0.374	0.155	0.377	0.155	0.529	0.532
12	AR	0.429	0.069	0.430	0.069	0.499	0.499
13	VA	0.330	0.166	0.331	0.166	0.496	0.497
14	SC	0.432	0.062	0.433	0.062	0.494	0.495
15	VA	0.414	0.069	0.414	0.069	0.483	0.484
16	VA	0.296	0.182	0.332	0.182	0.478	0.514
17	NC	0.391	0.083	0.391	0.083	0.474	0.475
18	OH	0.362	0.096	0.367	0.096	0.458	0.463
19	MI	0.345	0.112	0.346	0.112	0.457	0.458
20	MI	0.317	0.130	0.321	0.130	0.447	0.450
21	VA	0.265	0.177	0.266	0.177	0.441	0.443
22	CA	0.322	0.106	0.330	0.106	0.428	0.436
23	AR	0.348	0.073	0.348	0.073	0.420	0.421
24	NC	0.336	0.084	0.336	0.084	0.420	0.420
25	MN	0.315	0.090	0.316	0.090	0.405	0.406
26	VA	0.227	0.158	0.228	0.158	0.386	0.387
27	NC	0.308	0.072	0.309	0.072	0.380	0.382
28	NC	0.294	0.083	0.295	0.083	0.376	0.377
29	AR	0.323	0.049	0.323	0.049	0.371	0.372
30	IA	0.287	0.083	0.288	0.083	0.370	0.371
31	MN	0.296	0.074	0.312	0.074	0.370	0.386
32	MN	0.277	0.081	0.322	0.081	0.358	0.403
33	MN	0.270	0.074	0.270	0.074	0.344	0.345
34	VA	0.238	0.105	0.242	0.105	0.343	0.347
35	VA	0.268	0.066	0.270	0.066	0.334	0.337
36	CA	0.266	0.056	0.269	0.056	0.321	0.324
37	MN	0.255	0.063	0.256	0.063	0.318	0.319
38	MN	0.260	0.056	0.297	0.056	0.316	0.353
39	MN	0.242	0.070	0.243	0.070	0.312	0.313
40	VA	0.194	0.117	0.195	0.117	0.312	0.312

	Producer State	TEQ Dioxins/Furans , ND=0	TEQs PCBS, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBS, ND=LOD/2	Total TEQ DLCs, ND=0	Total TEQ DCLs, ND=LOD/2
41	MN	0.212	0.082	0.221	0.082	0.294	0.303
42	CA	0.210	0.070	0.218	0.070	0.279	0.288
43	AR	0.227	0.048	0.228	0.048	0.275	0.277
44	MN	0.211	0.050	0.211	0.050	0.261	0.262
45	MN	0.201	0.059	0.202	0.059	0.260	0.260
46	VA	0.181	0.079	0.192	0.079	0.260	0.271
47	MN	0.238	0.020	0.238	0.020	0.258	0.258
48	AR	0.183	0.073	0.187	0.073	0.257	0.260
49	UT	0.147	0.106	0.149	0.106	0.253	0.255
50	TX	0.202	0.050	0.207	0.050	0.253	0.257
51	MO	0.181	0.064	0.188	0.064	0.245	0.251
52	AR	0.164	0.073	0.166	0.073	0.237	0.239
53	PA	0.211	0.023	0.218	0.023	0.234	0.241
54	MI	0.131	0.090	0.640	0.094	0.221	0.734
55	WI	0.161	0.055	0.180	0.055	0.216	0.234
56	MN	0.170	0.046	0.238	0.046	0.216	0.284
57	WI	0.185	0.027	0.202	0.027	0.212	0.228
58	OH	0.108	0.092	0.292	0.092	0.200	0.384
59	AR	0.149	0.049	0.219	0.049	0.198	0.268
60	AR	0.129	0.042	0.132	0.042	0.170	0.174
61	AR	0.136	0.034	0.145	0.035	0.169	0.180
62	WI	0.123	0.032	0.143	0.032	0.155	0.175
63	TX	0.103	0.046	0.144	0.046	0.149	0.190
64	MN	0.134	0.011	0.134	0.011	0.145	0.145
65	MN	0.107	0.037	0.162	0.037	0.144	0.198
66	SD	0.103	0.037	0.141	0.037	0.140	0.177
67	CA	0.093	0.047	0.116	0.047	0.139	0.162
68	MN	0.074	0.058	0.152	0.058	0.132	0.210
69	AR	0.096	0.035	0.098	0.035	0.131	0.133
70	MN	0.059	0.064	0.165	0.064	0.122	0.228
71	AR	0.080	0.028	0.094	0.029	0.108	0.123
72	MO	0.074	0.030	0.107	0.030	0.104	0.137
73	MO	0.028	0.059	0.079	0.059	0.087	0.138
74	MO	0.037	0.042	0.112	0.042	0.079	0.154
75	MO	0.053	0.025	0.074	0.025	0.079	0.100
76	AR	0.035	0.040	0.206	0.041	0.074	0.248
77	AR	0.037	0.037	0.081	0.037	0.074	0.119
78	MO	0.039	0.035	0.127	0.036	0.074	0.163
79	IN	0.027	0.015	0.054	0.015	0.042	0.069
80	PA	0.022	0.008	0.059	0.008	0.030	0.067
81	IN	0.019	0.010	0.094	0.010	0.029	0.104
82	MN	0.022	0.004	0.069	0.005	0.026	0.074
83	IN	0.003	0.022	0.088	0.023	0.026	0.111

May 2015

FSIS, USDA

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBS, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBS, ND=LOD/2	Total TEQ DLCs, ND=0	Total TEQ DCLs, ND=LOD/2
84	MN	0.007	0.011	0.041	0.011	0.017	0.052
85	NE	0.003	0.005	0.053	0.005	0.007	0.058

Note: Results are expressed in pg TEQ/g lipid. Data are blank subtracted. All results reported on a lipid basis. The mean TEQ for all 20 DLCs may not equal the sum of the mean TEQs for dioxins/furans and PCBs due to rounding.

Table 11. Detection limits for the twenty DLCs analyzed in the 2002–2003, 2007–2008, and Dioxin 13 surveys

DLCs	Detection Limits (pg TEQ/g Lipid)		
	2002–2003 Survey	2007–2008 Survey	2012–2013 Survey
2378-TCDF	0.040	0.068	0.011
12378-PeCDF	0.078	0.038	0.013
23478-PeCDF	0.030	0.058	0.026
123478-HxCDF	0.064	0.060	0.016
123678-HxCDF	0.091	0.043	0.025
234678-HxCDF	0.073	0.045	0.029
123789-HxCDF	0.042	0.078	0.004
1234678-HpCDF	0.178	0.153	0.019
1234789-HpCDF	0.029	0.144	0.040
OCDF	0.090	0.119	0.016
2378-TCDD	0.062	0.029	0.029
12378-PeCDD	0.032	0.071	0.012
123478-HxCDD	0.033	0.026	0.035
123678-HxCDD	0.042	0.069	0.024
123789-HxCDD	0.046	0.053	0.081
1234678-HpCDD	0.119	0.107	0.019
OCDD	1.752	0.868	0.146
PCB-77	5.153	6.650	1.693
PCB-126	0.072	0.130	0.013
PCB-169	0.097	0.089	0.090