



**DIOXIN 08 Survey:
Dioxins and Dioxin-Like Compounds
in the U.S. Domestic Meat and
Poultry Supply**

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INTRODUCTION TO THIS REPORT

Between September 2007 and August 2008, 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 (Dioxin 08 survey). This survey is part of FSIS' effort for conducting periodic dioxin surveys as a prudent public health practice that 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. The information presented in this report uses the same format as the 2002-2003 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/PDF/Dioxin_Report_0605.pdf. In this and the previous report, the 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, municipal and medical waste incineration. Dioxin accumulates 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, see the document *Questions and Answers about Dioxins* posted on the Food and Drug Administration's (FDA's) website at <http://www.fda.gov/Food/FoodSafety/FoodContaminants/Adulteration/ChemicalContaminants/DioxinsPCBs/ucm077524.htm>.

The toxicity of the individual DLCs is not equal. 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 DLCs concentrations and their TEFs.

The latest WHO re-evaluation of the TEFs occurred in 2005, after the completion of 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). The recalculated data can be then directly compared to the data collected in the Dioxin 08 survey. 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: (2002-2003) and (1994-1996)

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 the data from both 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. Three approaches were taken: (1) comparison with nondetects set to zero, (2) comparison with nondetects set to half the limit of detection, and (3) comparison applying the earlier surveys' limits of detection to the newer data. 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*).

The comparison of the data from the surveys indicates that dioxin levels appear to have declined in three of the four slaughter classes, with young chickens, market hogs, and young turkeys declining 20-80%, while any declines in cattle dioxin levels, if real, are less than those observed in the other slaughter classes. Examination of the distribution of TEQ values for the surveys provided additional insight into whether cattle TEQs have actually declined. 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): 11% (15 of 139) in the 2002-2003 survey vs 16% (8 of 51) in the mid-1990s survey. 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-1990 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.

Although the comparison of the mid-1990s and 2002-03 surveys shed light on the changes in environmental levels and human exposure to dioxin compounds through dietary components, it was concluded that further study was needed to examine factors that might explain the differences in dioxin levels and distribution profiles in the four slaughter classes.

DIOXIN 08 SURVEY

The Dioxin 08 survey was conducted using the same methodology and instrumentation as the previous survey completed in 2003. The sample design was intended 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. Specific establishments were chosen for sample collection using a probability-proportional-to-size design, where slaughter totals were used as the size variable. Under this design, establishments were scheduled for FSIS sample collection in a product class at approximately the percentage of national slaughter that the establishments performed.

Inspectors collected approximately 250 grams (g) of back fat from cattle, 250 g of belly fat from hogs, or 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. TEQs 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, the 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 08 SURVEY RESULTS

The average congener concentrations for each slaughter class in the Dioxin 08 survey are presented in Table 2. In general, turkeys and beef had the highest mean and median TEQ levels. The mean, median, and range of the TEQs for each production classes are presented in Table 3. The contribution of cp-PCBs to the total mean TEQ ranged from 13% in market hogs to over 40% in turkeys. The higher contributions from PCB-126 to the mean TEQs of chicken and turkey may reflect different dietary regimens or different metabolizing capabilities in these animal classes.

Excluding PCB-77 (the concentration of this congener was driven by its high detection limit, 5.153 parts per trillion (ppt) in the modified EPA Method 1613), the dominant congeners were OCDD and HpCDD in beef and pork, OCDD, HpCDD, and PCB-126 in chicken, and OCDD, PCBs-126 and -169 in turkeys. In addition, 1,2,3,6,7,8-HxCDD was the third most dominant congener in beef. This congener was detected in 99% of the beef samples, 96% of the turkey samples, and over 40% of the pork and chicken samples making it one of the most prevalent congeners found.

Tables 4 through 7 list the ppt TEQ values for dioxin/furans, dioxin-like PCBs, and the combined DLCs using $nd = 0$ and $nd = DL/2$ for all the individual 510 samples. The state where each animal was produced is also listed for each sample.

- Table 4: Market hogs samples
- Table 5: Steer/heifer samples
- Table 6: Young chicken samples
- Table 7: 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 THE THREE SURVEYS

A statistical comparison of the 2002-2003 and 2008 data was possible because the methodology and detection limits of the two surveys were virtually identical (see Table 8). Higher detection limits in the survey conducted in the mid-1990s make it difficult to compare directly these data with the later surveys. Data comparison of data collected from 2002 to 2008 shows that the median TEQs had declined 14% and 25% for beef and chicken, respectively, with nearly equal declines in both PCDD/F and PCB TEQs. The median TEQs for turkey were relatively constant between these two survey time periods (6% decrease in total TEQ). The TEQ data similarity between 2002-2003 and 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.

The comparison of the 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.

Both turkey and beef had a wide range of TEQs with one sample in each class exceeding 4.0 ppt lipid weight (lw). If outlier TEQs from turkey samples from an identified localized contamination are excluded, steers and heifers generally had the widest range of TEQs. 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 time periods, data from three USDA surveys show a decreasing trend in TEQ over the past decade for domestic meat and poultry. The congener patterns remain relatively constant between 2002 and 2008 indicating similar animal exposures to dioxins and dioxin-like compounds during these periods.

SUMMARY

The Dioxin 08 survey consisted of a sampling plan designed to determine dioxins and dioxin-like compounds levels in domestic meat and poultry, conducted from September 2007 to September 2008. The results of the survey showed TEQs ranging from not detected to 4.5 ppt on a lipid weight (lw) basis. Mean total TEQ levels for beef, turkey, chicken, and pork were 0.66, 0.61, 0.17, and 0.16 ppt lw, respectively. To compare the Dioxin 08 survey data with data from previous USDA dioxin surveys in the mid-1990s and 2002-2003, TEQs from all datasets were calculated using the most recent 2005 TEFs. A comparison of the three surveys indicates declining TEQ trends in all slaughter classes over the 10-year period. The congener patterns remain relatively constant between 2002 and 2008 indicating similar animal exposures to dioxins and dioxin-like compounds during these time periods.

Table 1. Mean and median TEQs for Dioxins/Furans and Dioxin-like PCBs in USDA

		Mid-1990s Survey			2002-2003 Survey		
		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)
	Dioxin-like PCBs		0.27 (0.27)	0.37 (0.37)		0.11 (0.11)	0.13 (0.13)
Market Hogs	Dioxins/ Furans	56	1.11 (0.03)	1.38 (0.39)	136	0.12 (0.03)	0.19 (0.11)
	Dioxin-like PCBs		0.02 (0.00)	0.04 (0.03)		0.02 (0.02)	0.03 (0.03)
Young Chickens	Dioxins/ Furans	41	0.45 (0.14)	2.04 (1.79)	151	0.13 (0.06)	0.21 (0.14)
	Dioxin-like PCBs		0.11 (0.11)	0.19 (0.19)		0.05 (0.05)	0.08 (0.08)
Young Turkeys	Dioxins/ Furans	15	0.56 (0.39)	0.97 (0.78)	84	0.29 (0.25)	0.38 (0.34)
	Dioxin-like PCBs		0.40 (0.40)	0.46 (0.46)		0.15 (0.15)	0.19 (0.19)

Production Classes from the Mid-1990s and 2002-2003 Dioxin Surveys.

Note: Results are expressed in parts per trillion (ppt). 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 2. Mean Concentrations for Dioxin-Like Compounds (in ppt) by Congener for Each Slaughter Class in the Dioxin 08 Survey (Includes 2005 WHO TEFs).

Dioxin-Like Compounds	Steers/Heifers <i>n</i> = 139	Market Hogs <i>n</i> = 136	Young Chicken <i>n</i> = 151	Young Turkey <i>n</i> = 84	WHO 2005 TEF
2378-TCDD	0.04 (0.02)	0.02 (0.00)	0.02 (0.00)	0.05 (0.04)	1
12378-PeCDD	0.19 (0.18)	0.05 (0.00)	0.04 (0.00)	0.17 (0.17)	1
123478-HxCDD	0.22 (0.22)	0.04 (0.03)	0.03 (0.02)	0.09 (0.08)	0.1
123678-HxCDD	1.34 (1.34)	0.14 (0.12)	0.09 (0.07)	0.41 (0.41)	0.1
123789-HxCDD	0.24 (0.23)	0.06 (0.03)	0.04 (0.01)	0.05 (0.04)	0.1
1234678-HpCDD	3.46 (3.46)	0.93 (0.87)	0.45 (0.44)	0.33 (0.32)	0.01
OCDD	4.19 (4.00)	4.91 (4.78)	4.18 (4.09)	0.88 (0.50)	0.0003
2378-TCDF	0.04 (0.00)	0.05 (0.00)	0.06 (0.03)	0.16 (0.15)	0.1
12378-PeCDF	0.03 (0.01)	0.03 (0.01)	0.03 (0.02)	0.07 (0.06)	0.03
23478-PeCDF	0.11 (0.10)	0.05 (0.01)	0.05 (0.02)	0.14 (0.14)	0.3
123478-HxCDF	0.29 (0.29)	0.07 (0.04)	0.05 (0.02)	0.09 (0.08)	0.1
123678-HxCDF	0.16 (0.16)	0.04 (0.02)	0.04 (0.01)	0.05 (0.04)	0.1
234678-HxCDF	0.15 (0.14)	0.04 (0.01)	0.03 (0.01)	0.04 (0.02)	0.1
123789-HxCDF	0.05 (0.00)	0.05 (0.00)	0.05 (0.00)	0.04 (0.00)	0.1
1234678-HpCDF	0.66 (0.62)	0.26 (0.18)	0.11 (0.03)	0.09 (0.01)	0.01
1234789-HpCDF	0.10 (0.02)	0.10 (0.01)	0.09 (0.00)	0.08 (0.00)	0.01
OCDF	0.20 (0.14)	0.16 (0.10)	0.11 (0.06)	0.09 (0.03)	0.0003
PCB-77	4.29 (0.33)	4.45 (0.27)	4.52 (0.82)	4.36 (0.91)	0.0001
PCB-126	0.96 (0.96)	0.12 (0.05)	0.44 (0.42)	2.18 (2.18)	0.1
PCB-169	0.35 (0.35)	0.15 (0.12)	0.21 (0.17)	0.95 (0.95)	0.03

Note: Results are expressed in parts per trillion (ppt). Data are blank subtracted. All results reported on a lipid basis with Non-Detects = Detection Limit /2 and Non-Detects = 0 in parentheses.

Table 3. Mean and Median TEQ Values for Dioxins/Furans, Dioxin-like PCBs, and Total DLCs TEQ Range by Slaughter Class in the Dioxin 08 Survey.

	Steers/Heifers <i>N</i> = 139	Market Hogs <i>N</i> = 136	Young Chicken <i>N</i> = 151	Young Turkey <i>N</i> = 84
Mean Dioxins/Furans TEQ	0.55 (0.51)	0.14 (0.04)	0.12 (0.04)	0.36 (0.34)
Mean Dioxin-like PCBs TEQ	0.11 (0.11)	0.02 (0.01)	0.05 (0.05)	0.25 (0.25)
Median Dioxins/Furans TEQ	0.31 (0.27)	0.12 (0.02)	0.11 (0.02)	0.31 (0.28)
Median Dioxin-like PCBs TEQ	0.09 (0.09)	0.01 (0.00)	0.03 (0.03)	0.14 (0.14)
Total TEQ Range	0.15–4.86 (0.05–4.85)	0.10–1.37 (0.00–1.27)	0.10–1.28 (0.00–1.21)	0.14–4.60 (0.05–4.53)

Note: Results are expressed in parts per trillion (ppt). Data are blank subtracted. All results reported on a lipid basis with Non-Detects = Detection Limit /2 and Non-Detects = 0 in parentheses.

Table 4. TEQ Values for Market Hog Samples (n=136) in the Dioxin 08 Survey.

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBs, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBs, ND=0	Total TEQ DLCs, ND = 0	Total TEQ DLCs, ND=LOD/2
1	IL	1.268	0.000	1.355	0.012	1.268	1.367
2	MB	0.422	0.073	0.507	0.074	0.495	0.581
3	IA	0.239	0.039	0.280	0.040	0.278	0.320
4	MN	0.264	0.008	0.281	0.017	0.272	0.298
5	IA	0.215	0.011	0.268	0.021	0.226	0.289
6	NE	0.004	0.188	0.099	0.190	0.192	0.289
7	NC	0.124	0.038	0.202	0.038	0.162	0.240
8	MN	0.135	0.005	0.211	0.014	0.140	0.225
9	IA	0.135	0.000	0.231	0.011	0.135	0.242
10	MI	0.113	0.000	0.183	0.009	0.113	0.193
11	NC	0.072	0.036	0.143	0.036	0.108	0.179
12	NE	0.106	0.000	0.226	0.014	0.106	0.240
13	MD	0.076	0.022	0.163	0.023	0.098	0.186
14	PA	0.069	0.028	0.162	0.028	0.097	0.190
15	MO	0.091	0.005	0.198	0.016	0.096	0.214
16	MN	0.092	0.000	0.187	0.011	0.092	0.198
17	VA	0.065	0.027	0.151	0.027	0.092	0.178
18	NC	0.039	0.053	0.115	0.053	0.092	0.168
19	OH	0.091	0.000	0.171	0.010	0.091	0.182
20	IA	0.085	0.005	0.191	0.016	0.090	0.208
21	IA	0.081	0.004	0.156	0.013	0.085	0.168
22	NC	0.032	0.041	0.129	0.041	0.073	0.170
23	IA	0.072	0.000	0.162	0.011	0.072	0.173
24	OK	0.072	0.000	0.173	0.012	0.072	0.185
25	IA	0.068	0.003	0.137	0.011	0.071	0.148
26	MI	0.065	0.006	0.144	0.013	0.070	0.157
27	IA	0.023	0.047	0.121	0.047	0.070	0.168
28	OH	0.039	0.030	0.137	0.030	0.068	0.167
29	NC	0.038	0.027	0.121	0.028	0.065	0.148
30	IA	0.029	0.035	0.123	0.035	0.064	0.158
31	IL	0.051	0.008	0.176	0.019	0.059	0.195
32	NC	0.052	0.006	0.131	0.014	0.058	0.145
33	AR	0.009	0.050	0.105	0.050	0.058	0.155
34	MO	0.047	0.010	0.141	0.019	0.057	0.160
35	IA	0.054	0.000	0.164	0.012	0.054	0.177
36	IA	0.047	0.005	0.137	0.013	0.053	0.150
37	NC	0.041	0.005	0.129	0.013	0.045	0.142
38	OK	0.041	0.004	0.124	0.012	0.045	0.135
39	NC	0.013	0.030	0.110	0.031	0.044	0.141
40	OH	0.020	0.023	0.111	0.024	0.043	0.135
41	NC	0.037	0.006	0.114	0.013	0.042	0.127

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBs, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBs, ND=0	Total TEQ DLCs, ND = 0	Total TEQ DLCs, ND=LOD/2
42	IN	0.034	0.007	0.136	0.016	0.041	0.152
43	NC	0.032	0.009	0.133	0.018	0.041	0.151
44	IA	0.036	0.004	0.124	0.012	0.041	0.137
45	IA	0.036	0.005	0.121	0.012	0.040	0.133
46	IA	0.007	0.033	0.106	0.034	0.040	0.140
47	MO	0.034	0.005	0.139	0.015	0.039	0.154
48	IA	0.035	0.004	0.126	0.013	0.039	0.139
49	NC	0.037	0.000	0.136	0.011	0.037	0.146
50	IA	0.032	0.004	0.134	0.013	0.037	0.148
51	AZ	0.016	0.021	0.116	0.023	0.036	0.138
52	NE	0.032	0.004	0.124	0.012	0.036	0.136
53	MN	0.016	0.020	0.127	0.022	0.036	0.150
54	TX	0.034	0.000	0.133	0.010	0.034	0.143
55	AR	0.028	0.005	0.122	0.014	0.033	0.135
56	IN	0.029	0.004	0.125	0.013	0.033	0.138
57	MN	0.026	0.005	0.121	0.013	0.031	0.135
58	MB	0.031	0.000	0.126	0.010	0.031	0.137
59	IA	0.024	0.006	0.118	0.015	0.030	0.132
60	OH	0.030	0.000	0.121	0.010	0.030	0.131
61	OH	0.025	0.005	0.120	0.013	0.030	0.134
62	IA	0.024	0.005	0.116	0.013	0.029	0.129
63	IA	0.028	0.000	0.118	0.010	0.028	0.128
64	IA	0.024	0.004	0.123	0.012	0.028	0.135
65	IA	0.026	0.000	0.164	0.014	0.026	0.178
66	IA	0.019	0.006	0.131	0.016	0.025	0.146
67	IA	0.020	0.004	0.114	0.013	0.024	0.127
68	IA	0.018	0.004	0.130	0.014	0.022	0.144
69	IA	0.017	0.005	0.112	0.013	0.022	0.125
70	OK	0.019	0.000	0.110	0.009	0.019	0.119
71	---	0.004	0.015	0.139	0.026	0.019	0.165
72	AZ	0.015	0.003	0.095	0.010	0.018	0.105
73	NE	0.014	0.003	0.115	0.012	0.017	0.127
74	NC	0.013	0.004	0.107	0.012	0.017	0.119
75	NC	0.011	0.006	0.134	0.017	0.017	0.150
76	WI	0.017	0.000	0.114	0.010	0.017	0.124
77	IA	0.017	0.000	0.110	0.010	0.017	0.119
78	IA	0.007	0.009	0.145	0.020	0.016	0.165
79	TX	0.015	0.000	0.109	0.010	0.015	0.119
80	MO	0.010	0.004	0.120	0.014	0.014	0.134
81	MB	0.014	0.000	0.123	0.011	0.014	0.134
82	NE	0.014	0.000	0.130	0.012	0.014	0.142
83	SD	0.008	0.006	0.129	0.016	0.014	0.145
84	IA	0.014	0.000	0.132	0.012	0.014	0.144
85	IA	0.010	0.004	0.106	0.012	0.013	0.117

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBs, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBs, ND=0	Total TEQ DLCs, ND = 0	Total TEQ DLCs, ND=LOD/2
86	IA	0.013	0.000	0.108	0.010	0.013	0.117
87	IA	0.013	0.000	0.130	0.012	0.013	0.142
88	MT	0.013	0.000	0.116	0.011	0.013	0.127
89	NC	0.007	0.006	0.097	0.013	0.013	0.111
90	IA	0.012	0.000	0.109	0.010	0.012	0.118
91	TX	0.011	0.000	0.115	0.011	0.011	0.126
92	AR	0.011	0.000	0.118	0.011	0.011	0.129
93	IA	0.010	0.000	0.110	0.010	0.010	0.120
94	MN	0.010	0.000	0.147	0.014	0.010	0.161
95	IN	0.010	0.000	0.118	0.011	0.010	0.128
96	IA	0.010	0.000	0.101	0.009	0.010	0.110
97	MN	0.003	0.007	0.121	0.017	0.010	0.139
98	MN	0.009	0.000	0.112	0.010	0.009	0.123
99	CO	0.005	0.004	0.130	0.014	0.009	0.145
100	NC	0.005	0.004	0.098	0.012	0.009	0.110
101	IA	0.009	0.000	0.100	0.009	0.009	0.109
102	IA	0.002	0.007	0.104	0.015	0.009	0.119
103	NC	0.003	0.006	0.097	0.013	0.009	0.111
104	IN	0.009	0.000	0.118	0.011	0.009	0.130
105	IA	0.009	0.000	0.143	0.013	0.009	0.156
106	MO	0.003	0.006	0.112	0.015	0.009	0.126
107	IN	0.004	0.004	0.123	0.014	0.008	0.137
108	MN	0.002	0.006	0.090	0.013	0.008	0.103
109	IN	0.007	0.000	0.101	0.009	0.007	0.110
110	IA	0.007	0.000	0.111	0.010	0.007	0.121
111	MN	0.006	0.000	0.109	0.010	0.006	0.119
112	IN	0.006	0.000	0.110	0.010	0.006	0.121
113	IA	0.005	0.000	0.108	0.010	0.005	0.118
114	IA	0.005	0.000	0.108	0.010	0.005	0.119
115	MN	0.005	0.000	0.112	0.011	0.005	0.123
116	IA	0.004	0.000	0.116	0.011	0.004	0.127
117	NE	0.004	0.000	0.138	0.013	0.004	0.152
118	IA	0.004	0.000	0.141	0.014	0.004	0.155
119	MN	0.004	0.000	0.122	0.012	0.004	0.134
120	SD	0.003	0.000	0.102	0.010	0.003	0.111
121	MN	0.003	0.000	0.131	0.013	0.003	0.143
122	NE	0.003	0.000	0.117	0.011	0.003	0.128
123	IL	0.003	0.000	0.121	0.012	0.003	0.133
124	IA	0.002	0.000	0.122	0.012	0.002	0.134
125	IA	0.002	0.000	0.117	0.011	0.002	0.129
126	MN	0.002	0.000	0.121	0.012	0.002	0.132
127	IN	0.002	0.000	0.101	0.010	0.002	0.111
128	IA	0.002	0.000	0.113	0.011	0.002	0.124
129	OK	0.002	0.000	0.093	0.009	0.002	0.102

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBs, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBs, ND=0	Total TEQ DLCs, ND = 0	Total TEQ DLCs, ND=LOD/2
130	CO	0.002	0.000	0.105	0.010	0.002	0.115
131	IA	0.002	0.000	0.110	0.011	0.002	0.121
132	IL	0.002	0.000	0.128	0.012	0.002	0.140
133	IN	0.001	0.000	0.106	0.010	0.001	0.116
134	IA	0.000	0.000	0.115	0.011	0.000	0.126
135	MN	0.000	0.000	0.113	0.011	0.000	0.124
136	MN	0.000	0.000	0.144	0.014	0.000	0.158

Note: Results are expressed in parts per trillion (ppt). 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. A “---” indicates that producer state information is not available.

Table 5. TEQ Values for Steers/Heifers Samples (n=139) in the Dioxin 08 Survey.

	Producer State	TEQ Dioxins/Furans, ND=0	TEQ PCBs, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQ PCBs, ND=0	Total TEQ DLCs, ND = 0	Total TEQ DLCs, ND=LOD/2
1	CO	4.629	0.217	4.640	0.217	4.845	4.86
2	CO	3.054	0.056	3.082	0.057	3.110	3.14
3	MN	2.938	0.028	2.946	0.029	2.966	2.97
4	IL	2.888	0.026	2.897	0.026	2.914	2.92
5	TX	2.642	0.112	2.652	0.112	2.754	2.76
6	KS	2.525	0.046	2.552	0.046	2.571	2.60
7	MI	2.240	0.103	2.248	0.103	2.342	2.35
8	MN	2.119	0.044	2.129	0.044	2.163	2.17
9	CO	2.048	0.089	2.058	0.090	2.138	2.15
10	KS	1.236	0.097	1.247	0.097	1.333	1.34
11	MN	1.154	0.070	1.164	0.070	1.224	1.23
12	---	1.070	0.145	1.103	0.146	1.215	1.25
13	CA	0.931	0.275	0.943	0.276	1.207	1.22
14	IA	1.061	0.132	1.071	0.133	1.193	1.20
15	SD	1.017	0.068	1.027	0.069	1.086	1.10
16	NE	0.819	0.253	0.831	0.254	1.072	1.08
17	NE	0.925	0.146	0.949	0.147	1.071	1.10
18	MN	0.964	0.099	0.974	0.099	1.062	1.07
19	SD	0.995	0.066	1.026	0.067	1.061	1.09
20	IA	0.881	0.168	0.892	0.168	1.049	1.06
21	NE	0.807	0.179	0.817	0.179	0.985	1.00
22	WI	0.757	0.227	0.766	0.228	0.984	0.99

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBs, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBs, ND=0	Total TEQ DLCs, ND = 0	Total TEQ DLCs, ND=LOD/2
23	TX	0.916	0.062	0.945	0.063	0.979	1.01
24	TX	0.797	0.166	0.825	0.167	0.963	0.99
25	NE	0.886	0.077	0.896	0.077	0.962	0.97
26	MN	0.898	0.052	0.908	0.053	0.951	0.96
27	TX	0.825	0.098	0.835	0.099	0.923	0.93
28	SD	0.780	0.079	0.790	0.080	0.860	0.86
29	IA	0.811	0.047	0.815	0.047	0.858	0.86
30	WI	0.737	0.119	0.747	0.119	0.855	0.87
31	WI	0.756	0.090	0.766	0.090	0.846	0.86
32	MN	0.719	0.120	0.730	0.121	0.839	0.85
33	NE	0.750	0.078	0.777	0.079	0.828	0.86
34	KS	0.628	0.150	0.640	0.151	0.779	0.79
35	MN	0.679	0.084	0.699	0.084	0.763	0.78
36	IA	0.664	0.078	0.673	0.078	0.742	0.75
37	NE	0.611	0.128	0.621	0.129	0.739	0.75
38	NE	0.496	0.231	0.507	0.231	0.727	0.74
39	AZ	0.573	0.120	0.583	0.120	0.692	0.70
40	KS	0.574	0.117	0.602	0.117	0.691	0.72
41	NE	0.402	0.272	0.423	0.273	0.674	0.70
42	NE	0.636	0.035	0.675	0.035	0.671	0.71
43	CA	0.264	0.389	0.291	0.389	0.653	0.68
44	TX	0.184	0.430	0.217	0.430	0.614	0.65
45	AB	0.556	0.054	0.584	0.054	0.610	0.64
46	IA	0.555	0.051	0.565	0.052	0.607	0.62
47	NE	0.547	0.057	0.558	0.057	0.604	0.61
48	CA	0.312	0.239	0.322	0.239	0.551	0.56
49	KS	0.425	0.124	0.459	0.124	0.548	0.58
50	NE	0.322	0.211	0.349	0.211	0.532	0.56
51	KS	0.380	0.152	0.407	0.152	0.532	0.56
52	SD	0.445	0.086	0.469	0.087	0.531	0.56
53	NE	0.503	0.026	0.543	0.028	0.529	0.57
54	CA	0.326	0.196	0.341	0.196	0.522	0.54
55	AB	0.484	0.029	0.514	0.031	0.513	0.55
56	KS	0.389	0.120	0.400	0.120	0.509	0.52
57	CO	0.374	0.128	0.385	0.128	0.502	0.51
58	TX	0.316	0.166	0.327	0.166	0.482	0.49
59	CO	0.388	0.059	0.409	0.059	0.447	0.47
60	NE	0.369	0.074	0.397	0.074	0.443	0.47
61	IA	0.304	0.138	0.331	0.138	0.442	0.47
62	NE	0.307	0.129	0.317	0.130	0.437	0.45
63	CA	0.138	0.293	0.227	0.293	0.431	0.52
64	NE	0.355	0.076	0.378	0.076	0.430	0.45
65	---	0.305	0.108	0.332	0.109	0.414	0.44
66	TX	0.302	0.106	0.329	0.107	0.408	0.44

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBs, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBs, ND=0	Total TEQ DLCs, ND = 0	Total TEQ DLCs, ND=LOD/2
67	KS	0.310	0.096	0.340	0.097	0.406	0.44
68	KS	0.287	0.113	0.325	0.113	0.400	0.44
69	TX	0.279	0.113	0.307	0.113	0.392	0.42
70	OK	0.241	0.141	0.252	0.142	0.382	0.39
71	TX	0.241	0.138	0.268	0.138	0.379	0.41
72	ND	0.288	0.084	0.311	0.084	0.372	0.39
73	KS	0.244	0.116	0.277	0.117	0.361	0.39
74	TX	0.218	0.138	0.294	0.138	0.355	0.43
75	TX	0.225	0.123	0.255	0.124	0.348	0.38
76	NE	0.272	0.076	0.312	0.076	0.348	0.39
77	IA	0.312	0.028	0.352	0.029	0.340	0.38
78	IA	0.273	0.066	0.309	0.066	0.339	0.38
79	NE	0.240	0.094	0.267	0.095	0.334	0.36
80	KS	0.224	0.107	0.251	0.108	0.331	0.36
81	NE	0.263	0.068	0.284	0.068	0.331	0.35
82	KS	0.240	0.091	0.269	0.092	0.331	0.36
83	KS	0.244	0.085	0.272	0.085	0.329	0.36
84	KS	0.248	0.081	0.286	0.081	0.329	0.37
85	KS	0.204	0.124	0.248	0.124	0.328	0.37
86	CO	0.265	0.061	0.303	0.061	0.326	0.36
87	SD	0.265	0.057	0.293	0.057	0.322	0.35
88	CA	0.220	0.088	0.330	0.088	0.308	0.42
89	KS	0.190	0.110	0.232	0.110	0.300	0.34
90	IA	0.222	0.074	0.260	0.074	0.296	0.33
91	NE	0.234	0.061	0.313	0.062	0.295	0.37
92	SD	0.274	0.005	0.299	0.013	0.279	0.31
93	TX	0.143	0.119	0.212	0.119	0.262	0.33
94	KS	0.168	0.092	0.208	0.092	0.259	0.30
95	OH	0.229	0.023	0.311	0.025	0.252	0.34
96	TX	0.139	0.099	0.210	0.100	0.238	0.31
97	KS	0.077	0.158	0.153	0.158	0.235	0.31
98	TX	0.137	0.096	0.181	0.096	0.232	0.28
99	TX	0.153	0.070	0.197	0.071	0.224	0.27
100	NM	0.087	0.125	0.180	0.125	0.211	0.31
101	WA	0.035	0.176	0.126	0.177	0.211	0.30
102	KS	0.096	0.112	0.188	0.112	0.208	0.30
103	TX	0.032	0.176	0.129	0.176	0.208	0.31
104	KS	0.096	0.111	0.172	0.112	0.207	0.28
105	AZ	0.124	0.082	0.176	0.082	0.206	0.26
106	TX	0.012	0.188	0.108	0.188	0.200	0.30
107	TX	0.150	0.049	0.227	0.050	0.199	0.28
108	NE	0.092	0.101	0.165	0.101	0.193	0.27
109	WY	0.164	0.020	0.195	0.022	0.184	0.22
110	KS	0.090	0.092	0.153	0.093	0.182	0.25

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBs, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBs, ND=0	Total TEQ DLCs, ND = 0	Total TEQ DLCs, ND=LOD/2
111	NE	0.117	0.064	0.172	0.065	0.181	0.24
112	KS	0.084	0.092	0.173	0.092	0.176	0.27
113	CO	0.089	0.087	0.173	0.087	0.175	0.26
114	IA	0.096	0.078	0.178	0.079	0.175	0.26
115	TX	0.075	0.097	0.153	0.097	0.172	0.25
116	KS	0.077	0.086	0.154	0.086	0.162	0.24
117	NE	0.053	0.098	0.159	0.099	0.151	0.26
118	KS	0.091	0.060	0.182	0.060	0.151	0.24
119	KS	0.058	0.091	0.146	0.092	0.149	0.24
120	TX	0.022	0.126	0.117	0.127	0.148	0.24
121	TX	0.068	0.076	0.157	0.077	0.144	0.23
122	CO	0.068	0.075	0.161	0.075	0.143	0.24
123	AB	0.096	0.046	0.180	0.047	0.143	0.23
124	---	0.044	0.098	0.148	0.098	0.142	0.25
125	TX	0.039	0.096	0.127	0.097	0.135	0.22
126	TX	0.034	0.098	0.135	0.098	0.132	0.23
127	KS	0.043	0.089	0.133	0.089	0.132	0.22
128	TX	0.064	0.054	0.150	0.055	0.118	0.20
129	---	0.062	0.053	0.153	0.054	0.115	0.21
130	TX	0.026	0.087	0.120	0.088	0.114	0.21
131	SD	0.035	0.077	0.119	0.077	0.112	0.20
132	KS	0.014	0.092	0.119	0.092	0.106	0.21
133	MI	0.050	0.056	0.140	0.058	0.106	0.20
134	TX	0.034	0.071	0.127	0.071	0.105	0.20
135	TX	0.016	0.072	0.113	0.072	0.087	0.18
136	TX	0.013	0.070	0.109	0.070	0.083	0.18
137	TX	0.019	0.058	0.114	0.059	0.078	0.17
138	MN	0.031	0.037	0.121	0.038	0.068	0.16
139	TX	0.015	0.038	0.108	0.038	0.053	0.15

Note: Results are expressed in parts per trillion (ppt). 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. A "---" indicates that producer state information is not available.

Table 6. TEQ Values for Young Chicken Samples (n=151) in the Dioxin 08 Survey.

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBs, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBs, ND=0	Total TEQ DLCs, ND = 0	Total TEQ DLCs, ND=LOD/2
1	CA	0.080	1.129	0.153	1.129	1.209	1.281
2	CA	0.086	0.938	0.159	0.938	1.025	1.097
3	CA	0.080	0.298	0.157	0.298	0.378	0.455
4	KY	0.178	0.101	0.221	0.102	0.279	0.322
5	GA	0.208	0.038	0.234	0.038	0.245	0.272
6	MS	0.221	0.022	0.250	0.024	0.242	0.274
7	VA	0.160	0.069	0.237	0.069	0.229	0.306
8	KY	0.156	0.066	0.199	0.067	0.222	0.265
9	NC	0.185	0.019	0.229	0.021	0.204	0.250
10	AL	0.045	0.129	0.132	0.129	0.173	0.261
11	NC	0.144	0.027	0.199	0.029	0.171	0.228
12	VA	0.113	0.052	0.189	0.052	0.165	0.241
13	MS	0.107	0.055	0.175	0.055	0.162	0.231
14	IN	0.128	0.033	0.191	0.035	0.161	0.225
15	NC	0.080	0.080	0.160	0.081	0.160	0.241
16	NC	0.106	0.047	0.176	0.047	0.153	0.223
17	KY	0.124	0.028	0.191	0.030	0.152	0.221
18	NC	0.018	0.134	0.115	0.134	0.151	0.249
19	NC	0.084	0.066	0.156	0.066	0.150	0.222
20	MO	0.125	0.022	0.171	0.022	0.147	0.194
21	AR	0.108	0.034	0.185	0.036	0.142	0.221
22	LA	0.059	0.081	0.129	0.082	0.141	0.211
23	OR	0.021	0.101	0.112	0.101	0.121	0.212
24	AR	0.098	0.021	0.169	0.023	0.119	0.192
25	LA	0.034	0.081	0.122	0.082	0.115	0.204
26	AR	0.095	0.021	0.176	0.023	0.115	0.198
27	MD	0.065	0.050	0.137	0.051	0.115	0.188
28	AR	0.071	0.043	0.160	0.043	0.114	0.204
29	GA	0.056	0.053	0.139	0.053	0.108	0.193
30	GA	0.009	0.098	0.106	0.098	0.107	0.204
31	NC	0.023	0.082	0.111	0.082	0.105	0.193
32	WA	0.088	0.017	0.176	0.019	0.104	0.195
33	NC	0.102	0.000	0.169	0.010	0.102	0.179
34	AR	0.082	0.020	0.170	0.022	0.102	0.192
35	TX	0.015	0.087	0.124	0.087	0.102	0.211
36	NC	0.083	0.018	0.168	0.020	0.101	0.188
37	MS	0.085	0.016	0.172	0.018	0.101	0.190
38	AL	0.004	0.096	0.100	0.096	0.100	0.196
39	PA	0.069	0.030	0.140	0.032	0.099	0.172
40	GA	0.013	0.086	0.107	0.086	0.099	0.193
41	GA	0.006	0.092	0.101	0.093	0.098	0.194

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBs, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBs, ND=0	Total TEQ DLCs, ND = 0	Total TEQ DLCs, ND=LOD/2
42	VA	0.014	0.074	0.105	0.074	0.088	0.179
43	AL	0.003	0.085	0.095	0.085	0.088	0.179
44	MS	0.069	0.017	0.139	0.019	0.086	0.159
45	AR	0.004	0.081	0.101	0.081	0.084	0.182
46	AR	0.051	0.033	0.123	0.033	0.084	0.156
47	---	0.030	0.053	0.118	0.053	0.082	0.171
48	KY	0.082	0.000	0.150	0.009	0.082	0.159
49	MD	0.051	0.030	0.127	0.031	0.082	0.158
50	MS	0.062	0.019	0.140	0.021	0.081	0.161
51	SC	0.042	0.038	0.124	0.038	0.080	0.162
52	GA	0.016	0.062	0.106	0.064	0.078	0.170
53	MD	0.034	0.043	0.130	0.043	0.077	0.173
54	PA	0.076	0.000	0.161	0.009	0.076	0.170
55	AL	0.009	0.067	0.108	0.067	0.076	0.175
56	AL	0.038	0.037	0.121	0.038	0.075	0.158
57	WV	0.054	0.020	0.129	0.022	0.074	0.151
58	GA	0.003	0.069	0.099	0.071	0.072	0.170
59	PA	0.003	0.068	0.103	0.069	0.071	0.171
60	NC	0.027	0.044	0.109	0.046	0.071	0.154
61	AR	0.003	0.067	0.102	0.068	0.070	0.170
62	AL	0.006	0.063	0.133	0.064	0.069	0.197
63	MS	0.043	0.025	0.135	0.027	0.068	0.162
64	MS	0.013	0.054	0.104	0.054	0.066	0.158
65	KY	0.017	0.049	0.110	0.050	0.066	0.160
66	MS	0.047	0.018	0.131	0.020	0.065	0.151
67	GA	0.046	0.019	0.132	0.020	0.064	0.152
68	AR	0.064	0.000	0.138	0.009	0.064	0.147
69	AL	0.003	0.061	0.099	0.061	0.064	0.160
70	TX	0.017	0.046	0.108	0.047	0.064	0.155
71	TX	0.017	0.044	0.109	0.044	0.061	0.154
72	MS	0.040	0.021	0.127	0.023	0.061	0.150
73	MO	0.037	0.024	0.123	0.026	0.061	0.148
74	MS	0.042	0.019	0.128	0.021	0.061	0.149
75	GA	0.003	0.056	0.099	0.057	0.059	0.156
76	AL	0.025	0.032	0.120	0.034	0.057	0.154
77	MS	0.038	0.017	0.126	0.019	0.056	0.145
78	AR	0.031	0.023	0.113	0.025	0.054	0.138
79	AL	0.002	0.051	0.096	0.052	0.054	0.148
80	GA	0.002	0.051	0.097	0.052	0.053	0.149
81	AL	0.010	0.043	0.098	0.044	0.053	0.141
82	AR	0.003	0.050	0.097	0.050	0.052	0.147
83	TX	0.025	0.027	0.115	0.029	0.052	0.144
84	GA	0.021	0.030	0.157	0.033	0.051	0.190
85	MS	0.019	0.031	0.107	0.033	0.050	0.140

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBs, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBs, ND=0	Total TEQ DLCs, ND = 0	Total TEQ DLCs, ND=LOD/2
86	TX	0.021	0.029	0.111	0.030	0.050	0.141
87	GA	0.000	0.049	0.100	0.049	0.049	0.150
88	MD	0.022	0.027	0.110	0.029	0.049	0.139
89	TX	0.049	0.000	0.137	0.010	0.049	0.146
90	KY	0.048	0.000	0.127	0.009	0.048	0.136
91	GA	0.016	0.032	0.110	0.033	0.048	0.142
92	GA	0.016	0.032	0.105	0.033	0.048	0.138
93	AR	0.032	0.015	0.117	0.017	0.047	0.134
94	WV	0.046	0.000	0.126	0.010	0.046	0.136
95	MS	0.004	0.041	0.110	0.041	0.045	0.151
96	KY	0.004	0.041	0.096	0.041	0.044	0.137
97	AR	0.003	0.040	0.106	0.042	0.043	0.148
98	AL	0.020	0.022	0.114	0.024	0.042	0.138
99	MD	0.013	0.028	0.102	0.030	0.041	0.132
100	AL	0.013	0.028	0.102	0.029	0.041	0.131
101	AL	0.015	0.026	0.101	0.026	0.040	0.127
102	VA	0.008	0.033	0.106	0.035	0.040	0.141
103	LA	0.006	0.034	0.099	0.034	0.040	0.134
104	GA	0.015	0.024	0.112	0.026	0.039	0.139
105	GA	0.019	0.020	0.108	0.022	0.039	0.130
106	GA	0.019	0.020	0.108	0.022	0.039	0.129
107	NC	0.015	0.024	0.104	0.025	0.038	0.129
108	GA	0.012	0.026	0.113	0.028	0.038	0.141
109	OK	0.034	0.004	0.123	0.012	0.038	0.135
110	GA	0.014	0.023	0.105	0.025	0.037	0.130
111	AR	0.014	0.023	0.102	0.025	0.036	0.126
112	TX	0.005	0.030	0.097	0.030	0.035	0.127
113	VA	0.003	0.030	0.100	0.032	0.033	0.133
114	SC	0.032	0.000	0.115	0.009	0.032	0.124
115	AR	0.013	0.016	0.104	0.018	0.029	0.122
116	TN	0.007	0.022	0.105	0.023	0.029	0.128
117	DE	0.005	0.023	0.102	0.025	0.028	0.127
118	LA	0.005	0.023	0.099	0.024	0.028	0.123
119	DE	0.002	0.024	0.094	0.025	0.026	0.120
120	GA	0.003	0.019	0.105	0.021	0.022	0.126
121	TX	0.004	0.017	0.100	0.019	0.021	0.119
122	AR	0.002	0.018	0.095	0.020	0.020	0.116
123	TX	0.001	0.019	0.098	0.021	0.020	0.120
124	NC	0.005	0.015	0.096	0.017	0.019	0.113
125	---	0.002	0.016	0.104	0.018	0.018	0.123
126	MD	0.002	0.016	0.100	0.018	0.018	0.117
127	AL	0.012	0.000	0.104	0.010	0.012	0.114
128	AR	0.011	0.000	0.107	0.010	0.011	0.117
129	GA	0.011	0.000	0.107	0.010	0.011	0.116

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBs, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBs, ND=0	Total TEQ DLCs, ND = 0	Total TEQ DLCs, ND=LOD/2
130	TX	0.007	0.000	0.104	0.010	0.007	0.113
131	MS	0.006	0.000	0.099	0.009	0.006	0.108
132	GA	0.006	0.000	0.100	0.009	0.006	0.109
133	TX	0.006	0.000	0.102	0.009	0.006	0.111
134	GA	0.006	0.000	0.098	0.009	0.006	0.107
135	DE	0.005	0.000	0.095	0.009	0.005	0.104
136	MS	0.004	0.000	0.105	0.010	0.004	0.115
137	GA	0.004	0.000	0.100	0.009	0.004	0.109
138	MO	0.004	0.000	0.109	0.010	0.004	0.119
139	GA	0.003	0.000	0.097	0.009	0.003	0.106
140	AR	0.003	0.000	0.098	0.009	0.003	0.107
141	GA	0.003	0.000	0.096	0.009	0.003	0.106
142	TX	0.003	0.000	0.101	0.010	0.003	0.110
143	TX	0.002	0.000	0.095	0.009	0.002	0.104
144	MO	0.002	0.000	0.095	0.009	0.002	0.104
145	TX	0.001	0.000	0.102	0.010	0.001	0.112
146	AR	0.000	0.000	0.097	0.009	0.000	0.106
147	OK	0.000	0.000	0.099	0.010	0.000	0.108
148	PA	0.000	0.000	0.093	0.009	0.000	0.103
149	GA	0.000	0.000	0.101	0.010	0.000	0.111
150	MO	0.000	0.000	0.097	0.010	0.000	0.107
151	MO	0.000	0.000	0.098	0.010	0.000	0.108

Note: Results are expressed in parts per trillion (ppt). 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. A “---” indicates that producer state information is not available.

Table 7. TEQ Values for Young Turkeys Samples (n=84) in the Dioxin 08 Survey.

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBs, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBs, ND=0	Total TEQ DLCs, ND = 0	Total TEQ DLCs, ND=LOD/2
1	CA	0.109	4.418	0.180	4.418	4.526	4.597
2	CA	0.150	1.757	0.204	1.757	1.906	1.961
3	CA	0.333	1.505	0.354	1.505	1.838	1.859
4	WV	0.958	0.366	0.964	0.366	1.324	1.330
5	VA	0.901	0.322	0.907	0.322	1.222	1.229
6	KS	1.076	0.133	1.085	0.133	1.209	1.218
7	MN	0.909	0.227	0.914	0.228	1.136	1.142
8	CA	0.232	0.737	0.249	0.737	0.969	0.986
9	MN	0.764	0.197	0.771	0.197	0.960	0.968
10	AR	0.675	0.284	0.693	0.285	0.959	0.977
11	CA	0.165	0.767	0.209	0.768	0.932	0.976
12	MN	0.673	0.180	0.682	0.180	0.853	0.861
13	MN	0.451	0.354	0.463	0.354	0.804	0.818
14	AR	0.490	0.304	0.505	0.304	0.794	0.810
15	IN	0.654	0.104	0.663	0.104	0.758	0.767
16	MN	0.537	0.188	0.550	0.188	0.725	0.738
17	CO	0.600	0.123	0.607	0.124	0.723	0.730
18	AR	0.527	0.166	0.542	0.167	0.693	0.709
19	MN	0.583	0.098	0.593	0.098	0.681	0.691
20	MN	0.556	0.109	0.562	0.109	0.665	0.672
21	MI	0.494	0.162	0.502	0.162	0.655	0.664
22	OH	0.543	0.107	0.552	0.108	0.650	0.659
23	IA	0.470	0.177	0.479	0.177	0.647	0.656
24	MN	0.521	0.126	0.529	0.126	0.647	0.656
25	CO	0.513	0.100	0.519	0.100	0.612	0.619
26	MN	0.521	0.085	0.542	0.085	0.606	0.627
27	IN	0.470	0.128	0.478	0.128	0.598	0.606
28	MO	0.551	0.043	0.556	0.045	0.594	0.601
29	MN	0.447	0.116	0.456	0.116	0.562	0.572
30	AR	0.359	0.202	0.372	0.202	0.561	0.574
31	MN	0.463	0.097	0.471	0.097	0.560	0.569
32	IN	0.356	0.186	0.387	0.186	0.542	0.573
33	MN	0.405	0.125	0.418	0.126	0.530	0.543
34	NC	0.260	0.256	0.276	0.256	0.516	0.532
35	MI	0.387	0.125	0.393	0.125	0.512	0.519
36	MN	0.378	0.133	0.396	0.134	0.511	0.530
37	MO	0.377	0.129	0.385	0.129	0.506	0.515
38	NE	0.258	0.245	0.276	0.246	0.503	0.521
39	MN	0.351	0.140	0.367	0.140	0.491	0.507
40	NC	0.188	0.292	0.206	0.292	0.479	0.498

	Producer State	TEQ Dioxins/Furans, ND=0	TEQs PCBs, ND=0	TEQ Dioxins/Furans, ND=LOD/2	TEQs PCBs, ND=0	Total TEQ DLCs, ND = 0	Total TEQ DLCs, ND=LOD/2
41	AR	0.287	0.157	0.307	0.158	0.444	0.464
42	MN	0.353	0.089	0.362	0.089	0.442	0.451
43	WY	0.274	0.167	0.306	0.168	0.442	0.474
44	MN	0.347	0.094	0.360	0.094	0.441	0.454
45	MO	0.330	0.106	0.343	0.106	0.436	0.449
46	NC	0.278	0.151	0.307	0.151	0.429	0.458
47	IA	0.325	0.103	0.333	0.104	0.428	0.437
48	MN	0.319	0.108	0.333	0.109	0.427	0.442
49	MN	0.319	0.100	0.336	0.100	0.419	0.437
50	NC	0.234	0.175	0.264	0.175	0.409	0.439
51	IN	0.254	0.154	0.271	0.154	0.408	0.426
52	NC	0.163	0.245	0.196	0.245	0.408	0.442
53	MO	0.278	0.110	0.293	0.111	0.388	0.403
54	MO	0.284	0.101	0.296	0.102	0.386	0.397
55	NC	0.136	0.237	0.169	0.237	0.372	0.406
56	IL	0.193	0.177	0.221	0.177	0.370	0.398
57	AR	0.199	0.168	0.236	0.168	0.367	0.404
58	MN	0.260	0.100	0.276	0.101	0.361	0.377
59	WI	0.292	0.068	0.321	0.069	0.360	0.390
60	IL	0.200	0.160	0.231	0.161	0.360	0.392
61	IN	0.184	0.166	0.214	0.166	0.350	0.380
62	MO	0.236	0.097	0.264	0.097	0.333	0.362
63	MN	0.223	0.095	0.261	0.096	0.318	0.357
64	SC	0.145	0.162	0.186	0.162	0.307	0.348
65	MN	0.088	0.219	0.155	0.219	0.307	0.375
66	SC	0.166	0.139	0.193	0.139	0.305	0.332
67	NC	0.178	0.126	0.215	0.126	0.304	0.341
68	MO	0.188	0.102	0.225	0.103	0.290	0.327
69	NC	0.162	0.127	0.198	0.127	0.289	0.325
70	PA	0.244	0.045	0.279	0.045	0.289	0.325
71	NC	0.220	0.056	0.254	0.057	0.277	0.310
72	IL	0.167	0.093	0.200	0.094	0.261	0.293
73	NC	0.195	0.061	0.228	0.061	0.255	0.289
74	NC	0.053	0.198	0.130	0.199	0.251	0.329
75	AR	0.154	0.093	0.198	0.094	0.248	0.292
76	NC	0.203	0.035	0.235	0.036	0.239	0.271
77	NC	0.026	0.211	0.111	0.211	0.237	0.322
78	PA	0.197	0.032	0.225	0.032	0.229	0.257
79	TX	0.018	0.185	0.130	0.185	0.203	0.315
80	TX	0.023	0.172	0.107	0.173	0.195	0.280
81	SC	0.136	0.059	0.174	0.059	0.195	0.233
82	PA	0.051	0.138	0.127	0.139	0.189	0.266
83	AR	0.025	0.032	0.108	0.033	0.058	0.141
84	PA	0.029	0.021	0.116	0.023	0.050	0.139

Note: Results are expressed in parts per trillion (ppt). 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. Detection limits for the twenty DLCs analyzed in the 2002-2003 and Dioxin 08 surveys.

DLCs	Detection Limits (ppt)	
	2002-2003 survey	Dioxin 08 survey
2378TCDF	0.040	0.068
12378PeCDF	0.078	0.038
23478PeCDF	0.030	0.058
123478HxCDF	0.064	0.060
123678HxCDF	0.091	0.043
234678HxCDF	0.073	0.045
123789HxCDF	0.042	0.078
1234678HpCDF	0.178	0.153
1234789HpCDF	0.029	0.144
OCDF	0.090	0.119
2378TCDD	0.062	0.029
12378PeCDD	0.032	0.071
123478HxCDD	0.033	0.026
123678HxCDD	0.042	0.069
123789HxCDD	0.046	0.053
1234678HpCDD	0.119	0.107
OCDD	1.752	0.868
PCB-77	5.153	6.650
PCB-126	0.072	0.130
PCB-169	0.097	0.089