Table 2. Mean Level of Selected Microorganisms (per ml) in Turkey Carcass Rinse Fluids

Microorganism	Number of Samples Quantified	Number of Samples Positive[1]	Level of Positives, per ml			
			Log $_{10}$ Mean		Geometric Mean	
			Mean [2]	SE [3]	Mean [2]	95% CI [4]
INDICATOR ORGANISMS						
Aerobic Plate Count @ 35°C	1221	1221	3.32	0.02	2090	1922, 2273
Total Coliforms	1221	1218	1.69	0.02	49	45, 54
Escherichia coli (Biotype I)	1221	1208	1.42	0.02	26	24, 29
PATHOGENIC ORGANISMS						
Clostridium perfringens	1221	357	0.60	0.03	4.0	3.5, 4.6
Staphylococcus aureus	1221	814	1.35	0.03	22	20, 26
Listeria monocytogenes	71[5,6]	31	-0.85	0.09	0.14	0.10, 0.21
Campylobacter jejuni/coli	1221	1102	0.10	0.03	1.2	1.1, 1.4
Escherichia coli O157:H7	0[5]	NA[7]	NA[7]	NA[7]	NA[7]	NA[7]
Salmonella	227[5]	114	-0.98	0.04	0.11	0.09, 0.13

1 Positive by quantitative method.
2 Level only of those samples found positive by quantitative method.
3 Standard error of the mean of positive samples.
4 Confidence Interval.
5 Only those samples found positive by the qualitative method were quantified.
6 One sample positive by the qualitative method was unable to be enumerated due to insufficient reserve fluid.
7 NA = not applicable.

Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997).

Table 2a. Mean Level of Selected Microorganisms (per cm^2) Calculated from Turkey Carcass Rinse Fluids

Microorganism	Number of Samples Quantified	Number of Samples Positive[1]	Level of Positives, per cm^2			
			Log $_{10}$ Mean		Geometric Mean	
			Mean [2]	SE [3]	Mean [2]	95% CI [4]
INDICATOR ORGANISMS						
Aerobic Plate Count @ 35°C	1221	1221	2.47	0.02	297	273, 322
Total Coliforms	1221	1218	0.84	0.02	7.0	6.4, 7.6
Escherichia coli (Biotype I)	1221	1208	0.57	0.02	3.7	3.4, 4.1
PATHOGENIC ORGANISMS						
Clostridium perfringens	1221	357	-0.27	0.03	0.54	0.47, 0.62
Staphylococcus aureus	1221	814	0.50	0.03	3.2	2.8, 3.7
Listeria monocytogenes	71[5,6]	31	-1.72	0.09	0.02	0.01, 0.03
Campylobacter jejuni/coli	1221	1102	-0.75	0.03	0.18	0.16, 0.20
Escherichia coli O157:H7	0[5]	NA[7]	NA[7]	NA[7]	NA[7]	NA[7]
Salmonella	227[5]	114	-1.83	0.04	0.02	0.01, 0.02

1 Positive by quantitative method.
2 Level only of those samples found positive by quantitative method.
3 Standard error of the mean of positive samples.
4 Confidence Interval.
5 Only those samples found positive by the qualitative method were quantified.
6 One sample positive by the qualitative method was unable to be enumerated due to insufficient reserve fluid.
7 NA = not applicable.

Table 3. Aerobic Plate Count @ 35°C Distribution (per ml) in Turkey Carcass Rinse Fluids

Range, cfu/ml	Number of Samples	Percent of Total	Cumulative Number	Cumulative Percent
1 - 10	2	0.2	2	0.2
11 - 100	30	2.5	32	2.6
101 - 1,000	365	29.9	397	32.5
1,001 -10,000	654	53.6	1051	86.1
10,001 - 100,000	163	13.3	1214	99.4
100,001 - 1,000,000	6	0.5	1220	99.9
1,000,001 - 10,000,000	1	0.1	1221	100.0
TOTAL	1221	100.0		

Table 3a. Aerobic Plate Count @ 35°C Distribution (per cm^2) Calculated from Turkey Carcass Rinse Fluids

Range, cfu/cm^2	Number of Samples	Percent of Total	Cumulative Number	Cumulative Percent
>0 - 1	1	0.1	1	0.1
1.01 - 10	16	1.3	17	1.4
10.01 - 100	252	20.6	269	22.0
100.01 - 1,000	706	57.8	975	79.9
1,000.01 -10,000	235	19.2	1210	99.1
10,000.01 - 100,000	9	0.7	1219	99.8
100,000.01 - 1,000,000	1	0.1	1220	99.9
1,000,000.01 - 10,000,000	1	0.1	1221	100.0
TOTAL	1221	100.0		

Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997).

Table 4. Total Coliform Distribution (per ml) in Turkey Carcass Rinse Fluids

Range, cfu/ml	Number of Samples	Percent of Total	Cumulative Number	Cumulative Percent
<1 [1]	3	0.2	3	0.2
1 - 10	202	16.6	214	16.8
11 - 100	660	54.1	865	70.8
101 - 1,000	302	24.7	1167	95.6
1,001 -10,000	51	4.2	1218	99.8
10,001 - 100,000	3	0.2	1221	100.0
TOTAL	1221	100.0		

[1] Negative by method.

Table 4a. Total Coliform Distribution (per cm^2) Calculated from Turkey Carcass Rinse Fluids

Range, cfu/cm^2	Number of Samples	Percent of Total	Cumulative Number	Cumulative Percent
0[1]	3	0.2	3	0.2
0.01 - 1	113	9.3	116	9.5
1.01 - 10	647	53.0	763	62.5
10.01 - 100	387	31.7	1150	94.2
100.01 - 1,000	64	5.2	1214	99.4
1,000.01 -10,000	7	0.6	1221	100.0
TOTAL	1221	100.0		

[1] Negative by method.

Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997).

Table 5 . ***Escherichia coli*** **(Biotype I) Distribution (per ml) in Turkey Carcass Rinse Fluids**

Range, cfu/ml	Number of Samples	Percent of Total	Cumulative Number	Cumulative Percent
<1 [1]	13	1.1	13	1.1
1 - 10	373	30.5	386	31.6
11 - 100	613	50.2	999	81.8
101 - 1,000	190	15.6	1189	97.4
1,001 -10,000	29	2.4	1218	99.8
10,001 - 100,000	3	0.2	1221	100.0
TOTAL	1221	100.0		

[1] Negative by method.

Table 5a . ***Escherichia coli*** **(Biotype I) Distribution (per cm^2) Calculated from Turkey Carcass Rinse Fluids**

Range, cfu/cm^2	Number of Samples	Percent of Total	Cumulative Number	Cumulative Percent
0 [1]	13	1.1	13	1.1
0.01 - 1	270	22.1	283	23.2
1.01 - 10	646	52.9	929	76.1
10.01 - 100	253	20.7	1182	96.8
100.01 - 1,000	34	2.8	1216	99.6
1,000.01 - 10,000	5	0.4	1221	100.0
TOTAL	1221	100.0		

[1] Negative by method.

Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997).

Table 6. ***Clostridium perfringens*** **Distribution (per ml) in Turkey Carcass Rinse Fluids**

Range, cfu/ml	Number of Samples	Percent of Total	Cumulative Number	Cumulative Percent
<1 [1]	864	70.8	864	70.8
1 - 10	281	23.0	1145	93.8
11 - 100	64	5.2	1209	99.0
101 - 1,000	11	0.9	1220	99.9
1,001 - 10,000[2]	1	0.1	1221	100.0
TOTAL	1221	100.0		

[1] Negative by method.
[2] Maximum level detected = 3,250 cfu/ml

Table 6a. ***Clostridium perfringens*** **Distribution (per cm^2) Calculated from Turkey Carcass Rinse Fluids**

Range, cfu/cm^2	Number of Samples	Percent of Total	Cumulative Number	Cumulative Percent
0 [1]	864	70.8	864	70.8
0.01 - 1	262	21.5	1126	92.2
1.01 - 10	81	6.6	1207	98.9
10.01 - 100	12	1.0	1219	99.8
100.01 - 1,000[2]	2	0.2	1221	100.0
TOTAL	1221	100.0		

[1] Negative by method.
[2] Maximum level detected = 383 cfu/cm^2

Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997).

Table 7. ***Staphylococcus aureus*** **Distribution (per ml) in Turkey Carcass Rinse Fluids**

Range, cfu/ml	Number of Samples	Percent of Total	Cumulative Number	Cumulative Percent
<1 [1]	407	33.3	407	33.3
1 - 10	315	25.8	722	59.1
11 - 100	331	27.1	1053	86.2
101 - 1,000	121	9.9	1174	96.2
1,001 -10,000	45	3.7	1219	99.8
10,001 - 100,000[2]	2	0.2	1221	100.0
TOTAL	1221	100.0		

[1] Negative by method.
[2] Maximum level detected = 20,100 cfu/ml

Table 7a. ***Staphylococcus aureus*** **Distribution (per cm^2) Calculated from Turkey Carcass Rinse Fluids**

Range, cfu/cm^2	Number of Samples	Percent of Total	Cumulative Number	Cumulative Percent
0[1]	407	33.3	407	33.3
0.01 - 1	244	20.0	651	53.3
1.01 - 10	358	29.3	1009	82.6
10.01 - 100	144	11.8	1153	94.4
100.01 - 1,000	66	5.4	1219	99.8
1,001 - 10,000[2]	2	0.2	1221	100.0
TOTAL	1221	100.0		

[1] Negative by method.
[2] Maximum level detected = 3,703 cfu/cm^2

Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997).

Table 8. ***Listeria monocytogenes*** **Distribution (per ml) in Enumerated Positive Turkey Carcass Rinse Fluids**

Range, MPN/ml	Number of Samples	Percent of Total	Cumulative Number	Cumulative Percent
<0.03 [1]	40	56.3	40	56.3
0.03 - 0.30	22	31.0	62	87.3
0.301 - 3.0 [2]	9	12.7	71	100.0
TOTAL	71	100.0		

[1] Negative by quantitative MPN method.

[2] Maximum level detected = 2.3 MPN/ml.

Table 8a. ***Listeria monocytogenes*** **Distribution (per cm^2) Calculated from Enumerated Positive Turkey Carcass Rinse Fluids**

Range, MPN/cm^2	Number of Samples	Percent of Total	Cumulative Number	Cumulative Percent
0 [1]	40	56.3	40	56.3
0.01 - 0.03	18	25.4	58	81.7
0.0301 - 0.30	12	16.9	70	98.6
0.3001 - 3.0 [2]	1	1.4	71	100.0
TOTAL	71	100.0		

[1] Negative by quantitative MPN method.

[2] Maximum level detected = 0.3006 MPN/cm^2

Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997).

Table 9. ***Campylobacter jejuni/coli*** **Distribution (per ml) in Enumerated Positive Turkey Carcass Rinse Fluids**

Range, MPN/ml	Number of Samples	Percent of Total	Cumulative Number	Cumulative Percent
<0.03 [1]	119	9.7	119	9.7
0.03 - 0.30	347	28.4	466	38.2
0.301 - 3.0	402	32.9	868	71.1
3.01 - 30.0	284	23.3	1152	94.3
>30.0[2]	69	5.7	1221	100.0
TOTAL	1221	100.0		

[1] Negative by quantitative MPN method.
[2] Maximum level detected = 4,600 MPN/ml

Table 9a. ***Campylobacter jejuni/coli*** **Distribution (per cm^2) Calculated from Enumerated Positive Turkey Carcass Rinse Fluids**

Range, MPN/cm^2	Number of Samples	Percent of Total	Cumulative Number	Cumulative Percent
0 [1]	119	9.7	119	9.7
0.01 - 0.03	232	19.0	351	28.7
0.0301 - 0.30	451	36.9	802	65.7
0.3001 - 3.0	305	25.0	1107	90.7
3.001 - 30.0	101	8.3	1208	98.9
>30.0[2]	13	1.1	1221	100.0
TOTAL	1221	100.0		

[1] Negative by quantitative MPN method.
[2] Maximum level detected = 981 MPN/cm^2

Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997).

Table 10. ***Salmonella*** **Distribution (per ml) in Enumerated Positive Turkey Carcass Rinse Fluids**

Range, MPN/ml	Number of Samples	Percent of Total	Cumulative Number	Cumulative Percent
<0.03 [1]	113	49.8	113	49.8
0.030 - 0.30	99	43.7	212	93.4
0.301 - 3.0	14	6.2	226	99.6
3.01 - 30.0[2]	1	0.4	227	100.0
TOTAL	227	100.0		

[1] Negative by quantitative MPN method.

[2] Maximum level detected = 23 MPN/ml

Table 10a. ***Salmonella*** **Distribution (per cm^2) Calculated from Enumerated Positive Turkey Carcass Rinse Fluids**

Range, MPN/cm^2	Number of Samples	Percent of Total	Cumulative Number	Cumulative Percent
0 [1]	113	49.8	113	49.8
0.01 - 0.03	89	39.2	202	89.0
0.0301 - 0.30	23	10.1	225	99.1
0.3001 - 3.0	1	0.4	226	99.6
3.001 - 30.0[2]	1	0.4	227	100.0
TOTAL	227	100.0		

[1] Negative by quantitative MPN method.

[2] Maximum level detected = 4.9 MPN/cm^2

Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997).

Table 11. Number of Turkey Carcass Rinse Fluids Containing One or More Species of Identified Pathogenic Bacteria

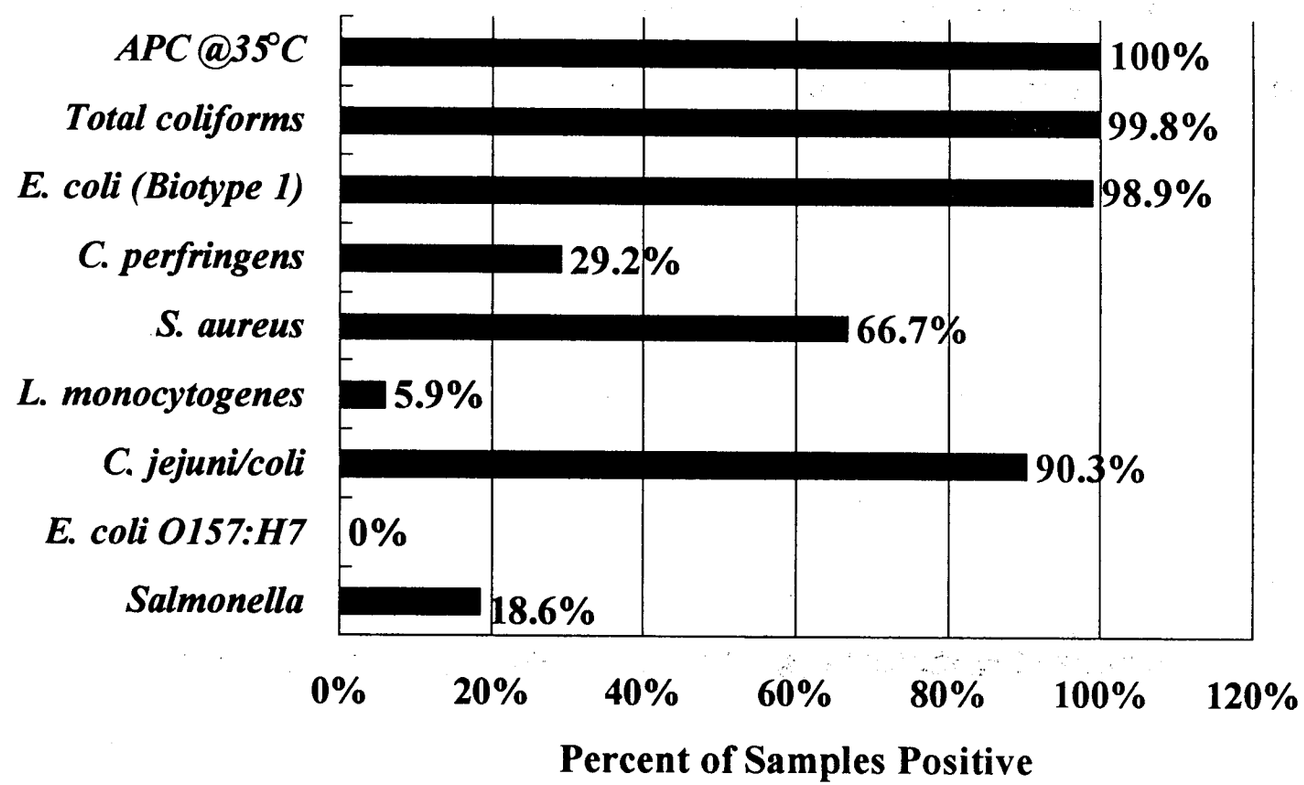
Number of Pathogens [1]	Number of Samples	Cumulative Number of Samples	Cumulative Percent
0[2]	32	32	2.6
1	261	293	24.0
2	557	850	69.6
3	292	1142	93.5
4	74	1216	99.6
5	5	1221	100.0

[1] *C. perfringens*, *S. aureus*, *L. monocytogenes*, *C. jejuni/coli*, *E. coli* O157:H7, *Salmonella* spp.
[2] Negative by method.

Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997).

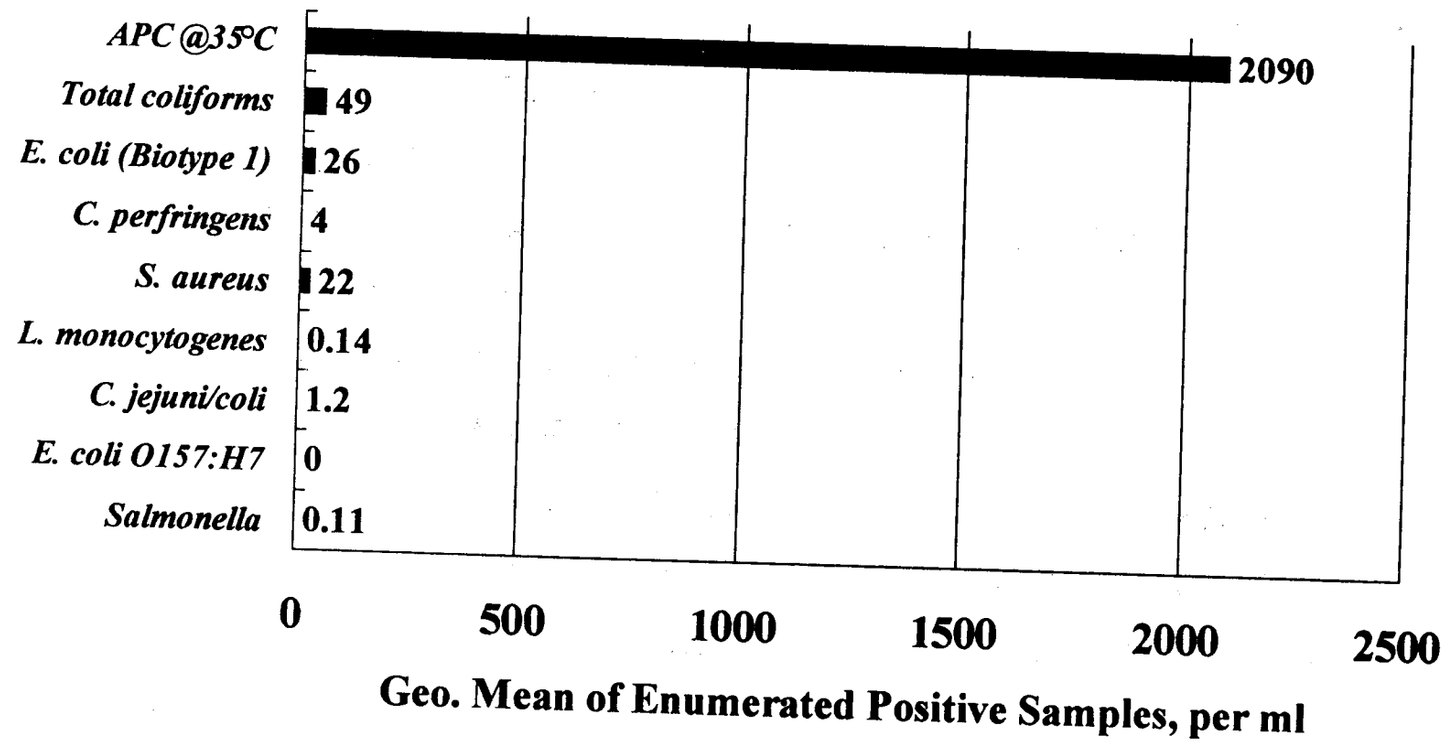
FIGURES

Figure 1. Prevalence of Selected Microorganisms in Turkey Carcass Rinse Fluids



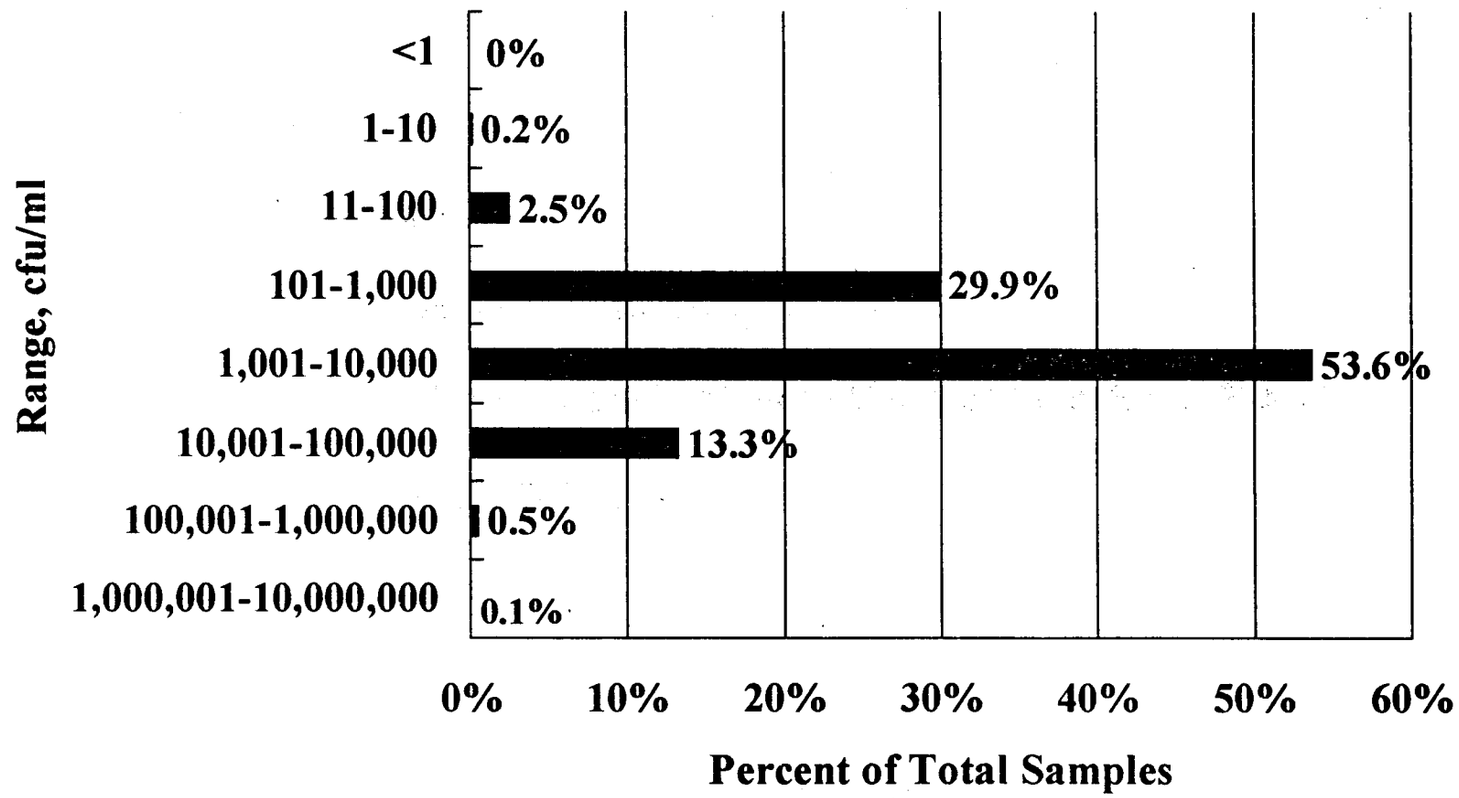
Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997)

Figure 2. Mean Level of selected Microorganisms (per ml) in Turkey Carcass Rinse Fluids



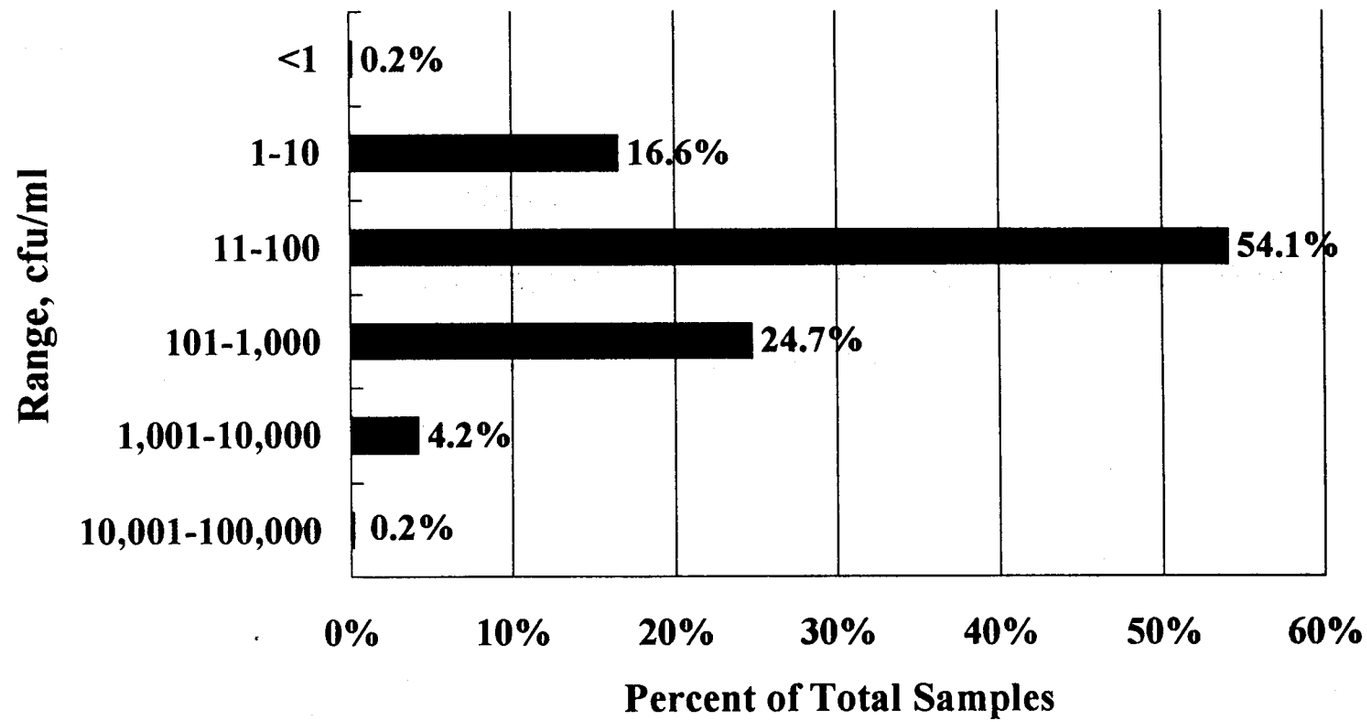
Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997)

Figure 3. Aerobic Plate Count @ 35C Distribution (per ml) in Turkey Carcass Rinse Fluids



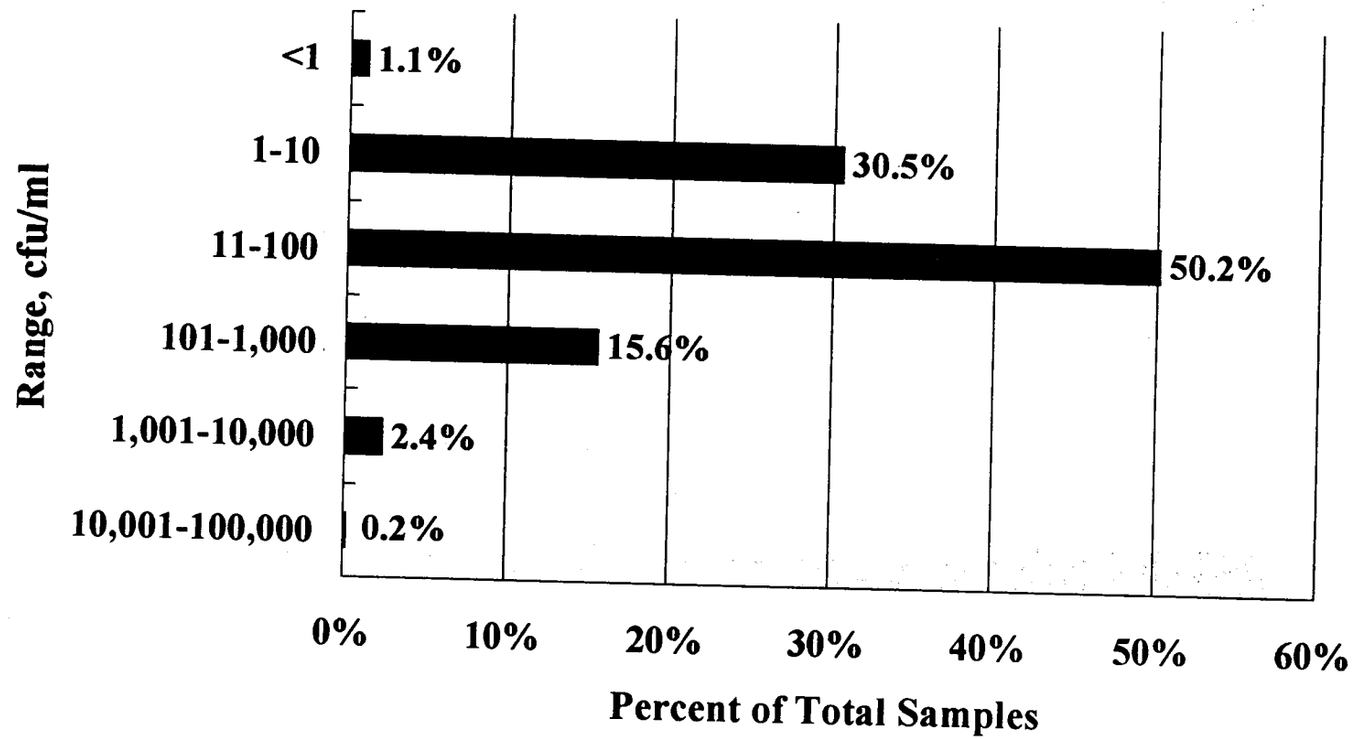
Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997)

Figure 4. Total Coliform Distribution (per ml) in Turkey Carcass Rinse Fluids



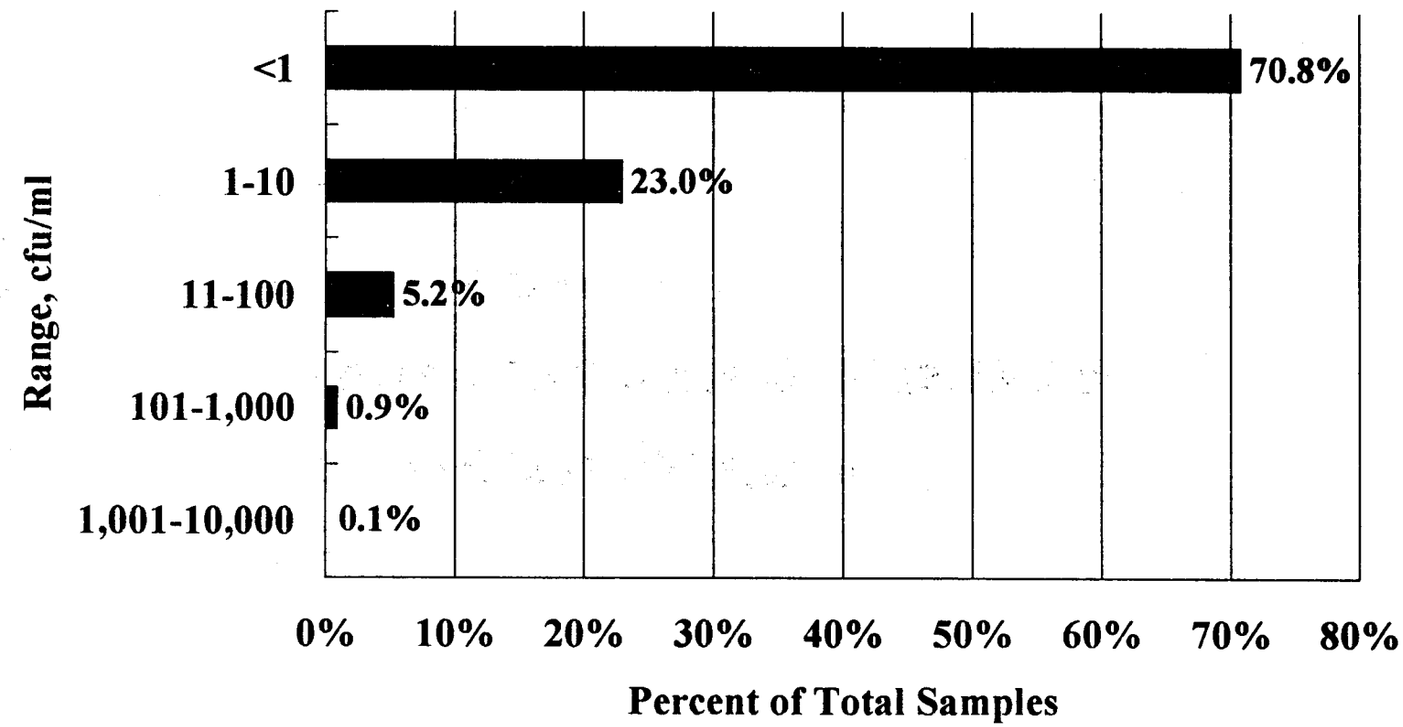
Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997)

Figure 5. *Escherichia coli* (Biotype 1) Distribution (per ml) in Turkey Carcass Rinse Fluids



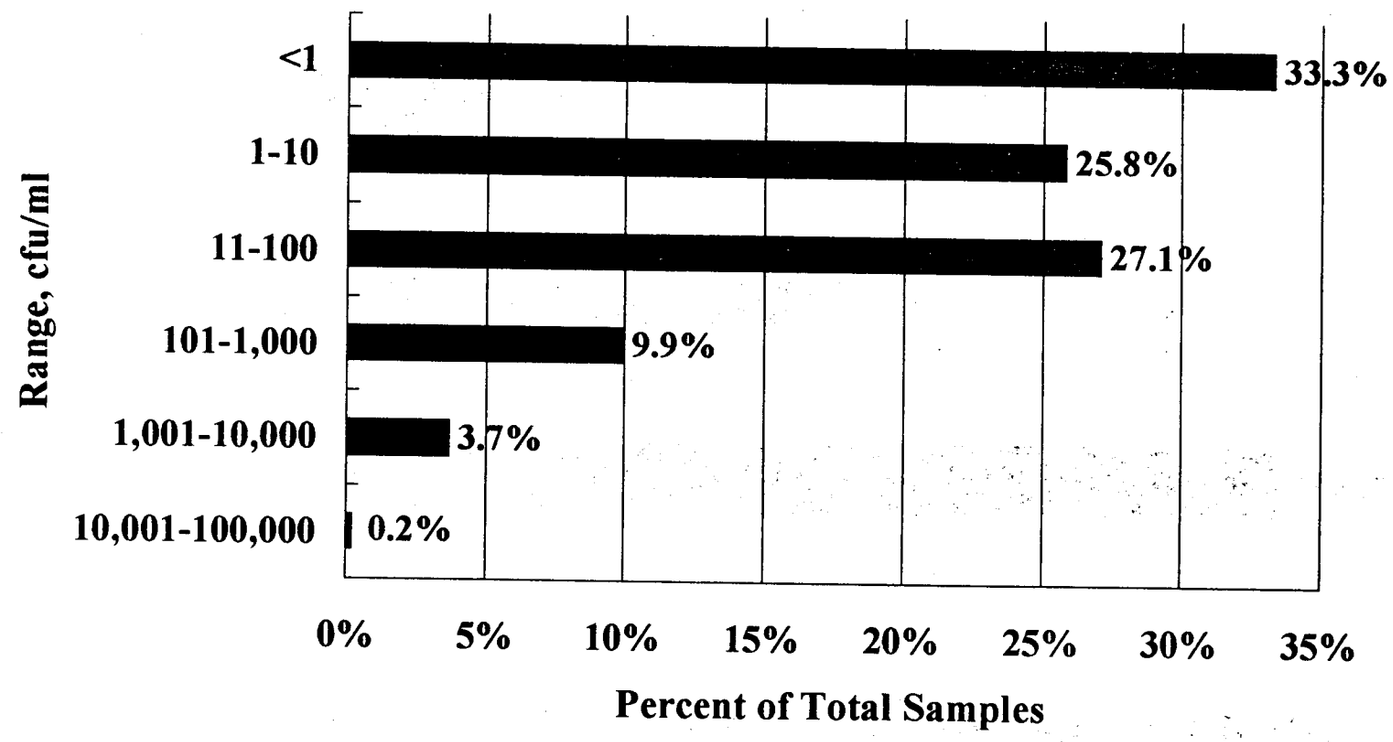
Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997)

Figure 6. *Clostridium perfringens* Distribution (per ml) in Turkey Carcass Rinse Fluids



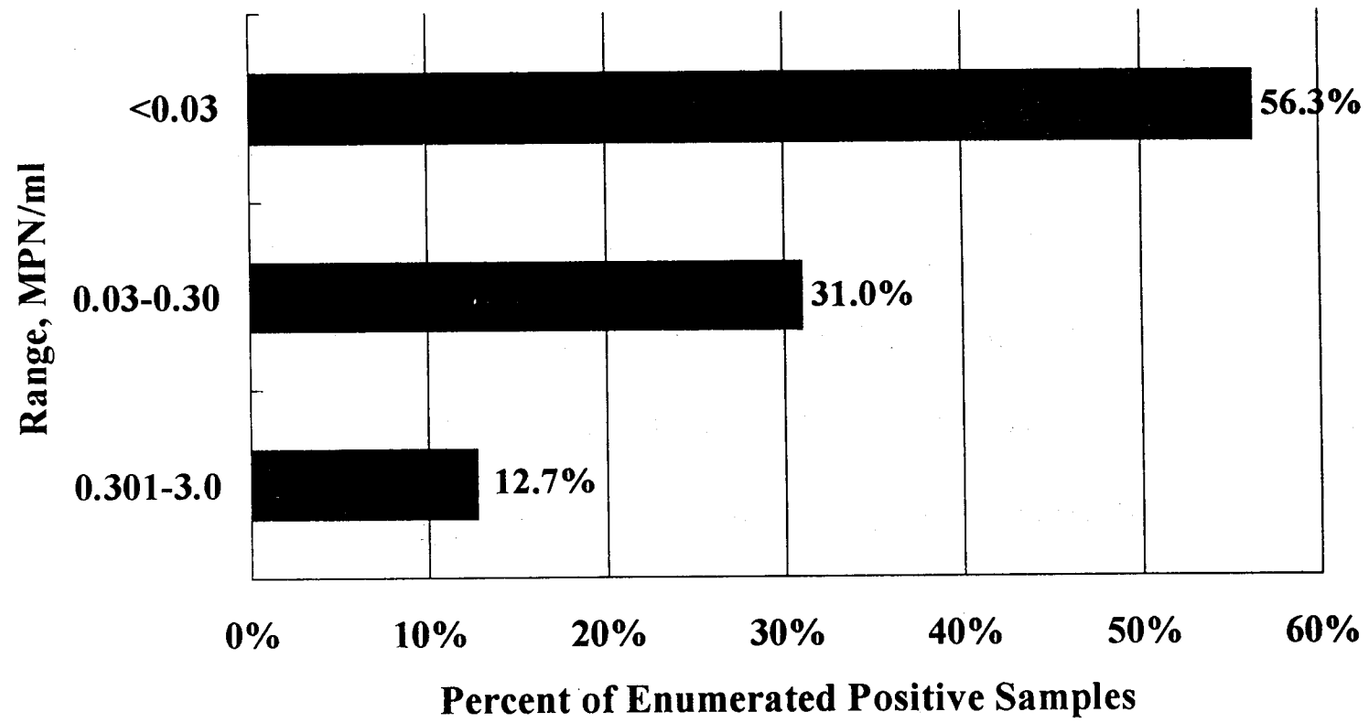
Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997)

Figure 7. *Staphylococcus aureus* Distribution (per ml) in Turkey Carcass Rinse Fluids



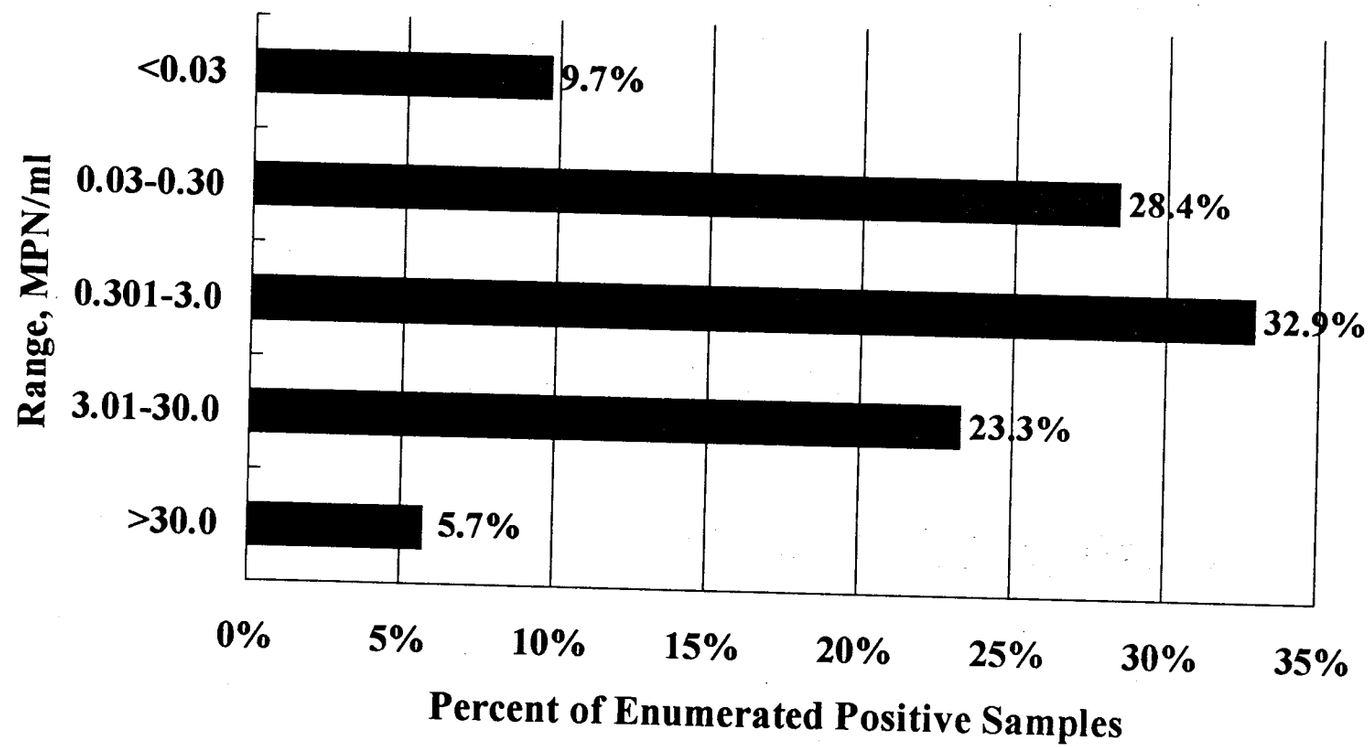
Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997)

Figure 8. *Listeria monocytogenes* Distribution (per ml) in Enumerated Positive Turkey Carcass Rinse Fluids



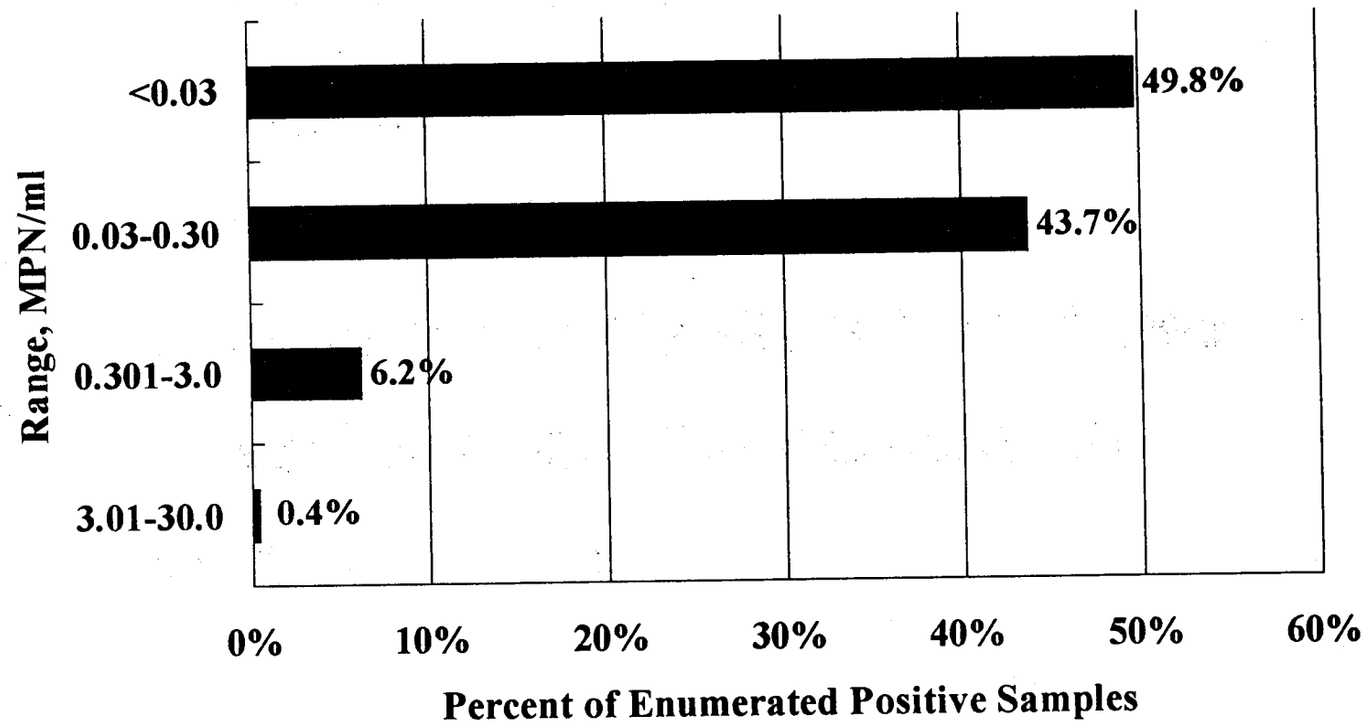
Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997)

Figure 9. *Campylobacter jejuni/coli* Distribution (per ml) in Enumerated Positive Turkey Carcass Rinse Fluids



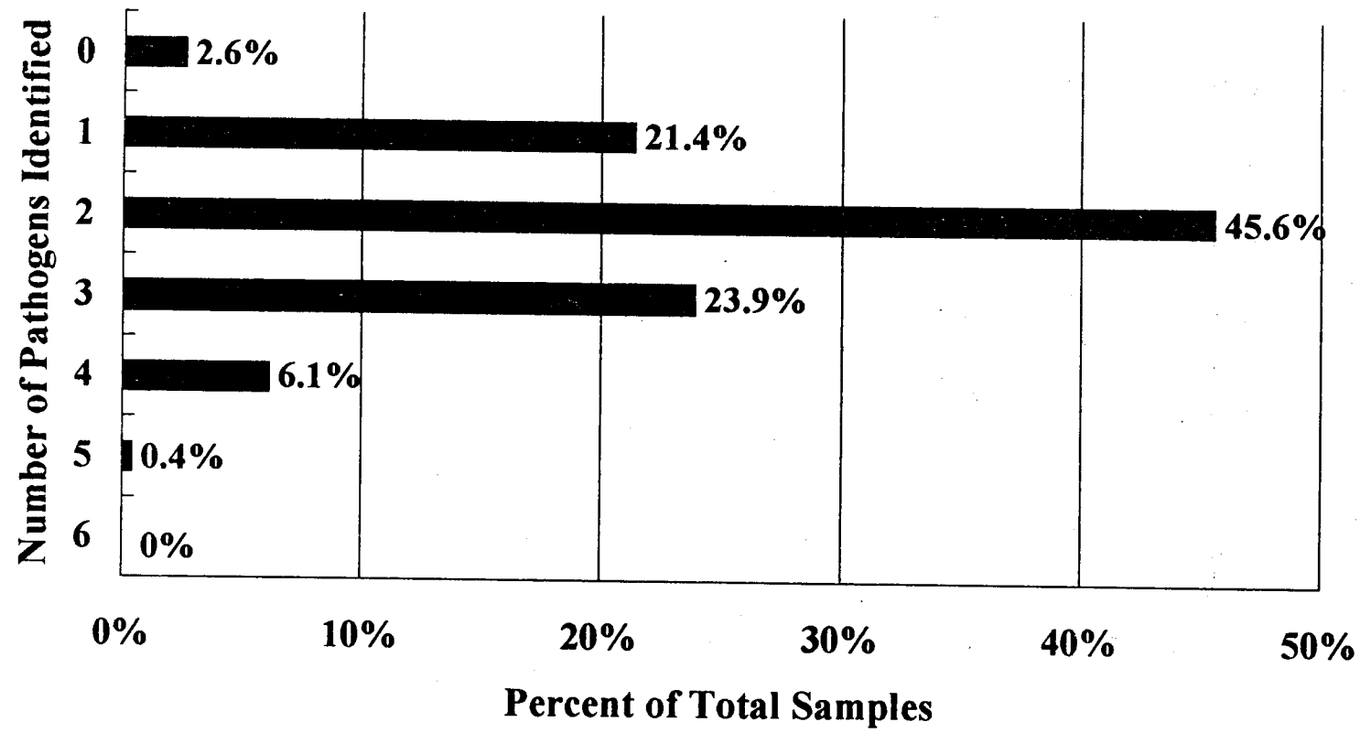
Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997)

Figure 10. *Salmonella* Distribution (per ml) in Enumerated Positive Turkey Carcass Rinse Fluids



Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997)

Figure 11. Percent of Turkey Carcass Rinse Fluids Containing One or more Species of Identified Pathogenic Bacteria



Source: Nationwide Young Turkey Microbiological Baseline Data Collection Program (August 1996 - July 1997)

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