



The Poultry Informed Professional

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National Antimicrobial Resistance Monitoring System: Human Enteric Bacteria Isolates 1998 Annual Report

Reprinted from the CDC 1998 NARMS Report

Summary

In 1998, there were 147 *Salmonella* Isolates, 315 *E. coli* O157: H7 isolates, and 382 *Campylobacter* isolates from humans submitted to the National Antimicrobial Resistance Monitoring System: Enteric Bacteria (NARMS). Twenty-seven percent of *Salmonella* isolates were resistant to one or more antimicrobial agents. Thirty-two percent of *Salmonella typhimurium* isolates had the multi-drug resistant pattern characteristics of DT104. One *Salmonella* isolate was resistant to ciprofloxacin.

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URGENT REQUEST

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Broiler Performance Data (Region) Live Production Cost					
	SW	Midwest	Southeast	Mid-Atlantic	S-Central
Feed cost/ton w/o color (\$)	118.07	109.26	127.03	128.75	123.50
Feed cost/lb meat (¢)	11.19	10.81	12.32	12.79	11.71
Days to 4.6 lbs	45	46	45	46	45
Med. cost/ton (¢)	2.76	1.59	2.82	3.02	2.73
Chick cost/lb (¢)	4.07	3.75	3.82	3.64	3.75
Vac-Med cost/lb (¢)	0.05	0.03	0.10	0.09	0.08
WB & 1/2 parts condemn. cost/lb	0.23	0.30	0.30	0.25	0.32
% mortality	3.81	5.15	4.77	4.36	4.73
Sq. Ft. @ placement	0.80	0.76	0.80	0.79	0.84
Lbs./Sq. Ft.	5.77	7.40	6.49	6.90	4.46
Down time (days)	18	16	15	16	17

Data for week ending 11/20/99

National Antimicrobial Resistance Monitoring System:

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The percentage of *Salmonella* isolates with ciprofloxacin minimum inhibitory concentrations (MICs) >0.25 increased from 0.4% in 1996 to 0.7% in 1998. Among *E. coli* 0157:H7 isolates, 7.3% were resistant to one or more antimicrobial agents. Among *Campylobacter* isolates, 55.0% were resistant to one or more antimicrobial agents; 13.3% were resistant to ciprofloxacin.

Methods

NARMS was launched in 1996, within the framework of CDC's Emerging Infections Program's Epidemiology and Laboratory Capacity Program and the Foodborne Disease Active Surveillance Network (FoodNet) as a collaboration between CDC, Food and Drug Administration-Center for Veterinary Medicine (FDA), United States Department of Agriculture-Food Safety and Inspection Service and Agricultural Research Service (USDA), and 14 state and local health departments to prospectively monitor the antimicrobial resistance of human non-typhoid *Salmonella* and *Escherichia coli* 0157:H7 isolates. In 1998, there were 16 NARMS health department partners (CA, CO, CT, FL, GA, KS, Los Angeles County, MD, MN, MA, NJ, New York City, New York State, OR, WA, and WV), representing approximately 97 million persons (37% of the United States population). In 1998, seven states (CA, CT, GA, MD, MN, NY and OR) also monitored antimicrobial resistance among human *Campylobacter* isolates (Table 1, Figure 1).

NARMS participating public health laboratories select every tenth *Salmonella* and every fifth *E. coli* 0157:H7 isolate received at their laboratory, and forward the isolates to the CDC for susceptibility testing. At CDC, a semi-automated system (Sensititre, Trek Diagnostics, Westlake, OH) is used to determine the MICs for 17 antimicrobial agents: amikacin, ampicillin, amoxicillin-clavulanic acid, apramycin, ceftiofur, ceftriaxone, cephalothin, chloramphenicol, ciprofloxacin, gentamicin, kanamycin, nalidixic acid, streptomycin, sulfamethoxazole, tetracycline, trimethoprim-sulfamethoxazole, and ticarcillin.

Public health laboratories from seven states also select and forward the first *Campylobacter* isolate received each week to CDC for susceptibility testing. For *Campylobacter*, the E-test system (AB BIODISK, Solna, Sweden) is used to determine the MICs for 8 antimicrobial agents: azithromycin, chloramphenicol, ciprofloxacin, clindamycin, erythromycin, gentamicin, nalidixic acid, and tetracycline. After confirmation to genus level, identification of *Campylobacter* to species level is performed using field motility, oxidase test, and hippurate test, and for hippurate-negative *Campylobacter* isolates, polymerase chain reaction.

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**Broiler Performance Data (Company)
Live Production Cost**

	Average Co.	Top 25%	Top 5 Cos.
Feed cost/ton w/o color (\$)	123.92	117.16	111.01
Feed cost/lb meat (¢)	11.92	11.19	10.65
Days to 4.6 lbs	45	46	45
Med. cost/ton (¢)	2.75	1.97	1.46
Chick cost/lb (¢)	3.87	3.67	3.19
Vac-Med cost/lb (¢)	0.07	0.03	0.04
WB & 1/2 parts condemn. cost/lb	0.28	0.19	0.21
% mortality	4.49	3.98	4.28
Sq. Ft. @ placement	0.80	0.79	0.78
Lbs./Sq. Ft.	6.41	6.42	6.96
Down time (days)	16	17	16

Data for week ending 11/20/99

Broiler Whole Bird Condemnation (Region)

	SW	Mid-West	S. East	Mid-Atlantic	S. Central
% Septox	0.341	0.478	0.283	0.364	0.289
% Airsac	0.092	0.123	0.297	0.123	0.354
% I.P.	0.073	0.188	0.255	0.111	0.213
% Leukosis	0.006	0.005	0.010	0.017	0.004
% Bruise	0.010	0.008	0.026	0.015	0.019
% Other	0.014	0.007	0.023	0.015	0.024
% Total	0.587	0.809	0.893	0.644	0.903
% 1/2 parts condemnations	0.382	0.411	0.309	0.350	0.367

Data for week ending 11/20/99

National Antimicrobial Resistance Monitoring System:

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For all three pathogens in report, MIC results are dichotomized, and isolates with intermediate susceptibility are categorized as sensitive. Breakpoints are determined using, when available, National Committee for Clinical Laboratory Standards (NCCLS). In 1998, a validation of MIC results obtained by the CDC Sensititre system and the USDA Sensititre system was performed by both laboratories. Twelve samples from each laboratory were tested in both laboratories for MICs to all 17 antimicrobial agents, results from both system were analyzed for consistency.

NOTICE: FDA's Center for Veterinary Medicine (CVM) will hold a series of public meetings to discuss issues related to antimicrobial resistance in food-producing animals, December 9-10, 1999 and February 22-23, 2000. For information, contact Lynda W. Cowatch, FDA/CVM (HFV-150), 7500 Standish Place, Rockville, MD 20855, 301-827-5281.

Population Size and number of isolates received, by site

Site	POP. Size		Salmonella		E. coli		Campylobacter	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
California (1)	2,146,096	(2.2)	49	(3.3)	6	(1.9)	48	(12.5)
Colorado	3,970,971	(4.1)	72	(4.9)	23	(7.3)		
Connecticut	3,274,069	(3.4)	60	(4.1)	13	(4.1)	51	(13.4)
Florida	14,915,980	(15.4)	66	(4.5)	9	(2.9)		
Georgia	7,642,207	(7.9)	172	(11.7)	48	(15.2)	110	(28.8)
Kansas	2,629,067	(2.7)	31	(2.1)	3	(1.0)		
Los Angeles (2)	9,213,533	(9.5)	135	(9.1)	5	(1.6)		
Massachusetts	6,147,132	(6.3)	150	(10.2)	35	(11.1)		
Maryland	5,134,808	(5.3)	54	(3.7)	7	(2.2)	27	(7.1)
Minnesota	4,725,419	(4.9)	71	(4.8)	56	(17.8)	59	(15.4)
New Jersey	8,115,011	(8.4)	156	(10.6)	21	(6.7)		
New York City (3)	7,420,166	(7.7)	183	(12.4)	3	(1.0)		
New York State (Excluding NYC)	10,755,135	(11.1)	147	(10.0)	33	(10.5)	36	(9.4)
Oregon	3,281,974	(3.4)	37	(2.5)	22	(7.0)	51	(13.4)
Washington	5,689,263	(5.9)	67	(4.5)	25	(7.9)		
West Virginia	1,811,156	(1.8)	26	(1.8)	6	(1.9)		
Totals	96,871,987*	(100.0)	1476	(100.0)	315	(100.0)	382	(100.0)

* 1997 post census estimate

(1) San Francisco and Alameda Counties

(2) Los Angeles County

(3) Five boroughs of New York City (Bronx, Brooklyn, New York, Queens, Richmond)

Antibiotic Susceptibility of *Salmonella* isolates

N = 1466

Antibiotic	Number resistant		Antibiotic	Number resistant	
	N	%		N	%
Amikacin	0	0	Ciprofloxacin	1	0.07
Amox/Clav acid	24	1.6	Gentamicin	42	2.9
Ampicilin	241	16.4	Kanamycin	84	5.7
Apramycin	1	0.07	Nalidixic acid	20	1.4
Ceftiofur	14	1.0	Streptomycin	273	18.6
Ceftriaxone	10	0.7	Sulfamethoxazole	283	19.3
Cephalothin	33	2.3	Tetracycline	295	20.1
Chloramphenicol	145	9.9	Trimeth/Sulfa	34	2.3

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**Frequency of *Salmonella* Serotypes/
Frequency of multiresistance among serotypes**

Serotype	Total		Number resistant to ≥ 1 antimicrobial		Number resistant to ≥ 2 antimicrobials	
	No.	(%)	No.	(%)	No.	(%)
Typhimurium	380	25.9	200	52.6	194	51.0
Enteritidis	245	16.7	30	12.2	22	8.9
Heidelberg	103	7.0	44	42.7	39	37.8
Newport	79	5.4	4	5.1	2	2.5
Javiana	54	3.7	2	3.7	2	3.7
Agona	39	2.7	16	41.0	12	30.8
Montevideo	33	20.	3	9.0	2	6.1
Muenchen	30	2.0	3	10.0	2	6.7
Hadar	26	1.8	26	100	25	96.0
Thompson	24	1.6	0	0	0	0
Braenderup	23	1.6	0	0	0	0
Infantis	22	1.5	2	9.0	1	4.5
Other serotypes	408	27.8	67	16.4	45	11.0
Total	1466	100	397	27.1	346	23.6

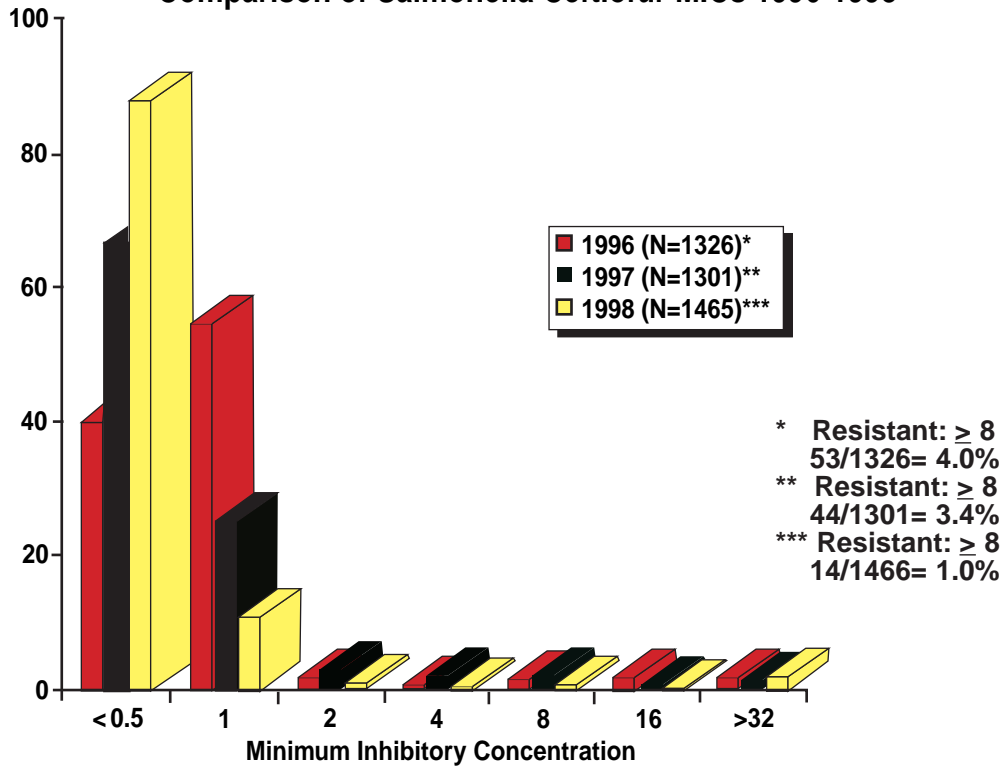
**Serotypes of *Salmonella* with reduced susceptibility
or resistant to ciprofloxacin 1996-1998
(N = 21)**

Serotype	Frequency	(%)
Enteritidis	7	33.3
Typhimurium	3	14.3
Berta	2	9.5
Virchow	2	9.5
Emek	1	4.8
Hadar	1	4.8
Heidelberg	1	4.8
Paratyphi A	1	4.8
Reading	1	4.8
Schwarzengrund	1	4.8
St. Paul	1	4.8

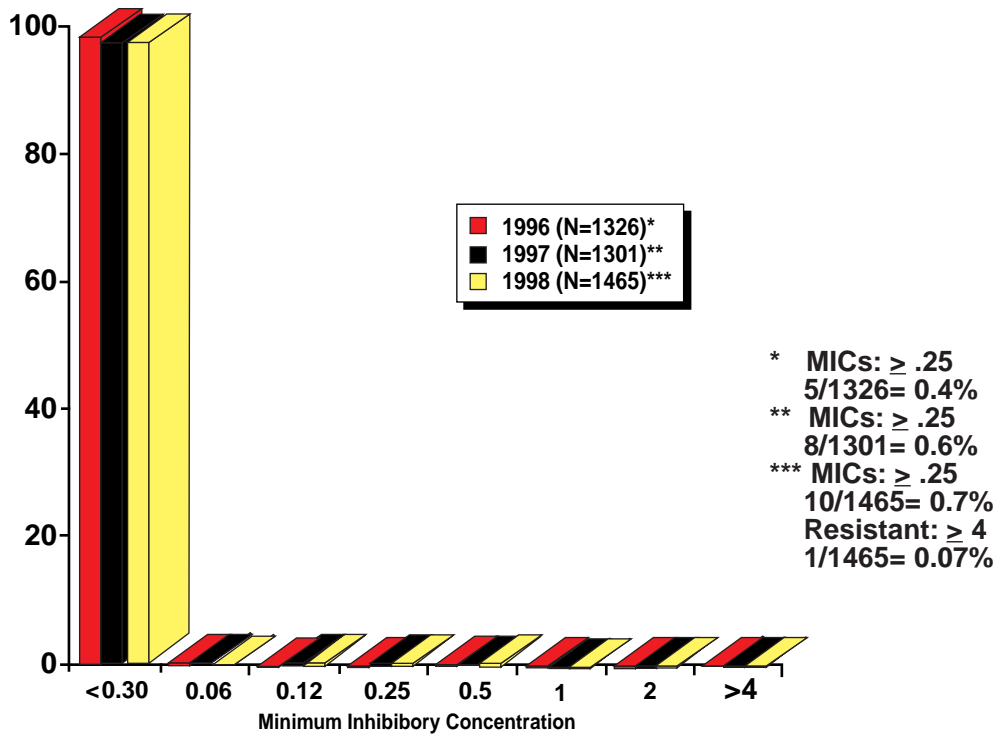
**Antimicrobial susceptibility of *Campylobacter* isolates
All *Campylobacter* isolates (N = 346)**

Antimicrobial Agent	Susc.(%)	Inter. (%)	Resist. (%)
Azithromycin	1.5	96.5	2.0
Chloramphenicol	91.0	7.5	1.5
Ciprofloxacin	85.8	0.6	13.6
Clindamycin	87.8	10.4	1.7
Erythromycin	32.6	64.2	3.2
Gentamicin	99.7	0.3	0
Nalidixic acid	82.0	0.9	17.1
Tetracycline	57.2	0.6	42.0

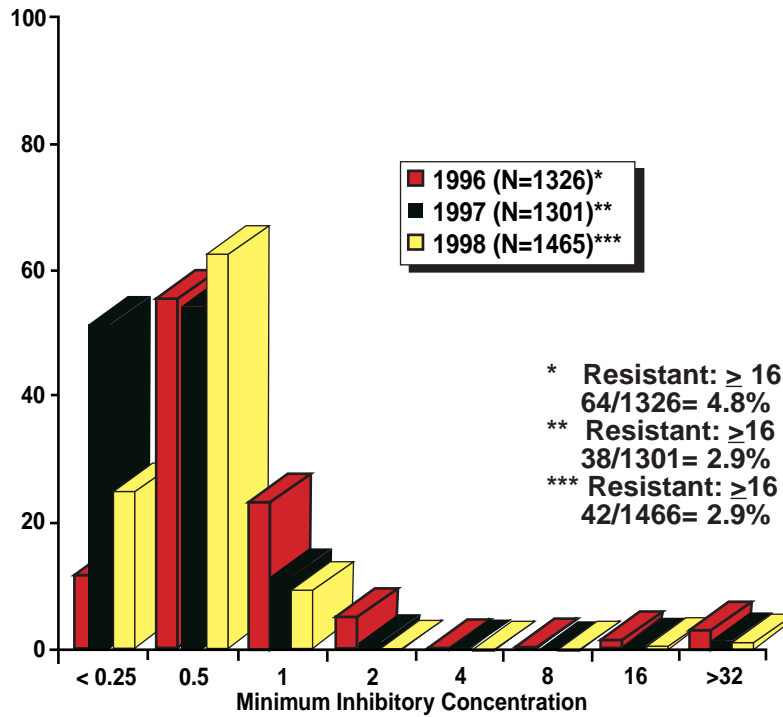
Comparison of Salmonella Ceftiofur MICs 1996-1998



Comparison of Salmonella Ciprofloxacin MICs 1996-1998

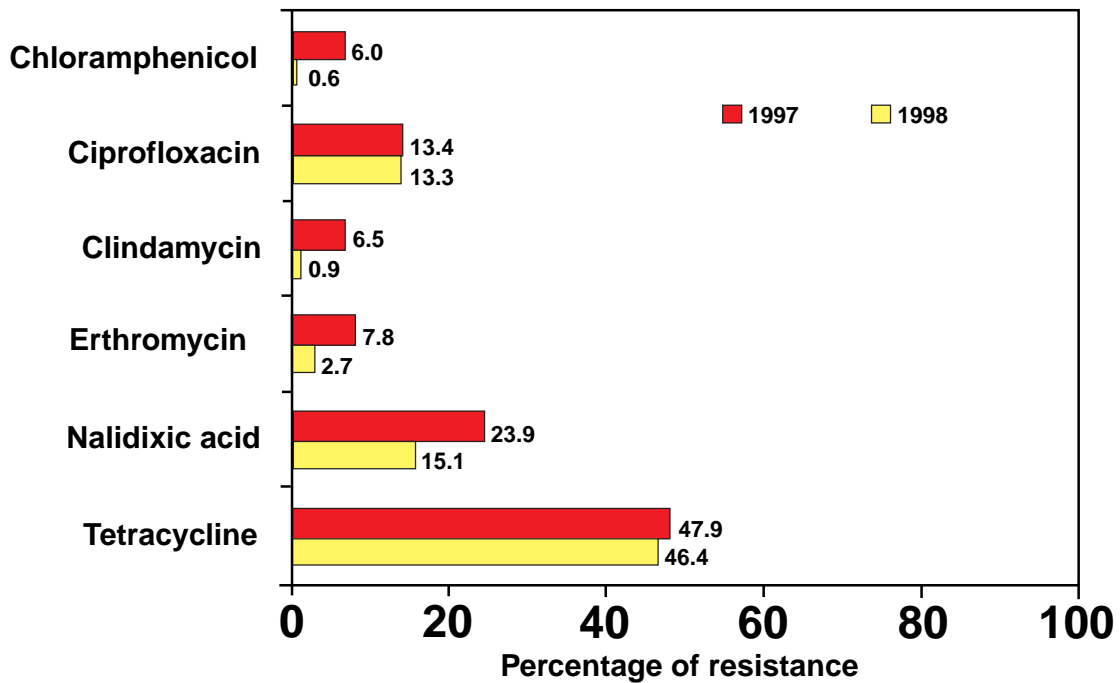


Comparison of Salmonella Gentamicin MICs 1996-1998



Resistance among *Campylobacter jejuni* isolates for all sites* 1997-1998

Antimicrobial agent



* agents tested in both years

Summary of Meeting Reports at the 34th Annual National Meeting on Poultry Health and Processing

VERTICAL TRANSMISSION WITH CAMPYLOBACTER IN CHICKENS HAS BEEN PROVEN according to Dr. Cox's research, USDA, ARS, Russell Research Center at Athens, GA., presented at the 34th National Meeting on Poultry Health and Processing on October 20-22. The transmission of *Campylobacter jejuni* from the hen to offspring through the egg has been dismissed because of the difficulty to be cultured from either newly hatched chicks or from hatchery samples. Dr. Cox's research demonstrated that isolates from fresh fecal droppings of a broiler breeder flock and from its progeny, a 6-week-old commercial broiler flock reared approximately 20 miles apart, were of clonal origin. This was shown by means of DNA sequencing. This finding provides strong evidence that *Campylobacter* is transmitted vertically.

Dr. Miguel Ruano
Master of Avian Medicine, Candidate

Excerpts from the latest USDA National Agricultural Statistics Service (NASS) "Broiler Hatchery," "Chicken and Eggs" and "Turkey Hatchery" Reports and Research Service (ERS) "Livestock, Dairy and Poultry Situation and Outlook" Reports

Broiler Eggs Set In 15 Selected States Down 2 Percent

According to the most recent National Agricultural Statistics Service (NASS) reports, commercial hatcheries in the 15-State weekly program set in incubators 177 million eggs during the week ending November 20, 1999. This was down 2 percent from the eggs set the corresponding week a year earlier. Average hatchability for chicks hatched during the week was 82 percent.

Broiler Chicks Placed Down Slightly

Broiler growers in the 15-State weekly program placed 135 million chicks for meat production during the week ending November 20, 1999. Placements were down slightly from the comparable week in 1998. Cumulative placements from January 3, 1999, through November 20, 1999, were 6.55 billion, up 3 percent from the same period a year earlier.

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Broiler Whole Bird Condemnation (Company)

	Average Co.	Top 25%	Top 5 Co.'s
% Septox	0.352	0.305	0.430
% Airsac	0.193	0.060	0.085
% I.P.	0.146	0.070	0.041
% Leukosis	0.011	0.004	0.008
% Bruise	0.017	0.012	0.010
% Other	0.018	0.008	0.009
% Total	0.736	0.460	0.581
% 1/2 parts condemnations	0.371	0.314	0.275

Data for week ending 11/20/99



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October Egg Production Up 5 Percent

U.S. egg production totaled 7.13 billion during October 1999, up 5 percent from the 6.79 billion produced in 1998. Production included 6.03 billion table eggs and 1.09 billion hatching eggs, of which 1.03 billion were broiler-type and 6.03 million were egg-type. The total number of layers during October 1999 averaged 327 million, up 3 percent from the total average number of layers during October 1998. October egg production per 100 layers was 2,192 eggs, up 2 percent from 2,157 eggs in October 1998.

All layers in the U.S. on November 1, 1999, totaled 327 million, up 3 percent from a year ago. The 327 million layers consisted of 268 million layers producing table or commercial type eggs, 55.7 million layers producing broiler-type hatching eggs, and 2.64 million layers producing egg-type hatching eggs. Rate of lay per day on November 1, 1999, averaged 70.4 eggs per 100 layers, up 1 percent from the 69.6 a year ago.

Laying flocks in the 30 major egg producing states produced 6.69 billion eggs during October, up 4 percent from October 1998. The average number of layers during October, at 306 million was up 3 percent from a year earlier.

Egg-Type Chicks Hatched Up 11 Percent

Egg-type chicks hatched during October totaled 38.6 million, up 11 percent from October 1998. Eggs in incubators totaled 31.1 million on November 1, 1999, up 2 percent from a year ago.

Domestic placements of egg-type pullet chicks for future hatchery supply flocks by leading breeders totaled 254,000 during October 1999, down 29 percent from October 1998.

Broiler Hatch Up 1 Percent

The October 1999 hatch of broiler-type chicks, at 698 million, was up 1 percent from October of the previous year. There were 574 million eggs in incubators on November 1, 1999, up 1 percent from a year earlier.

Leading breeders placed 7.12 million broiler-breeder-type chicks for future domestic hatchery supply flocks during October 1999, up 3 percent from October 1998.

Turkey Eggs in Incubators on November 1 Up 5 Percent From Last Year

Turkey eggs in incubators on November 1, 1999, in the United States totaled 28.9 million, up 1 percent from November 1 a year ago. Eggs in incubators were up 2 percent from the October 1 total of 28.3 million. Regional changes from the previous year were: East North Central, down 4 percent; West North Central, up 16 percent; North and South Atlantic, up 3 percent; South Central, up 2 percent; and West, down 6 percent.

Poults Placed During October Down 2 Percent

The 22.3 million poults placed during October 1999 in the United States were down 2 percent from the number placed during the same month a year ago. Placements were up 2 percent from the September total of 21.8 million. Regional changes from the previous year were: East North Central, down 9 percent; West North Central, up 7 percent; North and South Atlantic, down 7 percent; South Central, up 3 percent; and West, down 10 percent.

Poultry Production Stays Strong

Poultry producers are having a relatively good year in 1999. Broiler and egg operations will not be quite as profitable as in 1998, but producers are still in a favorable enough position to continue expanding production in 2000. Weaker than expected third-quarter 1999 broiler and egg prices and slightly increased production costs due to stronger prices for some feed ingredients should help temper expansion plans. Broiler and egg production is expected to increase more slowly in 2000 than it has in 1999.

Turkey producers are having the most profitable year since 1986. Production decreased in 1998 due to negative profits during 1996 and 1997. The production decline allowed stocks of turkey meat to be drawn down leading to higher wholesale turkey prices in 1999. With annual feed costs nearly 20 percent below a year ago, higher prices have generated attractive profits. The increased profits have encouraged turkey producers to expand production. Production is expected to be about unchanged from a year ago in 1999 as increased production in the second half of the year offsets lower production in the first half of the year. However output should increase by about 2 percent in 2000.

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Broiler Consumption Increasing Rapidly

Broiler use in 1999 is expected to increase by about 5 pounds per person from 1998 on a retail weight basis. This would be the largest annual increase since consumption rose more than 5 pounds between 1943 and 1944. The large increase during WWII was influenced by the fact that chicken was not a rationed commodity, while most other meats were being rationed so supplies could be diverted from the domestic market for military use. This year's large increase and an expected large increase for 2000 are being driven by two factors. Record profitability during 1998 encouraged stronger than usual production increases. Also, since 1993 much of the production increase has been absorbed by the export market. However economic weakness in Russia since 1998 and continued weakness in many Asian countries has limited expected exports in 1999 and 2000, keeping them nearly the same as in 1997 and 1998. Thus, much of what would have been exported is being consumed domestically. Retail prices for broilers are expected to average above a year ago even with this substantial increase in consumption, indicating strong demand for broilers.

Pullet hatch, for potential placement in the hatchery supply flock, was 6 percent lower than a year ago in September but has been 8 percent larger for the period 7-15 months earlier, which is the approximate time when the birds that are in the hatchery supply flock now would have been hatched. The broiler-type hatching egg production flock was 3 percent larger than a year ago on September 1. This indicates that the potential is available for production increases in 2000 even though egg sets have been reported below a year ago for most of October and the first 2 weeks of November in the 15-state NASS survey of hatcheries. However, weekly slaughter of heavy hens from the broiler hatchery supply flock has been above a year ago by 12-33 percent since August 1, indicating some efforts to keep production increases under control.

Whole broiler prices have shown less weakness than parts prices as these larger supplies of chicken are being sold on the domestic market. Compared with a year ago, parts prices have declined about an additional 10 percentage points more than whole bird prices. This has been due to the increasing segmentation of the chicken market. Lighter weight birds make up the whole bird quote while primarily heavier weight birds are cut up for the wholesale parts market. The changing supplies of these classes of birds have affected the price changes.

Since 1993 market segmentation has been important for chicken parts markets since much of the dark meat of the chicken has been exported while nearly all of the white meat has been marketed domestically. The increasing popularity of deboned breast meat in the domestic market led companies to further segment the market through bird weights in order to limit labor costs per pound of product on their processing lines. Companies started growing heavier birds for deboning since the amount of labor to process a small breast was nearly the same as for a large breast and the labor cost per pound was less for the larger breast.

The Agricultural Marketing Service began publishing shares of broiler slaughter by three weight categories in 1997. They classify the lightest birds as targeted to be cut-up and used in fast food restaurants as bone-in parts or sold whole for rotisserie preparation, the middle category as targeted for the retail market, and the heaviest birds for deboning. During January-October 1999 the share of birds in the heaviest weight category has been about 40 percent, compared to 30 percent a year earlier. The share of the two lighter categories has been about 5 percentage points less than last year at about 30 percent of production each. The relatively tighter market for light birds and the relatively larger supply of heavy birds have led to the difference in price declines for whole birds versus parts on the wholesale market.

Whole bird prices are expected average about 58 cents per pound in 1999, about 5 cents below a year ago. Prices for 2000 are expected to decrease an additional 2 cents to 56 cents per pound. Lower red meat supplies in 2000 should lessen the price impact of increased broiler production.

Egg Consumption Increasing

Total egg consumption per person has been increasing since 1995, from about 236 eggs to an expected 255 eggs in 1999. For many years consumption of eggs in processed form has been increasing while shell egg consumption decreased. From 1995 to 1997 declines in shell egg consumption were small enough that increases in processed egg consumption brought an increase in total egg consumption. In 1998 shell egg consumption increased and another increase is expected in 1999. Lower egg prices are probably a major factor in increased use. Changes in consumer attitudes toward the effects of cholesterol in eggs and increased promotion activities are also being credited with reversing the consumption decline.

Table egg production is expected to increase more than 3 percent in 1999 and to bring wholesale large egg prices down 8-9 cents per dozen. Egg production is expected to continue increasing but at a slightly slower rate in 2000. Increasing production is expected to continue pressuring egg prices with wholesale prices forecast about 4 cents lower in 2000.

Turkey Consumption Stable

Turkey supplies for the fall holidays should be about the same as last year with nearly 6 pounds per capita expected to be used in the fourth quarter. Despite virtually unchanged production, lower exports in 1999 allowed domestic supplies to increase nearly enough to offset the increase in population and allow nearly the same level of consumption as last year.

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Retail turkey prices are expected to be about 1 cent per pound higher than a year ago during the fourth quarter. Retailers will absorb much of the increase in wholesale prices for turkeys, which were nearly 9 cents per pound above a year ago in early November for Eastern Region hens.

A return to profitability in July 1998 and continued profitability for turkey producers in 1999 should encourage the strongest turkey production increase since 1996 next year. Turkey production is expected to increase about 2 percent in 2000. The number of turkeys raised is expected to be nearly unchanged from 1999 while heavier weights will provide the additional meat production.

Poultry Exports Dominated by Asia and Russia

U.S. poultry exports in 2000 are expected to be dominated by offsetting import demands in their two largest markets. Overall Russian poultry imports in 2000 are expected to remain relatively weak, although shipping patterns may change dramatically if new regulations barring transshipment through ports in Latvia and Estonia are put into place. Strong export growth to the Hong Kong/China and other Asian markets has been a major reason why 1999 exports have not declined as much as earlier estimated. Increases in import demand in Hong Kong/China and other Asian countries stem from generally improving economic conditions. Larger exports to Asia in 2000 are expected to offset the overall weakness in Russian demand. While exports to Asia are expected to rise, the rate of increase is expected to be lower than in 1999. Little increase in overall export demand, strong competition from foreign poultry producers, and large supplies of pork are expected to again put downward pressure on poultry prices in the domestic and world markets in 2000.

Broiler exports for 2000 are expected to total 4.68 billion pounds, up slightly over 1 percent from the previous year. The outlook is for little or no growth in exports to the Russian market, although direct shipments to Russia are expected to grow at the expense of exports that had been moving through Baltic countries. Broiler shipments are expected to rise to a number of Asian markets, but the rate of growth is expected to be less than the large increases seen in 1999.

Even with the events that have buffeted economies around the world over the last several years, U.S. broiler exports have remained relatively stable in terms of volume. The export totals for 1997 and 1998 and the forecast totals for 1999 and 2000 are all between 4.6 and 4.7 billion pounds. In the first 8 months of 1999 broiler shipments totaled 3.02 billion pounds, down 12 percent from the previous year. This gap is expected to narrow over the last third of 1999 as demand remains strong in most Asian countries and exports to Russia (in this case Russia plus Estonia and Latvia) are expected to be above those in the fall of 1998, when the ruble's devaluation caused shipments to Russia to drop dramatically. The total value of exports in 1999 is expected to decline again as weak demand in Russia, rising world poultry production, and competition from large pork supplies have depressed prices.

Turkey exports in 2000 are forecast to be approximately 390 million pounds, up from 1999, but well below the record of over 600 million pounds in 1997. Higher growth in exports to several Asian countries such as Taiwan, Korea, and Japan are expected to offset lower shipments to places such as Mexico and Hong Kong. Also in 2000 there is not expected to be any large drop in exports to Russia and Poland, as shipments to these countries fell so sharply in 1999. Again a chief determinant of exports will be the demand from the Mexican processed product sector, as a large percentage of U.S. turkey exports to Mexico are used with other meats in the sausage market. Mexico is the largest market for U.S. turkey products, and changes in its economy have a large influence on overall U.S. export levels.

Total egg shipments (shell eggs and the shell egg equivalent of egg products) in 2000 are expected to total 170 million dozen, up 8 percent from 1999. Exports are expected to rebound in 2000 following the steep declines in 1999 that resulted chiefly from lower exports of shell eggs to Hong Kong and egg products to Mexico. Exports of hatching eggs may continue to expand, especially to markets in Central America.

Through the first 8 months of 1999, egg shipments totaled 102 million dozen, down more than 30 percent from a year earlier. Decreases in Mexico and Hong Kong were the most dramatic with exports to these markets falling 72 and 29 percent, respectively. Higher egg production in both Mexico and China have depressed prices and lessened the demand for imported eggs and egg products.

In 2000 exports of other chicken are expected to total 415 million pounds, a small increase from 1999. Larger shipments to Hong Kong/China, Japan, and other Asian markets are expected to more than offset weak exports to Canada. Exports to Russia and Poland are also expected to show some growth, although these increases will be in relation to very small shipments in 1999.

Through August, U.S. exports of other chicken totaled 270 million pounds, down 4 percent from the previous year. The export market has been divided between countries recording rapid growth and countries showing sharp declines. Shipments to Hong Kong, Japan, Taiwan, and Korea have all recorded steep increases. On the other hand, exports to Canada have fallen considerably and exports to Russia and Poland are both down more than 95 percent. The devaluation of the ruble has affected all poultry shipments to Russia, but turkey and other chicken, which were chiefly used in processed products and sausages, have been affected the most.

Meetings, Seminars and Conventions

1999 December

Dec. 9-10: Risk Assessment Wkshp., DoubleTree Hotel, Rockville, Md. Contact: U.S. Food & Drug Administration, Centr for Vererinary Medicine, Office of Management and Communications, HFV-12, 7500 Standish Place, Rockville, Md. 20855. Ph: 301-594-1755.

2000 January

Jan. 6-8: National Turkey Federation Annual Convention, Hilton Walt Disney World Hotel, Orlando, FL. Contact NTF at (202) 898-0100

Jan. 16-21: Feed Tour 2000 — Watt USA Feed Tour 2000, visiting top feed mills in southeastern states plus IPE 2000 in Atlanta, Georgia USA. Contact: CindyDitzler, Feed Tour 2000, 122 SouthWesley Ave., Mt. Morris, IL 61054-1497, USA, Fax: +1 815-734-4201; e-mail: wattfeedtour@hotmail.com; website: www.wattnet.com

Jan. 17-18: Southern Poultry Science Society Annual Meeting, Atlanta, Georgia, Contact: Dr. Gene Pesti, Department of Poultry Science, Livestock and Poultry Building, University of Georgia, Athens, GA 30602 USA, Phone: +1 706-542-1321; Fax: +1 706-542-1827.

Jan. 19-21: 2000 International Poultry Exposition, Georgia World Congress Centre, Atlanta, Georgia, USA. Contact: US Poultry & Egg Association, 1530 Cooledge Road, Tucker, Georgia 30084, USA. Fax: +1 770 493-9257

2000 February

Feb. 14-18: Pepa Annual Conv., Paradise Point Resort, San Diego, Calif. Contact: Pacific Egg & Poultry Association, 1521 I St. Sacramento, Calif. 95814. Phone: 916-441-0801.

Feb. 16-17: NGFA Conv. & Industry Show, Holiday Inn Kearney, Neb. Contact: Nebraska Grain & Feed Assn., 1233 Lincoln Mall, Suite 200, Lincoln, Neb. 68508-3911. Phone: 402-476-6174.

Feb. 22-23: Antimicrobial Resistance Wkshp., DoubleTree Hotel, Rockville, Md. Contact: U.S. Food & Drug Administration, Center for Veterinary Medicine, Office of Management and Communications, HFV-12, 7500 Standish Place, Rockville, Md. 20855. Phone: 301-594-1755.

Feb. 24-25: VSFA Annual Mtng., The Homestead, Hot Springs, Va. Contact: Virginia State Feed Assn., 3437 Grandview Drive, Richmond, Va. 23225-1201. Phone: 804-272-5333.

2000 March

March 5-7: 49th Western Poultry Disease Conference. Capitol Plaza Holiday Inn, Sacramento, CA. Contact: Lina Layiktez at 530-757-3331; e-mail: events@ucdavis.edu. Web site: conferences.ucdavis.edu

March 9-11: 49th - Afia* Argo De Las Americans. Expo Guadalajara, Jalisco, Mexico. Contact: Denuse C. Selesnick, Agro Food Internatioal Associates c/o International Trade Information Inc., 23241 Ventura Blvd. Suite 308, Woodland Hills, Calif. 91364-1003. Phone: 818-591-2255.

March 14-15: Feed Mill Management Seminar, Nashville, Tenn. Contact: U.S. Poultry & Egg Association, 1530 Cooledge Road, Tucker, Ga. 30094. Phone: 770-493-9401.

March 15-16: 29th Annual Midwest Poultry Federation Convention, RiverCentre, St. Paul, MN. Contact: Laura Ginsburg at 651-646-4553; Fax: 651-646-4554.

March 22-23: New England Poultry Health Conference, Sheraton Hotel, Portsmouth, NY; William Bell, William Bell Assoc., Inc., P.O. Box 725, Augusta, Maine 04330

March 22-23: WPSA (UK Branch), Poultry Science Spring Meeting, Scarborough, UK. Contact: Dr. Paul Rose, Harper Adams University College, Newport, Shropshire TF10 8NB, UK. Fax: +4 (0) 1952 815217

March 29-30: Nebraska Poultry Industries Annual Convention, New World Inn, Highway 30 and 81 South, Columbus, NE. Contact: Nebraska Poultry Industries, Inc., A103 Animal

Sciences, University of Nebraska, P.O. Box 830908, Lincoln, NE 63583-0908. Phone: 403-472-2051.

2000 April

April 5-7: Food Irradiation 2000, "A food safety process for the new millennium", will be held at the Sheraton National Hotel in Arlington, Virginia (Washington DC). Contact: Deborah Crommett, Conference Co-ordinator, Intertech Conferences, 411 US Route One, Portland, Maine 04105 USA, Fax + (207) 781-2150

April 18-21: VIV China, International Trade Fair for Intensive Animal Production and Processing. Contact: Mr. Richard de Boer, Product Manager VIV Royal Dutch Jaarbeurs, PO Box 8500, 3503 RM Utecht, The Netherlands, Fax: +31 30 295 5709.

2000 May

May4-5: National Breeders Roundtable, St. Louis, Mo. Contact: U.S. Poultry & Egg Assoc., 1530 Cooledge Road, Tucker, GA 30094. Phone: 770-493-9401.

2000 June

June 1-3: AP&EA Convention, Birmingham, AL. Contact: Alabama Poultry & Egg Association, P.O. Box 240, Montgomery, AL 36101-0240. Phone: 334-265-2732

June 9-10: Ark. Poultry Festival, Arlington Hotel, Hot Springs, Ark. Contact: Judy Kimbrell, Poultry Federation, P.O. Box 1446, Little Rock, Ark. 72203. Phone: 501-375-8131

2000 July

July 6-14: XXth Gala International Symposium/Workshop on Rapid Methods and Automation in Microbiology. Manhattan, Kansas, Contact: Daniel Y.O. Fung, Kansas State University, Manhattan, KS 66506-1600. Phone: 785-532-5654; Fax: 785-532-5681; dfung@oz.oznet.ksu.edu; <http://www.dec.ksu.edu/dec/con/microbiology>