



United States  
Department of  
Agriculture

Animal and  
Plant Health  
Inspection  
Service

Veterinary  
Services

National  
Animal Health  
Monitoring  
System

December 2005



# Poultry '04

## Part IV: Reference of Health and Management of Backyard/Small Production Flocks and Gamefowl Breeder Flocks in the United States, 2004



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#N440.1205

Cover photos: large photo and top small photo courtesy of UGBA. Other three photos courtesy of Judy Rodriguez.

## Acknowledgments

The Poultry '04 study was a cooperative effort among animal health officials, university researchers, extension personnel, and poultry producers. We want to thank the industry members who helped determine the direction and objectives of this study.

We would also like to thank the State and Federal veterinary medical officers (VMOs) and animal health technicians (AHTs). Their hard work and dedication to the National Animal Health Monitoring System (NAHMS) are invaluable. The efforts of the flock owners, Area Veterinarian in Charge (AVIC), NAHMS Coordinator, VMO, AHT, and National Agricultural Statistic Service statisticians were critical in providing quality data for Poultry '04 reports. Thanks also to the United Gamefowl Breeders Association for collaborating in the study's development and implementation and to the personnel at the Centers for Epidemiology and Animal Health for their efforts in generating reports from Poultry '04 data. Recognition also goes to our reviewers, whose comments provided valuable expertise and guidance.

All participants are to be commended, particularly the backyard flock owners and gamefowl owners whose voluntary efforts made the Poultry '04 study possible.

Thomas E. Walton

A handwritten signature in black ink, appearing to read 'T. Walton', with a stylized flourish at the end.

Director  
Centers for Epidemiology and Animal Health

**Suggested bibliographic citation for this report:**

Part IV: Reference of Health and Management of Backyard/Small Production Flocks and Gamefowl Breeder Flocks in the United States, 2004

USDA:APHIS:VS,CEAH, National Animal Health Monitoring System, Fort Collins, CO #N440.1205

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## Introduction

The National Animal Health Monitoring System (NAHMS) is a nonregulatory division of the United States Department of Agriculture (USDA) designed to help meet the Nation's animal-health information needs.

Layers '99 was NAHMS' first national study on poultry baseline health and management. Layers '99 estimated the prevalence and associated risk factors of *Salmonella enterica* enteritidis in U.S. layer flocks.

Poultry '04 is NAHMS' second study of the U.S. poultry industry. For Poultry '04, NAHMS conducted a thorough assessment to determine the information needs of the poultry industry, researchers, and Federal and State governments. This assessment indicated a need for information regarding bird health, bird movement, and biosecurity practices of nontraditional poultry industries, such as backyard flocks, gamefowl, and live-poultry markets.

Part I: Reference of Health and Management of Backyard/Small Production Flocks in the United States, 2004 is the first in a series of reports containing national information from the Poultry '04 study. Data for Part I were collected via a questionnaire administered to owners of backyard flocks located within 1 mile of a sample of commercial poultry operations in 18 major poultry producing States (see map p.3).

Part II: Reference of Health and Management of Gamefowl Breeder Flocks in the United States, 2004 is the second report from the Poultry '04 study. A questionnaire was mailed to members of United Gamefowl Breeder Association (UGBA) State affiliates and to members of State associations not affiliated with UGBA. Gamefowl breeders from 34 States (see map p.3) responded to the survey.

Part III: Reference of Management Practices in Live Poultry Markets in the United States, 2004 focuses on bird movement, and cleaning and disinfection practices at live-poultry markets in California, Florida, New England, New Jersey, New York, Pennsylvania, and Texas.

**Part IV: Reference of Health and Management of Backyard/Small Production Flocks and Gamefowl Breeder Flocks in the United States, 2004** compares information collected from backyard flock producers and gamefowl breeders reported in respective parts I and II of the Poultry '04 study. This report is provided to facilitate comparison of selected observations from the two studies.

The methods used and the number of respondents in the study can be found at the end of this report.

Further information on NAHMS studies and reports is available online at: [www.aphis.usda.gov/vs/ceah/ncahs](http://www.aphis.usda.gov/vs/ceah/ncahs)

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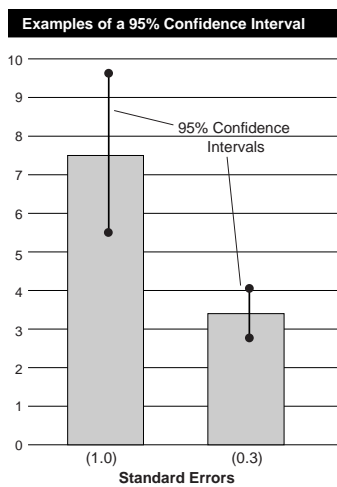
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## Terms Used In This Report

**Backyard flocks:** Residences with birds (other than pet birds or in addition to pet birds). Backyard flocks have fewer than 1,000 birds.

**Gamefowl:** Breeds of chickens, such as Kelso, Hatch, Claret, and Roundhead, intended primarily for exhibition/competition and bred for beauty, strength, health, vitality, and longevity.

**Pet birds:** Birds not normally used for food and usually housed in cages in the home, such as parrots, cockatiels, parakeets, finches, and canaries.



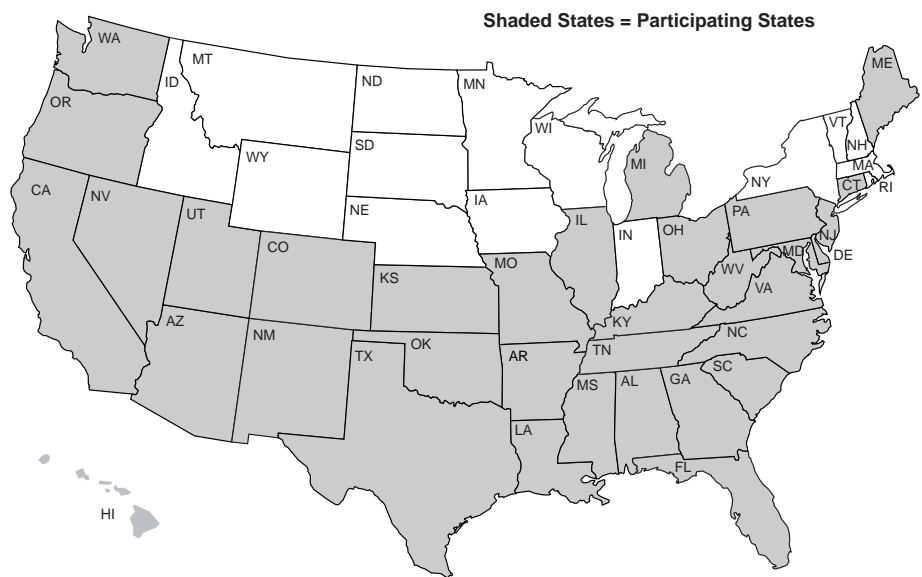
**Population estimates:** Estimates in this report are provided with a measure of precision called the standard error. A 95-percent confidence interval can be created with bounds equal to the estimate, plus or minus two standard errors. If the only error is sampling error, the confidence intervals created in this manner will contain the true population mean 95 out of 100 times. In the example to the left, an estimate of 7.5 with a standard error of 1.0 results in limits of 5.5 to 9.5 (two times the standard error above and below the estimate). The second estimate of 3.4 shows a standard error of 0.3 and results in limits of 2.8 and 4.0. Alternatively, the 90-percent confidence interval would be created by multiplying the standard error by 1.65 instead of 2.0. In general, when comparing point estimates between categories, estimates with confidence levels that overlap are not considered different. Most estimates in this report are rounded to the nearest tenth. If rounded to 0, the standard error was reported. If there were no reports of the event, no standard error was reported. Differences identified in this report are at the 95-percent confidence level.



**Poultry '04 Participating States (Backyard)**



**Poultry '04 Participating States (Gamefowl)**



## Section I: Population Estimates

### A. General Management

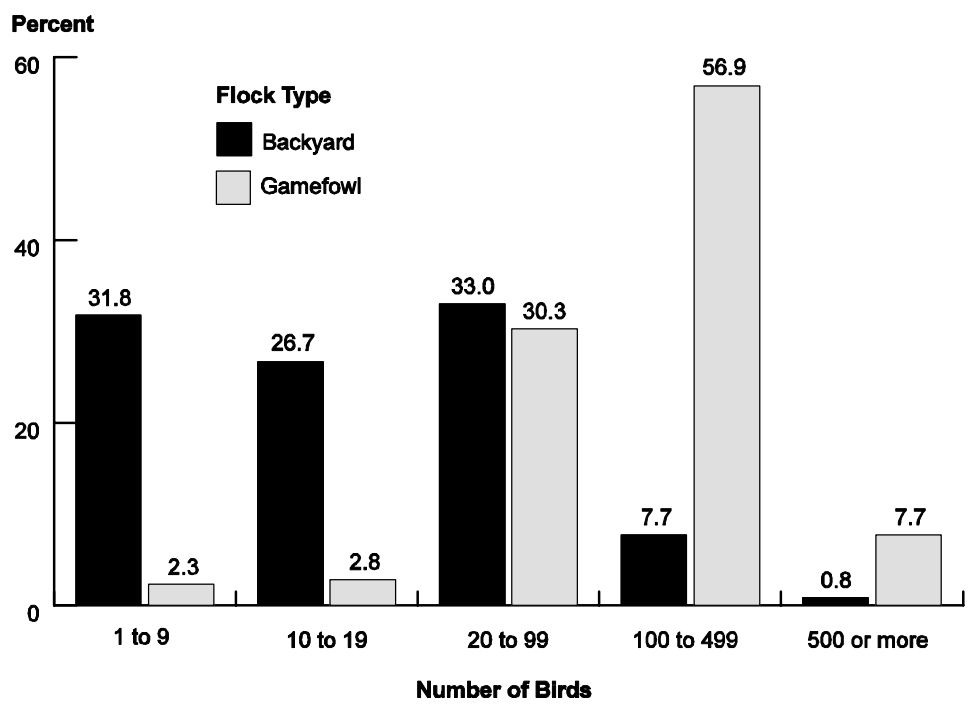
#### 1. Bird numbers and types

Gamefowl breeder flocks were larger than backyard flocks. Over half of gamefowl breeder flocks had 100 or more birds, while over half of backyard flocks had fewer than 20 birds.

a. Percentage of flocks by number of birds in flocks:

Percent Flocks				
Flock Type				
	Backyard		Gamefowl	
Number of Birds	Percent	Std. Error	Percent	Std. Error
1 to 9	31.8	(3.3)	2.3	(0.8)
10 to 19	26.7	(2.9)	2.8	(0.8)
20 to 99	33.0	(3.4)	30.3	(2.2)
100 to 499	7.7	(2.3)	56.9	(2.4)
500 or more	0.8	(0.6)	7.7	(1.2)
Total	100.0		100.0	

**Percentage of Flocks by Number of Birds in Flocks**



## 2. Housing

The majority of both backyard flock owners and gamefowl breeders housed at least some birds inside a barn or coop.

a. Percentage of flocks by bird housing type:

<b>Percent Flocks</b>				
<b>Flock Type</b>				
	<b>Backyard</b>		<b>Gamefowl</b>	
<b>Housing Type</b>	<b>Percent</b>	<b>Std. Error</b>	<b>Percent</b>	<b>Std. Error</b>
Outdoors, confined to property	51.5	(3.1)	86.0	(1.7)
Outdoors, able to leave property	47.1	(3.3)	57.0	(2.4)
Inside, e.g., barn or coop	73.3	(3.0)	91.5	(1.3)

Most flocks that were housed indoors were provided outdoor access.

b. For flocks where birds were housed inside a barn or coop, percentage of flocks where at least some birds were allowed outdoors:

<b>Percent Flocks</b>			
<b>Flock Type</b>			
<b>Backyard</b>		<b>Gamefowl</b>	
<b>Percent</b>	<b>Standard Error</b>	<b>Percent</b>	<b>Standard Error</b>
65.0	(4.1)	83.6	(1.9)

### 3. Animal contact

In over half of both backyard flocks and gamefowl breeder flocks, birds were exposed to the owners' dogs or cats and to wild birds. Other animal consisted primarily of horses and wildlife.

a. Percentage of flocks where birds had contact with other animals, by type of animal:

Type of Animal	Percent Flocks			
	Backyard		Gamefowl	
	Percent	Std. Error	Percent	Std. Error
Owner's dogs or cats	59.6	(3.9)	80.5	(1.9)
Neighbors' dogs or cats	37.8	(3.5)	19.6	(1.9)
Neighbors' poultry	8.6	(2.5)	5.3	(1.1)
Wild birds	63.0	(3.9)	82.2	(1.8)
Pigs	6.3	(1.4)	3.2	(0.8)
Cattle/sheep/goats	33.8	(3.4)	24.1	(2.0)
Other animals	16.9	(2.5)	18.1	(1.8)

Frequency of observing rodents was similar for backyard flocks and gamefowl breeder flocks.

b. Percentage of flocks by frequency that rodents or evidence of rodents were seen in bird areas:

<b>Percent Flocks</b>				
<b>Flock Type</b>				
	<b>Backyard</b>		<b>Gamefowl</b>	
<b>Frequency</b>	<b>Percent</b>	<b>Std. Error</b>	<b>Percent</b>	<b>Std. Error</b>
Usually	6.4	(1.6)	10.0	(1.5)
Sometimes	32.0	(3.4)	38.3	(2.3)
Rarely	33.8	(3.1)	42.1	(2.4)
Never	27.8	(3.3)	9.6	(1.5)
Total	100.0		100.0	

Nearly all gamefowl breeder flocks (94.0 percent) and about two-thirds of backyard flocks (65.2 percent) used some form of rodent control.

c. Percentage of flocks by rodent control methods used in bird areas:

<b>Percent Flocks</b>				
<b>Flock Type</b>				
	<b>Backyard</b>		<b>Gamefowl</b>	
<b>Control Method</b>	<b>Percent</b>	<b>Std. Error</b>	<b>Percent</b>	<b>Std. Error</b>
Bait	32.0	(3.1)	64.9	(2.3)
Traps and sticky tape	13.2	(2.2)	37.0	(2.3)
Cats	36.4	(3.7)	37.6	(2.4)
Dogs	22.5	(3.6)	52.9	(2.4)
Professional exterminator	1.3	(0.8)	7.8	(1.4)
Other	2.2	(0.9)	2.4	(0.7)
Any	65.2	(3.0)	94.0	(1.2)

## B. Health and Health Care

### 1. Veterinary services

The services of a veterinarian were used more frequently by gamefowl breeders than by backyard flock owners, although they were rarely used by either.

a. Percentage of flocks that used veterinary services for any bird(s) for any reason in the previous 12 months:

Percent Flocks			
Flock Type			
Backyard		Gamefowl	
Percent	Standard Error	Percent	Standard Error
2.9	(1.0)	18.2	(1.9)

### 2. Medication

Farm or feed store was the most common source of birds' medication for both backyard flocks and gamefowl breeder flocks. Nearly all gamefowl breeder flocks (91.6 percent) obtained medication in the previous 12 months, while only one in four (27.1 percent) backyard flocks did so.

a. Percentage of flocks by source of birds' medication in the previous 12 months:

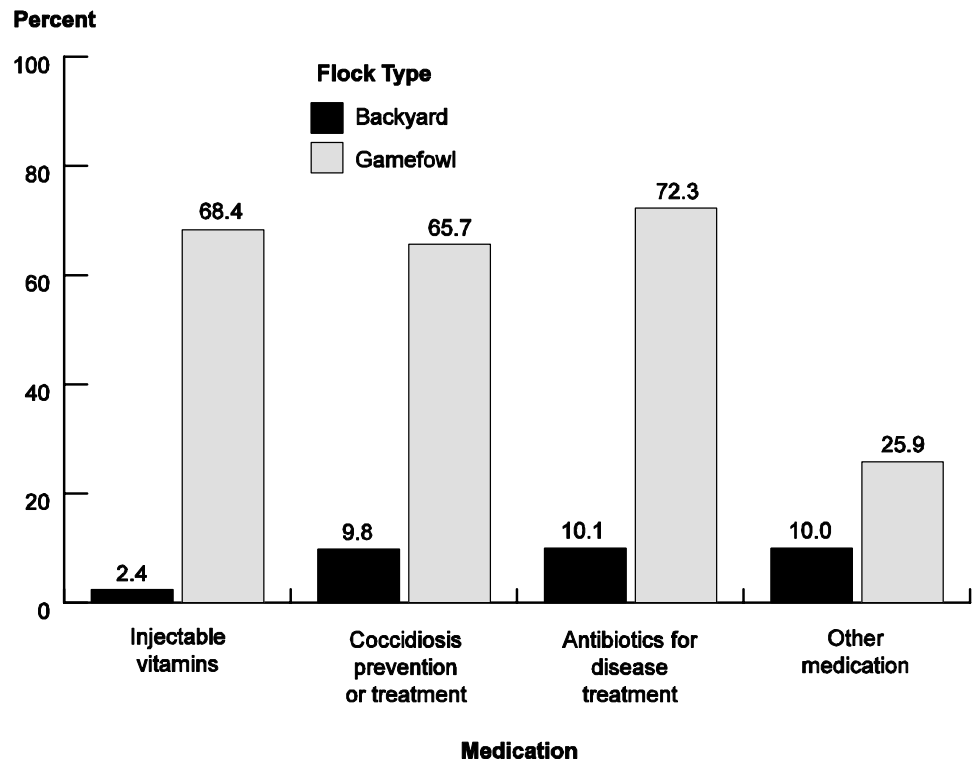
Percent Flocks				
Flock Type				
Source	Backyard		Gamefowl	
	Percent	Std. Error	Percent	Std. Error
Mail order or Internet	2.7	(0.9)	50.1	(2.4)
Farm or feed store	24.4	(3.4)	86.1	(1.6)
Make own	0.7	(0.3)	17.1	(1.8)
Veterinarian	3.1	(1.1)	16.3	(1.7)
Other suppliers	1.0	(0.5)	7.3	(1.1)
Any	27.1	(3.5)	91.6	(1.3)

Gamefowl breeder flocks were more likely to administer medication than backyard flocks.

b. Percentage of flocks that administered medication to the flock in the previous 12 months, by medication:

Percent Flocks				
Flock Type				
Medication	Backyard		Gamefowl	
	Percent	Std. Error	Percent	Std. Error
Injectable vitamins	2.4	(0.9)	68.4	(2.2)
Coccidiosis prevention or treatment	9.8	(2.5)	65.7	(2.3)
Antibiotics for disease treatment	10.1	(1.8)	72.3	(2.2)
Other medication	10.0	(2.5)	25.9	(2.1)

**Percentage of Flocks That Administered Medication to the Flock in the Previous 12 Months, by Medication**



**3. Vaccinations**

While over half of gamefowl breeder flocks (58.6 percent) vaccinated birds, only 2.8 percent of backyard flocks did so.

a. Percentage of flocks that vaccinated any birds in the previous 12 months:

<b>Percent Flocks</b>			
<b>Flock Type</b>			
<b>Backyard</b>		<b>Gamefowl</b>	
<b>Percent</b>	<b>Standard Error</b>	<b>Percent</b>	<b>Standard Error</b>
2.8	(1.1)	58.6	(2.3)

**4. Bird Health**

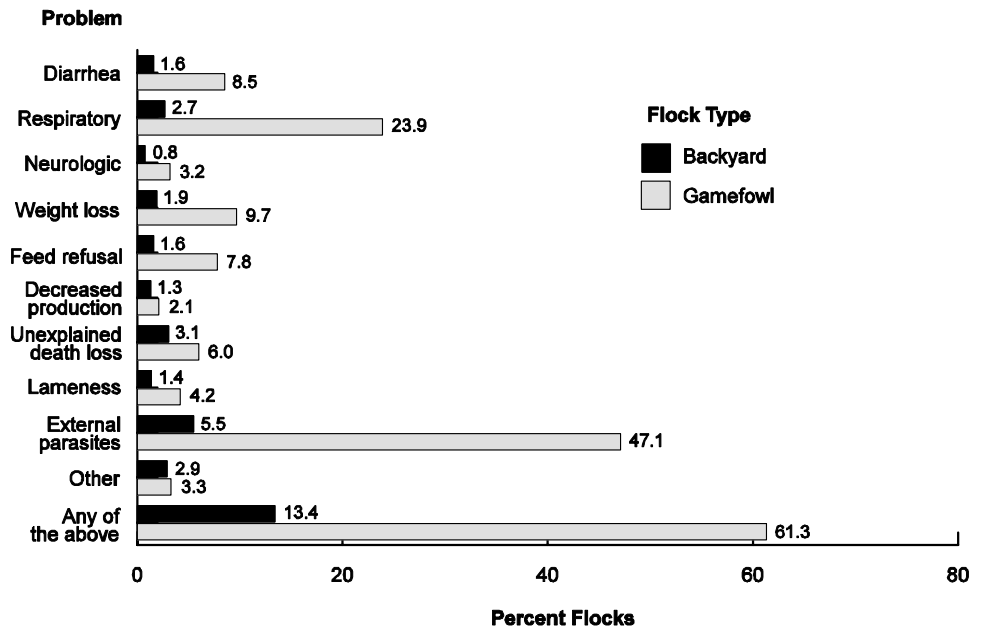
Backyard flocks reported very few health problems. The most common health problems reported in gamefowl breeder flocks were external parasites and respiratory problems.



a. Percentage of flocks that had the following flock health problems in the previous 3 months:

Problem	Percent Flocks			
	Backyard		Gamefowl	
	Percent	Std. Error	Percent	Std. Error
Diarrhea	1.6	(0.7)	8.5	(1.4)
Respiratory (nasal/eye discharge, cough/sneeze, swollen sinuses)	2.7	(1.1)	23.9	(2.1)
Neurologic (lack of coordination, weakness)	0.8	(0.6)	3.2	(0.8)
Weight loss	1.9	(0.9)	9.7	(1.5)
Feed refusal/depression (droopy birds)	1.6	(0.8)	7.8	(1.3)
Sudden decreased production not related to molting (reduced egg laying, hatching rate, no weight gain)	1.3	(0.6)	2.1	(0.7)
Unexplained death loss	3.1	(1.0)	6.0	(1.2)
Lameness	1.4	(0.5)	4.2	(0.9)
External parasites (mites, lice, etc.)	5.5	(2.1)	47.1	(2.4)
Other	2.9	(1.3)	3.3	(0.8)
Any of the above	13.4	(2.4)	61.3	(2.3)

**Percentage of Flocks that had the Following Flock Health Problems In the Previous 3 Months**

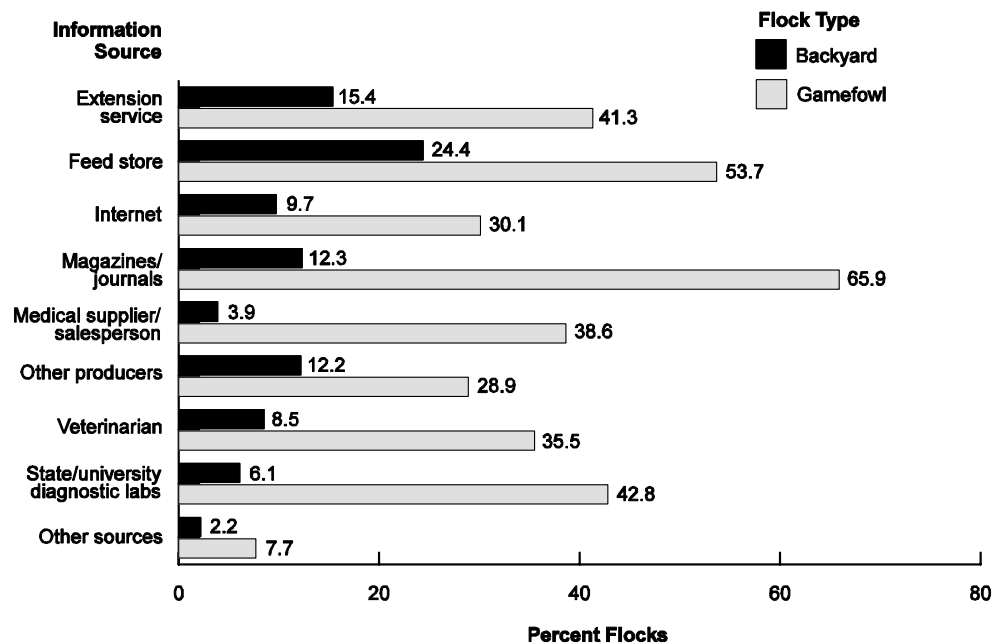


Backyard flocks ranked feed store and extension service as the most important sources of health information, while gamefowl breeder flocks ranked magazines/journals and feed store highest.

b. Percentage of flocks that ranked the following sources of bird health information as very important:

Information Source	Percent Premises			
	Backyard		Gamefowl	
	Percent	Std. Error	Percent	Std. Error
Extension service	15.4	(3.7)	41.3	(2.4)
Feed store	24.4	(3.1)	53.7	(2.4)
Internet	9.7	(1.8)	30.1	(2.3)
Magazines/journals	12.3	(3.0)	65.9	(2.3)
Medical supplier/ salesperson	3.9	(1.5)	38.6	(2.4)
Other producers	12.2	(2.9)	28.9	(2.3)
Veterinarian (private practitioner)	8.5	(2.5)	35.5	(2.4)
State or university diagnostic labs	6.1	(2.3)	42.8	(2.4)
Other sources	2.2	(0.8)	7.7	(1.3)

**Percentage of Flocks that Ranked the Following Sources of Bird Health Information as Very Important**

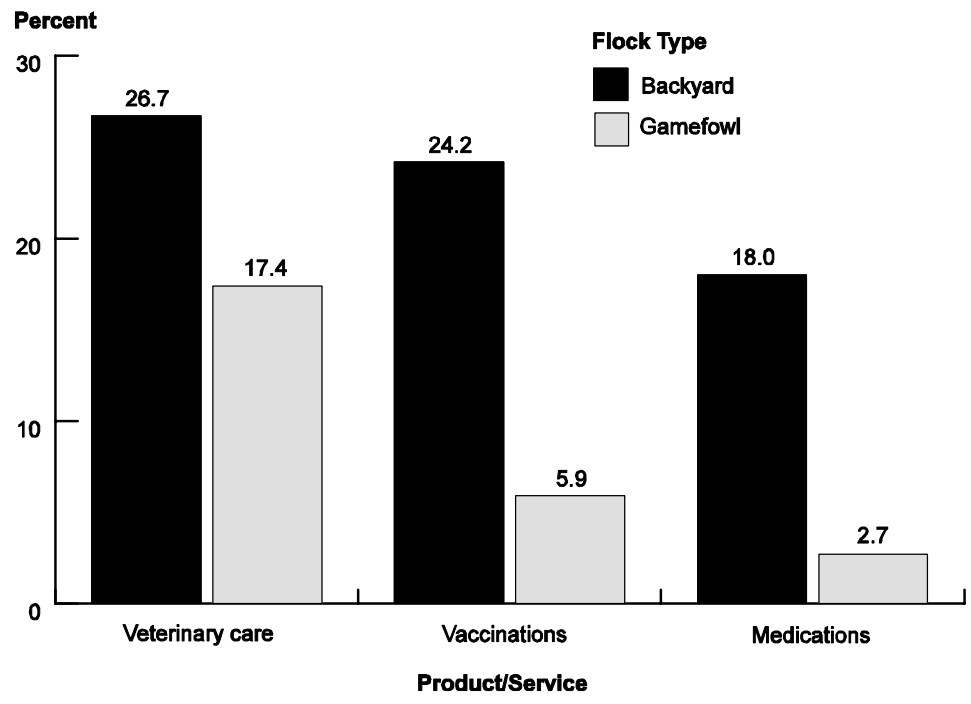


Backyard flocks reported more difficulty obtaining bird health services/products compared to gamefowl breeder flocks.

c. Percentage of flocks where availability of products/services for birds was low (score 1 or 2 out of 5):

Percent Flocks				
Flock Type				
	Backyard		Gamefowl	
Product/Service	Percent	Std. Error	Percent	Std. Error
Veterinary care	26.7	(4.9)	17.4	(1.8)
Vaccinations	24.2	(4.8)	5.9	(1.2)
Medications	18.0	(4.6)	2.7	(0.8)

**Percentage of Flocks Where Availability of Products/Services for Birds Was Low (Score 1 or 2 out of 5)**



## C. Biosecurity

### 1. Dedicated footwear

Specific footwear-related precautions for people entering the bird areas were required by 11.4 percent of backyard flocks and over half (52.2 percent) of gamefowl breeder flocks.

a. Percentage of flocks by primary type of footwear-related precautions required for anyone going into bird areas:

Precaution	Percent Flocks			
	Backyard		Gamefowl	
	Percent	Std. Error	Percent	Std. Error
Boots or shoes worn only in the bird area	9.0	(2.0)	16.4	(1.7)
Disposable boot or shoe covers	0.6	(0.4)	7.7	(1.4)
Use of footbath before or after entry	0.1	(0.0)	14.3	(1.7)
Scrub boots/shoes before or after entry	1.3	(0.5)	9.1	(1.5)
Combination of above	0.4	(0.3)	4.7	(0.9)
Any requirements	11.4	(2.0)	52.2	(2.4)

### 2. Hand washing

Hand washing was required more frequently after handling birds than before handling birds by both backyard flocks and gamefowl breeder flocks.

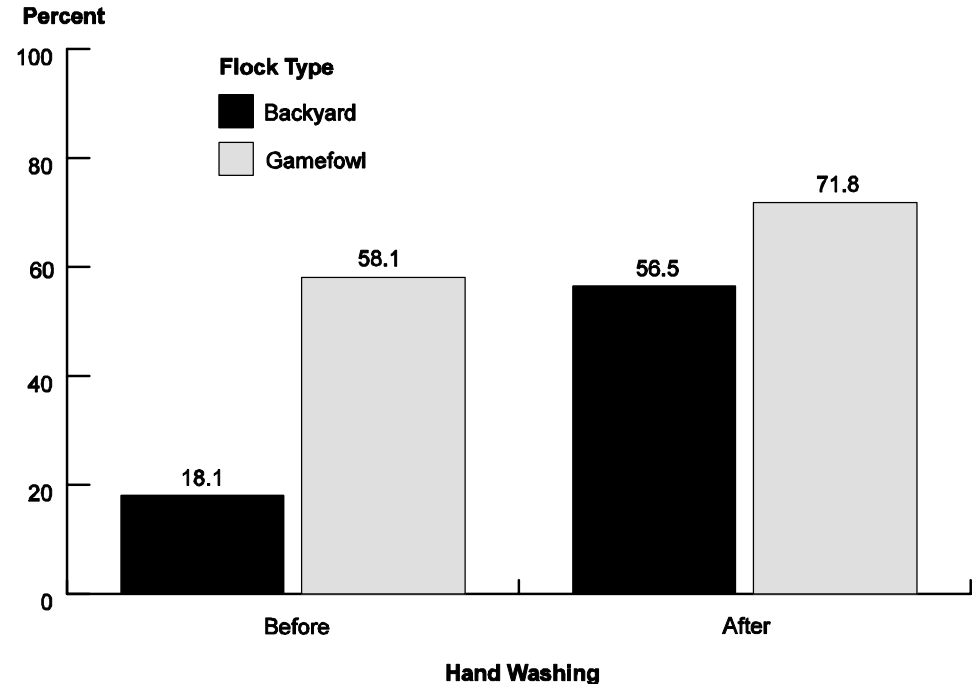
a. Percentage of flocks that required hand washing **before** handling poultry, by frequency:

Frequency	Percent Flocks			
	Backyard		Gamefowl	
	Percent	Std. Error	Percent	Std. Error
Always	10.9	(2.1)	26.2	(2.2)
Sometimes	7.2	(1.6)	31.9	(2.3)
Never	81.9	(2.6)	41.9	(2.4)
Total	100.0		100.0	

b. Percentage of flocks that required hand washing *after* handling poultry, by frequency:

Percent Flocks				
Flock Type				
	Backyard		Gamefowl	
Frequency	Percent	Std. Error	Percent	Std. Error
Always	40.2	(4.0)	49.4	(2.4)
Sometimes	16.3	(2.9)	22.4	(2.0)
Never	43.5	(4.0)	28.2	(2.1)
Total	100.0		100.0	

**Percentage of Flocks that Required Hand Washing Before and After Handling Poultry**



### 3. Visitors

About half of backyard flocks and gamefowl breeder flocks never allowed visitors.

a. Percentage of flocks where visitors such as neighbors, repairmen, meter readers, etc., were allowed in the poultry area, by frequency:

Percent Flocks				
Flock Type				
	Backyard		Gamefowl	
Frequency	Percent	Std. Error	Percent	Std. Error
Always	25.4	(3.6)	6.3	(1.1)
Sometimes	21.1	(2.4)	40.0	(2.3)
Never	53.5	(4.0)	53.7	(2.4)
Total	100.0		100.0	

### 4. Ponds and bird feeders

Ponds that attract wild waterfowl and the presence of wild-bird feeders were more common on the property of backyard flocks than on gamefowl breeder flocks.

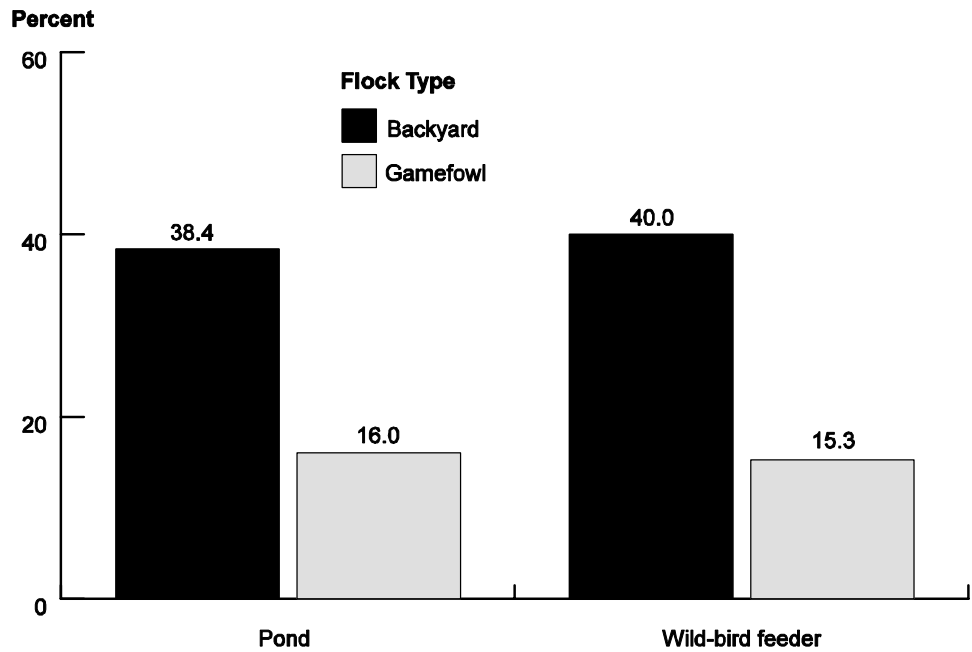
a. Percentage of flocks with a pond on the property that attracts wild waterfowl:

Percent Flocks			
Flock Type			
Backyard		Gamefowl	
Percent	Standard Error	Percent	Standard Error
38.4	(3.6)	16.0	(1.7)

b. Percentage of flocks with a wild-bird feeder on the property:

Percent Flocks			
Flock Type			
Backyard		Gamefowl	
Percent	Standard Error	Percent	Standard Error
40.0	(3.8)	15.3	(1.6)

**Percentage of Flocks With a Pond on the Property that Attracts Wild WaterFowl and Percentage of Flocks with a Wild-Bird Feeder**





**D. Bird Movement**

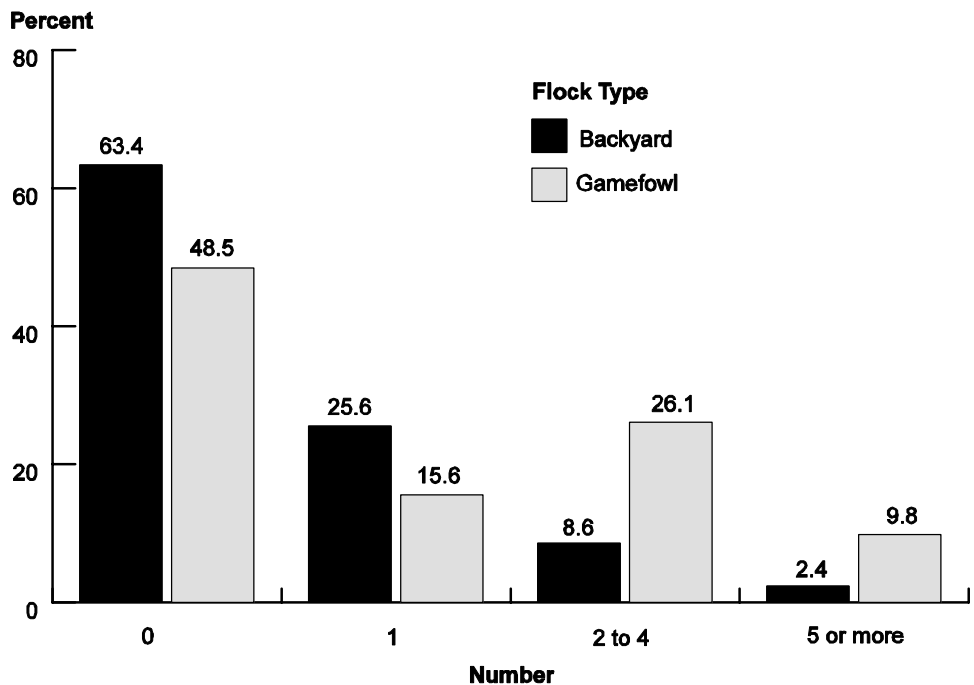
**1. Bird introductions**

Introductions of new birds into the flock occurred more frequently in gamefowl breeder flocks than in backyard flocks.

a. Percentage of flocks by number of times in the previous 12 months that new birds were introduced into the flock:

Percent Flocks				
Flock Type				
	Backyard		Gamefowl	
Number	Percent	Std. Error	Percent	Std. Error
0	63.4	(3.7)	48.5	(2.4)
1	25.6	(3.4)	15.6	(1.7)
2 to 4	8.6	(1.7)	26.1	(2.1)
5 or more	2.4	(0.9)	9.8	(1.4)
Total	100.0		100.0	

**Percentage of Flocks by Number of Times in the Previous 12 Months that New Birds Were Introduced into the Flock**



For gamefowl breeder flocks that added new birds in the previous 12 months, 85.0 percent added adult birds. Backyard flocks that added new birds in the previous 12 months were equally likely to introduce day-old chicks, young stock, or adult birds (38.2, 43.0, and 36.6 percent of flocks, respectively).

b. For flocks that introduced new birds in the previous 12 months, percentage of flocks by age group of birds introduced:

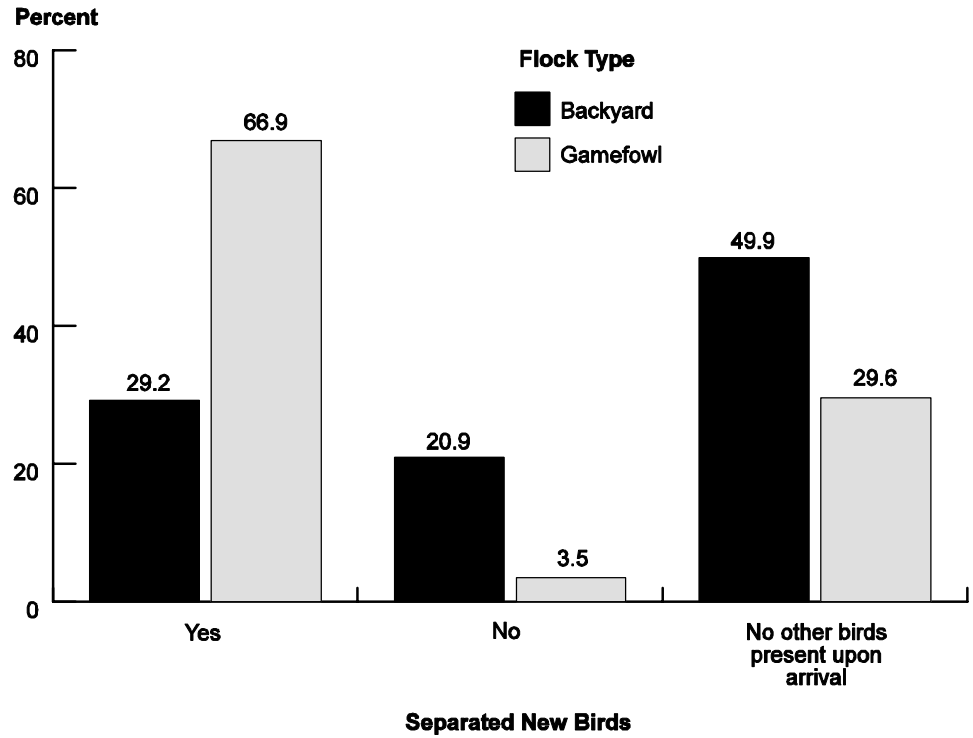
<b>Percent Flocks</b>				
<b>Flock Type</b>				
	<b>Backyard</b>		<b>Gamefowl</b>	
<b>Age Group</b>	<b>Percent</b>	<b>Std. Error</b>	<b>Percent</b>	<b>Std. Error</b>
Day-old chicks	38.2	(5.0)	15.7	(2.4)
Young stock (not yet reproductive age)	43.0	(5.8)	41.7	(3.2)
Adult birds (reproductive age)	36.6	(5.2)	85.0	(2.4)

For flocks that added new birds in the previous 12 months, 79.1 percent of backyard flocks and 96.5 percent of gamefowl breeder flocks either separated birds or had no other birds at time of addition.

c. For flocks that introduced new birds in the previous 12 months, percentage of flocks that usually separated or quarantined new birds from the rest of the flock upon arrival:

<b>Percent Flocks</b>				
<b>Flock Type</b>				
	<b>Backyard</b>		<b>Gamefowl</b>	
<b>Separated New Birds</b>	<b>Percent</b>	<b>Std. Error</b>	<b>Percent</b>	<b>Std. Error</b>
Yes	29.2	(5.0)	66.9	(3.1)
No	20.9	(4.8)	3.5	(1.2)
No other birds present upon arrival	49.9	(5.7)	29.6	(3.0)
Total	100.0		100.0	

**For Flocks that Introduced New Birds in the Previous 12 Months, Percentage of Flocks that Usually Separated or Quarantined New Birds from the Rest of the Flock Upon Arrival**



Obtaining new birds from outside the United States was extremely rare for both backyard flocks and gamefowl breeder flocks.

d. For flocks that introduced new birds in the previous 12 months, percentage of flocks by source location of new birds:

Location	Percent Flocks			
	Flock Type			
	Backyard		Gamefowl	
	Percent	Std. Error	Percent	Std. Error
Within same county	60.0	(5.1)	58.5	(3.1)
Outside county but within State	29.3	(4.6)	53.4	(3.2)
Outside State but within the United States	22.0	(5.1)	38.1	(3.1)
Outside the United States	0.2	(0.2)	1.2	(0.7)

Private individuals were the most common source of new birds for both backyard flocks and gamefowl breeder flocks. Backyard flocks were more likely to obtain birds from auction markets or feed stores than were gamefowl breeder flocks. Mail order or Internet was used by a similar percentage of backyard flocks and gamefowl breeder flocks (12.9 percent and 12.4 percent, respectively).

e. For flocks that introduced new birds in the previous 12 months, percentage of flocks by source of introduced birds:

<b>Percent Flocks</b>				
<b>Flock Type</b>				
	<b>Backyard</b>		<b>Gamefowl</b>	
<b>Source</b>	<b>Percent</b>	<b>Std. Error</b>	<b>Percent</b>	<b>Std. Error</b>
Local commercial hatchery	6.9	(2.9)	2.1	(1.0)
Poultry wholesaler or dealer	11.1	(4.5)	4.2	(1.3)
Private individual (e.g., neighbor)	58.5	(5.8)	92.9	(1.7)
Feed or farm store	16.6	(3.1)	2.3	(0.9)
Fair or show	1.7	(0.8)	8.0	(1.9)
Flea or farmer's market	3.9	(1.6)	2.2	(1.0)
Auction market	11.2	(3.3)	2.5	(1.0)
Mail order or Internet	12.9	(5.0)	12.4	(2.0)
Other	6.4	(2.8)	2.8	(1.1)

## 2. Sales

Few backyard flocks sold or gave away birds, while nearly three in four gamefowl breeder flocks did so.

a. Percentage of flocks that sold or gave away any live birds in the previous 12 months:

<b>Percent Flocks</b>			
<b>Flock Type</b>			
<b>Backyard</b>		<b>Gamefowl</b>	
<b>Percent</b>	<b>Standard Error</b>	<b>Percent</b>	<b>Standard Error</b>
17.8	(2.4)	70.9	(2.2)

Most backyard flocks and gamefowl breeder flocks that sold or gave away birds sold them to private individuals. Backyard flocks sold birds through auction markets more frequently than gamefowl breeder flocks.

b. For flocks that sold or gave away any live birds in the previous 12 months, percentage of flocks by means birds were sold or given away:

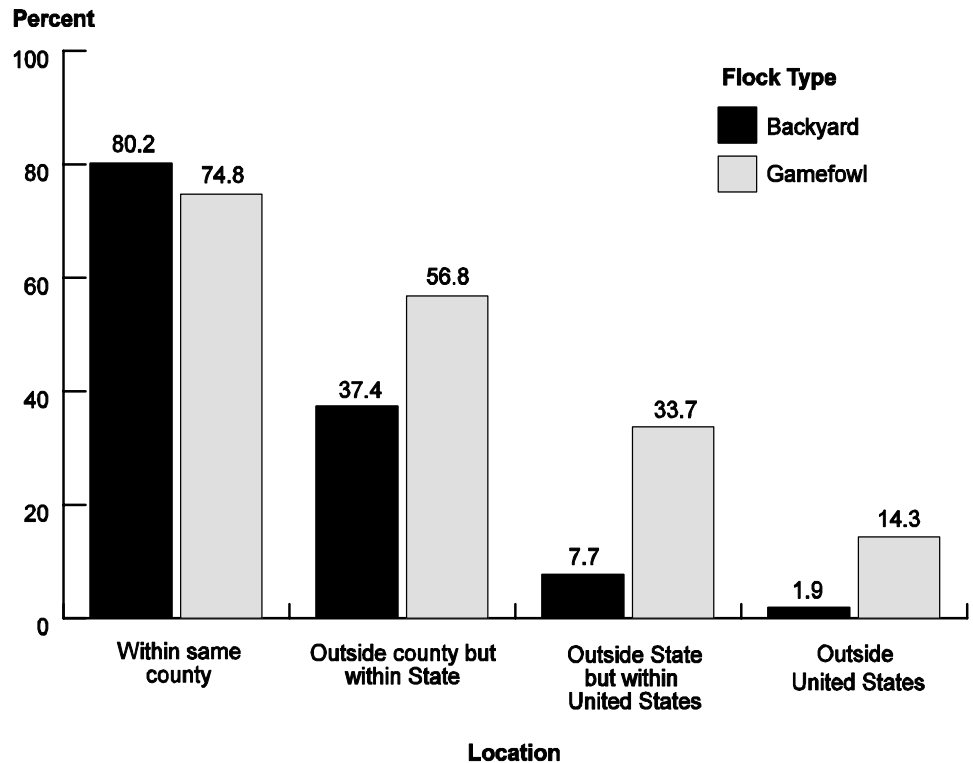
Means	Percent Flocks			
	Backyard		Gamefowl	
	Percent	Std. Error	Percent	Std. Error
Poultry wholesaler or dealer	0.5	(0.5)	4.8	(1.2)
Private individual (e.g., neighbor)	76.1	(5.2)	93.3	(1.4)
Feed or farm store	4.6	(3.0)	3.8	(1.0)
Fair or show	2.5	(2.1)	5.6	(1.2)
Live bird market	0.3	(0.3)	2.8	(0.8)
Flea or farmer's market	6.8	(3.7)	3.0	(0.7)
Auction market	20.8	(5.2)	4.6	(1.0)
Mail order or Internet	0.0	(--)	12.6	(1.9)
Other	7.0	(3.9)	1.6	(0.7)

Gamefowl breeder flocks had more interstate and international bird sales than backyard flocks.

c. For flocks where birds were sold or given away in the previous 12 months, percentage of flocks by location birds were sent:

Percent Flocks				
Flock Type				
	Backyard		Gamefowl	
Location	Percent	Std. Error	Percent	Std. Error
Within same county	80.2	(5.4)	74.8	(2.4)
Outside county but within State	37.4	(6.0)	56.8	(2.8)
Outside State but within United States	7.7	(3.8)	33.7	(2.5)
Outside United States	1.9	(1.9)	14.3	(1.9)

**For Flocks Where Birds Were Sold or Given Away in the Previous 12 Months, Percentage of Flocks by Location Birds were Sent**



### 3. Contact with other premises with birds

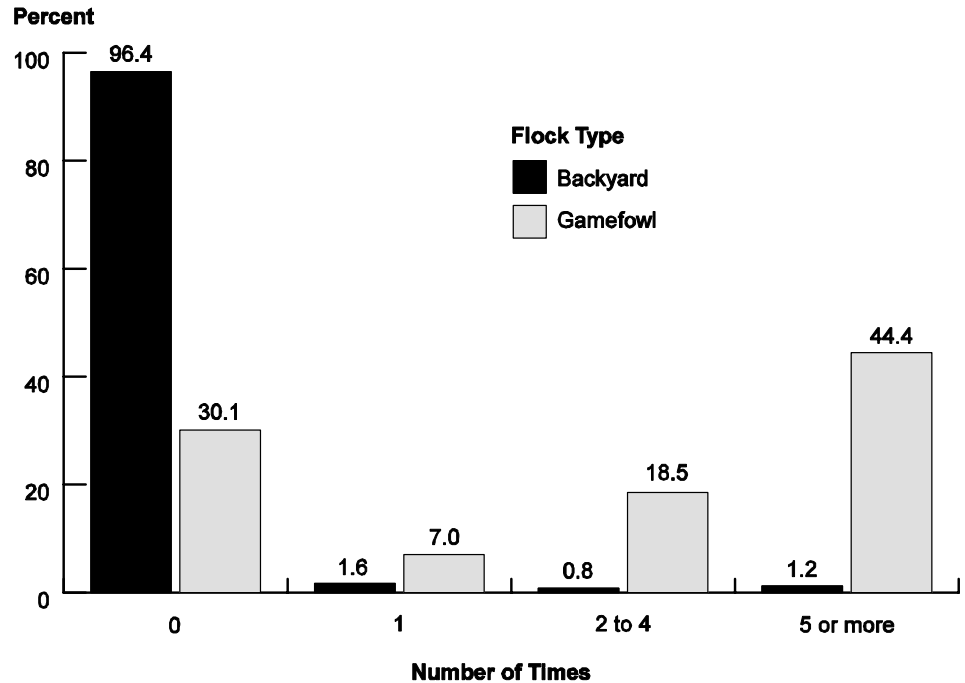
Less than 4 percent of backyard flocks moved birds to locations (e.g., fairs, shows, etc.) where other birds were present, whereas 69.9 percent of gamefowl breeder flocks did so.

a. Percentage of flocks that took birds to locations (e.g., fairs, shows, etc.) where other birds were present and returned the birds to the flock, by number of times in the previous 12 months:

<b>Percent Flocks</b>				
<b>Flock Type</b>				
	<b>Backyard</b>		<b>Gamefowl</b>	
<b>Number</b>	<b>Percent</b>	<b>Std. Error</b>	<b>Percent</b>	<b>Std. Error</b>
0	96.4	(1.0)	30.1	(2.2)
1	1.6	(0.6)	7.0	(1.3)
2 to 4	0.8	(0.4)	18.5	(1.9)
5 or more	1.2	(0.8)	44.4	(2.4)
Total	100.0		100.0	



**Percentage of Flocks that Took Birds to Locations (e.g., Fairs, Shows, etc.) Where Other Birds were Present and Returned the Birds to the Flock, by Number of Times in the Previous 12 Months**



Five out of 10 backyard flock producers (50.7 percent) and 7 out of 10 gamefowl breeder flock producers (71.2 percent) had visited locations in the previous 3 months that had live birds.

b. Percentage of flocks where respondent visited a location that had live birds (e.g., a market, feed store with birds, fair, or neighbor's flock) in the previous 3 months:

Percent Flocks			
Flock Type			
Backyard		Gamefowl	
Percent	Standard Error	Percent	Standard Error
50.7	(4.3)	71.2	(2.2)

## E. Carcass and Litter Disposal

### 1. Dead birds

Backyard flocks and gamefowl breeder flocks experienced similar mortality rates.

a. Number of birds that died in the previous 12 months (not counting birds slaughtered for human consumption), as a percentage of inventory on day of the survey:

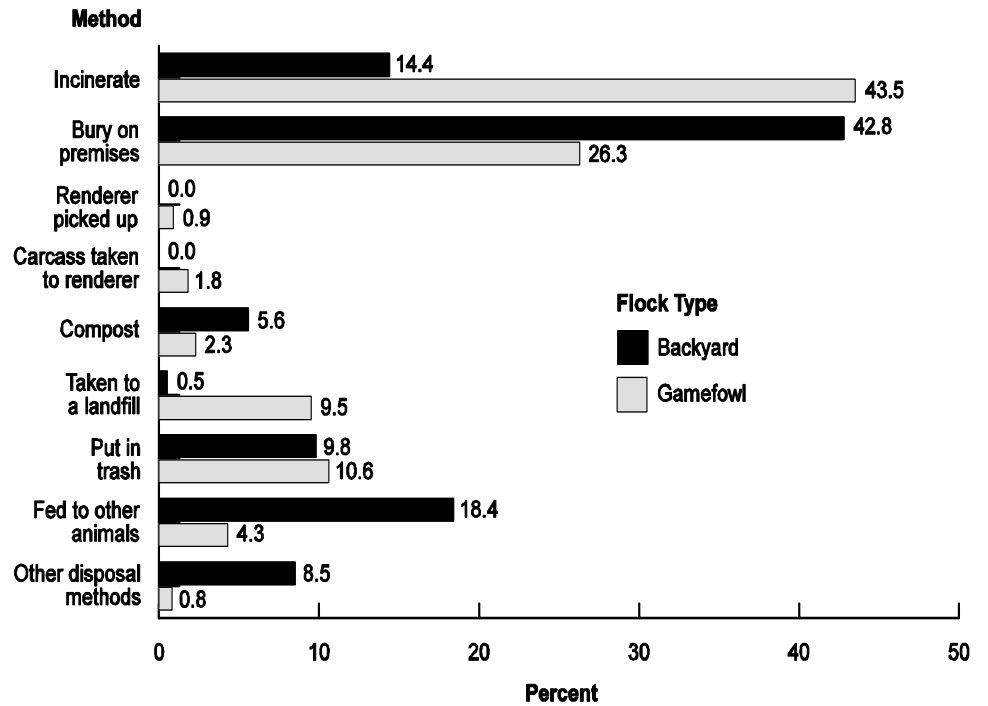
Percent Birds			
Flock Type			
Backyard		Gamefowl	
Percent	Standard Error	Percent	Standard Error
10.8	(1.3)	8.6	(0.9)

Burial on the premises was the most common method of disposing of dead birds for backyard flocks; incineration was the most common method used by gamefowl breeder flocks.

b. For flocks that had any birds die in the previous 12 months, percentage of flocks by *primary* method of disposing of dead birds:

Percent Flocks				
Method	Backyard		Gamefowl	
	Percent	Std. Error	Percent	Std. Error
Incinerate	14.4	(2.9)	43.5	(2.6)
Bury on premises	42.8	(5.1)	26.3	(2.1)
Renderer picked up	0.0	(--)	0.9	(0.4)
Carcass taken to renderer	0.0	(--)	1.8	(0.8)
Compost	5.6	(1.2)	2.3	(0.8)
Taken to a landfill	0.5	(0.3)	9.5	(1.5)
Put in trash	9.8	(4.1)	10.6	(1.6)
Fed to other animals	18.4	(3.0)	4.3	(1.0)
Other disposal methods	8.5	(2.5)	0.8	(0.5)
Total	100.0		100.0	

**For Flocks that had Any Birds Die in the Previous 12 Months, Percentage of Flocks by Primary Method of Disposing of Dead Birds**



## 2. Litter

Poultry litter and manure disposal methods were similar for backyard flocks and gamefowl breeder flocks.

a. Percentage of flocks by method that best describes how the flocks disposed of used poultry litter and manure:

Method	Percent Flocks			
	Flock Type			
	Backyard		Gamefowl	
	Percent	Std. Error	Percent	Std. Error
Place in manure shed/composted	4.9	(1.5)	5.5	(1.0)
Leave in an outdoor pile	5.2	(1.5)	4.6	(1.0)
Spread on field/garden at premises location	40.3	(3.7)	35.8	(2.3)
Taken to a landfill or put in trash	1.3	(0.7)	11.3	(1.7)
Haul away (sell or give away)	0.0	(--)	3.4	(0.8)
Other disposal methods	1.3	(0.8)	6.6	(1.3)
Do not have enough litter/manure to deal with	47.0	(3.2)	32.8	(2.3)
Total	100.0		100.0	

## F. Producer Characteristics

### 1. Reason for having birds

Both backyard flock producers and gamefowl breeders ranked fun/hobby highest as the reason for having birds. Backyard flock producers ranked food source higher than did gamefowl breeders, while gamefowl breeders ranked all other reasons higher than did backyard producers.

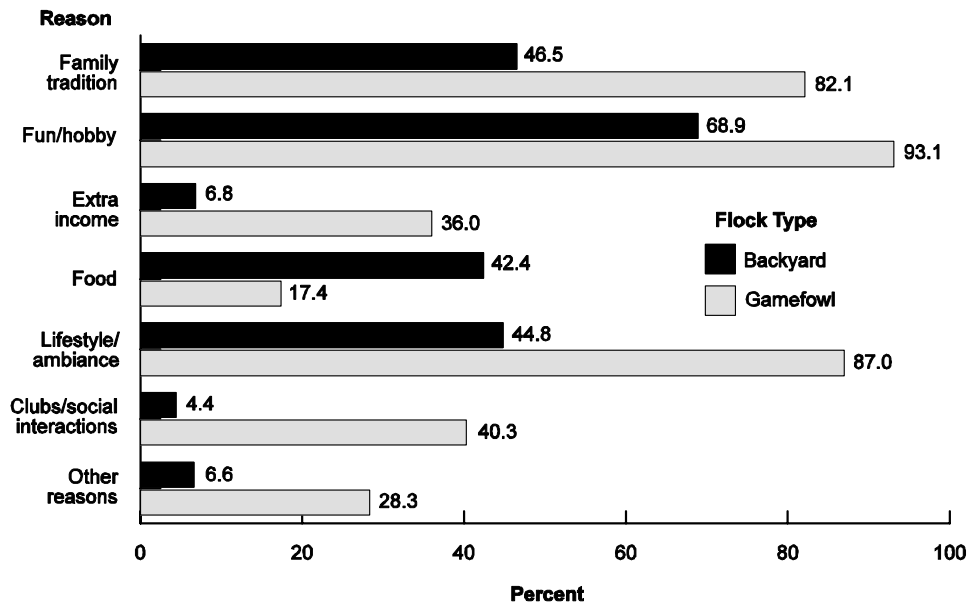
a. Percentage of flocks that rated\* the following reasons for having birds as high or very high (score of 7 to 10):

Reason	Percent Flocks			
	Backyard		Gamefowl	
	Percent	Std. Error	Percent	Std. Error
Family tradition	46.5	(3.4)	82.1	(1.9)
Fun/hobby	68.9	(2.8)	93.1	(1.3)
Extra income	6.8	(1.4)	36.0	(2.4)
Food	42.4	(3.4)	17.4	(1.9)
Lifestyle/ambiance	44.8	(4.3)	87.0	(1.7)
Clubs/social interactions (4H, avian organizations)	4.4	(1.0)	40.3	(2.4)
Other reasons to have birds	6.6	(1.8)	28.3**	(2.2)

\*On a scale of 1 to 10, with 1 being least important and 10 being most important

\*\*Primarily love of birds, teaching children, and the right to own birds

**Percentage of Flocks that Rated\* the Following Reasons for Having Birds as High or Very High (score of 7 to 10):**



\*On a scale of 1 to 10, with 1 being least important and 10 being most important

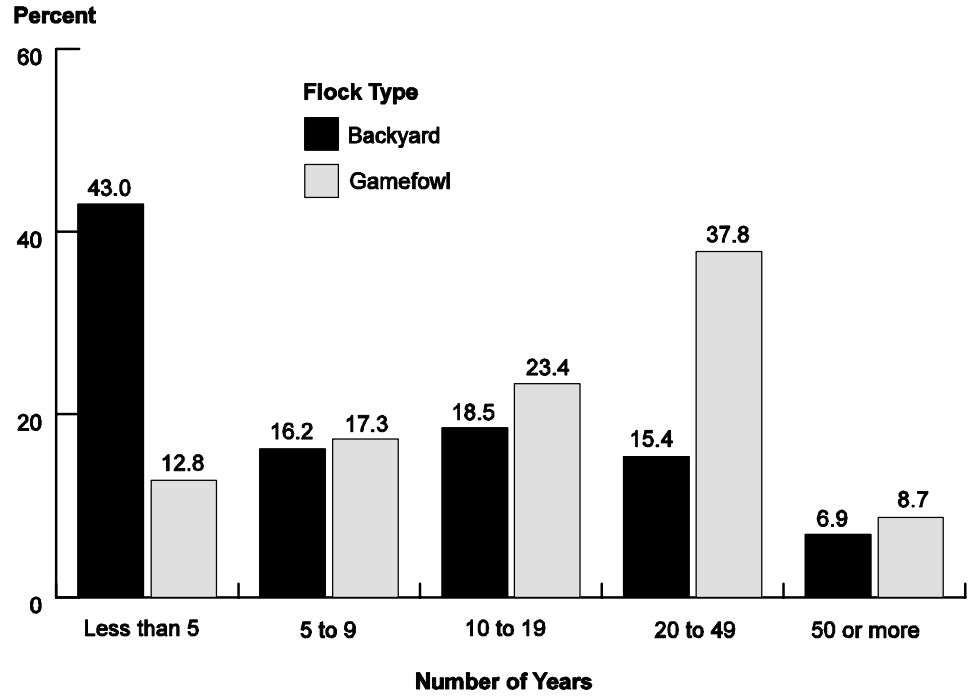
**2. Years of bird ownership**

Gamefowl breeders had raised birds on their premises longer than backyard flock producers. Nearly half the gamefowl breeders had raised birds on their premises for 20 or more years, while almost half the backyard flock producers had raised birds for less than 5 years.

a. Percentage of flocks by number of years birds had been raised by the family on the premises:

Number of Years	Percent Flocks			
	Backyard		Gamefowl	
	Percent	Std. Error	Percent	Std. Error
Less than 5	43.0	(3.6)	12.8	(1.6)
5 to 9	16.2	(2.4)	17.3	(1.9)
10 to 19	18.5	(2.3)	23.4	(2.0)
20 to 49	15.4	(2.3)	37.8	(2.3)
50 or more	6.9	(2.4)	8.7	(1.3)
Total	100.0		100.0	

**Percentage of Flocks by Number of Years Birds Had Been Raised by the Family on the Premises**



**3. Employment in commercial poultry industry**

Very few backyard flock producers or gamefowl breeders worked in the commercial poultry industry.

a. Percentage of flocks where someone in the household worked for a commercial poultry production or processing facility:

Percent Flocks			
Flock Type			
Backyard		Gamefowl	
Percent	Standard Error	Percent	Standard Error
3.5	(1.1)	0.8	(0.4)

## Section II: Methodology

### A. Needs Assessment

NAHMS develops study objectives by exploring existing literature and contacting industry members and other stakeholders about their informational needs and priorities during a needs assessment phase. For Poultry '04, the following activities were conducted:

- A focus group consisting of industry, State, Federal, and university representatives met at the World Poultry Exposition in Atlanta, Georgia, in January 2002.
- A needs assessment questionnaire was distributed to poultry veterinarians via the presidents of the egg layer, broiler, and turkey veterinary groups. This questionnaire was also distributed to State and Federal veterinarians, and laboratory and research personnel.
- Discussions were held with each of the poultry veterinary groups at the American Association of Avian Pathologists meeting in Denver, Colorado, in July 2002.
- Additional discussions occurred at the United States Animal Health Association Transmissible Diseases of Poultry Committee. This committee recommended that Poultry '04 focus its efforts addressing bird health, movement, and biosecurity practices of nontraditional poultry industries.

## Section IIa: Methodology (Backyard Flocks)

### A. Sampling and Estimation

#### 1. State selection

The initial selection of States to be included in the study was done using the NASS January 2004 poultry report. The top 10 States in terms of numbers of layers, broilers, and turkeys were selected. This process resulted in 16 States in the sample. South Carolina and Oklahoma were added due to their high combined value of production and both States' interest. The 18 States\* accounted for 80 percent of the Nation's broilers produced, 74 percent of egg production, and 84 percent of turkeys raised.

\* AL, AR, CA, DE, GA, IA, IN, MD, MN, MO, MS, NC, OH, OK, PA, SC, TX, VA



## **2. Commercial poultry operation selection**

The NASS 2002 census was used to select commercial operations with at least 10,000 chickens or at least 5,000 turkeys. The list was sorted by type of operation (broiler, layer, turkey) and geographically. A systematic random sample was selected, with the number of operations allocated to each State proportional to the value of production for that State. A letter was sent to the selected operation requesting permission to use the location of the operation as the center of a circle to canvass for backyard flocks. The State-allocated number of operations was randomly selected within operation type strata, among those agreeing to participate. Addresses of participating operations were forwarded to the NAHMS coordinator in the respective State.

## **3. Residence identification and sampling**

A 1-mile radius circle was “drawn” around each selected commercial operation. All residences within 1 mile of the selected commercial operation were identified. For circles with 20 or fewer residences, all residences were contacted. For apartment buildings and mobile home parks with less than 100 units, 5 randomly selected contacts were made, and for complexes with 100 or more units, 10 randomly selected contacts were made. For subpopulations of single-family homes in the circles, the following minimum sampling rules were used:

- Fewer than 200 homes: 20 contacts.
- 200 to 600 homes: contact 10 percent.
- More than 600 homes: 60 contacts.

These contacts were distributed throughout the neighborhood. Other homes in the circle (outside the neighborhood) were not included in this subsample and were sampled separately. Canvassers were instructed not to selectively visit residences where poultry was visible.

#### 4. Population inferences

Inferences cover the population of backyard/small production flocks within 1 mile of a commercial operation in 18 States. All respondent data were statistically weighted to reflect the population from which they were selected. The inverse of the probability of selection for each commercial operation was the initial selection weight (commercial operation weight). This weight was adjusted for the number of residences located within the circle divided by the number of contacts made, within each residence type (single family, apartment, mobile home park). The weight was further adjusted by the sum of weights for residences that qualified for the survey (backyard flocks, had birds other than pet birds) divided by the sum of weights for backyard flocks that completed the questionnaire. This adjustment was made within State, residence type, and total number of residences within the circle (fewer than 20 residences, 20 to 99 residences, 100 residences or more).

### B. Data Collection

Veterinary medical officers and animal health technicians canvassed circles between October 1 and December 1, 2004. Residences with birds other than pet birds (backyard flocks) were asked to complete a questionnaire. The interview took approximately 20 minutes to complete.

### C. Data Analysis

#### 1. Validation and estimation

Data were entered into a SAS data set. Validation checks were performed to identify numeric extremes, improper categorical responses, skip patterns not followed, and relational checks. Weighted point estimates were generated using SUDAAN software, which accounts for sampling methodology and clustering.

#### 2. Response rate

Locations of 350 commercial operations were provided to APHIS by NASS, of which 349 circles were canvassed. A total of 10,579 residences were contacted. Of these, 763 qualified to participate in the survey (backyard flocks, had birds other than or in addition to pet birds) and of those qualified, 540 (70.8 percent) participated.

Residence Type	Total Residences	Residences Contacted <sup>1</sup>
Single family	19,481	9,839
Apartment	1,086	594
Mobile home	406	146
Total	20,973	10,579

<sup>1</sup>See Section IIa, B3 for description of sampling plan

## Section IIb: Methodology (Gamefowl Breeder Flocks)

### A. Sampling and Estimation

#### 1. Mailing list

The entire mailing list for all State affiliates of the UGBA was selected (approximately 10,000 names) plus members of State associations not affiliated with UGBA. Articles appeared in several gamefowl magazines promoting the study, and a presentation was made at the UGBA annual meeting in Biloxi, Mississippi, in August 2004.

#### 2. Population inferences

Inferences cover the population of UGBA members (and members of State associations not affiliated with UGBA) in the United States. All respondent data were statistically weighted for nonresponse to reflect the population from which they were selected. The number of surveys mailed to each State, or cluster of small States, minus the number of undeliverable surveys returned was used as the initial number of "good surveys" mailed out. Because individuals could belong to more than one affiliate organization, they may have been on more than one list. Therefore, this number was reduced to account for the number of duplicate surveys, calculated as the percentage of undeliverable surveys returned that were duplicate addresses, to come up with the number of good surveys mailed out. This number was divided by the number of complete surveys returned to create the weight.

### B. Data Collection

Surveys were mailed out in November 2004. Completed surveys returned by March 10, 2005, were entered into a SAS data set and summarized for this report.

### C. Data Analysis

#### 1. Validation and estimation

Data were entered into a SAS data set. Validation checks were performed to identify numeric extremes, improper categorical responses, skip patterns not followed, and relational checks. Weighted point estimates were generated using SUDAAN software, which accounts for sampling methodology and clustering.

#### 2. Response rate

An estimated 8,882 unique surveys were mailed out, with 628 usable surveys returned (7.1 percent). Response rate ranged from 3 percent in Texas to 25 percent in Colorado. This low response rate may lead to nonresponse bias. Nevertheless, results of this study provide insights into an industry for which information is lacking.

Number of surveys mailed out, returned undeliverable, duplicate addresses (for undeliverables), and completed surveys:

Mailed out	10,759
- Undeliverable	1,179
= Delivered	9,580
Duplicate undeliverable	86 (7.3%)
Estimated unique delivered (nonduplicate)	8,882
Returned Completed surveys	628 (7.1%)

## Appendix I: Sample Profile

### A. Backyard Flocks

1. Number of **respondents** by type of commercial operation at center of circle:

Number of Respondents			
Type of Commercial Operation			
Broiler	Layer	Turkey	Total
329	147	64	540

### B. Gamefowl Breeder Flocks

Total
628

Appendix II: U.S. Poultry Statistics – 2004<sup>1, 2</sup>

Region	State	Broiler Production (1,000 head)	Eggs Produced (Million)	Turkeys Raised (1,000 head)
West	+ *California	**	5,380	15,700
	*Colorado	**	1,105	**
	*Washington	**	1,332	**
	Total	**	7,817	15,700
South Central	+ *Arkansas	1,241,500	3,565	28,500
	+ *Missouri	**	1,865	21,500
	+ *Oklahoma	243,800	**	**
	+ *Texas	620,700	4,825	**
	Total	2,106,000	10,255	50,000
North Central	+ Iowa	**	11,613	9,000
	+ Minnesota	46,300	2,930	46,500
	Nebraska	4,300	3,174	**
	North Dakota	**	**	1,000
	South Dakota	**	**	4,500
	Total	50,600	17,717	61,000
Northeast	+ *Delaware	240,700	**	**
	*Illinois	**	1,044	2,900
	+ Indiana	**	6,256	13,300
	+ *Maryland	284,600	**	**
	*Michigan	**	2,009	5,000
	New York	2,600	1,163	**
	+ *Ohio	41,600	7,355	5,800
	+ *Pennsylvania	133,500	6,585	12,000
	+ *Virginia	263,000	**	19,700
	*West Virginia	86,400	**	3,200
	Wisconsin	33,800	1,206	**
Total	1,086,200	25,618	61,900	
Southeast	+ *Alabama	1,052,000	2,099	**
	*Florida	78,500	3,068	**
	+ *Georgia	1,298,900	5,038	**
	*Kentucky	290,800	1,231	**
	+ *Mississippi	827,800	1,606	**
	+ *North Carolina	720,200	2,522	39,000
	+ *South Carolina	204,500	1,351	12,000
	*Tennessee	195,900	**	**
	Total	4,668,600	16,915	51,000
Total		7,911,400	78,322	239,600
Other States		829,250	10,809	24,607
Total U.S. (50 States)		8,740,650	89,131	264,207

+ Participated in the Backyard component of the Poultry '04 study

\* Participated in the Gamefowl component of the Poultry '04 study

\*\* State estimates less than 1 million head (1 billion eggs) combined in "Other States" category.

<sup>1</sup> Source: NASS April 2005 Poultry Production and Value, 2004 Summary

<sup>2</sup> Top commercial poultry producing States; statistics for noncommercial poultry not available

## Appendix III: Poultry '04 Study Objectives and Related Outputs

Objectives: Provide a basic understanding of bird health, management, and movement practices of live bird markets, gamefowl, and backyard flocks.

- Part I: Reference of Health and Management of Backyard/Small Production Flocks in the United States, 2004, August 2005
- Part II: Reference of Health and Management of Gamefowl Breeder Flocks in the United States, 2004, August 2005
- Part III: Reference of Management Practices in Live Poultry Markets in the United States, 2004, spring 2006
- **Part IV: Reference of Health and Management of Backyard/Small Production Flocks and Gamefowl Breeder Flocks in the United States, 2004, October 2005**
- Highlights: Health and Management of Backyard/Small Production Flocks in the United States, 2004, Info Sheet, August 2005
- Highlights: Health and Management of Gamefowl Breeder Flocks in the United States, 2004, August 2005
- Highlights: Management Practices in Live Poultry Markets in the United States, 2004, spring 2006