



United States  
Department of  
Agriculture

Animal and  
Plant Health  
Inspection  
Service

Veterinary  
Services

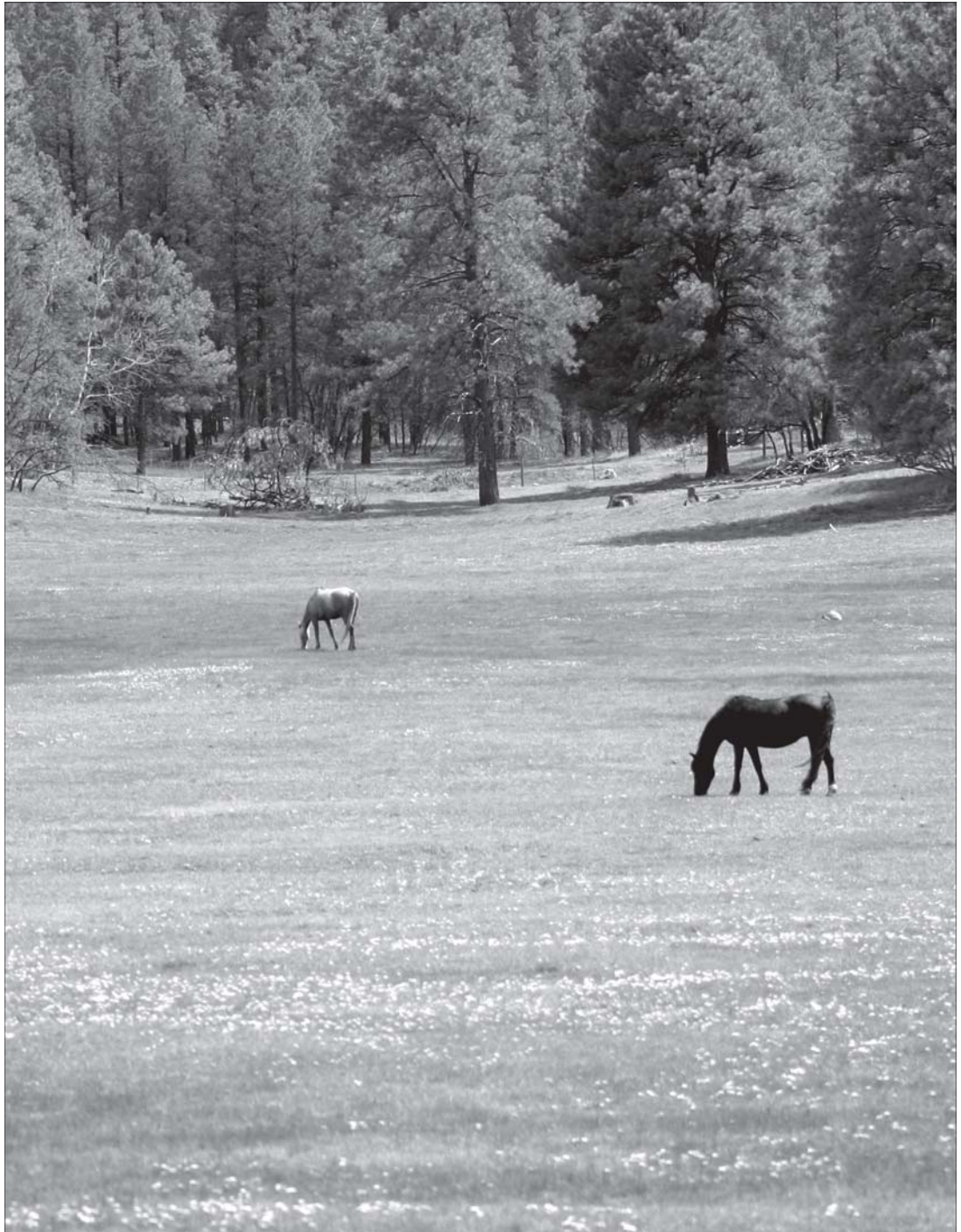
National  
Animal Health  
Monitoring  
System

March 2007



# Equine 2005

## Part II: Changes in the U.S. Equine Industry, 1998-2005



The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Mention of companies or commercial products does not imply recommendation or endorsement by the USDA over others not mentioned. USDA neither guarantees nor warrants the standard of any product mentioned. Product names are mentioned solely to report factually on available data and to provide specific information.

USDA:APHIS:VS:CEAH  
NRRC Building B, M.S. 2E7  
2150 Centre Avenue  
Fort Collins, CO 80526-8117  
970.494.7000  
E-mail: [NAHMS@usda.gov](mailto:NAHMS@usda.gov)  
<http://www.aphis.usda.gov/nahms>

#N452.0307


Cover photo courtesy of  
Judy Rodriguez

## Acknowledgments

This report was a cooperative effort between two U.S. Department of Agriculture (USDA) agencies: the National Agricultural Statistics Service (NASS) and the Animal and Plant Health Inspection Service (APHIS).

We would like to thank the NASS enumerators who visited equine operations and collected data for both the Equine '98 and Equine 2005 studies. Their hard work and dedication were invaluable. Thanks also to the veterinary medical officers who collected data for Equine '98. In addition, a note of appreciation goes to the personnel at the USDA-APHIS-Veterinary Services' Centers for Epidemiology and Animal Health for their efforts in generating and distributing this report, to Dr. Josie Traub-Dargatz for her guidance in study development and implementation, and to our reviewers for providing valuable expertise and guidance through their comments.

All participants are to be commended, particularly the equine owners whose voluntary efforts made this report possible.



Dr. Larry Granger  
Director  
Centers for Epidemiology and Animal Health

**Suggested bibliographic citation for this report:**

USDA. 2006. Equine 2005, Part II: Changes in the U.S.  
Equine Industry, 1998-2005  
USDA-APHIS-VS, CEAH. Fort Collins, CO #N452-0307

**Contacts for further information:**

Questions or comments on Equine 2005 study methods or requests for  
additional data analysis: Ms. Anne Berry (970) 494-7000  
Information on reprints or other reports: Ms. Anne Berry (970) 494-7000  
E-mail [NAHMS@aphis.usda.gov](mailto:NAHMS@aphis.usda.gov)

# Table of Contents

## Introduction 1

## Section I: Demographic Changes in the U.S. Equine Industry, 1850–2002 2

### A. Historical Changes in the U.S. Equine Industry 2

1. Inventory on farms and number of farms—Census of Agriculture 2
2. Number of equids on farms and number of farms—Census of Agriculture, 1997–2002 4
3. State-level inventory on farms and number of farms—Census of Agriculture, 1997–2002 5
4. Changes in U.S. equine inventory on all places (farms and nonfarms), 1997–2002 7
5. Value of U.S. livestock live animal exports, 1996–2005 9

## Section II: Specific Disease Surveillance in the U.S. Equine Industry 10

### A. Equine Infectious Anemia (EIA) 10

1. Number of EIA tests, 1972–2005 10
2. Percentage of positive EIA tests 11
3. Number of EIA tests and percentage positive by State, 1999–2005 11

### B. West Nile Virus (WNV) 13

1. Background 13
2. Chronological spread of equine WNV across the United States 14

### C. Vesicular Stomatitis (VS) 16

1. Background 16
2. Summary statistics, 1995–2005 16

## Section III: Management and Health Changes in the U.S. Equine Industry, 1998–2005 18

1. Background 18
2. Terms 20

### A. General 22

1. Primary function of operations 22
2. Primary use of equids 24
3. Equid distribution 25
4. Type of equid 26
5. Age of resident equids 29
6. Identification method 30

### B. Health and Health Management 33

1. Primary method of recording equine information 33
2. Testing 34
3. Familiarity with EIA 35
4. EIA testing 36
5. Vaccinations 38
6. Foal health 42
7. Equid health 46
8. Births 50

9. Foal deaths 51
10. Equid deaths 53

**C. Biosecurity 55**

1. Nonresident equids 55
2. Additions 57
3. Contact with other animals 60

**D. Equid Movement 61**

1. Distance traveled 61
2. Vehicle transportation 62
3. Destination 63
4. Direct contact with outside equids during trips 63

**E. General Management 65**

1. Feed source 65
2. Drinking water 66
3. Insect control 66
4. Manure management 68

**Appendix: Study Objectives and Related Outputs 69**

## Introduction

In 1983, promoters of the concept that would become the USDA's National Animal Health Monitoring System (NAHMS) envisioned a program that would monitor changes and trends in national animal health and management, thereby providing periodic snapshots of the U.S. livestock industries. With these industry overviews, stakeholders could identify opportunities for improvement, provide changing priorities for research and special studies, and detect emerging problems. Two NAHMS snapshots of the U.S. equine industry have been performed via the Equine 1998 and Equine 2005 studies.

Section I of this report presents demographic changes of the U.S. equine population from a historical perspective using data provided by the National Agricultural Statistics Service (NASS), Census of Agriculture, and U.S. Bureau of Census. Section II includes historical data regarding equine infectious anemia, West Nile virus, and vesicular stomatitis. Results of the two NAHMS studies in Section III provide an overview of changes in U.S. equine management and health from 1998 through 2005. Results of the Equine 1998 and 2005 studies and other NAHMS studies are available online at:  
<http://www.aphis.usda.gov/nahms>.

For questions about this report or additional copies contact:

USDA-APHIS-VS-CEAH  
2150 Centre Avenue, Bldg. B, MS 2E7  
Fort Collins, CO 80526-8117  
970.494.7000

## Section I: Demographic Changes in the U.S. Equine Industry, 1850–2002

This section presents data from sources other than the NAHMS Equine '98 and 2005 studies, so as to provide comprehensive information on the U.S. equine population.

### A. Historical Changes in the U.S. Equine Industry

#### 1. Inventory on farms and number of farms—Census of Agriculture

The Census of Agriculture has collected and reported equine inventory numbers roughly at 5-year intervals since 1840. The table on p. 3 shows inventory numbers from 1850-1920 at 10-year intervals and at 5-year intervals thereafter. The Census of Agriculture aggregates and reports data from all places that qualify as a farm. The current definition of a farm, first used in 1974, is a place that could or did actually sell \$1,000 of agricultural products annually. In addition, as of 1987 any operation that has five or more equids (other than commercial enterprises such as race tracks) qualifies as a farm, even if it has no other agricultural activity.

The total number of equids on farms can be derived from Census reports by combining the reported inventories for horses and ponies with the inventories for mules, donkeys, and burros (some years donkeys and burros were excluded and only mule numbers were collected). In 1954 and 1959 inventories were combined and reported under the “Horses and Ponies” category. The total number of farms with any equids cannot be similarly derived, as a given farm could have had more than one type of equid. Therefore, the table on p. 3 does not provide number of farms with equids.

Total equids increased rapidly from 4.9 million head in 1850 to a peak of 25.2 million head in 1920. Inventories thereafter mostly declined, except for the 20 years prior to the last Census. There were 3.7 million equids on farms in the United States in 2002, about three-fourths of the 4.9 million reported in 1850.

Horse and pony numbers peaked in 1910 at 19.8 million head. It is likely that the number of horses and ponies in the United States declined rapidly during the 1920s and 1930s because motorized vehicles replaced them as a means of transportation. By 1950, the number of horses and ponies was only about one-third of what it was in 1925. The decline continued until the low of 1.6 million head in 1974. As of 2002, there were 3.6 million horses and ponies in the United States, the highest number on farms since 1954.

There have always been fewer mules, donkeys, and burros than horses and ponies in the United States. The number of mules peaked in 1925 at 5.7 million head, about one-third the number of horses and ponies. The number of mules, donkeys, and burros declined rapidly in the late 1950s, 1960s and 1970s to 27,430 head in 1982. In 2002, there were 105,358 mules, donkeys, and burros.

Interestingly, in 2002 the number of horses and ponies per farm (6.7 head), and the number of mules, donkeys, and burros (3.5 head) were at all-time highs.



## Changes in U.S. equine inventory, 1850–2002:

Year/Month	Horses and Ponies			Mules, Burros, and Donkeys			Total Equine Inventory	Pct. of 1850
	Total Inventory	Number of Farms	Avg. per Farm	Total Inventory	Number of Farms	Avg. per Farm		
1850 (June 1)	4,336,719	N/A	N/A	559,331	N/A	N/A	4,896,050	100.0
1860 (June 1)	6,249,174	N/A	N/A	1,151,148	N/A	N/A	7,400,322	151.1
1870 (June 1)	7,145,370	N/A	N/A	1,125,415	N/A	N/A	8,270,785	168.9
1880 (June 1)	10,357,488	N/A	N/A	1,812,808	N/A	N/A	12,170,296	248.6
1890 (June 1)	15,266,244	N/A	N/A	2,251,876 <sup>2</sup>	N/A	N/A	17,518,120	357.8
1900 (June 1)	18,267,020	4,530,628	4.0	3,264,615 <sup>2</sup>	1,480,652 <sup>2</sup>	2.2	21,531,635 <sup>2</sup>	439.8
1910 (Apr. 15)	19,833,113	4,692,814	4.2	4,209,769 <sup>2</sup>	1,869,005 <sup>2</sup>	2.3	24,042,882 <sup>2</sup>	491.1
1920 (Jan. 1)	19,767,161	4,704,235	4.2	5,432,391 <sup>2</sup>	2,259,746 <sup>2</sup>	2.4	25,199,552 <sup>2</sup>	514.7
1925 (Jan. 1)	16,400,623	5,365,513	3.1	5,680,897 <sup>2</sup>	N/A	N/A	22,081,520 <sup>2</sup>	451.0
1930 (Apr. 1)	13,510,839	5,024,713	2.7	5,375,017 <sup>2</sup>	N/A	N/A	18,885,856 <sup>2</sup>	385.7
1935 (Jan. 1)	11,857,850	3,536,597	3.4	4,818,160 <sup>2</sup>	2,255,845 <sup>2</sup>	2.1	16,676,010 <sup>2</sup>	340.6
1940 (Apr. 1)	10,086,971	3,148,656	3.2	3,844,560 <sup>2</sup>	1,845,517 <sup>2</sup>	2.1	13,931,531 <sup>2</sup>	284.5
1945 (Jan. 1)	8,499,204	2,828,412	3.0	3,129,590 <sup>2</sup>	1,486,209 <sup>2</sup>	2.1	11,628,794 <sup>2</sup>	237.5
1950 (Apr. 1)	5,401,646	2,120,843	2.5	2,202,264 <sup>2</sup>	1,101,799 <sup>2</sup>	2.0	7,603,910 <sup>2</sup>	155.3
1954 (Oct.-Nov)	4,141,288 <sup>1</sup>	1,799,899 <sup>1</sup>	2.3	N/A	N/A	N/A	4,141,288 <sup>1</sup>	84.6
1959 (Oct.-Nov.)	2,955,256 <sup>1</sup>	1,138,986 <sup>1</sup>	2.6	N/A	N/A	N/A	2,955,256 <sup>1</sup>	60.4
1964 (Nov.-Dec.)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1969 (Dec. 31)	2,237,981	547,246	4.1	66,128	34,309	1.9	2,304,109	47.1
1974 (Dec. 31)	1,595,640	359,051	4.4	N/A	N/A	N/A	N/A	N/A
1978 (Dec. 31)	1,957,028	399,335	4.9	56,703	27,631	2.1	2,013,731	41.1
1982 (Dec. 31)	2,260,791	417,042	5.4	27,430	10,431	2.6	2,288,221	46.7
1987 (Dec. 31)	2,456,951	415,565	5.9	56,520	23,311	2.4	2,513,471	51.3
1992 (Dec. 31)	2,049,522	338,346	6.1	67,692	25,589	2.6	2,117,214	43.2
1997* (Dec. 31)	3,020,117	490,517	6.2	123,211	44,096	2.8	3,143,328	64.2
2002* (Dec. 31)	3,644,278	542,223	6.7	105,358	29,936	3.5	3,749,636	76.6

## Notes:

1890-1954: Number of mules on farms. Donkeys and burros were excluded.

1940: Horse and pony inventory includes only animals older than 3 months of age.

1954 and 1959: Horse, pony, and mule inventories reported together.

1964: No equine data.

N/A = not available.

\*1997 and 2002 = Census of Agriculture adjusted for incompleteness.

Source: USDA-NASS Census of Agriculture 1997 and 2002; 1850-1992 prepared by Commerce Department U.S. Bureau of Census.

<sup>1</sup>Farms reporting horses and/or mules in some States.

<sup>2</sup>Excludes burros and donkeys.

## 2. Number of equids on farms and number of farms—Census of Agriculture, 1997–2002

The 2002 Census reported 3.7 million equids on farms in the United States, a 19.3 percent increase from the number reported in the 1997 Census. A total of 552,900 farms had equids in 2002, a 10.2 percent increase from 1997.

Interestingly, the roughly half-million farms with equids is nearly three-fourths the number of farms with beef cows, six times the number of farms with milk cows, and seven times the number of hog and sheep farms.

The table below provides comparisons between 1997 and 2002 for various levels of farm size (number of equids on the farm). For example, for the smallest farms—those with 1 to 4 equids—the number of equids for both Census periods was about 657,000 head, while the number of the smallest farms actually declined 3.8 percent from 285,000 farms in 1997 to 274,300 farms in 2002. Note that this particular category is composed of places that sold at least \$1,000 worth of agricultural products and also had one to four equids. For the remaining size categories, the operation may have qualified as a farm based upon the number of equids (five or more) and/or sales of \$1,000 or more. For farms with 5 to 9 equids, the total number of equids increased 27.6 percent between 1997 and 2002, while the number of equids on farms with 10 to 19 equids increased 40.3 percent. The number of equids on farms with 20 or more equids increased 7.8 percent between 1997 and 2000, while the number of farms increased 10.5 percent, indicating that the number of equids per farm decreased.

Changes in U.S. equine inventory and number of farms, by size of farm, 1997–2002:

Number of Equids	Equids			Farms		
	1997 Number (x1,000)	2002 Number (x1,000)	2002 as % of 1997	1997 Number (x1,000)	2002 Number (x1,000)	2002 as % of 1997
1 to 4	656.9	656.6	100.0	285.0	274.3	96.2
5 to 9	867.8	1,107.1	127.6	136.0	172.4	126.8
10 to 19	740.3	1,038.8	140.3	58.0	81.0	139.7
20 or more	878.3	947.1	107.8	22.8	25.2	110.5
All	3,143.3	3,749.6	119.3	501.8	552.9	110.2
5 or more	2,486.4	3,093.0	124.4	216.7*	278.6	128.6

\*Sum may not add due to rounding.

Source: USDA-NASS Census of Agriculture

### 3. State-level inventory on farms and number of farms—Census of Agriculture, 1997–2002

A comparison by State of the data from the two Census periods is presented in the table on p. 6. Note that in 2002 Texas had 10.2 percent of the horses and ponies in the United States, with 372,300 head reported on 62,800 farms. The next States with the most horses and ponies (nearly 150,000 head) were Kentucky, Oklahoma, and Tennessee. Texas had 21.5 percent of the U.S. mules, burros, and donkeys. Note also that this table identifies the 28 States for which in-depth health and management practice trends are discussed in Section III of this report.



Photograph by Judy Rodriguez

## Changes in equine inventories and number of farms with equids, by State, 1997 and 2002:

State	Inventory—Animals on Farms (x1,000)						Number of Farms with Equids (x1,000)					
	Horses and Ponies		Mules, Burros, and Donkeys		All Equids <sup>1</sup>		Horses and Ponies		Mules, Burros, and Donkeys		All Equids	
	1997	2002	1997	2002	1997	2002	1997	2002	1997	2002	1997	2002
Alabama*	53.9	65.5	3.7	3.6	57.6	69.1	9.7	10.3	1.3	1.0	10.1	10.8
Alaska	2.4	1.9	0.0	0.0	2.4	1.9	0.2	0.2	0.0	0.0	0.2	0.2
Arizona	47.7	46.9	1.3	0.5	49.0	47.4	4.3	3.7	0.5	0.2	4.3	3.8
Arkansas	46.5	72.3	3.0	2.9	49.5	75.2	9.6	12.0	1.1	0.8	9.8	12.3
California*	149.3	132.0	4.0	2.5	153.3	134.4	19.3	16.4	1.5	0.7	19.5	16.6
Colorado*	89.1	107.1	2.8	1.9	91.9	109.0	12.4	13.9	1.0	0.6	12.5	14.0
Connecticut	9.9	9.5	0.2	0.1	10.1	9.6	1.2	1.2	0.1	0.1	1.3	1.2
Delaware	3.7	3.5	0.0	0.0	3.7	3.5	0.5	0.5	0.0	0.0	0.5	0.5
Florida*	70.1	99.9	2.7	1.6	72.8	101.5	9.8	12.8	0.7	0.6	10.0	12.9
Georgia*	49.3	74.0	2.4	2.7	51.6	76.8	8.5	11.5	0.9	0.8	8.8	11.8
Hawaii	4.9	4.6	0.1	0.1	5.0	4.6	0.6	0.5	0.0	0.0	0.6	0.5
Idaho	69.5	83.2	2.3	1.2	71.9	84.4	10.5	11.6	0.8	0.4	10.6	11.6
Illinois*	63.1	59.6	2.2	1.7	65.3	61.3	9.8	9.0	0.8	0.5	10.0	9.2
Indiana*	76.8	98.4	2.6	2.1	79.4	100.5	12.5	14.5	0.8	0.6	12.8	14.7
Iowa	68.6	77.1	2.5	2.1	71.1	79.2	11.2	11.5	0.8	0.4	11.4	11.6
Kansas*	58.1	67.4	2.0	1.5	60.0	68.9	11.9	12.2	0.8	0.5	12.1	12.3
Kentucky*	108.6	149.5	4.6	4.1	113.3	153.6	15.9	20.1	1.7	1.2	16.5	20.5
Louisiana*	41.3	47.8	1.8	1.1	43.1	48.9	7.6	7.1	0.6	0.3	7.8	7.3
Maine	8.8	12.7	0.2	0.2	9.0	12.9	1.6	2.2	0.1	0.1	1.6	2.2
Maryland*	25.7	25.9	0.7	0.4	26.4	26.4	3.1	3.2	0.3	0.2	3.1	3.2
Massachusetts	13.8	15.5	0.5	0.2	14.3	15.7	1.9	1.9	0.1	0.1	2.0	1.9
Michigan*	82.7	104.9	1.7	1.7	84.4	106.6	11.9	15.0	0.6	0.5	12.0	15.1
Minnesota*	69.7	92.8	1.5	1.3	71.2	94.0	11.5	14.3	0.6	0.4	11.6	14.4
Mississippi	46.9	66.8	2.6	2.1	49.5	68.9	9.0	10.8	1.0	0.7	9.3	11.0
Missouri*	104.1	141.4	5.3	4.7	109.4	146.0	19.7	23.6	1.9	1.4	20.2	24.1
Montana*	80.9	94.4	2.8	3.2	83.8	97.6	12.0	12.5	0.9	0.7	12.1	12.6
Nebraska	50.1	58.9	1.2	1.4	51.3	60.3	9.1	9.3	0.4	0.3	9.2	9.4
Nevada	15.7	16.1	0.4	0.2	16.0	16.3	1.8	1.7	0.1	0.1	1.8	1.8
New Hampshire	7.5	7.9	0.2	0.2	7.7	8.2	1.2	1.2	0.1	0.1	1.2	1.3
New Jersey*	25.0	26.9	0.4	0.5	25.5	27.4	2.7	3.0	0.2	0.2	2.7	3.1
New Mexico*	47.8	46.7	1.4	0.8	49.2	47.5	7.8	7.2	0.6	0.2	7.9	7.3
New York*	67.3	75.3	1.3	1.4	68.6	76.7	9.6	10.9	0.6	0.5	9.8	11.0
North Carolina	57.8	64.2	2.1	2.2	59.9	66.4	10.4	10.9	0.9	0.7	10.7	11.1
North Dakota	38.3	43.4	0.5	0.2	38.8	43.6	5.4	5.0	0.2	0.1	5.4	5.0
Ohio*	101.6	134.4	3.4	3.7	105.0	138.1	16.3	19.9	1.2	1.0	16.6	20.3
Oklahoma*	111.8	150.1	4.4	4.3	116.3	154.4	22.6	25.7	1.9	1.4	23.1	26.2
Oregon*	82.6	92.4	3.8	2.8	86.5	95.2	13.6	14.5	1.2	0.8	13.8	14.7
Pennsylvania*	99.5	113.4	6.5	3.7	105.9	117.1	16.1	16.8	1.6	0.8	16.3	17.1
Rhode Island	1.9	2.0	0.0	0.0	1.9	2.0	0.3	0.2	0.0	0.0	0.3	0.2
South Carolina	32.5	40.7	1.1	1.2	33.6	41.9	5.6	6.3	0.5	0.3	5.7	6.4
South Dakota	55.1	69.6	0.8	0.8	55.8	70.3	7.4	7.9	0.4	0.2	7.4	8.0
Tennessee*	114.7	148.7	8.2	6.4	122.9	155.0	20.3	24.0	2.9	1.9	21.3	24.9
Texas*	296.9	372.3	22.2	22.7	319.1	395.1	57.2	62.8	8.1	6.2	60.0	65.7
Utah	54.5	61.4	1.0	0.6	55.5	61.9	8.1	8.5	0.4	0.2	8.1	8.5
Vermont	11.9	11.2	0.3	0.4	12.2	11.7	1.7	1.8	0.1	0.1	1.8	1.9
Virginia*	68.3	81.3	2.9	2.5	71.2	83.9	11.0	12.3	1.0	0.7	11.3	12.6
Washington*	85.8	76.0	2.8	1.5	88.6	77.5	12.9	11.2	1.0	0.5	13.0	11.3
West Virginia	22.5	31.9	1.2	1.1	23.8	32.9	5.0	6.2	0.5	0.4	5.2	6.4
Wisconsin*	74.0	102.0	2.4	2.1	76.4	104.1	13.1	16.3	0.9	0.6	13.3	16.5
Wyoming*	51.4	62.9	1.1	0.8	52.5	63.7	5.4	6.1	0.4	0.2	5.5	6.1
Total <sup>1</sup> (28 States*)	2,349.4	2,843.0	101.6	87.3	2,451.2	2,930.3	384.2	427.1	36.0	25.0	393.7	436.3
Total <sup>2</sup> (50 States)	3,020.1	3,644.3	123.2	105.4	3,143.3	3,749.6	490.5	542.2	44.1	29.9	501.8	552.9

<sup>1</sup>Sum of horses and ponies, and mules, burros, and donkeys may not equal sum of all equids because of rounding.<sup>2</sup>Sum may not equal total because of rounding.

\*States participating in NAHMS Equine 1998 and 2005 studies.

Source: USDA-NASS Census of Agriculture. Values of 0.0 = fewer than 50 reported.

#### **4. Changes in U.S. equine inventory on all places (farms and nonfarms), 1997–2002**

There is no accurate estimate of the current total number of equids in the United States because the number of equids on nonfarm operations does not exist. On-farm equine estimates are conducted every 5 years as part of the Census of Agriculture (for the definition of a “farm” see p. 2). The only nonfarm equine estimates conducted by NASS occurred in 1998-99. USDA does not have an equine estimation program like it does for other livestock, poultry, and aquaculture. Speculation would suggest that now each Census of Agriculture represents a smaller and smaller portion of the equine population—currently 50 to 60 percent of the total equine population—because it only counts equids on places that meet the definition of a farm.

Today, statistics exist on nearly every phase of the economy. For example, in animal agriculture we know how many goats there are—even the numbers of mink and honeybee colonies are collected. During the early years of the Census, farm and ranch work was definitely the primary use of equids. In addition, a high percentage of the human population resided on farms and ranches and used equids as their primary means of transportation. The development of the automobile reduced the need for equids in the large farm sector as well as the urban sector. Horse-drawn farm machinery was soon altered, as the tractor was developed and fewer equids were needed on the farm.

One might speculate that the Census of Agriculture reports showing a large increase of equids in the early 1900s and the subsequent drop to the low levels in the 1950s still represented a high percentage of all equids in the United States. During the last few decades, small communities and the outskirts of cities have become popular destinations for people looking for a few acres in a “rural” environment. These rural environments provide room for a horse, or several horses, for riding and pleasure. The only measure we have in the United States quantifying this phenomena is the baseline study conducted by NASS in 1998 and 1999 (see table p. 8). This study showed that 3.20 million equids were on farms and 2.05 million were on nonfarms. Therefore, the conclusion is that the 1997 Census of Agriculture represents about 61 percent of the equids in the United States. No estimates were provided from the study on the number of places with equids.

U.S. equine inventory, 1997–2002:

<b>Inventory (Million Head)</b>				
<b>Date</b>	<b>Farm</b>	<b>Nonfarm</b>	<b>Total</b>	<b>No. Farms (x1,000)</b>
1997 Census	3.14	N/A	N/A	501.8
Jan. 1, 1998 (percent of total)	3.20 (61.0)	2.05 (39.0)	5.25 (100.0)	N/A
Jan. 1, 1999	N/A	N/A	5.32	N/A
2002 Census	3.75	N/A	N/A	552.9

The American Horse Council Foundation published an estimate of U.S. horse inventory for calendar year 2003. The estimate resulted from a survey of horse owners and suppliers conducted by Deloitte Consulting, LLC, a large auditing firm. The Deloitte estimate of 9.2 million horses in 2003 was nearly twice as great as the USDA-NASS equine estimate for 1999 (5.3 million equids), the last year for which NASS published such an inventory count. The large difference between the USDA-NASS 1999 estimate and Deloitte's 2003 estimate raises questions as to the true number of horses in the United States. USDA-NASS conducted a review of Deloitte's methodology at the request of USDA-APHIS. Based on this review, several distinct differences were identified between the two approaches to measuring the U.S. inventory.

First, different list-development procedures were employed by Deloitte and NASS, which leads to different adjustment procedures for missing data. Second, NASS methodology employs a multiframe approach, supplementing list-building activities with an area frame sample. The area frame is land-based and inherently includes all possible equine operations. It provides the capability to measure and adjust for list under-coverage and provides a measure of associated sampling error. Third, differences in list construction, nonresponse follow-up procedures, data adjustment procedures, and survey focus all contribute to the wide disparity in final inventory estimated by both studies.

### 5. Value of U.S. livestock live animal exports, 1996–2005

Although the value of U.S. livestock exports fluctuates greatly, the value of U.S. equine exports exceeded the value of U.S. swine, cattle, poultry, and sheep live-animal exports each year from 1996 through 2005. In addition to the exports recorded here, there are also seasonal, temporary export and return of U.S. equids to other countries.

Changes in U.S. livestock export values, 1996–2005:

<b>Cumulative-to-Date U.S. Export Values (x\$1,000)—World Totals, Live Animals</b>					
<b>Year</b>	<b>Equids</b>	<b>Swine</b>	<b>Cattle</b>	<b>Poultry</b>	<b>Sheep</b>
1996	248,445	8,816	113,141	95,071	14,204
1997	270,926	11,651	177,262	102,026	59,135
1998	316,537	23,414	162,363	98,673	25,274
1999	293,089	18,803	174,008	96,512	18,964
2000	422,648	11,901	271,607	84,454	17,750
2001	447,626	11,560	270,134	91,495	18,682
2002	302,039	37,967	131,433	94,417	19,930
2003	329,671	33,086	63,223	90,852	10,273
2004	343,872	32,804	3,230	63,900	6,449
2005	461,541	25,936	7,216	95,522	6,507

Source: USDA, Foreign Agricultural Service

## Section II: Specific Disease Surveillance in the U.S. Equine Industry

This section presents data from sources other than the NAHMS Equine '98 and 2005 studies, so as to provide comprehensive information on three equine diseases: equine infectious anemia, West Nile virus, and vesicular stomatitis.

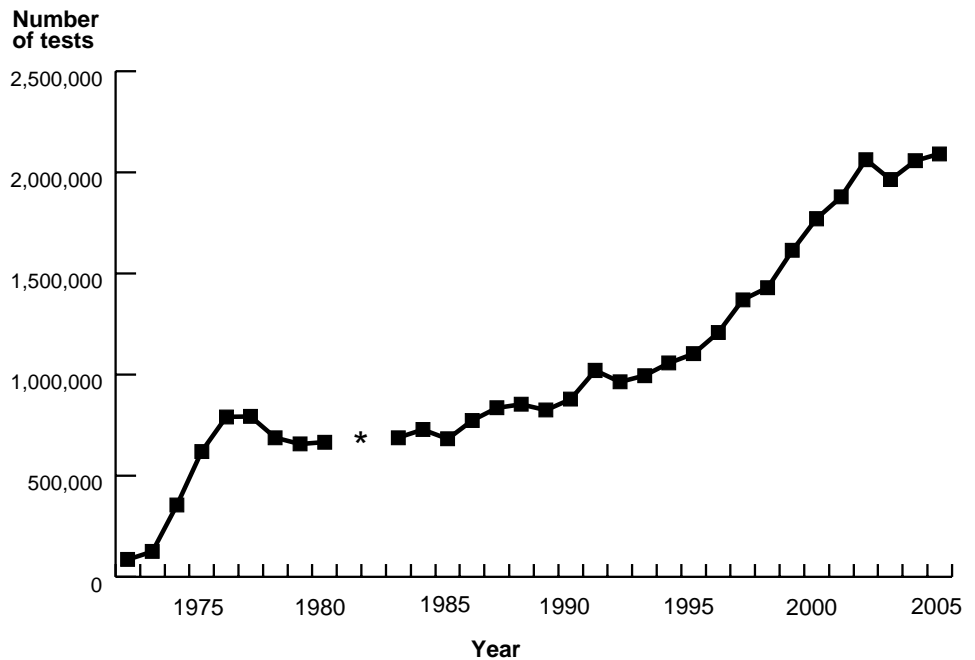
### A. Equine Infectious Anemia (EIA)

#### 1. Number of EIA tests, 1972–2005

EIA testing in the United States utilizing the Coggins test began in 1972. Since then, other tests for detecting EIA have been developed and approved. Data exist from 1972 to 2005 on the number of tests performed by each State annually and the percentage of those tests that were positive for EIA. The number of EIA tests has generally increased, with over 2 million tests performed in 2005. This increase could be due to multiple factors, e.g., more awareness of the disease, changes in testing requirements, more animal movement requiring testing, or an increase in the equine population.

---

**Number of EIA Tests Performed in the United States, 1972-2005**



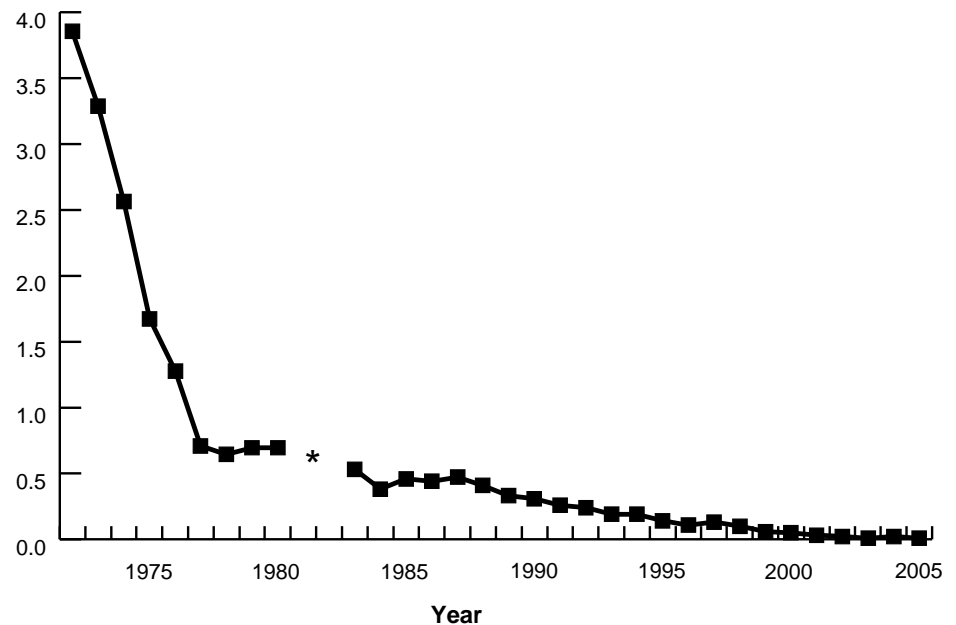


## 2. Percentage of positive EIA tests

The percentage of positive EIA tests among those tested declined steadily from nearly 4 percent in 1972 to less than 0.1 percent in 2005, with the most dramatic decline occurring from 1972 to 1978.

### Percentage of Samples that Tested Positive for EIA in the United States, 1972-2005

Percent tests positive



\*Data not available for 1981 and 1982

## 3. Number of EIA tests and percentage positive by State, 1999–2005

The number of EIA tests increased from 1999 to 2005. The percentage of tests positive for EIA among those tested declined in 2005 (0.01) compared to 1999 (0.06). States with the highest percentage of tests positive for EIA in 1999 (above 0.065) included Arizona, Arkansas, Louisiana, Michigan, Mississippi, North Dakota, Oklahoma, and Texas; in 2005 States with the highest percentage of positive tests (above 0.015) included Arkansas, Mississippi, Oklahoma, Texas, and Utah. The number of EIA tests in a given State is affected by local as well as intra- and interstate movement requirements and can vary over time based on changes in regulations and movement patterns.

## Number tested for EIA and percentage positive for EIA, 1999–2005:

State	1999			Number Tested					2005		
	Number Tested	Number Positive of Those Tested	Percent Positive of Those Tested	Number Tested					Number Tested	Number Positive of Those Tested	Percent Positive of Those Tested
				2000	2001	2002	2003	2004			
Alabama*	29,037	4	0.014	36,308	35,062	35,723	37,844	37,597	38,442	1	0.003
Alaska	1,599	0	0.000	1,752	1,607	1,472	1,220	1,391	1,301	0	0.000
Arizona	6,766	15	0.222	12,866	16,178	14,079	12,662	14,094	13,395	0	0.000
Arkansas	67,318	148	0.220	66,786	66,368	71,058	71,058	38,030	79,354	35	0.044
California*	24,580	1	0.004	25,677	30,666	32,834	34,468	34,777	40,499	1	0.002
Colorado*	18,437	5	0.027	21,434	25,781	18,450	29,279	29,635	27,815	3	0.011
Connecticut	2,330	0	0.000	2,373	2,447	2,277	2,376	4,933	1,298	0	0.000
Delaware	4,105	0	0.000	3,488	5,902	6,225	7,028	36,227	6,211	0	0.000
Florida*	111,776	21	0.019	125,205	130,173	131,598	130,751	129,960	141,140	2	0.001
Georgia*	63,874	5	0.008	57,448	67,484	66,692	62,265	64,661	59,781	2	0.003
Hawaii	571	0	0.000	503	318	212	511	689	720	0	0.000
Idaho	6,122	4	0.065	6,727	13,928	14,485	7,394	13,895	14,739	1	0.007
Illinois*	61,748	18	0.029	63,825	62,967	59,090	64,686	66,008	64,831	2	0.003
Indiana*	24,033	13	0.054	19,460	28,744	29,511	33,219	32,622	33,623	1	0.003
Iowa	12,880	1	0.008	25,392	16,012	18,697	19,215	22,002	22,721	1	0.004
Kansas*	17,243	3	0.017	14,870	16,255	18,463	17,985	6,737	13,291	2	0.015
Kentucky*	92,771	6	0.006	102,054	108,825	109,529	108,866	114,469	121,516	2	0.002
Louisiana*	39,140	109	0.278	46,284	61,953	70,000	30,766	49,632	9,891	3	0.030
Maine	5,426	0	0.000	5,607	5,325	6,544	6,454	6,087	6,896	1	0.015
Maryland*	29,070	1	0.003	31,140	30,963	32,534	34,690	39,610	34,371	0	0.000
Massachusetts	12,079	0	0.000	12,655	11,829	10,512	11,607	9,015	9,622	0	0.000
Michigan*	19,795	38	0.192	17,666	80,535	72,628	41,010	42,299	64,055	2	0.003
Minnesota*	38,952	9	0.023	47,700	46,029	48,326	47,354	47,543	47,118	5	0.011
Mississippi	40,921	31	0.076	28,381	26,228	38,080	36,236	43,517	42,910	9	0.021
Missouri*	84,910	18	0.021	97,795	75,205	110,224	110,354	115,129	69,750	2	0.003
Montana*	12,059	2	0.017	15,576	16,872	15,742	16,753	16,752	15,458	1	0.006
Nebraska	9,387	0	0.000	10,766	12,120	12,682	13,279	13,775	14,148	1	0.007
Nevada	6,198	4	0.065	7,912	10,174	11,045	14,879	17,229	18,229	0	0.000
New Hampshire	9,787	0	0.000	10,025	10,706	14,844	15,020	16,239	17,701	2	0.011
New Jersey*	34,386	2	0.006	25,115	15,578	25,549	24,203	28,027	24,855	0	0.000
New Mexico*	9,366	3	0.032	14,330	14,971	16,940	18,975	17,858	17,913	0	0.000
New York*	45,411	4	0.009	53,087	50,522	56,242	57,254	58,100	55,784	1	0.002
North Carolina	48,754	7	0.014	60,548	54,175	70,247	70,656	62,371	72,419	4	0.006
North Dakota	11,239	22	0.196	10,168	9,798	10,298	11,644	10,352	11,502	1	0.009
Ohio*	49,774	6	0.012	53,568	54,398	58,988	58,887	59,740	58,782	1	0.002
Oklahoma*	69,588	141	0.203	61,017	84,325	93,653	103,704	102,475	84,733	23	0.027
Oregon*	8,094	0	0.000	8,650	10,026	9,412	8,765	9,073	10,206	0	0.000
Pennsylvania*	44,925	2	0.004	51,594	53,166	75,070	58,407	67,411	88,546	4	0.005
Rhode Island	1,106	0	0.000	1,042	1,128	429	2,021	2,139	2,282	0	0.000
South Carolina	29,055	0	0.000	32,760	33,730	35,575	35,016	36,648	37,360	0	0.000
South Dakota	7,391	0	0.000	9,379	9,219	9,296	9,303	9,817	9,376	0	0.000
Tennessee*	72,872	23	0.032	66,110	69,536	71,923	80,733	97,577	83,412	4	0.005
Texas*	181,571	279	0.154	247,035	245,926	258,080	227,225	258,364	312,911	57	0.018
Utah	12,630	1	0.008	15,573	14,165	13,280	17,012	13,219	14,320	4	0.028
Vermont	209	0	0.000	208	227	7,263	9,020	9,737	4,866	0	0.000
Virginia*	49,569	7	0.014	57,695	53,967	49,222	55,380	54,629	93,804	0	0.000
Washington*	9,421	0	0.000	7,579	10,000	10,083	2,826	14,630	10,566	1	0.009
West Virginia	9,421	0	0.000	11,599	12,018	13,199	13,902	16,115	17,396	1	0.006
Wisconsin*	56,068	11	0.020	52,355	52,262	91,554	65,018	71,216	47,859	3	0.006
Wyoming*	9,643	1	0.010	11,291	12,738	11,719	12,329	11,460	12,907	0	0.000
Total (28 States*)	1,301,268	732	0.056	1,441,893	1,555,635	1,679,779	1,589,016	1,694,230	1,683,859	123	0.009
Total (50 States)	1,613,407	965	0.060	1,768,378	1,878,531	2,061,578	1,961,509	2,074,513	2,102,625	183	0.010

\*States participating in NAHMS Equine '98 and 2005 studies.

## B. West Nile Virus (WNV)

### 1. Background

WNV was first reported in the United States in 1999, with recognized illness due to the infection in birds, humans, and horses in New York. In 2000, seven States reported equine WNV cases, with the largest numbers of infection occurring in New Jersey and New York. In 2001, WNV was reported in 20 States as the virus moved south from the Northeast through the eastern coastal States. In 2001, Florida reported the largest number of equine WNV infections with just under 500 cases, over 7 times as many as any other State that year.

From 1999 through 2001, WNV infections were considered an emerging disease occurrence. Testing for the disease in horses was performed through the National Veterinary Services Laboratories (NVSL). In 2002, WNV was redefined by USDA-APHIS-Veterinary Services as an endemic disease to the United States, and testing moved to regional veterinary diagnostic laboratories as well as NVSL. The ability to track cases became more challenging as testing and reporting became more dispersed. Staff at USDA-APHIS-Veterinary Services have reported the number and State location of equine WNV cases from 1999 through 2005. Current information and surveillance data on WNV is available at: <https://www.aphis.usda.gov/aphis/ourfocus/animalhealth>.

Number of U.S. equine WNV cases, 1999–2005:

1999	2000	2001	2002	2003	2004	2005
25	60	738	15,257	5,181	1,406	1,088

In summer 2001, a conditionally licensed vaccine for prevention of WNV infection in equids was released. By early 2003, this vaccine had a full license, and early in 2004 a second equine WNV vaccine became fully licensed. In fall 2006, a third vaccine was licensed. Prior to release of these vaccines, protection against WNV was limited to efforts that minimized animals' exposure to insect vectors.

In 2002, 15,257 equine WNV cases were reported from 41 States. Of these, 9 States had over 500 but less than 1,000 cases and 4 States had more than 1,000 cases in 2002. The highest intensity of reported equine WNV cases moved to the Central United States.

In 2003, the number of equine WNV cases decreased to 5,181, approximately one-third the number in 2002. Vaccination of equids, alteration in the ecology of the virus, heightened vector control efforts, naturally acquired immunity by some of the equine population, along with the potential for less rigorous diagnostic

testing may have contributed to the reduction in number of cases. In 2003, the largest numbers of cases were reported from Texas, Pennsylvania, Colorado, and New Mexico, each of which had over 400 cases. In some States, such as Colorado, the number of equine WNV cases increased from the first year to the second year. Other States, like Nebraska, reported a decline in the number of reported cases in the second year. This could be due to an actual change in number of cases or to increased or decreased recognition, testing, or reporting of the infection. It is likely that immunization with the WNV vaccines had an impact on reduction in equine WNV cases, as the number of human cases actually increased in 2003 compared to 2002 on a national basis.

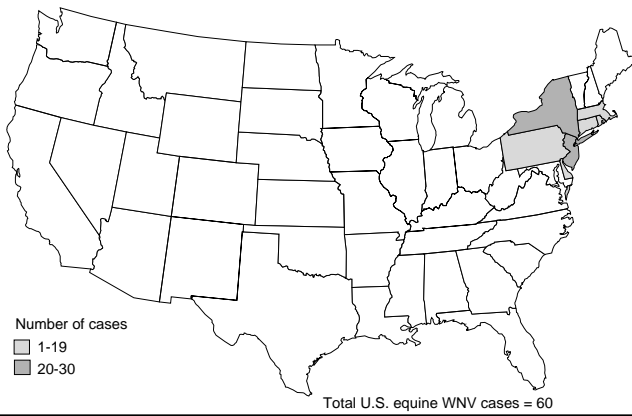
In 2004 and 2005, there were over 1,000 but fewer than 1,500 equine WNV cases nationally. In 2004 and 2005, California had the largest number of cases (more than 450 per year). In 2004, Arizona, Nevada, and Texas each had over 100 cases but fewer than 125 cases. In 2005, only Idaho and California had over 100 cases.

## **2. Chronological spread of equine WNV across the United States**

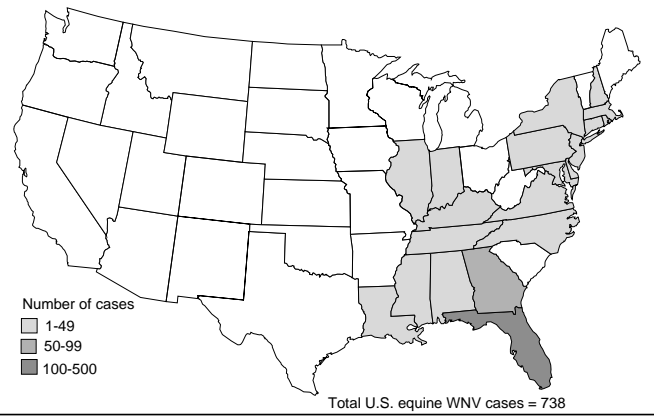
The maps to the right illustrate the initial movement of WNV outside of New York from 2000 to 2005. In 2001, the virus spread south and west, with equine WNV cases reported in Florida and the Midwest. In 2002, WNV cases were reported in the plains States and as far west as Washington State. In 2003, WNV equine cases were reported for the first time in California. In 2004, although the total number of equine WNV cases had declined to just under 1,400 nationally, 1 or more cases were reported from all but 9 continental States. In 2005, there were equine WNV cases reported from all but 12 continental States, with most reporting fewer than 50 cases—if they reported any cases at all. To date, Hawaii and Alaska have not reported any equine WNV cases.

Control of equine WNV relies on vaccination against the infection in advance of the vector season, insect control on the premises, and the application of insect repellants on horses.

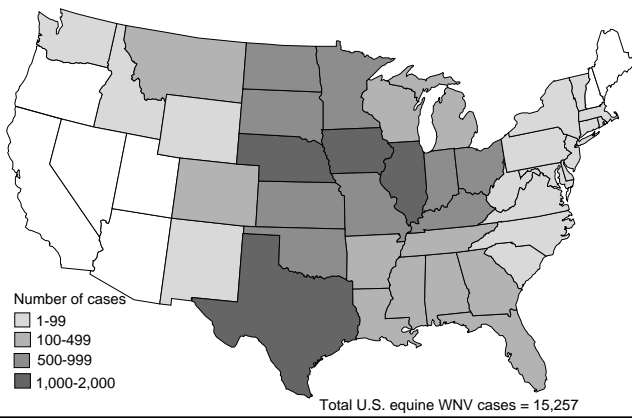
**Equine WNV Cases, 2000**



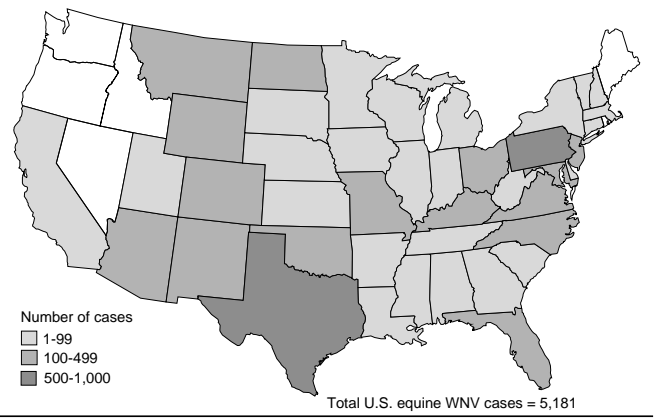
**Equine WNV Cases, 2001**



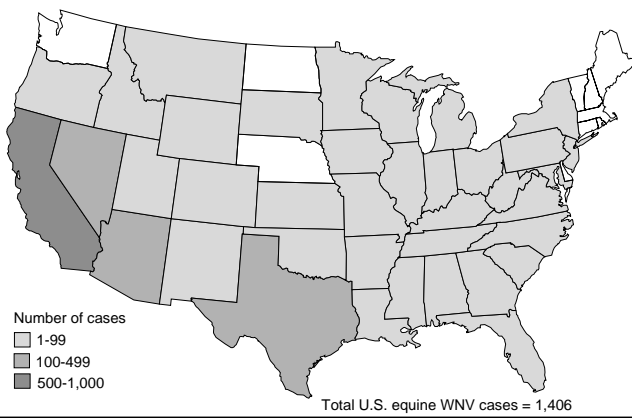
**Equine WNV Cases, 2002**



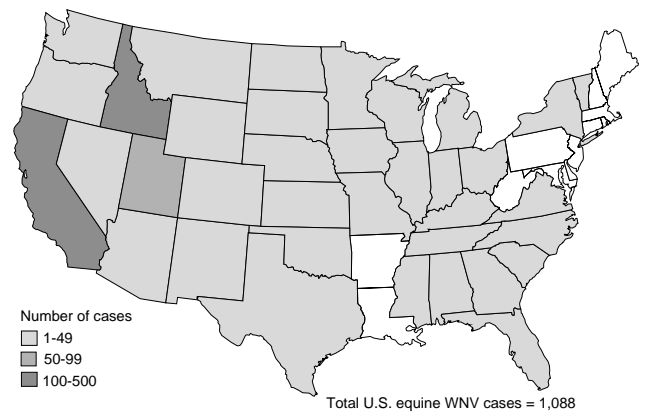
**Equine WNV Cases, 2003**



**Equine WNV Cases, 2004**



**Equine WNV Cases, 2005**



## **C. Vesicular Stomatitis (VS)**

### **1. Background**

VS is a rhabdovirus that causes vesicles and subsequently ulcers primarily on the lips and in the mouths of infected livestock. In some animals, lesions also occur on the coronary band and teats. The disease primarily affects horses and cattle, but can occasionally affect swine and less frequently other animals such as sheep and camelids. VS is spread by direct contact and by insect vectors. VS is considered endemic in feral swine on Osabaw Island off the coast of Georgia, and VS outbreaks occur periodically in the western United States.

Because VS is reportable to the World Organization for Animal Health, and because the lesions of VS in ruminants or swine are clinically indistinguishable from foot-and-mouth disease (FMD), USDA initiates foreign animal disease investigations in response to outbreaks. Horses are not affected by FMD, so FMD is not considered a potential cause of VS in horses. Premises with confirmed VS are quarantined until 21 days after verification that lesions in affected animals have healed.

### **2. Summary statistics, 1995–2005**

Five VS outbreaks occurred in the United States from 1995 through 2005. New Mexico and Colorado had VS cases in each of the five most recent outbreaks. In 2005, nine States had premises with livestock affected with VS. This was the largest outbreak of VS in the past decade, based on both number of premises affected and number of States with premises impacted. Wyoming had the largest number of premises with VS in 2005, followed by Utah and Colorado. The USDA's National Surveillance Unit (NSU) provides a Web site with frequent updates on the status of VS in the United States. The Web site at <https://www.aphis.usda.gov/aphis/ourfocus/animalhealth> is an excellent source of current and background information on VS and methods of testing.

a. Number of premises positive for VS (all species) in the United States, 1995–2005:

State	1995 <sup>1</sup>	1997 <sup>2</sup>	1998 <sup>3</sup>	2004 <sup>4</sup>	2005 <sup>4</sup>
Arizona	1	2	15	0	27
Colorado	165	273	102	199	100
Idaho	0	0	0	0	2
Montana	0	0	0	0	46
Nebraska	0	0	0	0	3
New Mexico	186	67	12	80	23
Texas	1	0	1	15	1
Utah	6	38	0	0	104
Wyoming	8	0	0	0	139
Total	367	380	130	294	445

<sup>1</sup>Bridges VE, et al., 1997. Review of the 1995 vesicular stomatitis outbreak in the western United States, *Jour Am Vet Med Assoc* 211(5):557.

<sup>2</sup>McCluskey BJ, et al., 1999. Review of the 1997 outbreak of vesicular stomatitis in the western United States, *Jour Am Vet Med Assoc* 215(9):1260.

<sup>3</sup>McCluskey BJ, 2003. Epidemiology of vesicular stomatitis viruses in the southwestern United States. *Ph.D. thesis*, Colorado State University, p. 12.

<sup>4</sup>USDA National Center for Animal Health Surveillance, National Surveillance Unit

b. Number of VSV-positive equids in 2005, by State:<sup>\*</sup>

State									
AZ	CO	ID	MT	NE	NM	TX	UT	WY	Total
30	89	6	112	1	27	2	122	195	584

<sup>\*</sup>USDA National Center for Animal Health Surveillance, National Surveillance Unit

## **Section III: Management and Health Changes in the U.S. Equine Industry, 1998-2005**

### **1. Background**

NAHMS' first national study of the U.S. equine industry, Equine '98, was based on selection criteria to represent any equine operation with 1 or more equids in 28 States. The sample provided 2,904 participating operations. The 28-State target population represented 78.2 percent of U.S. horses and ponies and 78.0 percent of farms with horses and ponies.

Equine 2005 focused on equine operations with 5 or more equids from the same 28 States. The sample provided 3,349 participating operations. The 28-State target population represented 78.0 percent of equids and 78.6 percent of operations with 5 or more equids in the United States.

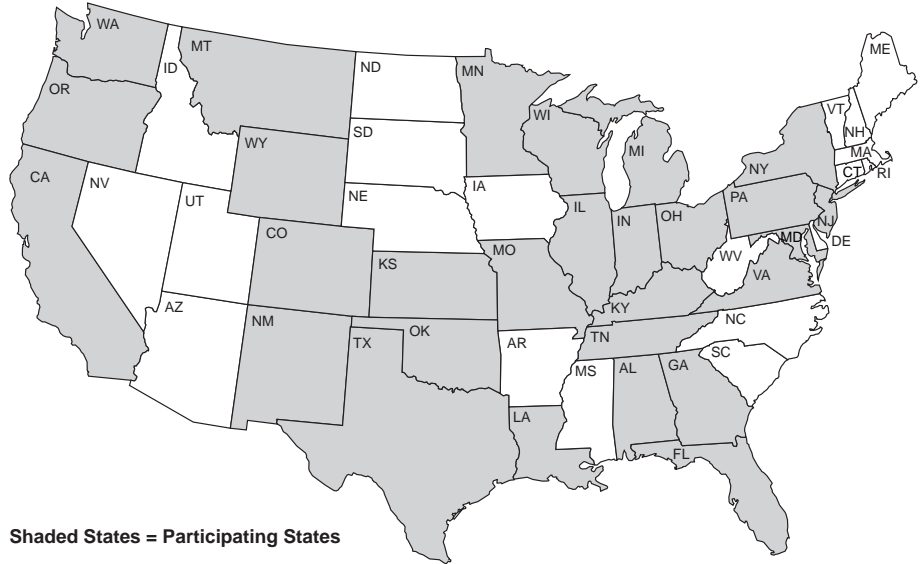
Some estimates in this report are compared to Equine '98, NAHMS previous equine study. Therefore, estimates comparing the 2 study periods are based on 3 points of commonality: same 28 States, data collection performed by NASS enumerators, and same reference population of 5 or more equids. For the evaluation of changes and trends, the data used to generate estimates based on the Equine '98 study were re-analyzed to represent operations with five or more equids present on January 1, 1998.

The U.S. equine population is difficult to enumerate because of the diversity of the equine industry, the geographic breadth of the equine population, and the suburban areas not included in the traditional livestock enumeration. In addition, interpretation of changes in estimates among two national studies conducted between 1998 and 2005 is difficult and may be speculative in nature. Differences may occur in the factors being measured, e.g., true secular time trends in the equine industry, changes in question wording, and random variation. These differences have been documented to aid in interpretation.

Most data are owner-reported and may vary according to recollection, quality of health records, and consistency of the interpretation of questions. These concerns are minimized by extensively training interviewers, pretesting all questionnaires, and validating data.



**States Participating in Equine '98 and Equine 2005**



## 2. Terms

**Equid:** Animal of the family *Equidae*. Only domestic horses, miniature horses, ponies, mules, donkeys/burros, and zedonks (zebra-donkey cross) were included.

**Foal:** Equid less than 6 months of age.

**Horse:** Domestic equid generally more than 14 hands (56 inches) high at the shoulder (near the last hairs of the mane). An equid less than 14 hands high may also be considered a horse if its breed registry defines it as such (other than miniature horse). Horses include light breeds (e.g., Arabian, Quarter Horse, Appaloosa, Morgan, Trakehner, etc.) and draft horses (e.g., Clydesdale, Belgian, and Percheron).

**N/A:** Not applicable.

**Operation:** An area of land managed as a unit by an individual, partnership, or hired manager.

**Operator:** The person responsible for the day-to-day decisions on the operation.

**Operation average:** A single value for each operation is summed over all operations reporting and divided by the number of operations reporting.

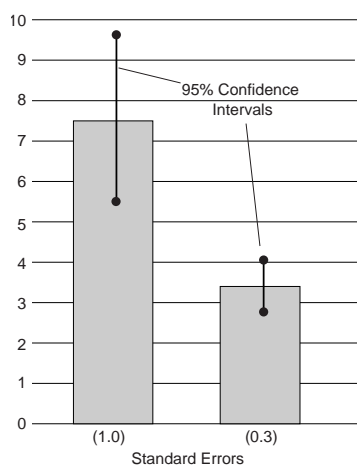
**Perceived cause (of illness or death):** Causes of illnesses or deaths were derived from observations of clinical signs reported by participants and not necessarily confirmed by a veterinarian or laboratory testing.

**Percent equids:** The total number of **equids** with a certain attribute, divided by the total number of equids.

**Primary function of operation:** The main purpose of the operation, i.e., boarding/training, breeding farm, farm/ranch, and residence with equids for personal use.

**Primary use of equids:** What the majority of horses on the operation are used for, i.e., pleasure, lessons/school, show/competition, breeding, racing, farm/ranch work.

Examples of a 95% Confidence Interval



**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. Most estimates in this report are rounded to the nearest tenth. If rounded to 0, the standard error was reported (0.0). If there were no reports of the event, no standard error was reported (—).

### Regions

- **South:** Alabama, Florida, Georgia, Kentucky, Louisiana, Maryland, Oklahoma, Tennessee, Texas, and Virginia
- **Northeast:** New Jersey, New York, Ohio, and Pennsylvania
- **West:** California, Colorado, Montana, New Mexico, Oregon, Washington, and Wyoming
- **Central:** Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, and Wisconsin

**Resident equid:** An equid that spent or was expected to spend more time at the operation than at any other operation, whether or not it was present at the time of the interview. The operation was its home base.

**Size of operation:** Size groupings were based on number of equids present on July 1, 1998, for the Equine '98 study and July 1, 2005, for the Equine 2005 study. Size of operation was categorized as small (5-9 equids), medium (10-19 equids), and large (20 or more equids). For the purpose of this report, small operations include operations that had five or more equids per the NASS list frame (primarily comprised of equine information from the 2002 Census of Agriculture) but had fewer than five equids on July 1, 2005; approximately 70 percent of these operations had three to four equids on July 1, 2005.

**A. General****1. Primary function of operations**

The percentage of operations with a primary function of equine boarding/training stable was higher in 1998 compared to 2005 (10.0 percent and 5.9 percent, respectively). The percentage of operations with a primary function of farm/ranch was lower in 1998 compared to 2005. In 2005, the selection of operations was based on operations that had five or more equids per the NASS list frame of places that met the definition of a "farm" (primarily comprised of equine information from the 2002 Census of Agriculture) which may explain the higher percentage of operations in 2005 with a primary function farm/ranch (see p. 2 for discussion on definition of a farm).

Percentage of operations by primary function of operation:

Primary Function	Percent Operations			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Equine boarding stable/training*	10.0	(1.4)	5.9	(0.4)
Equine breeding farm	15.1	(1.7)	14.4	(0.7)
Farm/ranch	30.1	(2.3)	40.3	(1.0)
Residence with equids for personal use (show, pleasure, etc.)	38.3	(2.7)	37.0	(1.0)
Other	6.5	(1.2)	2.4	(0.3)
Total	100.0		100.0	

\*1998 choices: "Boarding stable only," "Training facility only," and "Boarding stable/training."



APHIS photo by Charles Kerlee

## 2. Primary use of equids

In 1998 and 2005, nearly one of two operations used equids primarily for pleasure (46.1 and 45.7 percent, respectively) and about one of five operations used equids primarily for farm/ranch work (18.7 and 24.8 percent, respectively). The percentage of operations where the primary use of equids was racing decreased from 4.6 percent in 1998 to 1.4 percent in 2005. In 1998, lessons/school was not offered as a choice for primary use of equids, which may account for the lower percentage of operations in the “other” category in 2005 than in 1998.

Percentage of operations by primary use of equids:

Primary Use	Percent Operations			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Pleasure	46.1	(2.6)	45.7	(1.0)
Lessons/school	N/A		1.4	(0.2)
Show/competition (not betting)	10.4	(1.5)	9.6	(0.6)
Breeding	15.8	(1.8)	15.9	(0.7)
Racing	4.6	(1.1)	1.4	(0.2)
Farm/ranch work	18.7	(1.9)	24.8	(0.9)
Other	4.4	(0.9)	1.2	(0.2)
Total	100.0		100.0	

### 3. Equid distribution

The percentage of large operations was higher in 1998 than in 2005. This decrease in operation size is consistent with the Census of Agriculture data reported on p. 4.

a. Percentage of operations by size of operation:

	Percent Operations			
	1998		2005	
Size of Operation* (Number of Equids)	Percent	Std. Error	Percent	Std. Error
Small (5 to 9)	63.1	(2.4)	66.1	(0.8)
Medium (10 to 19)	23.7	(2.2)	26.1	(0.8)
Large (20 or more)	13.2	(1.4)	7.8	(0.3)
Total	100.0		100.0	

\*See p. 21 for detailed description of size breakout for 1998 and 2005.

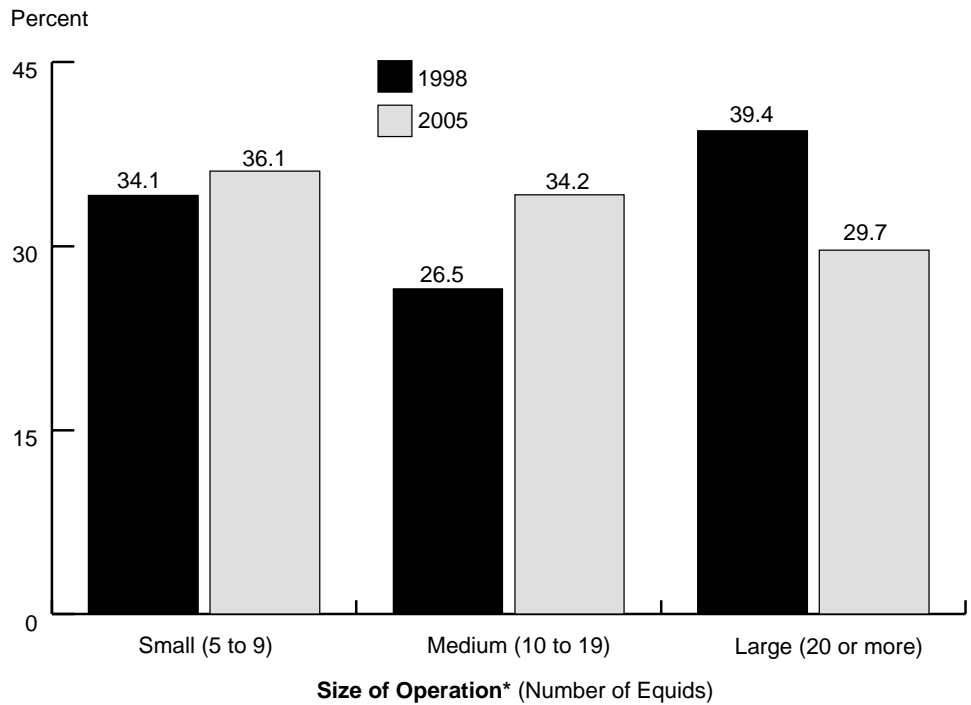
The percentage of equids on large operations decreased from 39.4 percent in 1998 to 29.7 percent in 2005.

b. Percentage of equids by size of operation:

	Percent Equids			
	1998		2005	
Size of Operation* (Number of Equids)	Percent	Std. Error	Percent	Std. Error
Small (5 to 9)	34.1	(2.2)	36.1	(0.8)
Medium (10 to 19)	26.5	(2.4)	34.2	(1.0)
Large (20 or more)	39.4	(2.6)	29.7	(1.1)
Total	100.0		100.0	

\*See p. 21 for detailed description of size breakout for 1998 and 2005.

**Percentage of Equids by Size of Operation**



\*See p. 21 for detailed description of size breakouts for 1998 and 2005

**4. Type of equid**

In both 1998 and 2005, over 95 percent of operations had full-size horses. The percentages of operations by type of equid were similar in 1998 and 2005.

a. Percentage of operations by type of equid:

Type of Equid	Percent Operations			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Donkeys or burros	7.4	(1.4)	12.2	(0.7)
Mules	9.5	(1.4)	7.9	(0.5)
Ponies	18.2	(1.8)	15.7	(0.7)
Miniature horses	5.4	(1.0)	7.5	(0.5)
Horses (excluding miniature horses)	98.4	(0.5)	95.6	(0.4)
Other equids	0.2	(0.1)	0.3	(0.1)



Overall, the percentages of equids by type were similar in 1998 and 2005 for most equid types. The percentage of miniature horses increased slightly from 1.8 percent of equids in 1998 to 3.9 percent in 2005.

b. Percentage of equids by type of equid:

Type of Equid	Percent Equids			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Donkeys or burros	2.0	(0.5)	3.7	(0.3)
Mules	2.4	(0.4)	2.3	(0.2)
Ponies	4.9	(0.7)	3.4	(0.2)
Miniature horses	1.8	(0.3)	3.9	(0.4)
Horses (excluding miniature horses)	88.9	(1.0)	86.6	(0.5)
Other equids	0.0	(0.0)	0.1	(0.0)
Total	100.0		100.0	

The percentage of resident equids paralleled the percentage of overall equids by type in 1998 and 2005. The percentage of miniature horses considered residents increased slightly from 1.9 percent of equids in 1998 to 3.6 percent in 2005. For this report, a resident equid was an equid that spent or was expected to spend more time at the operation than at any other operation, whether or not it was present at the time of the interview. The operation was its home base.

c. Percentage of *resident* equids by type of equid:

Type of Equid	Percent Resident Equids			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Donkeys or burros	2.1	(0.5)	3.8	(0.3)
Mules	2.2	(0.4)	2.4	(0.2)
Ponies	4.8	(0.7)	3.4	(0.2)
Miniature horses	1.9	(0.4)	3.6	(0.3)
Horses (excluding miniature horses)	89.0	(1.0)	86.7	(0.5)
Other equids	0.0	(0.0)	0.1	(0.0)
Total	100.0		100.0	

### 5. Age of resident equids

The percentage of the equine population 20 years of age or older increased from 5.6 percent in 1998 to 7.6 percent in 2005. The percentages of equids aged 5 to less than 20 years were similar in 1998 and 2005.

Percentage of *resident* equids by age:

Age	Percent Resident Equids			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Birth to 30 days	6.8	(0.5)	0.8	(0.1)
31 days but less than 6 months			7.4	(0.3)
6 months to less than 5 years	30.8	(1.2)	27.5	(0.5)
5 years to less than 20 years	55.4	(1.2)	56.7	(0.5)
20 years to less than 30 years	5.6*	(0.5)	6.9	(0.3)
30 years or older			0.7	(0.1)
Unknown**	1.4	(0.6)	--	(--)
Total	100.0		100.0	

The age category in 1998 was 20 or more years for the oldest age option.

\*\*Unknown age was not offered as an option to respondents in 2005.

## 6. Identification method

The methods of unique identification (ID) for equids on a given operation were not mutually exclusive, so that more than one form of ID could have been used on an operation or on the same equid. An ID unique on the home operation may not be unique off the home operation. The percentage of operations using no unique ID for at least one equid was lower in 2005 (49.3 percent) than in 1998 (59.6 percent). However, these percentages may have been influenced by the addition of “Coggins or other EIA test” and “passport” as methods of ID in the 2005 questionnaire, which were not options in the 1998 questionnaire. For the most part, the percentages of operations using various methods of unique ID were similar in 1998 and 2005, except that a smaller percentage of operations used tattoo as a form of ID in 2005 than in 1998. This could be reflective of the lower percentage of operations where racing was the primary use of equids in 2005 compared to 1998 (see table p. 24).

a. Percentage of operations that used the following unique ID methods for resident equids (each equid has a different ID; no two equids have the same ID), by ID method:

ID Method	Percent Operations			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Hot-iron brand	13.9	(1.4)	12.2	(0.6)
Freeze brand	10.7	(1.3)	13.8	(0.7)
Microchip	2.1	(0.8)	3.1	(0.3)
Tattoo	20.8	(2.1)	11.7	(0.6)
Permanent brand inspection (card with markings indicated or sketch)	6.9	(1.1)	7.5	(0.5)
Registration papers*	57.0	(2.6)	61.7	(1.0)
Coggins test papers (laboratory test results)	N/A		40.0	(1.0)
Halters or collars with name or number	3.9	(0.8)	4.1	(0.4)
Passport	N/A		1.1	(0.2)
Other unique ID	4.8	(0.9)	3.9	(0.4)
At least one equid with no unique ID	59.6	(2.5)	49.3	(1.0)
No unique ID for any equids	28.3	(2.2)	19.2	(0.8)

\*In 1998, category was photograph, sketch, or registration papers instead of registration papers.

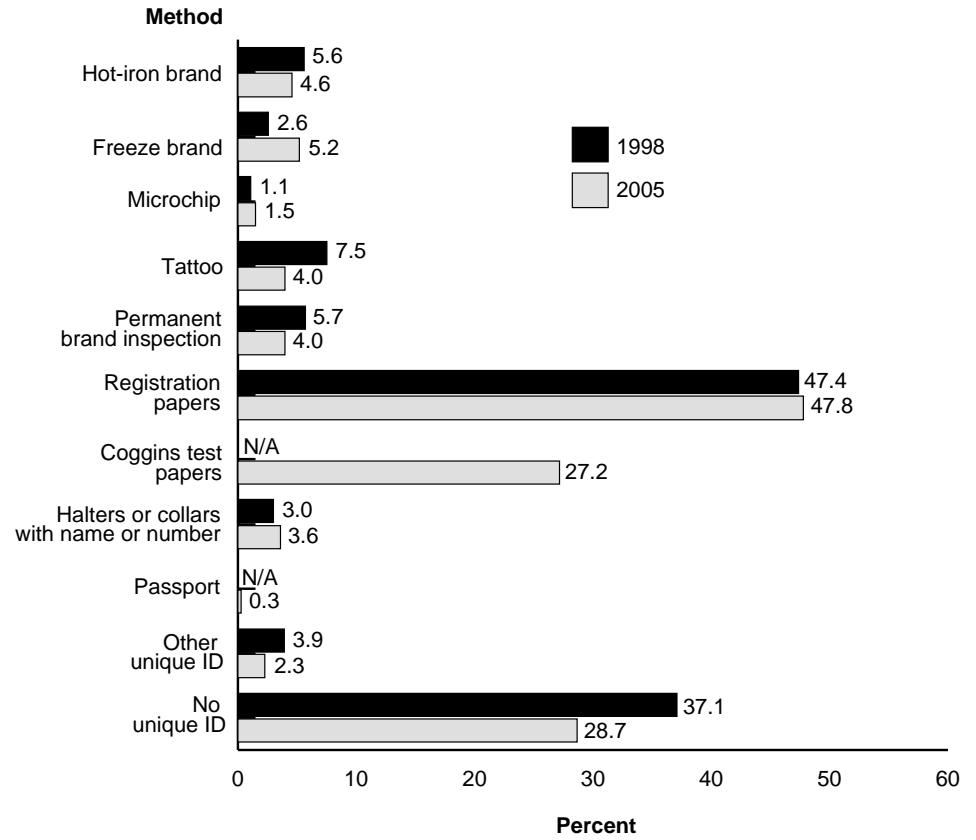
The percentage of equids with no unique ID was lower in 2005 (28.7 percent) than in 1998 (37.1 percent). However, these percentages may have been influenced by the addition of “Coggins or other EIA test” and “passport” as methods of ID in the 2005 questionnaire—which were not options in the 1998 questionnaire—or they may reflect a true increase in the percentage of equids with unique IDs. The percentage of equids with a freeze brand was slightly higher in 2005 (5.2 percent) compared to 1998 (2.6 percent).

b. Percentage of *resident* equids that were uniquely identified with following ID methods (each equid has a different ID; no two equids have the same ID):

ID Method	Percent Resident Equids			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Hot-iron brand	5.6	(0.9)	4.6	(0.4)
Freeze brand	2.6	(0.4)	5.2	(0.5)
Microchip	1.1	(0.4)	1.5	(0.2)
Tattoo	7.5	(0.9)	4.0	(0.3)
Permanent brand inspection (card with markings indicated or sketch)	5.7	(1.1)	4.0	(0.3)
Registration papers*	47.4	(2.3)	47.8	(1.0)
Coggins test papers (laboratory test results)	N/A		27.2	(0.8)
Halters or collars with name or number	3.0	(0.5)	3.6	(0.4)
Passport	N/A		0.3	(0.1)
Other unique ID	3.9	(0.9)	2.3	(0.3)
No unique ID	37.1	(2.1)	28.7	(0.8)

\*In 1998, category was photograph, sketch, or registration papers instead of registration papers.

**Percentage of Resident Equids that Were Uniquely Identified with the Following ID Methods**



## B. Health and Health Management

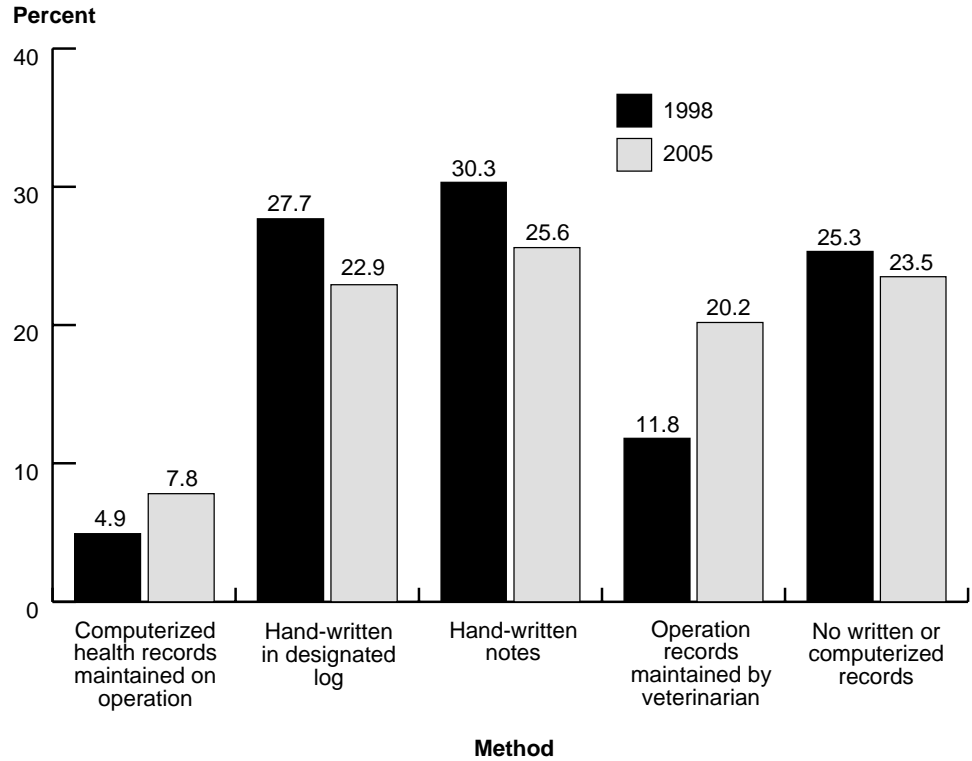
### 1. Primary method of recording equine information

The percentage of operations that used computerized records as the primary method of recording equine health information increased from 4.9 percent of operations in 1998 to 7.8 percent in 2005. Nearly half of operations in 2005 still used hand-written notes either in a designated log or on a calendar or check book as the primary method of record keeping. The percentage of operations that relied on a veterinarian to maintain equine health records increased from 11.8 percent in 1998 to 20.2 percent in 2005. The percentages of operations with no written or computerized records were similar in 1998 and 2005, with about one of four operations reporting no form of written or computerized equine health records.

Percentage of operations by primary method of recording equine health information:

	Percent Operations			
	1998		2005	
Method	Percent	Std. Error	Percent	Std. Error
Computerized health records maintained on the operation	4.9	(0.9)	7.8	(0.5)
Hand-written in designated log (e.g., health card, logbook)	27.7	(2.2)	22.9	(0.9)
Hand-written notes (e.g., calendar, checkbook)	30.3	(2.2)	25.6	(0.9)
Operation records maintained by veterinarian	11.8	(1.6)	20.2	(0.9)
No written or computerized records	25.3	(2.2)	23.5	(0.9)
Total	100.0		100.0	

**Percentage of Operations by Primary Method of Recording Equine Health Information**



**2. Testing**

The percentage of operations that performed fecal testing for parasites during the previous 12 months decreased from 20.0 percent in 1998 to 13.5 percent in 2005. A lower percentage of operations performing fecal testing may reflect a reliance on the effectiveness of parasite control methods or a lack of recognized parasite problems. The percentages of operations that performed feed/pasture analysis and water analysis were similar in 1998 and 2005.

Percentage of operations by testing performed during the previous 12 months:

Test	Percent Operations			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Fecal test for parasites	20.0	(1.8)	13.5	(0.7)
Feed or pasture analysis	7.9	(1.1)	8.1	(0.5)
Water analysis	7.5	(1.4)	7.8	(0.5)



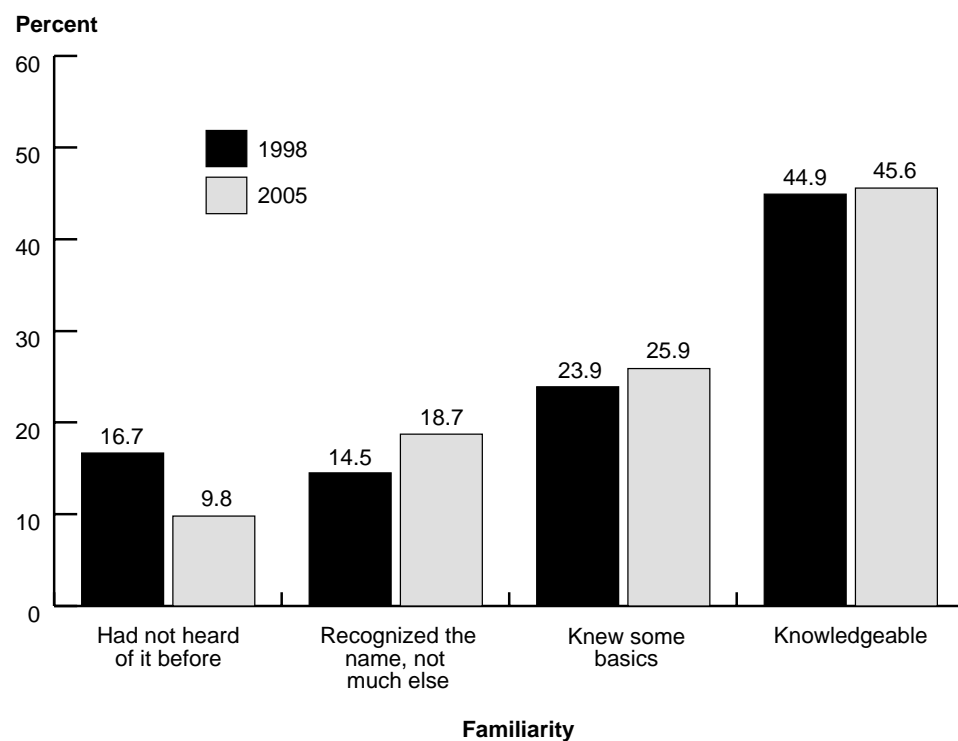
### 3. Familiarity with EIA

The percentage of operators that had at least heard of EIA increased from 1998 to 2005. However, the percentages of operators that indicated they were knowledgeable about EIA were similar in 1998 and 2005. USDA-APHIS-Veterinary Services began an educational initiative regarding EIA in 1996, which included an educational video and brochure. It is possible this initiative, along with other EIA educational efforts, improved operators' familiarity with EIA.

Percentage of operations by familiarity with EIA:

Familiarity	Percent Operations			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Had not heard of it before	16.7	(1.9)	9.8	(0.6)
Recognized the name, not much else	14.5	(1.6)	18.7	(0.8)
Knew some basics	23.9	(2.1)	25.9	(0.9)
Knowledgeable	44.9	(2.7)	45.6	(1.0)
Total	100.0		100.0	

Percentage of Operations by Familiarity with EIA



**4. EIA testing**

The percentages of operations that tested at least one equid for EIA were similar in 1998 and 2005, with 58.7 percent of operations testing at least one equid in 1998 and 54.1 percent doing so in 2005.

a. Percentage of operations that performed at least one Coggins or other test for EIA during the previous 12 months:

<b>Percent Operations</b>			
<b>1998</b>		<b>2005</b>	
<b>Percent</b>	<b>Std. Error</b>	<b>Percent</b>	<b>Std. Error</b>
58.7	(2.6)	54.1	(1.0)

In the following table, the overall percentage of all equids tested for EIA is presented. The overall percentages of equids tested were similar in 1998 and 2005.

b. Percentage of resident equids tested for EIA on all operations during the previous 12 months:

<b>Percent Resident Equids</b>			
<b>1998</b>		<b>2005</b>	
<b>Percent</b>	<b>Std. Error</b>	<b>Percent</b>	<b>Std. Error</b>
36.6	(2.0)	37.6	(0.8)

In contrast to the previous table, this table presents the percentage of equids tested on operations that tested at least one equid during the previous 12 months. The percentages were similar in 1998 and 2005.

c. For operations that tested for EIA, percentage of resident equids tested:

<b>Percent Resident Equids</b>			
<b>1998</b>		<b>2005</b>	
<b>Percent</b>	<b>Std. Error</b>	<b>Percent</b>	<b>Std. Error</b>
55.6	(2.5)	59.1	(1.0)

The average cost of an EIA test increased from \$22.95 in 1998 to \$27.33 in 2005, a \$4.38 (19.1 percent) difference.

d. For operations that tested for EIA, average cost per test (including call fee or cost of transportation):

<b>Average Cost per Test</b>			
<b>1998</b>		<b>2005</b>	
<b>Average</b>	<b>Std. Error</b>	<b>Average</b>	<b>Std. Error</b>
\$22.95	(0.67)	\$27.33	(0.59)

The primary reasons for testing for EIA were similar in 1998 and 2005, with a slightly lower percentage of operations testing primarily for change of ownership in 2005 compared to 1998, and a slightly higher percentage of operations testing for personal knowledge in 2005 compared to 1998.

e. For operations that tested for EIA, percentage of operations by primary reason for testing:

<b>Percent Operations</b>				
<b>Primary Reason for Testing</b>	<b>1998</b>		<b>2005</b>	
	<b>Percent</b>	<b>Std. Error</b>	<b>Percent</b>	<b>Std. Error</b>
Change of ownership within State	14.5	(2.2)	8.2	(0.7)
Show or event requirement within State	42.2	(3.0)	38.0	(1.3)
Facility (e.g., boarding, breeding) requirement within State	N/A*		11.1	(0.8)
Interstate movement (between two or more States)	21.5	(2.5)	19.2	(1.1)
International movement	1.3	(0.6)	0.3	(0.1)
Personal knowledge	12.1	(1.8)	18.8	(1.1)
Suspicion of equine illness	1.7	(0.8)	1.0	(0.3)
Other	6.7	(1.4)	3.4	(0.5)
<b>Total</b>	<b>100.0</b>		<b>100.0</b>	

\*Facility not an option in 1998.

## 5. Vaccinations

The percentages of operations that vaccinated resident equids during the previous 12 months were similar in 1998 and 2005: about three-fourths of operations had given at least some type of vaccine to resident equids during the previous 12 months.

a. Percentage of operations that administered any vaccine to resident equids during the previous 12 months:

Percent Operations			
1998		2005	
Percent	Std. Error	Percent	Std. Error
75.1	(2.4)	75.9	(0.9)

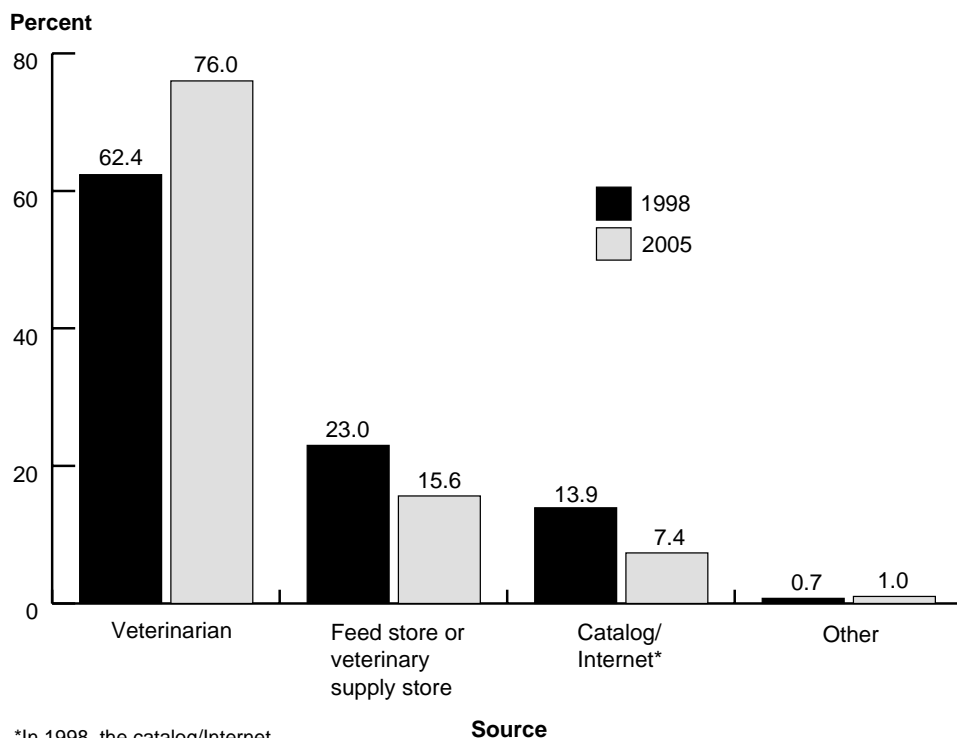
A veterinarian was the primary source of equine vaccines in both 1998 and 2005. The percentage of operations that used a veterinarian as the primary source of vaccines increased from 62.4 percent in 1998 to 76.0 percent in 2005. The percentage of operations that used a feed store or veterinary supply store decreased from 23.0 percent in 1998 to 15.6 percent in 2005.

b. For operations that administered any vaccine to resident equids during the previous 12 months, percentage of operations by primary source of vaccines:

Percent Operations				
Primary Source	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Veterinarian	62.4	(2.7)	76.0	(1.0)
Feed store or veterinary supply store	23.0	(2.2)	15.6	(0.9)
Catalog/Internet*	13.9	(2.1)	7.4	(0.6)
Other	0.7	(0.3)	1.0	(0.2)
Total	100.0		100.0	

\*In 1998, the catalog/Internet choice did not include Internet.

**For Operations that Administered any Vaccine to Resident Equids During the Previous 12 months, Percentage of Operations by Primary Source of Vaccines**



\*In 1998, the catalog/Internet choice did not include Internet.

The percentage of operations where a veterinarian administered the majority of vaccines increased from 40.7 percent in 1998 to 50.3 percent in 2005. In contrast, the percentage of operations where operation personnel (including operator) administered the majority of vaccines decreased from 47.9 percent in 1998 to 33.3 percent in 2005.

c. For operations that administered any vaccine to resident equids during the previous 12 months, percentage of operations by person who administered the majority of vaccines:

Person	Percent Operations			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Veterinarian	40.7	(3.0)	50.3	(1.2)
Operation personnel (including operator)	47.9	(3.2)	33.3	(1.1)
Equine owner (not operator)	10.4	(1.7)	16.1	(0.9)
Other	1.0	(0.5)	0.3	(0.1)
Total	100.0		100.0	

The most commonly used vaccines based on the percentages of all operations vaccinating any equids during the previous 12 months were similar in 1998 and 2005, with tetanus, eastern and western equine encephalitis (EEE/WEE), and flu vaccines each being administered by over 50 percent of operations. A lower percentage of operations administered flu, tetanus, and EEE/WEE vaccines in 2005 than in 1998. In order to determine the possible reason for this difference, the data for 2005 were analyzed to determine the percentage of operations giving just one type of vaccine and what vaccine was given. The majority of operations that administered only one vaccine gave WNV vaccine. Thus, operations that gave only WNV vaccine did not report giving other vaccines in 2005. WNV was first reported in the United States in 1999, and at the time there was no available vaccine to prevent the disease in equids. Since 1999, WNV has been responsible for the largest outbreak of an arboviral encephalomyelitis ever reported. Much information on this disease and methods of prevention have been provided to equine owners and the general public, which may account for the common use of WNV vaccine.

A higher percentage of operations reported using vaccine for equine viral arteritis (EVA) in 2005 than in 1998. Several States have a control program for EVA for their Thoroughbred populations, and there has been educational material on EVA provided from USDA-APHIS-Veterinary Services, which may account for the

increased use of this vaccine. The vaccine for equine protozoal myeloencephalopathy (EPM) was not available in 1998; 3.6 percent of operations reported vaccinating equids with EPM vaccine in 2005. Anthrax was not listed as a choice on the 1998 questionnaire but was in the 2005 questionnaire, with 1.8 percent of operations reporting use of this vaccine for their equids in 2005. A higher percentage of operations used vaccine for strangles in 2005 than in 1998. Since 1998, an additional type of vaccine (intranasal administration) for prevention of strangles was released. This new vaccine, along with increased concern regarding this disease, may account for increased reported use.

d. Percentage of operations that administered vaccines for the following diseases to one or more equids during the previous 12 months:

Disease	Percent Operations			
	1998		2005	
	Pct.	Std. Error	Pct.	Std. Error
Flu (influenza)	66.4	(3.7)	54.1	(1.0)
Strangles ( <i>Strep. equi</i> )	19.4	(2.8)	26.8	(0.9)
Rhinopneumonitis (herpesvirus)	51.6	(3.9)	47.5	(1.0)
Rabies	23.9	(3.0)	33.1	(1.0)
West Nile virus*	N/A		63.8	(1.0)
Eastern and western equine encephalitis*	65.5	(3.6)	56.4	(1.0)
Tetanus	76.5	(3.3)	60.7	(1.0)
Equine viral arteritis (EVA)	2.9	(0.9)	11.7	(0.7)
Venezuelan equine encephalitis* (VEE)	N/A		17.9	(0.8)
<i>Clostridium perfringens</i> (C&D)	0.6	(0.3)	2.5	(0.3)
Potomac horse fever (PHF)	16.8	(2.8)	10.6	(0.6)
Rotavirus	2.4	(0.9)	4.2	(0.4)
Anthrax*	N/A		1.8	(0.3)
Equine protozoal myeloencephalopathy* (EPM)	N/A		3.6	(0.4)
Other	0.1	(0.0)	0.5	(0.1)

\*The 1998 question did not separate encephalitis by EEE/WEE and VEE, and did not include WNV, anthrax, or EPM. The 1998 question offered VSV and leptospirosis as options. The 1998 question did not offer "don't know" as an option for vaccinations used.

## **6. Foal health**

The percentages of operations with foals affected by the conditions listed in the table to the right were similar in 1998 and 2005, with the exception of digestive problems other than colic, which decreased from 13.1 percent of operations in 1998 to 5.7 percent in 2005. Additional categories for foal conditions were added to the Equine 2005 questionnaire: failure to get milk, dystocia or birthing problem, and fever of undetermined origin. Thus, no comparisons with 1998 can be made for these categories. In addition, in 2005 participants were given the option to list problems not specified on the list; "other" foal conditions included mare sick/foal sick, did not know what the problem was, weak, albino, complication of castration, and hernia.



a. For operations that had any resident foals less than 6 months of age during the previous 12 months, percentage of operations where foals became affected with the following conditions:

Condition	Percent Operations			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Colic	2.7	(1.0)	2.8	(0.5)
Other digestive problems (e.g., diarrhea)	13.1	(2.8)	5.7	(0.7)
Respiratory problems (e.g., pneumonia, strangles, <i>Rhodococcus equi</i> , etc.)	4.8	(1.7)	5.2	(0.7)
Eye problems	1.9	(0.7)	1.4	(0.3)
Skin problems	0.7	(0.4)	1.2	(0.3)
Reproductive tract problems (e.g., hermaphrodite, cryptorchid)	2.0	(1.2)	0.5	(0.2)
Behavioral problems (e.g., unusual, affects use or safety)	0.1	(0.1)	0.3	(0.2)
Injury/wounds/trauma	12.5	(2.1)	13.9	(1.1)
Lameness, leg, or hoof problems (could not be used for intended purpose without treatment)*	3.2	(0.8)	3.6	(0.6)
Neurologic problems	0.4	(0.2)	0.4	(0.2)
Infectious disease unrelated to specific body system (septicemia, blood infection)	0.9	(0.5)	1.6	(0.4)
Chronic weight loss	1.0	(0.5)	0.2	(0.1)
Overweight/obese	0.3	(0.3)	0.2	(0.1)
Failure to get milk or colostrum from mare/dam	N/A		3.6	(0.6)
Complications from birthing/dystocia	N/A		1.2	(0.2)
Fever of undetermined origin	N/A		1.2	(0.3)
Other	N/A		1.3	(0.4)

\*Question from 1998 was worded as leg or hoof problems instead of lameness, leg, or hoof problems (2005).

The percentages of foals affected with the conditions listed in the table to the right were similar in 1998 and 2005, with the exception of digestive problems other than colic, which decreased from 21.5 percent of foals in 1998 to 6.3 percent in 2005. It is possible that operators reported serious problems or problems that were more recent rather than those that occurred many months prior to the interview or were not as serious or costly. Additional categories for foal conditions were added to the Equine 2005 questionnaire: failure to get milk, dystocia or birthing problem, and fever of undetermined origin. Thus, no comparisons with 1998 can be made for these categories. Injury/wounds/trauma, digestive problems other than colic, and respiratory problems each affected over 4 percent of foals in both 1998 and 2005.



APHIS photograph by Charles Kerlee

b. For operations that had any resident foals less than 6 months of age during the previous 12 months, percentage of foals affected with the following conditions:

Condition	Percent Foals			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Colic	2.1	(0.7)	4.2	(2.5)
Other digestive problems (e.g., diarrhea)	21.5	(5.2)	6.3	(0.9)
Respiratory problems (e.g., pneumonia, strangles, <i>Rhodococcus equi</i> , etc.)	9.3	(4.5)	4.3	(0.6)
Eye problems	1.3	(0.4)	1.0	(0.2)
Skin problems	0.8	(0.3)	0.8	(0.3)
Reproductive tract problems (e.g., hermaphrodite, cryptorchid)	1.3	(0.7)	0.3	(0.1)
Behavioral problems (e.g., unusual, affects use or safety)	0.1	(0.0)	0.2	(0.1)
Injury, wounds, or trauma	12.2	(2.6)	9.2	(0.8)
Lameness, leg, or hoof problems (could not be used for intended purpose without treatment)*	2.4	(0.5)	2.6	(0.4)
Neurologic problems	0.4	(0.2)	5.7**	(5.1)
Infectious disease unrelated to specific body system (septicemia, blood infection)	0.8	(0.4)	1.0	(0.3)
Chronic weight loss	0.7	(0.3)	0.1	(0.1)
Overweight/obese	0.4	(0.4)	0.2	(0.1)
Failure to get milk or colostrum from mare/dam	N/A		2.0	(0.3)
Complications from birthing/dystocia	N/A		1.0	(0.2)
Fever of undetermined origin	N/A		0.8	(0.2)
Other	N/A		0.8	(0.2)

\*Question from 1998 was worded as leg or hoof problems instead of lameness, leg, or hoof problems (2005).

\*\*Because of the large standard error in 2005, it is difficult to determine if there was a difference in neurologic problems between 1998 and 2005.

### **7. Equid health**

In general, the percentages of operations where equids 6 months of age or older were affected with the conditions listed in the table to the right were higher in 1998 than in 2005. It is possible that there was a true decline in the percentage of operations with one or more equids with these conditions, or it may be that operations in 2005 were less likely to report the occurrence of some of these problems. In the 2005 questionnaire, the question regarding the number of equids with each of the listed conditions was preceded by a question about antimicrobial use. Therefore, some respondents may have been more likely to report conditions for which they gave treatment. Liver/kidney problem and cancer were not choices in the 1998 questionnaire. Thus, no comparisons with 1998 and 2005 can be made for these categories. In addition, in 2005 participants were given the option to list problems not specified on the list; "other" equid conditions included envenomation (snake or insect bite) and endocrine disorders.

a. For operations that had any resident equids 6 months of age or older during the previous 12 months, percentage of operations where equids became affected with the following conditions:

Condition	Percent Operations			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Colic	26.5	(2.2)	10.4	(0.6)
Other digestive problems (e.g., diarrhea)	5.0	(1.0)	2.4	(0.3)
Dental problems	N/A		5.3	(0.5)
Respiratory problems	12.3	(1.7)	9.1	(0.6)
Eye problems	12.5	(1.5)	6.5	(0.5)
Skin problems	11.2	(1.5)	5.4	(0.5)
Reproductive problems (e.g., infertility, dystocia)	7.5	(1.2)	3.3	(0.4)
Behavioral problems (e.g., unusual, affects use or safety)	2.9	(0.8)	1.0	(0.2)
Injury, wounds, or trauma	29.1	(2.2)	25.7	(0.9)
Lameness, leg, or hoof problems (could not be used for intended purpose without treatment)*	23.5	(2.1)	15.5	(0.8)
Neurologic problems (e.g., spinal problem, wobblers, seizure, West Nile virus, EPM)	3.0	(0.8)	0.9	(0.2)
Infectious disease unrelated to specific body system (septicemia, blood infections)	2.5	(0.7)	1.6	(0.3)
Chronic weight loss	5.6	(1.1)	1.4	(0.2)
Overweight/obese	5.5	(1.3)	3.4	(0.4)
Liver or kidney disease	N/A		0.5	(0.1)
Cancer	N/A		1.1	(0.2)
Other	N/A		1.8	(0.3)

\*Question from 1998 was worded as leg or hoof problems instead of lameness, leg, or hoof problems (2005).

The percentages of equids with the conditions listed in the table to the right were similar in 1998 and 2005. One exception was the incidence of colic, which decreased from 5.0 percent of resident equids affected in 1998 to 1.9 percent in 2005. It is possible that there was a true decline in the percentage of equids with colic, or it may be that operations in 2005 were less likely to report the occurrence of colic. In the 2005 questionnaire, the question regarding the number of equids with each of the listed conditions was preceded by a question about antimicrobial use. Therefore, some respondents may have been more likely to report conditions for which they gave treatment. Liver/kidney problem and cancer were not choices in the 1998 questionnaire. Thus, no comparisons with 1998 and 2005 can be made for these categories.



APHIS photograph by Charles Kerlee

b. For operations that had any resident equids 6 months of age or older during the previous 12 months, percentage of equids that became affected with the following conditions:

Condition	Percent Equids			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Colic	5.0	(0.6)	1.9	(0.1)
Other digestive problems (e.g., diarrhea)	0.8	(0.2)	0.5	(0.1)
Dental problems	N/A		1.6	(0.2)
Respiratory problems	2.9	(0.5)	1.9	(0.1)
Eye problems	1.4	(0.2)	1.0	(0.1)
Skin problems	2.5	(0.5)	1.1	(0.1)
Reproductive problems (e.g., infertility, dystocia)	1.1	(0.2)	0.6	(0.1)
Behavioral problems (e.g., unusual, affects use or safety)	0.5	(0.1)	0.2	(0.0)
Injury/wounds/trauma	6.2	(0.5)	4.7	(0.2)
Lameness, leg, or hoof problems (could not be used for intended purpose without treatment)*	4.1	(0.4)	2.8	(0.2)
Neurologic problems (e.g., spinal problem, wobblers, seizure, West Nile virus, EPM)	0.4	(0.1)	0.2	(0.0)
Infectious disease unrelated to specific body system (septicemia, blood infections)	0.8	(0.2)	0.3	(0.1)
Chronic weight loss	0.7	(0.2)	0.2	(0.0)
Overweight/obese	0.9	(0.2)	0.9	(0.1)
Liver or kidney disease	N/A		0.1	(0.0)
Cancer	N/A		0.1	(0.0)
Other	N/A		0.3	(0.1)

\*Question from 1998 was worded as leg or hoof problems instead of lameness, leg, or hoof problems (2005).

**8. Births**

The percentage of operations that had any equine births on the operation during the previous 12 months decreased from 42.2 percent in 1998 to 33.6 percent in 2005.

a. Percentage of operations that had any equine births on the operation during the previous 12 months:

<b>Percent Operations</b>			
<b>1998</b>		<b>2005</b>	
<b>Percent</b>	<b>Std. Error</b>	<b>Percent</b>	<b>Std. Error</b>
42.2	(2.4)	33.6	(0.9)

The percentages of foals born alive were similar in 1998 and 2005. Less than 8 percent of foals were born dead or aborted in 1998 and 2005.

b. Percentage of foals by birth outcome during the previous 12 months:

<b>Percent Foals</b>				
	<b>1998</b>		<b>2005</b>	
<b>Births</b>	<b>Percent</b>	<b>Std. Error</b>	<b>Percent</b>	<b>Std. Error</b>
Born alive	92.9	(1.0)	93.5	(0.5)
Born dead or aborted*	7.1	(1.0)	6.5	(0.5)
Total	100.0		100.0	

\*Options in 1998 were born alive, born dead full term, and born dead premature.



**9. Foal deaths**

The overall percentages of foals aged 30 days or less that died were similar in 1998 and 2005, with between 4 and 5 percent of foals born alive dying in the first 30 days of life. The percentage of foals that died in the first 2 days was about the same as the percentage of foals that died in the next 28 days.

a. For foals born alive, percentage of foals that died in the first 30 days of life (including born on or moved onto the operation) during the previous 12 months, by age at death (in days):

	Percent Foals			
	1998		2005	
Age at Death (Days)	Percent	Std. Error	Percent	Std. Error
2 or less	2.0	(0.4)	2.6	(0.3)
3 to 30	2.2	(0.6)	2.3	(0.3)
Total	4.2	(0.8)	4.9	(0.4)

The percentages of foal deaths attributed to unknown and “other” causes decreased from 1998 to 2005. Two potential causes of foal deaths were included in the 2005 questionnaire but not the 1998 questionnaire: infectious disease unrelated to specific body system/blood infection (septicemia), and failed to get colostrum or milk from mare. Together, these two causes accounted for 18.2 percent of foal deaths in 2005. The percentage foal deaths from digestive problems other than colic increased from 0.6 percent in 1998 to 6.4 percent in 2005. The leading causes of death in 2005—excluding unknown and “other”—were injury/wounds/trauma, failed to get colostrum or milk from mare, dystocia, and birth defects. In 1998, “other” reported known causes of foal death included prematurity, lack of milk or colostrum production by mare, exposure, drowning, and infection. In 2005 “other” known causes of foal death included predator attacks and adverse environmental conditions.

b. For foals born alive, percentage of foal deaths during the first 30 days of life, by cause of death:

Cause of Death	Percent Foal Deaths			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Colic	0.2	(0.1)	1.5	(1.2)
Other digestive problems (e.g., diarrhea)	0.6	(0.3)	6.4	(1.9)
Respiratory problems (e.g., pneumonia, strangles, <i>Rhodococcus equi</i> , etc.)	1.5	(0.7)	3.6	(1.3)
Neurologic problems (e.g., spinal problem, wobblers, seizure, EPM, WNV, sleeping sickness, maladjustment syndrome)	3.1	(1.9)	0.5	(0.4)
Dystocia, trauma, or complications at birth	5.1	(3.2)	10.7	(2.6)
Birth defects	17.6	(6.4)	8.9	(2.1)
Injury/wounds/trauma unrelated to birth	9.4	(7.7)	18.6	(3.3)
Infectious disease unrelated to specific body system, blood infection (septicemia)	N/A		3.3	(1.7)
Failed to get colostrum or milk from mare	N/A		14.9	(3.5)
Other	29.3	(9.1)	13.7	(3.0)
Unknown cause	33.2	(8.2)	17.9	(3.1)
Total	100.0		100.0	

## 10. Equid deaths

The overall mortality rates for resident equids more than 30 days of age were similar in 1998 and 2005 (2.0 percent and 1.8 percent, respectively). The highest mortality rates in both 1998 and 2005 occurred in equids 20 years of age or older (approximately eight to nine times the rate for equids aged more than 30 days to less than 20 years).

a. Percentage of resident equids more than 30 days of age that died or were euthanized during the previous 12 months, by age:

Age at Death	Percent Resident Equids*			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
More than 30 days but less than 6 months	1.4	(0.5)	1.2	(0.2)
6 months to less than 5 years	1.5	(0.5)	1.1	(0.1)
5 years to less than 20 years	1.4	(0.3)	1.2	(0.1)
20 years or older	11.9	(2.2)	10.2	(0.8)
Total deaths of equids more than 30 days of age	2.0	(0.3)	1.8	(0.1)

\*(Number of resident equids that died or were euthanized) x 100/age class of resident equine inventory.

Based on common “write-in” causes in 1998, several reasons for death were added to the 2005 questionnaire, including cancer, liver/kidney problem, fire/lightning or other storm, and poisoning/toxicity (suspected or confirmed). In 1998, these causes were included in the “other” category. For equids aged more than 30 days to less than 6 months, the percentages of deaths were similar in 1998 and 2005 across all causes of death. About one in four deaths in resident equids aged more than 30 days to less than 6 months were attributed to unknown causes in 1998 and 2005. For equids aged 6 months or more, the percentages of deaths were similar in 1998 and 2005 across all causes of death with the exception of “other” causes of death, which was lower in 2005 than in 1998, likely because of the additional choices added to the 2005 questionnaire. Commonly reported causes of death in this age category in 1998 and 2005 were old age, colic, and injury/wounds/trauma. “Other” known causes of death in 1998 included cancer, heart disease, poisoning, lightning strike, liver disease, and birth defects. In 2005, “other” known causes of death included heart attack, snake bite, stroke, ruptured vessel, heat stroke, endocrine disease, and pigeon fever.

b. Percentage of equid deaths (including euthanasia), by cause of death and by age:

Cause	Percent Equid Deaths							
	Age Category							
	More than 30 Days to Less than 6 Months				6 Months or Older			
	1998		2005		1998		2005	
Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error	
Colic	7.5	(5.4)	3.4	(2.0)	22.2	(5.5)	15.2	(1.8)
Other digestive problems (e.g., diarrhea)	9.3	(5.8)	8.3	(4.3)	1.3	(0.7)	3.0	(0.9)
Respiratory problems including strangles	2.8	(1.8)	7.3	(3.6)	3.1	(1.7)	2.7	(0.7)
Neurologic problems (e.g., spinal problem, wobblers, seizure, WNV, EPM)	6.6	(5.0)	0.0	(--)	1.8	(1.5)	3.3	(0.8)
Dystocia or birthing complications	0.1	(0.1)	0.0	(--)	1.3	(0.6)	2.3	(0.6)
Reproductive problems other than dystocia	0.0	(--)	1.6	(1.6)	0.5	(0.3)	0.9	(0.4)
Injury/wounds/trauma	31.8	(14.3)	23.9	(7.9)	12.7	(5.8)	16.0	(1.7)
Lameness, leg, or hoof problems (could not be used for intended purpose without treatment)	7.8	(7.6)	8.5	(3.5)	6.9	(3.5)	7.7	(1.3)
Old age	--	(--)	N/A	N/A	24.8	(5.8)	30.4	(2.4)
Cancer	N/A		0.0	(--)	N/A		2.7	(0.7)
Liver or kidney disease	N/A		1.1	(1.1)	N/A		1.9	(0.6)
Fire, lightning strike, flood, or other storm	N/A		7.9	(6.2)	N/A		2.1	(0.9)
Poisoning/toxicity (suspected or confirmed)	N/A		0.0	(--)	N/A		0.3	(0.2)
Other known cause	5.8	(4.3)	14.6	(6.5)	18.0	(3.6)	5.8	(1.1)
Unknown cause	28.3	(18.1)	23.4	(8.1)	7.4	(3.0)	5.7	(1.0)
Total	100.0		100.0		100.0		100.0	

**C. Biosecurity****1. Nonresident equids**

The percentages of operations with 0, 1 to 9, and 10 or more nonresident equids that stayed fewer than 30 consecutive days were similar in 1998 and 2005.

Approximately 8 of 10 operations in 1998 and 2005 had no nonresident equid visitors during the previous 12 months.

a. Percentage of operations by number of nonresident equids that stayed on the operation for fewer than 30 consecutive days during the previous 12 months:

<b>Number Nonresident Equids</b>	<b>Percent Operations</b>			
	<b>1998</b>		<b>2005</b>	
	<b>Percent</b>	<b>Std. Error</b>	<b>Percent</b>	<b>Std. Error</b>
0	79.1	(2.0)	81.0	(0.8)
1 to 9	15.4	(1.7)	14.7	(0.7)
10 or more	5.5	(1.3)	4.3	(0.4)
Total	100.0		100.0	

For operations that had nonresident equids that stayed for fewer than 30 consecutive days, the percentages of operations that implemented the following health requirements for nonresident equids were similar in 1998 and 2005. In 2005, three choices were added to the health-requirement category: screening test for strangles or history of no occurrence in past 6 months, other past medical history, and quarantine prior to contact with resident equids. However, it is unlikely that these additional choices altered the response to the other choices because the choices for health requirements were not mutually exclusive (e.g., operations could have more than one of the requirements for nonresident equids).

b. For operations with nonresident equids that stayed fewer than 30 consecutive days during the previous 12 months, percentage of operations by frequency that the following health requirements were always or sometimes implemented for the majority of nonresident equids:

Health Requirement	Percent Operations			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Official health certificate, i.e., certified veterinary inspection (CVI)	31.9	(4.9)	24.8	(1.9)
Veterinary examination other than CVI	30.7	(5.1)	18.4	(1.7)
Coggins test (EIA test, swamp fever test)	50.2	(5.3)	45.3	(2.2)
Vaccination within past year	43.5	(5.2)	36.3	(2.1)
Deworming within past year	43.2	(5.2)	33.6	(2.1)
Screening test for strangles or history of no occurrence in past 6 months	N/A		9.7	(1.2)
Other past medical history from owner	N/A		21.8	(1.7)
Quarantine prior to contact with resident equids	N/A		17.2	(1.5)
Other	10.6	(3.1)	3.8	(0.8)

## 2. Additions

The percentage of operations that added new resident equids and the percentage of resident equids added both decreased from 1998 to 2005. Operations with primary functions of farm/ranch and residences with equids for personal use accounted for much of the difference, with a smaller percentage of operations with these primary functions indicating addition of new residents in 2005 compared to 1998.

a. Percentage of operations that added new resident equids during the previous 12 months and percentage of equids added, including foals not born to a resident mare (excluding births):

Measure	Percent			
	1998		2005	
	Pct.	Std. Error	Pct.	Std. Error
Percent operations	40.5	(2.3)	21.5	(0.8)
Percent resident equids*	11.3	(1.3)	6.3	(0.5)

\*Total number of equids added to resident equine population x 100/total resident equine inventory.

The percentages of operations adding new resident equids from various geographic sources were similar in 1998 and 2005. Less than 2 percent of operations added equids from outside the United States in 1998 and 2005.

b. For operations that added new resident equids during the previous 12 months, percentage of operations by source location of added equids:

Source	Percent Operations			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Within State	85.4	(2.4)	81.6	(1.6)
Outside State, within United States	28.1	(3.3)	29.9	(1.9)
Canada	1.2	(0.5)	1.1	(0.3)
Mexico	0.0	(--)	0.2	(0.1)
Outside North America	0.5	(0.3)	0.3	(0.1)
Unknown location	0.2	(0.1)	1.0	(0.5)

The percentages of new additions by source location were similar in 1998 and 2005. The majority of new resident equids came from within the State in 1998 and 2005.

c. For operations that added new resident equids during the previous 12 months, percentage of new additions by source location of added equids:

Source	Percent Additions*			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Within State	73.9	(4.0)	70.7	(3.2)
Outside State, within United States	25.1	(3.9)	25.7	(3.0)
Canada	0.5	(0.2)	2.2	(1.4)
Mexico	0.0	(--)	0.5	(0.3)
Outside North America	0.3	(0.1)	0.4	(0.3)
Unknown location	0.2	(0.1)	0.5	(0.3)
Total	100.0		100.0	

\*Number of equids added to resident equine population from various sources x 100/total new additions from all sources.



Health requirements for newly added resident equids were not mutually exclusive. For operations that added new resident equids during the previous 12 months, the percentage of operations that required an official health certificate (CVI) for newly added resident equids decreased from 53.1 percent in 1998 to 34.6 percent in 2005. Likewise, the percentage of operations that required a veterinary examination other than an official health certificate (CVI) for newly added equids decreased from 45.1 percent in 1998 to 29.2 percent in 2005. Three additional choices for health requirements were included in the 2005 questionnaire: screening test for strangles or history of no occurrence in past 6 months, other past medical history from owner, and quarantine prior to contact with resident equids. However, since the health-requirement choices were not mutually exclusive, it is unlikely that responses to the first five categories were influenced by the new choices. The percentage of "other" requirements decreased from 13.0 percent in 1998 to 5.0 percent in 2005, likely because of the above-mentioned choices added to the 2005 questionnaire. The percentage of operations with a primary function of equine boarding/training stable was higher in 1998 compared to 2005 (10.0 percent and 5.9 percent, respectively). The percentage of operations with a primary function of farm/ranch was lower in 1998 compared to 2005. Boarding/training facilities were more likely than farm/ranch operations to require an official health certificate (CVI), EIA test, and screening test for strangles or history of no occurrence in past 6 months.

d. For operations that added new resident equids during the previous 12 months, percentage of operations that always or sometimes implemented the following health requirements for new additions:

	Percent Operations			
	1998		2005	
Health Requirement	Percent	Std. Error	Percent	Std. Error
Official health certificate (CVI)	53.1	(3.5)	34.6	(2.0)
Veterinary examination other than CVI	45.1	(3.7)	29.2	(1.9)
Coggins test (EIA test, swamp fever test)	67.2	(3.7)	61.8	(2.0)
Vaccination within past year	57.0	(3.6)	49.2	(2.1)
Deworming within past year	65.8	(3.7)	48.9	(2.1)
Screening test for strangles or history of no occurrence in past 6 months	N/A		14.2	(1.4)
Other past medical history from owner	N/A		36.3	(2.0)
Quarantine prior to contact with resident equids	N/A		32.0	(2.0)
Other	13.0	(2.5)	5.0	(0.9)

### 3. Contact with other animals

The percentage of operations where poultry had direct contact with resident equids or their feed increased from 13.4 percent in 1998 to 18.6 percent in 2005. The percentage of operations where cattle had direct contact with resident equids or their feed increased from 34.1 percent in 1998 to 43.2 percent in 2005. The increase in equid contact with cattle and poultry may be a result of the higher percentage of operations with farm/ranch as a primary function in 2005 compared to 1998.

Percentage of operations where the following animals had physical contact with resident equids or their feed:

Animal	Percent Operations			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Poultry	13.4	(1.5)	18.6	(0.8)
Pigs	3.7	(0.8)	4.7	(0.4)
Cattle	34.1	(2.3)	43.2	(1.0)
Sheep/goats	11.4	(1.3)	13.9	(0.7)
Llamas/alpacas	1.5	(0.5)	2.4	(0.3)
Emus/ostriches	1.0	(0.3)	1.2	(0.2)
Dogs	77.9	(1.9)	76.9	(0.9)
Cats	67.7	(2.3)	66.4	(1.0)

**D. Equid Movement****1. Distance traveled**

The percentage of operations that did not move equids off the operation increased from 19.3 percent in 1998 to 36.6 percent in 2005. Operations with a primary function of farm/ranch and residences with equids for personal use accounted for much of the difference, as these operations moved horses less frequently in 2005 compared to 1998, and farm/ranch operations accounted for a larger percentage of operations in 2005 than in 1998.

Percentage of operations by maximum one-way distance resident equids traveled and returned during the previous 12 months (whether or not by vehicle, farthest away animal got from home operation):

	Percent Operations			
	1998		2005	
Distance (Miles)	Percent	Std. Error	Percent	Std. Error
0	19.3	(1.9)	36.6	(1.0)
1 to 9	8.6	(1.7)	5.0	(0.5)
10 to 49	20.5	(2.0)	19.0	(0.8)
50 to 99	11.5	(1.4)	8.9	(0.6)
100 to 499	27.4	(2.1)	22.2	(0.9)
500 to 999	7.5	(1.4)	5.4	(0.4)
1,000 or more	5.2	(0.9)	2.9	(0.3)
Total	100.0		100.0	

**2. Vehicle transportation**

The percentage of operations that transported any resident equids by vehicle off the home operation and returned the equids during the previous 12 months decreased from 73.5 percent in 1998 to 58.4 percent in 2005. Operations with a primary function of farm/ranch and residences with equids for personal use accounted for much of the difference, as these operations moved horses less frequently in 2005 than in 1998, and farm/ranch operations accounted for a larger percentage of operations in 2005 than in 1998.

Percentage of operations that transported any resident equids by vehicle off the home operation for any purpose and returned the equids to the operation during the previous 12 months:

<b>Percent Operations</b>			
<b>1998</b>		<b>2005</b>	
<b>Percent</b>	<b>Std. Error</b>	<b>Percent</b>	<b>Std. Error</b>
73.5	(2.3)	58.4	(1.0)

### 3. Destination

The destinations of transported equids were not mutually exclusive. For example, an operation could have transported equids with a final destination within the State for one trip and to Canada for another trip. Movement patterns were similar in 1998 and 2005

For operations that transported resident equids by vehicle off the home operation and returned during the previous 12 months, percentage of operations by destination of equids:

Percent Operations				
Destination	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Within State	96.6	(1.2)	94.8	(0.6)
Adjacent State	30.8*	(2.5)	34.3	(1.2)
Beyond adjacent States (including Alaska and Hawaii)			11.9	(0.8)
Canada	1.3	(0.5)	0.7	(0.2)
Mexico	0.0	(0.0)	0.3	(0.2)
Outside North America	0.2	(0.1)	0.2	(0.1)

\*1998 questionnaire: outside State, within United States.

### 4. Direct contact with outside equids during trips

The percentage of operations where resident equids left the home operation and had direct contact with outside equids decreased from 87.3 percent in 1998 to 75.1 percent in 2005.

a. Percentage of operations that had resident equids that left the operation and returned after direct contact with outside equids:

Percent Operations			
1998		2005	
Percent	Std. Error	Percent	Std. Error
87.3	(2.4)	75.1	(0.9)

For operations that had resident equids that left the home operation and returned after direct contact with outside equids, the percentages of operations that routinely isolated returning equids were similar in 1998 and 2005. The percentage of operations that only isolated returning equids for a cause such as disease or exposure to disease increased from 15.8 percent in 1998 to 26.0 percent in 2005. The percentage of operations that never isolated returning equids decreased from 72.3 percent in 1998 to 60.6 percent in 2005.

b. For operations that had resident equids that left the home operation and returned after direct contact with outside equids, percentage of operations by infection-control practice used for returning equids:

<b>Practice</b>	<b>Percent Operations</b>			
	<b>1998*</b>		<b>2005</b>	
	<b>Percent</b>	<b>Std. Error</b>	<b>Percent</b>	<b>Std. Error</b>
Routinely isolate returning equids	11.9	(2.5)	10.6	(0.7)
Only isolate returning equids for a cause such as disease or exposure to disease	15.8	(2.4)	26.0	(1.0)
Quarantine before arrival at home operation	N/A		2.8	(0.4)
Never isolate returning equids	72.3	(3.2)	60.6	(1.1)
<b>Total</b>	<b>100.0</b>		<b>100.0</b>	

\*Categories for 1998 were resident equine never leave premises, routinely isolated returning equine, isolated returning horses for a cause such as evidence of or exposure to disease, and never isolated returning horses.

## E. General Management

### 1. Feed source

The percentage of operations that fed grain concentrate/energy source beyond hay or pasture during the previous 12 months was slightly higher in 1998 than in 2005 (95.9 percent and 90.1 percent, respectively).

a. Percentage of operations that fed grain concentrate/energy source (beyond hay or pasture forage) during the previous 12 months:

Percent Operations			
1998		2005	
Percent	Std. Error	Percent	Std. Error
95.9	(1.1)	90.1	(0.6)

For operations that fed grain concentrate/energy source during the previous 12 months, the reported percentage of grain/concentrate by source was averaged over all operations. The highest percentage of grain/concentrate was purchased in bags in both 1998 and 2005.

b. For operations that fed grain concentrate/energy source (beyond hay or pasture forage) during the previous 12 months, operation average percentage of grain/concentrate fed, by source:

Source	Operation Average Percent of Grain/Concentrate			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Purchased in bags (retail source)	82.5	(1.8)	79.1	(0.8)
Bulk delivery from retail source	6.3	(1.1)	9.6	(0.6)
Bulk delivery from nonretail source	3.4	(0.8)	3.0	(0.3)
Home-grown	7.4	(1.2)	7.9	(0.5)
Other	0.4	(0.2)	0.4	(0.1)
Total	100.0		100.0	

The percentage of operations that stored grain/concentrate in a manner to prevent fecal contamination by mice or rats increased from 77.6 percent in 1998 to 85.0 percent in 2005.

c. For operations that fed grain concentrate/energy source (beyond hay or pasture forage) during the previous 12 months, percentage of operations that stored grain/concentrate in a manner that prevents contamination by mice, rats, or their feces:

Percent Operations			
1998*		2005	
Percent	Std. Error	Percent	Std. Error
77.6	(2.1)	85.0	(0.8)

\*Questionnaire in 1998 asked was feed stored in rodent-proof containers.

## 2. Drinking water

The predominant sources of drinking water for equids were similar in 1998 and 2005, with well water being the predominant source of water for equids on over half the operations in both 1998 and 2005.

Percentage of operations by predominant source of drinking water for resident equids during the previous 12 months:

Source	Percent Operations			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Well	58.9	(2.5)	57.5	(0.9)
Public/ municipal water supply	17.2	(2.3)	18.9	(0.8)
Spring	5.2	(1.0)	5.4	(0.5)
Surface water (pond, stream, river, or cistern)	18.2	(1.8)	18.1	(0.8)
Other	0.5	(0.3)	0.1	(0.0)
Total	100.0		100.0	

## 3. Insect control

The following methods of insect control were not mutually exclusive, as operations could have used various combinations of insect control. The percentage of operations that used repellent applied to equids decreased from 86.5 percent in 1998 to 73.1 percent in 2005. The percentages of operations that



used insecticides applied in or near equine housing area and insecticide applied on pastures increased from 1998 to 2005. Several methods of insect control were added to the 2005 questionnaire: bug zapper, fly sheet on equids, mosquito treatment in drinking water, water container emptied at least weekly, frequent removal of manure and weeds from premises, and screened-in stalls, as they were common “write-in” methods in the 1998 questionnaire. These additions probably account for the decrease from 1998 to 2005 in the percentage of operations that listed “other” as a method of insect control.

Percentage of operations where the following insect-control methods were used during summer:

Method	Percent Operations			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Repellents applied to equids	86.5	(2.4)	73.1	(0.9)
Insecticides applied in or near equine housing area	26.1	(3.2)	36.0	(1.0)
Insecticides applied to pasture areas	1.2	(0.5)	5.5	(0.5)
Regional control program, such as aerial spraying	2.5	(0.7)	4.1	(0.4)
Sticky tape	26.7	(3.3)	20.9	(0.8)
Bug zapper	N/A		8.4	(0.6)
Parasitic wasps specifically brought onto operation	2.4	(0.8)	3.1	(0.3)
Face mask on equid	32.3	(3.7)	27.2	(0.9)
Fly tags attached to equine halters	3.5	(1.4)	4.1	(0.4)
Fly sheets on equid	N/A		7.3	(0.5)
Insect control product in feed, such as using Equitrol®	2.8	(1.0)	5.6	(0.5)
Mosquito treatment in drinking water (mosquito dunks)	N/A		6.3	(0.5)
Water container emptied and refilled with fresh water at least weekly	N/A		58.5	(1.0)
Frequent removal of weeds and manure from premises	N/A		51.3	(1.0)
Screened-in stalls	N/A		2.4	(0.3)
Other	13.1	(2.4)	5.9	(0.5)
Any method	91.3	(2.1)	88.9	(0.7)

#### 4. Manure management

Methods of disposing of manure and waste bedding were not mutually exclusive. The percentage of operations that sold or gave away manure decreased from 24.9 percent in 1998 to 16.9 percent in 2005.

Percentage of operations by method of manure (including composted manure) and/or waste bedding disposal used during the previous 12 months:

Method	Percent Operations			
	1998		2005	
	Percent	Std. Error	Percent	Std. Error
Routine garbage pickup	1.7	(0.7)	2.6	(0.3)
Hauled to landfill (not routine garbage pickup)	0.7	(0.3)	1.5	(0.2)
Hauled away, other than to landfill	9.0	(1.2)	10.9	(0.6)
Applied on fields on the operation where any livestock (including equids) graze	39.6	(2.6)	37.2	(1.0)
Applied on fields on the operation where no livestock graze	40.9	(2.4)	42.0	(0.9)
Manure/waste bedding allowed to accumulate or left to nature	31.6	(2.1)	32.4	(1.0)
Sold or gave away	24.9	(2.1)	16.9	(0.7)
Other	5.0	(1.1)	2.3	(0.3)

## Appendix: Study Objectives and Related Outputs

1. Focus on health practices that could impact the occurrence of equine infectious diseases.
  - Part I: Baseline Reference of Equine Health and Management, 2005, November 2006
  - Highlights of Equine 2005 Part I information sheet, November 2006
  - Equine Identification and Familiarity with the National Identification System information sheet, November 2006
  - Nonambulatory Equids in the United States information sheet, November 2006
  
2. Determine health-management factors related to the control of equine infectious diseases, as implemented on-farm in the 28 participating States.
  - Equine Biosecurity and Biocontainment Practices on U.S. Equine Operations information sheet, November 2006
  
3. Compare relevant data collected in 2005 to data collected during the NAHMS Equine '98 study.
  - **Part II: Changes in the U.S. Equine Industry, 1998-2005, February 2007**
  - Information sheets, expected winter 2007
  
4. Help identify trends in equine health management related to the control of equine infectious diseases.
  - **Part II: Changes in the U.S. Equine Industry, 1998-2005, February 2007**
  - Information sheets, expected winter 2007
  
5. Gather data specific to equine vaccination.
  - Part I: Baseline Reference of Equine Health and Management, 2005, November 2006
  - Vaccination Practices on U.S. Equine Operations information sheet, December 2006

