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Animal and Plant Health Inspection Service

Veterinary Services

National Animal Health Monitoring System

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Report 1

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Equine 2015

Baseline Reference of Equine Health and Management in the United States, 2015

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Cover photograph courtesy of Camilla Kristensen.

Items of Note

The Equine 2015 study was conducted in 28 States, which were chosen for participation in the study based, in part, on the size of the States' equine population or the density of the States' equine population. As with past equine studies conducted by USDA's National Animal Health Monitoring System, Equine 2015 provides valuable information to study participants, stakeholders, and the equine industry as a whole. Data collected for the study represented 71.6 percent of equids and 70.9 percent of U.S. operations with five or more equids.

The USDA's National Agricultural Statistics Service directly captures data on U.S. equine operations during the Census of Agriculture; thus, the list frame used to select participants for the Equine 2015 study was based primarily on information from the 2012 Census of Agriculture. All farms on the list with five or more equids (including horses, ponies, mules, and donkeys) were eligible to be included in the sample. Horses residing at racetracks were not eligible. In total, 3,997 operations were selected for participation via a stratified random sample. For details, see the Methodology section on page 171.

Approximately 9 of 10 operations (88.9 percent) had 19 or fewer resident equids on May 1, 2015. These operations accounted for 58.1 percent of resident equids in the United States. Resident equids were defined as equids that spent more time at one operation than at any other operation (whether or not they were present on May 1, 2015). Although large operations (20 or more resident equids) accounted for only 11.1 percent of all operations, they accounted for 41.9 percent of all resident equids.

Operations could have had more than one type of resident equid on May 1, 2015. More than 90 percent of operations in each region (see map on p 3) had one or more horses. A higher percentage of operations in the South Central and Southeast regions (23.7 and 18.8 percent, respectively) had one or more donkeys or burros than operations in the West or Northeast regions (9.2 and 8.9 percent, respectively).

Overall, 65.6 percent of resident equids were 5 to 20 years old; this age category accounted for the highest percentage of all resident equids. Equids 1 year to less than 5 years of age accounted for 16.5 percent of resident equids, and equids 20 years of age or older accounted for 11.4 percent.

Quarter horses accounted for the highest percentage of all resident horse breeds (42.1 percent). This breed also accounted for the highest percentage of resident horses in the West and South Central regions (55.5 and 61.8 percent, respectively). The highest percentage of draft horses was in the Northeast region (15.2 percent of resident horses), and the highest percentage of Tennessee Walkers was in the Southeast region (15.1 percent).

Although equine operations used multiple information sources when making decisions related to equine health care, the majority (70.7 percent) used a private veterinarian as their primary information source in the previous 12 months.

Overall, 78.8 percent of operations had used a veterinarian to provide any service at least once in the previous 12 months; at least 40 percent of operations had used a veterinarian to provide an individual-animal diagnosis, treatment, or surgery; vaccination consultation; administration of vaccines; drugs or vaccines not administered by a veterinarian; dentistry (e.g., floating, filing, or removing teeth); and individual or herd diagnostic services. Over one-fourth of all operations (26.9 percent) used a veterinarian to provide an official health certificate, and 6.2 percent of all operations used a veterinarian to perform a biosecurity assessment.

Overall, 66.7 percent of operations vaccinated any resident equids in the previous 12 months. The percentage of operations that vaccinated any resident equids in the previous 12 months increased as operation size increased.

Overall, 93.4 percent of births in the previous 12 months resulted in a live foal. A higher percentage of foals in the West region (96.8 percent) were born alive compared with foals in the Northeast (90.9 percent) and Southeast (91.5 percent) regions.

Deciding to end the life of an equid can be difficult. Gathering information that allows an owner to consider in advance the criteria to use when making the decision to euthanize an equid can be helpful. Overall, more than half of all operations (59.8 percent) had an end-of-life plan for equids.

Overall, 5.8 percent of resident foals died in the first 30 days following birth; 3.3 percent died in the first 2 days, and another 2.5 percent died from 3 to 30 days following birth.

For resident equids less than 1 year of age, conditions commonly attributed to cause of death were injury, wounds, or trauma (27.8 percent of deaths); digestive problems other than colic, such as diarrhea (17.8 percent); respiratory problems (15.4 percent); and failure to get milk or colostrum (13.2 percent).

For resident equids 1 to less than 20 years of age, conditions commonly attributed to cause of death included colic (31.2 percent of deaths); injury, wounds, or trauma (16.3 percent); and respiratory problems (10.4 percent).

For resident equids 20 years or age or older, conditions commonly attributed to cause of death included “other” (26.6 percent of deaths), colic (13.4 percent), cancer (13.2 percent), neurologic problems (12.1 percent), and chronic weight loss (11.7 percent). The most common “other” specified condition attributed to death was old age.

Operators on 38.8 percent of operations were knowledgeable about equine infectious anemia (EIA), while 18.2 percent recognized the name, not much else, and 7.7 percent said they had not heard of it before. The percentage of operators knowledgeable about EIA was higher on large operations than on small operations (50.8 and 35.8 percent, respectively). Note: The interview question included the following prompt: “EIA is the disease for which the Coggins test is performed.”

Overall, 47.1 percent of operations performed at least one EIA test on resident equids in the previous 12 months, and 36.8 percent of resident equids had at least one EIA test in the previous 12 months.

For all operations, the average cost of an EIA test in the previous 12 months (including call fee or cost of transportation) was $40.77 and ranged from $39.34 in the South Central region to $46.39 in the West region.

Overall, 29.8 percent of operations never had resident equids leave the operation and return. A higher percentage of small operations (35.9 percent) never had resident equids leave the operation and return compared with medium and large operations (19.7 and 12.4 percent, respectively). A lower percentage of small operations (24.0 percent) only isolated resident equids for a cause such as disease or known exposure to disease compared with medium and large operations (36.2 and 35.9 percent, respectively). A similar percentage of operations across operation sizes never isolated returning equids.

The highest percentage of all operations (76.0 percent) used repellents applied to equids as a method of insect control. Over half of all operations (58.7 percent) emptied water containers and refilled them with fresh water at least once a week or used automatic waterers; 51.8 percent of all operations frequently removed weeds and/or manure from the premises as a form of insect control. Other common methods of insect control included insecticides applied in or near the equine housing area (36.8 percent of operations), face masks on equids (32.6 percent), and sticky tape or insect traps (31.8 percent). Operations may have used more than one method for insect control.

Overall, about one-third of operations (31.7 percent) composted equine manure on the operation. A higher percentage of large operations (47.3 percent) composted equine manure on the operation than small or medium operations (28.9 and 32.6 percent, respectively).

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Acknowledgments

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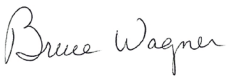

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Feedback

Feedback, comments, and suggestions regarding Equine 2015 study reports are welcomed. You may submit feedback via online survey at: http://www.aphis.usda.gov/nahms (Click on “Provide FEEDBACK on NAHMS reports.”)

For questions about this report or additional copies, please contact:

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Introduction

The National Animal Health Monitoring System (NAHMS) is a nonregulatory division of the U.S. Department of Agriculture's (USDA) Veterinary Services (VS) and is designed to help meet the Nation's animal health information needs.

Equine '98 was NAHMS first national study on equine baseline health and management and provided participants, industry, and animal health officials with baseline information on the Nation's equine population for education and research. The study's first phase included operations with one or more equids selected from a combined National Agricultural Statistics Service (NASS) area and list data set. (See Equine '98 for more methodology details.) To be eligible for participation in the study's second phase, operations must have had three or more horses on January 1, 1998.

Equine 2005 was NAHMS second national study of the U.S. equine industry. Like Equine '98, it was designed to provide participants, industry, and animal health officials with information on the Nation's equine population to serve as a basis for education and research related to equine infectious disease control. NASS collaborated with Veterinary Services to select a representative sample of operations with five or more equids from the 2002 Census of Agriculture list.

In 2005, NAHMS also conducted a study of equine events in six States. This study was a cooperative effort between Federal and State animal health officials, university researchers, extension personnel, and equine event coordinators/organizers. It was the first NAHMS study that focused on events at which equids congregate and included information recorded by event coordinators/organizers as well as animal health control strategies employed at the events.

Equine 2015 is the third NAHMS study of the U.S. equine industry. NASS cooperated with VS to select a representative sample of equine operations based on the 2012 Census of Agriculture for operations with 5 or more equids across 28 States. Detailed information on methods and number of respondents in this study can be found in the Methodology section (p 171). Equine 2015 updates baseline health and management information and provides detailed information on vaccine use, parasite control, tick control, tick borne diseases, prevalence of owner-reported lameness, management of lameness, and the cost of animal health care. The study also examined the prevalence of *Salmonella* shedding, tick infestation, and identification of ticks on equids. The outcome of a biosecurity assessment of equine operations will be reported.

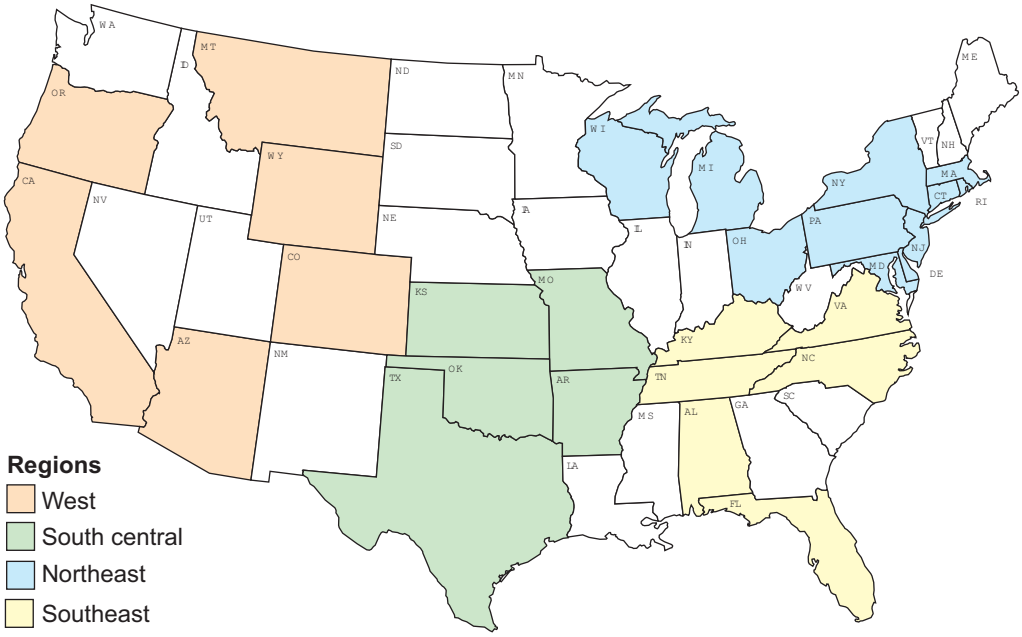
Study objectives for Equine 2015:

- Describe trends in equine care and health management for study years 1998, 2005, and 2015.
- Estimate the occurrence of owner-reported lameness and describe practices associated with the management of lameness.
- Describe health and management practices associated with important equine infectious diseases.
- Describe animal health related costs of equine ownership.
- Evaluate control practices for gastrointestinal parasites.
- Evaluate equines for presence of ticks and describe tick-control practices used on equine operations.
- Collect equine sera along with equine demographic information to create a serum bank for future studies.

“Baseline Reference of Equine Health and Management in the United States, 2015” is the first in a series of reports documenting results from the Equine 2015 study. This report focuses on general health and management practices and contains information on equine operations with 5 or more equids across 28 States. Specific objectives of Equine 2015 are listed in appendix IV.

Information on the methods used and the number of respondents in this study can be found in the Methodology section (p 171).

NAHMS Equine 2015 participating States



Regions:

Northeast: Connecticut, Delaware, Maryland, Massachusetts, Michigan, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Wisconsin
Southeast: Alabama, Florida, Kentucky, North Carolina, Tennessee, Virginia
South Central: Arkansas, Kansas, Missouri, Oklahoma, Texas
West: Arizona, California, Colorado, Montana, Oregon, Wyoming

Terms Used in This Report

Antibiotic: Drug used to treat bacterial infections. It can be given topically (applied to skin or wounds); in the uterus or eyes; or injected into muscles, veins, or joints.

Artificial vagina: Also referred to as an AV, this device is used to collect semen for artificial insemination.

Colic: Abdominal pain that can have multiple causes. Equids with colic can show any or all of the following clinical signs: pawing, rolling, sweating, stretching out, lying down more than usual, looking at sides, curling lip, not eating.

Donkey, burro, or ass: Domesticated equids whose ancestor is the wild ass. These equids have long ears; vary in size; and generally have longer, coarser hair coats than horses.

Equid: Animal of the family *Equidae.* Only domestic horses, miniature horses, ponies, mules, donkeys/burros, and zedonks (zebra-donkey cross) were included in the Equine 2015 study.

Euthanasia: The intentional ending of life, generally performed to relieve pain and suffering.

Farrier: Specialist in equine hoof care, including trimming, balancing hooves, and placing shoes on hooves, if necessary.

Foal: Equid less than 6 months of age.

Horse: Although there can be exceptions, in general a domestic equid more than 14.2 hands (58 inches) high at the withers (near the last hairs of the mane). An equid less than 14.2 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, and Morgan) and draft horses (e.g., Clydesdale, Belgian, and Percheron).

List frame: A digital or hand-written list of sampling units (e.g., farms or operations) in a target population that enumerates and identifies the subjects in the population. A list frame includes information that allows contact with sampling units and may contain auxiliary information about sampling units (such as the size of the farm or the types of animals on the farm) that can aid in carrying out complex sampling designs.

Live cover: A term used to refer to natural breeding of a mare by a stallion. With live cover, the stallion mounts a mare in estrus and deposits semen directly into the mare's vagina.

Miniature horse: A horse that is usually less than 34 to 38 inches tall at the withers. Although the size of a pony, miniature horses retain many characteristics of a horse.

Mule: A hybrid from a donkey sire and a horse dam.

Operation: An area of land managed as a unit by an individual, partnership, or hired manager. An operation must have had at least five equids to be eligible to participate in the Equine 2015 study.

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

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 by laboratory testing.

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

Phantom: Also referred to as a breeding dummy, breeding mount, or phantom mare, this device is secured to the floor and allows the stallion to mount his forelegs over it during semen collection.

Pony: Small-stature equid less than 14 hands high at the withers, often with specific conformation and temperament.

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. 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). An estimate of 3.4 with a standard error of 0.3 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 as (0.0). If there were no reports of the event, no standard error was reported (—).

Primary function of operation: The main purpose of the operation, i.e., boarding/training, breeding farm, farm/ranch, or residence with equids for personal use. After section A.2, primary functions with a small sample size were included in the “other” category. Operations in which the primary function was guest ranch or rescue rehabilitation were combined into the “other” category.

Primary use of equids: What the majority of equids on the operation are used for, i.e., pleasure, lessons/school, show/competition, breeding, racing, or farm/ranch work. After section A.2, use categories with a small sample size were included in the "other" category. Operations with a primary use of racing and retired or not in use were combined into the "other" use category due to small sample size.

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 study interview.

Sample profile: Information that describes characteristics of the operations from which Equine 2015 data were collected.

Size of operation: Size groupings were based on the number of equids present on May 1, 2015. Size of operation was categorized as small (5 to 9 equids), medium (10 to 19), and large (20 or more). For the purpose of this report, small operations include operations with five to nine equids per the NASS list frame (primarily comprised of equine information from the 2012 Census of Agriculture) but had fewer than five equids on May 1, 2015.

Section I: Population Estimates

Note: Where applicable, column or row totals are shown as 100.0 to aid in interpretation; however, estimates may not sum to 100.0 due to rounding.

A. General

Estimates of the type, size, and location of equine operations and estimates of the type, use, and breed of equids can serve as a basis for determining trends within the industry and as a means for describing various health management practices. This baseline information can also be of value when planning mitigation or responding to disease outbreaks.

1. Equine distribution

Equine management practices can vary based on multiple factors, including the number of equids on an operation. Approximately 9 of 10 operations (88.9 percent) had 19 or fewer resident equids on May 1, 2015. These operations accounted for 58.1 percent of all resident equids in the United States. Resident equids were defined as equids that spent more time at one operation than at any other operation, whether or not they were present on May 1, 2015. Although large operations accounted for only 11.1 percent of all operations, they accounted for 41.9 percent of all resident equids.

A.1. Percentage of operations and percentage of resident equids, by size of operation:

Percent

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Measure	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Operations	67.3	(1.0)	21.6	(1.0)	11.1	(0.5)	100.0	(—)
Resident equids	32.1	(1.1)	26.0	(1.2)	41.9	(1.6)	100.0	(—)

2. Primary function of operation

Respondents were asked to categorize their operations from a list of operation types used in previous NAHMS equine studies. Overall, farm/ranch was the primary function of 39.5 percent of operations, and residence with equids for personal use was the primary function of 38.8 percent. Both of these categories added together represented 78.3 percent of all operations. Equine boarding stable/training accounted for the next highest percentage of operations (9.3 percent.)

Higher percentages of large operations than small operations had a primary function of equine boarding stable/training or equine breeding farm, whereas a lower percentage of large operations than small operations had a primary function of residence with equids for personal use. In subsequent tables—with the exception of A.2.b—the primary functions of guest ranch and rescue/rehabilitation were included in the tables' "other" category, due to small sample size.

A.2.a. Percentage of operations by primary function and by size of operation:

Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Primary function	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Equine boarding stable/training	4.5	(0.7)	13.7	(1.6)	30.1	(2.4)	9.3	(0.6)
Riding stable (give lessons, rent equids, etc.)	1.0	(0.3)	3.5	(0.8)	7.5	(1.5)	2.2	(0.3)
Rescue/ rehabilitation	1.0	(0.3)	1.6	(0.6)	2.0	(0.6)	1.2	(0.3)
Equine breeding farm	4.7	(0.7)	11.0	(1.6)	18.5	(2.1)	7.6	(0.7)
Guest ranch	0.4	(0.3)	0.9	(0.5)	2.9	(1.0)	0.8	(0.2)
Farm/ranch	39.8	(1.6)	44.7	(2.5)	27.6	(2.5)	39.5	(1.3)
Residence with equids for personal use (show, pleasure, etc.)	48.2	(1.7)	24.0	(2.3)	10.4	(1.7)	38.8	(1.3)
Other	0.5	(0.2)	0.5	(0.4)	0.9	(0.5)	0.5	(0.2)
Total	100.0		100.0		100.0		100.0	

The percentages of operations by primary function were similar for most categories across regions; however, a higher percentage of operations in the Northeast region than in the South Central region (16.2 and 3.9 percent, respectively) had a primary function of equine boarding/training.

A.2.b. Percentage of operations by primary function and by region:

	Percent Operations							
	Region							
	West		South Central		Northeast		Southeast	
Primary function	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Equine boarding stable/training	9.6	(1.6)	3.9	(0.8)	16.2	(1.6)	10.2	(1.2)
Riding stable (give lessons, rent equids, etc.)	1.5	(0.7)	1.1	(0.4)	4.1	(0.9)	2.8	(0.7)
Rescue/ rehabilitation facility	1.0	(0.6)	1.1	(0.5)	2.1	(0.6)	0.8	(0.4)
Equine breeding farm	6.0	(1.4)	8.6	(1.4)	7.7	(1.2)	7.6	(1.1)
Guest ranch	2.5	(1.0)	0.5	(0.3)	0.5	(0.4)	0.1	(0.1)
Farm/ranch	45.8	(2.9)	42.5	(2.5)	36.5	(2.3)	32.6	(2.2)
Residence with equids for personal use (show, pleasure, etc.)	32.9	(2.9)	41.6	(2.5)	32.5	(2.2)	45.7	(2.3)
Other	0.8	(0.5)	0.7	(0.3)	0.4	(0.4)	0.2	(0.2)
Total	100.0		100.0		100.0		100.0	

3. Primary use of equids

Respondents were asked to report what they considered to be the primary use of their resident equids. A higher percentage of small operations (54.4 percent) indicated that pleasure was the primary use of their equids compared with medium and large operations (33.2 and 30.5 percent, respectively). A higher percentage of medium and large operations (4.2 and 11.1 percent, respectively) than small operations (1.6 percent) indicated a primary use of lessons/school. A higher percentage of medium and large operations (13.8 and 19.0 percent, respectively) had equids with a primary use of breeding than small operations (5.0 percent).

In subsequent tables, operations that indicated the primary use of equids to be racing or retired, not in use are included in the "other" category due to small sample size. The "other" category represents 8.1 percent of all operations, when the primary uses of racing and retired, not in use, were included.

A.3.a. Percentage of operations by primary use of equids and by size of operation:

Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Primary use	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Pleasure	54.4	(1.7)	33.2	(2.4)	30.5	(2.5)	47.2	(1.3)
Lessons/school	1.6	(0.4)	4.2	(0.9)	11.1	(1.7)	3.2	(0.4)
Showing/ competition (not betting)	6.6	(0.8)	10.3	(1.6)	12.7	(1.8)	8.1	(0.7)
Breeding	5.0	(0.8)	13.8	(1.8)	19.0	(2.2)	8.5	(0.7)
Racing	0.9	(0.3)	1.8	(0.7)	5.6	(1.2)	1.6	(0.3)
Farm or ranch work	24.1	(1.5)	32.4	(2.4)	15.9	(2.0)	25.0	(1.1)
Retired, not in use	5.7	(0.8)	2.7	(0.8)	2.3	(0.8)	4.7	(0.6)
Other	1.7	(0.4)	1.6	(0.6)	2.8	(0.8)	1.8	(0.3)
Total	100.0		100.0		100.0		100.0	

A higher percentage of operations in the Southeast region had equids with a primary use of pleasure than operations in the other regions. Conversely, a lower percentage of operations in the Southeast region than in the other regions had equids with a primary use of farm or ranch work.

A.3.b. Percentage of operations by primary use of equids and by region:

	Percent Operations							
	Region							
	West		South Central		Northeast		Southeast	
Primary use	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Pleasure	37.7	(3.0)	46.5	(2.5)	44.6	(2.4)	58.6	(2.2)
Lessons/school	2.1	(0.8)	1.8	(0.5)	5.9	(1.0)	3.6	(0.8)
Showing/ competition (not betting)	7.7	(1.7)	7.6	(1.3)	7.3	(1.2)	9.8	(1.3)
Breeding	8.6	(1.7)	8.8	(1.4)	8.0	(1.2)	8.3	(1.2)
Racing	0.2	(0.1)	2.1	(0.7)	2.6	(0.7)	1.2	(0.4)
Farm or ranch work	36.6	(2.8)	28.8	(2.3)	23.3	(2.1)	11.2	(1.5)
Retired, not in use	4.3	(1.3)	3.5	(0.9)	6.1	(1.2)	5.4	(1.1)
Other	2.8	(1.0)	0.9	(0.5)	2.3	(0.7)	1.8	(0.6)
Total	100.0		100.0		100.0		100.0	

4. Type of equids

There are multiple types of domestic equids, including donkeys/burros, mules, ponies, miniature horses, and full-size horses. Respondents were asked to report the number of each type of resident equid present on May 1, 2015. A resident equid was defined as an equid that spent or was expected to spend more time at the operation than at any other operation; in other words, the operation was its home base.

Operations could have had more than one type of resident equid on May 1, 2015. The highest percentage of operations—more than 90 percent in each region—had one or more horses (excluding miniature horses). The percentage of operations with one or more donkeys or burros was higher in the South Central and Southeast regions (23.7 and 18.8 percent, respectively) than in the West or Northeast regions (9.2 and 8.9 percent, respectively).

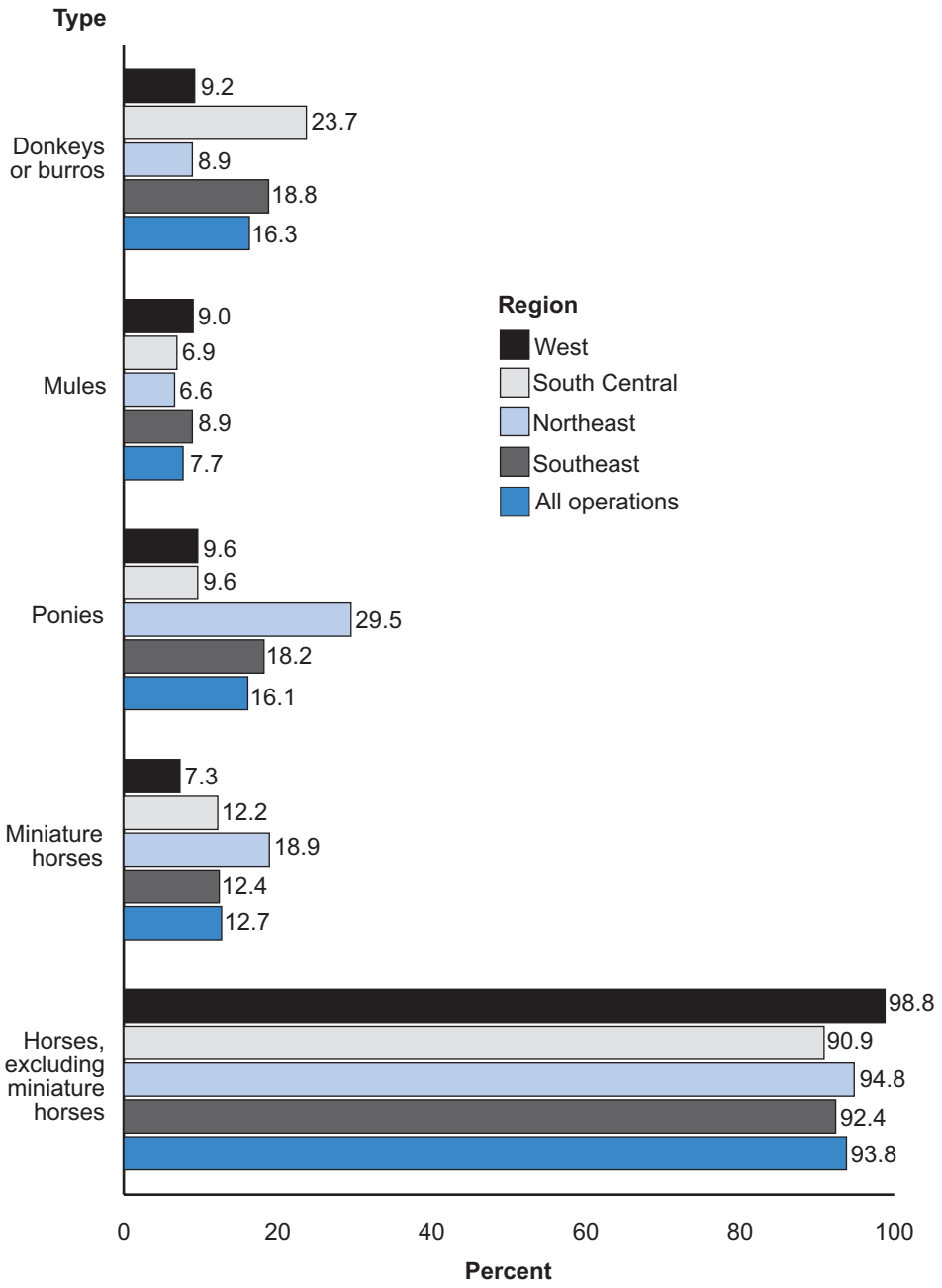
A.4.a. Percentage of operations by type of resident equid(s) present on May 1, 2015, and by region:

Percent Operations

Region

	West		South Central		Northeast		Southeast		All operations	
Equid type	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Donkeys or burros	9.2	(1.8)	23.7	(2.2)	8.9	(1.3)	18.8	(1.8)	16.3	(1.0)
Mules	9.0	(1.5)	6.9	(1.1)	6.6	(1.2)	8.9	(1.3)	7.7	(0.6)
Ponies	9.6	(1.7)	9.6	(1.3)	29.5	(2.1)	18.2	(1.7)	16.1	(0.8)
Miniature horses	7.3	(1.5)	12.2	(1.6)	18.9	(1.8)	12.4	(1.5)	12.7	(0.8)
Horses, excluding miniature horses	98.8	(0.6)	90.9	(1.6)	94.8	(1.1)	92.4	(1.3)	93.8	(0.7)
Other	0.0	(—)	0.0	(—)	0.2	(0.2)	0.3	(0.2)	0.1	(0.1)

Percentage of operations by type of resident equid(s) present on May 1, 2015, and by region



Different equid types can be susceptible to different health conditions and have different physical characteristics that often impact the use of the equid. For example, donkeys and mules are known for their ability to work in rough terrain and carry heavy loads, while several breeds of horses are recognized for their speed and/or agility.

Horses (excluding miniatures) made up the highest percentage of resident equids present on May 1, 2015 (85.5 percent). Miniature horses and donkeys made up an approximately equal percentage of resident equids overall (4.6 and 4.5 percent, respectively), followed by ponies and mules (3.4 and 2.0 percent, respectively). Donkeys/burros accounted for a higher percentage of equids in the South Central and Southeast regions (7.1 and 5.2 percent, respectively) than in the West or Northeast regions (1.7 and 2.6 percent, respectively). Ponies accounted for a higher percentage of equids in the Northeast and Southeast regions (6.5 and 4.1 percent, respectively) than in the West and South Central regions (1.6 and 1.8 percent, respectively). Miniature horses accounted for a lower percentage of equids in the West region (2.2 percent) than in the Northeast and Southeast regions (5.4 and 6.3 percent, respectively).

A.4.b. Percentage of resident equids present on May 1, 2015, by type of equid and by region:

Percent Equids

Region

	West		South Central		Northeast		Southeast		All operations	
Equid type	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Donkeys or burros	1.7	(0.4)	7.1	(0.9)	2.6	(0.5)	5.2	(0.7)	4.5	(0.4)
Mules	1.7	(0.4)	1.8	(0.5)	2.7	(0.6)	1.7	(0.3)	2.0	(0.2)
Ponies	1.6	(0.3)	2.0	(0.3)	6.5	(0.6)	4.1	(0.6)	3.4	(0.2)
Miniature horses	2.2	(0.6)	4.4	(1.0)	5.4	(0.8)	6.3	(1.1)	4.6	(0.5)
Horses, excluding miniature horses	92.8	(0.9)	84.6	(1.6)	82.7	(1.3)	82.6	(1.5)	85.5	(0.7)
Other	0.0	(—)	0.0	(—)	0.0	(0.0)	0.1	(0.1)	0.0	(0.0)
Total	100.0		100.0		100.0		100.0		100.0	

Photograph courtesy of Dr. Josie Traub-Dargatz.

5. Age of resident equids

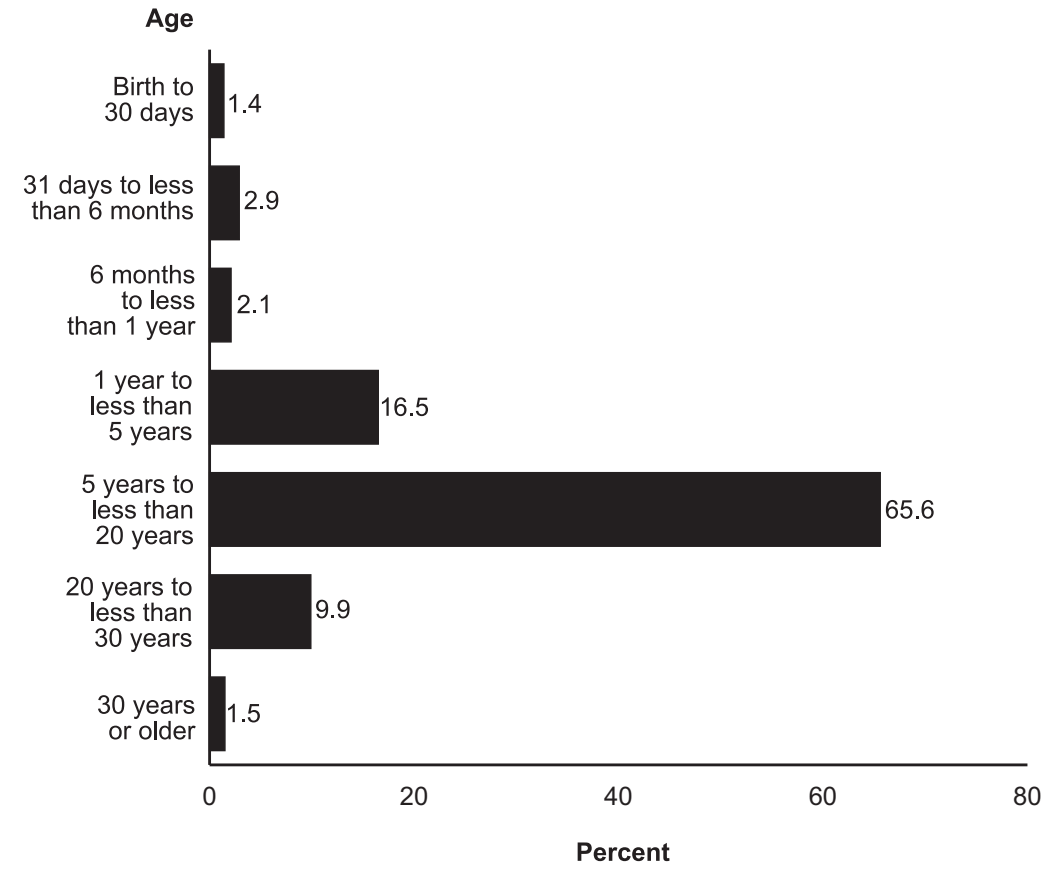
Equids can live into their 30s; the oldest pony on record lived 60 years, and full-size horses have been documented to live past 45 years. Health care and use of equids can impact their longevity. Recent advances in nutrition and dental care for geriatric equids, and a willingness of equine owners to care for aging equids, likely allow equids to live longer.

Overall, 65.6 percent of resident equids were 5 to 20 years old; this age category accounted for the highest percentage of resident equids. Equids 1 year to less than 5 years of age (16.5 percent) and 20 years of age and older (11.4 percent) comprised the next highest percentages of resident equids.

A.5.a. Percentage of resident equids on May 1, 2015, by age:

Age	Percent equids	Std. error
Birth to 30 days	1.4	(0.1)
31 days to less than 6 months	2.9	(0.3)
6 months to less than 1 year	2.1	(0.2)
1 year to less than 5 years	16.5	(0.6)
5 years to less than 20 years	65.6	(0.8)
20 years to less than 30 years	9.9	(0.4)
30 years or older	1.5	(0.2)
Total	100.0	

Percentage of resident equids on May 1, 2015, by age



Breeding farms had the highest percentage of operations with equids less than 6 months of age, which is logical based on the fact that the primary function of most breeding farm operations is to produce foals. A higher percentage of boarding/training stables and riding stables (64.0 and 75.5 percent, respectively) had resident equids over 20 years of age compared with operations with a primary function of farm/ranch or residences with equids for personal use (38.7 and 43.0 percent, respectively).

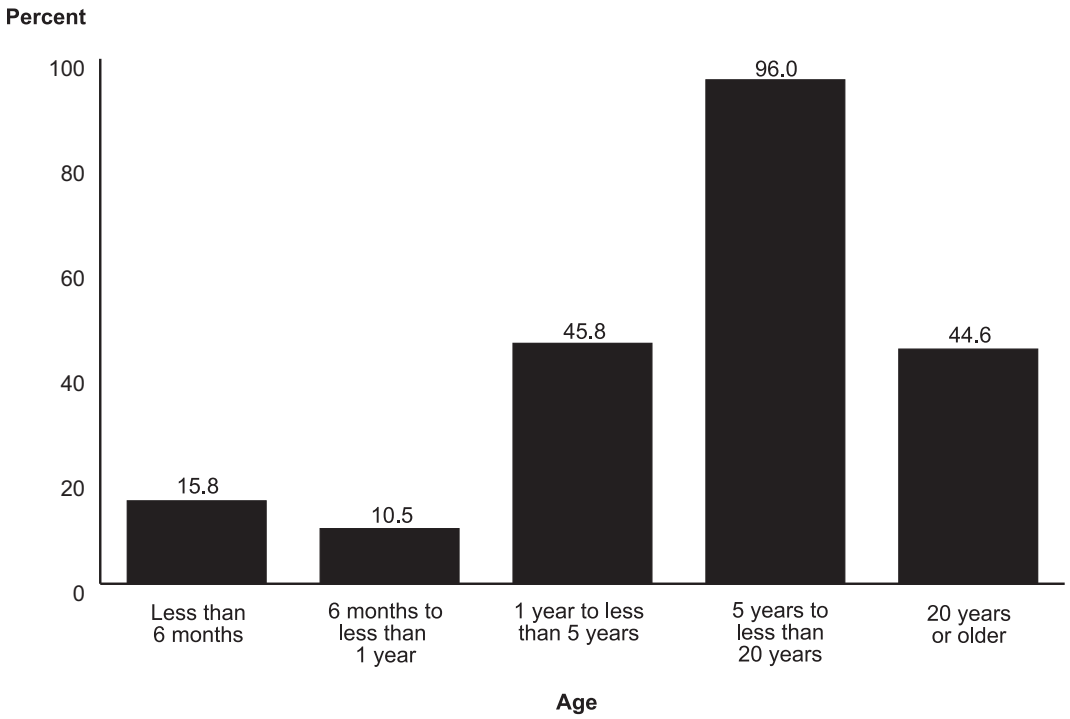
A.5.b. Percentage of operations by age of resident equids and by primary function of operation:

Percent Operations

Primary Function

Age	Equine boarding stable/ training		Riding stable		Equine breeding farm		Farm/ranch		Residence with equids for personal use		Other		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Less than 6 mo	15.1	(2.2)	16.1	(4.9)	52.0	(4.5)	15.3	(1.3)	9.5	(1.2)	15.5	(5.0)	15.8	(0.9)
6 mo to less than 1 yr	8.2	(1.6)	8.0	(3.3)	34.2	(4.3)	10.7	(1.1)	6.5	(1.0)	8.3	(3.6)	10.5	(0.7)
1 yr to less than 5 yr	60.8	(3.5)	58.0	(7.3)	71.2	(4.4)	47.6	(2.1)	34.8	(2.0)	44.0	(7.6)	45.8	(1.2)
5 yr to less than 20 yr	97.1	(1.0)	95.9	(2.6)	96.9	(1.6)	96.0	(0.8)	95.9	(0.8)	92.5	(3.8)	96.0	(0.5)
20 yr or older	64.0	(3.6)	75.5	(6.7)	47.2	(4.5)	38.7	(2.0)	43.0	(2.1)	53.0	(7.9)	44.6	(1.3)

Percentage of operations by age of resident equids



6. Gender of resident equids

Intact males and females can be used for breeding, although not all intact equids are used for that purpose. Castrating male equids is often performed to make them more tractable and trainable; spaying female equids is rare.

For all operations, the percentages of castrated males and nonpregnant intact females aged 1 year or more were similar as of May 1, 2015. There was a slightly higher percentage of intact males than pregnant mares. At the time of data collection, mares that were not yet pregnant were included in the nonpregnant intact female category. The Southeast region had the highest percentage of intact males (10.8 percent) compared with the West and Northeast regions (6.4 and 4.6 percent, respectively).

A.6. Percentage of resident equids 1 year of age or older as of May 1, 2015, by gender and by region:

Percent Equids

Region

	West		South Central		Northeast		Southeast		All operations	
Gender	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Intact males (stallions and colts)	6.4	(0.9)	8.4	(0.6)	4.6	(0.4)	10.8	(1.2)	7.7	(0.4)
Castrated males (geldings)	47.8	(2.3)	36.1	(1.7)	43.2	(1.4)	34.6	(1.5)	39.9	(0.9)
Intact females	37.3	(1.9)	45.1	(1.7)	43.6	(1.2)	45.1	(1.3)	43.1	(0.8)
Pregnant females	3.9	(1.3)	5.3	(0.8)	3.6	(0.5)	5.2	(0.9)	4.6	(0.4)
Spayed females	1.4	(0.5)	1.0	(0.3)	0.4	(0.2)	0.7	(0.2)	0.9	(0.2)
Unknown	3.2	(1.9)	4.1	(1.7)	4.6	(0.9)	3.5	(0.6)	3.9	(0.7)
Total	100.0		100.0		100.0		100.0		100.0	

7. Breed of resident horses

A horse's breed can impact its appearance, use, and predilection to various health conditions. Within the industry, there are competitions limited to specific breeds. Breed registries document birth date, color/markings, parentage, and other aspects of newborn foals.

The warmblood and draft categories in the following table comprise multiple breeds. For example, Dutch warmbloods and Holsteiners are categorized as warmbloods, and Belgians and Clydesdales are categorized as draft horses. Overall, Quarter horses accounted for the highest percentage of resident horses (42.1 percent). The West and South Central regions had a higher percentage of resident Quarter horses (55.5 and 61.8 percent, respectively) than the Northeast and Southeast regions (21.7 and 21.4 percent, respectively). The Northeast region accounted for the highest percentage of draft horses (15.2 percent), and the Southeast region had the highest percentage of Tennessee Walkers (15.1 percent). The "other" breed category included horses specified as crossbreeds or as breeds not listed in the following table (e.g., Paso Fino, Friesian, Irish Gypsy, Fox Trotter, Rocky Mountain horse, Icelandic) as well as resident equids in which the respondent did not know or did not specify the breed.

A.7. Percentage of resident horses as of May 1, 2015, by breed and by region:

	Percent Horses									
	Region									
	West		South Central		Northeast		Southeast		All operations	
Breed	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Appaloosa	1.8	(0.4)	1.6	(0.4)	2.5	(0.4)	2.0	(0.5)	1.9	(0.2)
Arabian	4.2	(0.8)	2.3	(0.6)	3.9	(0.8)	5.9	(2.2)	3.9	(0.6)
Draft	2.2	(0.6)	1.1	(0.3)	15.2	(1.5)	2.5	(0.6)	4.7	(0.4)
Miniature horse	2.3	(0.6)	5.0	(1.1)	6.3	(0.9)	7.1	(1.3)	5.1	(0.5)
Morgan	1.5	(0.5)	1.0	(0.5)	2.9	(0.5)	0.6	(0.2)	1.4	(0.2)
Mustang	2.0	(0.5)	1.1	(0.5)	0.5	(0.1)	0.4	(0.1)	1.0	(0.2)
Paint	7.4	(0.8)	8.0	(1.1)	6.4	(0.7)	4.8	(0.7)	6.8	(0.4)
Quarter horse	55.5	(2.8)	61.8	(3.1)	21.7	(1.8)	21.4	(1.7)	42.1	(1.6)
Saddlebred	0.9	(0.4)	2.8	(0.7)	1.8	(0.4)	4.3	(1.2)	2.5	(0.4)
Standardbred	1.1	(0.6)	1.4	(0.5)	10.7	(1.5)	2.9	(0.8)	3.7	(0.4)
Tennessee Walker	1.1	(0.3)	0.7	(0.2)	2.1	(0.4)	15.1	(1.7)	4.5	(0.4)
Thoroughbred	4.2	(1.1)	2.4	(0.8)	10.1	(1.6)	13.7	(2.4)	7.1	(0.8)
Warmblood	2.1	(0.5)	1.6	(0.6)	5.2	(0.7)	4.4	(0.8)	3.2	(0.3)
Grade	4.5	(1.3)	5.1	(1.7)	4.0	(0.6)	2.5	(0.5)	4.1	(0.6)
Other	9.3	(2.0)	4.2	(0.9)	6.7	(1.0)	12.3	(1.9)	7.8	(0.8)
Total	100.0		100.0		100.0		100.0		100.0	

8. Identification method

Animal identification (ID) is important for record keeping and can be critical in tracing animal movements during disease outbreaks, natural disasters, or thefts. Several methods are used to identify equids, and each sector of the equine industry uses methods that best suit its purpose. For example, most racing jurisdictions require a unique tattoo on a horse's upper lip. Equids might have no ID or multiple forms of ID. An ID need not be unique to each equid. For example, ranch brands are not unique IDs because all equids have the same brand, while registration papers, DNA tests, Coggins test forms, passports, brand inspections, microchips, and tattoos are unique to each equid.

Overall, 80.8 percent of operations used at least some form of equine ID. In total, 57.5 percent of operations used registration papers as a form of ID for one or more resident equids, and 44.1 percent of all resident equids had registration papers as a form of ID. Only 3.4 percent of operations had one or more equids with a microchip, and only 1.6 percent of all resident equids had a microchip.

A.8. Percentage of operations and percentage of resident equids by ID method(s) used for resident equids as of May 1, 2015:

ID method*	Percent operations	Std. error	Percent resident equids	Std. error
Hot-iron brand	18.3	(1.0)	7.9	(0.8)
Freeze brand	20.3	(1.0)	7.9	(0.8)
Microchip	3.4	(0.4)	1.6	(0.3)
Tattoo	12.8	(0.8)	6.3	(0.7)
Official brand inspection (card with markings indicated or sketch)	9.6	(0.7)	6.2	(0.6)
Registration papers	57.5	(1.3)	44.1	(1.5)
DNA (blood or hair)	17.8	(0.9)	16.8	(1.8)
Coggins (EIA) test papers (laboratory test results)	42.2	(1.3)	32.7	(1.2)
Halters or collars with name or number	6.5	(0.6)	7.3	(1.0)
Passport	2.3	(0.3)	0.8	(0.2)
Other	3.3	(0.4)	2.0	(0.3)
Any	80.8	(1.0)		

*Some resident equids could have had more than one type of ID.

9. Association/club membership

The percentage of operations in which the operator or anyone on the operation was a member of an equid-related association or club (e.g., breed or discipline association, riding club, 4-H) increased as operation size increased. Over one-third of small operations (38.1 percent) and about three-fourths of large operations (73.6 percent) belonged to an equid-related association or club.

A.9.a. Percentage of operations that belonged to an equid-related association or club, by size of operation:

Percent Operations

Size of Operation (number of equids)

Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
38.1	(1.6)	58.2	(2.5)	73.6	(2.4)	46.3	(1.3)

The percentage of operations in which the operator or anyone on the operation was a member of an equid-related association or club (e.g., breed or discipline association, riding club, 4-H) was similar across regions.

A.9.b. Percentage of operations that belonged to an equid-related association or club, by region:

Percent Operations

Region

West		**South Central**		**Northeast**		**Southeast**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
48.4	(3.0)	48.2	(2.5)	47.4	(2.4)	40.9	(2.2)

The percentage of operations in which the operator or anyone on the operation was a member of an equid-related association or club (e.g., breed or discipline association, riding club, 4-H) was higher on operations with a primary use of equids of lessons/school; showing/competition, not betting; and breeding than on operations with a primary use of pleasure, farm or ranch work, or “other.”

A.9.c. Percentage of operations that belonged to an equid-related association or club, by primary use of equids:

Percent Operations

Primary Use											
Pleasure		Lessons/ school		Showing/ compete- tion not betting		Breeding		Farm or ranch work		Other	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
39.3	(1.9)	86.0	(4.5)	87.1	(2.6)	79.0	(3.5)	33.1	(2.5)	37.2	(4.2)

B. Health Care Management

1. Primary method of recording equine health information

Records on vaccination, deworming, dental care, hoof care, medical and surgical procedures, and reproductive conditions provide information for the preventive care and treatment of sick animals.

Overall, approximately one of three operations (31.0 percent) had no written or computerized records on equine health. Small operations had the highest percentage of operations with no written or computerized records (35.9 percent), followed by medium and large operations (23.9 and 16.6 percent, respectively). Large operations had the highest percentage of operations that used computerized health records as their primary method of record keeping (16.6 percent) followed by medium and small operations (11.8 percent and 6.2 percent, respectively); 8.6 percent of all operations used computerized records, while 20.0 percent used handwritten notes in a designated log or file, and 21.1 percent used notes written on a calendar or checkbook.

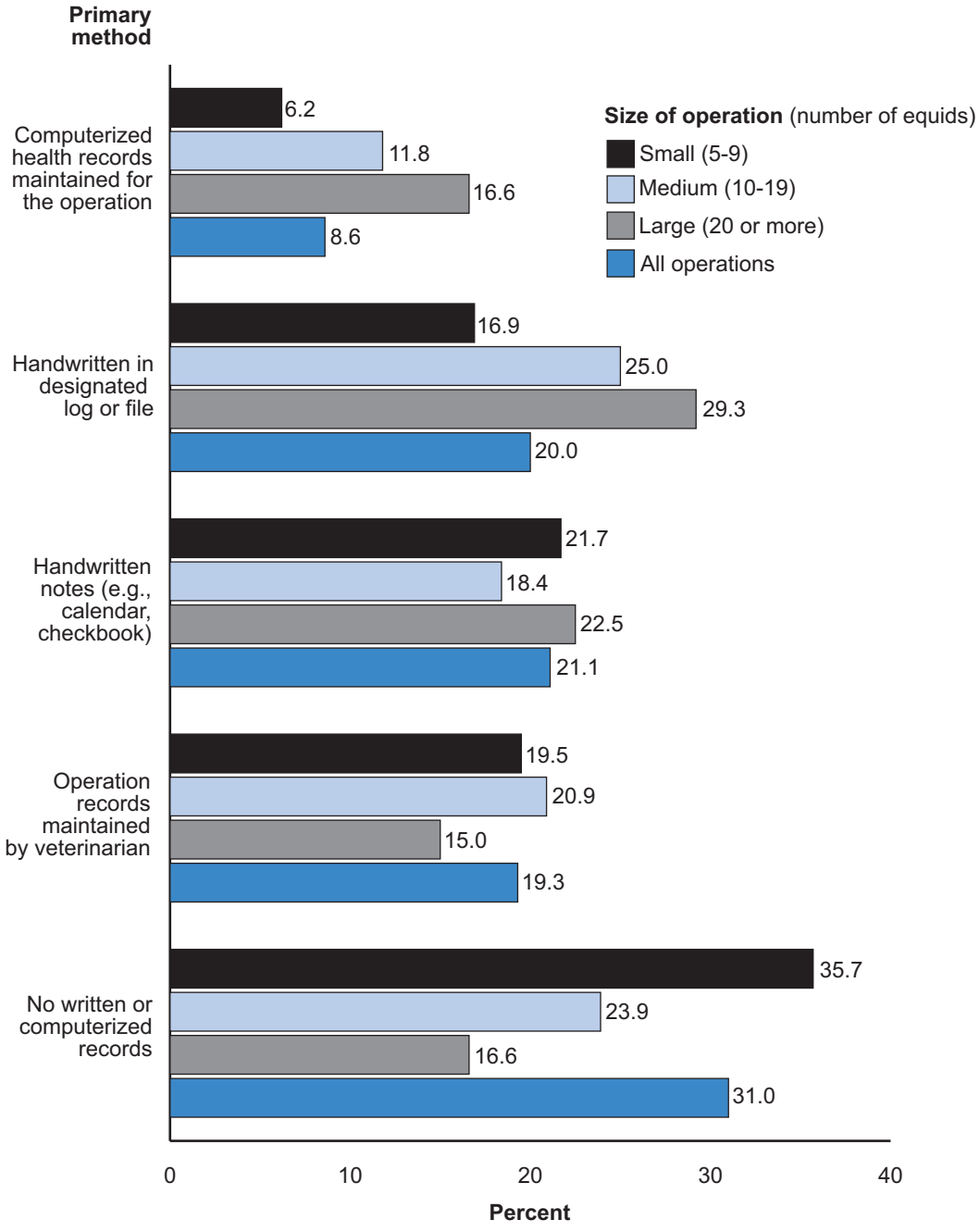
B.1.a. Percentage of operations by **primary** method of recording equine health information, and by size of operation:

Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Primary method	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Computerized health records maintained for the operation	6.2	(0.8)	11.8	(1.7)	16.6	(1.9)	8.6	(0.7)
Handwritten in designated log or file (e.g., health card, logbook)	16.9	(1.2)	25.0	(2.2)	29.3	(2.5)	20.0	(1.0)
Handwritten notes (e.g., calendar, checkbook)	21.7	(1.4)	18.4	(1.9)	22.5	(2.2)	21.1	(1.1)
Operation records maintained by veterinarian	19.5	(1.3)	20.9	(2.1)	15.0	(2.0)	19.3	(1.0)
No written or computerized records	35.7	(1.6)	23.9	(2.2)	16.6	(2.2)	31.0	(1.2)
Total	100.0		100.0		100.0		100.0	

Percentage of operations by primary method of recording equine health information, and by size of operation



Higher percentages of operations with a primary function of farm/ranch or residence with equids for personal use had no written or computerized equine health records compared with equine boarding stable/training, riding stable, or equine breeding farm operations. A lower percentage of operations with a primary function of farm/ranch or residence with equids for personal use had computerized health records or handwritten records in a designated log or file compared with equine boarding stable/training, riding stable, and equine breeding farm operations.

B.1.b. Percentage of operations by primary method of recording equine health information, and by primary function of operation:

	Percent Operations											
	Primary Function											
	Equine boarding stable/ training		Riding stable		Equine breeding farm		Farm/ ranch		Residence with equids for personal use		Other	
Primary method	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Computerized health records maintained for the operation	21.1	(2.8)	22.6	(5.8)	19.3	(3.4)	4.4	(0.8)	6.9	(1.1)	8.2	(3.7)
Hand-written in designated log or file (e.g., health card, logbook)	28.5	(3.3)	34.8	(7.2)	36.2	(4.5)	15.5	(1.4)	18.7	(1.6)	19.3	(7.1)
Hand-written notes (e.g., calendar, checkbook)	16.3	(2.5)	9.2	(3.1)	21.2	(3.5)	23.6	(1.8)	20.3	(1.8)	19.6	(5.6)
Operation records maintained by veterinarian	22.7	(3.0)	20.1	(6.7)	15.6	(3.4)	15.9	(1.6)	22.2	(1.8)	26.6	(6.7)
No written or computer records	11.4	(2.6)	13.4	(4.4)	7.6	(2.4)	40.5	(2.0)	32.0	(2.0)	26.3	(7.2)
Total	100.0		100.0		100.0		100.0		100.0		100.0	

Of the 8.6 percent of operations that used computerized records for equine health information, 51.4 percent entered data into a self-generated equine record system, while 44.6 percent maintained data in a commercial equine software program.

B.1.c. For the 8.6 percent of operations that used computerized records (table B.1.a), percentage of operations by method used to operate the computerized record system, and by size of operation:

Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Method	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Enter own data in commercial equine health software	37.4	(6.5)	33.1	(7.0)	49.1	(6.2)	38.6	(4.1)
Commercial software maintained by external data manager	5.1	(2.6)	6.4	(3.5)	7.3	(3.3)	6.0	(1.8)
Enter data in self-generated equine record (e.g., Word, Excel)	52.4	(6.8)	57.8	(7.3)	40.2	(6.1)	51.4	(4.2)
Other	5.1	(2.9)	2.8	(2.1)	3.4	(1.9)	4.0	(1.6)
Total	100.0		100.0		100.0		100.0	

2. Source of equine health care information

Having information about where equine owners/operations obtain equine health information can help target educational and outreach efforts when new information becomes available or when the need to deliver information about disease situations arise.

Equine operators/owners can obtain information on the health care of their animals from multiple sources. During the study interview, respondents were asked to report all sources of equine health care information used in the previous 12 months. Of the information resources listed in the following table, the highest percentage of all operations (79.8 percent) used a private veterinarian as a source of information, followed by a farrier (65.2 percent). Overall, about one-third of operations consulted other equine owners, feed store or veterinary supply store personnel, and/or equine magazines or reference books.

B.2.a. Percentage of operations by resource(s) consulted when making equine health care decisions in the previous 12 months, and by size of operation:

Percent Operations

Size of Operation (number of equids)

Resource	Small (5–9) Pct.	Std. error	Medium (10–19) Pct.	Std. error	Large (20 or more) Pct.	Std. error	All operations Pct.	Std. error
Private veterinarian	75.7	(1.4)	85.7	(1.7)	93.6	(1.3)	79.8	(1.0)
Equine nutritionist other than veterinarian	5.5	(0.8)	10.8	(1.6)	20.6	(2.1)	8.3	(0.7)
Acupuncturist/ chiropractor other than veterinarian	8.7	(0.9)	18.2	(2.1)	33.2	(2.5)	13.5	(0.8)
Equine dentist other than veterinarian	17.2	(1.2)	32.8	(2.4)	47.1	(2.7)	23.9	(1.0)
Farrier	61.8	(1.6)	69.5	(2.4)	77.3	(2.3)	65.2	(1.2)
Extension agent/ university or vocational-agricultural personnel/4-H instructor	5.6	(0.8)	9.6	(1.4)	16.3	(2.0)	7.7	(0.7)
Riding instructor/ horse trainer	14.9	(1.2)	27.9	(2.3)	34.9	(2.5)	19.9	(1.0)
Other equine owner	30.6	(1.5)	40.9	(2.5)	46.7	(2.7)	34.6	(1.2)
Equine associations/ meetings/newsletters	17.5	(1.3)	30.6	(2.4)	39.6	(2.6)	22.8	(1.1)
Feed store or veterinary supply store personnel	29.3	(1.5)	40.3	(2.5)	46.6	(2.7)	33.6	(1.2)
Radio/TV/newspaper	8.7	(0.9)	11.3	(1.8)	9.9	(1.6)	9.4	(0.8)
Equine magazines/ reference books	28.0	(1.5)	41.4	(2.5)	47.3	(2.7)	33.0	(1.2)
Equine psychic	1.6	(0.4)	2.0	(0.7)	4.2	(1.1)	2.0	(0.4)
Equine massage therapist	4.6	(0.7)	8.5	(1.4)	20.2	(2.1)	7.1	(0.6)
Social media other than Web/Internet such as Twitter or Facebook	11.0	(1.0)	18.6	(2.0)	24.7	(2.3)	14.1	(0.9)
Other Web/Internet	18.7	(1.3)	24.9	(2.2)	33.1	(2.5)	21.7	(1.0)
Other	1.3	(0.4)	2.5	(0.8)	2.5	(0.8)	1.7	(0.3)

The percentage of operations that consulted a veterinarian when making equine health care decisions was similar across regions.

B.2.b. Percentage of operations by resource(s) consulted when making equine health care decisions in the previous 12 months, and by region:

	Percent Operations							
	Region							
	West		South Central		Northeast		Southeast	
Resource	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Private veterinarian	82.5	(2.0)	79.1	(2.1)	83.0	(1.9)	75.6	(2.0)
Equine nutritionist other than veterinarian	7.5	(1.6)	5.4	(1.0)	13.2	(1.6)	8.7	(1.2)
Acupuncturist/ chiropractor other than veterinarian	18.2	(2.4)	11.0	(1.4)	17.8	(1.7)	8.8	(1.2)
Equine dentist other than veterinarian	15.8	(2.2)	18.4	(1.8)	39.1	(2.2)	24.6	(1.9)
Farrier	64.1	(2.9)	59.9	(2.5)	74.8	(2.2)	64.6	(2.2)
Extension agent/ university or vocational-agricultural personnel/4-H instructor	6.0	(1.6)	5.6	(1.0)	8.5	(1.3)	11.2	(1.5)
Riding instructor/ horse trainer	21.7	(2.3)	16.4	(1.8)	24.3	(1.9)	19.2	(1.7)
Other equine owner	34.4	(2.8)	30.9	(2.3)	40.5	(2.3)	34.7	(2.2)
Equine associations/ meetings/newsletters	21.9	(2.5)	21.1	(2.0)	25.9	(2.1)	23.0	(1.9)
Feed store or veterinary supply store personnel	31.2	(2.7)	32.1	(2.3)	33.4	(2.3)	37.9	(2.2)
Radio/TV/newspaper	10.3	(2.0)	10.7	(1.5)	10.2	(1.4)	6.2	(1.1)
Equine magazines/ reference books	34.8	(2.9)	30.2	(2.2)	36.8	(2.3)	32.0	(2.1)
Equine psychic	2.4	(1.0)	0.8	(0.4)	3.0	(0.8)	2.5	(0.7)
Equine massage therapist	7.2	(1.5)	4.2	(0.9)	13.3	(1.5)	5.5	(0.9)
Social media other than Web/Internet such as Twitter or Facebook	10.4	(1.8)	13.8	(1.6)	17.1	(1.8)	15.1	(1.6)
Other Web/Internet	20.1	(2.4)	18.2	(1.8)	27.4	(2.1)	22.7	(1.9)
Other	1.9	(0.7)	0.8	(0.4)	2.4	(0.8)	2.0	(0.7)

For most resources listed in the following table, lower percentages of operations with a primary function of farm/ranch or residence with equids for personal use used the listed resources compared with operations with a primary function of equine boarding stable/ training, riding stable, or equine breeding farm.

B.2.c. Percentage of operations by resource(s) consulted when making equine health care decisions in the previous 12 months, and by primary function of operation:

	Percent Operations											
	Primary Function											
	Equine boarding stable/ training		Riding stable		Equine breeding farm		Farm/ ranch		Residence with equids for personal use		Other	
Resource	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Private veterinarian	95.6	(1.7)	94.6	(3.8)	93.9	(1.8)	75.2	(1.8)	76.5	(1.8)	89.7	(4.2)
Equine nutritionist other than veterinarian	22.6	(3.0)	17.2	(5.7)	12.7	(2.6)	5.5	(0.9)	5.8	(1.0)	18.2	(5.4)
Acupuncturist/chiropractor other than veterinarian	44.0	(3.6)	30.8	(6.8)	18.8	(3.2)	7.9	(1.1)	9.3	(1.3)	22.4	(6.3)
Equine dentist other than veterinarian	61.2	(3.5)	49.0	(7.3)	31.7	(4.0)	16.4	(1.5)	19.1	(1.6)	30.3	(6.7)
Farrier	86.0	(2.6)	82.7	(5.6)	81.8	(3.6)	56.8	(2.1)	64.8	(2.1)	59.0	(8.1)
Extension agent/ university or vocational-agricultural personnel/ 4-H instructor	17.2	(2.8)	21.0	(6.0)	10.5	(2.5)	5.4	(0.9)	5.9	(1.0)	12.4	(4.5)
Riding instructor/ horse trainer	53.5	(3.6)	48.4	(7.3)	33.7	(4.3)	10.9	(1.2)	15.8	(1.6)	30.3	(7.0)
Other equine owner	53.9	(3.6)	48.3	(7.3)	46.3	(4.5)	27.4	(1.8)	33.8	(2.1)	41.2	(7.5)
Equine associations/ meetings/newsletters	41.8	(3.5)	52.5	(7.2)	46.4	(4.5)	14.6	(1.4)	19.5	(1.7)	31.8	(6.9)
Feed store or veterinary supply store personnel	47.2	(3.6)	56.8	(7.3)	41.6	(4.4)	28.2	(1.9)	32.5	(2.0)	39.2	(7.4)
Radio/TV/newspaper	5.9	(1.6)	18.4	(6.0)	11.0	(2.9)	8.6	(1.2)	9.9	(1.3)	12.1	(4.6)
Equine magazines/ reference books	51.1	(3.6)	54.3	(7.3)	51.2	(4.5)	24.0	(1.7)	32.3	(2.0)	43.6	(7.6)
Equine psychic	6.5	(2.1)	4.7	(3.1)	2.7	(1.2)	1.1	(0.4)	1.5	(0.5)	3.3	(2.7)
Equine massage therapist	21.6	(2.6)	20.7	(5.9)	13.2	(2.8)	2.9	(0.6)	5.6	(1.0)	13.6	(4.7)
Social media other than Web/Internet such as Twitter or Facebook	28.0	(3.1)	25.8	(6.6)	29.3	(4.0)	8.1	(1.1)	12.6	(1.4)	25.5	(6.4)
Other Web/Internet	42.4	(3.5)	52.3	(7.3)	40.3	(4.4)	13.5	(1.4)	19.1	(1.7)	29.6	(6.7)
Other	2.2	(0.9)	4.5	(3.1)	2.0	(1.4)	1.5	(0.5)	1.6	(0.5)	1.3	(0.9)

Although operations used multiple information sources when making decisions on equine health care (see table B.2.a), the majority used a private veterinarian as the primary source of information.

Overall, 70.7 percent of operations used a private veterinarian as the primary resource for equine health information in the previous 12 months. The highest percentage of operations reported that a veterinarian was the primary source of equine health information, irrespective of operation size. Other than farrier, no other listed primary resource for equine health information represented more than 10 percent of operations.

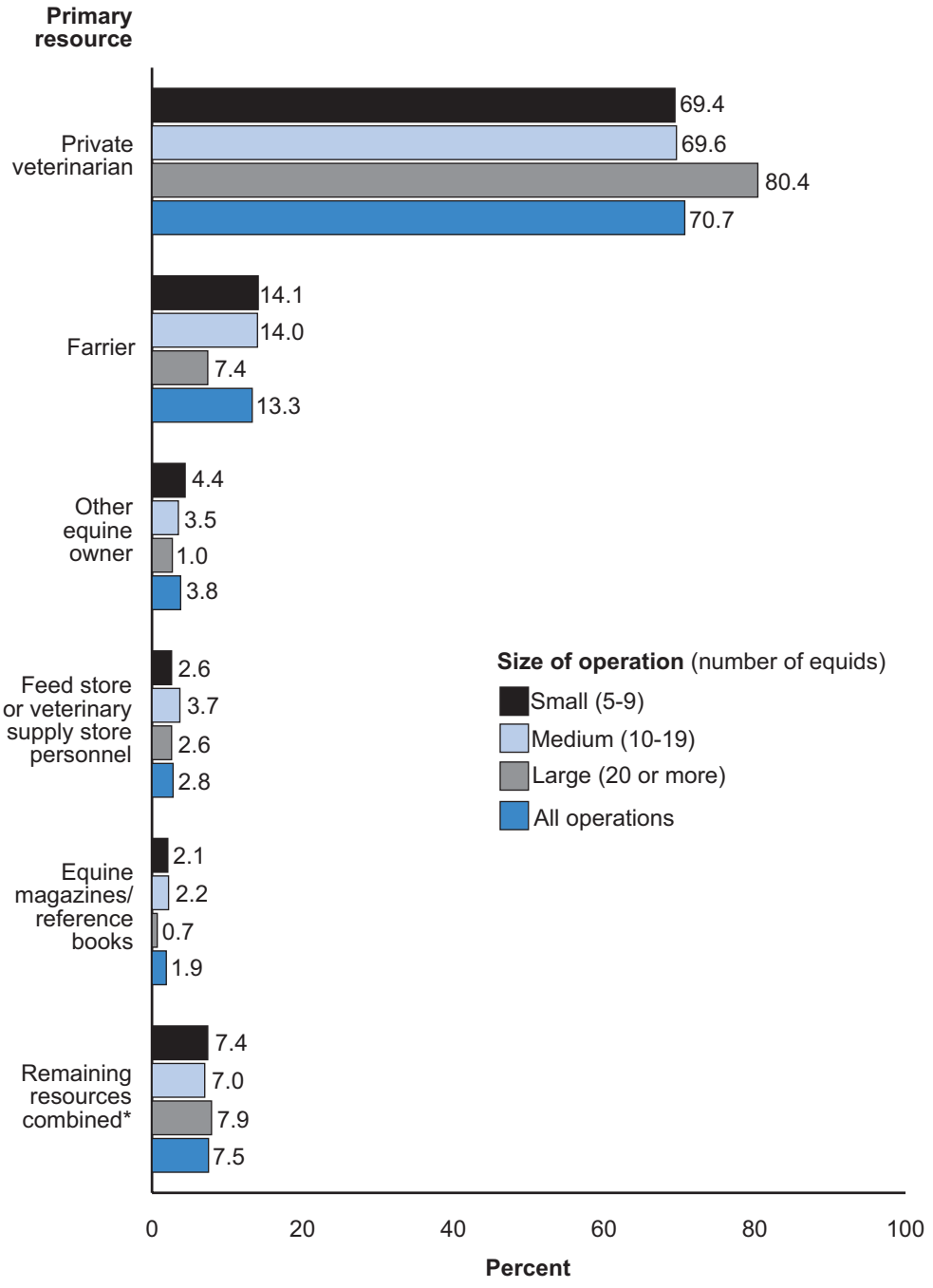
B.2.d. Percentage of operations by **primary** resource(s) consulted regarding equine health care decisions in the previous 12 months, and by size of operation:

Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Primary resource	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Private veterinarian	69.4	(1.7)	69.6	(2.5)	80.4	(2.2)	70.7	(1.2)
Equine nutritionist other than veterinarian	0.2	(0.1)	0.4	(0.3)	0.0	(—)	0.2	(0.1)
Acupuncturist/ chiropractor other than veterinarian	0.0	(—)	0.4	(0.3)	0.6	(0.4)	0.2	(0.1)
Equine dentist other than veterinarian	0.3	(0.2)	0.0	(—)	0.5	(0.5)	0.3	(0.2)
Farrier	14.1	(1.2)	14.0	(1.9)	7.4	(1.4)	13.3	(0.9)
Extension agent/university or vocational-agricultural personnel/4-H instructor	0.4	(0.3)	0.7	(0.4)	0.4	(0.4)	0.4	(0.2)
Riding instructor/ horse trainer	2.0	(0.5)	1.4	(0.6)	1.4	(0.6)	1.8	(0.3)
Other equine owner	4.4	(0.7)	3.5	(0.9)	1.0	(0.5)	3.8	(0.5)
Equine associations/ meetings/newsletters	0.7	(0.3)	0.8	(0.4)	0.7	(0.5)	0.7	(0.2)
Feed store or veterinary supply store personnel	2.6	(0.6)	3.7	(1.0)	2.6	(1.0)	2.8	(0.4)
Radio/TV/newspaper	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Equine magazines/ reference books	2.1	(0.5)	2.2	(0.8)	0.7	(0.4)	1.9	(0.4)
Equine psychic	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Equine massage therapist	0.4	(0.2)	0.0	(—)	0.0	(—)	0.2	(0.1)
Social media other than Web/Internet such as Twitter or Facebook	0.6	(0.2)	0.4	(0.3)	1.2	(0.6)	0.6	(0.2)
Other Web/Internet	1.9	(0.5)	2.1	(0.8)	2.0	(0.6)	2.0	(0.4)
Other	1.1	(0.3)	0.9	(0.5)	1.1	(0.7)	1.0	(0.3)
Total	100.0		100.0		100.0		100.0	

Percentage of operations by primary resource(s) consulted regarding equine health care decisions in the previous 12 months, and by size of operation



*Equine nutritionist other than veterinarian; acupuncturist/chiropractor other than veterinarian; equine dentist other than veterinarian; extension agent/university or vocational-agricultural personnel/4-H instructor; equine associations/meetings/newsletters; radio/TV/newspaper; equine psychic; equine massage therapist; social media other than Web/Internet such as Twitter or Facebook; other Web/Internet.

3. Equine health services from a veterinarian

Veterinarians provide an array of important information and services, including emergency or routine care of individual animals; surgery; and advising operators about preventive care methods such as vaccination, deworming, and biosecurity.

Most operations used multiple types of services provided by a veterinarian at least once in the previous 12 months. Overall, 78.7 percent of operations used a veterinarian's services. At least 40 percent of all operations used a veterinarian at least once in the previous 12 months to provide individual-animal diagnosis, treatment, or surgery; vaccination consultation; administration of vaccines; drugs, or vaccines not administered by a veterinarian; dentistry (e.g. floating ,filing, or removing teeth); and individual or herd diagnostic services. Over one-fourth of operations (26.9 percent) used a veterinarian to provide an official health certificate, and 6.2 percent of operations used a veterinarian to perform a biosecurity assessment. In general, the percentages of operations that used a veterinarian for services listed in the following table increased as size of operation increased, which is not unexpected since larger operations have more equids to care for.

B.3.a. Percentage of operations on which a veterinarian provided the following service(s) to resident equids at least once in the previous 12 months, by size of operation:

	Percent Operations							
	Size of Operation (number of equids)							
	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Service	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Individual-animal diagnosis, treatment, or surgery (including castration)	37.0	(1.6)	60.4	(2.5)	76.5	(2.3)	46.4	(1.3)
Reproductive services (e.g., ultrasound, semen collection, artificial insemination)	7.1	(0.8)	19.0	(2.1)	35.9	(2.6)	12.8	(0.8)
Vaccination consultation	39.2	(1.6)	53.4	(2.5)	63.9	(2.6)	45.0	(1.3)
Administered vaccine(s)	42.2	(1.7)	50.5	(2.6)	64.7	(2.6)	46.5	(1.3)
Provide drugs or vaccines, not administered by a veterinarian	33.2	(1.6)	53.4	(2.6)	67.6	(2.6)	41.3	(1.3)
Deworming consultation	28.2	(1.5)	36.0	(2.4)	49.5	(2.7)	32.2	(1.2)
Administered dewormer	20.8	(1.4)	27.4	(2.3)	31.7	(2.5)	23.4	(1.1)
Dentistry (e.g., floating teeth, removing teeth, filing teeth)	42.1	(1.6)	54.0	(2.6)	66.5	(2.5)	47.4	(1.3)
Nutritional consultation	12.6	(1.1)	23.0	(2.1)	34.8	(2.6)	17.3	(0.9)
Diagnostic services individual or herd test	34.1	(1.6)	53.4	(2.6)	64.9	(2.6)	41.6	(1.2)
Official health certificate	18.4	(1.3)	37.2	(2.5)	59.2	(2.7)	26.9	(1.1)
Purchase or insurance examination	4.2	(0.7)	12.9	(1.7)	26.9	(2.3)	8.6	(0.7)
Biosecurity assessment	4.8	(0.7)	6.7	(1.2)	13.5	(1.7)	6.2	(0.6)
Other	0.6	(0.2)	0.3	(0.2)	1.9	(0.9)	0.7	(0.2)
Any	73.9	(1.4)	86.3	(1.7)	93.2	(1.3)	78.7	(1.1)

A higher percentage of operations in the Northeast region (56.8 percent) used a veterinarian at least once for individual-animal diagnosis, treatment, or surgery than operations in the South Central and Southeast regions (41.4 and 44.2 percent, respectively). A higher percentage of operations in the Northeast region (54.3 percent) used a veterinarian at least once in the previous 12 months to administer vaccines than operations in the West region (38.3 percent).

B.3.b. Percentage of operations on which a veterinarian provided the following service(s) to resident equids at least once in the previous 12 months, by region:

	Percent Operations							
	Region							
	West		South Central		Northeast		Southeast	
Service	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Individual-animal diagnosis, treatment, or surgery (including castration)	46.2	(3.0)	41.4	(2.4)	56.8	(2.4)	44.2	(2.3)
Reproductive services (e.g., ultrasound, semen collection, artificial insemination)	11.2	(1.8)	13.1	(1.5)	14.1	(1.6)	12.8	(1.4)
Vaccination consultation	43.3	(3.0)	44.7	(2.5)	50.3	(2.4)	42.1	(2.2)
Administered vaccine(s)	38.3	(2.9)	44.7	(2.5)	54.3	(2.4)	48.9	(2.3)
Provide drugs or vaccines, not administered by a veterinarian	45.0	(3.1)	39.3	(2.4)	44.5	(2.4)	38.1	(2.2)
Deworming consultation	29.3	(2.8)	33.0	(2.3)	37.1	(2.3)	29.2	(2.0)
Administered dewormer	17.8	(2.3)	26.7	(2.2)	25.7	(2.2)	21.7	(1.9)
Dentistry (e.g., floating teeth, removing teeth, filing teeth)	57.1	(2.8)	45.4	(2.5)	47.0	(2.4)	42.0	(2.2)
Nutritional consultation	16.9	(2.2)	15.7	(1.8)	22.7	(1.9)	15.1	(1.6)
Diagnostic services individual or herd test	25.5	(2.7)	46.4	(2.5)	47.2	(2.4)	43.8	(2.3)
Official health certificate	22.5	(2.6)	28.2	(2.1)	28.0	(2.1)	28.2	(1.9)
Purchase or insurance examination	7.4	(1.6)	7.7	(1.2)	11.3	(1.3)	8.5	(1.0)
Biosecurity assessment	5.5	(1.4)	6.4	(1.2)	7.5	(1.2)	5.2	(0.9)
Other	0.5	(0.4)	0.3	(0.2)	1.3	(0.5)	0.9	(0.5)
Any	79.4	(2.3)	78.0	(2.1)	84.5	(1.8)	73.9	(2.1)

In general, a lower percentage of operations with a primary function of farm/ranch or residence with equids for personal use than operations with a primary function of equine boarding stable/training, riding stable, or equine breeding farm used a veterinarian for the services listed in the following table.

B.3.c. Percentage of operations on which a veterinarian provided the following service(s) to resident equids at least once in the previous 12 months, by primary function of operation:

	Percent Operations					
	Primary Function					
	Equine boarding stable/ training	Riding stable	Equine breeding farm	Farm/ ranch	Residence with equids for personal use	Other
Service	Pct. Std. error	Pct. Std. error	Pct. Std. error	Pct. Std. error	Pct. Std. error	Pct. Std. error
Individual animal diagnosis, treatment, or surgery (including castration)	80.6 (3.3)	74.6 (6.6)	71.0 (4.3)	38.8 (2.0)	38.6 (2.1)	60.9 (7.7)
Reproductive services (e.g., ultrasound, semen collection, artificial insemination)	21.6 (2.5)	6.7 (3.1)	49.4 (4.5)	9.7 (1.2)	7.5 (1.2)	6.1 (3.0)
Vaccination consultation	74.4 (3.2)	60.4 (7.2)	65.4 (4.3)	35.7 (2.0)	43.0 (2.1)	40.9 (7.5)
Administered vaccine(s)	82.6 (2.9)	67.3 (7.0)	57.9 (4.5)	35.4 (2.0)	45.7 (2.2)	45.7 (7.8)
Provide drugs or vaccines, not administered by a veterinarian	71.0 (3.4)	62.1 (7.1)	61.7 (4.5)	34.5 (2.0)	35.8 (2.1)	43.6 (7.6)
Deworming consultation	57.7 (3.6)	47.1 (7.4)	45.5 (4.5)	26.5 (1.9)	28.7 (1.9)	30.4 (6.7)
Administered dewormer	35.9 (3.4)	29.2 (6.8)	32.7 (4.2)	19.4 (1.7)	22.7 (1.8)	20.2 (5.8)
Dentistry (e.g., floating teeth, removing teeth, filing teeth)	69.1 (3.3)	67.3 (6.9)	62.6 (4.4)	38.2 (2.1)	46.8 (2.2)	55.1 (7.8)
Nutritional consultation	38.1 (3.4)	35.5 (7.1)	27.6 (4.0)	11.7 (1.3)	14.7 (1.6)	22.7 (5.8)
Diagnostic services individual or herd test	72.3 (3.4)	67.3 (7.2)	61.2 (4.5)	32.7 (2.0)	38.2 (2.1)	42.1 (7.4)
Official health certificate	54.2 (3.6)	43.6 (7.3)	47.6 (4.5)	21.0 (1.7)	21.9 (1.8)	21.6 (5.6)
Purchase or insurance examination	34.3 (3.3)	19.8 (5.8)	20.3 (3.6)	4.5 (0.8)	3.7 (0.8)	8.0 (3.8)
Biosecurity assessment	17.4 (2.8)	9.6 (3.6)	10.3 (2.3)	4.2 (0.9)	4.6 (0.9)	5.4 (2.6)
Other	1.9 (1.0)	0.0 (—)	1.6 (1.1)	0.3 (0.2)	0.6 (0.3)	0.0 (—)
Any	95.7 (1.7)	100.0 (—)	93.5 (2.1)	73.0 (1.8)	76.2 (1.8)	80.8 (6.7)

4. Primary dental care provider

As an equid becomes older, the shape and angle of its teeth change and can become problematic. In general, it is recommended that equine dental checkups be done annually and/or when signs of dental problems occur. Common signs of dental problems include long, unchewed particles of hay in manure; changes in eating or drinking habits; partially chewed feed dropped from the mouth; slow chewing; inappetence; weight loss; and resistance to the bit.

The percentage of operations that provided dental care for their equids increased as operation size increased, ranging from 51.9 percent of small operations to 84.1 percent of large operations.

Approximately equal percentages of all operations used a veterinarian as the primary equine dental-care provider (39.1 percent) or provided no dental care to resident equids (40.3 percent). Some States allow only licensed veterinarians to provide equine dental care.

B.4.a. Percentage of operations by **primary** provider of equine dental care in the previous 12 months, and by size of operation:

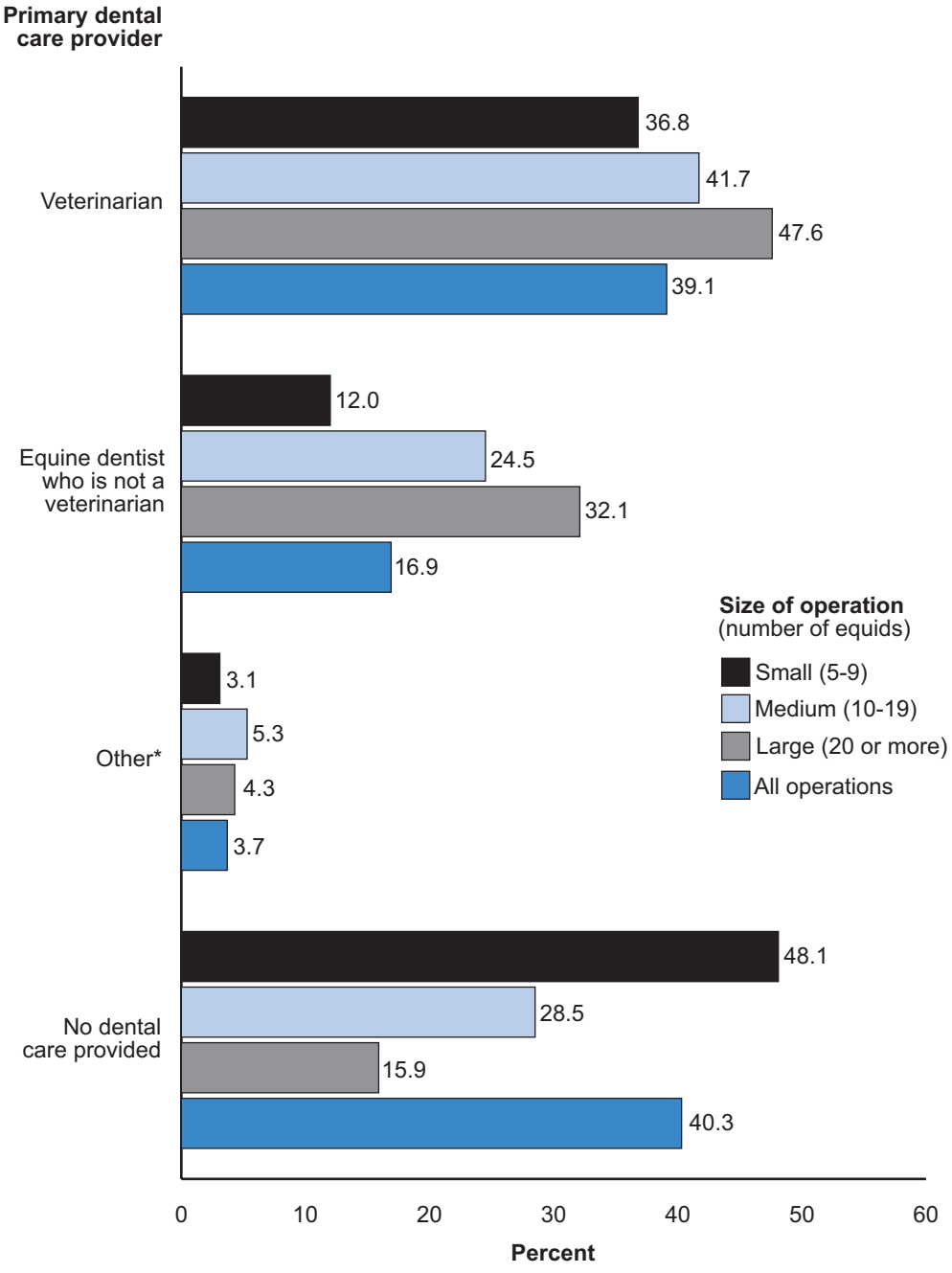
Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Primary provider	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Veterinarian	36.8	(1.6)	41.7	(2.6)	47.6	(2.7)	39.1	(1.2)
Equine dentist who is not a veterinarian	12.0	(1.0)	24.5	(2.1)	32.1	(2.5)	16.9	(0.9)
Other*	3.1	(0.5)	5.3	(1.0)	4.3	(1.1)	3.7	(0.4)
No dental care provided	48.1	(1.6)	28.5	(2.3)	15.9	(2.0)	40.3	(1.2)
Total	100.0		100.0		100.0		100.0	

*Includes farrier, owner, friend, and trainer.

Percentage of operations by primary provider of equine dental care in the previous 12 months, and by size of operation



*Includes farrier, owner, friend, and trainer.

A higher percentage of operations in the Northeast region (71.5 percent) provided dental care to resident equids in the previous 12 months compared with operations in the Southeast and South Central regions (55.1 and 52.4 percent, respectively). Operations in the Northeast region accounted for the highest percentage of operations that used a nonveterinarian equine dentist as the primary provider of dental care (33.3 percent), while operations in the West region accounted for the highest percentage of operations that used a veterinarian as the primary provider of dental care (52.4 percent).

B.4.b. Percentage of operations by **primary** provider of equine dental care in the previous 12 months, and by region:

	Percent Operations							
	Region							
	West		South Central		Northeast		Southeast	
Primary dental care provider	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Veterinarian	52.4	(2.8)	39.6	(2.5)	31.5	(2.3)	33.8	(2.2)
Equine dentist who is not a veterinarian	9.2	(1.7)	10.0	(1.3)	33.3	(2.2)	18.2	(1.7)
Other	2.9	(0.9)	2.8	(0.7)	6.6	(1.2)	3.2	(0.8)
No dental care provided	35.4	(2.7)	47.6	(2.5)	28.5	(2.2)	44.9	(2.2)
Total	100.0		100.0		100.0		100.0	

A higher percentage of operations with a primary function of boarding stable/training, riding stable, or breeding operation provided dental care to resident equids in the previous 12 months compared with farm/ranch and residence with equids for personal use operations. A higher percentage of equine boarding stable/training, riding stable, and equine breeding farm operations used a nonveterinarian equine dentist as the primary provider of dental care compared with farm/ranch or residence with equids for personal use operations.

B.4.c. Percentage of operations by primary provider of equine dental care in the previous 12 months, and by primary function of operation:

	Percent Operations											
	Primary Function											
	Equine boarding stable/ training		Riding stable		Equine breeding farm		Farm/ranch		Residence with equids for personal use		Other	
Primary dental care provider	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Veterinarian	46.8	(3.6)	49.3	(7.4)	52.2	(4.5)	32.0	(2.0)	41.0	(2.1)	42.2	(7.9)
Equine dentist who is not a veterinarian	43.9	(3.5)	44.9	(7.3)	23.5	(3.6)	12.2	(1.3)	12.0	(1.3)	23.0	(6.1)
Other	0.8	(0.6)	0.0	(—)	4.3	(1.5)	5.3	(0.8)	3.0	(0.6)	2.4	(1.8)
No dental care provided	8.6	(2.3)	5.8	(3.5)	20.0	(3.8)	50.4	(2.1)	44.1	(2.1)	32.3	(7.4)
Total	100.0		100.0		100.0		100.0		100.0		100.0	

5. Hoof care provider

Like the fingernails of people, equids' hooves grow continuously. Equids that spend time on rough ground wear down their hooves naturally; however, many domesticated equids are kept on soft, level ground or in stalls or paddocks where their hooves are not worn down and, thus, their hooves need periodic trimming. Hoof trimming is accomplished by using nippers to remove excess hoof wall. A hoof knife is used to remove excess sole, and a rasp is used to smooth the edge of the hoof wall. The procedure may be performed by professional farriers or others with appropriate skill.

In the previous 12 months, 26.2 percent of all operations usually used operation personnel to trim the hooves of resident equids; 7.3 percent of operations did not provide hoof trimming. A similar percentage of small and medium operations hired a professional farrier for hoof trimming, and large operations accounted for the highest percentage of operations (71.5 percent) that used a professional farrier. Overall, 4.5 percent of operations used a professional hoof trimmer who was not a farrier.

B.5.a. Percentage of operations by usual provider of hoof-trimming services in the previous 12 months, and by size of operation:

Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Provider	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Operation personnel (including operator)	25.0	(1.5)	31.4	(2.4)	23.5	(2.3)	26.2	(1.1)
Hired professional farrier	58.1	(1.7)	60.0	(2.5)	71.5	(2.5)	60.0	(1.3)
Professional hoof trimmer who is not a farrier	5.0	(0.8)	4.5	(1.1)	2.0	(0.7)	4.5	(0.6)
Veterinarian	0.1	(0.1)	0.2	(0.2)	0.3	(0.2)	0.2	(0.1)
Other outside person	1.9	(0.4)	2.1	(0.7)	0.8	(0.7)	1.8	(0.3)
Not done	10.0	(1.0)	1.7	(0.6)	1.9	(0.7)	7.3	(0.7)
Total	100.0		100.0		100.0		100.0	

A higher percentage of operations in the West region (34.8 percent) usually used operation personnel to trim hooves in the previous 12 months compared with operations in the Northeast and Southeast regions (21.2 and 20.9 percent, respectively). A higher percentage of operations in the Northeast region (67.9 percent) usually used a hired farrier for hoof trimming compared with operations in the West and South Central regions (54.7 and 55.8 percent, respectively). A similar percentage of operations across regions used a professional hoof trimmer (not a farrier) as the usual provider of hoof trimming services.

B.5.b. Percentage of operations by usual provider of hoof-trimming services in the previous 12 months, and by region:

Percent Operations

	Region							
	West		South Central		Northeast		Southeast	
Provider	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Operation personnel (including operator)	34.8	(2.8)	27.9	(2.2)	21.2	(2.0)	20.9	(1.9)
Hired professional farrier	54.7	(3.0)	55.8	(2.5)	67.9	(2.3)	63.1	(2.2)
Professional hoof trimmer who is not a farrier	4.8	(1.3)	5.4	(1.2)	4.1	(1.0)	3.5	(0.9)
Veterinarian	0.1	(0.1)	0.0	(0.0)	0.0	(—)	0.5	(0.3)
Other outside person	1.3	(0.6)	1.3	(0.5)	2.5	(0.8)	2.3	(0.7)
Not done	4.2	(1.2)	9.5	(1.6)	4.3	(1.1)	9.7	(1.5)
Total	100.0		100.0		100.0		100.0	

Equids used to perform tasks such as farm/ranch work, showing, racing, and other performance activities may require shoes to protect their hooves. The need for shoes is determined by several factors, including hoof type, terrain, and the amount of use the equid experiences. Some equids may require corrective shoeing to balance the hoof or to modify how the hoof moves during its stride. Applying shoes requires more skill and equipment than hoof trimming.

Approximately half of all operations (50.4 percent) used a hired professional farrier to provide routine shoeing in the previous 12 months, while one-fourth of operations (25.3 percent) did not provide routine shoeing. The percentage of operations that provided routine shoeing was higher for medium and large operations (83.6 and 86.9 percent, respectively) than for small operations (69.8 percent). The percentage of operations on which operation personnel usually provided routine shoeing was similar across operations sizes. Overall, 53.9 percent of operations provided corrective shoeing to any resident equids in the previous 12 months. A higher percentage of large operations (77.0 percent) than small operations (46.7 percent) provided corrective shoeing.

B.5.c. Percentage of operations by usual provider of routine shoeing and corrective shoeing in the previous 12 months, by size of operation:

Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Provider	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Routine shoeing								
Operation personnel (including operator)	13.2	(1.1)	17.2	(1.9)	15.0	(1.9)	14.3	(0.9)
Hired professional farrier	46.7	(1.7)	54.7	(2.6)	64.8	(2.6)	50.4	(1.3)
Professional hoof trimmer who is not a farrier	7.8	(0.9)	9.1	(1.5)	5.1	(1.1)	7.8	(0.7)
Veterinarian	0.4	(0.2)	0.6	(0.4)	1.1	(0.6)	0.6	(0.2)
Other outside person	1.6	(0.4)	2.0	(0.9)	0.9	(0.7)	1.6	(0.3)
Not done	30.2	(1.5)	16.4	(1.9)	13.1	(1.9)	25.3	(1.1)
Total	100.0		100.0		100.0		100.0	
Corrective shoeing								
Operation personnel (including operator)	10.0	(1.0)	13.1	(1.7)	11.2	(1.6)	10.8	(0.8)
Hired professional farrier	31.7	(1.6)	46.2	(2.6)	60.7	(2.7)	38.1	(1.2)
Professional hoof trimmer who is not a farrier	2.8	(0.5)	3.5	(1.0)	1.9	(0.7)	2.9	(0.4)
Veterinarian	0.1	(0.1)	0.0	(—)	0.3	(0.3)	0.1	(0.1)
Other outside person	2.1	(0.4)	1.7	(0.6)	3.0	(1.0)	2.1	(0.3)
Not done	53.3	(1.7)	35.5	(2.5)	23.0	(2.4)	46.1	(1.3)
Total	100.0		100.0		100.0		100.0	

6. Vaccinations

Vaccines are biologic preparations that induce active immunity to a particular disease. The administration of vaccines is called vaccination. Criteria to determine the need for vaccination include risk of disease, consequences of disease, anticipated effectiveness of selected product, potential adverse reactions to vaccine, cost of immunization (time, labor, vaccine cost) versus potential cost of disease (time out of use), impact of movement restrictions imposed to control contagious disease spread, labor, medication costs for treating sick animals, and loss of life. The American Association of Equine Practitioners recommends core vaccines for all horses in the United States, including vaccination against tetanus, rabies, Eastern and Western encephalitis, and West Nile virus.

Overall, 66.7 percent of operations vaccinated any resident equids in the previous 12 months. The percentage of operations that vaccinated any resident equids increased as operation size increased.

B.6.a. Percentage of operations that administered any type of vaccine to resident equids in the previous 12 months, by size of operation:

Percent Operations

Size of Operation (number of equids)

Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
61.6	(1.6)	73.2	(2.2)	84.3	(2.0)	66.7	(1.2)

A higher percentage of operations in the West region (74.4 percent) vaccinated any resident equids in the previous 12 months compared with operations in the South Central and Southeast regions (62.7 and 63.3 percent, respectively).

B.6.b. Percentage of operations that administered any type of vaccine to resident equids in the previous 12 months, by region:

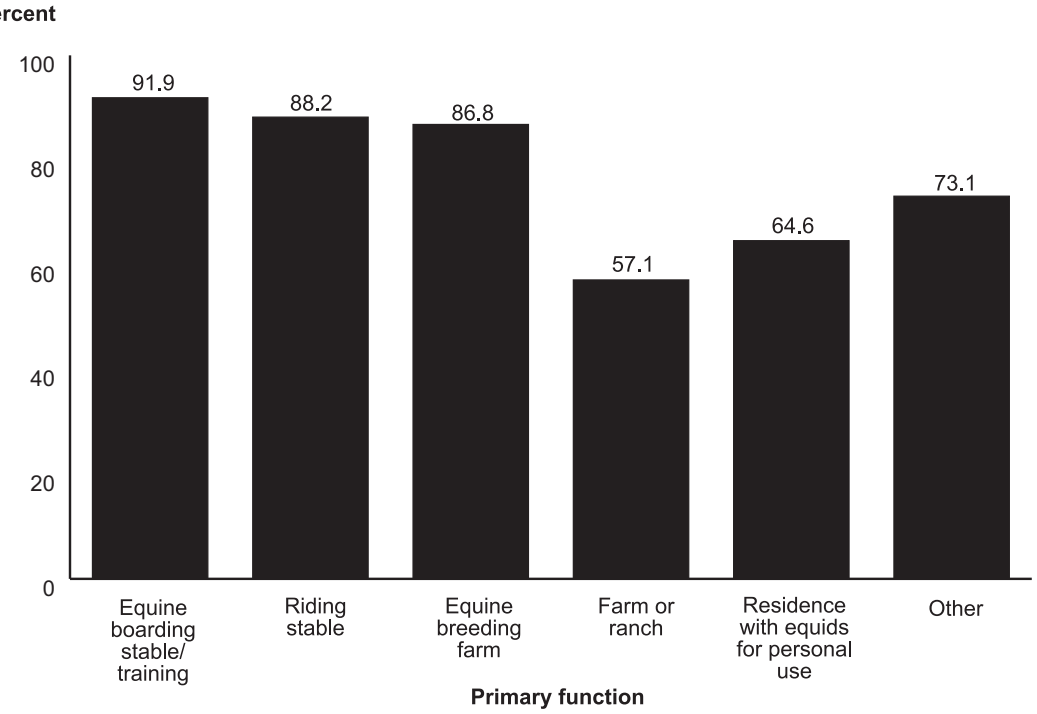
Percent Operations							
Region							
West		South Central		Northeast		Southeast	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
74.4	(2.4)	62.7	(2.4)	69.0	(2.3)	63.3	(2.2)

A lower percentage of operations with a primary function of farm/ranch and residence with equids for personal use vaccinated any resident equids in the previous 12 months compared with equine boarding stable/training, riding stable, and equine breeding farm operations.

B.6.c. Percentage of operations that administered any type of vaccine to resident equids in the previous 12 months, by primary function of operation:

Percent Operations											
Primary Function											
Equine boarding stable/ training		Riding stable		Equine breeding farm		Farm/ ranch		Residence with equids for personal use		Other	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
91.9	(2.4)	88.2	(4.5)	86.8	(3.1)	57.1	(2.1)	64.6	(2.0)	73.1	(7.1)

Percentage of operations that administered any type of vaccine to resident equids in the previous 12 months, by primary function of operation



For the 66.7 percent of operations that vaccinated any resident equids in the previous 12 months, the highest percentage of operations (73.1 percent) used a veterinarian as the primary source of vaccines. The percentage of operations that primarily obtained vaccines from a veterinarian was similar across operation sizes.

B.6.d. For the 66.7 percent of operations that administered any type of vaccine to resident equids in the previous 12 months (table B.6.a), percentage of operations by primary source of vaccines and by size of operation:

Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Primary source	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Veterinarian	73.6	(1.9)	70.9	(2.8)	74.5	(2.6)	73.1	(1.4)
Feed store or veterinary supply store	19.2	(1.7)	18.2	(2.4)	14.9	(2.2)	18.4	(1.2)
Catalog/Internet	7.1	(1.1)	11.0	(1.9)	10.6	(1.7)	8.6	(0.9)
Other	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Total	100.0		100.0		100.0		100.0	

For operations that vaccinated any resident equids in the previous 12 months, the percentage of operations that obtained vaccines primarily from a veterinarian was similar across regions. A higher percentage of operations in the West region obtained vaccines primarily from a feed or veterinary supply store (26.9 percent) compared with operations in the Northeast region (11.5 percent).

B.6.e. For the 66.7 percent of operations that administered any type of vaccine to resident equids in the previous 12 months (table B.6.a), percentage of operations by primary source of vaccines and by region:

Percent Operations

Region

	West		South Central		Northeast		Southeast	
Primary source	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Veterinarian	68.4	(3.3)	71.9	(2.8)	77.5	(2.4)	75.1	(2.6)
Feed store or veterinary supply store	26.9	(3.1)	18.6	(2.4)	11.5	(1.9)	16.2	(2.3)
Catalog/Internet	4.7	(1.5)	9.5	(1.8)	11.0	(1.8)	8.6	(1.6)
Other	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Total	100.0		100.0		100.0		100.0	

For operations that vaccinated any resident equids in the previous 12 months, a higher percentage of operations with a primary function of equine breeding farms, farm/ranch, and residence with equids for personal use sourced their vaccines from a feed or veterinary supply store compared with equine boarding/stable and riding stable operations.

B.6.f. For the 66.7 percent of operations that administered any type of vaccine to resident equids in the previous 12 months (table B.6.a), percentage of operations by primary source of vaccines and by primary function of operation:

Percent Operations

	Primary Function											
	Equine boarding stable/ training		**Riding stable**		**Equine breeding farm**		**Farm/ ranch**		**Residence with equids for personal use**		**Other**	
Primary source	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Veterinarian	86.5	(2.5)	74.0	(6.7)	62.3	(4.8)	70.8	(2.6)	74.2	(2.4)	63.2	(8.7)
Feed store or veterinary supply store	8.4	(2.0)	5.4	(3.2)	21.8	(4.2)	21.8	(2.4)	18.4	(2.1)	24.7	(7.7)
Catalog/ Internet	5.1	(1.6)	20.6	(6.2)	15.9	(3.5)	7.3	(1.3)	7.4	(1.5)	12.1	(5.7)
Other	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Total	100.0		100.0		100.0		100.0		100.0		100.0	

For operations that vaccinated any resident equids in the previous 12 months, 51.7 percent had a veterinarian administer the majority of vaccines, while on 44.0 percent of operations the equine owner administered the majority of vaccines. A higher percentage of large operations (7.2 percent) used operation personnel to administer the majority of vaccines compared with small operations (2.4 percent).

B.6.g. For the 66.7 percent of operations that administered any type of vaccine to resident equids in the previous 12 months (table B.6.a), percentage of operations by person who administered the majority of vaccines, and by size of operation:

Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Person	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Veterinarian	50.7	(2.2)	51.9	(3.0)	56.1	(2.9)	51.7	(1.6)
Equine owner	45.8	(2.2)	44.0	(3.0)	36.2	(2.8)	44.0	(1.6)
Operation personnel who are not the equine owner	2.4	(0.7)	3.6	(1.1)	7.2	(1.5)	3.4	(0.5)
Other	1.0	(0.4)	0.5	(0.5)	0.5	(0.4)	0.8	(0.3)
Total	100.0		100.0		100.0		100.0	

For operations that vaccinated any resident equids in the previous 12 months, a lower percentage of operations in the West and South Central regions (38.4 and 48.4 percent, respectively) had a veterinarian administer the majority of vaccines compared with operations in the Northeast and Southeast regions (60.8 and 60.9 percent, respectively). The equine owner administered the majority of vaccinations on a higher percentage of operations in the West and South Central regions (55.6 and 48.1 percent, respectively) compared with operations in the Northeast and Southeast regions (35.1 and 35.4 percent, respectively).

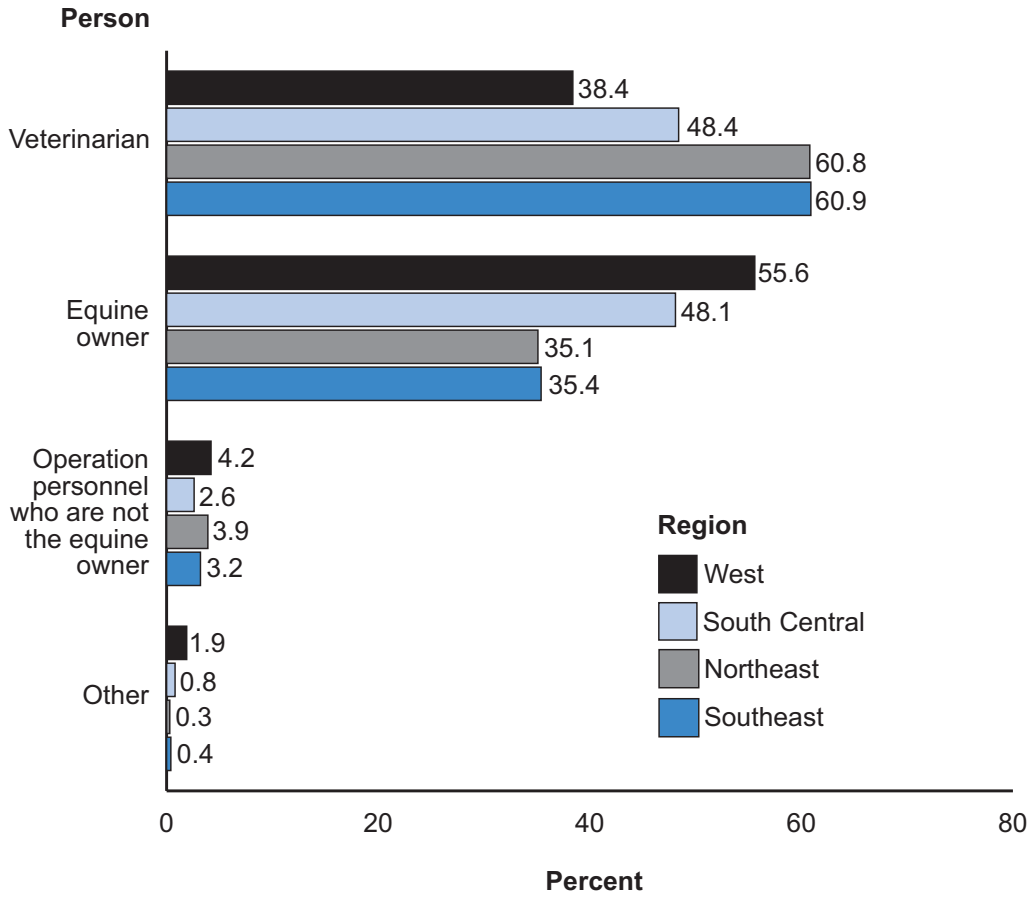
B.6.h. For the 66.7 percent of operations that administered any type of vaccine to resident equids in the previous 12 months (table B.6.a), percentage of operations by person who administered the majority of vaccines, and by region:

Percent Operations

Region

	West		South Central		Northeast		Southeast	
Person	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Veterinarian	38.4	(3.5)	48.4	(3.1)	60.8	(2.7)	60.9	(2.8)
Equine owner	55.6	(3.6)	48.1	(3.1)	35.1	(2.7)	35.4	(2.8)
Operation personnel who are not the equine owner	4.2	(1.5)	2.6	(0.8)	3.9	(1.0)	3.2	(1.0)
Other	1.9	(0.7)	0.8	(0.5)	0.3	(0.3)	0.4	(0.4)
Total	100.0		100.0		100.0		100.0	

For the 66.7 percent of operations that administered any type of vaccine to resident equids in the previous 12 months, percentage of operations by person who administered the majority of vaccines, and by region



For operations that vaccinated any resident equids in the previous 12 months, operations with a primary function of equine boarding stable/training had the highest percentage of operations in which a veterinarian administered the majority of vaccines (78.5 percent) and the lowest percentage of operations in which the equine owner administered the majority of vaccines (17.0 percent).

B.6.i. For the 66.7 percent of operations that administered any type of vaccine to resident equids in the previous 12 months (table B.6.a), percentage of operations by person who administered the majority of vaccines, and by primary function of operation:

Percent Operations

Primary Function

	Equine boarding stable/ training		Riding stable		Equine breeding farm		Farm/ ranch		Residence with equids for personal use		Other	
Person	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Veterinarian	78.5	(2.9)	54.9	(7.9)	44.3	(4.9)	41.2	(2.7)	54.4	(2.7)	45.9	(9.0)
Equine owner	17.0	(2.7)	38.3	(7.8)	51.2	(4.9)	55.8	(2.8)	41.2	(2.7)	42.2	(8.8)
Operation personnel who are not the equine owner	3.8	(1.2)	6.8	(3.5)	4.5	(1.6)	2.0	(0.7)	3.4	(1.0)	11.9	(5.5)
Other	0.8	(0.5)	0.0	(—)	0.0	(—)	1.1	(0.5)	1.0	(0.5)	0.0	(—)
Total	100.0		100.0		100.0		100.0		100.0		100.0	

7. End-of-life decisionmaking

Euthanasia is the intentional ending of a life and is generally used to relieve pain and suffering. Making the decision to end the life of an equid can be difficult. Gathering information that allows an owner to consider in advance what criteria to use when faced with the decision of when to end an equid's life can make the process less stressful, while optimizing the care of the equid. The American Association of Equine Practitioners has guidelines for making humane decisions about euthanasia as well as recommendations regarding different methods of performing euthanasia.

Overall, more than half of operations (59.8 percent) had an end-of-life plan for equids (i.e., what criteria would be used to decide whether or not to euthanize). The percentage of operations with an end-of-life plan for equids was higher on large operations than on small operations (71.5 and 57.1 percent, respectively).

B.7.a. Percentage of operations that had an end-of-life plan for their equids, such as what criteria to use when deciding whether or not to euthanize an equid, by size of operation:

Percent Operations

Size of Operation (number of equids)

Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
57.1	(1.7)	62.2	(2.5)	71.5	(2.5)	59.8	(1.3)

The percentage of operations with an end-of-life plan for equids was similar across regions.

B.7.b. Percentage of operations that had an end-of-life plan for their equids, such as what criteria to use when deciding whether or not to euthanize an equid, by region:

Percent Operations

Region

West		**South Central**		**Northeast**		**Southeast**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
66.7	(2.9)	57.2	(2.5)	60.0	(2.4)	57.4	(2.2)

A higher percentage of operations with a primary function of equine boarding stable/ training, riding stables, or breeding farms had an end-of-life plan for their equids compared with operations with a primary function of farm/ranch.

B.7.c. Percentage of operations that had an end-of-life plan for their equids, such as what criteria to use when deciding whether or not to euthanize an equid, by primary function of operation:

Percent Operations											
Primary Function											
Equine boarding stable/ training		Riding stable		Equine breeding farm		Farm/ ranch		Residence with equids for personal use		Other	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
70.4	(3.3)	80.7	(5.3)	75.8	(3.9)	52.2	(2.1)	59.8	(2.1)	73.5	(6.9)

For the 59.8 percent of operations with an end-of-life plan for equids, the highest percentage of operations (85.8 percent) used a veterinarian as a source of information when deciding whether or not to euthanize an equid. Overall, 22.9 percent of operations used other equine owners and 12.2 percent used farriers as information sources. Often, more than one source of information was used to make an end-of-life decision.

B.7.d. For the 59.8 percent of operations that had an end-of-life plan for their equids, percentage of operations by source(s) of information used when deciding whether or not to euthanize an equid:

Source	Percent operations	Std. error
Veterinarian	85.8	(1.2)
Other equine owners	22.9	(1.4)
Farrier	12.2	(1.0)
Internet resources	5.3	(0.7)
Magazines or other literature	5.6	(0.8)
Rescue/rehabilitation resources	3.0	(0.6)
Extension agent	1.9	(0.5)
Grief or other professional counselor	0.8	(0.4)
Animal communicator/psychic	0.6	(0.3)
Other	1.8	(0.4)

Operators might have considered multiple factors when deciding whether or not to euthanize an equid. The highest percentage of operations (92.9 percent) indicated that an equid's pain and suffering was a criterion they would use when making an end-of-life decision, followed by likelihood of survival (60.0 percent).

B.7.e. Percentage of operations by criteria that would, or has, contributed to making the decision of whether or not to euthanize an equid:

Criteria	Percent operations*	Std. error
Cost of treatment	40.0	(1.3)
Pain and suffering	92.9	(0.7)
Return to use	27.3	(1.1)
Likelihood of survival	60.0	(1.3)
Length of recovery	22.5	(1.1)
Insurance status of equid	3.8	(0.5)
Other	2.6	(0.4)

*All participating operations responded to this question, whether or not they had an end-of-life plan.

C. Health Events

Determining the common health conditions that affect equids can help identify areas for future educational efforts and research. It also allows for comparisons over time, such as trends in the occurrence of health conditions, and allows individual equine owners to compare the health events of their equids with those on a national level.

Note: It is possible that operation owners were more likely to remember and report more serious or recent conditions and not recall conditions that were self-resolving, caused only minor illness, or occurred many months before the study interview.

1. Equids less than 6 months of age

The percentage of operations that had any resident equids less than 6 months of age (foals) in the previous 12 months increased as operation size increased. Overall, 15.9 percent of operations had resident equids in this age group.

C.1.a. Percentage of operations that had any resident foals less than 6 months of age in the previous 12 months, by size of operation:

Percent Operations

Size of Operation (number of equids)

Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
7.8	(0.9)	24.2	(2.2)	48.3	(2.7)	15.9	(0.9)

The percentage of operations that had any resident equids less than 6 months of age (foals) in the previous 12 months was similar across regions.

C.1.b. Percentage of operations that had any resident foals less than 6 months of age in the previous 12 months, by region:

Percent Operations

Region

West		**South Central**		**Northeast**		**Southeast**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
17.7	(2.2)	16.7	(1.6)	14.7	(1.5)	14.1	(1.5)

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The percentage of resident foals that had a health condition listed in the following table at least once in the previous 12 months was calculated as a percentage of the inventory of foals less than 6 months of age on May 1, 2015. For the purposes of this study, even if a foal had developed the same condition multiple times during the 12 months, it was counted as having had the condition just once. If a foal developed more than one of the conditions listed, it was counted as a percentage of foals with each condition. Common health conditions of foals included digestive problems other than colic, such as diarrhea or choke (6.8 percent of foals); and conditions such as injury, wounds, or trauma (4.8 percent); respiratory problems (4.3 percent); lameness, leg, or hoof problems (3.0 percent); and failure to get milk or colostrum (2.9 percent). More than 3 percent of operations had one or more foals with each of these conditions.

Common conditions for which an antibiotic was given to resident foals included respiratory problems (3.4 percent of foals); injury, wounds, or trauma (2.9 percent); digestive problems other than colic, such as diarrhea (2.9 percent); failure to get milk or colostrum (1.3 percent); and lameness, leg, or hoof problems (1.2 percent). Since the study questionnaire did not ask for the names of the drugs used, it is possible that operations mistakenly reported an antibiotic treatment that was in fact a treatment using a different type of drug.

C.1.c. For the 15.9 percent of operations that had any resident foals less than 6 months of age in the previous 12 months (table C.1.a), percentage of operations on which any foals became affected with the listed condition(s), percentage of foals affected, and percentage of foals treated with an antibiotic for the condition(s):

Condition	Percent operations with affected foals	Std. error	Percent resident foals affected[1]	Std. error	Percent resident foals treated[1]	Std. error
Colic	2.9	(0.8)	1.2	(0.3)	0.8	(0.2)
Other digestive problems, such as diarrhea or choke	7.2	(1.4)	6.8	(2.1)	2.9	(0.7)
Dental problems, excluding routine floating	0.1	(0.1)	0.0	(0.0)	0.0	(—)
Respiratory problems, such as strangles, flu, pneumonia, reactive airway disease, heaves	4.2	(1.2)	4.3	(1.7)	3.4	(1.6)
Eye problems	2.7	(1.0)	1.0	(0.4)	0.9	(0.4)
Skin problems	1.4	(0.5)	1.0	(0.5)	0.1	(0.1)
Reproductive problems, such as hermaphrodite or cryptorchid	0.1	(0.1)	0.0	(0.0)	0.0	(—)
Behavioral problems that affected use, health, or safety	0.9	(0.6)	0.4	(0.2)	0.0	(—)
Injury, wounds, or trauma	10.0	(1.8)	4.8	(1.2)	2.9	(1.0)
Lameness, leg, or hoof problems[2]	7.2	(1.6)	3.0	(0.6)	1.2	(0.4)
Neurologic problems, such as spinal problems, wobblers, seizure, West Nile virus, EHM, EPM	0.8	(0.4)	0.3	(0.1)	0.1	(0.1)
Pigeon fever caused by *Corynebacterium pseudotuberculosis*	0.1	(0.1)	0.1	(0.1)	0.0	(—)
Other infectious disease unrelated to specific body system, such as septicemia or blood infections	1.5	(0.5)	0.7	(0.3)	0.5	(0.2)
Chronic weight loss/underweight	0.4	(0.2)	0.2	(0.1)	0.2	(0.1)
Overweight/obese	0.5	(0.3)	0.2	(0.1)	0.1	(0.1)
Failure to get milk or colostrum from dam	4.8	(1.0)	2.9	(0.9)	1.3	(0.8)
Liver or kidney disease	0.3	(0.3)	0.1	(0.1)	0.0	(—)
Fever of undetermined origin	1.4	(0.5)	0.7	(0.2)	0.4	(0.2)
Other	2.4	(1.0)	1.7	(0.8)	0.5	(0.3)

[1]Foals born in 2014 or 2015, as a percentage of inventory of foals less than 6 months of age on May 1, 2015.

[2]Equid could not be used for intended purpose without treatment—drugs, alternative therapies, corrective shoeing, or rest.

For the 15.9 percent of operations that had any resident foals less than 6 months of age in the previous 12 months, a similar percentage of operations across regions treated any foals at least once with an antibiotic to prevent disease. Overall, 4.3 percent of foals on these operations were treated with an antibiotic to prevent disease, and this percentage was similar across regions, when considering the size of the standard errors. Since the study questionnaire did not ask for the names of the drugs used, it is possible that operations mistakenly reported an antibiotic treatment that was in fact a treatment using a different type of drug.

C.1.d. For the 15.9 percent of operations that had any resident foals less than 6 months of age in the previous 12 months (table C.1.a), percentage of operations that treated any foals with an antibiotic to prevent (no condition present) disease and percentage of foals treated, by region:

Percent

	Region									
	West		South Central		Northeast		Southeast		All operations	
Measure	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Operations	1.1	(0.7)	3.0	(1.3)	3.0	(1.3)	3.3	(2.1)	2.6	(0.7)
Foals*	0.4	(0.3)	8.1	(4.6)	2.0	(0.9)	2.6	(1.8)	4.3	(2.0)

*As a percentage of inventory of foals less than 6 months of age on May 1, 2015.

Overall, 19.0 percent of the 15.9 percent of operations that had any resident foals less than 6 months of age had treated one or more foals with an antibiotic in the previous 12 months. The percentage of operations that treated a foal at least once with an antibiotic for any reason was similar across regions, and the percentage of foals treated did not vary by region, when standard errors are considered.

C.1.e. For the 15.9 percent of operations that had any resident foals less than 6 months of age in the previous 12 months (table C.1.a), percentage of operations that treated any foals with an antibiotic at least once for any reason (for a condition or to prevent disease) and percentage of all resident foals treated, by region:

Percent

	Region									
	West		South Central		Northeast		Southeast		All operations	
Measure	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Operations	19.8	(5.0)	19.8	(4.2)	15.0	(3.4)	20.5	(4.3)	19.0	(2.2)
Foals*	10.0	(2.3)	21.1	(5.7)	15.0	(4.1)	19.1	(5.5)	17.2	(2.8)

*As a percentage of inventory of foals less than 6 months of age on May 1, 2015.

2. Equids 6 months to less than 1 year of age

The percentage of operations that had any resident equids 6 months to less than 1 year of age in the previous 12 months increased as operation size increased. Overall, 10.5 percent of operations had resident equids in this age group.

C.2.a. Percentage of operations that had any resident equids 6 months to less than 1 year of age in the previous 12 months, by size of operation:

Percent Operations

Size of Operation (number of equids)

Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
5.4	(0.8)	15.7	(1.8)	31.2	(2.5)	10.5	(0.7)

The percentage of operations that had any resident equids 6 months to less than 1 year of age in the previous 12 months was similar across regions.

C.2.b. Percentage of operations that had any resident equids 6 months to less than 1 year of age in the previous 12 months, by region:

Percent Operations

Region

West		**South Central**		**Northeast**		**Southeast**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
12.7	(1.8)	10.8	(1.4)	8.4	(1.2)	9.9	(1.3)

The percentage of resident equids 6 months to less than 1 year of age that had a health condition listed in the following table at least once in the previous 12 months was calculated as a percentage of the inventory of equids 6 months to less than 1 year of age on May 1, 2015. For the purposes of this study, even if an equid of this age had developed the same condition multiple times in the previous 12 months, it was counted as having had the condition just once. If an equid of this age developed more than one of the conditions listed, it was counted as a percentage of equids with each condition. Common conditions for equids 6 months to less than 1 year of age included injury, wounds, or trauma (7.2 percent of equids); respiratory problems (3.4 percent); and lameness, leg, or hoof problems (3.3 percent).

Common conditions for which resident equids in this age group were given an antibiotic included injury, wounds, or trauma (3.6 percent of equids) and respiratory disease (3.4 percent). Since the study questionnaire did not ask for the names of the drugs used, it is possible that operations mistakenly reported an antibiotic treatment that was in fact a treatment using a different type of drug.

C.2.c. For the 10.5 percent of operations that had any resident equids 6 months to less than 1 year of age in the previous 12 months (table C.2.a), percentage of operations in which any of these equids became affected with a condition(s) listed in the following table, percentage of equids affected, and percentage of equids treated with an antibiotic for the condition(s):

Condition	Percent operations with affected equids	Std. error	Percent resident equids affected[1]	Std. error	Percent resident equids treated[1]	Std. error
Colic	3.6	(1.7)	2.2	(0.9)	1.4	(0.9)
Other digestive problems, such as diarrhea or choke	1.1	(0.6)	0.7	(0.4)	0.4	(0.3)
Dental problems, excluding routine floating	0.7	(0.5)	0.4	(0.3)	0.3	(0.3)
Respiratory problems, such as strangles, flu, pneumonia, reactive airway disease, heaves	2.6	(1.1)	3.4	(1.6)	3.4	(1.6)
Eye problems	1.0	(0.5)	0.6	(0.3)	0.6	(0.3)
Skin problems	2.5	(0.9)	2.1	(0.8)	0.7	(0.4)
Reproductive problems, such as hermaphrodite or cryptorchid	0.0	(—)	0.0	(—)	0.0	(—)
Behavioral problems that affected use, health, or safety	0.2	(0.2)	0.2	(0.1)	0.0	(—)
Injury, wounds, or trauma	8.7	(1.8)	7.2	(1.8)	3.6	(1.0)
Lameness, leg, or hoof problems[2]	4.0	(1.3)	3.3	(1.2)	0.3	(0.2)
Neurologic problems, such as spinal problems, wobblers, seizure, West Nile virus, EHM, EPM	1.8	(1.0)	0.9	(0.5)	0.3	(0.3)
Pigeon fever caused by *Corynebacterium pseudotuberculosis*	0.7	(0.7)	0.3	(0.3)	0.3	(0.3)
Other infectious disease unrelated to specific body system, such as septicemia or blood infections	0.2	(0.2)	0.2	(0.2)	0.2	(0.2)
Chronic weight loss/underweight	0.9	(0.6)	0.7	(0.6)	0.1	(0.1)
Overweight/obese	1.1	(0.7)	1.7	(1.1)	0.3	(0.3)
Liver or kidney disease	0.0	(—)	0.0	(—)	0.0	(—)
Fever of undetermined origin	0.7	(0.4)	1.0	(0.6)	0.8	(0.6)
Other	0.8	(0.6)	0.4	(0.3)	0.4	(0.3)

[1]As a percentage of resident equids 6 months to less than 1 year of age on May 1, 2015.
[2]Equid could not be used for intended purpose without treatment—drugs, alternative therapies, corrective shoeing, or rest.

For the 10.5 percent of operations that had any resident equids 6 months to less than 1 year of age in the previous 12 months, the percentage of operations that gave any of these equids an antibiotic to prevent disease and the percentage of equids treated to prevent disease were similar across regions, when the standard errors are considered. Since the study questionnaire did not ask for the names of the drugs used, it is possible that operations mistakenly reported an antibiotic treatment that was in fact a treatment using a different type of drug.

C.2.d. For the 10.5 percent of operations that had any resident equids 6 months to less than 1 year of age in the previous 12 months (table C.2.a), percentage of operations that treated any of these equids with an antibiotic to prevent (no condition present) disease and percentage of equids treated, by region:

Percent

	Region									
	West		South Central		Northeast		Southeast		All operations	
Measure	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Operations	2.6	(2.6)	5.0	(2.6)	2.2	(1.5)	6.0	(4.1)	4.1	(1.5)
Equids*	1.2	(1.2)	5.0	(2.6)	2.0	(1.4)	3.2	(2.2)	3.2	(1.2)

*As a percentage of resident equids 6 months to less than 1 year of age on May 1, 2015.

For the 10.5 percent of operations that had any resident equids 6 months of age to less than 1 year of age, the percentage of operations that gave any of these equids an antibiotic at least once in the previous 12 months and the percentage of equids treated were similar across regions, when standard errors are considered.

C.2.e. For the 10.5 percent of operations that had any resident equids 6 months to less than 1 year of age in the previous 12 months (table C.2.a), percentage of operations that treated any of these equids with an antibiotic at least once for any reason (for a condition or to prevent disease) and percentage of equids treated, by region:

Percent

Region

	West		South Central		Northeast		Southeast		All operations	
Measure	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Operations	11.8	(4.5)	14.7	(5.2)	18.1	(5.7)	24.9	(6.2)	16.8	(2.8)
Equids*	8.4	(4.7)	12.6	(5.0)	13.6	(4.6)	26.4	(9.5)	14.4	(3.2)

*As a percentage of resident equids 6 months to less than 1 year of age on May 1, 2015.

3. Equids 1 year to less than 5 years of age

The percentage of operations that had resident equids 1 year to less than 5 years of age in the previous 12 months increased as operation size increased. Overall, 45.9 percent of operations had resident equids of this age.

C.3.a. Percentage of operations that had any resident equids 1 year to less than 5 years of age in the previous 12 months, by size of operation:

Percent Operations

Size of Operation (number of equids)

Small (5–9)		Medium (10–19)		Large (20 or more)		All operations	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
32.0	(1.5)	69.7	(2.3)	83.1	(2.0)	45.9	(1.2)

The percentage of operations that had any resident equids 1 year to less than 5 years of age in the previous 12 months was similar across regions.

C.3.b. Percentage of operations that had any resident equids 1 year to less than 5 years of age in the previous 12 months, by region:

Percent Operations							
Region							
West		South Central		Northeast		Southeast	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
47.2	(3.0)	45.2	(2.3)	46.5	(2.4)	45.0	(2.3)

The percentage of resident equids 1 year to less than 5 years of age that had a health condition listed in the following table at least once in the previous 12 months was calculated as a percentage of the inventory of equids 1 year to less than 5 years of age on May 1, 2015. For the purposes of this study, even if an equid of this age had developed the same condition multiple times during the 12 months, it was counted as having had the condition just once. If an equid of this age developed more than one of the conditions listed, it was counted as a percentage of equids with each condition. Common conditions of equids in this age group included injury, wounds, or trauma (8.0 percent of equids), and lameness, leg, or hoof problems (6.8 percent).

Common conditions for which antibiotics were given to equids in this age group included injury, wounds, or trauma (5.1 percent of equids); respiratory problems (3.2 percent); and lameness, leg, or hoof problems (2.2 percent). Since the study questionnaire did not ask for the names of the drugs used, it is possible that operations mistakenly reported an antibiotic treatment that was in fact a treatment using a different type of drug.

C.3.c. For the 45.9 percent of operations that had any resident equids 1 year to less than 5 years of age in the previous 12 months (table 3.C.a), percentage of operations in which any of these equids became affected with the condition(s) listed in the following table, percentage of equids affected, and percentage of equids treated with an antibiotic for the condition(s):

Condition	Percent operations with affected equids	Std. error	Percent resident equids affected[1]	Std. error	Percent resident equids treated[1]	Std. error
Colic	6.8	(0.8)	3.1	(0.4)	1.0	(0.2)
Other digestive problems, such as diarrhea or choke	1.9	(0.4)	0.8	(0.2)	0.3	(0.1)
Dental problems, excluding routine floating	2.7	(0.6)	1.7	(0.6)	0.3	(0.1)
Respiratory problems, such as strangles, flu, pneumonia, reactive airway disease, heaves	3.4	(0.6)	3.9	(1.0)	3.2	(0.9)
Endocrine disorder, such as hypothyroid or Cushings	0.2	(0.1)	0.1	(0.0)	0.0	(—)
Eye problems	3.1	(0.6)	1.3	(0.3)	0.7	(0.2)
Skin problems	3.6	(0.6)	2.1	(0.4)	0.5	(0.2)
Reproductive problems, such as abortion, infertility, or infection of the reproductive tract	1.6	(0.5)	0.6	(0.2)	0.4	(0.1)
Behavioral problems that affected use, health, or safety	1.2	(0.4)	0.8	(0.3)	0.0	(—)
Injury, wounds, or trauma	15.2	(1.3)	8.0	(0.9)	5.1	(0.7)
Lameness, leg, or hoof problems[2]	10.8	(1.1)	6.8	(1.0)	2.2	(0.6)
Neurologic problems, such as spinal problems, wobblers, seizure, West Nile virus, EHM, EPM	1.4	(0.4)	0.6	(0.2)	0.1	(0.1)
Pigeon fever caused by *Corynebacterium pseudotuberculosis*	0.5	(0.2)	0.3	(0.1)	0.1	(0.1)
Other infectious disease unrelated to specific body system, such as septicemia or blood infections	0.3	(0.2)	0.1	(0.1)	0.1	(0.0)
Chronic weight loss/underweight	1.7	(0.4)	0.7	(0.2)	0.1	(0.0)
Overweight/obese	1.8	(0.6)	1.8	(0.6)	0.0	(—)
Liver or kidney disease	0.1	(0.1)	0.0	(0.0)	0.0	(—)
Cancer	0.3	(0.2)	0.1	(0.0)	0.0	(—)
Fever of undetermined origin	0.8	(0.3)	1.0	(0.6)	0.8	(0.6)
Other	0.6	(0.3)	0.2	(0.1)	0.1	(0.1)

[1]As a percentage of resident equids 1 year to less than 5 years of age on May 1, 2015.

[2]Equid could not be used for intended purpose without treatment—drugs, alternative therapies, corrective shoeing, or rest.

For the 45.9 percent of operations that had resident equids 1 year to less than 5 years of age, the percentage of operations that gave an antibiotic to prevent disease was similar across regions, when standard errors are considered. Overall, 2.0 percent of equids in this age group were treated with an antibiotic to prevent disease. Since the study questionnaire did not ask for the names of the drugs used, it is possible that operations mistakenly reported an antibiotic treatment that was in fact a treatment using a different type of drug.

C.3.d. For the 45.9 percent of operations that had any resident equids 1 year to less than 5 years of age in the previous 12 months (table 3.C.a), percentage of operations that treated any of these equids with an antibiotic to prevent (no condition present) disease and percentage of equids treated, by region:

Percent

	Region									
	West		South Central		Northeast		Southeast		All operations	
Measure	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Operations	4.2	(2.0)	5.1	(1.5)	2.9	(1.2)	4.9	(1.6)	4.4	(0.8)
Equids*	2.0	(0.9)	2.2	(0.8)	1.2	(0.5)	2.5	(1.0)	2.0	(0.4)

*As a percentage of resident equids 1 year to less than 5 years of age on May 1, 2015.

For the 45.9 percent of operations with resident equids 1 year to less than 5 years of age, the percentage of operations that gave any equid an antibiotic and the percentage of equids treated with an antibiotic for any reason in the previous 12 months were similar across regions, when considering standard errors.

C.3.e. For the 45.9 percent of operations that had any resident equids 1 year to less than 5 years of age in the previous 12 months (table 3.C.a), percentage of operations that treated any of those equids with an antibiotic at least once for any reason (for a condition or to prevent disease) and percentage of equids treated, by region:

Percent

Region

	West		South Central		Northeast		Southeast		All operations	
Measure	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Operations	23.5	(3.6)	22.0	(2.8)	20.4	(2.8)	19.4	(2.7)	21.4	(1.5)
Equids*	13.1	(2.6)	14.2	(2.7)	11.6	(2.1)	16.1	(3.8)	13.9	(1.5)

*As a percentage of resident equids 1 year to less than 5 years of age on May 1, 2015.

4. Equids 5 years to less than 20 years of age

The percentage of operations with resident equids 5 years to less than 20 years of age was similar across operation sizes. Overall, 96.0 percent of operations had equids in this age group.

C.4.a. Percentage of operations that had any resident equids 5 years to less than 20 years of age in the previous 12 months, by size of operation:

Percent Operations

Size of Operation (number of equids)

Small (5–9)		Medium (10–19)		Large (20 or more)		All operations	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
94.9	(0.7)	99.0	(0.5)	97.3	(0.8)	96.0	(0.5)

The percentage of operations that had any resident equids 5 years to less than 20 years of age was similar across regions.

C.4.b. Percentage of operations that had any resident equids 5 years to less than 20 years of age in the previous 12 months, by region:

Percent Operations							
Region							
West		South Central		Northeast		Southeast	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
96.6	(1.0)	96.7	(0.9)	95.3	(1.1)	95.3	(1.0)

The percentage of resident equids 5 years to less than 20 years of age that had a condition listed in the following table at least once in the previous 12 months was calculated as a percentage of the inventory of equids 5 years to less than 20 years of age on May 1, 2015. For the purposes of this study, even if an equid of this age had developed the same condition multiple times during the 12 months, it was counted as having had the condition just once. If an equid of this age developed more than one of the conditions listed, it was counted as a percentage of equids with each condition. Common conditions in this age group included lameness, leg, or hoof problems (6.2 percent of equids); injury, wounds, or trauma (4.3 percent); and colic (2.8 percent).

Common conditions for which an antibiotic was given for this age group included injury, wounds, or trauma (2.7 percent of equids); lameness, leg, or hoof problems (1.6 percent); and respiratory problems (1.2 percent). Certain antibiotics may be used to treat lameness due to infections in the joints or soft tissues; antibiotics might also be used treat systemic infections, such as Lyme disease. Antibiotics such as doxycycline can have both anti-inflammatory and antimicrobial effects. Since the study questionnaire did not ask for the names of the drugs used, it is possible that operations mistakenly reported an antibiotic treatment that was in fact a treatment using a different type of drug.

C.4.c. For the 96.0 percent of operations that had any resident equids 5 years to less than 20 years of age in the previous 12 months (table C.4.a), percentage of operations in which any of these equids became affected with the following condition(s), percentage of equids affected, and percentage of all equids treated with an antibiotic for the condition(s):

Condition	Percent operations with affected equids	Std. error	Percent resident equids affected[1]	Std. error	Percent resident equids treated[1]	Std. error
Colic	12.8	(0.9)	2.8	(0.2)	0.9	(0.1)
Other digestive problems such as diarrhea or choke	3.4	(0.4)	0.7	(0.1)	0.2	(0.0)
Dental problems excluding routine floating	4.7	(0.6)	1.1	(0.2)	0.2	(0.1)
Respiratory problems such as strangles, flu, pneumonia, reactive airway disease, heaves	6.5	(0.6)	1.8	(0.2)	1.2	(0.2)
Endocrine disorder such as hypothyroid or Cushings	2.3	(0.4)	0.5	(0.1)	0.1	(0.0)
Eye problems	6.8	(0.6)	1.4	(0.1)	0.8	(0.1)
Skin problems	7.8	(0.7)	2.2	(0.2)	0.6	(0.1)
Reproductive problems such as abortion, infertility, or infection of the reproductive tract	2.4	(0.4)	0.6	(0.1)	0.4	(0.1)
Behavioral problems that affected use, health, or safety	1.8	(0.3)	0.4	(0.1)	0.0	(0.0)
Injury, wounds, or trauma	16.9	(1.0)	4.3	(0.3)	2.7	(0.2)
Lameness, leg, or hoof problems[2]	23.7	(1.1)	6.2	(0.4)	1.6	(0.2)
Neurologic problems such as spinal problems, wobblers, seizure, West Nile virus, EHM, EPM	1.8	(0.3)	0.3	(0.1)	0.1	(0.0)
Pigeon fever caused by *Corynebacterium pseudotuberculosis*	0.4	(0.2)	0.1	(0.0)	0.0	(0.0)
Other infectious disease unrelated to specific body system such as septicemia or blood infections	0.8	(0.2)	0.2	(0.1)	0.1	(0.0)
Chronic weight loss/underweight	2.7	(0.4)	0.5	(0.1)	0.0	(0.0)
Overweight/obese	5.0	(0.6)	1.6	(0.2)	0.0	(0.0)
Liver or kidney disease	0.7	(0.2)	0.1	(0.0)	0.0	(0.0)
Cancer	2.2	(0.4)	0.3	(0.1)	0.1	(0.0)
Fever of undetermined origin	1.1	(0.3)	0.3	(0.1)	0.2	(0.0)
Other	1.2	(0.3)	0.2	(0.1)	0.0	(0.0)

[1]As a percentage of resident equids 5 years to less than 20 years of age on May 1, 2015.

[2]Equid could not be used for intended purpose without treatment—drugs, alternative therapies, corrective shoeing, or rest.

For the 96.0 percent of operations that had any resident equids 5 years to less than 20 years of age, the percentage of operations that treated any equids in this age group to prevent disease was similar across regions, when considering the standard errors. The percentage of resident equids in this age group treated with an antibiotic to prevent disease was also similar across regions. Since the study questionnaire did not ask for the names of the drugs used, it is possible that operations mistakenly reported an antibiotic treatment that was in fact a treatment using a different type of drug.

C.4.d. For the 96.0 percent of operations that had any resident equids 5 years to less than 20 years of age in the previous 12 months (table C.4.a), percentage of operations that treated any of these equids with an antibiotic to prevent (no condition present) disease and percentage of equids treated, by region:

Percent

Region

	West		South Central		Northeast		Southeast		All operations	
Measure	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Operations	3.3	(1.2)	6.9	(1.4)	4.7	(1.1)	3.0	(0.8)	4.7	(0.6)
Equids*	0.8	(0.3)	1.9	(0.4)	1.6	(0.5)	1.7	(0.8)	1.5	(0.3)

*As a percentage of resident equids 5 years to less than 20 years of age on May 1, 2015.

For the 96.0 percent of operations that had any resident equids 5 years to less than 20 years of age, the percentage of operations that treated any equids in this age group with an antibiotic for any reason in the previous 12 months was similar across regions. The percentage of equids in this age group that were treated at least once with an antibiotic for any reason was also similar across regions.

C.4.e. For the 96.0 percent of operations that had any resident equids 5 years of age to less than 20 years of age in the previous 12 months (table C.4.a), percentage of operations that treated any of these equids with an antibiotic at least once for any reason (for a condition or to prevent disease) and percentage of equids treated, by region:

Percent

	Region									
	West		South Central		Northeast		Southeast		All operations	
Measure	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Operations	30.0	(2.8)	26.0	(2.2)	29.3	(2.2)	26.5	(2.1)	27.7	(1.2)
Equids*	8.3	(1.0)	9.5	(1.1)	9.7	(0.9)	10.2	(1.2)	9.4	(0.5)

*As a percentage of resident equids 5 years to less than 20 years of age on May 1, 2015.

5. Equids 20 years of age or older

The percentage of operations with any resident equids 20 years of age or older increased as size of operation increased. Overall, 44.6 percent of operations had one or more resident equids 20 years of age or older.

C.5.a. Percentage of operations that had any resident equids 20 years of age or older in the previous 12 months, by size of operation:

Percent Operations

Size of Operation (number of equids)

Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
39.5	(1.6)	50.9	(2.6)	63.2	(2.7)	44.6	(1.3)

The percentage of operations with any resident equids 20 years of age or older was similar across regions.

C.5.b. Percentage of operations that had any resident equids 20 years of age or older in the previous 12 months, by region:

Percent Operations

Region

West		**South Central**		**Northeast**		**Southeast**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
45.7	(2.8)	41.7	(2.5)	49.0	(2.4)	43.8	(2.3)

The percentage of resident equids 20 years of age or older that had a condition at least once in the previous 12 months was calculated as a percentage of the inventory of equids 20 years of age or older on May 1, 2015. For the purposes of this study, even if an equid of this age had developed the same condition multiple times during the 12 months, it was counted as having had the condition just once. If an equid of this age developed more than one of the conditions listed, it was counted as a percentage of equids with each condition.

Common conditions for equids 20 years of age or older included lameness, leg, or hoof problems (9.9 percent of equids); dental problems (4.5 percent); chronic weight loss (4.5 percent); colic (4.2 percent); eye problems (4.2 percent); injury, wounds, or trauma (3.8 percent); and skin problems (3.0 percent).

Conditions commonly treated with antibiotic in this age group included eye problems (2.4 percent of equids); injury, wounds, or trauma (1.7 percent); and lameness, leg, or hoof problems (1.7 percent). Since the study questionnaire did not ask for the names of the drugs used, it is possible that operations mistakenly reported an antibiotic treatment that was in fact a treatment using a different type of drug.

C.5.c. For the 44.6 percent of operations that had any resident equids 20 years of age or older in the previous 12 months (table C.5.a), percentage of operations in which any of these equids became affected with the following conditions, percentage of equids affected, and percentage of equids treated with an antibiotic for the condition:

Condition	Percent operations with affected equids	Std. error	Percent resident equids affected[1]	Std. error	Percent resident equids treated[1]	Std. error
Colic	9.6	(1.1)	4.2	(0.5)	1.2	(0.3)
Other digestive problems such as diarrhea or choke	5.0	(0.8)	2.3	(0.4)	0.6	(0.1)
Dental problems excluding routine floating	7.9	(1.0)	4.5	(0.7)	1.0	(0.3)
Respiratory problems such as strangles, flu, pneumonia, reactive airway disease, heaves	4.4	(0.8)	1.7	(0.3)	0.8	(0.2)
Endocrine disorder such as hypothyroid or Cushings	4.2	(0.7)	2.6	(0.5)	0.2	(0.1)
Eye problems	8.9	(1.1)	4.2	(0.5)	2.4	(0.4)
Skin problems	6.0	(0.9)	3.0	(0.5)	0.8	(0.3)
Reproductive problems such as abortion, infertility, or infection of the reproductive tract	1.7	(0.5)	0.7	(0.2)	0.4	(0.1)
Behavioral problems that affected use, health, or safety	0.6	(0.3)	0.2	(0.1)	0.0	(—)
Injury, wounds, or trauma	6.9	(0.9)	3.8	(0.6)	1.7	(0.3)
Lameness, leg, or hoof problems[2]	17.0	(1.5)	9.9	(1.1)	1.7	(0.3)
Neurologic problems such as spinal problems, wobblers, seizure, West Nile virus, EHM, EPM	2.3	(0.6)	0.9	(0.2)	0.2	(0.1)
Pigeon fever caused by *Corynebacterium pseudotuberculosis*	0.0	(—)	0.0	(—)	0.0	(—)
Other infectious disease unrelated to specific body system such as septicemia or blood infections	0.6	(0.3)	0.3	(0.2)	0.2	(0.1)
Chronic weight loss/underweight	8.4	(1.0)	4.5	(0.7)	0.6	(0.2)
Overweight/obese	3.0	(0.7)	1.7	(0.4)	0.0	(0.0)
Liver or kidney disease	0.1	(0.1)	0.0	(0.0)	0.0	(0.0)
Cancer	2.3	(0.5)	0.9	(0.2)	0.3	(0.1)
Fever of undetermined origin	1.7	(0.5)	0.7	(0.2)	0.4	(0.2)
Other	2.8	(0.6)	1.2	(0.3)	0.1	(0.1)

[1]As a percentage of resident equids 20 years of age or older on May 1, 2015.

[2]Equid could not be used for intended purpose without treatment—drugs, alternative therapies, corrective shoeing, or rest.

For the 44.6 percent of operations with any resident equids 20 years of age or older, the percentage of operations that gave an antibiotic to prevent disease and the percentage of equids treated with an antibiotic in the previous 12 months were similar across regions. Since the study questionnaire did not ask for the names of the drugs used, it is possible that operations mistakenly reported an antibiotic treatment that was in fact a treatment using a different type of drug.

C.5.d. For the 44.6 percent of operations that had any resident equids 20 years of age or older in the previous 12 months (table C.5.a), percentage of operations that treated any of these equids with an antibiotic to prevent (no condition present) disease and percentage of equids treated, by region:

Percent

	Region									
	West		South Central		Northeast		Southeast		All operations	
Measure	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Operations	4.2	(1.6)	4.2	(1.7)	4.6	(1.5)	4.4	(1.5)	4.3	(0.8)
Equids*	2.1	(0.8)	3.1	(1.5)	2.6	(1.0)	2.3	(0.9)	2.5	(0.6)

*As a percentage of resident equids 20 years of age or older on May 1, 2015.

For the 44.6 percent of operations that had any resident equids 20 years of age or older, the percentage of operations that gave equids an antibiotic for any reason and the percentage of all equids treated in the previous 12 months were similar across regions.

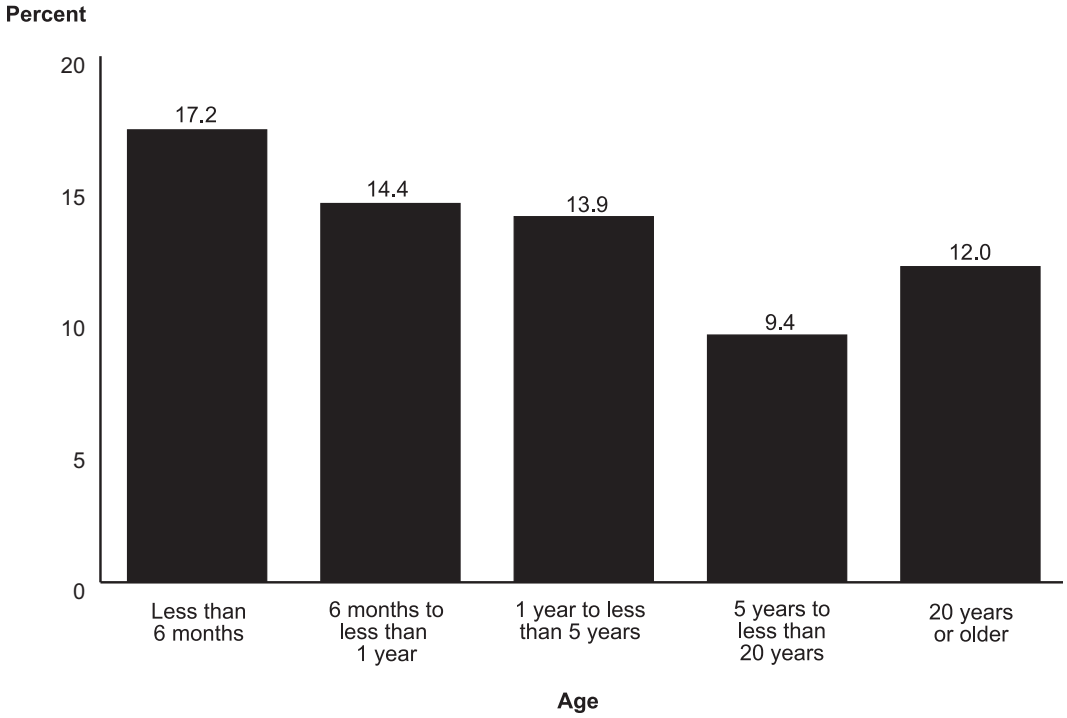
C.5.e. For the 44.6 percent of operations that had any resident equids 20 years of age or older in the previous 12 months (table C.5.a), percentage of operations that treated any of these equids with an antibiotic at least once for any reason (for a condition or to prevent disease) and percentage of equids treated:

Percent

	Region									
	West		South Central		Northeast		Southeast		All operations	
Measure	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Operations	21.8	(3.5)	23.2	(3.4)	21.3	(2.8)	22.8	(2.9)	22.4	(1.6)
Equids*	11.1	(1.8)	14.3	(2.6)	10.3	(1.6)	12.3	(2.1)	12.0	(1.0)

*As a percentage of resident equids 20 years of age or older on May 1, 2015.

Percentage of equids treated with an antibiotic for any reason in the previous 12 months, by age of equid



6. Equine births

The percentage of operations with any equine births in the previous 12 months increased as size of operation increased; 19.9 percent of all operations had one or more equine births in the previous 12 months.

6.a. Percentage of operations that had any equine births on the operation in the previous 12 months, by size of operation:

Percent Operations

Size of Operation (number of equids)

Small (5–9)		Medium (10–19)		Large (20 or more)		All operations	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
10.2	(1.0)	33.1	(2.4)	53.1	(2.7)	19.9	(0.9)

The percentage of operations that had any equine births in the previous 12 months was similar across regions.

C.6.b. Percentage of operations that had any equine births on the operation in the previous 12 months, by region:

Percent Operations

Region

West		South Central		Northeast		Southeast	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
19.6	(2.1)	22.1	(1.8)	18.2	(1.7)	18.9	(1.6)

Overall, 93.4 percent of births on operations in the previous 12 months resulted in a live foal. A higher percentage of foals in the West region (96.8 percent) were born alive than in the Northeast and Southeast regions (90.9 and 91.5 percent, respectively).

C.6.c. Percentage of equine births by outcome in the previous 12 months, and by region:

Percent Births

Region

	West		South Central		Northeast		Southeast		All operations	
Outcome	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Born alive	96.8	(1.0)	93.6	(1.4)	90.9	(1.9)	91.5	(1.5)	93.4	(0.8)
Born dead or aborted	3.2	(1.0)	6.4	(1.4)	9.1	(1.9)	8.5	(1.5)	6.6	(0.8)
Total	100.0		100.0		100.0		100.0		100.0	

7. Resident foal deaths

Overall, 5.8 percent of resident foals died in the first 30 days of life, 3.3 percent died within the first 2 days, and 2.5 percent died within 3 to 30 days. Similar percentages of resident foals died across regions within each age group and overall.

C.7. Percentage of foals that had died in the first 30 days of life in the previous 12 months, by age at death and by region:

Percent Foals*

Region

	West		South Central		Northeast		Southeast		All operations	
Age at death (days)	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
2 or less	2.3	(0.9)	2.3	(0.7)	4.0	(1.3)	5.4	(1.6)	3.3	(0.5)
3 to 30	3.1	(1.5)	3.0	(0.9)	1.8	(0.9)	1.5	(0.7)	2.5	(0.6)
30 or less	5.4	(1.8)	5.3	(1.3)	5.8	(1.6)	6.9	(1.8)	5.8	(0.8)

*As a percentage of live births.

8. Resident equine deaths

For all operations, the percentages of resident equids that died or were euthanized at less than 6 months of age and at 20 years of age or older were higher than for equids 1 year to less than 5 years of age and 5 years to less than 20 years of age. The percentage of equid deaths was similar across regions, when considering the standard errors.

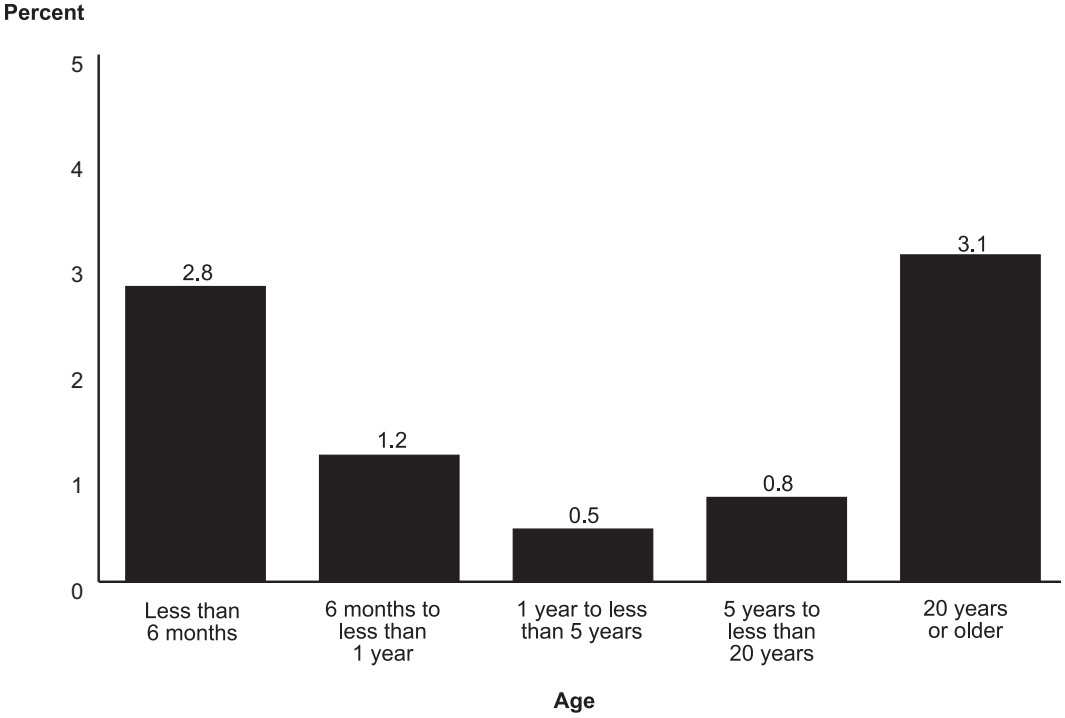
C.8.a. Percentage of resident equids that died or were euthanized in the previous 12 months, by age at death and by region:

Percent Resident Equids*

	Region									
	West		South Central		Northeast		Southeast		All operations	
Age at death	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Less than 6 months	2.6	(1.5)	3.4	(1.0)	2.6	(1.5)	1.6	(1.2)	2.8	(0.7)
6 months to less than 1 year	1.3	(1.3)	1.1	(1.1)	2.3	(2.3)	0.6	(0.6)	1.2	(0.7)
1 year to less than 5 years	0.6	(0.3)	0.5	(0.2)	0.5	(0.2)	0.6	(0.3)	0.5	(0.1)
5 years to less than 20 years	1.1	(0.2)	0.6	(0.1)	0.8	(0.2)	1.0	(0.2)	0.8	(0.1)
20 years or older	5.5	(1.3)	2.4	(0.9)	2.8	(0.7)	2.3	(0.7)	3.1	(0.4)

*As a percentage of age class inventory on May 1, 2015.

Percentage of resident equids that died or were euthanized in the previous 12 months,* by age at death



*As a percentage of age class inventory on May 1, 2015.

For resident equids less than 1 year of age, conditions commonly attributed to cause of death were injury, wounds, or trauma (27.8 percent of deaths); other digestive problems, such as diarrhea or choke (17.8 percent); respiratory problems (15.4 percent); and failure to get milk or colostrum (13.2 percent).

For resident equids 1 year to less than 20 years of age, conditions commonly attributed to cause of death included colic (31.2 percent of deaths); injury, wounds, or trauma (16.3 percent); and respiratory problems (10.4 percent).

For resident equids 20 years or age or older, conditions commonly attributed to cause of death included “other” (26.6 percent of deaths), colic (13.4 percent), cancer (13.2 percent), neurologic problems (12.1 percent), and chronic weight loss (11.7 percent). Old age was the most common condition in the “other” category.

C.8.b. Percentage of resident equine deaths (including euthanasia) by cause of death and by age at death:

	Percent Resident Equine Deaths					
	Age					
	<1 yr[1]		1–<20 yr[2]		20+ yr	
Cause of death	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Colic	1.1	(1.1)	31.2	(4.2)	13.4	(3.9)
Other digestive problems, such as diarrhea or choke	17.8	(6.4)	3.2	(1.8)	0.6	(0.6)
Dental problems, excluding routine floating	0.0	(—)	1.1	(0.8)	2.3	(2.3)
Respiratory problems, such as strangles, flu, pneumonia, reactive airway disease, heaves	15.4	(7.8)	10.4	(3.3)	3.4	(2.3)
Endocrine disorder, such as hypothyroid or Cushings			2.7	(1.1)	4.2	(2.0)
Eye problems	2.4	(2.3)	1.7	(1.1)	0.0	(—)
Skin problems	4.3	(4.1)	0.3	(0.3)	0.0	(—)
Reproductive problems, such as abortion, infertility, or infection of the reproductive tract	0.0	(—)	3.3	(1.3)	0.0	(—)
Behavioral problems that affected use, health, or safety	0.0	(—)	0.3	(0.3)	0.0	(—)
Injury, wounds, or trauma	27.8	(9.9)	16.3	(3.3)	4.3	(2.1)
Lameness, leg, or hoof problems[3]	0.0	(—)	7.4	(2.3)	7.6	(2.8)
Neurologic problems, such as spinal problems, wobblers, seizure, West Nile virus, EHM, EPM	7.5	(4.7)	3.3	(1.2)	12.1	(4.9)
Pigeon fever caused by *Corynebacterium pseudotuberculosis*	0.0	(—)	0.0	(—)	0.0	(—)
Other infectious disease unrelated to specific body system, such as septicemia or blood infections	1.3	(1.3)	0.0	(—)	0.0	(—)
Chronic weight loss/underweight	0.0	(—)	2.5	(1.1)	11.7	(4.4)
Overweight/obese	0.0	(—)	3.6	(3.5)	0.0	(—)
Failure to get milk or colostrum	13.2	(6.7)				
Liver or kidney disease	0.0	(—)	1.0	(0.6)	0.6	(0.6)
Cancer			5.0	(2.8)	13.2	(4.6)
Fever of undetermined origin	0.0	(—)	0.8	(0.8)	0.0	(—)
Other	9.2	(8.5)	6.1	(3.3)	26.6	(5.8)
Total	100.0		100.0		100.0	

[1]There were too few deaths in the less-than-6-months and the 6-months-to-less-than-1-year age categories to break out by the 21 causes of death; so deaths by cause are reported for resident equids less than 1 year of age.

[2]There were too few deaths in the 1-to-5-years and 5-to-20-years age categories to break out by the 21 causes of death; so deaths by cause are reported for resident equids less than 1 year to less than 20 years of age.

[3]Equid could not be used for intended purpose without treatment—drugs, alternative therapies, corrective shoeing, or rest.

D. Tests Performed on Equine Operations

1. Type of testing performed

The American Association of Equine Practitioners' parasite control guidelines indicate that the goals of a parasite control program for equids are to limit parasitic infections so that animals remain healthy and free of clinical illness, control parasite egg shedding, and maintain efficacy of antiparasitic drugs by avoiding further development of anthelmintic resistance. To achieve these goals, the guidelines emphasize ascertaining the magnitude of parasite egg shedding by conducting fecal egg-count surveillance (fecal test for parasites) on individual equids.

Pasture, hay, and other feed analyses can help guide decisionmaking about supplementing equine diets with minerals, vitamins, or additional protein. Water analyses may be performed to detect bacterial load or potential toxic levels of micronutrients (e.g., selenium), toxins (e.g., lead), sulfates, nitrates, and degree of salinity and hardness (calcium and magnesium levels).

A higher percentage of large operations (38.4 percent) performed a fecal test for parasites on resident equids in the previous 12 months compared with small and medium operations (13.4 and 19.5 percent, respectively). The percentage of operations that tested feed or pasture increased as size of operation increased. A higher percentage of large operations than small operations tested water (10.0 and 4.7 percent, respectively), and a higher percentage of all operations performed fecal tests for parasites than performed feed/pasture or water tests.

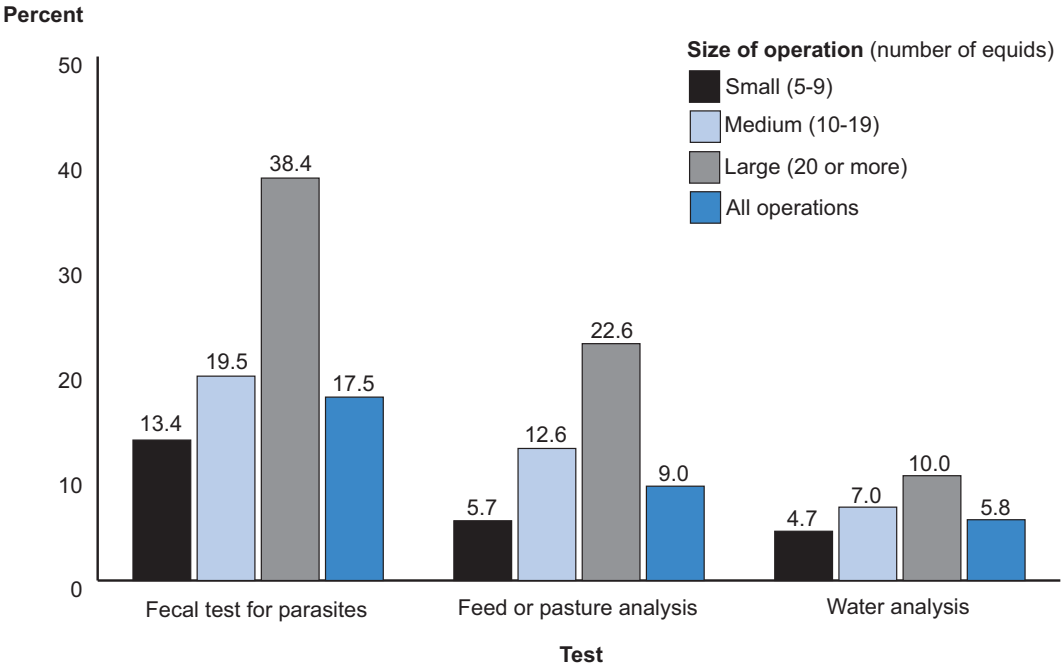
D.1.a. Percentage of operations by type(s) of testing performed in the previous 12 months, and by size of operation:

Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Test	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Fecal test for parasites	13.4	(1.2)	19.5	(1.9)	38.4	(2.6)	17.5	(0.9)
Feed or pasture analysis	5.7	(0.8)	12.6	(1.6)	22.6	(2.2)	9.0	(0.7)
Water analysis	4.7	(0.7)	7.0	(1.2)	10.0	(1.6)	5.8	(0.6)

Percentage of operations by type(s) of testing performed in the previous 12 months, and by size of operation



Fecal testing for parasites was performed on a similar percentage of operations across regions, when standard errors are considered. A higher percentage of operations in the Northeast region (11.9 percent) tested feed or pasture than operations in the South Central region (6.3 percent). A water analysis was performed on a higher percentage of operations in the Northeast region than in the West region (9.5 and 3.1 percent, respectively).

D.1.b. Percentage of operations by type(s) of testing performed in the previous 12 months, and by region:

	Percent Operations							
	Region							
	West		South Central		Northeast		Southeast	
Test	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Fecal test for parasites	14.4	(2.1)	16.0	(1.8)	21.4	(1.8)	18.6	(1.7)
Feed or pasture analysis	9.4	(1.8)	6.3	(1.1)	11.9	(1.4)	10.0	(1.3)
Water analysis	3.1	(0.9)	5.1	(1.2)	9.5	(1.4)	5.8	(1.1)

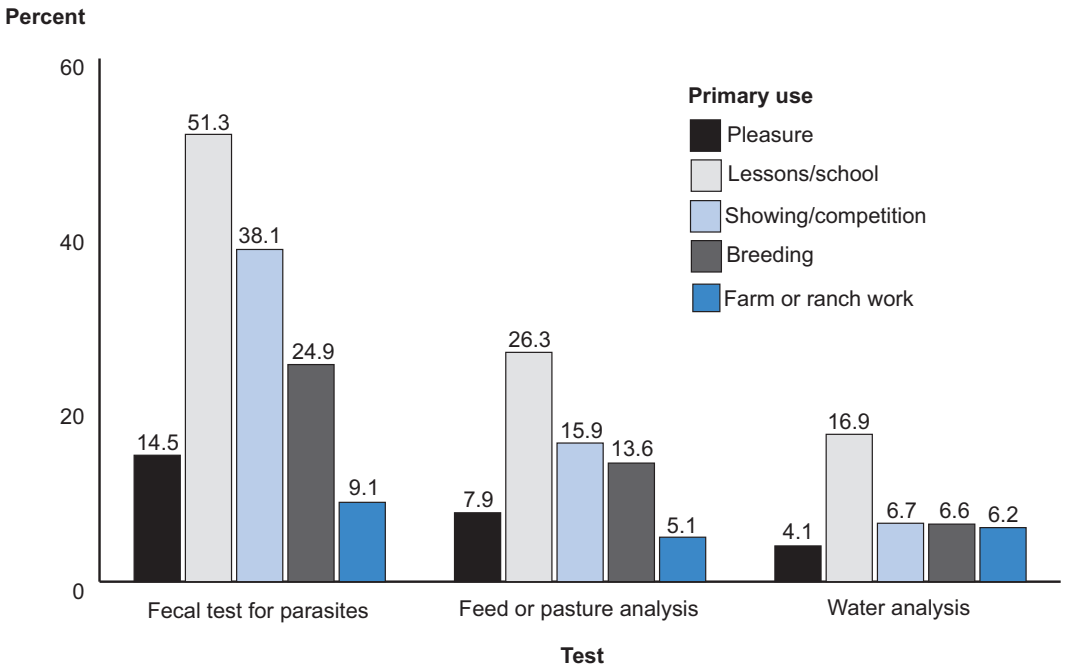
A lower percentage of operations that primarily used equids for pleasure or farm/ranch work performed fecal testing for parasites than operations that primarily used equids for lessons/school, showing/competition, or breeding. A higher percentage of operations that used equids primarily for lessons/school performed feed or pasture analyses than operations that primarily used equids for pleasure, farm or ranch work, or "other."

D.1.c. Percentage of operations by type(s) of testing performed in the previous 12 months, and by primary use of equid:

Percent Operations

	Primary Use											
	Pleasure		Lessons/ school		Showing/ competi- tion not betting		Breeding		Farm/ ranch work		Other	
Test	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Fecal test for parasites	14.5	(1.3)	51.3	(6.1)	38.1	(4.3)	24.9	(3.6)	9.1	(1.6)	19.3	(3.5)
Feed or pasture analysis	7.9	(0.9)	26.3	(5.1)	15.9	(3.5)	13.6	(2.8)	5.1	(1.1)	10.2	(2.6)
Water analysis	4.1	(0.8)	16.9	(4.4)	6.7	(2.1)	6.6	(2.3)	6.2	(1.2)	8.1	(2.4)

Percentage of operations by type(s) of testing performed in the previous 12 months, and by primary use of equid



2. Familiarity with equine infectious anemia

Equine infectious anemia (EIA) is a viral disease of equids. An effective test for antibodies specific to EIA virus (EIAV) was described by Coggins in 1972[1] and was rapidly adopted by regulatory authorities around the world. These serologic testing programs were designed and adopted to help control the spread of EIAV. Since 1972, samples have been collected from U.S. equids and tested for antibodies against EIAV, partially in response to State, Federal, and/or international regulations and to meet requirements of equine events and private equine facilities. There are no vaccines available to prevent EIA infections—which last the lifetime of the equid—nor are there any drugs to treat EIA infections.

Equine infectious anemia virus is spread iatrogenically when needles, syringes, or multiuse bottles contaminated with blood from an infected equid are used to treat another equid. Transfusing blood from untested, infected donor equids can also spread EIAV to recipient equids. Large biting flies, such as horse or deer flies (tabanids), are one of the natural means of spreading EIAV. Some infected equids remain clinically asymptomatic, while others develop various combinations of signs: fever, weight loss, swelling in limbs, or anemia. Equids that test positive for EIAV are either euthanized or put under lifelong quarantine. Through control efforts, the prevalence of EIA in the United States has dramatically decreased from nearly 4 percent of tested equids in 1972 to 0.005 percent in 2015.

Overall, owners/operators on 38.8 percent of operations were knowledgeable about EIA, while 18.2 percent recognized the name, but not much else and 7.7 percent said they had not heard of it. The percentage of operations that were knowledgeable about EIA was higher on large operations than on small operations (50.8 and 35.8 percent, respectively). Note: The interview question included the prompt “EIA is the disease for which the Coggins test is performed.”

[1]Coggins L, Norcross NL, Nusbaum SR. 1972. Diagnosis of equine infectious anemia by immune diffusion test. Am J Vet Res 33:11–18.

D.2.a. Percentage of operations by owner's/operator's level of familiarity with EIA, and by size of operation:

Percent Operations

Size of Operation (number of equids)

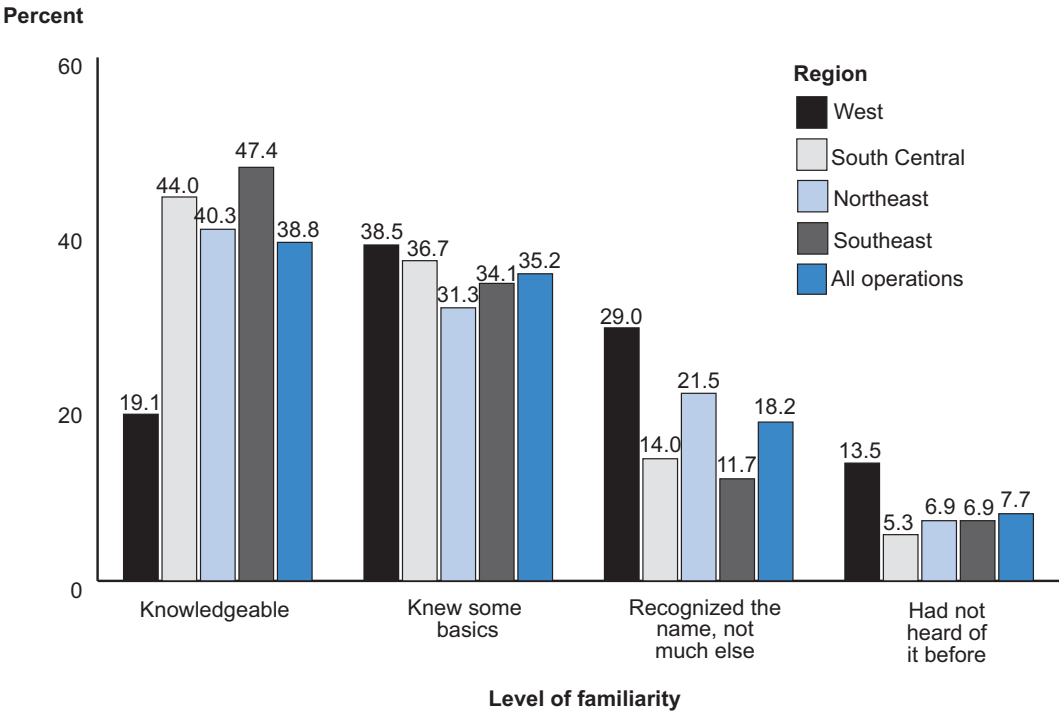
	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Level of familiarity	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Knowledgeable	35.8	(1.6)	42.1	(2.5)	50.8	(2.7)	38.8	(1.2)
Knew some basics	37.0	(1.7)	31.3	(2.4)	32.5	(2.5)	35.2	(1.3)
Recognized the name, not much else	18.0	(1.3)	21.9	(2.1)	12.3	(1.8)	18.2	(1.0)
Had not heard of it before	9.3	(1.0)	4.7	(1.0)	4.4	(1.2)	7.7	(0.7)
Total	100.0		100.0		100.0		100.0	

A lower percentage of owners/operators on operations in the West region were knowledgeable about EIA than owners/operators in the South Central, Northeast, and Southeast regions.

D.2.b. Percentage of operations by owner's/operator's level of familiarity with EIA, and by region:

	Percent Operations							
	Region							
	West		South Central		Northeast		Southeast	
Level of familiarity	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Knowledgeable	19.1	(2.5)	44.0	(2.5)	40.3	(2.4)	47.4	(2.3)
Knew some basics	38.5	(3.0)	36.7	(2.4)	31.3	(2.3)	34.1	(2.2)
Recognized the name, not much else	29.0	(2.7)	14.0	(1.7)	21.5	(2.0)	11.7	(1.5)
Had not heard of it before	13.5	(1.8)	5.3	(1.2)	6.9	(1.3)	6.9	(1.2)
Total	100.0		100.0		100.0		100.0	

Percentage of operations by owner's/operator's level of familiarity with EIA, and by region



A higher percentage of owners/operators on operations with a primary function of equine boarding stable/training, riding stable, or equine breeding farm were knowledgeable about EIA than owners/operators on farm/ranch, residence with equid for personal use, or "other" operations.

D.2.c. Percentage of operations by owner's/operator's level of familiarity with EIA, and by primary function of operation:

	Percent Operations											
	Primary Function											
	Equine boarding stable/ training		Riding stable		Equine breeding farm		Farm/ ranch		Residence with equids for personal use		Other	
Level of familiarity	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Knowledge-able	54.2	(3.6)	65.7	(7.2)	53.8	(4.5)	33.2	(2.0)	37.4	(2.1)	21.4	(5.5)
Knew some basics	33.8	(3.4)	24.1	(6.6)	33.0	(4.3)	34.0	(2.0)	37.4	(2.1)	43.8	(7.8)
Recognized the name, not much else	10.2	(2.3)	7.4	(4.4)	9.9	(2.8)	23.3	(1.7)	17.3	(1.6)	16.5	(5.7)
Had not heard of it before	1.8	(1.0)	2.7	(2.0)	3.3	(1.6)	9.5	(1.2)	7.8	(1.2)	18.2	(7.0)
Total	100.0		100.0		100.0		100.0		100.0		100.0	

3. EIA testing

Testing equids for EIA could be prompted by requirements for equine movement, change of ownership, or State veterinary regulatory authorities. Overall, 47.1 percent of operations had performed at least one EIA test on resident equids in the previous 12 months, and 36.8 percent of resident equids had at least one EIA test in the previous 12 months. The percentage of operations that had one or more equids tested for EIA increased as operation size increased. The percentage of equids tested was higher on large operations than on small operations (43.5 and 30.6 percent, respectively).

D.3.a. Percentage of operations that performed at least one Coggins or other test for EIA and percentage of resident equids tested in the previous 12 months, by size of operation:

Percent

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Measure	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Operations	40.9	(1.6)	54.8	(2.5)	69.6	(2.5)	47.1	(1.3)
Equids	30.6	(1.4)	33.8	(2.0)	43.5	(2.9)	36.8	(1.4)

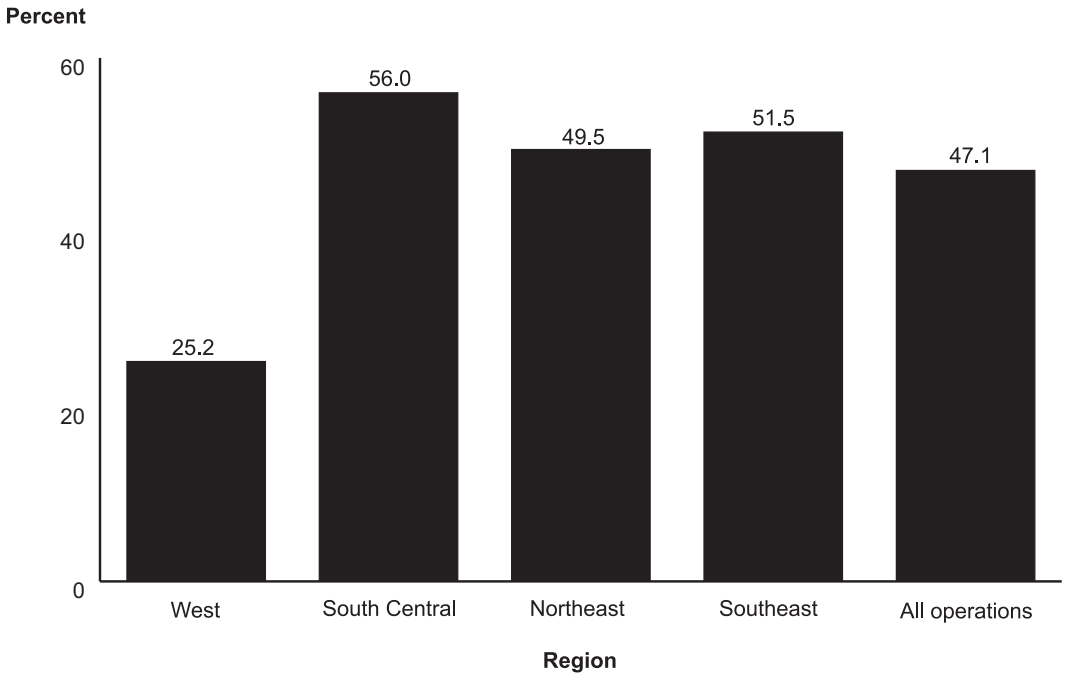
The percentage of operations that performed at least one EIA test on resident equids and the percentage of resident equids tested in the previous 12 months were lower in the West region compared with the South Central, Northeast, and Southeast regions.

D.3.b. Percentage of operations that performed at least one Coggins or other test for EIA and percentage of resident equids tested in the previous 12 months, by region:

Percent Operations

	Region							
	West		South Central		Northeast		Southeast	
Measure	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Operations	25.2	(2.7)	56.0	(2.5)	49.5	(2.4)	51.5	(2.3)
Equids	9.7	(1.2)	44.1	(3.0)	40.4	(2.2)	47.7	(2.8)

Percentage of operations that performed at least one Coggins or other test for EIA, by region



A higher percentage of operations with a primary function of equine boarding stable/ training, riding stable, or equine breeding farm had performed one or more EIA tests in the previous 12 months than farm/ranch, residence with equids for personal use, or "other" operations. The percentage of resident equids tested for EIA was higher on equine boarding stable/training and riding stable operations than on farm/ranch and residence with equids for personal use operations.

D.3.c. Percentage of operations that performed at least one Coggins or other test for EIA and percentage of resident equids tested in the previous 12 months, by primary function of operation:

Percent Operations

Primary Function

	Equine boarding stable/ training		Riding stable		Equine breeding farm		Farm/ranch		Residence with equids for personal use		Other	
Measure	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Operations	75.2	(3.2)	74.2	(6.5)	64.0	(4.5)	38.9	(2.0)	44.3	(2.2)	40.0	(7.3)
Equids	66.9	(3.5)	52.9	(7.0)	32.9	(3.8)	24.5	(2.0)	31.7	(1.8)	36.3	(11.0)

For operations that tested for EIA in the previous 12 months, the average cost of an EIA test (including call fee or cost of transportation) for all operations was approximately $41.00; this cost was similar across operation sizes.

D.3.d. For the 47.1 percent of operations that tested for EIA in the previous 12 months (table D.3.a), average cost per test, by size of operation:

Average Cost per Test ($)

Size of Operation (number of equids)

Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
41.53	(1.66)	40.90	(2.32)	40.28	(2.81)	40.77	(1.53)

The average cost of an EIA test (including call fee or cost of transportation) ranged from $39.34 in the South Central region to $46.39 in the West region.

D.3.e. For the 47.1 percent of operations that tested for EIA in the previous 12 months (table D.3.a), average cost per test, by region:

Average Cost per Test ($)

Region

West		South Central		Northeast		Southeast	
Avg.	Std. error	Avg.	Std. error	Avg.	Std. error	Avg.	Std. error
46.39	(4.74)	39.34	(3.21)	43.41	(1.68)	39.96	(2.22)

For the 47.1 percent of operations that had tested for EIA in the previous 12 months, over half (58.8 percent) tested equids to meet the requirements of a show or event within their State, 38.8 percent tested because of requirements for interstate movement of equids, and 33.5 percent tested because of requirements for within-State movement of equids other than to a show/event or for change of ownership. The percentages of operations that tested resident equids for change of ownership within State or for interstate movement increased as operation size increased. The percentage of operations that tested equids for personal knowledge was higher on small operations (33.5 percent) than on large operations (19.9 percent). The percentage of operations that tested equids for international movement requirements was higher on large operations (13.5 percent) than on small or medium operations (1.6 and 3.2 percent, respectively).

D.3.f. For the 47.1 percent of operations that tested for EIA in the previous 12 months (table D.3.a), percentage of operations by reason(s) for EIA testing and by size of operation:

Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Reason	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Change of ownership within State	10.8	(1.5)	29.3	(3.2)	45.6	(3.2)	21.2	(1.4)
Show or event requirement within State	52.0	(2.7)	69.6	(3.2)	66.0	(3.1)	58.8	(1.8)
Within-State movement other than for change of ownership or show/event	32.7	(2.5)	32.9	(3.3)	37.1	(3.0)	33.5	(1.8)
Facility requirement	15.2	(1.8)	37.2	(3.5)	40.6	(3.1)	24.9	(1.5)
Interstate movement between two or more States	30.3	(2.4)	40.8	(3.5)	65.5	(3.1)	38.8	(1.8)
International movement	1.6	(0.7)	3.2	(1.1)	13.5	(2.2)	4.0	(0.6)
For personal knowledge	33.5	(2.5)	23.8	(2.9)	19.9	(2.5)	28.8	(1.7)
Suspicion of equine illness	1.2	(0.5)	2.1	(0.9)	4.2	(1.2)	1.9	(0.4)
Requirement for riding on public land	25.5	(2.2)	27.8	(3.1)	24.7	(2.7)	26.0	(1.6)
Other	2.6	(0.9)	1.7	(0.8)	2.6	(0.9)	2.4	(0.6)

For the 47.1 percent of operations that had tested for EIA in the previous 12 months, a higher percentage of operations in the West region than in the other regions tested resident equids because of interstate movement requirements. Conversely, a lower percentage of operations in the West region than in the other regions tested for personal knowledge or as a requirement for riding on public land.

D.3.g. For the 47.1 percent of operations that tested for EIA in the previous 12 months (table D.3.a), percentage of operations by reason(s) for testing and by region:

	Percent Operations							
	Region							
	West		South Central		Northeast		Southeast	
Reason	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Change of ownership within State	18.6	(4.7)	18.0	(2.3)	27.3	(2.7)	21.7	(2.4)
Show or event requirement within State	54.5	(6.2)	60.2	(3.3)	63.6	(3.2)	54.1	(3.1)
Within-State movement other than for change of ownership or show/event	23.3	(5.6)	33.4	(3.1)	32.1	(3.1)	39.2	(3.1)
Facility requirement	18.0	(5.4)	17.1	(2.3)	35.8	(3.1)	30.1	(2.8)
Interstate movement between two or more States	65.7	(6.2)	29.2	(2.8)	44.5	(3.3)	36.8	(2.9)
International movement	7.2	(3.4)	2.5	(0.8)	4.6	(1.2)	4.3	(1.2)
For personal knowledge	5.2	(2.3)	29.8	(3.1)	30.4	(3.1)	36.1	(3.1)
Suspicion of equine illness	1.9	(1.3)	1.6	(0.7)	2.3	(1.0)	2.1	(0.7)
Requirement for riding on public land	6.7	(3.7)	21.5	(2.6)	26.3	(2.9)	40.8	(3.1)
Other	0.4	(0.4)	2.1	(1.0)	3.7	(1.3)	2.5	(1.0)

Overall, an in-State show or event requirement was the primary reason for performing EIA testing on resident equids by the highest percentage of all operations (38.2 percent). The percentage of operations that performed EIA testing primarily for change-of-ownership requirements within their State was higher on large operations than on small operations (14.5 and 3.5 percent, respectively). The percentages of operations that performed EIA testing primarily for personal knowledge or to meet a requirement for riding on public land were higher on small operations than on medium or large operations.

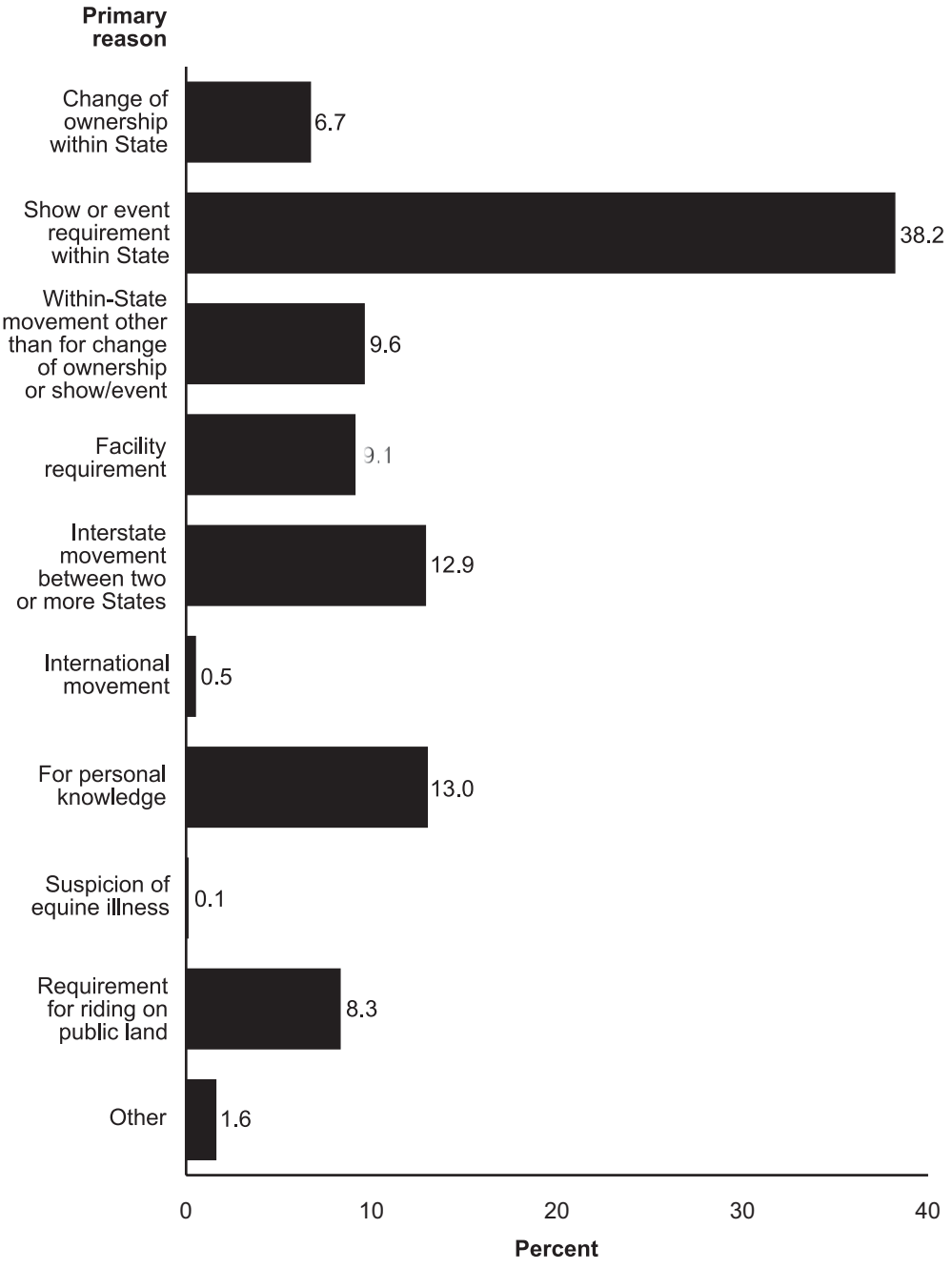
D.3.h. For the 47.1 percent of operations that tested for EIA in the previous 12 months (table D.3.a), percentage of operations by primary reason for EIA testing, and by size of operation:

Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Primary reason	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Change of ownership within State	3.5	(1.0)	9.2	(2.1)	14.5	(2.4)	6.7	(0.9)
Show or event requirement within State	33.7	(2.5)	47.6	(3.6)	39.6	(3.2)	38.2	(1.8)
Within-State movement other than for change of ownership or show/event	12.5	(1.8)	6.2	(1.6)	4.4	(1.2)	9.6	(1.2)
Facility requirement	5.4	(1.0)	13.1	(2.5)	16.4	(2.3)	9.1	(1.0)
Interstate movement between two or more States	12.6	(1.8)	10.7	(2.0)	17.4	(2.5)	12.9	(1.2)
International movement	0.7	(0.6)	0.6	(0.4)	0.0	(—)	0.5	(0.4)
For personal knowledge	18.5	(2.1)	7.4	(1.8)	2.2	(0.8)	13.0	(1.3)
Suspicion of equine illness	0.0	(—)	0.0	(—)	0.6	(0.6)	0.1	(0.1)
Requirement for riding on public land	11.3	(1.6)	4.2	(1.3)	3.6	(1.2)	8.3	(1.0)
Other	1.9	(0.8)	1.0	(0.7)	1.4	(0.6)	1.6	(0.5)
Total	100.0		100.0		100.0		100.0	

For operations that had tested for EIA in the previous 12 months, percentage of operations by primary reason for EIA testing



For operations that tested for EIA, the percentage of operations that performed EIA testing primarily for interstate movement requirements was higher in the West region than in the other regions, and the percentage of operations that tested for personal knowledge was lower in the West region than in the other regions.

D.3.i. For the 47.1 percent of operations that tested for EIA in the previous 12 months (table D.3.a), percentage of operations by **primary** reason for EIA testing, and by region:

Percent Operations

Region

	West		South Central		Northeast		Southeast	
Primary reason	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Change of ownership within State	6.9	(2.5)	6.9	(1.7)	9.6	(1.9)	3.8	(1.0)
Show or event requirement within State	40.5	(6.3)	42.5	(3.3)	38.8	(3.3)	30.2	(2.9)
Within-State movement other than for change of ownership or show/event	4.5	(2.1)	9.5	(2.2)	7.5	(1.9)	13.7	(2.3)
Facility requirement	2.9	(1.8)	5.6	(1.5)	14.4	(2.1)	12.3	(2.0)
Interstate movement between two or more States	39.1	(5.9)	10.0	(1.9)	9.7	(1.9)	9.0	(1.7)
International movement	4.4	(3.2)	0.0	(—)	0.0	(—)	0.2	(0.2)
For personal knowledge	1.4	(1.1)	16.7	(2.6)	10.4	(2.2)	14.9	(2.3)
Suspicion of equine illness	0.0	(—)	0.0	(—)	0.0	(—)	0.4	(0.4)
Requirement for riding on public land	0.0	(—)	7.6	(1.8)	7.0	(1.8)	13.9	(2.3)
Other	0.4	(0.4)	1.2	(0.9)	2.6	(1.2)	1.7	(0.8)
Total	100.0		100.0		100.0		100.0	

E. Biosecurity

Biosecurity refers to actions taken to reduce the risk of introducing or spreading infectious disease to or within a group of animals. Equids can be exposed to infectious disease agents through contact with other equids, other types of animals, people and/or equipment, and through exposure to insects and/or ticks. The emphasis of this section is to describe the various ways that equids can be exposed to infectious disease agents and the actions taken to mitigate the risk of exposure.

1. Nonresident equids

Nonresident equids that visit an operation for training, breeding, competition, or any other reason can expose resident equids to infectious disease agents. The percentage of operations that had nonresident equids that stayed for less than 30 consecutive days ranged from 12.1 percent of small operations to 37.3 percent of large operations.

E.1.a. Percentage of operations by number of nonresident equids that stayed on the operation for less than 30 consecutive days in the previous 12 months, and by size of operation:

Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Number nonresident equids	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
0	87.9	(1.1)	75.0	(2.2)	62.7	(2.7)	82.3	(0.9)
1 to 9	9.6	(1.0)	16.4	(2.0)	23.8	(2.4)	12.7	(0.8)
10 or more	2.5	(0.5)	8.6	(1.3)	13.5	(1.9)	5.0	(0.5)
Any	12.1	(1.1)	25.0	(2.2)	37.3	(2.7)	17.7	(0.9)
Total	100.0		100.0		100.0		100.0	

The percentage of operations that had any nonresident equids in the previous 12 months was similar across regions. A higher percentage of operations in the Northeast region (7.5 percent) had 10 or more nonresident equids that stayed for less than 30 consecutive days than operations in the South Central and Southeast regions (2.9 and 3.5 percent, respectively).

E.1.b. Percentage of operations by number of nonresident equids that stayed on the operation for less than 30 consecutive days in the previous 12 months, and by region:

	Percent Operations							
	Region							
	West		South Central		Northeast		Southeast	
Number equids	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
0	77.8	(2.3)	84.6	(1.7)	82.0	(1.8)	83.5	(1.6)
1 to 9	14.7	(2.0)	12.5	(1.6)	10.5	(1.4)	13.0	(1.5)
10 or more	7.5	(1.4)	2.9	(0.6)	7.5	(1.2)	3.5	(0.7)
Any	22.2	(2.3)	15.4	(1.7)	18.0	(1.8)	16.5	(1.6)
Total	100.0		100.0		100.0		100.0	

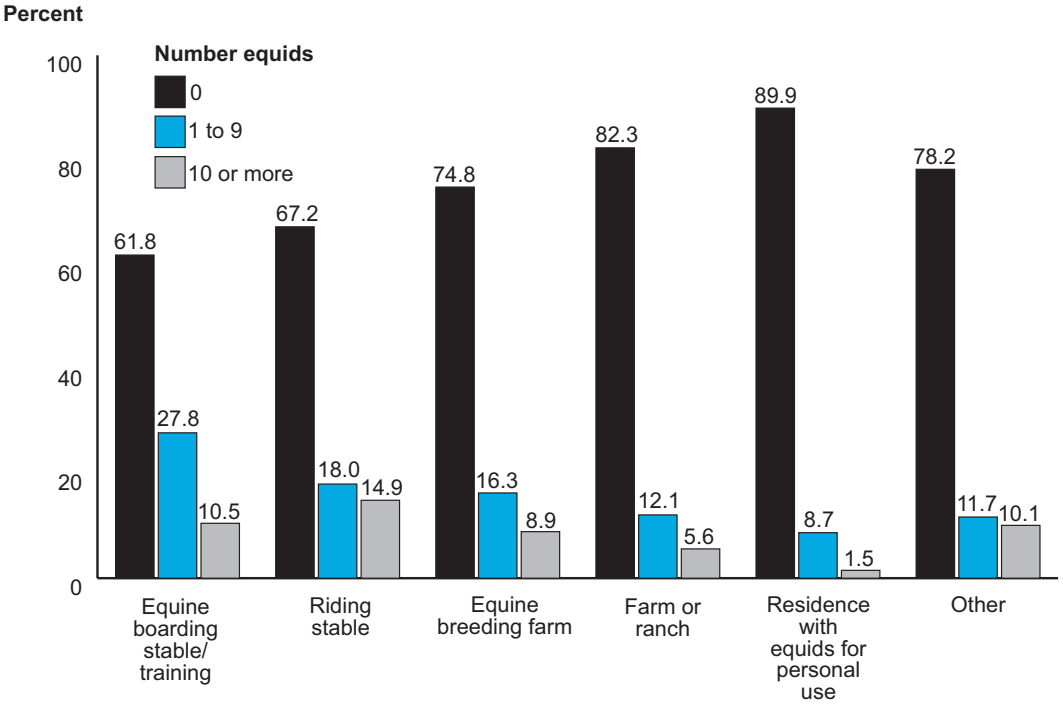
A lower percentage of operations with a primary function of farm/ranch or residence with equids for personal use (17.7 and 10.1 percent, respectively) had nonresident equids that stayed on the operation for less than 30 days than equine boarding stable/training operations (38.2 percent).

E.1.c. Percentage of operations by number of nonresident equids that stayed on the operation for less than 30 consecutive days in the previous 12 months, and by primary function of operation:

Percent Operations

	Primary Function											
	Equine boarding stable/ training		Riding stable		Equine breeding farm		Farm/ranch		Residence with equids for personal use		Other	
Number equids	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
0	61.8	(3.5)	67.2	(7.0)	74.8	(3.9)	82.3	(1.6)	89.9	(1.3)	78.2	(5.9)
1 to 9	27.8	(3.2)	18.0	(6.1)	16.3	(3.4)	12.1	(1.4)	8.7	(1.2)	11.7	(4.6)
10 or more	10.5	(2.0)	14.9	(4.9)	8.9	(2.3)	5.6	(0.9)	1.5	(0.4)	10.1	(4.1)
Any	38.2	(3.5)	32.8	(7.0)	25.2	(3.9)	17.7	(1.6)	10.1	(1.3)	21.8	(5.9)
Total	100.0		100.0		100.0		100.0		100.0		100.0	

Percentage of operations by number of nonresident equids that stayed on the operation for less than 30 consecutive days in the previous 12 months, and by primary function of operation



Requiring that certain health-related precautions be taken when nonresident equids enter equine facilities can reduce the risk of disease introduction. For operations with nonresident equids that stayed on the operation for less than 30 consecutive days, 49.0 percent always or sometimes required a Coggins or other EIA test for the majority of nonresident equids. Over one-third of operations always or sometimes required vaccination and/or deworming in the previous 12 months (38.9 and 37.0 percent, respectively). Less than one-fourth of operations (22.4 percent) always or sometimes quarantined nonresident equids prior to contact with resident equids, and 32.3 percent of operations always or sometimes required an official health certificate for nonresident equids.

E.1.d. For the 17.7 percent of operations that had nonresident equids that stayed for less than 30 consecutive days in the previous 12 months (table E.1.a), percentage of operations by frequency the following health requirements were used for the majority of nonresident equids of any age:

	Percent Operations						
	Frequency						
	Always		Sometimes		Never		
Health requirement	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Total
Official health certificate, also called certificate of veterinary inspection	21.4	(2.4)	10.9	(1.7)	67.7	(2.7)	100.0
Veterinary examination other than for official health certificate	14.3	(2.1)	6.5	(1.2)	79.3	(2.3)	100.0
Coggins test, also called EIA test or swamp fever test	42.5	(2.7)	6.5	(1.4)	51.0	(2.8)	100.0
Vaccination within past year	32.3	(2.6)	6.6	(1.4)	61.1	(2.7)	100.0
Deworming within past year	31.0	(2.6)	6.0	(1.4)	63.0	(2.7)	100.0
Screening test for strangles or history of no occurrence in past 6 months	8.4	(1.4)	6.0	(1.4)	85.6	(1.9)	100.0
Other past medical history from owner	16.2	(2.1)	6.7	(1.3)	77.1	(2.4)	100.0
Quarantine prior to contact with resident equids	15.6	(1.9)	6.8	(1.3)	77.6	(2.2)	100.0
Other	2.3	(0.9)	0.2	(0.2)	97.5	(1.0)	100.0

2. Addition of resident equids

Adding new equids to a resident equine population poses the risk of introducing disease to the operation. Overall, 15.4 percent of operations added one more new resident equids in the previous 12 months. The percentage of operations that added new resident equids increased as operation size increased. The percentage of equids added was similar across operation sizes.

E.2.a. Percentage of operations that added new resident equids in the previous 12 months and percentage of equids added, including foals not born to a resident mare (excluding births), by size of operation:

Percent

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Measure	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Operations	9.3	(1.0)	22.9	(2.1)	37.9	(2.6)	15.4	(0.9)
Equids added*	29.4	(1.9)	22.5	(2.0)	19.3	(3.8)	21.3	(2.6)

*As a percentage of May 1, 2015, inventory of operations that added any equids.

The percentage of operations that added one or more new resident equids in the previous 12 months was higher in the West and Northeast regions (19.5 and 19.9 percent, respectively) than in the South Central region (11.0 percent). The percentage of equids added was similar across regions.

E.2.b. Percentage of operations that added new resident equids in the previous 12 months and percentage of equids added, including foals not born to a resident mare (excluding births), by region:

Percent

	Region							
	West		South Central		Northeast		Southeast	
Measure	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Operations	19.5	(2.4)	11.0	(1.4)	19.9	(1.7)	14.1	(1.5)
Equids added*	19.7	(2.3)	21.3	(8.5)	20.2	(1.6)	24.1	(3.8)

*As a percentage of May 1, 2015, inventory for operations that added any equids.

A higher percentage of operations with a primary function of equine boarding stable/ training (42.9 percent), riding stable (30.7 percent), equine breeding farm (22.8 percent), or “other” (29.9 percent) added one or more new equids than farm/ranch (11.9 percent) and residence with equids for personal use operations (9.0 percent). The percentage of equids added was similar across primary functions.

E.2.c. Percentage of operations that added new resident equids in the previous 12 months and percentage of equids added, including foals not born to a resident mare (excluding births), by primary function of operation:

Percent

	Primary Function											
	Equine boarding stable/ training		Riding stable		Equine breeding farm		Farm/ ranch		Residence with equids for personal use		Other	
Measure	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Operations	42.9	(3.5)	30.7	(6.4)	22.8	(3.8)	11.9	(1.3)	9.0	(1.3)	29.9	(6.4)
Equids added*	23.1	(3.0)	14.8	(2.1)	12.4	(4.2)	25.8	(8.0)	22.0	(2.2)	29.4	(7.3)

*As a percentage of May 1, 2015, inventory for operations that added any equids.

For operations that added new resident equids in the previous 12 months, the highest percentage (84.7 percent) obtained new equids within State. Approximately one-third of operations (32.6 percent) obtained new equids from outside their State but within the United States. Sourcing new equids from outside of the United States was uncommon.

E.2.d. For the 15.4 percent of operations that added new resident equids in the previous 12 months (table E.2.a), percentage of operations and percentage of equids added, by source location of added equids:

Source	Percent operations	Std. error	Percent added equids	Std. error
Within State	84.7	(2.0)	63.3	(4.3)
Outside of the State, within the United States	32.6	(2.7)	32.3	(4.3)
Canada	1.9	(0.6)	2.9	(1.5)
Mexico	0.1	(0.1)	0.0	(0.0)
Outside North America	0.5	(0.3)	0.3	(0.2)
Unknown	2.2	(1.2)	1.3	(0.7)
Total			100.0	

Health requirements for newly introduced resident equids are intended to reduce the risk of disease introduction. These requirements could include a veterinary examination of the equid's health, various tests, and vaccination or deworming prior to commingling new arrivals with resident equids. In addition, separating new animals from resident equids for a period of observation can also reduce the risk of disease introduction.

Eighty percent of operations did not require that new equids be screened for strangles or have a history of no occurrence in the past 6 months. Strangles is caused by *Streptococcus equi* bacteria that can be shed even after an equid fully recovers from the disease. Having some health requirement related to strangles for newly introduced equids can reduce the risk of introducing this disease to a group of equids.

E.2.e. For the 15.4 percent of operations that added new resident equids in the previous 12 months (table E.2.a), percentage of operations by frequency that the following health requirements were implemented for new additions:

	Percent Operations						
	Frequency						
	Always		Sometimes		Never		
Health requirement	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Total
Official health certificate, also called certificate of veterinary inspection	32.4	(2.8)	14.4	(2.3)	53.2	(3.1)	100.0
Veterinary examination other than for official health certificate	24.4	(2.6)	13.9	(2.1)	61.7	(2.9)	100.0
Coggins test, also called EIA test or swamp fever test	55.6	(3.0)	10.3	(2.0)	34.1	(2.9)	100.0
Vaccination within past year	48.5	(3.0)	10.2	(1.9)	41.3	(3.0)	100.0
Deworming within past year	49.6	(3.0)	9.4	(1.8)	41.1	(3.0)	100.0
Screening test for strangles or history of no occurrence in past 6 months	10.4	(1.7)	9.6	(1.8)	80.0	(2.3)	100.0
Other past medical history from owner	30.9	(2.8)	12.2	(1.9)	56.9	(3.0)	100.0
Quarantine prior to contact with resident equids	37.2	(3.0)	6.8	(1.3)	56.0	(3.1)	100.0
Other	1.5	(0.7)	0.3	(0.2)	98.2	(0.7)	100.0

For operations that added new resident equids in the previous 12 months, 65.9 percent sometimes or always required a Coggins or other EIA test for new equids; 58.7 percent sometimes or always required vaccination within the past year; and 58.9 percent sometimes or always required deworming within the past year. Other common requirements used sometimes or always were an official health certificate (46.8 percent of operations), other past medical history from owner (43.1 percent), and quarantine prior to contact with resident equids (44.0 percent).

For operations that added new resident equids in the previous 12 months, the percentage of operations that implemented the health requirements listed in the following table for some or all new resident equids did not differ substantially across operation sizes.

E.2.f. For the 15.4 percent of operations that added new resident equids in the previous 12 months (table E.2.a), percentage of operations that always or sometimes implemented the following health requirements for new resident equids, by size of operation:

	Percent Operations							
	Size of Operation (number of equids)							
	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Health requirement	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Official health certificate, also called certificate of veterinary inspection	39.9	(5.4)	45.1	(5.4)	58.9	(4.2)	46.8	(3.1)
Veterinary examination other than for official health certificate	36.3	(5.2)	40.2	(5.4)	39.2	(4.2)	38.3	(2.9)
Coggins test, also called EIA test or swamp fever test	59.6	(5.4)	64.8	(5.2)	76.8	(3.7)	65.9	(2.9)
Vaccination within past year	52.7	(5.6)	59.6	(5.3)	66.4	(4.0)	58.7	(3.0)
Deworming within past year	56.6	(5.5)	60.0	(5.3)	61.1	(4.2)	58.9	(3.0)
Screening test for strangles or history of no occurrence in past 6 months	15.8	(4.0)	19.2	(4.1)	27.1	(3.9)	20.0	(2.3)
Other past medical history from owner	38.3	(5.3)	40.8	(5.4)	53.1	(4.3)	43.1	(3.0)
Quarantine prior to contact with resident equids	41.6	(5.5)	41.3	(5.4)	50.8	(4.3)	44.0	(3.1)
Other	1.2	(1.2)	1.8	(1.3)	2.8	(1.2)	1.8	(0.7)

For operations that added new resident equids in the previous 12 months, a lower percentage of operations in the West region (36.9 percent) always or sometimes required a Coggins or other EIA test for new resident equids than operations in the South Central (68.8 percent), Northeast (79.0 percent,) and Southeast (79.9 percent) regions. A lower percentage of operations in the West region (44.5 percent) required deworming within the past year for new equids than operations in the Northeast region (67.8 percent).

E.2.g. For the 15.4 percent of operations that added new resident equids in the previous 12 months (table E.2.a), percentage of operations that always or sometimes implemented the following health requirements for new resident equids, by region:

	Percent Operations							
	Region							
	West		South Central		Northeast		Southeast	
Health requirement	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Official health certificate, also called certificate of veterinary inspection	37.7	(6.5)	48.9	(7.0)	46.8	(5.1)	55.1	(5.6)
Veterinary examination other than for official health certificate	27.7	(6.2)	38.4	(6.8)	39.2	(4.6)	49.9	(5.6)
Coggins test, also called EIA test or swamp fever test	36.9	(6.8)	68.8	(6.3)	79.0	(4.2)	79.9	(4.7)
Vaccination within past year	45.3	(6.9)	51.5	(7.0)	68.0	(4.6)	70.5	(5.1)
Deworming within past year	44.5	(6.9)	61.0	(6.5)	67.8	(4.6)	62.4	(5.5)
Screening test for strangles or history of no occurrence in past 6 months	10.2	(3.6)	22.4	(5.8)	18.8	(3.3)	30.5	(5.2)
Other past medical history from owner	38.1	(6.8)	30.9	(6.2)	54.1	(4.8)	48.4	(5.6)
Quarantine prior to contact with resident equids	39.8	(6.8)	40.1	(6.7)	48.4	(5.1)	47.9	(5.6)
Other	1.1	(0.7)	0.0	(—)	5.6	(2.4)	0.0	(—)

For operations that added new resident equids in the previous 12 months, a lower percentage of operations with a primary function of farm/ranch required a Coggins or other EIA test and/or vaccination in the past year for new equids compared with equine boarding stable/training, riding stable, or breeding farm operations. A higher percentage of breeding farm operations (42.9 percent) required new equids be screened for strangles or have had no occurrence of strangles in the previous 6 months compared with farm/ranch or residence with equids for personal use operations (12.9 and 13.0 percent, respectively).

E.2.h. For the 15.4 percent of operations that added new resident equids in the previous 12 months (table E.2.a), percentage of operations that always or sometimes implemented the following health requirements for new additions, by primary function of operation:

Percent Operations

Primary Function

	Equine boarding stable/ training		Riding stable		Equine breeding farm		Farm/ranch		Residence with equids for personal use		Other	
Health requirement	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Official health certificate, also called certificate of veterinary inspection	61.5	(5.1)	50.3	(12.2)	72.1	(8.1)	35.5	(5.2)	36.0	(7.2)	34.2	(11.5)
Veterinary examination other than for official health certificate	42.2	(5.2)	51.0	(12.2)	57.1	(9.6)	28.7	(4.9)	35.6	(7.2)	32.5	(11.3)
Coggins test, also called EIA test or swamp fever test	83.0	(4.2)	88.4	(5.7)	88.3	(6.5)	45.5	(5.7)	60.5	(7.2)	55.9	(11.3)
Vaccination within past year	81.7	(4.4)	85.6	(6.4)	70.3	(8.0)	37.9	(5.6)	50.7	(7.3)	48.6	(11.8)
Deworming within past year	75.0	(4.7)	79.2	(9.8)	65.7	(8.7)	39.9	(5.6)	61.0	(7.1)	45.7	(11.8)
Screening test for strangles or history of no occurrence in past 6 months	22.3	(4.2)	39.0	(12.2)	42.9	(9.7)	12.9	(3.6)	13.0	(4.3)	18.0	(9.5)
Other past medical history from owner	56.5	(5.3)	69.4	(10.6)	49.3	(9.8)	36.0	(5.7)	28.3	(6.6)	43.5	(11.5)
Quarantine prior to contact with resident equids	51.6	(5.3)	63.4	(11.4)	44.3	(9.2)	36.5	(5.6)	39.8	(7.1)	46.5	(12.0)
Other	2.9	(1.5)	6.7	(4.7)	3.0	(3.0)	0.0	(—)	0.0	(—)	10.9	(10.0)

3. Management of resident stallions

Overall, 15.3 percent of operations used one or more stallions for breeding purposes in the previous 12 months. The percentage of operations with one or more breeding stallions was similar across regions.

E.3.a. Percentage of operations by number of resident stallions used for breeding purposes in the previous 12 months, and by region:

	Percent Operations									
	Region									
	West		South Central		Northeast		Southeast		All operations	
Number of stallions	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
0	86.3	(1.9)	82.5	(1.7)	87.1	(1.5)	84.2	(1.6)	84.7	(0.8)
1	8.1	(1.6)	11.8	(1.4)	9.5	(1.4)	10.1	(1.3)	10.1	(0.7)
2	2.8	(0.7)	4.1	(0.9)	1.7	(0.5)	3.7	(0.8)	3.2	(0.4)
3 or more	2.8	(0.8)	1.5	(0.4)	1.7	(0.5)	2.0	(0.5)	1.9	(0.3)
Any	13.7	(1.9)	17.5	(1.7)	12.9	(1.5)	15.8	(1.6)	15.3	(0.8)

The list of persons who handled stallions used for breeding purposes was not mutually exclusive. The highest percentage of operations (90.0 percent) indicated that the owner handled stallions for breeding. On 5.2 percent of operations, a regular farm veterinarian handled stallions, and on 2.7 percent a specialized breeding facility veterinarian handled stallions.

E.3.b. For the 15.3 percent of operations with one or more resident stallions used for breeding purposes in the previous 12 months (table E.3.a), percentage of operations by person who handled stallions:

Person	Percent operations	Std. error
Owner	90.0	(1.7)
Farm manager	9.4	(1.6)
Regular farm veterinarian	5.2	(1.3)
Specialized breeding facility nonveterinarian	3.0	(1.0)
Specialized breeding facility veterinarian	2.7	(1.2)

For operations with one or more resident stallions, 88.6 percent of operations used stallions for live cover breeding and 16.3 percent used them to collect semen for future use. The use of live cover and semen collection were not mutually exclusive.

E.3.c. For the 15.3 percent of operations with one or more resident stallions used for breeding purposes in the previous 12 months (table E.3.a), percentage of operations by breeding management:

Breeding management	Percent operations	Std. error
Live cover	88.6	(1.8)
Semen collection	16.3	(2.3)

During semen collection, biosecurity procedures are used, in part, to reduce the risk of spreading venereal disease. For operations that collected semen from breeding stallions in the previous 12 months, at least three-fourths used each of the biosecurity procedure(s) listed in the following table.

E.3.d. For the 16.3 percent of operations in table E.3.c that collected semen from their stallions (2.5 percent of all operations), percentage of operations by biosecurity procedure used when collecting semen:

Biosecurity procedure	Percent operations	Std. error
Disposable gloves	79.1	(6.6)
Sanitize or change cover on phantom between stallions*	78.5	(6.4)
Use dedicated artificial vagina or sanitize between stallions	75.0	(7.2)
Use a disposable liner or sanitize the bucket used for washing the stallion between stallions	80.5	(6.6)

*For operations that used a phantom.

4. Isolation for infection control

Isolating equids that may present a contagious disease risk to other equids on an operation can reduce the risk posed by these equids. Exposure to other equids or displaying clinical signs of disease are common reasons for isolating equids.

Overall, 29.8 percent of operations never had resident equids leave the operation and return. A higher percentage of small operations (35.9 percent) never had resident equids leave and return compared with medium and large operations (19.7 and 12.4 percent, respectively). A lower percentage of small operations (24.0 percent) only isolated resident equids for a cause such as disease or known exposure to disease compared with medium or large operations (36.2 and 35.9 percent, respectively). A similar percentage of operations across operation sizes never isolated returning equids.

E.4.a. Percentage of operations by general isolation policy for managing resident equids that left the operation and returned, and by size of operation:

Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
General policy	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Equids never leave the operation	35.9	(1.6)	19.7	(2.0)	12.4	(1.8)	29.8	(1.2)
Equids never have contact with outside equids after leaving the operation	6.4	(0.8)	9.3	(1.5)	8.5	(1.8)	7.2	(0.7)
Routinely isolate after returning to the operation	5.3	(0.7)	8.6	(1.5)	16.4	(2.0)	7.2	(0.6)
Routinely isolate before returning to the operation	2.6	(0.6)	2.7	(0.8)	3.9	(1.1)	2.8	(0.5)
Only isolate for a cause such as disease or known exposure to disease	24.0	(1.5)	36.2	(2.5)	35.9	(2.6)	28.0	(1.2)
Never isolate returning equids	25.7	(1.5)	23.6	(2.2)	23.0	(2.3)	25.0	(1.1)
Total	100.0		100.0		100.0		100.0	

A lower percentage of operations in the West region (20.9 percent) never had resident equids leave and return than operations in the South Central and Southeast regions (31.0 and 37.2 percent, respectively). The percentages of operations that only isolated equids for a cause such as disease or known exposure to disease or that never isolated returning equids were similar across regions.

E.4.b. Percentage of operations by general isolation policy for managing resident equids that left the operation and returned, and by region:

Percent Operations

Region

	West		South Central		Northeast		Southeast	
General policy	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Equids never leave the operation	20.9	(2.5)	31.0	(2.4)	28.2	(2.2)	37.2	(2.3)
Equids never have contact with outside equids after leaving the operation	11.1	(2.0)	5.0	(1.1)	9.5	(1.4)	4.9	(1.0)
Routinely isolate after returning to the operation	8.1	(1.5)	5.3	(1.1)	8.7	(1.4)	7.8	(1.1)
Routinely isolate before returning to the operation	3.5	(1.3)	2.7	(0.8)	2.5	(0.7)	2.6	(0.7)
Only isolate for a cause such as disease or known exposure to disease	28.2	(2.8)	28.7	(2.2)	27.4	(2.1)	27.2	(2.0)
Never isolate returning equids	28.2	(2.8)	27.2	(2.2)	23.7	(2.2)	20.3	(1.9)

Overall, 42.1 percent of operations ever had equids with suspected or confirmed contagious disease. The percentage of operations that ever had contagious disease in equids increased as size of operation increased.

E.4.c. Percentage of operations that ever had equids with suspected or confirmed contagious disease, by size of operation:

Percent Operations

Size of Operation (number of equids)

Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
37.6	(1.6)	47.1	(2.6)	59.8	(2.7)	42.1	(1.3)

The percentage of operations that ever had equids with suspect or confirmed contagious disease was not substantially different across regions.

E.4.d. Percentage of operations that ever had equids with suspected or confirmed contagious disease, by region:

Percent Operations

Region

West		**South Central**		**Northeast**		**Southeast**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
47.1	(3.0)	39.4	(2.4)	40.4	(2.4)	43.3	(2.2)

For operations that ever had equids with suspected or confirmed contagious disease, a lower percentage of small operations than large operations (81.8 and 93.1, percent, respectively) isolated these equids.

E.4.e. For the 42.1 percent of operations that ever had equids with suspected or confirmed contagious disease (table E.4.c), percentage of operations that isolated these equids, by size of operation:

Percent Operations

Size of Operation (number of equids)

Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
81.8	(2.2)	85.3	(2.6)	93.1	(1.7)	84.4	(1.5)

For operations that ever had equids with a suspected or confirmed contagious disease, the percentage of operations that isolated these equids was similar across regions.

E.4.f. For the 42.1 percent of operations that ever had equids with suspected or confirmed contagious disease (table E.4.c), percentage of operations that isolated these equids, by region:

Percent Operations

Region

West		**South Central**		**Northeast**		**Southeast**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
83.3	(3.5)	84.6	(3.0)	88.5	(2.4)	81.7	(2.8)

5. Contact with other animals

Equids that have physical contact with other animals (nonequids) can be exposed to shared disease agents. For example, *Salmonella,* a bacteria that can cause diarrhea in animals, can be shed in the feces of animals other than equids, including those listed in the following table.

On the majority of operations, resident equids or their feed had contact with domestic animals other than equids in the previous 12 months. Common domestic animals that equids or their feed had contact with were dogs (75.2 percent of operations), cats (62.5 percent), and cattle (42.9 percent). Overall, equids or their feed had contact with poultry on 19.2 percent of operations.

E.5.a. Percentage of operations on which the following domestic animals had physical contact with resident equids or their feed in the previous 12 months, by size of operation:

Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Domestic animal	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Cats	59.1	(1.6)	70.1	(2.4)	67.8	(2.6)	62.5	(1.3)
Cattle	41.0	(1.7)	50.2	(2.5)	40.1	(2.7)	42.9	(1.3)
Dogs	73.8	(1.5)	77.4	(2.1)	79.4	(2.2)	75.2	(1.1)
Pigs	6.1	(0.8)	5.1	(1.1)	7.1	(1.5)	6.0	(0.6)
Emus/ostriches	0.9	(0.3)	0.1	(0.1)	1.3	(0.8)	0.8	(0.2)
Llamas or alpacas	2.4	(0.5)	1.9	(0.6)	4.8	(1.3)	2.6	(0.4)
Poultry	18.5	(1.2)	21.5	(2.1)	18.9	(2.1)	19.2	(1.0)
Rabbits	9.3	(1.0)	10.1	(1.6)	11.6	(1.7)	9.7	(0.8)
Sheep/goats	14.5	(1.1)	15.3	(1.8)	17.0	(2.1)	15.0	(0.9)
Other	0.0	(0.0)	0.6	(0.6)	0.6	(0.4)	0.2	(0.1)
Any	84.3	(1.2)	89.8	(1.5)	91.9	(1.4)	86.4	(0.9)

The West region accounted for the highest percentage of operations on which resident equids or their feed had physical contact with dogs or cattle in the last 12 months. Poultry had contact with equids or their feed on a higher percentage of operations in the Northeast region than in the other regions. Rabbits had contact with equids or their feed on a higher percentage of operations in the Southeast region (14.7 percent) than in the South Central region (7.7 percent). Sheep/goats had contact with equids or their feed on a higher percentage of operations in the West region (21.2 percent) than in the South Central region (12.2 percent).

E.5.b. Percentage of operations on which the following domestic animals had physical contact with resident equids or their feed in the last 12 months, by region:

	Percent Operations							
	Region							
	West		South Central		Northeast		Southeast	
Domestic animal	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Cats	66.3	(2.8)	52.6	(2.5)	74.2	(2.2)	62.1	(2.2)
Cattle	58.9	(3.0)	47.7	(2.5)	35.5	(2.3)	29.2	(2.1)
Dogs	83.8	(2.0)	73.4	(2.3)	70.1	(2.3)	74.9	(2.0)
Pigs	5.1	(1.1)	4.6	(1.0)	8.7	(1.4)	6.1	(1.2)
Emus/ostriches	0.4	(0.4)	0.8	(0.4)	0.5	(0.4)	1.4	(0.6)
Llamas or alpacas	2.7	(0.8)	3.5	(0.9)	2.2	(0.7)	1.5	(0.5)
Poultry	18.7	(2.3)	14.1	(1.6)	28.5	(2.3)	18.2	(1.8)
Rabbits	8.2	(1.8)	7.7	(1.3)	8.8	(1.5)	14.7	(1.6)
Sheep/goats	21.2	(2.3)	12.2	(1.6)	13.8	(1.7)	14.5	(1.6)
Other	0.2	(0.2)	0.5	(0.4)	0.1	(0.1)	0.0	(—)
Any	91.2	(1.6)	82.8	(2.0)	89.1	(1.5)	84.6	(1.7)

Photograph courtesy of Dr. Josie Traub-Dargatz.

A higher percentage of operations with a primary function of farm/ranch had resident equids or their feed come in physical contact with cattle in the last 12 months compared with operations with the other primary functions. This finding is not surprising, since equids are often used on farm/ranch operations to move, sort, or rope cattle.

E.5.c. Percentage of operations on which the following domestic animals had physical contact with resident equids or their feed in the previous 12 months, by primary function of operation:

Percent Operations

	Primary Function									
	Equine boarding stable/ training		Riding stable		Equine breeding farm		Farm/ ranch		Residence with equids for personal use		Other	
Domestic animal	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Cats	67.0	(3.4)	73.7	(6.6)	66.8	(4.5)	60.7	(2.1)	62.2	(2.1)	54.3	(8.0)
Cattle	22.3	(3.0)	21.6	(6.4)	29.3	(4.2)	65.0	(2.0)	30.2	(2.0)	25.5	(6.4)
Dogs	75.4	(3.0)	61.1	(7.1)	73.1	(4.1)	79.7	(1.7)	72.2	(1.9)	68.5	(7.4)
Pigs	2.5	(1.1)	12.1	(4.4)	3.5	(1.5)	7.4	(1.0)	5.0	(0.9)	13.9	(5.5)
Emus/ ostriches	0.5	(0.5)	0.0	(—)	0.5	(0.4)	0.6	(0.3)	1.2	(0.5)	0.0	(—)
Llamas or alpacas	0.6	(0.5)	2.3	(1.6)	2.4	(1.0)	2.7	(0.7)	2.5	(0.6)	8.7	(4.2)
Poultry	13.2	(2.3)	17.5	(5.1)	15.4	(3.2)	22.3	(1.7)	17.8	(1.6)	25.8	(6.7)
Rabbits	8.3	(2.2)	11.5	(4.0)	11.3	(2.9)	9.7	(1.2)	9.2	(1.3)	15.0	(5.5)
Sheep/ goats	10.9	(2.1)	20.8	(5.9)	8.8	(2.3)	18.0	(1.6)	13.0	(1.4)	25.1	(6.6)
Other	0.4	(0.3)	0.0	(—)	0.4	(0.4)	0.4	(0.4)	0.0	(—)	0.0	(—)
Any	87.6	(2.3)	86.6	(5.0)	87.2	(3.1)	89.4	(1.3)	83.3	(1.6)	77.0	(7.2)

Wildlife can pose a disease risk to equids. For example, terrestrial rabies is most often spread by raccoons and skunks, although bats, foxes, and coyotes can also spread rabies. In addition, one of the causative agents of equine protozoal myeloencephalitis is shed in the feces of opossums, which can expose equids to the causative organism through contaminated feed.

Overall, on 68.2 percent of operations resident equids or their feed had physical contact with at least one of the wild animals listed in the following table. The percentages of operations by type of wildlife that equids or their feed had physical contact with were similar across operation sizes. Overall, on more than half of operations equids or their feed had contact with deer (55.8 percent of operations), rabbits (54.4 percent), or raccoons (50.6 percent). “Other” types of wildlife that had contact with equids or their feed included elk, antelope, bobcats, mountain lions, bears, birds, snakes, prairie dogs, armadillos, and squirrels.

E.5.d. Percentage of operations on which the following wild animals had physical contact with resident equids or their feed in the previous 12 months, by size of operation:

Percent Operations

Size of Operation (number of equids)

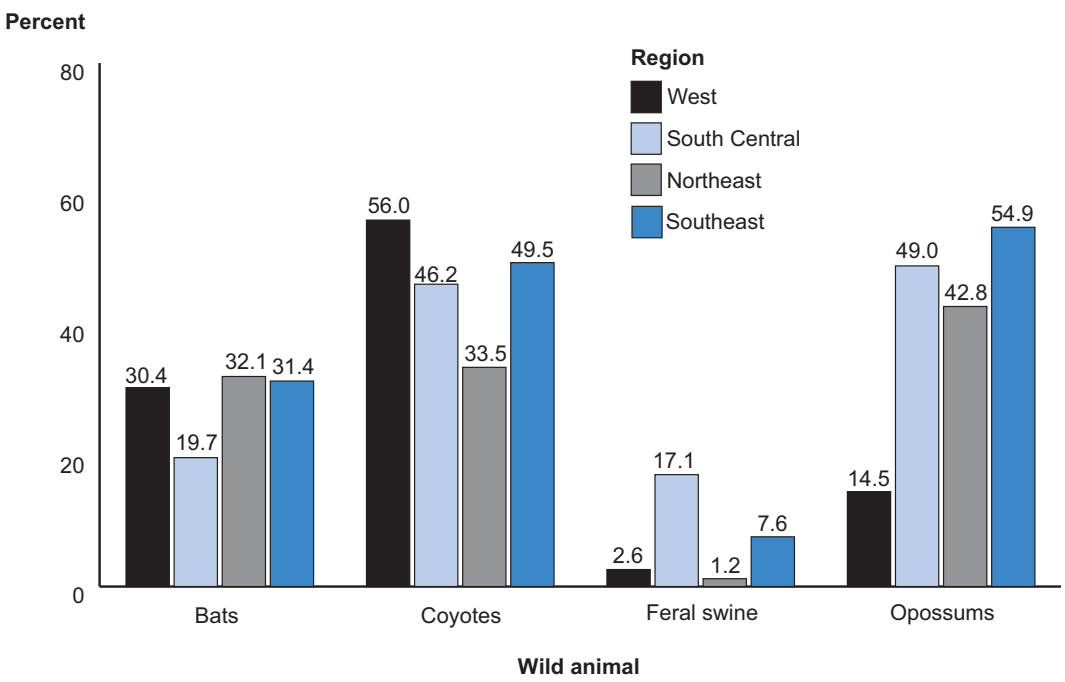
	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Wild animal	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Bats	27.4	(1.4)	26.2	(2.2)	30.3	(2.5)	27.4	(1.1)
Coyotes	45.2	(1.7)	47.2	(2.6)	51.4	(2.7)	46.3	(1.3)
Deer	54.7	(1.7)	58.2	(2.6)	57.6	(2.7)	55.8	(1.3)
Feral swine	8.4	(1.0)	7.6	(1.4)	8.8	(1.6)	8.3	(0.8)
Foxes	35.9	(1.6)	39.7	(2.5)	41.5	(2.7)	37.4	(1.2)
Opossums	41.3	(1.6)	41.6	(2.5)	46.0	(2.7)	41.9	(1.2)
Rabbits	52.8	(1.7)	57.7	(2.6)	57.7	(2.7)	54.4	(1.3)
Raccoons	49.4	(1.7)	53.8	(2.6)	51.3	(2.7)	50.6	(1.3)
Skunks	47.5	(1.7)	49.7	(2.6)	50.7	(2.8)	48.3	(1.3)
Other	7.1	(0.8)	9.2	(1.5)	11.7	(1.8)	8.1	(0.7)
Any	67.3	(1.6)	70.4	(2.3)	69.5	(2.6)	68.2	(1.2)

Resident equids or their feed had physical contact with bats in the previous 12 months on a lower percentage of operations in the South Central region than in the other regions. Equids or their feed had contact with coyotes on a lower percentage of operations in the Northeast region than in the other regions. Feral swine had contact with equids or their feed on a higher percentage of operations in the South Central and Southeast regions (17.1 and 7.6 percent, respectively) than in the West and Northeast regions (2.6 and 1.2 percent, respectively). Opossums had contact with equids or their feed on a lower percentage of operations in the West region than in the other regions.

E.5.e. Percentage of operations on which the following wild animals had physical contact with resident equids or their feed in the previous 12 months, by region:

	Percent Operations							
	Region							
	West		South Central		Northeast		Southeast	
Wild animal	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Bats	30.4	(2.6)	19.7	(1.8)	32.1	(2.3)	31.4	(2.2)
Coyotes	56.0	(3.1)	46.2	(2.5)	33.5	(2.3)	49.5	(2.3)
Deer	53.8	(2.7)	50.4	(2.5)	57.0	(2.5)	63.7	(2.2)
Feral swine	2.6	(1.1)	17.1	(1.9)	1.2	(0.5)	7.6	(1.3)
Foxes	40.7	(3.0)	28.7	(2.2)	39.7	(2.4)	44.1	(2.3)
Opossums	14.5	(1.9)	49.0	(2.5)	42.8	(2.5)	54.9	(2.3)
Rabbits	58.0	(3.0)	51.8	(2.5)	51.3	(2.5)	57.6	(2.3)
Raccoons	45.8	(3.0)	49.9	(2.5)	48.7	(2.5)	57.2	(2.3)
Skunks	51.7	(3.1)	48.3	(2.5)	45.7	(2.4)	47.7	(2.3)
Other	18.9	(2.2)	3.7	(0.9)	8.7	(1.3)	4.1	(0.9)
Any	74.2	(2.7)	63.0	(2.5)	67.4	(2.3)	70.8	(2.1)

Percentage of operations on which bats, coyotes, feral swine, or oppossums had physical contact with resident equids or their feed in the previous 12 months, by region



6. Precautions taken for visitors

People who come onto an equine operation can bring disease-causing agents on their hands, clothing, footwear, or equipment. The vehicle they use to enter the operation could also harbor disease-causing agents on tires or other surfaces.

Overall, in the previous 12 months, 25.0 percent of operations used any of the infection-control precautions listed in the following table for people who visited the operation, including veterinarians, farriers, and other service providers. For operations that had any sick animals, 20.6 percent of operations required that visitors who have contact with animals visit the healthiest or more susceptible animals first and sick animals last. About one of five operations required that visitors clean and disinfect hands (19.7 percent).

E.6.a. Percentage of operations by precaution(s) taken for visitors accessing the equine facility (veterinarians, farriers, etc.) in the previous 12 months:

Precaution	Percent operations	Std. error
Use separate or disinfected equipment/tack	12.9	(0.8)
Change clothes or wear clean coveralls	8.2	(0.7)
Disinfect or change boots	9.6	(0.7)
Clean and disinfect hands	19.7	(1.0)
Park vehicles away from animal area	11.2	(0.8)
Require visitors to contact healthiest or more susceptible animals first and sick animals last*	20.6	(2.0)
Other	0.4	(0.1)
Any	25.0	(1.1)

*20.6 percent of the 28.2 percent of operations with sick animals required this.

The highest percentage of operations (29.6 percent) normally required that anyone from the operation who had visited another equine operation clean and disinfect their hands upon return; less than 15 percent of operations required disinfection of equipment/tack, change of clothes, or disinfection or change of boots.

E.6.b. Percentage of operations by precaution(s) normally taken in the previous 12 months for anyone from the operation who had visited another equine operation:

Precaution	Percent operations	Std. error
Disinfect equipment/tack	13.9	(0.9)
Change clothes or wear clean coveralls	14.7	(0.9)
Disinfect or change boots	14.2	(0.9)
Clean and disinfect hands	29.6	(1.2)
Other	0.3	(0.1)

7. Management of feed and drinking water

Providing equids with clean feed and water can reduce their risk of exposure to disease-causing agents. Overall, 81.8 percent of operations had stored grain/concentrate/complete feed for resident equids in the previous 12 months. A higher percentage of large operations (88.2 percent) stored grain/concentrate/complete feed for equids compared with small operations (79.6 percent).

E.7.a. Percentage of operations that stored any grain/concentrate/complete feed for resident equids in the previous 12 months, by size of operation:

Percent

Size of Operation (number of equids)

Small (5–9)		Medium (10–19)		Large (20 or more)		All operations	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
79.6	(1.3)	85.4	(1.8)	88.2	(1.9)	81.8	(1.0)

A higher percentage of operations in the Northeast region than in the other regions stored grain/concentrate/complete feed to be fed to resident equids than operations in the other regions.

E.7.b. Percentage of operations that stored any grain/concentrate/complete feed for resident equids in the previous 12 months, by region:

Percent Operations							
Region							
West		South Central		Northeast		Southeast	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
83.8	(2.1)	77.0	(2.2)	91.9	(1.3)	77.5	(1.9)

A lower percentage of operations with primary use of equids for pleasure (79.9 percent) and farm or ranch work (77.0 percent) stored grain/concentrate/complete feed for resident equids than operations with primary uses of lessons/school, showing/competition, or breeding.

E.7.c. Percentage of operations that stored any grain/concentrate/complete feed for resident equids in the previous 12 months, by primary use of equids:

Percent Operations											
Primary Use											
Pleasure		Lessons/ school		Showing/ competi- tion not betting		Breeding		Farm/ ranch work		Other	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
79.9	(1.5)	99.5	(0.5)	91.6	(2.1)	90.3	(2.4)	77.0	(2.3)	80.6	(3.7)

Feed can be contaminated by feces or insects that contain/carry disease-causing agents. When equids eat contaminated feed, these disease agents can cause illness. Storing feed in a manner that reduces the risk of fecal contamination can lessen the risk of equids being exposed to disease agents such as *Salmonella*, bacteria that can cause diarrhea, fever, and toxemia in equids.

For operations that stored grain/concentrate/complete feed for resident equids, approximately 90 percent stored the feed in a manner that prevents fecal contamination. The percentages of operations that stored grain/concentrate/complete feed in this manner were generally similar across operation sizes. The fact that a high percentage of equine operations stored feed to reduce fecal contamination by various animals reduces the risk of disease introduction from this source.

E.7.d. For the 81.8 percent of operations that stored any grain/concentrate/complete feed in the previous 12 months (table E.7.a), percentage of operations that stored grain/concentrate/complete feed in a manner that prevents fecal contamination by the following animals or their feces, by size of operation:

Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Animal type	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Domestic livestock, including equids	90.4	(1.1)	89.6	(1.7)	89.8	(1.7)	90.2	(0.8)
Dogs or cats	90.3	(1.1)	87.0	(1.9)	90.3	(1.6)	89.6	(0.8)
Domestic or wild birds, including poultry	90.3	(1.1)	87.1	(1.9)	88.9	(1.7)	89.4	(0.8)
Mice or rats	91.1	(1.0)	83.4	(2.1)	87.4	(1.9)	88.9	(0.9)
Other	88.6	(1.2)	87.5	(1.9)	88.7	(1.7)	88.3	(0.9)

For operations that stored grain/concentrate/complete feed for resident equids, a lower percentage of operations in the Northeast region (83.2 percent) than in the Southeast region (93.0 percent) stored the feed in a manner that prevented fecal contamination by mice/rats.

E.7.e. For the 81.8 percent of operations that stored any grain/concentrate/complete feed in the previous 12 months (table E.7.a), percentage of operations that stored grain/concentrate/complete feed in a manner that prevents fecal contamination by the following animals or their feces, by region:

Percent Operations

	Region							
	West		South Central		Northeast		Southeast	
Animal type	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Domestic livestock, including equids	93.4	(1.3)	88.9	(1.8)	87.1	(1.7)	92.2	(1.4)
Dogs or cats	90.3	(1.7)	88.8	(1.8)	87.3	(1.7)	92.3	(1.4)
Domestic or wild birds, including poultry	91.1	(1.6)	88.6	(1.8)	86.4	(1.7)	92.3	(1.4)
Mice or rats	90.4	(1.7)	89.4	(1.7)	83.2	(1.9)	93.0	(1.3)
Other wildlife	88.8	(2.0)	87.3	(1.8)	85.8	(1.8)	92.1	(1.4)

In general, a lower percentage of operations that primarily used equids for farm or ranch work stored grain/concentrate/complete feed in a manner that prevents feed contamination compared with operations that primarily used equids for lessons/school or showing/competition.

E.7.f. For the 81.8 percent of operations that stored any grain/concentrate/complete feed in the previous 12 months (table E.7.a), percentage of operations that stored grain/concentrate/complete feed in a manner that prevents fecal contamination by the following animals or their feces, by primary use of equids:

Percent Operations

	Primary Use											
	Pleasure		Lessons/ school		Showing/ competition		Breeding		Farm/ ranch work		Other	
Animal type	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Domestic livestock	91.3	(1.2)	95.0	(2.2)	94.8	(1.7)	92.1	(2.5)	85.7	(2.0)	87.6	(3.4)
Dogs or cats	90.1	(1.3)	95.0	(2.2)	95.2	(1.5)	90.5	(2.6)	85.3	(2.0)	88.1	(3.3)
Domestic or wild birds	90.7	(1.2)	94.3	(2.2)	94.0	(1.8)	91.5	(2.6)	83.8	(2.1)	88.7	(3.2)
Mice or rats	91.2	(1.2)	92.6	(3.0)	95.3	(1.6)	89.2	(2.9)	82.4	(2.1)	85.7	(3.5)
Other wildlife	89.3	(1.3)	95.0	(2.2)	92.9	(2.1)	90.4	(2.7)	83.6	(2.2)	85.8	(3.5)

Water sources can contain pathogens that affect equids. It is difficult to determine the purity of surface water such as lakes, streams, and irrigation ditches, as there are multiple ways these water sources can be contaminated: fecal contamination from waterfowl and other wildlife, or runoff from upstream livestock facilities. Unlike public/municipal water that is periodically tested, well water testing is prompted only by the property owner. Untested well water could contain pathogens or toxic levels of minerals.

On over half of all operations (55.5 percent) well water was the predominant source of water for resident equids in the previous 12 months. A lower percentage of large operations (11.4 percent) used surface water as a predominant source of water compared with small operations (17.5 percent).

E.7.g. Percentage of operations by predominant source of drinking water for resident equids in the previous 12 months, and by size of operation:

Percent Operations

Size of Operation (number of equids)

	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Source	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Well	52.6	(1.6)	61.3	(2.4)	62.2	(2.6)	55.5	(1.2)
Public/municipal water supply	23.9	(1.4)	21.9	(2.1)	21.0	(2.2)	23.2	(1.1)
Spring	5.6	(0.8)	3.1	(0.7)	5.5	(1.1)	5.0	(0.6)
Surface water	17.5	(1.3)	13.8	(1.7)	11.4	(1.7)	16.0	(0.9)
Other	0.4	(0.2)	0.2	(0.2)	0.0	(—)	0.3	(0.1)
Total	100.0		100.0		100.0		100.0	

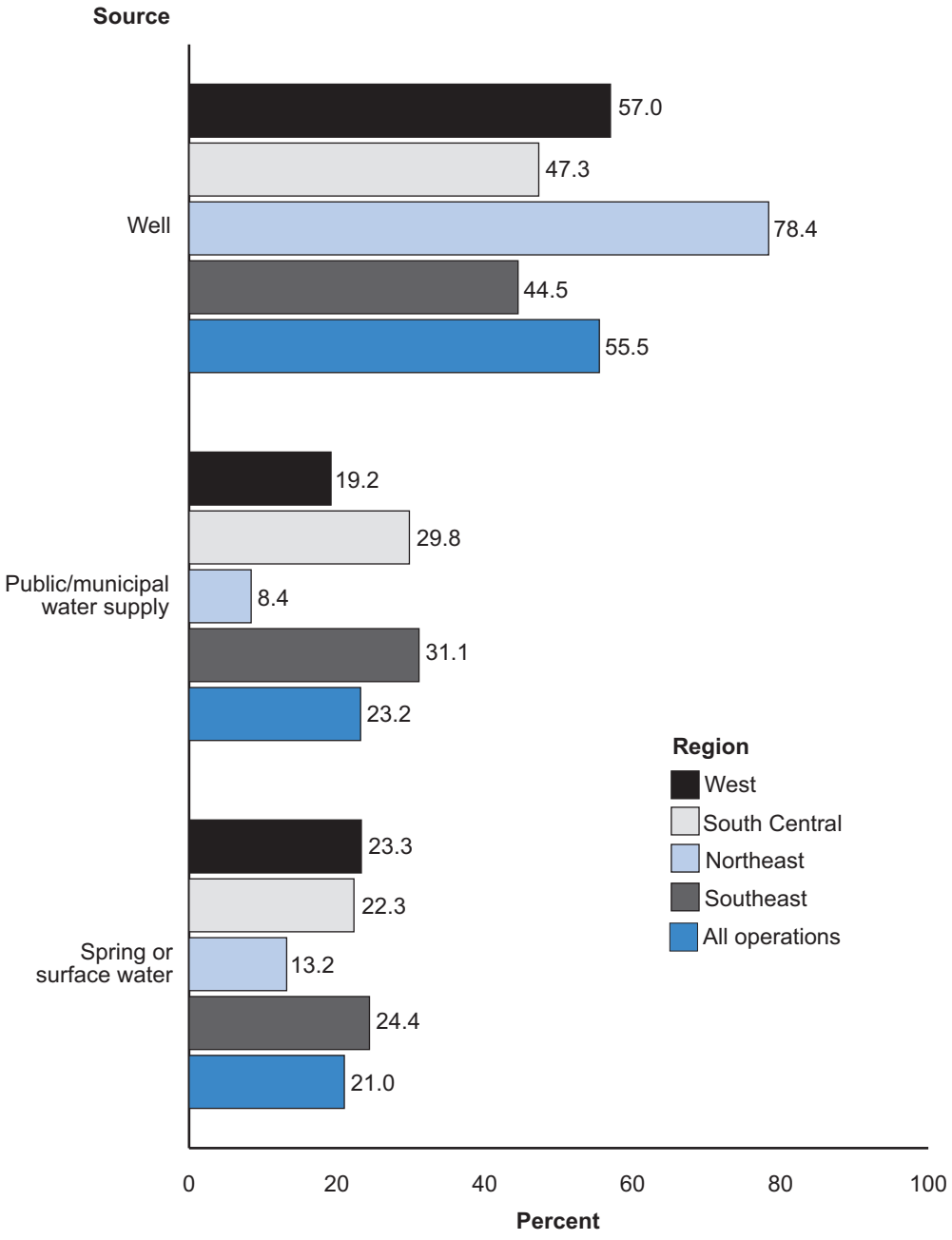
A higher percentage of operations in the Northeast region (78.4 percent) used well water as the predominant source of water for resident equids compared with operations in the West, South Central, and Southeast regions (57.0, 47.3, and 44.5 percent, respectively). A lower percentage of operations in the South Central region (0.9 percent) used spring water as the primary source of water for equids compared with operations in the other regions.

E.7.h. Percentage of operations by predominant source of drinking water for resident equids in the previous 12 months, and by region:

Percent Operations

	Region							
	West		South Central		Northeast		Southeast	
Source	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Well	57.0	(3.0)	47.3	(2.5)	78.4	(2.0)	44.5	(2.0)
Public/municipal water supply	19.2	(2.3)	29.8	(2.3)	8.4	(1.3)	31.1	(2.0)
Spring	7.2	(1.7)	0.9	(0.4)	8.7	(1.4)	5.4	(1.1)
Surface water	16.1	(2.1)	21.4	(2.0)	4.5	(1.0)	19.0	(1.8)
Other	0.6	(0.4)	0.5	(0.3)	0.0	(—)	0.0	(—)
Total	100.0		100.0		100.0		100.0	

Percentage of operations by predominant source of drinking water for resident equids in the previous 12 months, and by region



A higher percentage of operations with a primary function of equine boarding stable/ training (73.4 percent) used well water as the predominant source of water for resident equids compared with farm/ranch or residence with equids for personal use operations (53.1 and 49.7 percent, respectively). A higher percentage of farm/ranch operations used surface water as the predominant source of drinking water compared with operations with the other primary functions.

E.7.i. Percentage of operations by predominant source of drinking water for resident equids in the previous 12 months, and by primary function of operation:

	Percent Operations											
	Primary Function											
	Equine boarding stable/ training		Riding stable		Equine breeding farm		Farm/ ranch		Residence with equids for personal use		Other	
Source	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Well	73.4	(3.3)	69.6	(6.8)	65.2	(4.2)	53.1	(2.1)	49.7	(2.1)	74.0	(6.4)
Public/ municipal water supply	23.4	(3.2)	18.2	(5.6)	25.9	(3.9)	15.6	(1.5)	31.4	(2.0)	8.9	(4.1)
Spring	1.1	(0.7)	3.2	(2.5)	4.6	(1.6)	7.6	(1.1)	3.5	(0.8)	5.7	(3.4)
Surface water	2.0	(1.2)	9.0	(4.4)	4.3	(1.5)	23.7	(1.7)	14.8	(1.5)	8.4	(3.3)
Other	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.6	(0.3)	2.9	(2.9)
Total	100.0		100.0		100.0		100.0		100.0		100.0	

8. Insect control methods

Insects can irritate equids and spread disease agents, making insect control an important part of equine management. Insects such as flies can be a nuisance to equids. For example, stable flies feed on the lower legs of equids. Their painful bite results in a defensive action by the equid. Face flies can irritate the lining of the eye causing conjunctivitis. Horn flies are primarily pests of cattle, but can adapt to horses as an alternate host. Tabanid flies include horse and deer flies. These flies have a very painful bite, and because they inject an anticoagulant when feeding, sometimes blood will drip from feeding sites after the flies have left.

Flies can transmit various pathogens. For example, tabanids can mechanically transmit EIA virus, while face flies can transmit pathogens that cause keratoconjunctivitis (inflammation of cornea and conjunctiva). Methods for controlling flies include applying pesticide to animals, sanitizing the operation (such as appropriate manure disposal), and using feed-through additives, traps with fly attractants, ultraviolet light traps (zappers), and bait strips.

There are more than 3,000 species of mosquito, of which 150 reside in the United States. Mosquitoes can transmit several disease agents to equids, such as Eastern equine encephalitis (EEE) and West Nile viruses. Methods for controlling mosquitoes include insecticides, repellants, and elimination of standing water on the operation.

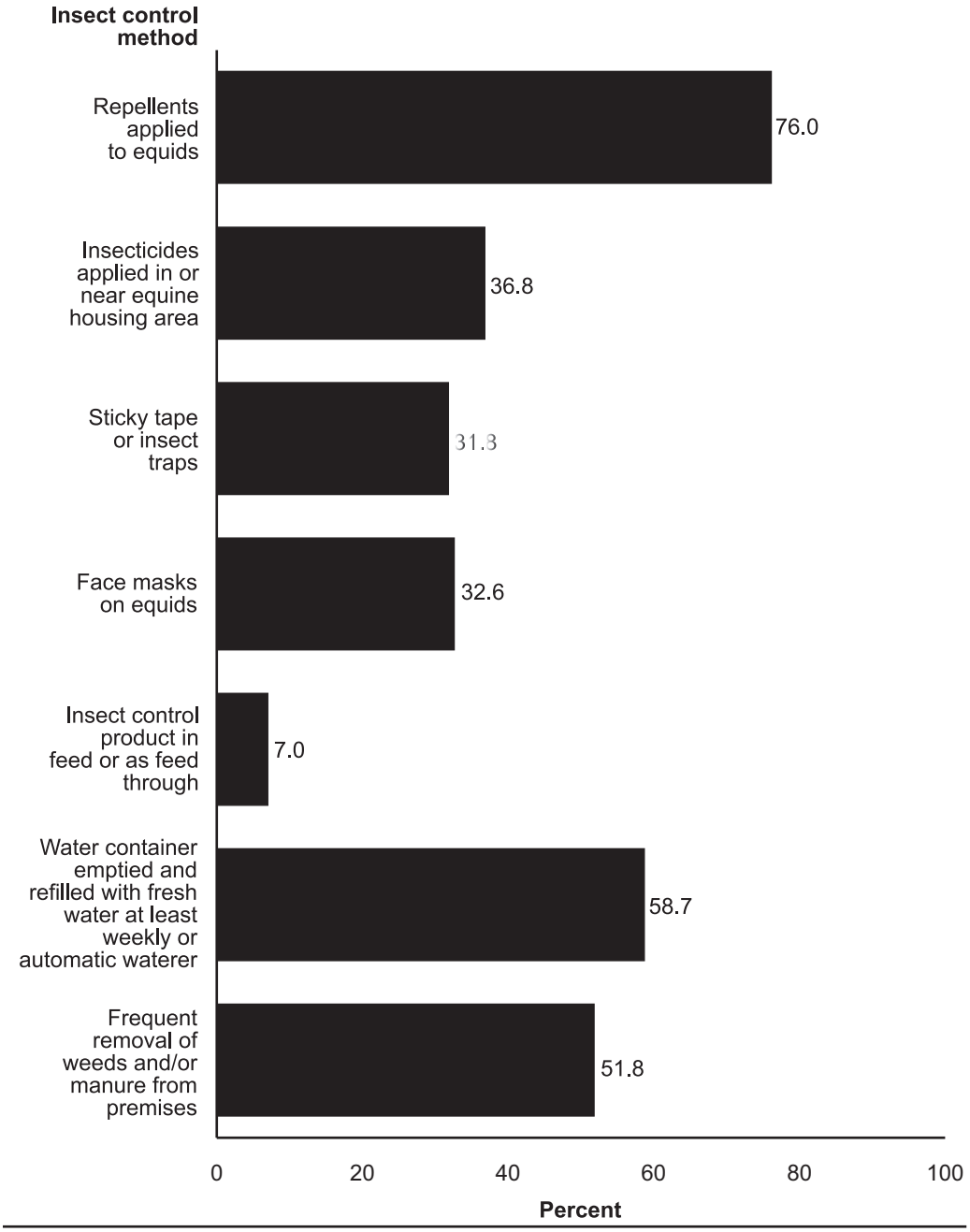
Operations may have used multiple methods for insect control. The highest percentage of all operations (76.0 percent) used repellents applied to equids as a method of insect control. Over half of all operations (58.7 percent) emptied water containers and refilled them with fresh water at least once a week or used automatic waterers. Overall, 51.8 percent of operations frequently removed weeds and/or manure from the premises to control insects. Other common methods of insect control included insecticides applied in or near the equine housing area (36.8 percent of operations), use of equid face masks (32.6 percent), and use of sticky tape or insect traps (31.8 percent). Only 7.0 percent of all operations used an insect control product in feed or as feed through.

In general, a lower percentage of small operations used the various insect control methods compared with medium or large operations. Since insects such as flies are attracted to locations with multiple hosts, more control strategies may be necessary on operations with a large number of equids.

E.8.a. Percentage of operations by insect control method(s) used, and by size of operation:

	Percent Operations							
	Size of Operation (number of equids)							
	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Method	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Repellents applied to equids	72.3	(1.5)	82.8	(1.9)	85.0	(1.9)	76.0	(1.1)
Insecticides applied in or near equine housing area	33.3	(1.6)	43.4	(2.5)	45.1	(2.7)	36.8	(1.2)
Insecticides applied to pasture areas	6.4	(0.8)	9.7	(1.6)	9.1	(1.5)	7.4	(0.7)
Regional control program, such as aerial spraying	3.3	(0.5)	4.7	(1.0)	6.6	(1.3)	4.0	(0.5)
Sticky tape or insect traps	28.8	(1.6)	38.9	(2.5)	35.8	(2.6)	31.8	(1.2)
Bug zapper	7.3	(0.9)	11.8	(1.7)	10.1	(1.7)	8.6	(0.7)
Fly predators specifically brought onto the operation	9.1	(1.0)	10.9	(1.5)	14.5	(1.8)	10.1	(0.8)
Face masks on equids	28.3	(1.5)	37.0	(2.4)	49.6	(2.7)	32.6	(1.2)
Fly sheets on equids	10.9	(1.0)	18.9	(1.9)	28.7	(2.4)	14.6	(0.8)
Fly tags attached to equine halters	3.6	(0.6)	5.7	(1.2)	7.5	(1.6)	4.5	(0.5)
Insect control product in feed or as feed through	6.4	(0.9)	8.6	(1.4)	7.1	(1.3)	7.0	(0.7)
Mosquito treatment in drinking water (mosquito dunks)	8.4	(1.0)	8.4	(1.5)	7.5	(1.3)	8.3	(0.8)
Water container emptied and refilled with fresh water at least weekly or automatic waterer	55.3	(1.7)	63.3	(2.5)	70.1	(2.5)	58.7	(1.3)
Frequent removal of weeds and/or manure from premises	46.6	(1.7)	59.9	(2.5)	67.3	(2.5)	51.8	(1.3)
Screened-in stalls	2.8	(0.5)	3.6	(0.9)	7.4	(1.5)	3.5	(0.4)
Other	1.9	(0.4)	2.7	(0.7)	2.0	(0.6)	2.0	(0.3)
Any	85.6	(1.2)	94.3	(1.1)	96.3	(1.0)	88.7	(0.9)

Percentage of operations by insect control method(s) used



A lower percentage of operations in the West region (27.0 percent) applied insecticides in or near equine housing to control insects compared with operations in the South Central and Southeast regions (44.8 and 39.1 percent, respectively). A higher percentage of operations in the Southeast region (7.2 percent) had a regional insect control program such as aerial spraying compared with operations in the South Central and Northeast regions (1.6 and 2.3 percent, respectively). In general, a higher percentage of operations in the Northeast region than in the other regions used several insect control methods.

E.8.b. Percentage of operations by insect control method(s) used, and by region:

	Percent Operations							
	Region							
	West		South Central		Northeast		Southeast	
Method	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Repellents applied to equids	77.9	(2.5)	75.4	(2.2)	77.7	(2.1)	73.6	(2.0)
Insecticides applied in or near equine housing area	27.0	(2.6)	44.8	(2.5)	31.5	(2.2)	39.1	(2.2)
Insecticides applied to pasture areas	7.0	(1.5)	9.2	(1.4)	3.9	(0.9)	8.6	(1.3)
Regional control program, such as aerial spraying	5.8	(1.3)	1.6	(0.5)	2.3	(0.7)	7.2	(1.2)
Sticky tape or insect traps	31.8	(2.8)	31.4	(2.3)	37.4	(2.4)	27.2	(2.1)
Bug zapper	7.9	(1.4)	9.1	(1.4)	7.0	(1.3)	9.7	(1.4)
Fly predators specifically brought onto the operation	10.0	(1.8)	9.2	(1.4)	11.9	(1.6)	9.7	(1.4)
Face masks on equids	38.5	(2.9)	21.8	(2.0)	44.2	(2.3)	31.9	(2.1)
Fly sheets on equids	16.3	(2.1)	9.5	(1.3)	20.9	(1.8)	14.6	(1.6)
Fly tags attached to equine halters	2.5	(0.8)	4.9	(1.1)	3.9	(0.9)	6.2	(1.1)
Insect control product in feed or as feed through	4.5	(1.3)	8.9	(1.4)	5.1	(1.0)	8.0	(1.2)
Mosquito treatment in drinking water (mosquito dunks)	8.5	(1.7)	12.2	(1.7)	3.4	(0.9)	7.0	(1.2)
Water container emptied and refilled with fresh water at least weekly or automatic waterer	58.3	(3.0)	56.5	(2.5)	70.4	(2.3)	51.6	(2.3)
Frequent removal of weeds and/or manure from premises	55.6	(3.0)	45.4	(2.5)	63.9	(2.4)	46.4	(2.3)
Screened-in stalls	1.9	(0.7)	2.9	(0.8)	6.2	(1.2)	3.2	(0.8)
Other	1.4	(0.5)	1.1	(0.5)	3.6	(0.9)	2.5	(0.7)
Any	88.9	(2.0)	87.2	(1.8)	92.7	(1.3)	86.7	(1.6)

A lower percentage of operations that primarily used equids for farm/ranch work used fly masks, fly sheets, and/or removed weeds to control insects compared with operations that primarily used equids for lessons/school, showing/competition, or breeding.

E.8.c. Percentage of operations by insect control method(s) used, and by primary use of equids:

	Percent Operations											
	Primary Use											
	Pleasure		Lessons/ school		Showing/ competition not betting		Breeding		Farm/ ranch work		Other	
Method	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Repellents applied to equids	73.9	(1.7)	91.1	(3.8)	85.1	(3.5)	85.5	(3.1)	74.2	(2.3)	67.4	(4.3)
Insecticides applied in or near equine housing area	34.2	(1.8)	45.0	(6.0)	50.1	(4.4)	44.2	(4.3)	35.4	(2.6)	30.1	(4.1)
Insecticides applied to pasture areas	6.4	(0.9)	11.2	(4.2)	9.7	(2.6)	12.3	(3.4)	6.7	(1.3)	6.8	(2.1)
Regional control program, such as aerial spraying	3.6	(0.7)	8.5	(2.7)	8.7	(2.4)	3.2	(1.4)	3.4	(0.9)	2.4	(1.2)
Sticky tape or insect traps	29.4	(1.7)	48.9	(6.1)	44.1	(4.4)	38.1	(4.4)	29.1	(2.4)	25.1	(3.9)
Bug zapper	10.3	(1.2)	13.0	(4.3)	10.6	(2.6)	5.6	(1.7)	4.3	(1.0)	10.2	(2.8)
Fly predators specifically brought onto the operation	11.0	(1.2)	26.8	(5.4)	15.7	(3.0)	13.2	(2.9)	3.1	(0.8)	10.2	(2.4)
Face masks on equids	32.7	(1.7)	69.7	(5.7)	58.8	(4.4)	40.2	(4.2)	16.9	(2.1)	30.8	(4.0)
Fly sheets on equids	12.5	(1.2)	43.5	(6.1)	32.6	(3.9)	22.4	(3.6)	5.3	(1.1)	17.3	(3.2)
Fly tags attached to equine halters	4.0	(0.7)	5.3	(2.5)	7.7	(2.2)	7.2	(2.2)	3.5	(1.0)	3.9	(1.7)
Insect control product in feed or as feed through	7.1	(0.9)	6.7	(2.7)	9.9	(2.5)	9.4	(3.0)	5.1	(1.2)	7.4	(2.6)
Mosquito treatment in drinking water (mosquito dunks)	7.6	(1.1)	6.4	(2.5)	11.8	(2.7)	10.7	(3.3)	6.9	(1.5)	11.4	(3.2)
Water container emptied and refilled with fresh water at least weekly or automatic waterer	58.5	(1.9)	85.7	(4.3)	70.0	(4.2)	65.6	(4.2)	49.8	(2.7)	56.9	(4.5)
Frequent removal of weeds and/or manure from premises	47.9	(1.9)	80.2	(4.9)	70.0	(4.0)	65.7	(4.0)	46.7	(2.7)	48.7	(4.5)
Screened-in stalls	2.1	(0.5)	9.4	(3.9)	7.4	(2.4)	7.1	(2.0)	2.1	(0.7)	5.9	(1.9)
Other	2.8	(0.6)	0.5	(0.5)	2.3	(1.1)	1.9	(1.0)	0.5	(0.3)	3.0	(1.2)
Any	86.9	(1.4)	97.9	(2.0)	94.6	(2.5)	94.5	(1.7)	88.1	(1.8)	83.5	(3.6)

A lower percentage of small operations (77.7 percent) used some form of chemical to control insects compared with medium and large operations (87.3 and 90.2 percent, respectively).

E.8.d. Percentage of operations that used some form of chemical to control insects, by size of operation:

Percent Operations

Size of Operation (number of equids)

Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
77.7	(1.4)	87.3	(1.7)	90.2	(1.6)	81.2	(1.0)

The percentage of operations that used some form of chemical insect control was similar across regions.

E.8.e. Percentage of operations that used some form of chemical to control insects, by region:

Percent

Region

West		**South Central**		**Northeast**		**Southeast**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
82.3	(2.3)	81.0	(2.1)	81.7	(1.9)	80.0	(1.9)

Over 90 percent of operations that primarily used equids for lessons/school, showing/ competition, or breeding used some form of insect control.

E.8.f. Percentage of operations that used some form of chemical to control insects, by primary use of equids:

Percent Operations

Primary Use

Pleasure		Lessons/ school		Showing/ competition not betting		Breeding		Farm/ ranch work		Other	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
79.3	(1.6)	93.0	(3.6)	90.3	(2.9)	91.6	(2.0)	77.8	(2.3)	76.2	(4.0)

9. Manure management

Composting manure has multiple benefits: it reduces the number of flies, kills parasites and other pathogens such as bacteria and viruses, reduces odors, and reduces the bulk of manure and soiled bedding. Composting manure can improve its marketability to gardeners, landscapers, topsoil companies, and nurseries. In addition, because composting converts nitrogen to a less soluble form, it is less likely that it will be “washed out” of manure and into ground or surface water.

Overall, about one-third of operations (31.7 percent) composted equine manure on the operation in the previous 12 months. A higher percentage of large operations (47.3 percent) composted equine manure than small or medium operations (28.9 and 32.6 percent, respectively).

E.9.a. Percentage of operations that composted equine manure on the operation in the previous 12 months, by size of operation:

Percent Operations

Size of Operation (number of equids)

Small (5–9)		Medium (10–19)		Large (20 or more)		All operations	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
28.9	(1.5)	32.6	(2.4)	47.3	(2.7)	31.7	(1.2)

A higher percentage of operations in the Northeast region (43.8 percent) than in the South Central and Southeast regions (21.8 and 30.1 percent, respectively) composted equine manure on the operation.

E.9.b. Percentage of operations that composted equine manure on the operation in the previous 12 months, by region:

Percent Operations							
Region							
West		South Central		Northeast		Southeast	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
36.7	(2.9)	21.8	(1.9)	43.8	(2.5)	30.1	(2.1)

A higher percentage of operations with a primary function of boarding/training (52.0 percent) composted equine manure in the previous 12 months compared with operations with a primary function of farm/ranch or residence with equids for personal use (22.7 and 32.0 percent, respectively).

E.9.c. Percentage of operations that composted equine manure on the operation in the previous 12 months, by primary function of operation:

Percent Operations											
Primary Function											
Equine boarding stable/ training		Riding stable		Equine breeding farm		Farm/ ranch		Residence with equids for personal use		Other	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
52.0	(3.7)	49.5	(7.6)	41.3	(4.4)	22.7	(1.7)	32.0	(2.0)	47.7	(7.9)

Removing manure can reduce odor, fly activity, and the potential for contaminating feed or water sources due to runoff. Using manure instead of chemical fertilizer for fields can reduce the use of nonrenewable resources. If manure is spread on fields where animals graze, it is important to compost it before application to reduce the risk of pathogen spread.

Operations may have disposed of manure by more than one method. Overall, approximately equal percentages of operations applied manure to fields where livestock (including equids) grazed (39.2 percent of operations), applied manure to fields where no livestock graze (38.7 percent), or left manure/waste bedding to nature (35.4 percent). Very few operations in any region hauled manure to a landfill. A lower percentage of operations in the Northeast region applied equine manure to fields where livestock grazed (including equids) compared with operations in the other regions. A higher percentage of operations in the Northeast region applied manure to fields where no livestock grazed compared with operations in the other regions. A lower percentage of operations in the Northeast region allowed manure/waste bedding to accumulate or left it to nature compared with operations in the other regions. A lower percentage of operations in the South Central region than in the other regions sold or gave away manure.

E.9.d. Percentage of operations by method(s) used to dispose of manure (including composted manure) in the previous 12 months, and by region:

Percent Operations

	Region									
	West		South Central		Northeast		Southeast		All operations	
Method	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Routine garbage pickup	6.5	(1.5)	3.4	(0.8)	2.7	(0.7)	3.1	(0.8)	3.8	(0.5)
Hauled to a landfill (not routine garbage pickup)	5.2	(1.3)	0.6	(0.3)	1.4	(0.5)	2.1	(0.7)	2.1	(0.4)
Hauled away, other than a landfill	14.9	(2.0)	10.0	(1.4)	17.9	(1.8)	9.0	(1.2)	12.5	(0.8)
Applied on fields on the operation where any livestock (including equids) graze	46.2	(3.0)	41.2	(2.5)	29.4	(2.3)	39.0	(2.3)	39.2	(1.3)
Applied on fields on the operation where no livestock graze	29.9	(2.8)	26.2	(2.1)	65.5	(2.3)	39.3	(2.2)	38.7	(1.2)
Manure/waste bedding allowed to accumulate or left to nature	37.5	(2.9)	41.8	(2.5)	24.8	(2.2)	34.1	(2.2)	35.4	(1.2)
Sold or gave away	21.6	(2.5)	10.4	(1.3)	29.2	(2.1)	21.7	(1.9)	19.5	(0.9)
Other	0.9	(0.4)	2.7	(0.8)	1.4	(0.6)	1.1	(0.5)	1.7	(0.3)

F. Equine Movement and Disposition of Equids Removed from Operation

1. Vehicle transportation

Equids are commonly moved from operations for competitions, breeding, sale, and pleasure, such as transporting people to trailheads on public lands. Moving equids can pose a risk of disease transmission if precautions are not taken to mitigate the risk. Understanding the scope of movement (number of trips, distance traveled, and location) can assist in planning for disease outbreak mitigation.

Overall, on 57.8 percent of operations one or more resident equids were transported off the operation by vehicle for any purpose and then returned. The percentage of operations that moved equids off the operation increased as operation size increased.

F.1.a. Percentage of operations in which any resident equids were transported off the operation by vehicle for any reason and then returned in the previous 12 months, by size of operation:

Percent Operations

Size of Operation (number of equids)

Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
51.1	(1.7)	67.8	(2.3)	78.5	(2.2)	57.8	(1.3)

A higher percentage of operations in the West region (70.0 percent) transported resident equids off the operation by vehicle compared with operations in the South Central (57.0 percent), Northeast (55.9 percent), or Southeast (50.0 percent) regions.

F.1.b. Percentage of operations in which any resident equids were transported off the operation by vehicle for any reason and then returned in the previous 12 months, by region:

Percent Operations							
Region							
West		South Central		Northeast		Southeast	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
70.0	(2.7)	57.0	(2.5)	55.9	(2.4)	50.0	(2.3)

A higher percentage of operations that primarily used equids for lessons/school (89.4 percent); showing/competition, not betting (90.7 percent); and breeding (71.6 percent) transported resident equids by vehicle for any reason compared with operations that primarily used equids for pleasure (50.7 percent), farm/ranch work (57.2 percent) or “other” (38.4 percent).

F.1.c. Percentage of operations in which any resident equids were transported off the operation by vehicle for any reason and then returned in the previous 12 months, by primary use of equids:

Percent Operations											
Primary Use											
Pleasure		Lessons/ school		Showing/ competetion, not betting		Breeding		Farm or ranch work		Other	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
50.7	(1.9)	89.4	(3.7)	90.7	(2.3)	71.6	(3.9)	57.2	(2.6)	38.4	(4.3)

For operations that transported any resident equids off the operation and had them return to the operation, about one-third transported equids a maximum one-way distance of 20 to 99 miles or 100 to 499 miles (35.7 and 35.8 percent of operations, respectively). Overall, 14.1 percent of operations transported equids a maximum one-way distance of 500 miles or more. A higher percentage of large operations (32.2 percent) transported equids a maximum one-way distance of 500 miles compared with small and medium operations (9.3 and 14.7 percent, respectively).

F.1.d. For the 57.8 percent of operations in which any resident equids were transported off the operation by vehicle for any reason and then returned in the previous 12 months (table F.1.a), percentage of operations by maximum one-way distance equids traveled, and by size of operation:

	Percent Operations							
	Size of Operation (number of equids)							
	Small (5–9)		**Medium** (10–19)		**Large** (20 or more)		**All operations**	
Distance (mi)	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
1 to 19	16.0	(1.8)	14.7	(2.3)	7.5	(1.9)	14.4	(1.2)
20 to 99	40.4	(2.4)	31.9	(3.0)	23.8	(2.6)	35.7	(1.6)
100 to 499	34.3	(2.3)	38.8	(3.1)	36.5	(3.0)	35.8	(1.6)
500 or more	9.3	(1.3)	14.7	(2.4)	32.2	(2.9)	14.1	(1.1)
Total	100.0		100.0		100.0		100.0	

For operations that transported any resident equids off the operation and had them return, the maximum one-way distance equids traveled was similar across regions, when standard errors are considered.

F.1.e. For the 57.8 percent of operations in which any resident equids were transported off the operation by vehicle for any reason and then returned in the previous 12 months (table F.1.a), percentage of operations by maximum one-way distance equids traveled, and by region:

	Percent Operations							
	Region							
	West		South Central		Northeast		Southeast	
Distance (mi)	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
1 to 19	16.2	(2.9)	13.5	(2.2)	18.5	(2.6)	9.5	(1.9)
20 to 99	28.3	(3.2)	40.2	(3.2)	36.3	(3.1)	37.0	(3.2)
100 to 499	41.0	(3.6)	31.4	(3.0)	33.7	(3.0)	38.6	(3.1)
500 or more	14.6	(2.6)	14.9	(2.0)	11.4	(1.9)	14.9	(2.2)
Total	100.0		100.0		100.0		100.0	

For operations that transported any resident equids off the operation and had them returned, the majority of operations that primarily used resident equids for pleasure or farm/ranch work transported equids a maximum one-way distance of less than 100 miles (61.0 and 57.8 percent operations, respectively). The majority of operations that used equids primarily for lessons/school, showing/competition, or breeding transported equids a maximum one-way distance of 100 miles or more.

F.1.f. For the 57.8 percent of operations in which any resident equids were transported off the operation by vehicle for any reason and then returned in the previous 12 months (table F.1.a), percentage of operations by maximum one-way distance equids traveled, and by primary use of equids:

Percent Operations

	Primary Use											
	Pleasure		**Lessons/ school**		**Showing/ competition not betting**		**Breeding**		**Farm or ranch work**		**Other**	
Distance (mi)	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
1 to 19	16.3	(2.0)	11.6	(4.4)	1.0	(0.8)	7.3	(2.6)	20.6	(3.1)	17.6	(5.1)
20 to 99	44.7	(2.7)	22.4	(5.3)	14.3	(3.3)	35.2	(4.9)	37.2	(3.6)	21.5	(5.7)
100 to 499	30.2	(2.4)	51.7	(6.5)	51.5	(4.7)	42.4	(5.1)	32.2	(3.5)	32.4	(6.9)
500 or more	8.8	(1.5)	14.3	(4.8)	33.1	(4.3)	15.1	(3.1)	10.0	(2.1)	28.5	(5.9)
Total	100.0		100.0		100.0		100.0		100.0		100.0	

For operations that transported any resident equids off the operation and had them returned, the highest percentage of operations (95.8 percent) transported equids within State. A higher percentage of operations in the Southeast region (39.5 percent) than in the West and South Central regions (23.3 and 27.4 percent, respectively) transported resident equids to an adjacent State.

F.1.g. For the 57.8 percent of operations in which any resident equids were transported off the operation by vehicle for any reason and then returned in the previous 12 months (table F.1.a) percentage of operations by destination of equids and by region:

Percent Operations

	Region									
	West		South Central		Northeast		Southeast		All operations	
Destination	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Within State	97.6	(0.9)	95.7	(1.1)	94.5	(1.5)	95.3	(1.4)	95.8	(0.6)
Adjacent State	23.3	(3.1)	27.4	(2.7)	31.4	(2.9)	39.5	(3.1)	29.7	(1.5)
Nonadjacent State	8.4	(1.8)	11.3	(1.8)	12.0	(1.8)	16.3	(2.3)	11.8	(1.0)
Canada	0.7	(0.4)	0.2	(0.2)	1.4	(0.6)	1.3	(0.7)	0.8	(0.2)
Mexico	0.0	(—)	0.2	(0.2)	0.0	(—)	0.0	(—)	0.1	(0.1)
Outside North America	0.8	(0.6)	1.0	(0.6)	0.3	(0.3)	0.4	(0.2)	0.7	(0.3)

For operations that transported any resident equids off the operation and had them returned, over half of operations that primarily used equids for showing/competition (52.2 percent) transported equids to an adjacent State, and over one-fourth (26.5 percent) transported equids to a nonadjacent State.

F.1.h. For the 57.8 percent of operations in which any resident equids were transported off the operation by vehicle for any reason and then returned in the previous 12 months (table F.1.a), percentage of operations by destination of equids and by primary use of equids:

Percent Operations

	Primary Use											
	Pleasure		Lessons/ school		Showing/ competi- tion		Breeding		Farm/ ranch work		Other	
Destination	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Within State	96.3	(0.9)	98.7	(0.9)	97.3	(1.4)	93.5	(2.2)	95.6	(1.3)	90.3	(3.7)
Adjacent State	22.2	(2.0)	38.5	(6.3)	52.2	(4.8)	39.6	(5.0)	24.4	(3.0)	35.2	(6.4)
Nonadjacent State	8.3	(1.3)	9.3	(2.9)	26.5	(3.8)	15.2	(3.0)	7.5	(1.8)	21.3	(5.2)
Canada	0.6	(0.3)	1.4	(1.0)	0.6	(0.4)	1.2	(1.2)	0.5	(0.3)	3.7	(1.9)
Mexico	0.2	(0.2)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Outside North America	0.9	(0.5)	0.0	(—)	0.0	(—)	0.4	(0.3)	1.0	(0.7)	0.7	(0.7)

For operations that transported any resident equids off the operation by vehicle for any reason and had them returned, the majority of operations (74.3 percent) made 1 to 19 trips within State. Approximately one-fourth of operations (27.1 percent) made 1 to 19 trips to an adjacent State.

F.1.i. For the 57.8 percent of operations in which any resident equids were transported off the operation by vehicle for any reason and returned in the previous 12 months (table F.1.a), percentage of operations by number of trips made and by destination:

Percent Operations

Destination

Number trips	Within State		Outside the State and to an adjacent State		Outside the State and to a non-adjacent State		Canada		Mexico		Outside North America	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
0	4.2	(0.6)	70.3	(1.5)	88.2	(1.0)	99.2	(0.2)	99.9	(0.1)	99.3	(0.3)
1 to 9	56.6	(1.7)	23.1	(1.4)	10.7	(0.9)	0.8	(0.2)	0.1	(0.1)	0.7	(0.3)
10 to 19	17.7	(1.3)	4.0	(0.6)	0.8	(0.2)	0.0	(—)	0.0	(—)	0.0	(—)
20 or more	21.5	(1.4)	2.7	(0.5)	0.3	(0.1)	0.0	(0.0)	0.0	(—)	0.0	(0.0)
Total	100.0		100.0		100.0		100.0		100.0		100.0	

2. Disposition of resident equids permanently removed from operation

Understanding the disposition of equids that permanently leave their home base can help identify trends in the industry. Overall, approximately one-fourth of operations (24.6 percent) permanently removed one or more resident equids. A higher percentage of operations in the Northeast region (30.7 percent) permanently removed one or more resident equids compared with operations in the South Central region (20.0 percent).

F.2.a. Percentage of operations that permanently removed any resident equids in the previous 12 months, by region:

Percent Operations

Region									
West		South Central		Northeast		Southeast		All operations	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
26.1	(2.5)	20.0	(1.8)	30.7	(2.1)	24.0	(1.8)	24.6	(1.0)

For operations that permanently removed any resident equids, the majority of operations (65.6 percent) sold these equids to a private party. Other common means of removal included moving resident equids to another facility (26.0 percent of operations), given to private party (22.0 percent), and sold at public auction (21.3 percent). A higher percentage of operations in the West and Southeast regions (30.7 and 32.7 percent, respectively) gave away resident equids to a private party as a means of permanent removal compared with operations in the Northeast region (8.5 percent). A lower percentage of operations in the Southeast region (9.6 percent) sold resident equids at a public auction compared with operations in the South Central and Northeast regions (30.1 and 26.3 percent, respectively).

F.2.b. For the 24.6 percent of operations that permanently removed any resident equids in the previous 12 months (table F.2.a), percentage of operations by method(s) of removal and by region:

Percent Operations

Region

	West		South Central		Northeast		Southeast		All operations	
Method	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Sold to private party	61.7	(5.4)	73.9	(4.5)	59.2	(4.0)	67.2	(4.1)	65.6	(2.3)
Given to private party	30.7	(5.0)	19.1	(4.1)	8.5	(2.0)	32.7	(4.1)	22.0	(2.0)
Donated	1.9	(1.5)	1.9	(1.2)	4.0	(1.3)	4.1	(1.5)	3.0	(0.7)
Sold at public auction	16.7	(4.1)	30.1	(4.4)	26.3	(3.7)	9.6	(2.3)	21.3	(1.9)
Sent to slaughter	1.7	(0.9)	2.2	(1.4)	4.4	(1.8)	1.2	(0.9)	2.4	(0.7)
Stolen	3.1	(1.5)	0.0	(—)	1.2	(0.7)	0.0	(—)	1.0	(0.4)
Moved to another facility	18.2	(3.9)	22.2	(4.0)	31.1	(3.4)	31.6	(3.9)	25.9	(1.9)
Other	3.8	(2.2)	0.0	(—)	2.0	(1.0)	0.0	(—)	1.4	(0.6)

The majority of permanently removed resident equids (61.8 percent) were sold to a private party or at public auction. A lower percentage of equids were given away to a private party in the Northeast and South Central regions (3.3 and 4.7 percent, respectively) than in the West and Southeast regions (20.8 and 13.1 percent, respectively). A lower percentage of permanently removed equids were sold at public auction in the Southeast region (14.2 percent) than in the South Central region (27.1 percent).

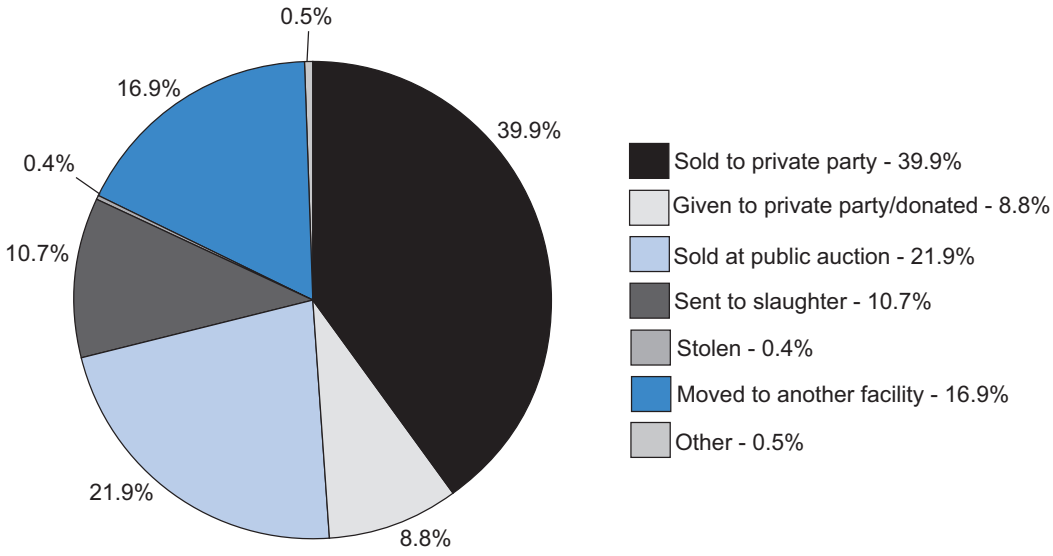
F.2.c. Percentage of permanently removed resident equids, by method of removal and by region:

Percent Equids

Region

	West		South Central		Northeast		Southeast		All operations	
Method	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Sold to private party	41.2	(5.3)	37.0	(11.4)	40.9	(3.4)	44.7	(4.1)	39.9	(5.8)
Given to private party	20.8	(6.7)	4.7	(2.1)	3.3	(0.9)	13.1	(2.0)	8.8	(2.0)
Donated	0.4	(0.3)	0.3	(0.3)	1.7	(0.6)	1.9	(0.7)	0.9	(0.2)
Sold at public auction	14.4	(4.1)	27.1	(3.2)	24.1	(4.8)	14.2	(3.0)	21.9	(2.3)
Sent to slaughter	2.5	(1.6)	21.2	(13.7)	2.6	(1.3)	0.5	(0.3)	10.7	(7.7)
Stolen	1.7	(0.9)	0.0	(—)	0.7	(0.5)	0.0	(—)	0.4	(0.2)
Moved to another facility	17.2	(4.6)	9.8	(3.8)	25.5	(4.0)	25.7	(3.4)	16.9	(2.9)
Other	1.7	(1.3)	0.0	(—)	1.3	(0.7)	0.0	(—)	0.5	(0.3)
Total	100.0		100.0		100.0		100.0		100.0	

Percentage of permanently removed resident equids, by method of removal



The reasons for change in equine ownership or location have been an ongoing interest to the equine industry. The reasons for permanently removing an equid were not mutually exclusive; for example, if an operation had multiple equids permanently leave the operation, some of these equids may have been sold for a business profit while others developed a health problem, making them no longer serviceable to the operator. Other operations may have had a change in their situation that made their equids too expensive to keep, or equids might have no longer been of use to the operation, such as when the owner became ill.

For operations that permanently removed resident equids, the majority of operations (56.5 percent) sold equids for profit. The percentages of operations by reasons for removal were similar across regions, when standard errors are considered.

F.2.d. For the 24.6 percent of operations that permanently removed any resident equids in the previous 12 months (table F.2.a), percentage of operations by reason for removal, and by region:

Percent Operations

	Region									
	West		South Central		Northeast		Southeast		All operations	
Reason	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Business profit	57.9	(5.2)	65.5	(4.8)	52.5	(4.0)	49.4	(4.4)	56.5	(2.3)
Age	8.4	(2.8)	5.9	(2.1)	10.5	(2.6)	7.8	(2.4)	8.1	(1.2)
Lameness/injury	3.8	(1.7)	8.2	(2.4)	8.6	(2.5)	4.9	(1.7)	6.5	(1.1)
Reproductive problem	0.9	(0.6)	1.3	(0.9)	1.8	(0.9)	1.6	(1.2)	1.4	(0.5)
Other illness	0.5	(0.5)	2.1	(2.0)	0.5	(0.5)	0.3	(0.3)	0.9	(0.6)
Temperament problem	12.2	(3.5)	9.1	(2.8)	5.3	(1.7)	4.8	(2.0)	7.7	(1.3)
Too expensive to keep	4.0	(2.4)	7.2	(2.5)	5.8	(2.0)	9.6	(2.6)	6.7	(1.2)
Situation changed, such as owner or children moved or owner illness	9.8	(3.3)	12.3	(3.3)	10.7	(2.5)	14.8	(3.0)	11.9	(1.5)
Boarder decided to move equid	15.8	(3.8)	11.0	(2.5)	22.5	(3.0)	21.6	(3.3)	17.7	(1.6)
Other	19.2	(4.0)	12.4	(3.5)	11.6	(2.4)	22.9	(3.8)	16.2	(1.7)

The majority of resident equids that were permanently removed from the operation (65.7 percent) were sold for business profit. A higher percentage of resident equids in the South Central region (80.9 percent) were removed for business profit than in the other regions.

F.2.e. Percentage of permanently removed resident equids, by reason for removal and by region:

Percent Equids

Region

	West		South Central		Northeast		Southeast		All operations	
Reason	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Business profit	52.5	(6.7)	80.9	(6.6)	52.3	(5.9)	53.2	(5.6)	65.7	(5.5)
Age	3.5	(1.1)	1.4	(0.7)	4.0	(1.1)	3.2	(1.1)	2.6	(0.6)
Lameness/injury	1.4	(0.5)	1.1	(0.5)	3.0	(1.0)	1.6	(0.8)	1.6	(0.4)
Reproductive problem	0.2	(0.1)	0.2	(0.1)	0.8	(0.5)	0.5	(0.4)	0.4	(0.1)
Other illness	0.1	(0.1)	0.2	(0.2)	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)
Temperament problem	3.1	(0.9)	2.2	(1.3)	2.2	(0.7)	1.2	(0.5)	2.1	(0.6)
Too expensive to keep	6.2	(4.7)	1.7	(0.9)	2.9	(1.0)	5.3	(2.0)	3.4	(1.1)
Situation changed, such as owner or children moved or owner illness	12.2	(6.4)	3.6	(1.6)	7.4	(2.0)	8.6	(2.5)	6.7	(1.7)
Boarder decided to move equid	12.6	(3.6)	6.0	(2.7)	17.0	(3.1)	17.2	(4.5)	11.2	(2.2)
Other	8.2	(2.1)	2.6	(1.1)	10.2	(3.4)	9.1	(2.2)	6.1	(1.3)
Total	100.0		100.0		100.0		100.0		100.0	

Section II: Methodology

A. Needs Assessment

Prior to each national study, NAHMS conducts a needs assessment to determine an industry's critical information gaps. For the Equine 2015 study, the needs assessment gathered input through multiple means, including reviews of the literature and equine health-related discussions held at various equine industry meetings. In addition, NAHMS conducted a survey. Responses were provided by 89 equine industry leaders and 2,435 individuals via an online questionnaire from November 2013 through January 2014. The needs assessment report is available at NAHMS Web site: http://www.aphis.usda.gov/nahms

B. Sampling

1. State selection

The goal for NAHMS national studies is to include States that account for at least 70 percent of the animal and farm populations being studied. This method helps to ensure that the representation of the sample collected and the statistical inferences made using the sample data can be generalized to the target population, but balances this scientific aim with practical budget constraints.

A total of 28 States were selected for inclusion in the study based upon each State's contribution to the total number of U.S. equine farms, number of equids, and equine density (number of horses per square mile). Twenty-one of the States were included due to high weighted averages of the number of equine operations and the number of equids in the State, while the remaining States were included based upon equine density and geographic coverage.

The 28 States represented 71.8 percent of all equids in the United States and 72.1 percent of all U.S. farms with equids (appendix II and III). The 28-State target population represented 71.6 percent of all equids on farms with 5 or more equids and 70.9 percent of farms with 5 or more equids in the United States (appendix II and III).

2. Farm selection

Equine farms were the primary sampling units in this study. The only time equine operations are directly captured by NASS is during the Census of Agriculture; thus, the NASS list frame of equine operations used for this study was based primarily on the 2012 Census of Agriculture. A farm is defined in the Census of Agriculture as being any place with $1,000 or more sales of agriculture products during the year or having at least five equids. Thus, all farms on the NASS list frame in the chosen 28 States with 5 or more equids were eligible to be included in the NAHMS sample.

A stratified random sampling design was planned and 3,997 operations were selected to be part of the sample. Stratification was based on State and size of operation from the 2012 Agricultural Census (where "size" is defined as the number of resident equids—

5 to 9, 10 to 19, and 20 or more). The total sample size was computed to achieve prespecified precision criteria while accounting for the estimated population size, design effect, and expected response rate at the 95 percent confidence level. The sample size was allocated to strata proportional to size, based upon a weighted average number of equine operations and number of equids within the strata. This sampling design allows for logistical efficiencies in administering the survey, prespecified precision for estimates, and oversampling of larger farms.

3. Population inferences

The reference population is composed of all places/operations in the NASS list frame with 5 or more equids that meet the NASS Agricultural Census definition of a farm for the 28 States. Sample data were weighted to reflect the reference population from which they were selected. Weights were created and supplied by NASS and were checked by NAHMS staff to ensure that the sum of the weights approximated the population size.

The inverse of the probability of selection (with probabilities being approximately proportional to stratum size) was used as the initial weight and then adjusted for nonresponse within State and operation size strata. Nonresponse is accounted for using an additional adjustment according to the proportion of nonrespondents within each stratum.

SUDAAN software (RTI, version 11.0.1) was used to produce population estimates and their standard errors. The SUDAAN software allows estimation of standard errors for complex sampling designs using Taylor series linearization.

C. Data Collection

Approximately 809 NASS-trained enumerators were involved in data collection for the baseline equine health descriptive report via personal interviews from April through July 2015.

D. Data Analysis and Estimation

1. Validation and estimation

Data were entered by NASS staff into a SAS data file and checked for validity. NAHMS staff independently performed data validation checks on the data set to identify consistency and statistical issues. Consistency issues include logical inconsistencies within a survey and were identified using summaries of responses to check for invalid responses (e.g., a response of ‘3’ for a 0/1 response variable); threshold checks (e.g., identifying invalid total sums of equine inventory); and if-then checks (e.g., if no equids were foals less than 6 months of age, should not report disease conditions for foals).

Statistical issues were identified via investigation of summary measures of responses for variables, and extreme outliers were investigated by data analysts and subject-matter experts. Inconsistencies were identified using SAS software, and hard copies of surveys were reviewed by data analysts and subject-matter experts. Identified inconsistencies were addressed using item-level imputation measures, if appropriate values could be logically deduced.

Summarization and estimation were performed using SUDAAN software, which accounts for the stratified sampling study design. Estimates were generated by one analyst and numbers and estimation code were reviewed by a second analyst to ensure accurate reporting of estimates.

2. Response rates

Of the 3,997 operations selected for participation, 569 were ineligible (no resident equids or out of scope). Of the 3,428 eligible operations, 66 were office holds (deliberately not contacted) and 748 were unable to be contacted. Of the 2,614 eligible operations that were contacted, 1,920 (945 + 975) provided questionnaire data. Of those, 945 operations agreed to be contacted for the second phase of the study.

Response category	Number of operations	Percent operations	Contacts	Usable[1]	Complete[2]
No resident equids on May 1, 2015, not eligible	552	13.8	X	X	
Refused	694	17.4	X		
Completed NASS interview for baseline report, signed consent for phase II	945	23.6	X	X	X
Completed NASS interview for baseline report, refused consent for phase II	975	24.4	X	X	X
Out of scope—ineligible	17	0.4			
Office hold	66	1.7			
Inaccessible	748	18.7			
Total	3,997	100.0			
Percent of total operations			79.2	61.9	48.0
Percent of total operations weighted			80.0	63.6	48.4

[1]Provided inventory data.
[2]Provided equine health data.

Appendix I: Sample Profile

A. Responding Operations

1. Size of operations

Number of resident equids[1]	Number of responding operations
5 to 9[2]	1,038
10 to 19	469
20 or more	413
Total	1,920

[1]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.
[2]Includes operations that had five or more equids per NASS list frame but could have had fewer than five equids on May 1, 2015.

2. Regions

Region	Responding operations
West (AZ, CA, CO, MT, OR, WY)	375
South Central (AR, KS, MO, OK, TX)	524
Northeast (CT, DE, MA, MD, MI, NJ, NY, OH, PA, RI, WI)	493
Southeast (AL, FL, KY, NC, TN, VA)	528
Total	1,920

3. Type of operations

Primary function of operation	Responding operations
Equine boarding stable/training	262
Riding stable	57
Rescue/rehabilitation facility	29
Equine breeding farm	174
Guest ranch	19
Farm/ranch	713
Residence with equids for personal use	650
Other	11
Not specified	5
Total	1,920

Appendix II: 2012 Census—U.S. Equine Populations

		2012 Census: Number of Equids on Farms[1]				
Region	**State**	**All**	**5–9**	**10–19**	**20 or more**	**5 or more[2]**
Northeast	CT	18,227	2,607	4,917	9,179	16,703
	DE	6,261	1,552	1,646	2,362	5,560
	MA	21,004	3,814	4,552	11,215	19,581
	MD	29,842	7,710	7,853	10,894	26,457
	MI	92,221	25,652	22,885	28,468	77,005
	NJ	28,639	6,085	6,049	13,097	25,231
	NY	93,600	19,901	22,685	39,933	82,519
	OH	121,055	34,492	33,794	33,306	101,592
	PA	129,460	36,443	37,115	37,972	111,530
	RI	2,518	474	768	947	2,189
	WI	109,226	32,030	27,269	25,948	85,247
	Total	652,053	170,760	169,533	213,321	553,614
South Central	AR	69,255	23,267	17,064	14,093	54,424
	KS	78,787	18,937	15,553	29,394	63,884
	MO	127,588	39,117	30,199	30,875	100,191
	OK	172,438	46,301	37,469	54,914	138,684
	TX	458,333	126,701	97,375	137,585	361,661
	Total	906,401	254,323	197,660	266,861	718,844
Southeast	AL	75,108	24,421	18,727	19,212	62,360
	FL	129,667	30,040	29,430	54,877	114,347
	KY	154,483	40,407	32,326	56,803	129,536
	NC	75,953	22,065	19,696	20,206	61,967
	TN	112,009	34,697	29,590	25,097	89,384
	VA	93,771	25,772	22,788	30,087	78,647
	Total	640,991	177,402	152,557	206,282	536,241
West	AZ	95,440	23,042	18,629	40,091	81,762
	CA	149,253	30,785	29,441	72,804	133,030
	CO	116,262	29,933	25,189	43,709	98,831
	MT	102,547	26,599	19,967	42,065	88,631
	OR	74,157	18,095	15,346	27,452	60,893
	WY	75,035	14,841	15,196	39,447	69,484
	Total	612,694	143,295	123,768	265,568	532,631
Total 28 States		2,812,139	745,780	643,518	952,032	2,341,330
28 States as a % of 50 States		71.8	70.9	70.7	72.8	71.6
Total U.S.		3,913,938	1,051,540	910,150	1,306,906	3,268,596

[1]Source: NASS, 2012 Census of Agriculture.

[2]Reference population.

Appendix III: 2012 Census—Number of Farms Reporting Equids

		2012 Census: Number of Farms Reporting Equids[1]				
Region	**State**	**All**	**5–9**	**10–19**	**20 or more**	**5 or more[2]**
Northeast	CT	1,698	412	359	279	1,050
	DE	713	249	127	66	442
	MA	1,849	586	340	343	1,269
	MD	3,373	1,196	596	278	2,070
	MI	12,666	4,006	1,775	833	6,614
	NJ	3,142	928	452	348	1,728
	NY	10,389	3,097	1,754	1,058	5,909
	OH	16,825	5,289	2,626	999	8,914
	PA	16,854	5,513	2,908	1,138	9,559
	RI	302	69	60	29	158
	WI	17,729	5,020	2,106	796	7,922
	Total	85,540	26,365	13,103	6,167	45,635
South Central	AR	11,531	3,654	1,339	458	5,451
	KS	11,031	2,994	1,238	612	4,844
	MO	20,634	6,170	2,359	821	9,350
	OK	25,099	7,279	2,920	1,147	11,346
	TX	71,518	19,892	7,589	3,421	30,902
	Total	139,813	39,989	15,445	6,459	61,893
Southeast	AL	10,908	3,819	1,462	550	5,831
	FL	14,522	4,666	2,272	1,265	8,203
	KY	20,248	6,345	2,528	1,318	10,191
	NC	11,274	3,482	1,523	614	5,619
	TN	17,673	5,409	2,295	712	8,416
	VA	12,870	4,010	1,760	906	6,676
	Total	87,495	27,731	11,840	5,365	44,936
West	AZ	11,428	3,662	1,472	690	5,824
	CA	15,275	4,832	2,268	1,539	8,639
	CO	14,437	4,675	1,950	1,123	7,748
	MT	12,087	4,179	1,581	982	6,742
	OR	9,940	2,844	1,184	570	4,598
	WY	6,251	2,318	1,169	690	4,177
	Total	69,418	22,510	9,624	5,594	37,728
Total 28 States		382,266	116,595	50,012	23,585	190,192
28 States as a % of 50 States		72.1	71.0	70.6	71.4	70.9
Total U.S.		530,030	164,328	70,793	33,031	268,152

[1]Source: NASS, 2012 Census of Agriculture.

[2]Reference population.

Appendix IV: Study Objectives and Related Outputs

1. Describe trends in equine care and health management for study years 1998, 2005, and 2015

- "Changes in the U.S. Equine Industry, 1998–2015," descriptive report
- "Baseline Reference of Equine Health and Management, 2015," descriptive report,
- Information Sources and Providers of Equine Health Care, 2015, information sheet
- Equine Biosecurity and Biocontainment Practices on U.S. Equine Operations, 2015, information sheet,
- Equine Mortality, 2015, information sheet
- End-of-life Planning for Equids in the United States, 2015, information sheet
- Testing for Equine Infectious Anemia in the United States, 2015, information sheet
- Equine Movement and Disposition of U.S. Equids, 2015, information sheet
- Demographics of the U.S. Equine Population, information sheet

2. Estimate the occurrence of owner-reported lameness and describe practices associated with the management of lameness

- Lameness Occurrence and Management, information sheet

3. Describe health and management practices associated with important equine infectious diseases

- "U.S. Equine Health and Selected Management Topics, 2015," descriptive report

4. Describe animal health related costs of equine ownership

- "U.S. Equine Health and Selected Management Topics, 2015," descriptive report
- Cost of equine ownership in the United States, 2015

5. Evaluate control practices for gastrointestinal parasites

- "U.S. Equine Health and Selected Management Topics, 2015," descriptive report
- Parasite Test Findings, information sheet

6. Evaluate equids for presence of ticks and describe tick-control practices used on equine operations

- "U.S. Equine Health and Selected Management Topics, 2015," descriptive report
- Tick Occurrence and Identification on Equids, 2015, information sheet

7. Collect equine sera along with equine demographic information to create a serum bank for future studies.

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