United States
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of Agriculture

Animal and
Plant Health
Inspection
Service

**Veterinary
Services**

Part II:

Baseline Reference of 1998 Equine Health and Management

National Animal Health Monitoring System **September 1998**

Acknowledgments

This report has been prepared from material received and analyzed by the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) during a nationwide study of management and animal health on equine operations.

The Equine '98 Study was a cooperative effort between State and Federal agricultural statisticians, animal health officials, university researchers, extension personnel, and equine owners and operators. We want to thank the hundreds of industry members who helped determine the direction and objectives of this study by participating in focus groups and responding to interactive Internet and telephone surveys.

Thanks also to the National Agricultural Statistics Service (NASS) enumerators and State and Federal Veterinary Medical Officers (VMO's) and Animal Health Technicians (AHT's) who visited the operations and collected the data for their hard work and dedication to the National Animal Health Monitoring System (NAHMS). The roles of the producer, Area Veterinarian in Charge (AVIC), NAHMS Coordinator, VMO, AHT, and NASS enumerator were critical in providing quality data for Equine '98 reports. Thanks also to the staff at the Centers for Epidemiology and Animal Health (CEAH) for their efforts in generating timely reports from Equine '98 data.

All participants are to be commended for their efforts, particularly the producers whose voluntary efforts made the Equine '98 Study possible.

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Part I: Table of Contents
(Provided in Part II for reader reference.)

Part II Regional Information

Part I: Regional Information

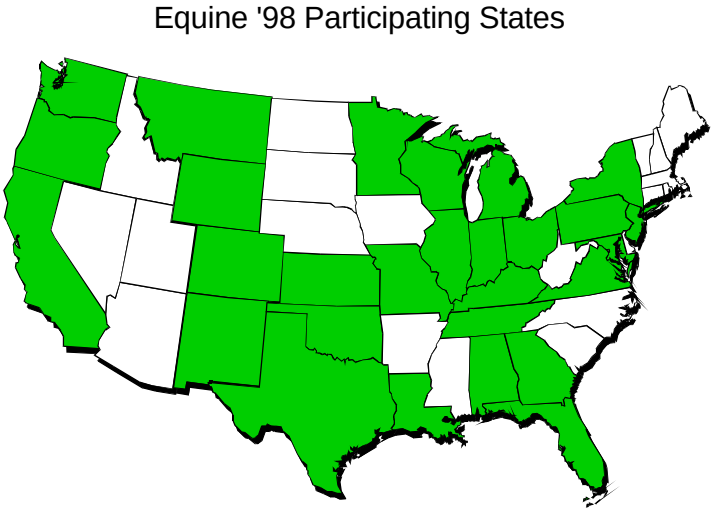
(Provided in Part II for reader reference.)

Introduction

The National Animal Health Monitoring System's (NAHMS) Equine '98 Study was designed to provide both participants and the industry with information on the nation's equine population for education and research. NAHMS is sponsored by the USDA:APHIS:Veterinary Services (VS).

NAHMS developed study objectives by exploring existing literature and contacting industry members about their informational needs and priorities. The objectives are listed inside the back cover of this report.

The USDA's National Agricultural Statistics Service (NASS) collaborated with VS to select a statistically-valid sample such that inferences can be made for all places with equids and for all equids in the 28 states. The sample provided 2,904 participating operations from 28 states for Equine '98 (see map at right). The 28-state target population represented 78.2 percent of U.S. horses and ponies and 78.0 percent of farms with horses and ponies (see Appendix II).



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Parts I and II: Baseline Reference of 1998 Equine Health and Management are the first in a series of releases documenting Equine '98 Study results. NASS enumerators collected data for these reports via a questionnaire administered on-site from March 16, 1998, through April 10, 1998. Inventory data from the 133 participating race tracks were only included in Part I, tables A.1.a through A.2.c.

Results of the Equine '98, NAHMS' first equine study and other NAHMS studies are accessible on the World Wide Web at http://www.aphis.usda.gov/vs/ceah/cahm (menu choices: National Animal Health Monitoring System and Equine).

For questions about this report or additional Equine '98 and NAHMS results, please contact:

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*Identification numbers are assigned to each graph in this report for public reference.

Terms Used in This Report

Equid: Animal of the family *Equidae*. For this study, included only domestic horses, miniature horses, ponies, mules, and donkeys/burros.

Horse: For this study, a domestic equid that was at least 14 hands tall when full grown.

N/A: Not applicable.

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

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

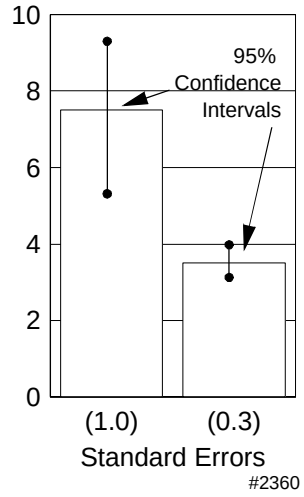
Operation average: A single value for each operation is summed over all operations reporting divided by the number of operations reporting.

Perceived cause (of illness or death): Causes of illnesses or deaths were derived from observations of clinical signs reported by participating owners/operators and not necessarily substantiated by a veterinarian or laboratory.

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

Percent equids on those operations: The total number of equids residing on an ***operation*** with a given attribute, divided by the total number of equids on all operations.

Examples of a 95% Confidence Interval



Population estimates: Averages and proportions weighted to represent the population. For this report, the reference population was all equine operations in the 28 selected States. Most of the estimates in this report are provided with a measure of variability called the ***standard error***. Chances are 95 out of 100 that the interval created by the estimate plus or minus two standard errors will contain the true population value. In the example above, an estimate of 7.5 with a standard error of 1.0 results in a range of 5.5 to 9.5 (two times the standard error above and below the estimate). The second estimate of 3.4 shows a standard error of 0.3 and results in a range of 2.8 and 4.0. Similarly, the 90 percent confidence interval would be created by multiplying the standard error by 1.65 instead of two. Most estimates in this report are rounded to the nearest tenth. If rounded to 0, the standard error was reported. If there were no reports of the event, no standard error was reported.

Ratio: The sum of one variable across all operations divided by the sum of another variable across all operations. For example, on page 13 of Part I, the sum of equids on August 1, 1997, is divided by the sum of equids on January 1, 1998. The nearer to one, the more the two variables are similar.

Resident equid: An equid that spent or was expected to spend more time at the operation than at any other operation. The operation was its home base.

Regions for NAHMS Equine '98:
-**Western**: California, Colorado, Montana, New Mexico, Oregon, Washington, and Wyoming.
-**Northeast**: New Jersey, New York, Ohio, and Pennsylvania.
-**Southern**: Alabama, Florida, Georgia, Kentucky, Louisiana, Maryland, Oklahoma, Tennessee, Texas, and Virginia.
-**Central**: Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, and Wisconsin.

Sample profile: Information that describes characteristics of the operations from which Equine '98 data were collected.

Size of operation: Size groupings based on number of equids present on January 1, 1998. Size of operation was categorized as 1-2, 3-5, 6-19, and 20 or more equids present on January 1, 1998.

Section I: Population Estimates

A. Biosecurity

1. Operation management: visiting non-resident equids

Overall, 11.2 percent of operations had at least one non-resident equid come onto the operation in 1997 and stay for fewer than 30 consecutive days. This overall percentage of operations may be an underestimation as operators may not have included non-resident equids that visited for less than 24 hours in their definition of non-resident visitors.

a. Percent of operations by number of non-resident equids that came to the operation for fewer than 30 consecutive days during 1997 and region:

Percent Operations by Region

	Southern		Northeast		Western		Central		All Operations	
Number Non-resident Equid Visitors	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
0	90.2	*(1.4)*	87.9	*(3.2)*	84.5	*(3.3)*	91.4	*(1.7)*	88.8	*(1.1)*
1-9	8.9	*(1.4)*	9.2	*(2.7)*	13.7	*(3.3)*	6.2	*(1.3)*	9.5	*(1.1)*
10 or more	0.9	*(0.2)*	2.9	*(1.7)*	1.8	*(0.5)*	2.4	*(1.2)*	1.7	*(0.4)*
Total	100.0		100.0		100.0		100.0		100.0	

As the size of the operations increased (number equids), so did the percentage of operations that had non-resident equid visitors in 1997. The percentage of operations with 10 or more non-resident visitors increased with increasing size of operation, indicating the larger the operation, the larger the number of temporary equine visitors to the operation.

b. Percent of operations by number of non-resident equids that came to the operation for fewer than 30 consecutive days during 1997 and size of operation:

Percent Operations by Size of Operation (Number Equids)

	1-2		3-5		6-19		20 or More	
Number Non-resident Equid Visitors	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
0	95.0	*(1.8)*	88.0	*(1.7)*	80.5	*(2.5)*	62.0	*(5.5)*
1-9	4.9	*(1.8)*	11.5	*(1.7)*	14.3	*(2.0)*	22.7	*(5.1)*
10 or more	0.1	*(0.1)*	0.5	*(0.3)*	5.2	*(1.7)*	15.3	*(3.5)*
Total	100.0		100.0		100.0		100.0	

Larger percentages of primarily boarding and/or training facilities (34.2 percent) and breeding farms (34.8 percent) had non-resident visitors than operations that were primarily ranches or farms or residences with equids for personal use. These percentages indicate that boarding/training facilities and breeding farms had more temporary equine traffic in 1997.

c. Percent of operations by number of non-resident equids that came to the operation for fewer than 30 consecutive days during 1997 and primary function of the operation:

Percent Operations by Primary Function of Operation

	Boarding/Training Facility		Breeding Farm		Farm/Ranch		Residence (Personal Use)		Other	
Number Non-resident Equid Visitors	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
0	65.8	*(6.7)*	65.2	*(5.9)*	91.8	*(1.3)*	91.5	*(1.6)*	79.9	*(7.3)*
1-9	22.0	*(5.4)*	29.6	*(5.9)*	7.0	*(1.1)*	8.1	*(1.6)*	10.6	*(4.5)*
10 or more	12.2	*(4.6)*	5.2	*(1.7)*	1.2	(0.7)	0.4	*(0.2)*	9.5	*(5.8)*
Total	100.0		100.0		100.0		100.0		100.0	

Larger percentages of operations that primarily used equids for showing/competition and breeding had non-resident equid visitors than did other operations.

d. Percent of operations by number of non-resident equids that came to the operation and stayed for fewer than 30 consecutive days during 1997 and primary use of equids on hand:

Percent Operations by Primary Use of Equids

	Pleasure		Showing/Competition (Not Betting)		Breeding		Racing		Farm/Ranch		Other	
Number Non-resident Equid Visitors	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error
0	92.9	*(1.4)*	73.9	*(5.8)*	65.6	*(5.9)*	90.0	*(4.2)*	87.8	*(2.2)*	81.8	*(5.9)*
1-9	6.6	*(1.4)*	17.5	*(4.9)*	27.9	*(5.6)*	8.1	*(4.0)*	9.6	*(1.8)*	17.7	*(5.9)*
10 or more	0.5	*(0.2)*	8.6	*(3.3)*	6.5	*(3.0)*	1.9	*(1.3)*	2.6	*(1.4)*	0.5	(0.2)
Total	100.0		100.0		100.0		100.0		100.0		100.0	

The health requirement choices listed in the table below were not mutually exclusive, e.g., the operation may have required both a Coggins test and vaccination of non-resident visiting equids.

More than one-third of the operations that had non-resident visitors of 30 days or less during 1997 ***always or sometimes*** required a test for equine infectious anemia (EIA, 40.8 percent), vaccination (34.3 percent), and deworming (35.0 percent) within the previous year. Nearly half (44.6 percent) of operations never had any health requirements for the majority of non-resident equid visitors.

e. For operations where non-resident equids came to the operation for fewer than 30 consecutive days during 1997, percent of operations by frequency of the following health requirements for the majority of visiting non-resident horses:

Percent Operations by Frequency

	Always		Sometimes		Never		Total
Health Requirement	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent
Official health certificate	17.1	*(3.3)*	9.6	*(3.5)*	73.3	*(4.4)*	100.0
Veterinary examination other than for health certificate	14.9	*(4.0)*	7.4	*(2.0)*	77.7	*(4.3)*	100.0
Equine infectious anemia (EIA) test, Coggins test, Swamp Fever test	30.8	*(4.2)*	10.0	*(3.8)*	59.2	*(4.9)*	100.0
Vaccination within past year	26.5	*(4.3)*	7.8	*(2.7)*	65.7	*(4.8)*	100.0
Deworming within past year	31.7	*(4.7)*	3.3	*(1.3)*	65.0	*(4.8)*	100.0
Anything else	5.0	*(1.7)*	1.2	*(0.7)*	93.8	*(1.8)*	100.0
	Always/Sometimes		Standard Error				
Any requirements	55.4		*(6.2)*		44.6	*(5.2)*	100.0

2. Operation management: additions to resident equids

Overall, 22.0 percent of operations added resident equine in 1997. A smaller percentage of operations in the Northeast region (14.8 percent) added new resident equids compared to the other regions. Overall, new equid additions were 10.3 percent of the resident equine population in 1997.

a. (B9) Percent of operations that added equids (and percent of equids added[1]) to the resident equine population during 1997, excluding births, by region:

Percent by Region

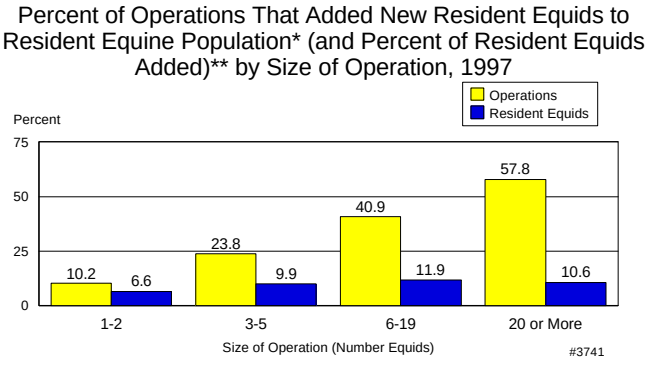
	Southern		Northeast		Western		Central		All Operations	
Percent	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Operations	19.2	*(2.1)*	14.8	*(3.1)*	25.3	*(3.0)*	28.0	*(3.9)*	22.0	*(1.5)*
Resident equids	9.3	*(1.0)*	7.4	*(1.7)*	10.1	*(0.9)*	14.2	*(3.5)*	10.3	*(0.9)*

The percentage of operations that added new resident equids increased with the size of operation (number of equids). However, as a percentage, there was no corresponding relative increase in equine inventory for larger operations.

b. (B9) Percent of operations that added new equids to the resident equine population during 1997, excluding births, (and percent of equids added[1]) by size of operation:

Percent by Size of Operation (Number Equids)

	1-2		3-5		6-19		20 or More	
Percent	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Operations	10.2	*(2.2)*	23.8	*(2.4)*	40.9	*(3.1)*	57.8	*(5.7)*
Resident equids	6.6	*(1.4)*	9.9	*(1.3)*	11.9	*(2.2)*	10.6	*(1.3)*



*Excluding births.
**Total number of equids added to resident equine population as a percent of January 1, 1998, total resident equine inventory in the 28 Equine '98 states.

1 Total number of equids added to resident equine population as a percent of January 1, 1998, total resident equine inventory in the 28 Equine '98 states.

A larger percentage of operations with a primary function of boarding and/or training added new resident equids than did operations of the other primary function categories. The new additions made up a larger percentage of the boarding/training operations' resident inventory (18.4 percent) than operations with primary functions of breeding (9.7 percent), residence with equids for personal use (8.9 percent), or farm/ranch (7.4 percent).

c. Percent of operations that added new equids to the resident equine population (and percent equids added[1]) during 1997, excluding births, by primary function of the operation:

Percent by Primary Function of Operation

	Boarding/Training Facilities		Breeding Farm		Farm/Ranch		Residence (Personal Use)		Other	
Percent	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Operations	67.8	*(6.1)*	44.6	*(5.8)*	18.1	*(2.0)*	18.1	*(2.0)*	36.0	*(10.7)*
Resident equids	18.4	*(1.7)*	9.7	*(1.7)*	7.4	*(0.8)*	8.9	*(1.1)*	18.0	*(9.3)*

For operations that added equids, more than four out of five (88.6 percent) added new resident equids from within the state, and the largest percentage of those equids added (77.7 percent) were from within the state. Few operations (0.9 percent) brought in new additions from outside the U.S. No operations reported importing equids as residents from Mexico in 1997. Extremely infrequent events such as importation of equids from Mexico may have been below the detection level of this study.

d. For operations that added new equids to the resident equine population during 1997, percent of operations that added equids to the resident equine population, excluding births, (and percent of new additions[2]) by source location:

Percent

Source Location	Operations	Standard Error	Equids[2]	Standard Error
Within state	88.6	*(1.7)*	77.7	*(3.0)*
Outside state, within United States	21.0	*(2.6)*	21.5	*(3.0)*
Canada	0.6	*(0.3)*	0.4	*(0.1)*
Mexico	0.0	--	0.0	--
Outside North America	0.3	*(0.2)*	0.2	*(0.1)*
Unknown	0.2	*(0.1)*	0.2	*(0.1)*
Total	--		100.0	

1 Total number of equids added to resident equine population as a percent of January 1, 1998, total resident equine inventory in the 28 Equine '98 states.

2 Number of equids added to resident equine population from various sources as a percent of total new additions from all sources.

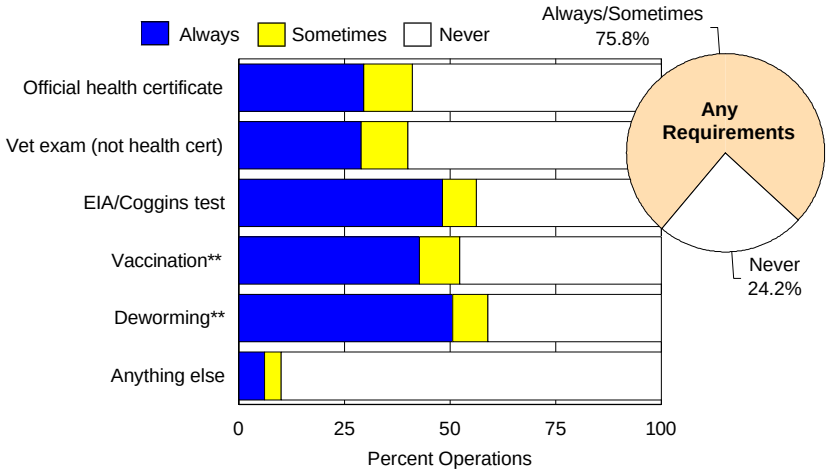
For operations that added new resident equids, over one-half never required a health certificate (58.8 percent) or veterinary examination (60.0 percent), while over one-half at least sometimes required a test for equine infectious anemia (EIA, 56.3 percent), vaccination (52.4 percent), or deworming (59.0 percent) within the previous year. Approximately one in four operations (24.2 percent) never had any requirements for new additions.

e. For operations that added new equids to the resident equine population during 1997 (excluding births), percent of operations by frequency of the following health requirements for new additions:

Percent Operations by Frequency

Health Requirement	Always Percent	Always Standard Error	Sometimes Percent	Sometimes Standard Error	Never Percent	Never Standard Error	Total Percent
Official health certificate	29.7	*(2.9)*	11.5	*(2.4)*	58.8	*(3.3)*	100.0
Veterinary examination other than for health certificate	29.0	*(3.4)*	11.0	*(2.1)*	60.0	*(3.5)*	100.0
EIA test, Coggins test, Swamp Fever test	48.2	*(3.7)*	8.1	*(2.2)*	43.7	*(3.8)*	100.0
Vaccination within past year	42.8	*(3.5)*	9.6	*(2.2)*	47.6	*(3.5)*	100.0
Deworming within past year	50.6	*(3.8)*	8.4	*(2.1)*	41.0	*(3.7)*	100.0
Anything else	6.2	*(1.5)*	3.9	*(1.7)*	89.9	*(2.2)*	100.0
	Always/Sometimes		Standard Error				
Any requirements	75.8		*(3.4)*		24.2	*(3.4)*	100.0

Percent of Operations* by Frequency of Health Requirements for New Additions, 1997



*For operations that added new resident equids to the resident inventory, (excluding births). #3742
**Previous 12 months.

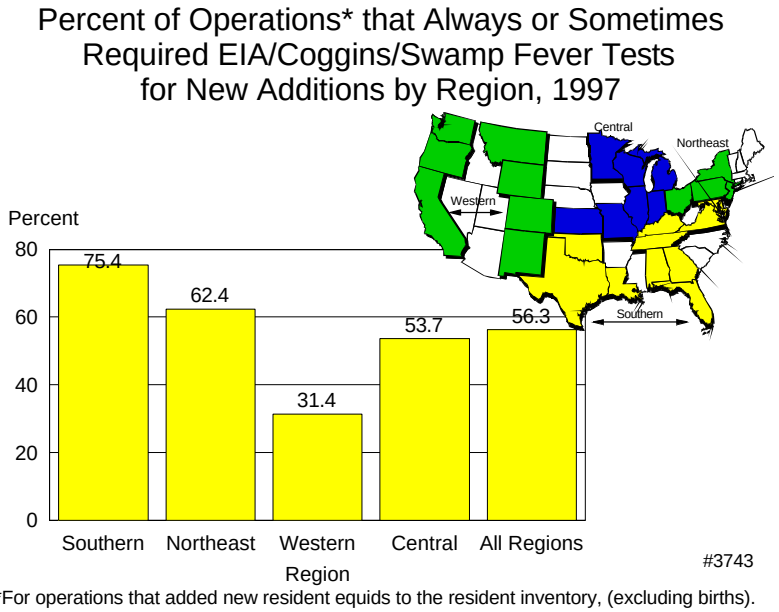
Over a third of operations in each region always or sometimes required new resident equids to have had an official health certificate and/or veterinary examination. Over one-half of operations in the Southern (75.4 percent), Northeast (62.4 percent), and Central (53.7 percent) regions required a test for EIA prior to adding a new resident equid. Approximately one-half of operations in each region required a vaccination for new resident equids within the previous year. Over one-half in each region required deworming within the previous year.

Requirements commonly specified for new resident equine additions under 'anything else' included hoof trimming or inspection of hooves/shoes; dental exam and dental work, if indicated; evaluation for behavioral problems; reproductive soundness exam or uterine culture; health history from previous owner or veterinarian; proof of ownership/brand inspection/registration papers; visual exam by the new operator/owner; liability release from the equid's owner (applicable at boarding/training facilities where the operator was not the owner of the equid to be added); insurance examination.

f. (B9c) For operations that added new equids to the resident equine population during 1997 (excluding births), percent of operations that ***always or sometime***s required the following for new additions by region:

Percent Operations by Region

	Southern		Northeast		Western		Central	
Health Requirement	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Official health certificate	42.4	*(5.5)*	47.4	*(11.0)*	33.7	*(5.9)*	45.0	*(6.9)*
Veterinary examination other than for health certificate	48.0	*(5.9)*	36.9	*(9.6)*	33.5	*(6.4)*	37.0	*(7.1)*
EIA test, Coggins test, Swamp Fever test	75.4	*(5.8)*	62.4	*(12.7)*	31.4	*(6.0)*	53.7	*(7.9)*
Vaccination within past year	49.1	*(6.1)*	56.2	*(12.1)*	55.3	*(5.9)*	52.7	*(7.1)*
Deworming within past year	54.4	*(6.3)*	58.5	*(12.2)*	59.2	*(6.0)*	64.7	*(7.3)*
Anything else	9.5	*(3.1)*	13.7	*(5.7)*	5.8	*(1.7)*	13.9	*(6.2)*
Any requirements	83.1	*(5.5)*	75.4	*(13.7)*	70.2	*(5.7)*	72.0	*(7.1)*



*For operations that added new resident equids to the resident inventory, (excluding births).

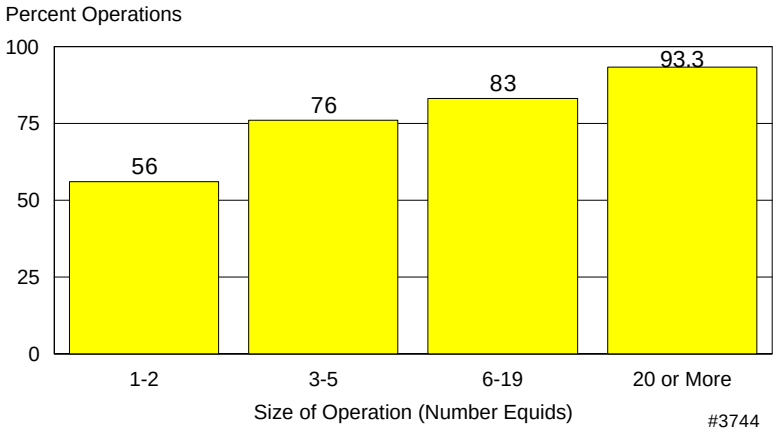
As the size of operation increased, a larger percentage of operations required an official health certificate, a veterinary examination (other than an official health certificate), and deworming within the previous year for new resident equids. Percentages of operations with at least some health requirements prior to adding a new resident equid increased with increasing size of operation.

g. For operations that added new equids to the resident equine population during 1997 (excluding births), percent of operations, that ***always or sometimes*** required the following for new additions by size of operation:

Percent Operations by Size of Operation (Number Equids)

	1-2		3-5		6-19		20 or More	
Health Requirement	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Official health certificate	31.5	*(10.3)*	31.9	*(5.1)*	49.2	*(4.4)*	69.9	*(5.7)*
Veterinary examination other than for health certificate	36.4	*(11.1)*	36.5	*(5.4)*	40.7	*(4.8)*	58.8	*(6.7)*
EIA test, Coggins test, Swamp Fever test	52.0	*(11.3)*	42.6	*(5.8)*	68.2	*(4.8)*	76.0	*(5.4)*
Vaccination within past year	44.7	*(11.2)*	51.9	*(5.8)*	50.4	*(4.4)*	77.9	*(5.2)*
Deworming within past year	39.1	*(10.9)*	61.4	*(5.6)*	64.1	*(4.8)*	74.9	*(5.7)*
Anything else	4.7	*(4.6)*	7.8	*(4.4)*	12.5	*(3.4)*	22.1	*(5.3)*
Any requirements	56.0	*(11.3)*	76.0	*(4.7)*	83.0	*(3.9)*	93.3	*(2.2)*

Percent of Operations* That ***Always*** or ***Sometimes*** Had ***Any*** Health Requirements for New Additions by Size of Operation, 1997



*For operations that added new resident equids to resident inventory, excluding births.

When adding a new equid, operations that were primarily breeding farms more frequently required a test for EIA (81.6 percent), an official health certificate (72.6 percent), and/or a veterinary examination other than for an official health certificate (55.2 percent) than operations of the other primary function categories. Breeding farms and boarding stables and/or training operations were most likely to have required vaccinations before adding new resident equids in the previous year.

h. For operations that added new equids to the resident equine population during 1997 (excluding births), percent of operations that ***always or sometimes*** required the following for new additions by primary function of operation:

Percent Operations by Primary Function of Operation

	Boarding/Training Facilities		Breeding Farm		Farm/Ranch		Residence (Personal Use)		Other	
Health Requirement	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Official health certificate	37.0	*(8.3)*	72.6	*(6.9)*	37.3	*(5.3)*	35.7	*(5.6)*	52.6	*(18.2)*
Veterinary examination other than for health certificate	28.5	*(7.3)*	55.2	*(8.3)*	32.1	*(5.3)*	43.0	*(6.0)*	48.6	*(17.4)*
EIA test, Coggins test, Swamp Fever test	70.4	*(9.2)*	81.6	*(5.7)*	45.3	*(5.7)*	52.8	*(6.1)*	59.9	*(19.8)*
Vaccination within past year	81.8	*(7.9)*	85.7	*(4.3)*	33.8	*(5.4)*	48.8	*(5.9)*	49.8	*(17.6)*
Deworming within past year	75.0	*(9.1)*	87.1	*(4.1)*	45.7	*(5.9)*	57.1	*(6.0)*	52.8	*(18.2)*
Anything else	18.3	*(7.1)*	8.3	*(3.6)*	7.9	*(2.6)*	8.7	*(4.0)*	18.0	*(9.5)*
Any requirements	95.9	*(2.1)*	95.1	*(3.1)*	63.0	*(6.1)*	75.1	*(5.2)*	67.4	*(21.3)*

Approximately one-third (34.0 percent) of all operations that added new equids routinely quarantined new arrivals, which was similar across regions. Methods used to quarantine equids were not specified.

i. For operations that added new equids to the resident equine population during 1997 (excluding births), percent of operations that routinely quarantined new arrivals by region:

Percent Operations by Region

Southern		Northeast		Western		Central		All Operations	
Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
28.6	*(4.6)*	40.0	*(10.6)*	38.5	*(6.6)*	34.9	*(6.2)*	34.0	*(3.1)*

The larger the operation, the higher the percentage of operations that routinely quarantined new arrivals.

j. For operations that added new equids to the resident equine population during 1997 (excluding births), percent of operations that routinely quarantined new arrivals by size of operation:

Percent Operations by Size of Operation (Number Equids)

1-2		3-5		6-19		20 or More	
Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
13.5	*(6.9)*	33.0	*(5.3)*	41.2	*(4.3)*	57.1	*(6.5)*

A larger percentage (64.0 percent) of breeding farms routinely quarantined new equids before adding them to the resident population than did other types of operations.

k. For operations that added new equids to the resident equine population during 1997 (excluding births), percent of operations that routinely quarantined new arrivals by primary function of the operation:

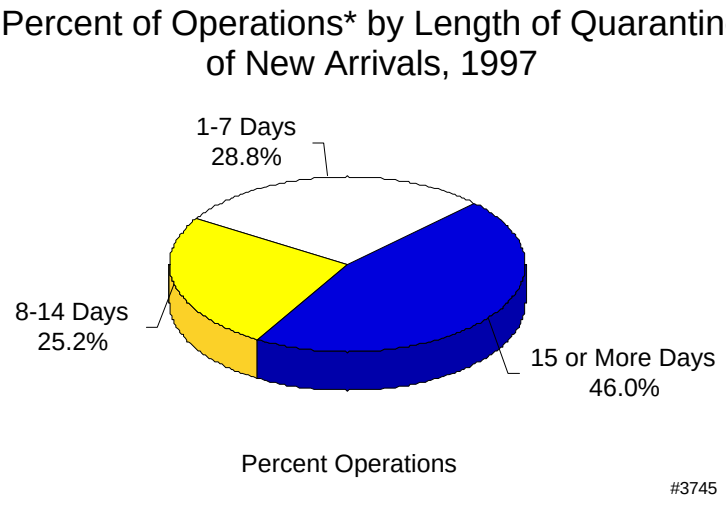
Percent Operations by Primary Function of Operation

Boarding/Training Facilities		Breeding Farm		Farm/Ranch		Residence (Personal Use)		Other	
Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
38.7	*(9.1)*	64.0	*(7.2)*	31.8	*(5.4)*	25.9	*(4.6)*	43.4	*(16.4)*

Approximately one-half (54.0 percent) of operations that quarantined newly added equids utilized a separation period of between 1 and 14 days, while the rest (46.0 percent) quarantined new equids for more than 2 weeks.

l. For operations that routinely quarantined newly added equids (excluding births), percent of operations by routine length of quarantine (in days):

Length (Days)	Percent Operations	Standard Error
1-7	28.8	*(5.4)*
8-14	25.2	*(4.2)*
15 or more	46.0	*(5.1)*
Total	100.0	



*For operations that routinely quarantined new resident equids before adding to resident inventory, excluding births.

m. For operations that routinely quarantined newly added equids, operation average routine length of quarantine (in days) of new additions:

Operation Average (Days)	Standard Error
28.5	*(5.0)*

3. Contact with other animals

Dogs and cats had physical contact with resident equids or their feed on 74.0 percent and 61.3 percent of operations, respectively, during 1997. Cattle had physical contact with resident equids or their feed on just over one-third (36.9 percent) of operations. The percentages of resident equids that had potential contact with the specific domestic animals listed parallel the percentages for operations, indicating that operation size difference was not a factor for other animal contact.

a. Percent of operations (and percent of resident equids on those operations) where the following domestic animals had physical contact with equids or their feed during 1997:

	Percent			
Animal	Operations	Standard Error	Resident Equids	Standard Error
Poultry	13.5	*(1.3)*	15.1	*(1.4)*
Pigs	2.6	*(0.5)*	3.7	*(0.7)*
Cattle	36.9	*(2.1)*	36.4	*(1.8)*
Sheep/goats	10.3	*(1.1)*	10.8	*(1.0)*
Llamas/alpacas	1.1	*(0.4)*	2.1	*(0.6)*
Emus/ostriches	1.3	*(0.8)*	1.4	*(0.4)*
Dogs	74.0	*(1.8)*	76.9	*(1.5)*
Cats	61.3	*(1.9)*	65.3	*(1.7)*
Any of the above	85.8	*(1.5)*	87.6	*(1.2)*

Overall, animals had physical contact with equids or their feed on larger percentages of operations in the Western region than in other regions. Cattle and poultry had physical contact with equids or their feed on a larger percentage of operations in the Western (47.5 and 22.8 percent, respectively) than in other regions.

b. Percent of operations where the following domestic animals had physical contact with equids or their feed during 1997 by region:

	Percent Operations by Region							
	Southern		Northeast		Western		Central	
Animal	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Poultry	11.1	*(1.7)*	12.8	*(3.7)*	22.8	*(3.1)*	8.4	*(2.0)*
Pigs	2.4	*(0.6)*	3.0	*(2.4)*	3.8	*(1.4)*	1.5	*(0.7)*
Cattle	38.3	*(3.2)*	21.1	*(4.4)*	47.5	*(5.2)*	32.1	*(4.2)*
Sheep/goats	7.7	*(1.4)*	13.1	*(4.0)*	16.4	*(2.8)*	6.7	*(1.8)*
Llamas/alpacas	0.5	*(0.2)*	0.0	*(0.0)*	3.6	*(1.5)*	0.2	*(0.2)*
Emus/ostriches	0.9	*(0.4)*	0.0	*(0.0)*	3.8	*(3.0)*	0.3	*(0.3)*
Dogs	69.6	*(2.9)*	71.4	*(4.7)*	84.7	*(2.6)*	72.4	*(4.7)*
Cats	47.3	*(2.8)*	71.8	*(4.9)*	72.3	*(3.4)*	69.6	*(4.6)*
Any of the above	83.3	*(2.3)*	84.5	*(3.7)*	91.7	*(2.0)*	84.7	*(4.4)*

B. Animal Movement

1. Vehicle transportation off operation and return

Overall, 54.6 percent of operations transported resident equids off the home operation and back by vehicle in 1997.

a. Percent of operations where any resident equids were transported by vehicle off the home operation for any purpose and returned in 1997 by region:

Percent Operations by Region

Southern		Northeast		Western		Central		All Operations	
Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
51.8	*(3.3)*	44.7	*(5.7)*	66.3	*(4.9)*	52.8	*(4.9)*	54.6	*(2.2)*

Larger percentages of operations that were primarily boarding and/or training facilities (89.4 percent) and breeding farms (84.3 percent) transported resident equids off the home operation by vehicle and returned them in 1997 than operations described by other primary functions.

b. Percent of operations where any resident equids were transported by vehicle off the home operation for any purpose and returned in 1997 by primary function of the operation:

Percent Operations by Primary Function of Operation

Boarding/Training Facilities		Breeding Farm		Farm/Ranch		Residence (Personal Use)		Other	
Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
89.4	*(6.4)*	84.3	*(4.8)*	50.8	*(3.3)*	52.8	*(3.2)*	37.7	(9.5)

Larger percentages of operations where equids were primarily for showing/competition (97.0 percent), racing (87.8 percent), and breeding (79.1 percent) transported resident equids by vehicle off the home operation and back during 1997 than operations described as primarily using equids for pleasure, farm/ranch, or other equid use.

c. Percent of operations where any resident equids were transported by vehicle off the home operation for any purpose and returned in 1997 by primary use of equids present:

Percent of Operations by Primary Use of Equids

Pleasure		Showing/Competition (Not Betting)		Breeding		Racing		Farm/Ranch		Other	
Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error
46.7	*(2.8)*	97.0	*(1.9)*	79.1	*(5.5)*	87.8	*(6.6)*	61.0	*(4.3)*	38.2	*(8.8)*

As the size of operation increased, a larger percentage of operations transported resident equids by vehicle off the home operation.

d. Percent of operations where any resident equids were transported by vehicle off the home operation for any purpose and returned in 1997 by size of operation:

Percent Operations by Size of Operation (Number Equids)

1-2		3-5		6-19		20 or More	
Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
35.4	*(3.7)*	65.3	*(2.8)*	75.8	*(2.8)*	87.9	*(3.1)*

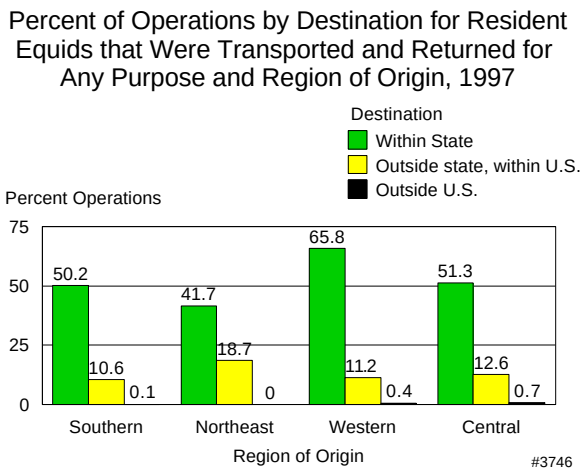
Overall, 53 percent of operations transported resident equids to a destination within the state and back to the home operation, while 12.2 percent transported resident equids to another state within the U.S. and back. Transporting was infrequent to Canada (0.3 percent of operations), Mexico (less than 0.1 percent), or outside North America (less than 0.1 percent).

The Western region had the largest percentage of operations (65.8 percent) transporting resident equids within the state compared to the other regions.

e. Percent of (all) operations by destination for resident equids that were transported by vehicle off the home operation for any purpose and returned in 1997 by region of origin:

Percent Operations by Region of Origin

	Southern		Northeast		Western		Central		All Operations	
Destination	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Within state	50.2	*(3.3)*	41.7	*(5.5)*	65.8	*(4.9)*	51.3	*(4.8)*	53.0	*(2.2)*
Outside state, within United States	10.6	*(1.5)*	18.7	*(4.2)*	11.2	*(2.1)*	12.6	*(2.3)*	12.2	*(1.1)*
Canada	0.0	*(0.0)*	0.0	*(0.0)*	0.4	*(0.3)*	0.7	*(0.4)*	0.3	*(0.1)*
Mexico	0.0	*(0.0)*	0.0	--	0.0	*(0.0)*	0.0	--	0.0	*(0.0)*
Outside North America	0.1	*(0.1)*	0.0	*(0.0)*	0.0	*(0.0)*	0.0	--	0.0	*(0.0)*



Operations transported resident equids by vehicle to sites within the state and returned them in 1997 for each of the purposes listed below, although more operations (31.3 percent) moved them within the state for riding or working than for any other reason. Overall, 15.5 percent of operations transported resident equids within the state to a veterinary hospital and returned them to the home operation.

While a total of 12.5 percent of operations transported equids out of state (Table B.1.e.), less than 7 percent of operations transported resident equids outside of the state for any single purpose, the most common reasons being riding or working or to show, race, or compete.

f. Percent of (all) operations by destination for resident equids that were transported by vehicle off the home operation for any purpose and returned during 1997 and purpose of travel:

Percent Operations by Purpose of Travel

	Riding/Working		Show/Race/Competition		Breeding		Veterinary Hospital		Other	
Destination	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Within state	31.3	*(1.9)*	20.0	*(1.5)*	8.9	*(1.0)*	15.5	*(1.7)*	5.0	*(0.9)*
Outside state, within United States	5.0	*(0.7)*	6.5	*(0.8)*	1.6	*(0.4)*	0.6	*(0.3)*	0.8	*(0.3)*
Canada	0.0	*(0.0)*	0.2	*(0.1)*	0.0	*(0.0)*	0.0	--	0.1	*(0.1)*
Mexico	0.0	--	0.0	*(0.0)*	0.0	--	0.0	--	0.0	--
Outside North America	0.0	*(0.0)*	0.0	*(0.0)*	0.0	*(0.0)*	0.0	--	0.0	*(0.0)*

Over 50 percent of operations in the Western region transported equids for riding or working which was higher than for other regions. The Southern and Western regions had higher percentages of operations that transported equids to veterinary hospitals (22.3 and 18.1 percent, respectively), while the Northeast (2.3 percent) had the lowest percentage in this destination category. Due to long distances, equids in the Southern and Western regions may have been transported to veterinarians more often, rather than having had the veterinarians visit the premises.

g. Percent of (all) operations by purpose of travel for resident equids that were transported by vehicle off the home operation for any purpose and returned during 1997 and region:

Percent Operations by Purpose of Travel

	Riding/Working		Show/Race/Competition		Breeding		Veterinary Hospital		Other	
Region	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Southern	25.9	*(2.5)*	20.0	*(2.2)*	10.9	*(1.7)*	22.3	*(2.9)*	4.1	*(0.9)*
Northeast	19.3	*(3.8)*	22.5	*(4.6)*	10.8	*(3.3)*	2.3	*(1.5)*	6.7	*(2.3)*
Western	51.0	*(4.8)*	18.5	*(2.6)*	7.0	*(1.4)*	18.1	*(4.0)*	7.8	*(2.6)*
Central	32.1	*(4.4)*	24.7	*(3.7)*	9.6	*(2.0)*	9.8	*(1.9)*	4.7	*(1.8)*
All operations	32.3	*(1.9)*	21.0	*(1.5)*	9.7	*(1.0)*	16.0	*(1.7)*	5.4	*(0.9)*

2. Number of trips

Thirty percent of operations made 1 to 99 trips with resident equids within the state by vehicle for riding/working and 19.5 percent for showing/racing/competing. Less than 2 percent of operations made 100 or more trips outside the state for any purpose during 1997.

a. Percent of (all) operations by destination, number of trips resident equids took where they left the home operation for any purpose and returned during 1997, and purpose of trip:

Percent Operations by Purpose of Trip

	Riding/Working		Show/Race/ Competition		Breeding		Veterinary Hospital		Other	
Destination/ Number Trips	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error
Within state:										
0	68.7	*(1.9)*	80.0	*(1.5)*	91.1	*(1.0)*	84.4	*(1.7)*	95.0	*(0.9)*
1-9	18.3	*(1.5)*	10.5	*(1.2)*	7.7	*(0.9)*	13.0	*(1.4)*	3.9	*(0.8)*
10-99	11.7	*(1.2)*	9.0	*(0.9)*	1.1	*(0.3)*	2.2	*(0.5)*	1.1	*(0.3)*
100 or more	1.3	*(0.4)*	0.5	*(0.2)*	0.1	*(0.0)*	0.4	*(0.3)*	0.0	*(0.0)*
Total	100.0		100.0		100.0		100.0		100.0	
Outside state, within U.S.:										
0	95.0	*(0.7)*	93.5	*(0.8)*	98.4	*(0.4)*	99.4	*(0.3)*	99.2	*(0.3)*
1-9	3.8	*(0.6)*	4.4	*(0.7)*	1.4	*(0.4)*	0.5	*(0.2)*	0.8	*(0.3)*
10-99	0.8	*(0.2)*	1.8	*(0.4)*	0.2	*(0.1)*	0.1	*(0.1)*	0.0	*(0.0)*
100 or more	0.4	*(0.3)*	0.3	*(0.2)*	0.0	*(0.0)*	0.0	*(0.0)*	0.0	*(0.0)*
Total	100.0		100.0		100.0		100.0		100.0	
Canada:										
0	100.0	*(0.0)*	99.8	*(0.1)*	100.0	*(0.0)*	100.0	*(0.0)*	99.9	*(0.1)*
1-9	0.0	*(0.0)*	0.2	*(0.1)*	0.0	*(0.0)*	0.0	--	0.1	*(0.1)*
10-99	0.0	--	0.0	*(0.0)*	0.0	--	0.0	--	0.0	--
100 or more	0.0	--	0.0	--	0.0	--	0.0	--	0.0	--
Total	100.0		100.0		100.0		100.0		100.0	

3. Distance traveled (whether or not by vehicle)

Overall in 1997, no resident equids left the operation for any purpose (whether by vehicle or other means) on 37.8 percent of operations. For another 57.1 percent of operations, resident equids left the operation and returned a maximum ***one-way*** distance of less than 500 miles. For 5.1 percent of operations, the maximum ***one-way*** distance resident equids traveled and returned was 500 or more miles.

The Western region had the largest percentage of operations where resident equids traveled and the largest percentage of operations where equids traveled 100 or more miles.

a. Percent of operations by maximum distance resident equids traveled one way (in miles) and returned during 1997 (farthest away animal got from home operation) and region:

Percent Operations by Region

Distance (Miles)	Southern Percent	Southern Standard Error	Northeast Percent	Northeast Standard Error	Western Percent	Western Standard Error	Central Percent	Central Standard Error	All Operations Percent	All Operations Standard Error
0	44.2	*(3.2)*	43.6	*(5.9)*	21.8	*(3.4)*	39.1	*(4.8)*	37.8	*(2.1)*
1-9	8.5	*(1.9)*	10.2	*(3.7)*	16.0	*(4.0)*	10.5	*(2.5)*	10.9	*(1.4)*
10-49	16.9	*(2.0)*	18.4	*(3.9)*	20.1	*(3.8)*	21.7	*(4.0)*	18.9	*(1.6)*
50-99	8.7	*(1.5)*	6.3	*(2.1)*	13.0	*(2.7)*	10.7	*(2.5)*	9.8	*(1.1)*
100-499	16.4	*(1.9)*	17.9	*(4.5)*	22.6	*(3.0)*	13.7	*(2.7)*	17.5	*(1.4)*
500 or more	5.3	*(1.0)*	3.6	*(1.2)*	6.5	*(1.6)*	4.3	*(1.3)*	5.1	*(0.6)*
Total	100.0		100.0		100.0		100.0		100.0	

Percentages of operations where no resident equid left the operation declined with increasing size of operation. As well, percentages of operations with equids traveling a maximum ***one-way*** distance of 100 miles or more increased with increasing numbers of equids.

b. Percent of operations by maximum distance resident equids traveled one way (in miles) and returned during 1997 (farthest away animal got from home operation) and size of operation:

Percent Operations by Size of Operation (Number Equids)

Distance (Miles)	1-2 Percent	1-2 Standard Error	3-5 Percent	3-5 Standard Error	6-19 Percent	6-19 Standard Error	20 or More Percent	20 or More Standard Error
0	54.5	*(3.7)*	29.3	*(2.5)*	17.0	*(2.2)*	11.2	*(2.9)*
1-9	15.7	*(2.9)*	7.1	*(1.4)*	8.1	*(1.9)*	1.3	*(1.0)*
10-49	14.2	*(2.8)*	23.4	*(2.5)*	25.1	*(2.5)*	5.5	*(1.7)*
50-99	6.8	*(1.7)*	13.4	*(1.9)*	10.5	*(1.6)*	11.7	*(3.4)*
100-499	8.2	*(2.0)*	21.9	*(2.3)*	27.9	*(2.8)*	39.1	*(5.5)*
500 or more	0.6	*(0.5)*	4.9	*(1.3)*	11.4	*(2.0)*	31.2	*(5.5)*
Total	100.0		100.0		100.0		100.0	

Operations where equids' primary use was pleasure and farm/ranch were least likely to have any equids leave the operation. Operations where the primary use was showing/competition, racing, and breeding had more trips of 100 miles or more in 1997.

c. Percent of operations by maximum distance resident equids traveled one way (in miles) and returned during 1997 (farthest away animal got from home operation) and primary use of equids on hand:

Percent Operations by Primary Use of Equids

	Pleasure		Showing/Competition (Not Betting)		Breeding		Racing		Farm/Ranch		Other	
Distance (Miles)	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error
0	44.8	*(2.8)*	3.1	*(1.9)*	17.2	*(4.5)*	6.3	*(3.8)*	30.8	*(4.3)*	49.6	*(10.3)*
1-9	12.6	*(2.0)*	0.0	*(0.0)*	6.5	*(4.2)*	9.4	*(6.3)*	11.6	*(3.5)*	3.4	*(3.2)*
10-49	17.8	*(2.1)*	8.3	*(3.0)*	10.3	*(2.9)*	9.5	*(6.9)*	32.8	*(3.8)*	18.5	*(8.1)*
50-99	9.1	*(1.4)*	9.1	*(3.7)*	21.7	*(5.7)*	7.8	*(6.6)*	8.6	*(1.8)*	12.0	*(5.1)*
100-499	13.0	*(1.6)*	57.1	*(6.3)*	29.5	*(5.4)*	44.6	*(9.7)*	13.1	*(2.7)*	13.7	*(4.9)*
500 or more	2.7	*(0.6)*	22.4	*(5.0)*	14.8	*(3.5)*	22.4	*(9.3)*	3.1	*(1.1)*	2.8	*(1.6)*
Total	100.0		100.0		100.0		100.0		100.0		100.0	

For operations where any resident equids left the home operation and returned in 1997 whether or not by vehicle, the ***average*** maximum ***one-way*** trip was 156 miles. This average distance was relatively similar across regions.

d. For operations where resident equids left and returned in 1997, operation average maximum distance resident equids traveled one way (in miles) and returned during 1997 (farthest away animal got from home operation) by region:

Operation Average (Miles) by Region

Southern		Northeast		Western		Central		All Operations	
Miles	Standard Error	Miles	Standard Error	Miles	Standard Error	Miles	Standard Error	Miles	Standard Error
167	*(17)*	154	*(28)*	160	*(22)*	134	*(19)*	156	*(11)*

As size of operation increased, so did the ***average*** maximum ***one-way*** distance traveled.

e. For operations where resident equids left and returned in 1997, operation average maximum distance resident equids traveled one way (in miles) and returned during 1997 (farthest away animal got from home premises) by size of operation:

Operation Average (Miles) by Size of Operation (Number Equids)

1-2		3-5		6-19		20 or More	
Miles	Standard Error	Miles	Standard Error	Miles	Standard Error	Miles	Standard Error
57	*(9)*	145	*(17)*	232	*(24)*	516	*(58)*

The average maximum ***one-way*** distance resident equids traveled and returned to the home operation in 1997 was greater for equids used primarily for showing/competition (369 miles), racing (348 miles), and breeding (268 miles) than for pleasure, farm/ranch, or other use.

f. For operations where resident equids left and returned in 1997, operation ***average*** maximum distance resident equids traveled one way (in miles) and returned during 1997 (farthest away animal got from home operation) by primary use of equids present:

Operation Average Distance (Miles) by Primary Use of Equids

Pleasure		Showing/Competition (Not Betting)		Breeding		Racing		Farm/Ranch		Other	
Miles	Stand. Error	Miles	Stand. Error	Miles	Stand. Error	Miles	Stand. Error	Miles	Stand. Error	Miles	Stand. Error
109	*(12)*	369	*(39)*	268	*(34)*	348	*(96)*	106	*(22)*	176	*(70)*

4. Boarding off home operation 30 days or more

Approximately one in eight operations (12.1 percent) boarded equids off the home operation for 30 days or more.

a. Percent of operations that boarded equids off the home operation for 30 or more consecutive days during 1997 and returned to the operation:

Percent Operations	Standard Error
12.1	*(1.1)*

5. Disposition of Resident Equids (Excluding Deaths)

Overall, 21.4 percent of operations had at least one resident equid permanently leave the operation, excluding deaths, while 13.4 percent of the resident equids permanently left their home operation. ***Note:*** the percentage of operations with permanent dispositions of equids was roughly the same as the percentage for operations with new additions (22.0 percent, see Table A.2.a.)

a. Percent of operations (and percent of resident equids) that had resident equids ***permanently*** leave the home operation for any reason during 1997 (excluding death):

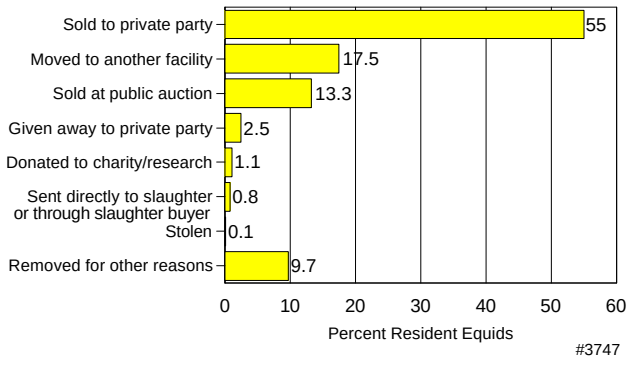
Percent Operations	Standard Error	Percent Resident Equids	Standard Error
21.4	*(1.4)*	13.4	*(1.0)*

For those resident equids that permanently left their home operations, the largest percentage were sold to a private party (55.0 percent), while 13.3 percent were sold at public auction, 17.5 percent were moved to another facility, and 9.7 percent were removed for other reasons than those listed. The Other Reasons category included many boarding or training facilities where the operators did not know the disposition.

b. For resident equids that ***permanently*** left the home operation during 1997, percent of equids by disposition:

Disposition	Percent Resident Equids	Standard Error
Sold to private party	55.0	*(3.9)*
Given away to private party	2.5	*(0.7)*
Donated to charity/research	1.1	*(0.6)*
Sold at public auction	13.3	*(2.1)*
Sent direct to slaughter or through slaughter horse buyer	0.8	*(0.3)*
Stolen	0.1	*(0.0)*
Moved to another facility	17.5	*(2.9)*
Removed for other reasons	9.7	*(4.0)*
Total	100.0	

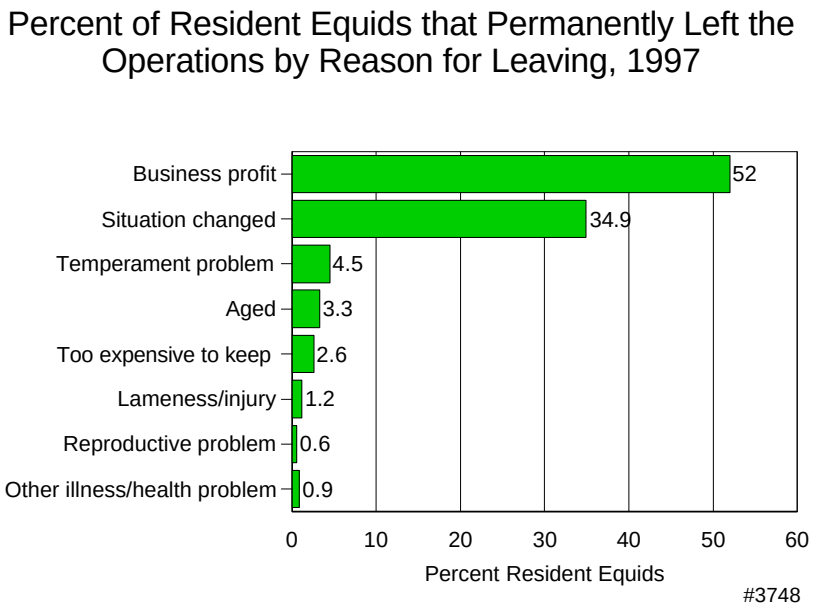
Percent of Resident Equids that Permanently Left the Operations in 1997 by Disposition



Of those resident equids that permanently left, over one-half (52.0 percent) were sold for a business profit, while just over one-third (34.9 percent) left because the owners' situations changed.

c. For resident equids that ***permanently*** left the home operation during 1997, percent of equids that left for the following reasons:

Reason	Percent Resident Equids	Standard Error
Business profit	52.0	*(4.1)*
Aged	3.3	*(0.8)*
Lameness/injury	1.2	*(0.3)*
Reproductive problem	0.6	*(0.3)*
Other illness/health problem	0.9	*(0.4)*
Temperament problem	4.5	*(1.0)*
Too expensive to keep	2.6	*(0.7)*
Situation changed (e.g., owner or children moved, owner illness)	34.9	*(4.3)*
Total	100.0	



6. Identification methods

Methods of unique equine identification were not mutually exclusive, e.g., an operation might have used both freeze brands and registration papers. The largest percentage of ***operations*** uniquely identified resident equids based on photographs, sketches, or registration papers (43.1 percent).

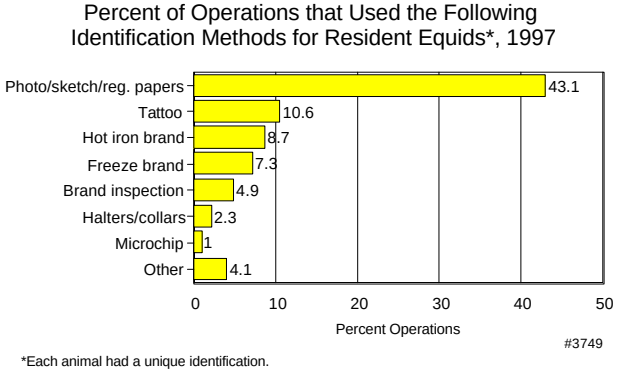
Operations in the Western region were more likely to use hot iron brands (24.0 percent) and brand inspections (19.6 percent) as equid identification methods compared to those in other regions. Microchip identification of equids was infrequently used (1.0 percent of operations overall). Microchips were used by the largest percentage (2.2 percent) of operations in the Southern region. Operations in the Western region were most likely to have unique identification for resident equids.

Hot iron branding more likely provided a operation identification than a unique equine identification. However, over three-fourths (76.6 percent) of operations that used hot iron branding also used another identification method (not shown).

a. Percent of ***operations*** that used the following animal identification methods for resident equids (each animal had a unique identification) by region:

Percent Operations by Region

	Southern		Northeast		Western		Central		All Operations	
Method	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Hot iron brand	4.3	*(1.1)*	1.3	*(0.6)*	24.0	*(3.4)*	4.9	*(1.7)*	8.7	*(1.1)*
Freeze brand	8.5	*(1.9)*	4.1	*(1.2)*	9.4	*(1.9)*	4.5	*(1.3)*	7.3	*(1.0)*
Microchip	2.2	*(0.7)*	0.0	*(0.0)*	0.6	*(0.3)*	0.0	*(0.0)*	1.0	*(0.3)*
Tattoo	6.4	*(1.1)*	18.8	*(4.1)*	14.0	*(3.0)*	10.1	*(2.6)*	10.6	*(1.2)*
Brand inspection	0.5	*(0.3)*	0.0	*(0.0)*	19.6	*(4.1)*	0.2	*(0.1)*	4.9	*(1.0)*
Photograph/sketch/ registration papers	30.9	*(3.3)*	40.8	*(5.5)*	56.8	*(5.2)*	52.5	*(4.8)*	43.1	*(2.3)*
Halters or collars with name or number	2.1	*(0.7)*	3.3	*(1.4)*	1.8	*(0.6)*	2.7	*(1.0)*	2.3	*(0.4)*
Other unique identification	4.0	*(1.2)*	3.6	*(1.4)*	4.5	*(1.4)*	4.2	*(1.5)*	4.1	*(0.7)*
At least one equid with ***no*** unique identification	67.2	*(3.4)*	70.3	*(5.2)*	50.8	*(4.9)*	63.2	*(4.6)*	62.9	*(2.2)*
No unique identification for any equids	53.9	*(3.3)*	48.4	*(6.0)*	23.8	*(4.8)*	39.2	*(4.7)*	42.9	*(2.2)*



Overall, the largest percentage (43.0 percent) of ***equids*** was identified by photo, sketch, or registration papers.

The largest percentage of equids with some form of unique identification was in the Western region (70.7 percent). The Western region also had the largest percentages of equids that were identified by hot iron brands (15.7 percent) and brand inspections (18.3 percent).

b. Percent of ***resident equids*** that were uniquely identified with the following animal identification methods (each animal had a unique identification) by region:

Percent Resident Equids by Region

	Southern		Northeast		Western		Central		All Operations	
Method	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Hot iron brand	1.4	*(0.3)*	0.5	*(0.2)*	15.7	*(2.1)*	1.7	*(0.5)*	5.1	*(0.6)*
Freeze brand	3.4	*(0.7)*	1.4	*(0.3)*	3.5	*(0.6)*	1.9	*(0.5)*	2.9	*(0.3)*
Microchip	2.1	*(0.6)*	0.0	*(0.0)*	0.2	*(0.1)*	0.0	*(0.0)*	0.9	*(0.3)*
Tattoo	6.7	*(1.3)*	8.6	*(1.6)*	5.2	*(0.8)*	5.3	*(1.1)*	6.2	*(0.6)*
Brand inspection	0.5	*(0.4)*	0.1	*(0.0)*	18.3	*(3.4)*	0.1	*(0.0)*	5.0	*(1.0)*
Photograph/sketch/ registration papers	38.2	*(3.3)*	38.9	*(3.8)*	48.9	*(3.3)*	47.5	*(4.0)*	43.0	*(1.8)*
Halters or collars with name or number	2.3	*(0.6)*	3.4	*(1.2)*	2.8	*(0.8)*	2.5	*(1.0)*	2.6	*(0.4)*
Other unique identification	3.3	*(1.1)*	3.8	*(1.8)*	3.4	*(1.1)*	3.9	*(1.5)*	3.5	*(0.7)*
No unique identification	48.2	*(2.9)*	49.2	*(4.6)*	29.3	*(2.5)*	43.6	*(3.9)*	42.4	*(1.7)*

Operations where the primary use of equids was pleasure or farm/ranch were less likely to use unique individual identification than other types of operations. Tattoos were used most commonly on operations where the primary use of equids was racing.

c. Percent of ***operations*** that used the following animal identification methods for resident equids (each animal had a unique identification) by primary use of equids:

Percent Operations by Primary Use of Equids

	Pleasure		Show/Competition		Breeding		Racing		Farm/Ranch		Other	
Method	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error
Hot iron brand	6.7	*(1.5)*	14.9	*(3.8)*	6.8	*(1.8)*	1.6	*(0.7)*	14.5	*(2.4)*	16.3	*(5.5)*
Freeze brand	4.7	*(1.0)*	15.1	*(4.1)*	15.6	*(4.2)*	1.2	*(0.5)*	12.8	*(3.5)*	7.4	*(3.8)*
Microchip	0.5	*(0.2)*	4.9	*(2.9)*	4.9	*(3.9)*	3.2	*(3.0)*	0.1	*(0.1)*	1.3	*(1.3)*
Tattoo	5.9	*(1.2)*	26.3	*(5.2)*	33.9	*(6.3)*	81.6	*(8.6)*	6.7	*(2.1)*	9.5	*(5.0)*
Brand inspection	3.7	*(1.3)*	2.4	*(1.0)*	5.5	*(2.0)*	4.2	*(3.2)*	6.6	*(1.6)*	23.1	*(8.3)*
Photograph/sketch/ registration papers	42.2	*(3.1)*	66.1	*(5.6)*	72.2	*(5.6)*	49.4	*(10.6)*	26.7	*(3.2)*	35.1	*(8.5)*
Halters or collars with name or number	2.2	*(0.6)*	3.8	*(1.3)*	6.8	*(2.8)*	3.8	*(2.4)*	0.4	*(0.3)*	1.6	*(1.4)*
Other unique identification	3.7	*(0.8)*	6.3	*(3.2)*	3.4	*(1.9)*	1.0	*(1.0)*	5.4	*(2.5)*	4.6	(2.7)
At least one equid with no unique identification	67.6	*(3.0)*	43.0	*(6.2)*	37.2	*(5.7)*	35.4	*(10.2)*	65.9	*(4.2)*	55.6	*(10.1)*
No unique identification for any equids	48.4	*(3.0)*	14.7	*(4.1)*	15.2	*(4.2)*	12.8	*(8.3)*	45.2	*(4.4)*	43.1	*(10.7)*

C. Nutrition Management

1. Source of nutrition/diet information

The largest percentage of operations (57.9 percent) considered veterinarians a ***very*** important source of equine nutrition/diet information. Farriers, feed or animal health supply store personnel, and horse magazines/reference books were each considered as ***very*** important sources for such information by over 20 percent of operations.

Other horse owners were ***very or somewhat*** important sources of equine nutrition/diet information for 60.6 percent of operations. The web/internet was not important, or was unavailable or inaccessible, to 87.6 percent of operations.

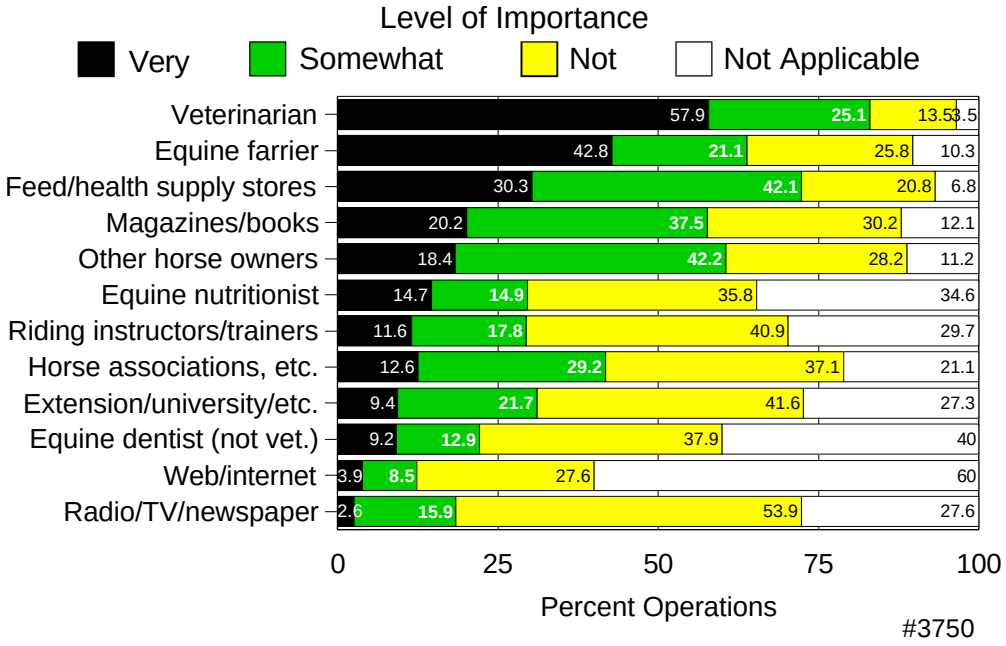
(See graph on next page.)

a. Percent of operation by importance of source of nutrition/diet information:

Percent Operations by Level of Importance

	Very Important		Somewhat Important		Not Important		Not Applicable		Total
Source	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent
Veterinarian	57.9	*(2.2)*	25.1	*(1.8)*	13.5	*(1.4)*	3.5	*(0.7)*	100.0
Equine nutritionist	14.7	*(1.4)*	14.9	*(1.5)*	35.8	*(2.0)*	34.6	*(2.1)*	100.0
Equine dentist (other than veterinarian)	9.2	*(1.0)*	12.9	*(1.3)*	37.9	*(2.0)*	40.0	*(2.2)*	100.0
Farrier	42.8	*(2.2)*	21.1	*(1.7)*	25.8	*(2.0)*	10.3	*(1.2)*	100.0
Extension agents/university or vo-ag personnel/4-H instructor	9.4	*(1.2)*	21.7	*(1.6)*	41.6	*(2.0)*	27.3	*(1.9)*	100.0
Riding instructors/ horse trainers	11.6	*(1.2)*	17.8	*(1.6)*	40.9	*(2.0)*	29.7	*(2.0)*	100.0
Other horse owners	18.4	*(1.6)*	42.2	*(2.0)*	28.2	*(1.9)*	11.2	*(1.3)*	100.0
Horse associations/ meetings/newsletters	12.6	*(1.3)*	29.2	*(1.8)*	37.1	*(2.0)*	21.1	*(1.8)*	100.0
Feed store or animal health supply store personnel	30.3	*(1.9)*	42.1	*(2.0)*	20.8	*(1.7)*	6.8	*(1.0)*	100.0
Radio/TV/newspaper	2.6	*(0.5)*	15.9	*(1.5)*	53.9	*(2.1)*	27.6	*(1.9)*	100.0
Horse magazines/ reference books	20.2	*(1.6)*	37.5	*(2.0)*	30.2	*(1.9)*	12.1	*(1.4)*	100.0
Web/internet	3.9	*(0.8)*	8.5	*(1.1)*	27.6	*(1.8)*	60.0	*(2.0)*	100.0

Percent of Operations by Importance of Sources of Equine Nutrition/Diet Information, 1997



Veterinarians were a ***very or somewhat*** important source of equine nutrition/diet information to 80 percent or more of operations in each operation size category.

The importance of equine nutritionists and dentists, Extension agent/university or vocational agriculture personnel/4-H instructor, riding instructors/horse trainers and associations, and written material in general tended to increase in importance with increasing size of operation. The web or internet was ***very or somewhat*** important as a source of nutrition/diet information to 26.6 percent of operations with 20 or more horses.

b. Percent of operation where the following information sources were ***very or somewhat important*** for nutritional/diet information by size of operation:

Percent Operations by Size of Operation (Number Equids)

	1-2		3-5		6-19		20 or More	
Source	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Veterinarian	82.0	*(2.9)*	85.4	*(1.8)*	80.0	*(2.4)*	86.6	*(3.3)*
Equine nutritionist	25.0	*(3.2)*	29.7	*(2.9)*	35.6	*(2.9)*	55.1	*(5.5)*
Equine dentist (other than veterinarian)	16.6	*(2.7)*	25.1	*(2.7)*	27.2	*(2.6)*	37.2	*(5.2)*
Farrier	59.9	*(4.0)*	69.0	*(2.5)*	64.4	*(2.7)*	63.7	*(5.2)*
Extension agents/ university or Vo-ag personnel/4-H instructor	29.5	*(3.3)*	31.2	*(2.4)*	33.0	*(2.9)*	40.2	*(5.6)*
Riding instructors/ horse trainers	23.8	*(3.3)*	33.9	*(2.6)*	32.2	*(2.9)*	43.5	*(5.5)*
Other horse owners	60.0	*(4.1)*	60.4	*(2.5)*	62.9	*(2.7)*	61.3	*(5.2)*
Horse associations/ meetings/newsletters	34.2	*(3.6)*	46.4	*(3.0)*	47.1	*(3.1)*	67.5	*(5.0)*
Feed store or animal health supply store personnel	71.3	*(3.5)*	75.2	*(2.2)*	71.5	*(2.8)*	64.2	*(5.6)*
Radio/TV/newspaper	16.1	*(2.8)*	19.9	*(2.3)*	20.1	*(2.4)*	27.0	*(4.8)*
Horse magazines/ reference books	49.5	*(3.7)*	64.9	*(2.7)*	62.1	*(3.1)*	71.3	*(5.0)*
Web/internet	10.0	*(2.3)*	15.5	*(2.2)*	9.5	*(1.7)*	26.6	*(4.5)*

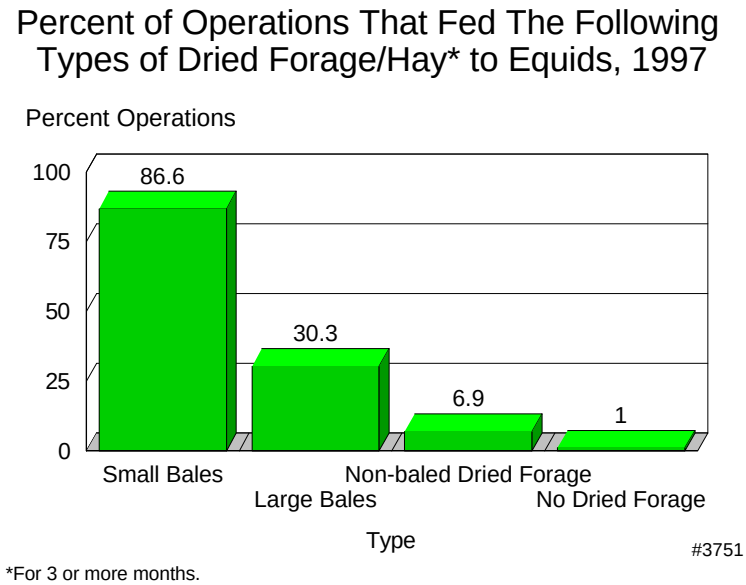
2. Dried forage fed

Types of dried forage fed shown below were not mutually exclusive and were reported as fed if the forage was fed to one or more resident equids for 3 or more months during 1997.

The largest percentage (86.6 percent) of operations fed small bales. Over one-half (54.2 percent of operations) fed grass hay, 26.9 percent fed alfalfa hay, and 35.1 percent fed grass and alfalfa mix hay from small bales. Fewer operations fed large bales (30.3 percent), and most of what they fed was grass hay (22.1 percent of operations). Only 1.0 percent of operations fed no dried forage to equids on the operation.

a. Percent of operations that fed the following types of dried forage/hay to equids for 3 or more months in 1997:

Type	Percent Operations	Standard Error
Small bales (less than 200 lbs.)	86.6	*(1.5)*
Grass hay	54.2	*(2.3)*
Alfalfa hay	26.9	*(2.1)*
Grass and alfalfa mix hay	35.1	*(2.0)*
Other (corn stalks, oat straw, etc.)	7.5	*(1.1)*
Large bales (200 lbs. or more)	30.3	*(2.0)*
Grass hay	22.1	*(1.7)*
Alfalfa hay	3.7	*(0.8)*
Grass and alfalfa mix hay	7.4	*(1.2)*
Other (corn stalks, oat straw, etc.)	2.2	*(0.7)*
Non-baled dried forage such as hay cubes	6.9	*(1.1)*
No dried forage	1.0	*(0.3)*



Types of dried forage fed shown below were not mutually exclusive and were reported if the forage was fed to one or more resident equids for at least 3 months during 1997.

Irrespective of region, the largest percentage of operations fed small bales. Alfalfa from small bales was fed by the largest percentage (51.3 percent) of operations in the Western region. Alfalfa from small bales was fed infrequently in the Southern region, either alone (18.9 percent) or mixed with grass (15.3 percent).

Larger percentages of operations in the Southern and Central regions fed large bales (37.4 percent and 36.2 percent, respectively) compared to other regions. Less than 9 percent of operations in each region fed non-baled forage such as hay cubes.

b. Percent of operations that fed the following types of dried forage/hay to equids for 3 or more months in 1997 by region:

	Percent Operations by Region							
	Southern		Northeast		Western		Central	
Type	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Small bales (less than 200 lbs.)	82.9	*(2.6)*	92.7	*(2.5)*	92.8	*(1.8)*	83.2	*(3.9)*
Grass hay	69.5	*(3.2)*	54.9	*(5.5)*	43.8	*(5.0)*	36.0	*(4.3)*
Alfalfa hay	18.9	*(2.3)*	11.7	*(3.0)*	51.3	*(5.3)*	24.7	*(4.3)*
Grass and alfalfa mix hay	15.3	*(2.0)*	53.8	*(5.6)*	40.4	*(4.2)*	55.9	*(4.7)*
Other (corn stalks, oat straw, etc.)	5.1	*(1.3)*	4.6	*(2.6)*	12.7	*(2.9)*	8.0	*(2.7)*
Large bales (200 lbs. or more)	37.4	*(3.1)*	21.1	*(4.4)*	17.5	*(3.3)*	36.2	*(4.7)*
Grass hay	34.6	*(3.1)*	14.8	*(4.4)*	6.2	*(1.3)*	19.9	*(3.5)*
Alfalfa hay	2.9	*(0.8)*	1.2	*(0.5)*	5.6	*(2.5)*	4.5	*(1.9)*
Grass and alfalfa mix hay	3.6	*(1.0)*	7.6	*(1.8)*	6.0	*(1.5)*	16.1	*(4.2)*
Other (corn stalks, oat straw, etc.)	1.9	*(0.7)*	0.0	--	4.1	*(2.5)*	1.8	*(1.0)*
Non-baled dried forage such as hay cubes	5.9	*(1.6)*	5.4	*(2.0)*	8.8	*(3.0)*	7.6	*(2.5)*
No dried forage	1.4	*(0.6)*	0.0	*(0.0)*	1.2	*(0.6)*	0.6	*(0.4)*

Overall, 33.2 percent of operations that fed dried forage fed it once per day or less, while 19.2 percent fed forage three times or more per day or continuously.

For operations that fed dried forage for 3 or more months in 1997, the number of times equids were typically fed dried forage per day was relatively consistent irrespective of the size of operation. The largest percentage of operations in each size category fed dried forage two times per day.

c. For operations that fed dried forage/hay for 3 or more months in 1997, percent of operations by number of times equids were typically fed per day and size of operation:

Percent Operations by Size of Operation (Number Equids)

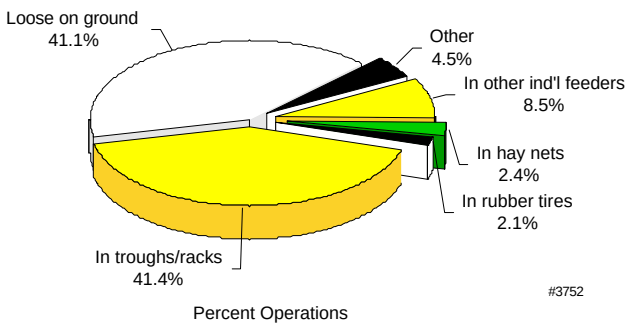
	1-2		3-5		6-19		20 or More		All Operations	
Times per Day	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Less than 1	10.0	*(1.9)*	6.7	*(1.4)*	6.8	*(1.3)*	5.9	*(2.9)*	8.1	*(1.0)*
1	25.9	*(3.3)*	25.6	*(2.5)*	23.0	*(2.5)*	20.2	*(5.0)*	25.1	*(1.8)*
2	45.4	*(3.8)*	50.7	*(2.9)*	45.1	*(3.2)*	58.5	*(5.6)*	47.6	*(2.1)*
3 or more or continuous access	18.7	*(3.3)*	17.0	*(2.1)*	25.1	*(3.2)*	15.4	*(3.1)*	19.2	*(1.8)*
Total	100.0		100.0		100.0		100.0		100.0	

The largest percentage of operations that fed dried forage for 3 or more months in 1997 usually fed hay either loose on the ground (41.1 percent) or in troughs or racks (41.4 percent).

d. For operations that fed dried forage/hay for 3 or more months in 1997, percent of operations by method that best describes where dried forage/hay was usually fed:

Method	Percent Operations	Standard Error
In troughs/racks	41.4	*(2.1)*
Loose on the ground	41.1	*(2.0)*
In other individual feeders	8.5	*(1.5)*
In rubber tires	2.1	*(2.1)*
In hay nets	2.4	*(0.6)*
Other	4.5	(0.6)
Total	100.0	

Percent of Operations* by Method Dried Forage Was Usually Fed, 1997



*For operations that fed dried forage/hay for 3 or more months in 1997.

3. Grain/carbohydrate source

Averaged across operations, 86.8 percent of grain/concentrate fed to equids was purchased in bags from a retail source. The Central region fed a larger percentage (15.0 percent) of home grown grain/concentrate to equids and less grain/concentrate that was purchased in bags from retail sources than the other regions.

Data needed to estimate *percent* of feed, the amount of grain fed, were not collected during Equine '98. However each participant provided an estimate of percent of feed from each source.

a. For operations that fed grain/concentrate in 1997, operation average percent of grain/concentrate fed in 1997 by source and region:

	Operation Average Percent by Region									
	Southern		Northeast		Western		Central		All Operations	
Source	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Purchased in bags (retail source)	95.3	*(0.9)*	81.8	*(4.2)*	90.1	*(1.8)*	70.1	*(4.4)*	86.8	*(1.3)*
Bulk delivery (retail source)	1.6	*(0.5)*	1.8	*(0.6)*	2.0	*(0.7)*	6.9	*(2.1)*	2.9	*(0.6)*
Bulk delivery (other source)	0.7	*(0.4)*	2.4	*(1.7)*	1.5	*(0.5)*	6.5	*(2.3)*	2.4	*(0.6)*
Home grown	1.4	*(0.4)*	8.6	*(2.4)*	5.3	*(1.4)*	15.0	*(3.8)*	6.2	*(1.0)*
Other	1.0	*(0.5)*	5.4	*(2.8)*	1.1	*(0.6)*	1.5	*(1.0)*	1.7	*(0.5)*
Total	100.0		100.0		100.0		100.0		100.0	

The types of grain/concentrate sources fed as shown below were not mutually exclusive, e.g., a source was reported if fed to at least one equid on the operation in 1997.

Overall, the largest percentage of operations (57.2 percent) fed equids unpelleted sweet feed with unpelleted grain as the second most commonly fed grain source (42.9 percent of operations).

The largest percentage of operations that fed no grain/concentrate source to equids in 1997 was in the Western region (11.9 percent), and the smallest percentage was in the Southern region (2.2 percent).

b. Percent of operations that fed the following grain/concentrate sources (feed type) in 1997 by region:

Percent Operations by Region

	Southern		Northeast		Western		Central		All Operations	
Source (Feed Type)	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Unpelleted sweet feed (e.g., grain mixed with molasses)	60.7	*(3.2)*	63.2	*(5.7)*	51.1	*(4.2)*	53.4	*(4.8)*	57.2	*(2.1)*
Unpelleted grain (e.g., whole or rolled oats, corn)	41.9	*(3.6)*	29.2	*(4.9)*	47.5	*(4.3)*	48.1	*(4.8)*	42.9	*(2.2)*
Geriatric feed	5.5	*(1.3)*	9.6	*(3.5)*	10.8	*(2.9)*	6.9	*(1.9)*	7.6	*(1.1)*
Complete feed pellets/cubes	21.1	*(2.2)*	17.0	*(3.8)*	20.5	*(3.7)*	13.3	*(2.9)*	18.7	*(1.5)*
Grain mix with pellets	24.3	*(2.7)*	27.7	*(5.0)*	15.6	*(3.2)*	20.9	*(3.0)*	21.9	*(1.7)*
Other	8.1	*(1.7)*	7.4	*(2.5)*	11.1	*(3.5)*	6.2	*(1.8)*	8.3	*(1.2)*
None	2.2	*(0.7)*	6.2	*(4.1)*	11.9	*(2.5)*	5.0	*(2.0)*	5.6	*(1.0)*

Nearly 83.0 percent of operations that fed grain/concentrate in 1997 stored the grain/concentrate in rodent-proof containers as reported by owners/operators.

c. For operations that fed grain/concentrate in 1997, percent of operations that stored grain/concentrate in rodent-proof containers:

Percent Operations	Standard Error
82.9	*(1.5)*

4. Winter feeding

Overall, the majority of operations typically fed equids dried forage (98.2 percent) and/or grain/concentrate (87.4 percent) in the winter. Fewer operations in the Western region (74.3 percent) fed grain/concentrate to equids in winter than in other regions.

a. Percent of operations that typically fed equids the following feed types during the winter by region:

Percent Operations by Region

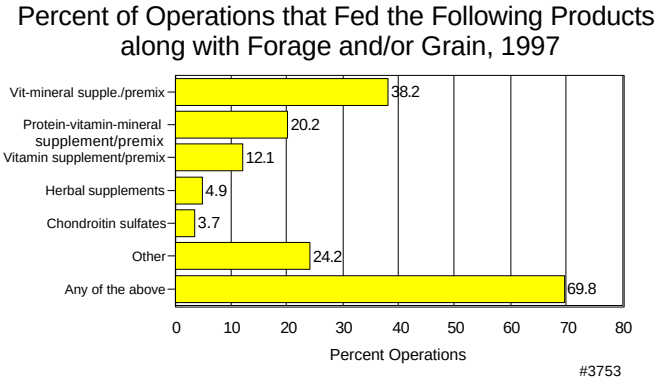
	Southern		Northeast		Western		Central		All Operations	
Feed	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Dried or baled forage	98.2	*(0.6)*	98.6	*(0.8)*	97.5	*(0.8)*	98.8	*(0.6)*	98.2	*(0.4)*
Grain/concentrate	92.4	*(1.8)*	89.8	*(4.3)*	74.3	*(3.4)*	90.6	*(2.7)*	87.4	*(1.4)*
Both	91.3	*(1.9)*	88.4	*(4.3)*	73.4	*(3.4)*	89.7	*(2.8)*	86.4	*(1.4)*

5. Supplements

Feeding of the items listed in the table below were not mutually exclusive. The supplements would have been reported if fed to one or more equids on the operation in 1997. Over one-third (38.2 percent) of operations fed a vitamin-mineral supplement/premix to equids, while 4.9 percent fed herbal supplements. Approximately 24 percent fed supplements other than those listed below.

a. Percent of operations that fed the following products along with forage and/or grain during 1997:

Supplement	Percent Operations	Standard Error
Vitamin-mineral supplement/premix	38.2	*(2.0)*
Protein-vitamin-mineral supplement/premix	20.2	*(1.4)*
Vitamin supplement/premix	12.1	*(1.3)*
Chondroitin sulfates	3.7	*(0.9)*
Herbal supplements	4.9	*(1.1)*
Other	24.2	*(1.9)*
Any of the above	69.8	*(2.1)*



6. Drinking water

Well water was the primary source of water for resident equids in 1997 for over 60 percent of operations in the Northeast, Western, and Central regions. Municipal (21.9 percent of operations) and surface water (32.9 percent) were used more frequently for resident equids in the Southern region than in other regions. No operations used bottled water.

a. Percent of operations by ***predominant*** source of drinking water for resident equids during 1997 and region:

Percent Operations by Region

	Southern		Northeast		Western		Central		All Operations	
Source	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Well	38.9	*(4.0)*	64.1	*(5.9)*	62.3	*(5.2)*	68.2	*(4.7)*	54.1	*(2.4)*
Municipal water supply	21.9	*(2.6)*	7.0	*(3.1)*	14.9	*(5.1)*	15.0	*(4.1)*	16.8	*(1.9)*
Spring	5.9	*(1.7)*	15.7	*(4.3)*	6.5	*(1.9)*	3.9	*(2.0)*	6.9	*(1.1)*
Surface water, such as pond, stream, river, or cistern	32.9	*(3.4)*	13.2	*(4.3)*	16.3	*(2.9)*	12.9	*(2.9)*	22.0	*(1.8)*
Other	0.4	*(0.2)*	0.0	*(0.0)*	0.0	--	0.0	*(0.0)*	0.2	*(0.1)*
Total	100.0		100.0		100.0		100.0		100.0	

Resident equids had continuous access to water on the vast majority of operations in the summer of 1997 and winter of 1997/1998.

b. Percent of operations where resident equids had continuous access to water at all times (24 hours a day, unfrozen) during summer 1997 and winter 1997/1998 by region:

Percent Operations by Region

	Southern		Northeast		Western		Central		All Operations	
Season	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Summer 1997	100.0	*(0.0)*	94.6	*(3.1)*	99.8	*(0.2)*	99.4	*(0.4)*	99.1	*(0.4)*
Winter 1997/1998	99.0	*(0.5)*	82.0	*(4.6)*	95.0	*(1.6)*	96.2	*(1.2)*	95.2	*(0.8)*

D. Pasture Management

1. Turnout management

The majority of operations had acreage available for equine turnout during the summer of 1997. Approximately one-half (49 percent) of operations subdivided the available acreage. The amount of time per day equids were turned out was not determined.

a. Percent of operations by availability of field or pasture for equid turnout during summer 1997 and region:

Percent Operations by Region

	Southern		Northeast		Western		Central		All Operations	
Turnout Management	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
No acreage for turnout	0.9	*(0.5)*	3.4	*(2.4)*	8.8	*(2.5)*	1.6	*(0.9)*	3.2	*(0.8)*
Turnout acreage subdivided	47.3	*(3.2)*	44.5	*(5.4)*	51.6	*(4.2)*	52.0	*(4.8)*	49.0	*(2.1)*
Turnout acreage not subdivided	51.8	*(3.1)*	52.1	*(5.8)*	39.6	*(4.2)*	46.4	*(4.8)*	47.8	*(2.1)*
Total	100.0		100.0		100.0		100.0		100.0	

On average, the maximum number of equids per acre at one time was 0.8 with a slightly higher maximum stocking density on operations that did subdivide available acreage, regardless of geographic region. Maximum stocking density was similar across regions, which is interesting since quality of pasture might vary by region. However, this information refers to turnout acreage, not necessarily pasture providing nutrition, which might explain the regional similarity.

b. For operations with turnout acreage, operation average maximum number of equids per acre at one time by turnout management practice and region:

Operation Average Maximum (Equids per Acre) by Region

	Southern		Northeast		Western		Central		All Operations	
Turnout Management	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Turnout acreage not subdivided	0.5	*(0.1)*	0.7	*(0.1)*	0.7	*(0.1)*	0.5	*(0.1)*	0.6	*(0.0)*
Turnout acreage subdivided*	0.8	*(0.1)*	1.2	*(0.2)*	1.3	*(0.1)*	1.2	*(0.1)*	1.1	*(0.1)*
All operations	0.7	*(0.1)*	0.9	*(0.1)*	1.0	*(0.1)*	0.9	*(0.1)*	0.8	*(0.0)*

* Maximum number of equids per acre at one time on the most densely stocked unit.

About two-thirds (67.7 percent) of operations had a maximum stocking density for turnout of less than one equid per acre (i.e., each equid had more than one acre for turnout). While there were operations in all regions with a maximum stocking density of three or more equids per acre, the largest percentage of operations in the Western region and the smallest in the Southern region had a maximum stocking density of three or more equids per acre.

c. For operations with turnout acres available during summer 1997, percent of operations by maximum number of equids per acre for turnout at one time and region:

Percent Operations by Region

	Southern		Northeast		Western		Central		All Operations	
Maximum Equids per Acre	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Less than 0.5	55.6	*(4.0)*	35.7	*(5.8)*	44.3	*(4.7)*	46.3	*(4.7)*	48.4	*(2.3)*
0.5 - 0.9	19.6	*(2.4)*	24.8	*(4.6)*	13.6	*(2.3)*	21.3	*(3.9)*	19.3	*(1.6)*
1.0 - 1.9	16.1	*(2.8)*	25.8	*(5.2)*	19.7	*(3.9)*	20.3	*(4.1)*	19.1	*(1.9)*
2.0 - 2.9	6.0	*(1.5)*	7.3	*(2.9)*	12.3	*(3.0)*	7.7	*(2.0)*	8.0	*(1.1)*
3 or more	2.7	*(0.8)*	6.4	*(2.1)*	10.1	*(2.9)*	4.4	*(1.3)*	5.2	*(0.8)*
Total	100.0		100.0		100.0		100.0		100.0	

The most common reason for subdividing turnout acres was to prevent overgrazing (68.4 percent of operations that subdivided turnout acres) followed by the need to segregate different groups of equids (36.5 percent of operations).

d. For operations that subdivided their turnout acreage, percent of operations by reason for subdividing acres:

Reason	Percent Operations	Standard Error
To allow segregation of different groups of equids	36.5	*(2.6)*
To prevent overgrazing	68.4	*(2.6)*
To maintain certain equids not requiring stabling	24.4	*(2.6)*
To provide quiet area for animals recovering from injury or stress	17.8	*(1.9)*
As part of a parasite control program	14.7	*(2.0)*

2. Pasture use for 3 months or more in 1997

The majority of operations (90.3 percent) used pasture (growing forage present) for 3 or more months for resident equids during 1997. The majority of resident equids (83.2 percent) were pastured for 3 or more months during 1997. The quality of pasture was not evaluated in this phase of the Equine '98 Study.

a. Percent of operations (and percent of resident equids) where any resident equids were pastured (growing forage present) for 3 or more months during 1997 by region:

Percent by Region

	Southern		Northeast		Western		Central		All Operations	
Measure	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Operations	95.9	*(0.9)*	90.4	*(3.2)*	76.0	*(5.3)*	94.8	*(1.4)*	90.3	*(1.6)*
Resident equids*	89.7	*(2.2)*	85.1	*(3.2)*	69.7	*(4.2)*	86.2	*(2.2)*	83.2	*(1.6)*

*As a percentage of August 1, 1997, inventory.

Over 27 percent of operations that pastured equids for 3 or more months did not rely on pasture to provide at least 90 percent of the roughage. This finding was similar across regions (large standard errors).

b. For operations where equids were pastured for 3 or more months during 1997, percent of operations where pasture provided at least 90 percent of the roughage for those equids while on pasture by region:

Percent Operations by Region

Southern		Northeast		Western		Central		All Operations	
Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
76.9	*(3.0)*	68.8	*(5.2)*	67.5	*(4.6)*	71.1	*(4.1)*	72.7	*(2.0)*

E. Housing Management

1. Cooling and heating methods

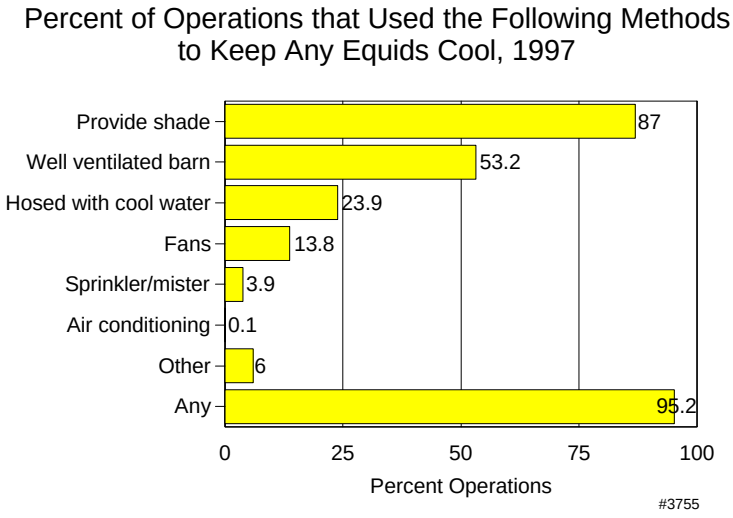
Methods of cooling equids used were not mutually exclusive. Most operations (95.2 percent) used at least one method of keeping equids cool. Providing shade (87.0 percent of operations), a well ventilated barn (53.2 percent), and/or hosing the equid with cool water (23.9 percent) were the most commonly used methods. Air conditioning was used infrequently (0.1 percent of operations).

The largest percentage of operations provided shade in each region. More operations in the Northeast region (88.0 percent) and fewer in the Western region (29.6 percent) used a well-ventilated barn as a cooling method. Fans were less frequently used in the Western region compared to other regions. Local climatic conditions potentially influence the types of cooling methods used.

a. Percent of operations that used the following methods to keep ***any*** equid ***cool*** during 1997 by region:

Percent Operations by Region

	Southern		Northeast		Western		Central		All Operations	
Method	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Well ventilated barn	53.0	*(3.5)*	88.0	*(3.2)*	29.6	*(3.9)*	58.2	*(4.7)*	53.2	*(2.2)*
Air conditioning	0.1	*(0.0)*	0.0	*(0.0)*	0.2	*(0.2)*	0.0	*(0.0)*	0.1	*(0.1)*
Fans	15.7	*(2.2)*	17.6	*(3.6)*	3.7	*(1.1)*	18.6	*(3.8)*	13.8	*(1.4)*
Hosed with cool water	23.4	*(3.4)*	25.6	*(4.1)*	21.7	*(4.0)*	26.1	*(4.0)*	23.9	*(2.0)*
Sprinkler or mister	3.6	*(0.8)*	2.3	*(1.2)*	6.7	*(1.8)*	2.4	*(1.0)*	3.9	*(0.6)*
Provide shade	85.4	*(2.2)*	88.1	*(3.9)*	86.5	*(2.5)*	89.6	*(3.4)*	87.0	*(1.4)*
Other	8.3	*(2.0)*	4.0	*(1.9)*	4.5	*(1.2)*	4.6	*(1.6)*	6.0	*(1.0)*
Any of the above	94.6	*(1.3)*	97.9	*(2.1)*	92.0	*(1.9)*	98.2	*(0.7)*	95.2	*(0.8)*



Methods used to keep equids warm were not mutually exclusive. The most commonly used methods during 1997 were increased feeding (66.0 percent of operations) and use of a shelter (barn [69.5 percent], windbreak [34.4 percent], or shed [32.6 percent]), a blanket (30.5 percent), and providing bedding (46.3 percent).

Fewer operations in the Western region used a barn as a method of providing warmth to equids in winter than did operations in other regions. Nearly 86 percent of operations in the Northeast provided bedding to keep equids warm. Few operations (7.4 percent) in the Southern region used heated drinking water as a method of providing warmth to equids. Few operations (4.5 percent) used a supplemental heat source. This practice was more common on large operations (those with 20 or more equids), especially on operations where foals were born (not shown in table).

b. Percent of operations that used the following methods to keep ***any*** equid ***warm*** during 1997 by region:

Percent Operations by Region

	Southern		Northeast		Western		Central		All Operations	
Method	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Barn	69.9	*(3.1)*	96.1	*(1.6)*	44.0	*(3.7)*	80.5	*(3.4)*	69.5	*(1.9)*
Three-sided shelter with roof	29.1	*(2.7)*	33.3	*(5.1)*	32.2	*(4.1)*	39.1	*(4.5)*	32.6	*(1.9)*
Windbreak	27.7	*(2.7)*	25.0	*(4.7)*	38.0	*(3.8)*	48.5	*(4.4)*	34.4	*(1.9)*
Supplemental heat source	6.5	*(2.3)*	2.2	*(1.0)*	1.2	*(0.5)*	5.8	*(2.2)*	4.5	*(1.1)*
Blanket	27.7	*(3.0)*	40.8	*(5.3)*	32.6	*(4.0)*	27.6	*(4.1)*	30.5	*(1.9)*
Bedding	31.6	*(3.1)*	85.9	*(3.0)*	29.4	*(3.7)*	69.0	*(3.8)*	46.3	*(2.1)*
Increased feeding	52.9	*(3.4)*	68.3	*(5.0)*	78.7	*(3.3)*	75.9	*(3.5)*	66.0	*(2.0)*
Heated drinking water	7.4	*(1.4)*	25.9	*(5.0)*	24.7	*(4.2)*	46.7	*(5.0)*	22.6	*(1.8)*
Other	4.1	*(1.4)*	0.4	*(0.3)*	2.9	*(1.3)*	1.6	*(0.7)*	2.8	*(0.7)*
Any of the above	96.3	*(1.0)*	100.0	*(0.0)*	95.2	*(1.5)*	99.7	*(0.2)*	97.3	*(0.6)*

Almost all (95.1 percent) operations provided equids with access to some type of shelter or windbreak in the winter of 1997.

c. Percent of operations (and percent of resident equids on these operations) where ***all*** resident equids present on the operation had access to shelter or a windbreak during the previous winter by region:

Percent by Region

	Southern		Northeast		Western		Central		All Operations	
Percent	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Operations	94.2	*(1.3)*	97.9	*(1.5)*	91.7	*(1.8)*	99.0	*(0.4)*	95.1	*(0.7)*
Resident equids	86.1	*(3.1)*	98.3	*(0.9)*	85.3	*(2.4)*	98.1	*(0.8)*	89.9	*(1.5)*

2. Primary housing

About one-half of operations reported the primary method of housing for the majority of resident equids as pasture with shelter. This housing method was most common across operations irrespective of season and time of day. To house the majority of resident equids on winter nights, nearly one-fourth of operations used stalls only.

a. Percent of operations by primary housing method for the majority of resident equids and season:

Percent Operations by Season

	Winter Day		Winter Night		Summer Day		Summer Night	
Housing Method	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Stalls only	11.0	*(1.2)*	23.5	*(1.6)*	8.8	*(1.0)*	11.4	*(1.2)*
Stalls with runs	9.0	*(1.3)*	8.5	*(1.3)*	6.8	*(1.2)*	7.1	*(1.3)*
Drylot paddock only	1.6	*(0.5)*	1.0	*(0.3)*	1.9	*(0.5)*	1.6	*(0.5)*
Drylot paddock with shelter	8.8	*(1.3)*	8.1	*(1.3)*	5.4	*(1.1)*	5.4	*(1.1)*
Pasture only	16.0	*(1.3)*	11.7	*(1.2)*	20.4	*(1.6)*	19.7	*(1.5)*
Pasture with shelter	52.2	*(2.2)*	46.3	*(2.1)*	55.4	*(2.1)*	53.6	*(2.1)*
Other	1.4	*(0.5)*	0.9	*(0.3)*	1.3	*(0.5)*	1.2	*(0.5)*
Total	100.0		100.0		100.0		100.0	

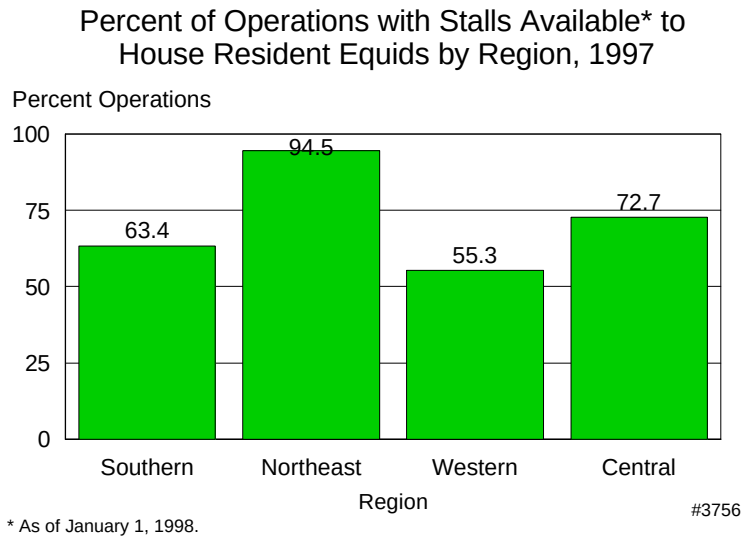
3. Stall housing

Stalls were available on two-thirds of operations (67.6 percent). The Northeast region had the largest percentage of operations with stalls.

a. Percent of ***operations*** with any stalls available as of January 1, 1998, to house resident equids by region:

Percent Operations by Region

Southern		Northeast		Western		Central		All Operations	
Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
63.4	*(3.4)*	94.5	*(1.9)*	55.3	*(4.3)*	72.7	*(3.8)*	67.6	*(1.9)*



Approximately one-half of operations (48.9 percent) housed at least one resident equine in stalls during the winter of 1997/1998. The smallest percentage of operations using stalls to house equids in either summer or winter were in the Western region. The Northeast region had the largest regional percentage of operations using stalls to house equids for both summer and winter.

b. Percent of operations that housed any resident equids in stalls on the operation during 1997 by season and region:

Percent Operations by Region

	Southern		Northeast		Western		Central		All Operations	
Season	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Summer 1997	38.2	*(2.9)*	61.5	*(5.7)*	27.8	*(3.4)*	42.1	*(4.7)*	39.6	*(2.0)*
Winter 1997/1998	44.8	*(3.0)*	78.9	*(4.3)*	32.1	*(3.4)*	56.9	*(4.4)*	48.9	*(2.0)*

Almost three-fourths of operations (71.3 percent) that had stalls available to house resident equids had at least one stall available per resident equid present on January 1, 1998 (i.e., one or less equids per stall), while 5.6 percent of operations had three or more equids per stall. Operations may have provided an alternative shelter as well.

c. For operations that had stalls available to house resident equids on January 1, 1998, percent of operations by number of resident equids present on the operation on January 1, 1998, per stall available:

Number Equids per Stall	Percent Operations	Standard Error
Less than one	32.7	*(2.4)*
1.0	38.6	*(2.6)*
1.1-2.9	23.1	*(1.8)*
3.0 or more	5.6	*(0.8)*
Total	100.0	

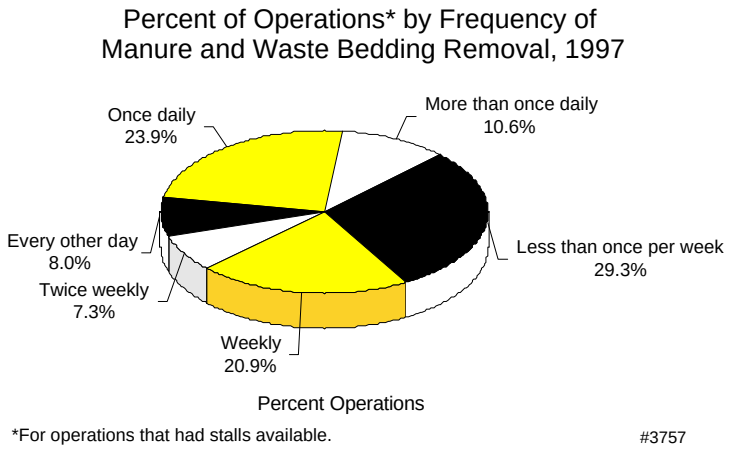
F. Bedding and Manure Management

Approximately one-third (34.5 percent) of operations cleaned stalls once a day or more often, while approximately one-half (50.2 percent) cleaned them weekly or less often. Perhaps the frequency of stall cleaning was related to how much time equids occupied the stalls. On some operations, equids may only be in stalls a few hours per day or only during inclement weather.

1. Removal from stalls

a. For operations that had stalls available to house resident equids on January 1, 1998, percent of operations by frequency of manure and waste bedding removal:

Frequency	Percent Operations	Standard Error
More than once daily	10.6	*(1.6)*
Once daily	23.9	*(1.9)*
Every other day	8.0	*(1.3)*
Twice weekly	7.3	*(1.4)*
Weekly	20.9	*(2.1)*
Less than once per week	29.3	*(2.3)*
Total	100.0	



The majority (72.1 percent) of operations always removed equids from stalls during manure removal and rebedding activity on operations that used stalls in 1997.

b. For operations that had stalls available to house resident equids on January 1, 1998, percent of operations by how frequently equids were removed from the stalls prior to manure removal and/or rebedding:

Frequency	Percent Operations	Standard Error
Always	72.1	*(2.1)*
Most of the time	13.5	*(1.4)*
Sometimes	7.1	*(1.1)*
Never	7.3	*(1.5)*
Total	100.0	

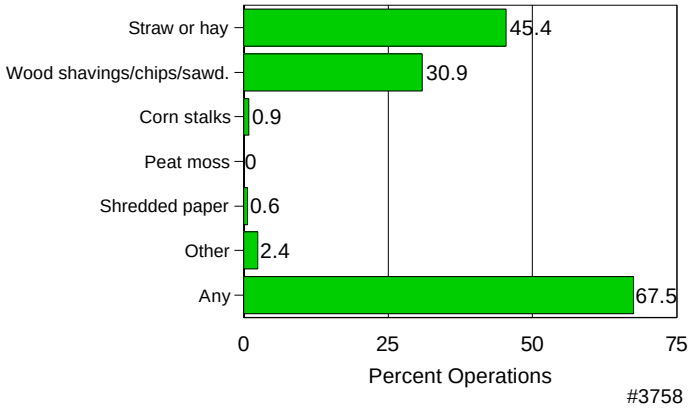
2. Bedding Type

Two-thirds (67.5 percent) of operations used bedding. The most commonly used bedding for equids in 1997 was straw or hay (45.4 percent of all operations) followed by wood shavings (30.9 percent). Corn stalks (0.9 percent), shredded paper (0.6 percent), and peat moss (<0.1 percent) were infrequently used as equine bedding in 1997. More than one bedding type may have been used on an operation.

a. Percent of operations by bedding type used for equids during 1997:

Bedding Type	Percent Operations	Standard Error
Straw or hay	45.4	*(2.2)*
Wood shavings, chips, or sawdust	30.9	*(1.8)*
Corn stalks	0.9	*(0.4)*
Peat moss	0.0	*(0.0)*
Shredded paper	0.6	*(0.3)*
Other	2.4	*(0.6)*
Any	67.5	*(1.9)*

Percent of Operations by Bedding Type(s) Used for Equids, 1997



For operations that use bedding, the predominant bedding type in all regions was straw or hay (57.7 percent) followed by wood shavings, chips, or sawdust (39.3 percent).

b. For operations that used bedding for equids during 1997, percent of operations by ***predominant*** bedding type used and region:

Percent Operations by Region

	Southern		Northeast		Western		Central		All Operations	
Bedding Type	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Straw or hay	52.9	*(4.5)*	58.1	*(5.7)*	59.2	*(4.9)*	62.2	*(4.8)*	57.7	*(2.5)*
Wood shavings, chips, or sawdust	44.8	*(4.5)*	39.6	*(5.6)*	35.3	*(5.9)*	35.1	*(4.7)*	39.3	*(2.6)*
Corn stalks	0.0	*(0.0)*	0.0	*(0.0)*	0.0	*(0.0)*	0.3	*(0.3)*	0.1	*(0.1)*
Peat moss	0.0	*(0.0)*	0.0	*(0.0)*	0.0	*(0.0)*	0.0	*(0.0)*	0.0	*(0.0)*
Shredded paper	0.0	*(0.0)*	2.3	*(2.3)*	0.0	*(0.0)*	0.2	*(0.2)*	0.5	*(0.4)*
Other	2.3	*(1.0)*	0.0	*(0.0)*	5.5	*(2.8)*	2.2	*(1.4)*	2.4	*(0.8)*
Total	100.0		100.0		100.0		100.0		100.0	

Each of the reasons for selecting bedding type listed in the table below (except other) were ***very*** or ***somewhat*** important on at least one-half of the operations. Availability of bedding was most often listed as ***very*** important (67.4 percent of operations).

c. For operations that used bedding for equids during 1997, percent of operations by importance of reason for selecting bedding type:

Percent Operations by Level of Importance

	Very Important		Somewhat Important		Not Important		Total
Reason	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent
Type of flooring	29.5	*(2.3)*	22.1	*(1.9)*	48.4	*(2.5)*	100.0
Ease of removing waste bedding and manure	53.2	*(2.5)*	21.3	*(1.9)*	25.5	*(2.4)*	100.0
Cost of bedding	48.8	*(2.5)*	24.6	*(2.1)*	26.6	*(2.2)*	100.0
Use or health of equids	43.8	*(2.5)*	29.4	*(2.4)*	26.8	*(2.4)*	100.0
Availability of bedding	67.4	*(2.3)*	19.9	*(1.9)*	12.7	*(1.7)*	100.0
Appearance/smell of bedding	31.8	*(2.1)*	28.3	*(2.3)*	39.9	*(2.5)*	100.0
Traditional use of bedding	34.2	*(2.5)*	24.4	*(2.2)*	41.4	*(2.6)*	100.0
Ease of recycling	30.2	*(2.3)*	24.4	*(2.2)*	45.4	*(2.7)*	100.0
Other	2.8	*(0.7)*	2.4	*(0.7)*	94.8	*(1.0)*	100.0

3. Disposal methods for manure and/or waste bedding

Overall, over one-third (36.4 percent) of operations composted equine manure and bedding on the operation during 1997. (Material composted off the operation would not be included here.)

a. Percent of operations that composted equine manure or waste bedding during 1997 by region:

Percent Operations by Region

	Southern		Northeast		Western		Central		All Operations	
Frequency	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Usually	19.6	*(2.5)*	30.6	*(5.7)*	29.0	*(4.8)*	23.7	*(4.4)*	24.2	*(2.0)*
Sometimes	10.7	*(1.8)*	18.0	*(4.8)*	13.5	*(2.9)*	10.3	*(2.7)*	12.2	*(1.3)*
Never	66.0	*(2.9)*	49.8	*(5.9)*	54.4	*(4.9)*	63.8	*(4.8)*	60.7	*(2.1)*
Don't know	3.7	*(1.3)*	1.6	*(0.8)*	3.1	*(1.2)*	2.2	*(0.9)*	2.9	*(0.7)*
Total	100.0		100.0		100.0		100.0		100.0	

The percentage of operations that usually composted equine manure and bedding was relatively similar irrespective of the number of equids on the operation.

b. Percent of operations that composted equine manure or waste bedding during 1997 by size of operation:

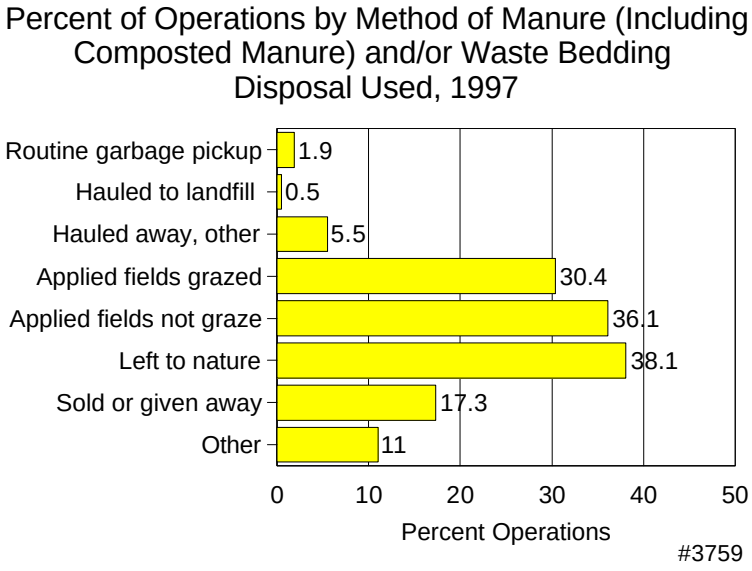
Percent Operations by Size of Operation (Number Equids)

	1-2		3-5		6-19		20 or More	
Frequency	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Usually	21.1	*(3.6)*	26.4	*(2.6)*	25.3	*(3.0)*	35.4	*(5.2)*
Sometimes	13.3	*(2.6)*	11.9	*(1.8)*	9.9	*(1.6)*	11.8	*(3.3)*
Never	62.0	*(4.0)*	59.5	*(2.8)*	61.8	*(3.3)*	51.4	*(5.6)*
Don't know	3.6	*(1.3)*	2.2	*(0.7)*	3.0	*(1.0)*	1.4	*(0.5)*
Total	100.0		100.0		100.0		100.0	

The most frequently used method of manure and waste bedding disposal was application to fields on the operation. Few operations disposed of manure and waste bedding by hauling it to landfills (0.5 percent) or through routine garbage pickup (1.9 percent).

c. Percent of operations by method of manure (including composted manure) and/or waste bedding disposal used during 1997:

Method	Percent Operations	Standard Error
Routine garbage pickup	1.9	*(0.9)*
Hauled to landfill (not routine garbage pickup)	0.5	*(0.2)*
Hauled away, other than to landfill	5.5	*(0.8)*
Applied on fields on the operation where any livestock (including equids) graze	30.4	*(1.8)*
Applied on fields on the operation where no livestock graze	36.1	*(2.0)*
Manure/waste bedding allowed to accumulate or left to nature	38.1	*(2.0)*
Sold or given away	17.3	*(1.4)*
Other	11.0	*(1.5)*



Application to fields on the operation was the primary method of manure and waste bedding disposal for at least one-half of the operations in the three larger sizes of operation. The percentage of operations that primarily allowed manure (including composted manure, see Table F.3.e.) to accumulate or left it to nature decreased with increasing numbers of equids on the operation.

d. Percent of operations by ***primary*** method of manure (including composted manure) and/or waste bedding disposal and size of operation:

Percent Operations by Size of Operation (Number Equids)

	1-2		3-5		6-19		20 or More		All Operations	
Method	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Routine garbage pickup	2.9	*(1.8)*	0.6	*(0.5)*	0.3	*(0.3)*	0.8	*(0.3)*	1.6	*(0.9)*
Hauled to landfill (not routine garbage pickup)	0.0	*(0.0)*	0.3	*(0.3)*	0.2	*(0.2)*	0.5	*(0.3)*	0.2	*(0.1)*
Hauled away, other than to landfill	2.2	*(1.1)*	1.7	*(0.6)*	3.5	*(0.9)*	8.9	*(2.5)*	2.5	*(0.6)*
Applied on fields where any livestock (including equids) graze	17.2	*(2.7)*	25.8	*(2.4)*	29.9	*(2.9)*	29.7	*(5.0)*	22.8	*(1.6)*
Applied on fields on the operation where no livestock graze	29.9	*(3.7)*	26.3	*(2.2)*	32.5	*(2.7)*	30.7	*(5.5)*	29.2	*(1.9)*
Manure/waste bedding allowed to accumulate or left to nature	33.7	*(3.7)*	28.7	*(2.5)*	21.8	*(2.3)*	15.1	*(4.7)*	29.2	*(1.9)*
Sold or given away	3.6	*(1.2)*	8.2	*(1.6)*	8.8	*(1.9)*	11.5	*(3.1)*	6.4	*(0.9)*
Other	10.5	*(2.6)*	8.4	*(1.7)*	3.0	*(1.0)*	2.8	*(1.0)*	8.1	*(1.3)*
Total	100.0		100.0		100.0		100.0		100.0	

In 1997, operations where at least some of the equid manure and waste bedding was composted were more likely to apply manure to fields where ***no*** livestock grazed. These same operations were less likely to allow manure to accumulate or leave it to nature than operations that never composted. Whether or not the composted manure was applied to fields was not determined.

e. Percent of operations by ***primary*** method of manure (including composted manure) and/or waste bedding disposal and frequency of composting manure and waste bedding on the operation:

	Percent Operations by Frequency of Composting							
	Usually		Sometimes		Never		Don't Know	
Method	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Routine garbage pickup	1.7	*(1.6)*	0.1	*(0.1)*	1.9	*(1.3)*	0.1	*(0.1)*
Hauled to landfill (not routine garbage pickup)	0.1	*(0.1)*	0.0	*(0.0)*	0.2	*(0.2)*	0.1	*(0.1)*
Hauled away, other than to landfill	1.9	*(0.6)*	0.9	*(0.5)*	3.1	*(0.9)*	3.3	*(2.5)*
Applied on fields where any livestock (including equids) graze	19.0	*(2.9)*	24.0	*(4.4)*	24.3	*(2.1)*	20.5	*(7.6)*
Applied on fields on the operation where no livestock graze	34.6	*(4.4)*	50.5	*(5.9)*	23.3	*(2.0)*	14.8	*(5.7)*
Manure/waste bedding allowed to accumulate or left to nature	19.2	*(4.5)*	14.1	*(3.9)*	35.1	*(2.5)*	54.2	*(11.0)*
Sold or given away	8.2	*(2.0)*	7.3	*(2.4)*	5.7	*(1.1)*	2.0	*(1.8)*
Other	15.3	*(3.5)*	3.1	*(1.6)*	6.4	*(1.5)*	5.0	*(3.1)*
All primary methods	100.0		100.0		100.0		100.0	

Section II: Methodology

A. Early Planning

Early planning was the key to success in providing equine statistics. In 1996, two USDA Agencies, APHIS and NASS, committed to provide equine health statistics via the Equine '98 Study (first report disseminated in August 1998, to be followed by a number of reports through 1999) and demographic statistics (January 1, 1998, and January 1, 1999, equine inventories to be published in February 1999).

B. Equine '98 Methods

1. Identifying industry informational needs

First, a *Catalog of Opportunities for Equine Health Monitoring* was compiled and distributed in June 1995. Second, a needs assessment was undertaken to identify industry informational needs. Next, objectives (shown on the inside back cover of this report) were developed for the Equine '98 Study from input via a number of focus groups. These focus groups included industry representatives, researchers, and state and federal animal health officials. In addition, web site and 1-800 telephone call-in surveys were conducted from January 1 through March 15, 1997, to provide needs assessment input. This collective feedback formed the basis for the study objectives.

2. Materials development

Specific estimates for information needed to meet the objectives were identified via a mockup of the report without any data. Questionnaire design then began, followed by pre-testing in September and October 1997. The initial training school for NAHMS Coordinators (one from each of 28 participating states) took place in January 1998 in Fort Collins, Colorado. Subsequent training schools were held for NASS enumerators and APHIS VMO's (Veterinary Medical Officers) and AHT's (Animal Health Technicians) in each state.

3. The sample

A goal for all NAHMS national studies is to include states that account for at least 70 percent of the animal and producer/owner populations in the U.S. Budget constraints beyond this level of coverage were an important consideration. The most recent data available on which to base the selection of states to be included in Equine '98 Study was the 1992 Census of Agriculture data for horses and ponies (shown in Appendix II for states selected). Use of these data is limited in that it represented horses and ponies on farms only. A farm is defined as any place with $1,000 or more sales of agriculture products during the year or having at least five horses. Based on this definition, a large number of horses and operations with horses were not included in the Census of Agriculture data. These data were the best available at the time for choosing states to be in the study.

Each state's contribution to the U.S. total for number of horses and ponies and number of farms reporting horses or ponies was calculated. The animal contribution was given a weight of 0.6 and the number of farms a weight of 0.4. This weighted contribution (single number for percent of total) was a key determinant in selecting the states. Every state that accounted for 2 percent or more of the U.S. total horses and ponies was included in the study except for Iowa and Idaho which were excluded due to expected resource conflicts with a then proposed NAHMS cattle on feed study. Thus, 21 states were initially selected based on this criterion. In addition, seven states were included that individually contributed less than 2 percent. Georgia, Maryland and New Jersey were included due to a high

level of state equine industry interest, and Alabama, Louisiana, New Mexico, and Wyoming were included to improve geographical representation. A total of 28 states were eventually included in the Equine'98 Study which accounted for 78.2 percent of the U.S. 1992 Census horses and ponies and 78.0 percent of the farms with horses and ponies.

4. Data Collection

Approximately 200 NASS enumerators collected data for the Parts I and II baseline health descriptive reports via personal interviews from March 16, 1998, through April 10, 1998. Approximately 150 VMO's and AHT's collected data for subsequent Equine '98 health reports in the 28 states.

5. Editing and Estimation

Initial data entry and editing for Equine '98 Parts I and II baseline reports were performed in each individual NASS state office. NAHMS personnel performed additional data edits on the entire data set after data from all states were combined. The response and non-response categories for the entire data set are shown below.

Category	Number	Percent
1 - race track office handling	163	3.8
2 - zero equine on hand Jan. 1, 1998	199	4.6
3 - no resident equine on Jan. 1, 1998	13	0.3
4 - refused	787	18.2
5 - 7 complete	2,758	64.0
8 - out of scope	37	0.9
9 - inaccessible	354	8.2
Total	4,311	100.0

The numerator for the response rate calculation includes the 2,758 complete questionnaires, 199 responses with zero equine, and 13 responses with no resident equine for a total of 2,970 good responses. The denominator includes 2,970 good responses plus 787 refusals and 354 inaccessible for a total of 4,111. The response rate was therefore 72.2 percent. The two categories excluded from the response rate calculation were 163 race tracks and 37 out of scope questionnaires such as prison farms and university farms. Race tracks were contacted for inventory data on the January Equine Survey and were not re-contacted.

Data for Parts I and II of the baseline health statistics were summarized from 2,904 good reports. These reports were 2,758 complete responses plus 133 race tracks which had some equine inventory on January 1, 1998, plus 13 reports with equine present but no ***resident*** equine on January 1, 1998. Non-response adjustments were made to the initial sampling weights to account for those operators not responding. This adjustment allowed inferences to be made to the target population of any place with one or more equine on January 1, 1998, in the 28 states.

C. Sampling and Estimation Details for Demographics and Health Statistics

1. NASS sampling frames - Area Frame

The sampling phase for providing equine statistics began in early 1997. USDA/NASS livestock estimates were historically based on a multiple frame sampling technique which incorporates the benefits of sampling from both a list and area frame. The NASS area frame within each of the 48 continental

states was based on a land use stratification such as intensively cultivated land, range land, urban land areas, and land in cities. The sampling units were actual land areas and were approximately the same size within each stratum. These sampling units are called segments which vary in size from stratum to stratum. For example, in the intensively cultivated or crop production stratum, the segment size was one square mile, whereas in the agricultural and mixed urban strata, the size could be as small as one-fourth square mile. Since equine are more often located in fringe areas around towns or cities such as found in the agriculture/urban strata compared to other livestock, additional segments from these strata were allocated to the sample.

Once a segment was selected, maps and/or photographs were prepared for a field interview. The entire land area of the segment was accounted for and associated with an operator (person responsible for the day-to-day decisions). Each segment was thus sub-divided into smaller land areas called tracts. The tract operator's name is very important in creating the multiple frame estimates to avoid duplication with the list. There were 7,122 segments selected in all 48 states. NASS collected data for the Fall Area Survey during December 1997. Respondents reported the number of equine expected to be on hand January 1,1998, on the total acres operated including acres operated outside the tract. The estimate for an Area Frame operation such as for total equine is then prorated back to the tract by the ratio of the operation's acres within the tract divided by the operation's total acres.

2. NASS sample frames - list frame

Since NASS did not previously have a list frame for equine, one had to be built. The goal was to compile names of operators/operations with large numbers of equids not normally considered to qualify as a "farm" (since farms would be estimated based on the area frame). Therefore, list building concentrated on larger places with horses, such as service providers, that would generally not have other agriculture interests. Such operations included boarding stables, riding and training facilities, and race tracks. These large, non-farm operations were rare and would not be accurately measured by the Area Frame. This list development occurred during the summer and fall of 1997. From January 1 through January 15, 1998, all list names in all 48 states were contacted by telephone or personal interview and asked for their equine inventory on January 1, 1998.

3. Multiple frame estimation

The Area Frame sample data and the List Frame sample data were then combined. However, to avoid any possible duplication, the List Frame names were matched against the Area Frame names. Whenever a match occurred, the Area Frame data were not used, i.e., if an operation was on the list, it was represented by using the List Frame data. The multiple frame estimate was therefore comprised of an area estimate of the list incompleteness plus the list estimate. NASS has deemed multiple frame estimation to be most efficient for a given cost and to yield more precise estimates for livestock than other Area Frame estimators. This estimator was used in providing both the demographic and health statistics.

4. Population inferences

The inverse of the probability of selection was used as the initial weight and then adjusted for the various phases of selection and non-response. For both the demographic and the health statistics, the reference population was any place/operation with one or more equid on January 1,1998. The NASS estimates of equine inventory in the U.S. for January 1, 1998, will be published in February 1999 along with the January 1, 1999, inventory estimates. The reference population for equine inventory

(NASS estimates) will be 48 states, and the reference population for health statistics is limited to 28 states (Equine ’98 Study.)

D. Equine ’98 Sample Selection

1. Sub-sample of January 1, 1998, demographics sample

The combined NASS Area and List data set which provided estimates for the January 1, 1998, inventory for all states in the U.S. then became the basis for selecting the sample for the Equine ’98 Study for the 28 target states. The Equine ’98 sample selection is therefore a sub-sample of the NASS Fall 1997 Area Survey and January 1998 Equine Survey respondents that reported one or more equid on hand on January 1, 1998. The sub-sampling was done within size groups based on total equid for list and area separately. Distribution of the sample to individual states was based primarily on the U.S. 1992 Census size indicator (previously discussed).

The following table is provided to facilitate further understanding of the Equine ‘98 sampling process.

Equine ‘98 Sampling Process[1]

	NASS Collection	Equine ‘98 Sample
Area Sampling Frame:		
Number of segments selected for Fall survey	5,491	
Number of tracts reported	38,482	
Number of tracts reporting equine	6,125	
Number of tracts selected for Equine ‘98		2,244
List Sampling Frame:		
Number list records	14,856	
Number selected for January survey	14,856	
Number reporting equine in January survey	9,032	
Number selected for Equine ‘98 (excluding race tracks)		1,904
Number race tracks included in Equine ‘98 (office handling)		163
Total sample collected for Equine ‘98		4,311

1 For the 28 states, a total of 2,244 samples were selected as a sub-sample of operators with one or more equid reported on the Fall Area Survey. Likewise, 1,904 list operators were selected as a sub-sample of operators with one or more equid reported on the January Equine Survey (list). In addition, inventory data (only) from 163 race tracks were included as reported on the January Equine Survey.

Appendix I: Sample Profile

A. Responding operations (operations with any equids present on January 1, 1998)

1. Type of operation

Primary Function of Operation	Number Responding Operations
Boarding/Training facility	678
Race track	133
Breeding farm	389
Farm/Ranch	714
Residence with equids for personal use	695
Other	295
Total	2,904

2. Region

Region	Number Responding Operations
Southern	1,141
Northeast	418
Western	715
Central	630
Total	2,904

3. Total equids on hand January 1, 1998

Number	Number Responding Operations
Less than 3	364
3 - 5	616
6 - 19	915
20 or more	1,009
Total	2,904

4. Total resident equids (whether or not present) January 1, 1998 (does not include race tracks)

Number	Number Responding Operations
Less than 3	617
3 - 5	376
6 - 19	875
20 or more	903
Total	2,771

Appendix II: 1992 Census - Horses & Ponies

U.S. Inventory of Horses & Ponies (on Farms) & Number of Farms Reporting Horses & Ponies[1]

Region	State	Number Horses and Ponies[1] (Thousand Head)		Farms Reporting Horses and Ponies[1] (Thousand Farms)	
Central	Illinois	46.1		7.3	
	Indiana	48.1		8.4	
	Kansas	42.9		9.7	
	Michigan	54.0		7.8	
	Minnesota	43.1		7.7	
	Missouri	64.6		14.2	
	Wisconsin	43.6		8.1	
	Total	342.4		63.2	
Northeast	New Jersey	23.9		2.5	
	New York	43.3		6.4	
	Ohio	72.0		10.9	
	Pennsylvania	58.0		9.2	
	Total	197.2		29.0	
Southern	Alabama	29.7		5.7	
	Florida	52.0		6.7	
	Georgia	31.1		5.6	
	Kentucky	78.1		12.4	
	Louisiana	28.0		5.1	
	Maryland	24.3		2.8	
	Oklahoma	70.0		14.9	
	Tennessee	61.1		12.4	
	Texas	209.1		38.5	
	Virginia	44.0		7.1	
	Total	627.4		111.2	
Western	California	124.9		15.0	
	Colorado	69.4		9.9	
	Montana	56.4		8.2	
	New Mexico	41.4		5.7	
	Oregon	51.9		9.2	
	Washington	51.1		7.9	
	Wyoming	40.7		4.5	
	Total	435.8		60.4	
Total (28 states)		1,602.8	(78.2% of U.S.)	263.8	(78.0% of U.S.)
Total U.S. (50 states)		2,049.5		338.3	

1 Source: 1992 Census of Agriculture. By definition, this information includes horses and ponies on ***farms*** only. A farm is defined as any place that produced and sold $1,000 or more in agricultural products or had five or more horses. This definition may exclude over one-half the horse population in the U.S. National Agricultural Statistics Service (NASS), U.S.D.A., will publish official January 1, 1998, and January 1, 1999, inventory numbers in February 1999 which will be estimates for all equids on all places regardless of the farm definition.

Expected Products and Related Study Objectives

1. Provide baseline information on equine health.

- Part I: Baseline Reference of 1998 Equine Health and Management, August 1998.
- ***Part II: Baseline Reference of 1998 Equine Health and Management, September 1998.***
- Morbidity/mortality (info sheet), expected fall 1998.

2. Estimate uses of equine health-related management practices.

- *Part II: Baseline Reference of 1998 Equine Health and Management, September 1998.*
- Part III, expected winter 1998.
- Sources of information/use of veterinarian (info sheet), August 1998.
- Biosecurity (info sheet), August 1998.
- Vaccination practices (info sheet).
- Animal movement (info sheet).

3. Determine type and use of animals in the U.S. equine population by type of operation.

- Part I: Baseline Reference of 1998 Equine Health and Management, August 1998.
- Composition of equine population (info sheet), August 1998.

4. Measure the prevalence of specific infectious agents or frequency of antibodies to specific infectious agents.

- Flu (info sheet).
- Equine viral arteritis, EVA (info sheet).
- *Salmonella* (info sheet).
- Parasites (info sheet).
- *Streptococcus equi* (info sheet).

5. Gather data related to specific health problems.

- Colic (info sheet), expected summer 1999.
- Lameness (interpretive report), expected summer 1999.
- Respiratory disease (info sheet), expected summer 1999.
- Equine protozoal myeloencephalitis, EPM, including economics estimates, (interpretive summary) expected winter 1999.
- Equine infectious anemia, EIA, including estimates of testing costs (info sheet), expected summer 1999.

6. Feed problems.

- Endophytes (info sheet).
- Fumonisins (info sheet).

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