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Goat 2009

Part III: Biosecurity and Disease-prevention Practices on U.S. Goat Operations, 2009

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Items of Note

The Goat 2009 study marks the first time that the National Animal Health Monitoring System (NAHMS) has taken an in-depth look at the U.S. goat industry. In this third report from the study, you will find nationally representative information on the health and management practices of one of the Nation's fastest growing livestock industries.

Kidding management and kid care

Proper care of pregnant does and anticipating potential problems associated with kidding can minimize preventable losses. While many factors contribute to abortions, one relatively easy method for reducing abortions is to separate does kidding for the first time from older does. This practice helps prevent younger does from becoming infected with possible abortion-causing pathogens prior to kidding. Overall, 38.1 percent of all operations physically separated first-time kidders from does that had previously given birth.

Another effective method for reducing the potential for disease spread is to clean manure and waste bedding between every kidding doe. One-fourth of all operations (25.7 percent) had cleaned manure and waste bedding from the kidding area between each doe during the last kidding season.

Placentas and aborted fetuses can harbor thousands of infectious organisms. These organisms can spread infections to goats within the herd or to other animals on the farm. Overall, 40.6 of operations left placentas in the field or birthing areas. The percentage of operations that left placentas in the field or birthing area varied by type of operation; for example, a lower percentage of dairy goat operations (19.9 percent) than meat goat operations (45.6 percent) left placentas in the field or birthing areas.

Colostrum is the first milk a newborn kid should receive, primarily because it provides valuable antibodies from the doe, which help protect against disease. There are, however, a number of reasons for not providing a doe's colostrum to its offspring; one reason would be if a producer was trying to eliminate caprine arthritis encephalitis (CAE) from the herd. Overall, 43.2 percent of operations provided kids colostrum from their mothers, either from nursing or by hand, while 21.5 percent provided colostrum from other does.

Coccidia are tiny parasites that infect cells in the small intestine and can cause scours, unthriftiness, weight loss, and death in extreme cases. Coccidia are the most common cause of diarrhea or scours in goats from 3 weeks to 5 months of age. Overall, 43.4 percent of operations fed medicated feed to kids to prevent coccidia.

Vaccinations

Vaccination can reduce the prevalence and/or severity of disease and should usually be a part of herd-management plans. Given that clostridium Type C and D and tetanus are the only universally recommended vaccines for goats, it is not surprising that the majority of operations vaccinated goats for clostridium Type C and D (89.5 percent of operations) and tetanus (86.6 percent of operations). Goats are considered highly susceptible to enterotoxemia due to clostridial infections (most often Type D) and tend not to mount a prolonged immune response to the vaccine. Therefore, some producers may need to immunize their animals two to four times annually to achieve adequate protection. Overall, 4.4 percent of operations vaccinated their goats three to four times a year, and 30.5 percent vaccinated their goats twice a year.

Parasite control

Parasites are a normal part of the ecosystem, and most goats have parasites of some kind. Necropsy records have shown that internal parasites cause more goats to die in the southeastern United States than the total of the next three leading causes of goat deaths (www.scsrpc.com). Of all internal parasites, the gastrointestinal parasite *Haemonchus contortus* or barber's pole worm, is arguably the most economically important parasite to goat producers. The barber's pole worm lives in the intestine and sucks blood from the host, sometimes causing anemia, bottle jaw (swelling under the jaw), and possibly death. It is important to note that not all goats infected with the barber's pole worm will become clinically ill, and, therefore, not all need to be treated for this worm. In fact, treating all goats for worms contributes to resistance to dewormers. The FAMACHA© card was developed in South Africa to allow producers to identify which goats need to be treated for barber's pole worms and which do not. Overall, 13.5 percent of goat producers use the FAMACHA card for internal parasite management in goats or kids.

Disease

Just under one-fourth of goat producers (21.5 percent) identified caseous lymphadenitis as being suspected or confirmed on their operations in the previous 3 years. Caseous lymphadenitis, also known as boils or cheese glands, is an important source of economic loss to sheep and goat producers due to loss of condition in live animals, loss of sales for breeding stock, condemnation and trim of carcasses, and devaluation of the hides.

Biosecurity

Biosecurity is the system of management practices that prevent the introduction of disease. Practices that reduce an operation's risk for disease introduction include not bringing new animals onto the operation and isolating animals after their return from other operations after breeding, showing, etc. Overall, 45.7 percent of operations added any goats to their operation during the previous 12 months. The majority of these operaitons (66.2 percent) inspected the new arrivals for abscesses and/or scars from previous abscesses. Deworming was conducted on 65.5 percent of these operations.

Dairy goat operations

Bulk-tank somatic cell count (BTSCC) refers to the number of white blood cells and secretory cells per milliliter of raw milk and is used as a measure of milk quality and udder health. Increased BTSCCs are generally associated with increased intramammary infection and decreased milk production. Approximately one-tenth of dairy goat operations (10.1 percent) performed the pooled milk somatic cell count during the previous 12 months.

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American Dairy Goat Association
American Goat Federation
American Meat Goat Association
University of Alabama.

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Director
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Feedback

Feedback, comments, and suggestions regarding Goat 2009 study reports are welcomed. Please forward correspondence via email to: NAHMS@aphis.usda.gov, or you may submit feedback via online survey at: http://nahms.aphis.usda.gov (Click on “FEEDBACK on NAHMS reports.”)

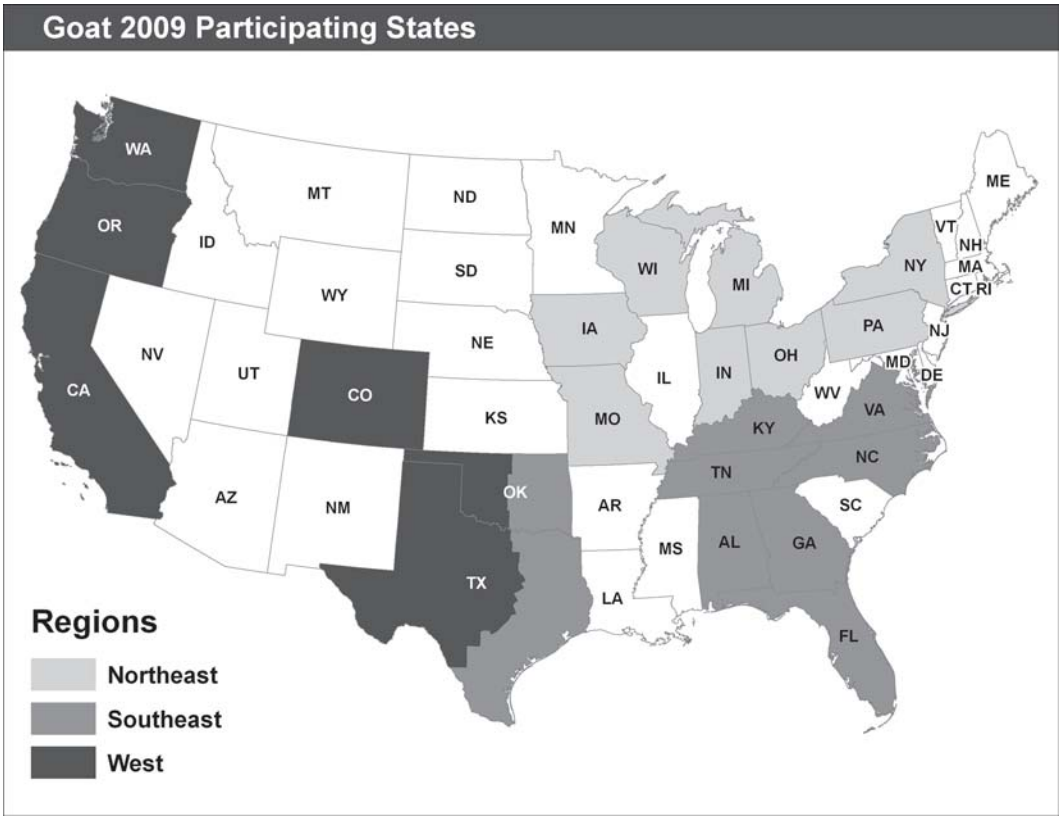
Introduction

The National Animal Health Monitoring System (NAHMS) is an information gathering and disseminating organization within the Animal and Plant Health Inspection Service (APHIS), an agency of the U.S. Department of Agriculture (USDA). The purpose of the NAHMS program is to collect and analyze animal health data to provide scientifically sound and current information on the health status of U.S. livestock and poultry. The information is intended to benefit both livestock producers (by facilitating efficient production and animal welfare) and the general public (by facilitating a safer and higher quality food supply). Special emphasis is placed on obtaining valid estimates of management practices, production levels, and disease status of the national herds.

NAHMS studies animal health problems as well as food-safety and food-quality issues. As the food- and fiber-animal industry grows more sophisticated and production becomes more concentrated in large, confined facilities, demand increases for information on the impact of animal health problems. These problems are often related to animal genetics, herd management practices, the environment in which animals are located, and exposure to infectious agents. The NAHMS program attempts to measure the occurrence of these conditions and reports the findings to the livestock industry and the general public. Additionally, as the livestock industry addresses concerns with food quality and food safety, it needs valid information on which to base decisions.

The NAHMS program compiles some of its information from sources other than surveys of producers. These sources include other government agencies, livestock industry organizations, and universities. Surveys of livestock producers are conducted to assemble data not available elsewhere.

Goat 2009 is NAHMS first-ever study of the U.S. goat industry and was conducted in 21 of the Nation’s major goat-producing States (see map on next page). The study provides participants, stakeholders, and the industry as a whole with valuable information representing 75.5 percent of U.S. goat operations and 82.2 percent of U.S. goats (NASS 2007 Census of Agriculture). “Part III: Biosecurity and Disease-prevention Practices on U.S. Goat Operations, 2009” is the third report containing national information from the NAHMS Goat 2009 study. Of the 1,835 goat operations with 10 or more goats that completed the study’s first questionnaire, 633 also completed an additional questionnaire. Data from this second questionnaire were the basis for this report.



Texas and Oklahoma were divided on a line corresponding to north-south Interstate 35. The western halves of the States were included in the West region, and the eastern halves were included in the Southeast region. For more detailed information regarding the counties involved, see Appendix II, p 128.

The methods used and number of respondents in the study can be found in Section II and Appendix I of this report, respectively.

Terms Used in This Report

BTSCC: Bulk tank somatic cell count (BTSCC) refers to the number of white blood cells (leukocytes) and secretory cells per milliliter of raw milk and is used as a measure of milk quality and udder health.

Goat: Animal 1 year old and older.

Herd size: Herd sizes are based on the number of goats or kids for each operation on the NASS list sampling frame at the time of sample selection. Size breakouts are: small (10 to 19 head); medium (20 to 99 head); large (100 head or more).

Herd type:

Open range—any unfenced acreage, even if it was a few acres surrounded by residential areas.

Fenced range—any fenced area not specifically cultivated to raise forage or browse.

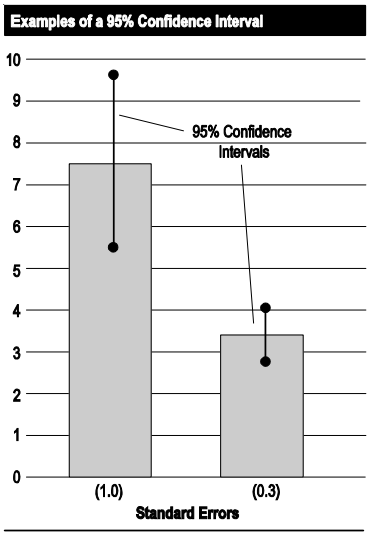
Fenced farm—any fenced area specifically cultivated to raise forage or browse.

Dry lot—pen that does not allow for grazing and is not meant for finishing goats on a high-energy diet for slaughter.

Kid: Goat less than 1 year old.

NA: Not applicable.

Operation average: A single value for each operation is summed over all operations reporting divided by the number of operations reporting (see operation average percentage of goats dewormed, p 54).



Population estimates: Estimates in this report are provided with a measure of precision called the standard error. A 95-percent confidence interval can be created with bounds equal to the estimate, plus or minus two standard errors. If the only error is sampling error, the confidence intervals created in this manner will contain the true population mean 95 out of 100 times. In the example to the left, an estimate of 7.5 with a standard error of 1.0 results in limits of 5.5 to 9.5 (two times the standard error above and below the estimate). The second estimate of 3.4 shows a standard error of 0.3 and results in limits of 2.8 and 4.0. Alternatively, the 90-percent confidence interval would be created by multiplying the standard error by 1.65 instead of 2. Most estimates in this report are rounded to the nearest tenth. If rounded to 0, the standard error was reported (0.0). If there were no reports of the event, no standard error was reported (—).

Primary production focus (of operation): Meat, dairy, and “other”. An operation may have goats to produce both meat and dairy products. If multiple categories applied, producers were asked to select the primary production focus of the operation.

Regions:

West: California, Colorado, Oklahoma, Oregon, Texas, Washington

Southeast: Alabama, Florida, Georgia, Kentucky, North Carolina, Tennessee, Virginia

Northeast: Indiana, Iowa, Michigan, Missouri, New York, Ohio, Pennsylvania, Wisconsin

Section I: Population Estimates

A. Breeds

1. Breed composition of does

Boer does were the most common breed on the highest percentage of operations (44.5 percent) and 52.0 percent of does were on these operations. Boers are meat goats, and since 83.5 percent of goats in the United States are meat goats (Appendix II.E., p 133), it is not surprising that Boer goats represented the highest percentage of does. Some breeds are actually a combination of two breeds; for example, Pygora goats are a combination of Pygmy and Angora goats. Pygoras were first registered as a breed in 1987 and produce fibers that combine the long, silky ringlets of mohair goats with the fine down produced by pygmy goats. Pygmy does accounted for only 3.9 percent of goats in the United States, and just 7.0 percent of operations reported that Pygmy does accounted for the majority of their herd. Overall, 70.8 percent of does were on operations with meat goat breeds (Boer, Kiko, Spanish, Tennessee fainting). These operations accounted for 57.3 percent of all operations. The majority of the crossbred does were either Boer or Kiko crossed with dairy breeds.

Percentage of operations and percentage of does on these operations by the one or two most common breeds of does on the operation:

Breed	Percent operations	Std. error	Percent does	Std. error
Alpine	6.5	(1.0)	6.6	(1.2)
Angora	1.9	(0.3)	7.5	(5.2)
Boer	44.5	(2.2)	52.0	(4.2)
Kiko	3.3	(0.8)	2.9	(0.7)
LaMancha	2.1	(0.5)	3.6	(1.2)
Nigerian dwarf	2.1	(0.6)	1.0	(0.4)
Nubian	10.3	(1.2)	5.4	(0.9)
Pygmy	7.0	(1.1)	3.9	(1.0)
Pygora	0.4	(0.2)	0.3	(0.1)
Saanen	3.0	(0.6)	5.2	(1.3)
Sable	0.0	(0.0)	0.1	(0.1)
Spanish	7.2	(1.3)	14.0	(3.1)
Tennessee fainting	2.3	(0.6)	1.9	(0.7)
Toggenburg	1.1	(0.4)	1.0	(0.4)
Crossbreed (two breeds)	34.9	(2.2)	33.8	(3.9)
Other	3.0	(0.8)	2.8	(0.7)
No does	0.2	(0.2)	0.0	(0.0)

2. Composition of kid crop

On 45.8 percent of operations the majority of the 2009 kid crop consisted of two breeds of goats, while on 39.5 percent of operations the majority of the 2009 kid crop consisted of purebreds. Animals are often crossbred in order to produce offspring with improved market stock. For example, a buck of superior growth or carcass merit will produce kids that better suit the market for slaughter animals.

Percentage of operations by breed composition of the majority of the 2009 kid crop:

Breed composition	Percent operations	Std. error
Purebred	39.5	(2.2)
Crossbreed (two breeds)	45.8	(2.3)
Crossbred (three breeds)	7.4	(1.2)
No kid crop	7.3	(1.2)
Total	100.0	

B. Kidding Management and Kid Care

Note: Tables in this section are for operations on which any kids were born alive.

1. Kidding area

Pregnant does infected with pathogens for the first time might abort, kid early, or give birth to small or abnormal kids. Keeping first-kidding does away from older does until they have kidded reduces the risk of younger does becoming newly infected by older does.

A higher percentage of dairy goat operations (57.1 percent) separated first-kidding does compared with meat goat and “other” goat operations (36.7 and 32.5 percent, respectively).

a. Percentage of operations that physically separated first-kidding does from does that had given birth before, by primary production:

Percent Operations							
Primary Production							
Dairy		Meat		Other		All operations	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
57.1	(5.4)	36.7	(2.9)	32.5	(4.9)	38.1	(2.3)

Overall, 38.1 percent of operations separated first-kidding does from older does. A higher percentage of operations in the Northeast region than in the West and Southeast regions separated first-kidding does and older does.

b. Percentage of operations that physically separated first-kidding does from does that had given birth before, by region:

Percent Operations					
Region					
West		Southeast		Northeast	
Percent	Std. error	Percent	Std. error	Percent	Std. error
35.7	(4.1)	32.3	(3.6)	53.0	(4.3)

Using the kidding area as a place to house sick goats can be convenient when facilities are limited; however, doing so can also increase the risk of spreading infections within the herd. This risk should be factored into decisions regarding where to house sick goats. Overall, only 9.7 percent of operations had housed sick goats in the kidding area during the previous 12 months. This practice was more frequent on operations with 100 or more goats than on operations with 10 to 19 goats (17.0 and 4.9 percent of operations, respectively).

c. Percentage of operations that housed sick goats in the kidding area during the previous 12 months, by herd size:

Percent Operations

Herd Size (number of goats and kids)

Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
4.9	(1.8)	11.1	(2.1)	17.0	(3.2)	9.7	(1.3)

The percentage of operations that housed sick goats in the kidding area did not vary by region.

d. Percentage of operations that housed sick goats in the kidding area during the previous 12 months, by region:

Percent Operations

Region

West		**Southeast**		**Northeast**	
Percent	**Std. error**	**Percent**	**Std. error**	**Percent**	**Std. error**
7.0	(1.7)	10.2	(2.2)	12.6	(2.8)

The percentage of operations that housed sick goats in the kidding area did not vary by primary production.

e. Percentage of operations that housed sick goats in the kidding area during the previous 12 months, by primary production:

Percent Operations

Primary Production

Dairy		Meat		Other	
Percent	**Std. error**	**Percent**	**Std. error**	**Percent**	**Std. error**
8.4	(2.6)	11.0	(1.8)	5.9	(2.1)

Although not always feasible—especially on large operations—manure and waste bedding should be cleaned from the kidding area between every kidding doe. One-fourth of operations (25.7 percent) cleaned manure and waste bedding from the kidding areas after each doe during the last kidding season. Over half of operations (52.3 percent) cleaned manure and waste bedding from the kidding areas at least several times during the last kidding season. Cleaning frequency was consistent across operation sizes.

f. Percentage of operations by frequency that manure and waste bedding were cleaned from kidding areas during the last kidding season, and by herd size:

Percent Operations

Herd Size (number of goats and kids)

	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Frequency	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
After each doe	24.8	(3.5)	28.2	(3.1)	19.3	(3.4)	25.7	(2.0)
Several times during the kidding season	24.5	(3.6)	28.7	(3.2)	24.7	(3.5)	26.6	(2.1)
Once, at the end of kidding season	20.9	(3.3)	16.8	(2.7)	20.2	(4.3)	18.8	(1.9)
Never	29.8	(4.0)	26.3	(3.3)	35.8	(4.6)	28.9	(2.3)
Total	100.0		100.0		100.0		100.0	

A lower percentage of operations in the Northeast region (9.4 percent) never cleaned manure and waste bedding from the kidding areas compared with operations in the Southeast and West regions (34.1 and 35.3 percent, respectively).

g. Percentage of operations by frequency that manure and waste bedding were cleaned from kidding areas during the last kidding season, and by region:

	Percent Operations					
	Region					
	West		Southeast		Northeast	
Frequency	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
After each doe	28.5	(3.5)	19.5	(3.1)	33.7	(4.2)
Several times during the kidding season	18.1	(3.2)	28.7	(3.5)	35.2	(4.1)
Once, at the end of kidding season	18.1	(3.5)	17.7	(2.9)	21.7	(3.5)
Never	35.3	(4.2)	34.1	(3.8)	9.4	(2.5)
Total	100.0		100.0		100.0	

A higher percentage of dairy goat operations (50.9 percent) than meat goat or “other” goat operations (21.5 and 26.2 percent, respectively) cleaned manure and waste bedding from the kidding area between each kidding doe. Only 3.1 percent of dairy goat operations never cleaned manure and waste bedding from the kidding area compared with 31.4 percent of meat goat operations and 34.5 percent of “other” goat operations

h. Percentage of operations by frequency that manure and waste bedding were cleaned from kidding areas during the last kidding season, and by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Frequency	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
After each doe	50.9	(5.4)	21.5	(2.5)	26.2	(4.4)
Several times during the kidding season	26.3	(4.8)	26.9	(2.7)	25.9	(4.6)
Once, at the end of kidding season	19.7	(4.3)	20.2	(2.5)	13.4	(3.5)
Never	3.1	(1.7)	31.4	(2.9)	34.5	(5.2)
Total	100.0		100.0		100.0	

2. Disposal of placentas and aborted fetuses

Placentas and aborted fetuses can harbor thousands of infectious organisms, which can spread infections to other goats within the herd or to other animals on the farm. Good biosecurity includes prompt removal of placentas and aborted fetuses.

A lower percentage of operations with 10 to 19 and 20 to 99 goats left placentas and aborted fetuses in the field or birthing areas (36.2 and 37.4 percent, respectively) than operations with 100 or more goats (64.2 percent). The majority of “other” methods of disposal included giving to dogs to eat.

a. Percentage of operations by method used to dispose of placentas or aborted fetuses during the last kidding season, and by herd size:

Percent Operations

Herd Size (number of goats and kids)

	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Method	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Left in field/ birthing areas	36.2	(4.1)	37.4	(3.5)	64.2	(4.2)	40.6	(2.4)
Burned/ incinerated	5.6	(1.9)	10.3	(2.0)	8.0	(1.9)	8.3	(1.3)
Composted	11.5	(2.3)	15.1	(2.3)	7.4	(1.7)	12.8	(1.4)
Disposed of in landfill/dump	9.5	(2.5)	9.8	(2.0)	6.0	(2.0)	9.1	(1.4)
Buried	28.1	(3.6)	21.1	(2.9)	10.5	(2.9)	22.2	(2.0)
Other	9.1	(2.4)	6.3	(1.6)	3.9	(1.7)	7.0	(1.2)
Total	100.0		100.0		100.0		100.0	

A higher percentage of operations in the West and Southeast regions (52.6 and 41.6 percent, respectively) left placentas and aborted fetuses in the field and birthing areas than operations in the Northeast region (21.6 percent). A higher percentage of operations in the Northeast region than in the West and Southeast regions composted placentas and aborted fetuses.

b. Percentage of operations by method used to dispose of placentas or aborted fetuses during the last kidding season, and by region:

	Percent Operations					
	Region					
	West		Southeast		Northeast	
Method	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Left in field/ birthing areas	52.6	(4.1)	41.6	(3.8)	21.6	(3.4)
Burned/incinerated	6.5	(2.0)	7.2	(1.9)	13.0	(2.7)
Composted	5.7	(1.5)	6.6	(2.0)	34.8	(4.0)
Disposed of in landfill/dump	9.2	(2.4)	8.1	(2.1)	11.1	(2.7)
Buried	21.1	(3.4)	27.2	(3.4)	14.0	(3.0)
Other	4.9	(1.8)	9.3	(2.2)	5.5	(2.0)
Total	100.0		100.0		100.0	

A lower percentage of dairy goat operations (19.9 percent) than meat goat operations (45.6 percent) left placentas and aborted fetuses in the field or birthing areas.

c. Percentage of operations by method used to dispose of placentas or aborted fetuses during the last kidding season, and by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Method	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Left in field/ birthing areas	19.9	(4.1)	45.6	(3.0)	35.6	(5.1)
Burned/incinerated	11.0	(3.6)	8.0	(1.6)	7.9	(2.5)
Composted	19.9	(3.8)	11.8	(1.8)	12.0	(3.1)
Disposed of in landfill/dump	14.2	(3.9)	7.2	(1.5)	12.7	(3.6)
Buried	25.2	(4.7)	21.1	(2.5)	24.2	(4.5)
Other	9.8	(3.7)	6.3	(1.4)	7.6	(2.9)
Total	100.0		100.0		100.0	

3. Nutrition and colostrum management for unweaned kids

Providing colostrum to newborn kids as soon as possible following birth is important because colostrum provides valuable antibodies from the doe that help protect kids against disease. There are, however, a number of reasons for not letting newborns get colostrum from their mothers. For example, producers attempting to eliminate caprine arthritis encephalitis (CAE) in the herd should remove newborns before they suckle mothers thought to be infected with CAE.

Overall, 43.2 percent of operations fed unweaned kids colostrum from the mother (either by nursing or by hand). A higher percentage of operations with 100 or more goats than operations with 10 to 19 goats also fed colostrum from does other than the mother (39.9 and 10.7 percent of operations, respectively).

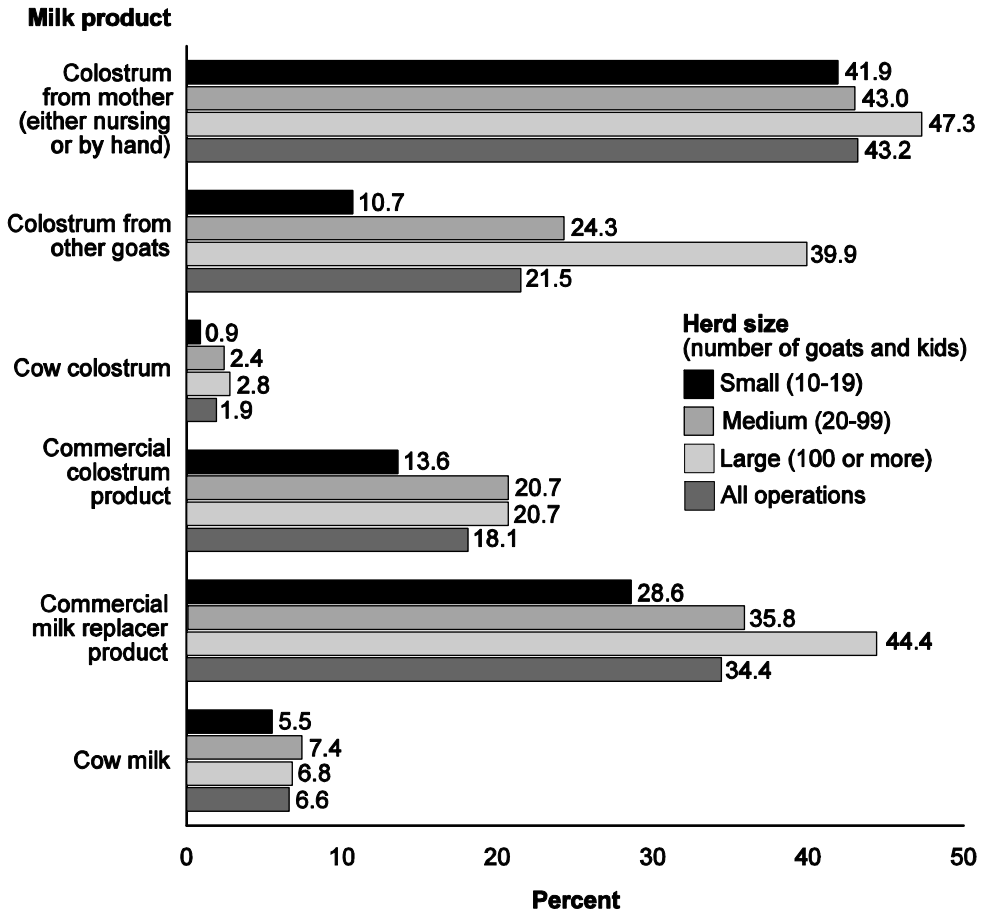
a. Percentage of operations that fed the following liquid diets (or milk products) to any unweaned kids during the previous 12 months, by herd size:

Percent Operations

Herd Size (number of goats and kids)

	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Milk product	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Colostrum from mother (either nursing or by hand)	41.9	(4.0)	43.0	(3.3)	47.3	(4.6)	43.2	(2.3)
Colostrum from other goats	10.7	(2.6)	24.3	(2.8)	39.9	(4.3)	21.5	(1.8)
Cow colostrum	0.9	(0.7)	2.4	(0.9)	2.8	(1.0)	1.9	(0.5)
Commercial colostrum product	13.6	(2.9)	20.7	(2.8)	20.7	(3.6)	18.1	(1.8)
Commercial milk replacer product	28.6	(3.8)	35.8	(3.3)	44.4	(4.7)	34.4	(2.2)
Cow milk	5.5	(1.9)	7.4	(1.9)	6.8	(2.0)	6.6	(1.2)

Percentage of operations that fed the following liquid diets (or milk products) to any unweaned kids during the prevous 12 months, by herd size



About 7 of 10 operations in the Northeast region (70.8 percent) fed colostrum from the mother (either by nursing or by hand) to unweaned kids compared with nearly 4 of 10 operations in the West region (39.2 percent) and about 3 of 10 operations in the Southeast region (31.9 percent). Just over half the operations in the Northeast region (51.0 percent) also fed commercial milk replacer to unweaned kids compared with just under a third of operations in the West and Southeast regions (30.8 and 28.4 percent, respectively).

b. Percentage of operations that fed the following liquid diets (or milk products) to any unweaned kids during the previous 12 months, by region:

	Percent Operations					
	Region					
	West		Southeast		Northeast	
Milk product	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Colostrum from mother (either nursing or by hand)	39.2	(3.9)	31.9	(3.5)	70.8	(3.9)
Colostrum from other goats	21.1	(3.1)	16.8	(2.7)	31.1	(3.9)
Cow colostrum	0.8	(0.5)	2.4	(1.1)	2.6	(1.0)
Commercial colostrum product	14.0	(2.9)	16.3	(2.9)	27.7	(3.8)
Commercial milk replacer product	30.8	(3.9)	28.4	(3.5)	51.0	(4.2)
Cow milk	5.1	(1.8)	7.5	(2.1)	7.2	(2.1)

A higher percentage of dairy goat operations fed unweaned kids colostrum from the mother and from other goats than meat goat operations or “other” goat operations.

c. Percentage of operations that fed the following liquid diets (or milk products) to any kids during the previous 12 months, by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Milk product	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Colostrum from mother (either nursing or by hand)	74.6	(5.0)	39.4	(2.9)	38.7	(4.8)
Colostrum from other goats	41.2	(5.1)	21.2	(2.3)	11.8	(3.0)
Cow colostrum	1.1	(0.8)	1.4	(0.5)	4.1	(1.9)
Commercial colostrum product	7.7	(2.6)	19.6	(2.3)	18.7	(4.0)
Commercial milk replacer product	33.3	(4.7)	35.6	(2.9)	30.9	(4.6)
Cow milk	6.6	(2.4)	7.2	(1.6)	4.9	(2.1)

Photograph courtesy of Dr. Katherine Marshall.

A total of 25.1 percent of operations stored excess colostrum, and 25.1 percent stored excess colostrum or sold colostrum during the previous 12 months. Every operation that sold colostrum also stored excess colostrum, but not all operations that stored excess colostrum sold it.

d. Percentage of operations that stored excess colostrum and/or sold colostrum during the previous 12 months, by herd size:

Percent Operations

Herd Size (number of goats and kids)

	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
	Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Stored excess colostrum	22.1	(3.3)	25.1	(2.8)	33.1	(4.1)	25.1	(1.9)
Sold	0.0	(—)	1.9	(0.7)	3.7	(1.8)	1.4	(0.5)
Stored or sold	22.1	(3.3)	25.1	(2.8)	33.1	(4.1)	25.1	(1.9)

A higher percentage of dairy goat operations stored excess colostrum and/or sold colostrum (61.4 and 8.9 percent, respectively) compared with meat goat operations (23.0 and 0.7 percent, respectively) and “other” goat operations (12.4 and 0.0 percent, respectively).

e. Percentage of operations that stored excess colostrum and/or sold colostrum during the previous 12 months, by primary production:

Percent Operations

Primary Production

	Dairy		**Meat**		**Other**	
	Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Stored excess colostrum	61.4	(5.4)	23.0	(2.4)	12.4	(3.1)
Sold	8.9	(2.9)	0.7	(0.5)	0.0	(—)
Stored or sold	61.4	(5.4)	23.0	(2.4)	12.4	(3.1)

C. Preventive Practices

1. Feed supplements

Coccidia are tiny parasites that infect cells in the small intestine and can cause scours, unthriftiness, weight loss, and death in extreme cases. Kids are more often clinically affected than adults. These parasites can be managed by reducing overcrowding and stress, feeding animals in feedbunks that prevent fecal contamination of food, and improving nutrition. Coccidia infections can also be prevented and treated by medicating animal feed with coccidiostats. In addition to preventing coccidial infections, coccidiostats also improve feed efficiency and kid growth.

Goats were fed medicated feed to prevent coccidia on 30.1 percent of operations, while kids were fed medicated feed on 43.4 percent of operations.

Percentage of operations and percentage of goats and kids on these operations by preventive practices normally used for goats and kids:

	Goats				Kids			
Preventive practice	Pct. operations	Std. error	Pct. goats	Std. error	Pct. operations	Std. error	Pct. kids	Std. error
Fed medicated feed to prevent coccidia	30.1	(2.1)	26.3	(3.1)	43.4	(2.4)	54.5	(4.3)
Goat mineral block	66.6	(2.2)	63.5	(4.8)	65.3	(2.3)	67.5	(3.8)
Other mineral block (e.g., cow)	35.4	(2.2)	41.1	(4.7)	32.4	(2.2)	37.4	(3.9)

2. Disease testing

A higher percentage of large operations tested goats for caprine arthritis encephalitis (CAE), Johne's disease, or tuberculosis (TB) compared with small operations.

a. Percentage of operations that tested any goats for the following diseases during the previous 12 months, by herd size:

Percent Operations

Herd Size (number of goats and kids)

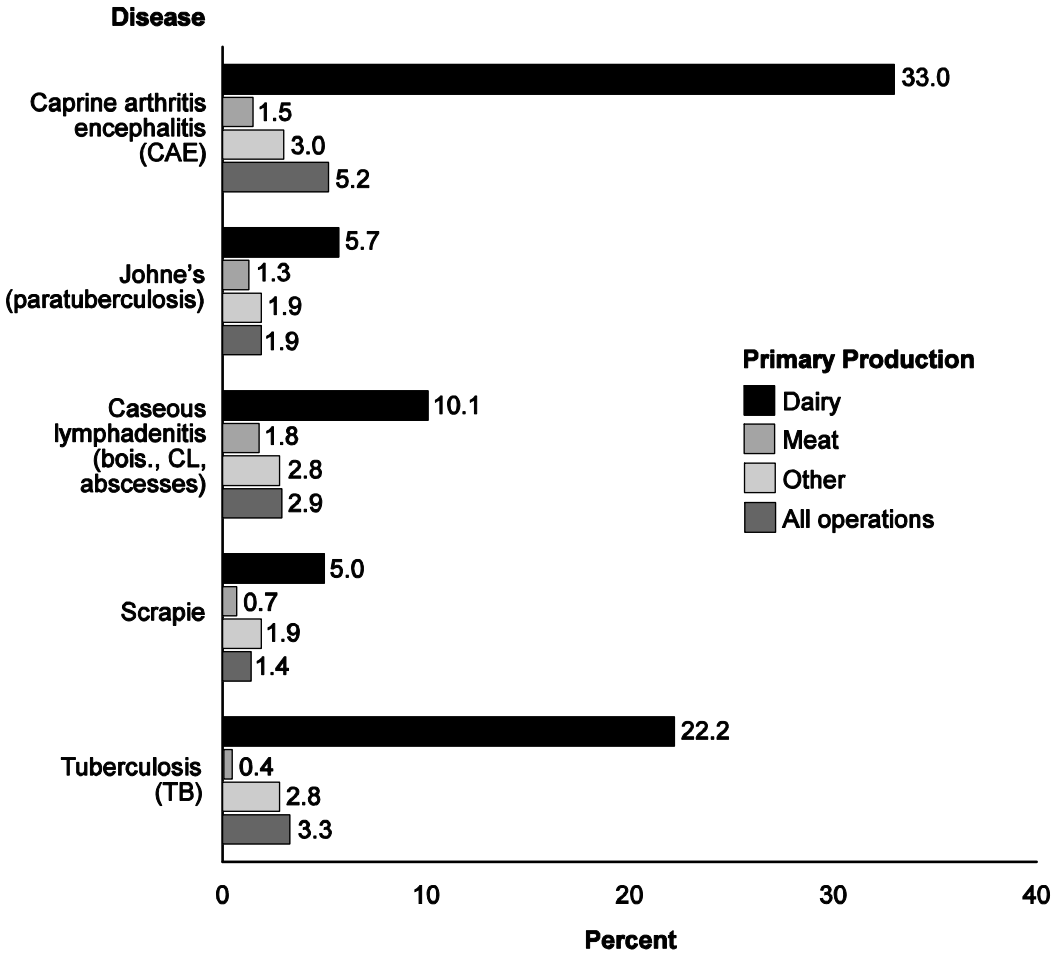
	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Disease	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Caprine arthritis encephalitis (CAE)	2.4	(0.8)	6.7	(1.3)	8.6	(2.2)	5.2	(0.7)
Johne's disease (paratuberculosis)	0.5	(0.4)	2.2	(0.8)	4.7	(1.6)	1.9	(0.5)
Caseous lymphadenitis (boils, CL, abscesses)	1.7	(0.9)	3.8	(1.2)	3.6	(1.3)	2.9	(0.7)
Scrapie	0.4	(0.3)	2.0	(0.7)	2.7	(1.1)	1.4	(0.4)
Tuberculosis (TB)	0.9	(0.5)	3.9	(1.0)	8.5	(2.3)	3.3	(0.6)

A higher percentage of dairy goat operations than meat goat operations tested goats for CAE or TB.

b. Percentage of operations that tested any goats for the following diseases during the previous 12 months, by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Disease	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Caprine arthritis encephalitis (CAE)	33.0	(4.8)	1.5	(0.5)	3.0	(1.4)
Johne's disease (paratuberculosis)	5.7	(2.3)	1.3	(0.5)	1.9	(1.1)
Caseous lymphadenitis (boils, CL, abscesses)	10.1	(3.4)	1.8	(0.8)	2.8	(1.4)
Scrapie	5.0	(2.1)	0.7	(0.3)	1.9	(1.1)
Tuberculosis (TB)	22.2	(4.4)	0.4	(0.2)	2.8	(1.4)

Percentage of operations that tested any goats for the following diseases during the previous 12 months, by primary production



3. Vaccinations

Vaccinations can play an important role in reducing disease and should be part of any herd management program. The percentage of operations that had vaccinated any goats or kids during the previous 12 months ranged from 34.4 percent of “other” goat operations to 55.7 of meat goat operations.

a. Percentage of operations that vaccinated any goats or kids during the previous 12 months, by primary production:

Percent Operations

Primary Production

Meat		Dairy		Other		All operations	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
55.7	(5.1)	53.3	(2.9)	34.4	(4.1)	49.0	(2.2)

Vaccine availability and efficacy for certain diseases must be considered as part of any herd vaccination plan. Given that tetanus and clostridium Type C and D, enterotoxemia vaccines are the only universally recommended vaccines for goats, it is not surprising that the majority of operations vaccinated goats for these diseases (86.6 and 89.5 percent of operations, respectively). Recommendations for other vaccines are dependent on herd conditions.

b. For operations that vaccinated any goats or kids during the previous 12 months, percentage of operations by whether any goats or kids were vaccinated against the following diseases:

Percent Operations

Use of Vaccine

	Yes		No		Do not know		
Disease	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Total**
Clostridium Type C and D, eterotoxemia	89.5	(1.8)	9.4	(1.7)	1.1	(0.6)	100.0
Tetanus	86.6	(2.1)	12.5	(2.1)	0.9	(0.6)	100.0
Other clostridial diseases (blackleg, malignant edema, sorehead)	15.1	(2.3)	80.9	(2.5)	4.0	(1.3)	100.0
Caseous lymphadenitis (boils, CL, abscesses)	8.3	(1.8)	89.8	(1.9)	1.9	(0.8)	100.0
Campylobacter or chlamydia (abortions, EAE)	4.3	(1.3)	93.3	(1.6)	2.4	(0.9)	100.0
Foot rot (foot vax)	4.1	(1.3)	94.3	(1.5)	1.6	(0.7)	100.0
Leptospirosis	7.7	(1.7)	90.9	(1.8)	1.4	(0.6)	100.0
Rabies	3.6	(1.1)	95.2	(1.2)	1.2	(0.6)	100.0
Pasteurella/ Mannheimia (pneumonia)	8.6	(1.8)	89.6	(2.0)	1.8	(0.9)	100.0
Sore mouth (orf, contagious ecthyma)	7.0	(1.5)	90.9	(1.7)	2.1	(0.9)	100.0
Other	3.8	(1.1)	94.0	(1.5)	2.2	(1.0)	100.0

Because the sore mouth vaccine is comprised of live virus, vaccinating for sore mouth is recommended only when animals are infected with the virus. Vaccinating a herd not already infected will introduce the virus into the herd. The percentage of operations that vaccinated any goats or kids against sore mouth ranged from 1.2 percent of small operations to 24.8 percent of large operations.

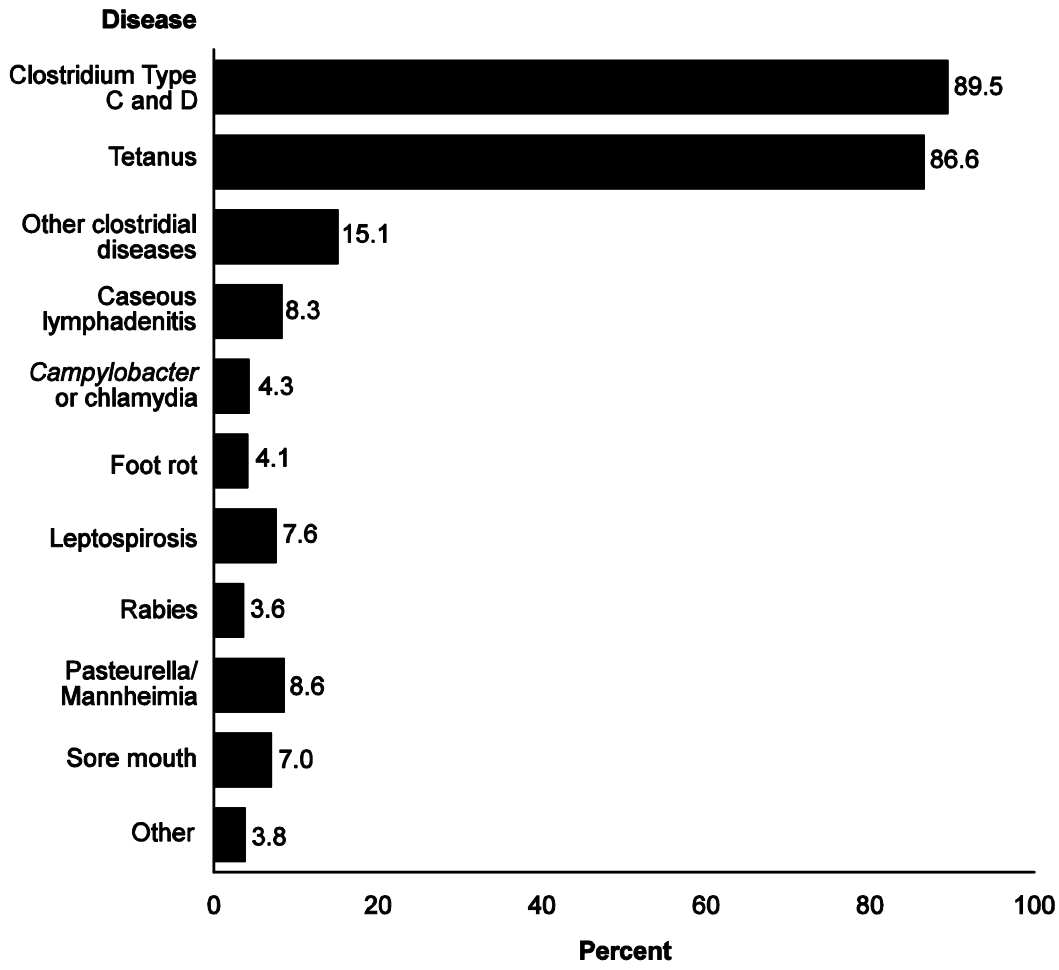
c. For operations that vaccinated any goats or kids during the previous 12 months, percentage of operations that vaccinated any goats or kids against the following diseases, by herd size:

Percent Operations

Herd Size (number of goats and kids)

	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Disease	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Clostridium Type C and D, enterotoxemia	90.5	(3.2)	91.9	(2.4)	80.2	(5.0)	89.5	(1.8)
Tetanus	86.9	(4.2)	88.7	(2.8)	79.6	(4.7)	86.6	(2.1)
Other clostridial diseases (blackleg, malignant edema, sorehead)	13.9	(4.1)	13.7	(3.1)	21.4	(5.3)	15.1	(2.3)
Caseous lymphadenitis (boils, CL, abscesses)	5.9	(2.8)	9.7	(2.9)	8.8	(3.0)	8.3	(1.8)
Campylobacter or chlamydia (abortions, EAE)	2.2	(2.2)	3.7	(1.8)	10.1	(3.5)	4.3	(1.3)
Foot rot (foot vax)	2.2	(2.2)	5.8	(2.1)	2.3	(1.4)	4.1	(1.3)
Leptospirosis	6.3	(3.1)	7.5	(2.5)	10.8	(3.6)	7.6	(1.7)
Rabies	7.2	(2.9)	2.5	(1.1)	0.0	(—)	3.6	(1.1)
Pasteurella/ Mannheimia (pneumonia)	6.4	(2.9)	9.1	(2.9)	11.1	(3.1)	8.6	(1.8)
Sore mouth (orf, contagious ecthyma)	1.2	(1.2)	4.7	(1.9)	24.8	(5.5)	7.0	(1.5)
Other	7.4	(2.9)	1.2	(0.9)	5.1	(2.5)	3.8	(1.1)

For operations that vaccinated any goats or kids during the previous 12 months, percentage of operations that vaccinated any goats or kids against the following diseases



A higher percentage of operations in the West region (12.8 percent) vaccinated goats for sore mouth compared with operations in the Northeast region (2.2 percent). A lower percentage of operations in the Northeast region than in the West or Southeast regions vaccinated against other clostridial diseases.

d. For operations that vaccinated any goats or kids during the previous 12 months, percentage of operations that vaccinated any goats or kids against the following diseases, by region:

Percent Operations

	Region					
	West		Southeast		Northeast	
Disease	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Clostridium Type C and D, enterotoxemia	88.8	(3.0)	88.7	(3.5)	91.3	(2.9)
Tetanus	82.6	(4.1)	86.4	(3.8)	91.4	(2.7)
Other clostridial diseases (blackleg, malignant edema, sorehead)	19.0	(4.3)	19.6	(4.5)	5.7	(1.9)
Caseous lymphadenitis (boils, CL, abscesses)	5.8	(2.4)	12.4	(4.2)	6.9	(2.5)
Campylobacter or chlamydia (abortions, EAE)	5.0	(2.4)	4.9	(2.5)	2.9	(1.5)
Foot rot (foot vax)	3.6	(2.5)	6.3	(2.6)	2.2	(1.4)
Leptospirosis	7.0	(2.7)	10.0	(3.7)	5.9	(2.2)
Rabies	4.3	(2.5)	2.9	(1.2)	3.4	(1.4)
Pasteurella/ Mannheimia (pneumonia)	12.0	(3.7)	7.0	(3.1)	6.2	(2.1)
Sore mouth (orf, contagious ecthyma)	12.8	(3.1)	5.2	(2.5)	2.2	(1.3)
Other	2.8	(1.5)	2.0	(1.5)	7.0	(2.8)

A higher percentage of meat goat operations vaccinated for leptospirosis and *Pasteurella* (9.3 and 10.5 percent, respectively) compared with dairy goat operations (0.0 and 2.4 percent, respectively).

e. For operations that vaccinated any goats or kids during the previous 12 months, percentage of operations that vaccinated any goats or kids against the following diseases, by primary production:

Percent Operations

Primary Production

	Dairy		Meat		Other	
Disease	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Clostridium Type C and D, enterotoxemia	93.3	(3.3)	89.4	(2.2)	87.7	(4.7)
Tetanus	93.1	(2.7)	84.4	(2.8)	91.2	(4.1)
Other clostridial diseases (blackleg, malignant edema, sorehead)	5.8	(2.8)	16.2	(2.8)	17.1	(5.6)
Caseous lymphadenitis (boils, CL, abscesses)	7.2	(3.0)	8.1	(2.2)	10.1	(4.9)
Campylobacter or chlamydia (abortions, EAE)	1.1	(0.9)	3.9	(1.4)	8.5	(4.6)
Foot rot (foot vax)	1.3	(1.3)	4.2	(1.5)	5.5	(4.2)
Leptospirosis	0.0	(—)	9.3	(2.2)	6.4	(4.2)
Rabies	5.9	(2.9)	1.4	(0.9)	11.0	(4.7)
Pasteurella/ mannheimia (pneumonia)	2.4	(1.3)	10.5	(2.5)	5.0	(2.9)
Sore mouth (orf, contagious ecthyma)	3.2	(2.2)	7.4	(1.8)	8.0	(3.8)
Other	2.7	(2.4)	4.3	(1.5)	2.7	(2.1)

For operations that vaccinated goats against enterotoxemia, the majority (62.4 percent) vaccinated annually.

f. For operations that vaccinated any goats or kids against enterotoxemia during the previous 12 months, percentage of operations by frequency that enterotoxemia boosters were given, and by region:

Percent Operations

Region

Frequency of boosters	West		Southeast		Northeast		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Three to four times a year	6.7	(2.3)	0.0	(—)	6.4	(2.6)	4.4	(1.2)
Twice a year	37.9	(5.4)	27.9	(5.6)	24.6	(4.6)	30.5	(3.1)
Annually	52.2	(5.6)	70.1	(5.7)	66.1	(5.0)	62.4	(3.2)
Less often than annually	3.2	(1.5)	2.0	(1.4)	2.9	(1.8)	2.7	(0.9)
Total	100.0		100.0		100.0		100.0	

g. For operations that vaccinated any goats or kids against enterotoxemia during the previous 12 months, percentage of operations by frequency that enterotoxemia boosters were given, and by primary production:

Percent Operations

Primary Production

Frequency of boosters	Dairy		Meat		Other	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Three to four times a year	8.9	(4.5)	4.1	(1.4)	2.7	(2.1)
Twice a year	36.6	(6.9)	31.0	(3.9)	23.7	(6.6)
Annually	48.8	(7.1)	62.3	(4.0)	72.6	(6.8)
Less often than annually	5.7	(3.2)	2.6	(1.1)	1.0	(0.9)
Total	100.0		100.0		100.0	

Over half of operations that vaccinated any goats or kids for sore mouth (55.9 percent) did not know the specific vaccine used.

h. For operations that vaccinated any goats or kids against sore mouth during the previous 12 months, percentage of operations by type of vaccine used:

Vaccine used	Percent operations	Std. error
Colorado Serum Company	10.5	(5.4)
Texas Agrilife	33.6	(10.6)
Don’t know	55.9	(11.1)
Total	100.0	

4. Production records

Record keeping can help producers increase the performance of their herd by identifying the animals that should be kept as replacements. Knowing which animals produce larger kids or have needed fewer therapies may help producers decide which animals to keep or cull. Knowing laboratory test results for each animal can also help identify which animals need to be treated or culled.

The top-four parameters for keeping records on individual goats were number of kids born (68.0 percent of operations), number of kid deaths (57.0 percent of operations), vaccinations (51.0 percent of operations), and number of kids weaned (46.8 percent of operations). The least reported record-keeping parameter was weaning weights, with 7.4 percent of operations keeping such records.

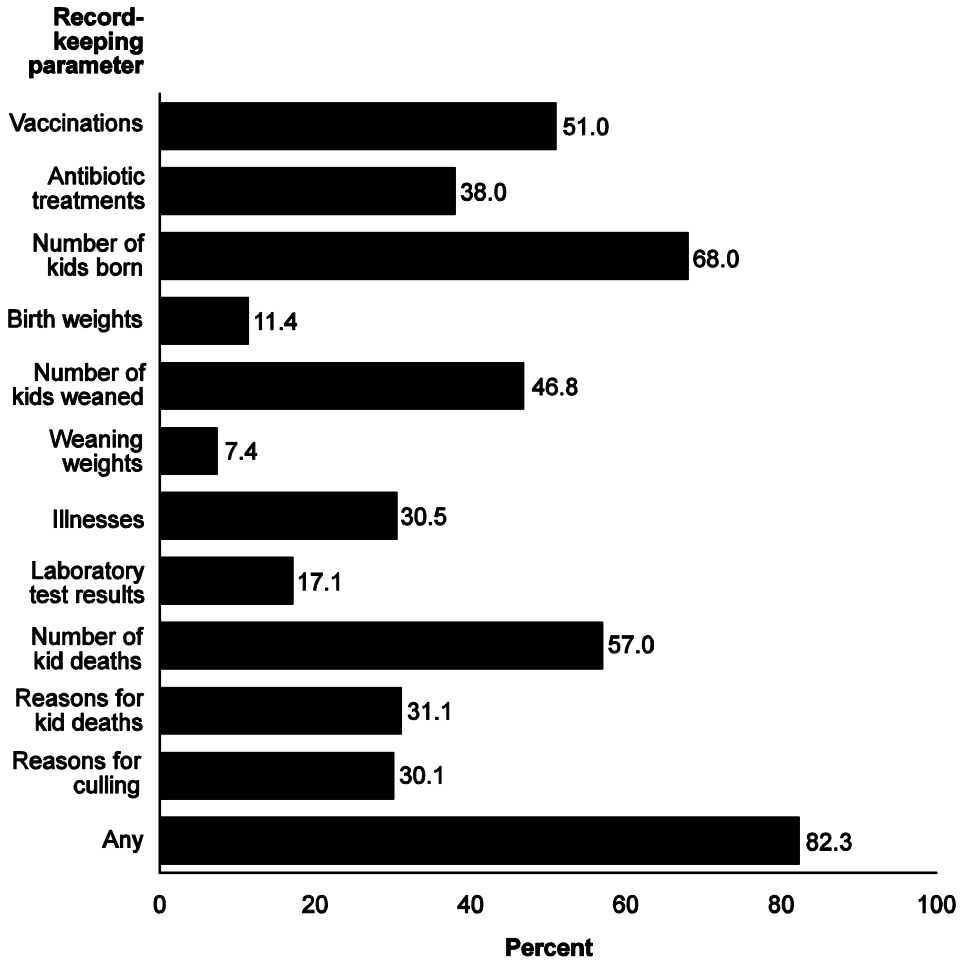
a. Percentage of operations that kept individual-goat records for the following record-keeping parameters during the previous 12 months, by herd size:

Percent Operations

Herd Size (number of goats and kids)

	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Record-keeping parameter	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Vaccinations	47.3	(4.6)	53.6	(3.8)	50.4	(5.3)	51.0	(2.6)
Antibiotic treatments	31.0	(4.3)	42.8	(3.5)	36.1	(4.6)	38.0	(2.5)
Number of kids born	66.9	(4.1)	68.6	(3.4)	68.5	(4.5)	68.0	(2.3)
Birth weights	10.7	(2.4)	12.0	(2.3)	10.9	(2.8)	11.4	(1.5)
Number of kids weaned	44.9	(4.1)	46.0	(3.5)	54.7	(4.9)	46.8	(2.4)
Weaning weights	6.6	(1.9)	7.8	(1.9)	8.3	(2.4)	7.4	(1.2)
Illnesses	27.2	(3.7)	32.6	(3.1)	30.7	(4.3)	30.5	(2.2)
Laboratory test results	14.2	(3.0)	18.4	(2.6)	19.2	(3.9)	17.1	(1.8)
Number of kid deaths	54.8	(4.4)	58.0	(3.6)	58.6	(4.8)	57.0	(2.5)
Reasons for kid deaths	30.6	(3.9)	28.6	(3.1)	41.1	(4.8)	31.1	(2.2)
Reasons for culling	24.2	(3.9)	32.4	(3.4)	35.4	(4.5)	30.1	(2.3)
Any	83.4	(3.4)	80.9	(2.9)	84.8	(3.7)	82.3	(2.0)

Percentage of operations that kept individual-goat records for the following record-keeping parameters during the previous 12 months



Nearly 7 of 10 operations in the Northeast region (68.8 percent) kept vaccination records compared with 5 of 10 operations in the West region (50.0 percent) and about 4 of 10 operations in the Southeast region (41.3 percent). A higher percentage of operations in the Northeast region (83.6 percent) kept records for number of kids born compared with operations in the West or Southeast regions (66.7 and 61.1 percent, respectively).

b. Percentage of operations that kept individual-goat records for the following record-keeping parameters during the previous 12 months, by region:

	Percent Operations					
	Region					
	West		Southeast		Northeast	
Record-keeping parameter	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Vaccinations	50.0	(4.4)	41.3	(4.3)	68.8	(4.0)
Antibiotic treatments	36.7	(4.3)	34.5	(4.0)	45.9	(4.4)
Number of kids born	66.7	(4.2)	61.1	(3.9)	83.6	(2.9)
Birth weights	12.0	(2.7)	7.3	(1.9)	18.2	(3.5)
Number of kids weaned	52.0	(4.3)	36.0	(3.7)	60.1	(4.2)
Weaning weights	9.7	(2.5)	5.1	(1.6)	8.6	(2.4)
Illnesses	31.0	(3.7)	24.2	(3.2)	42.1	(4.4)
Laboratory test results	19.3	(3.1)	10.6	(2.3)	27.8	(4.6)
Number of kid deaths	58.2	(4.3)	50.5	(4.0)	68.0	(4.2)
Reasons for kid deaths	37.0	(4.0)	23.9	(3.3)	36.3	(4.2)
Reasons for culling	31.5	(3.9)	26.4	(3.7)	35.0	(4.3)
Any	80.2	(3.9)	78.8	(3.4)	90.5	(2.2)

Dairy goat operations had the highest percentage of operations that kept records for vaccinations, number of kids weaned, illnesses, and laboratory test results.

c. Percentage of operations that kept individual-goat records for the following record-keeping parameters during the previous 12 months, by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Record-keeping parameter	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Vaccinations	71.9	(5.4)	52.9	(3.3)	34.3	(4.9)
Antibiotic treatments	56.4	(6.1)	37.7	(3.1)	29.8	(4.7)
Number of kids born	81.6	(4.5)	68.9	(2.9)	57.5	(5.3)
Birth weights	15.2	(4.2)	11.9	(1.9)	7.6	(2.6)
Number of kids weaned	66.2	(5.3)	49.7	(3.0)	27.9	(4.3)
Weaning weights	8.9	(3.0)	8.5	(1.6)	3.4	(1.8)
Illnesses	50.6	(5.7)	30.2	(2.8)	21.6	(3.8)
Laboratory test results	54.1	(6.0)	11.5	(2.0)	15.6	(3.7)
Number of kid deaths	65.7	(5.7)	59.7	(3.0)	44.3	(5.3)
Reasons for kid deaths	47.2	(5.7)	31.4	(2.8)	23.3	(3.9)
Reasons for culling	46.8	(5.8)	30.5	(2.9)	19.9	(4.2)
Any	90.5	(3.4)	83.2	(2.4)	74.0	(4.9)

D. Parasite Control

1. Use of the FAMACHA^{ã} card

The FAMACHA card originated in South Africa and has been validated by the Southern Consortium for Small Ruminant Parasite Control as a very effective and economical method for controlling the intestinal parasite *Haemonchus contortus*, or barber's pole worm, so named because of its red and white stripes. Barber's pole worms are arguably one of the most economically important parasites for goat producers. They live in the intestine and feed on blood from the host, sometimes causing anemia, bottle jaw (swelling under the jaw), or death. Barber's pole worms can also damage the nutrition-absorbing cells of the intestine, causing weight loss, poor growth, and reduced milk production.

Not all goats infected with barber's pole worms become clinically ill. Unaffected goats do not need to be treated for worms. In fact, treating all goats for worms contributes to the development of resistance to dewormers. Dewormer resistance is a serious concern for the goat and other animal industries. The FAMACHA card allows producers to identify which goats need to be treated for barber's pole worms and which do not. The card provides a chart with examples of inner eyelid color and allows a producer to compare goat eyelid color with the chart to determine whether anemia exists and, therefore, which animals need to be treated for worms. It is important to note, however, that anemia can be caused by many things other than the barber's pole worm; so, if deworming does not improve the animal's condition, then some other illness might be present. Goats that always need to be treated for barber's pole worm should be culled, and good record keeping will help identify these animals.

Just 6.4 percent of small operations, 17.6 percent of medium operations, and 20.0 of large operations used the FAMACHA card for any reason. Overall, 13.5 percent of goat operations used the FAMACHA card for any reason.

a. Percentage of operations by use of the FAMACHA card for internal parasite management in goats or kids, and by herd size:

Percent Operations

	Herd Size (number of goats and kids)							
	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Use	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
For identifying or culling worm-susceptible goats or kids	4.3	(1.5)	12.0	(2.1)	13.5	(2.6)	9.2	(1.2)
To selectively deworm goats (e.g., only goats or kids with certain scores are dewormed)	4.9	(1.5)	14.4	(2.3)	17.1	(2.9)	11.1	(1.3)
Other	1.0	(1.0)	1.0	(0.5)	1.2	(1.0)	1.0	(0.5)
Use for any reason	6.4	(1.8)	17.6	(2.5)	20.0	(3.2)	13.5	(1.5)

b. Percentage of operations by use of the FAMACHA card for internal parasite management in goats or kids, and by region:

	Percent Operations					
	Region					
	West		Southeast		Northeast	
Use	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
For identifying or culling worm-susceptible goats or kids	4.4	(1.5)	11.9	(2.2)	10.4	(2.4)
To selectively deworm goats (e.g., only goats or kids with certain scores are dewormed)	6.5	(1.9)	13.3	(2.2)	13.1	(2.7)
Other	0.0	(—)	1.6	(1.0)	1.2	(0.7)
Use for any reason	7.7	(2.0)	16.6	(2.5)	15.7	(2.8)
Do not use	92.3	(2.0)	83.4	(2.5)	84.3	(2.8)
Total	100.0		100.0		100.0	

c. Percentage of operations by use of the FAMACHA card for internal parasite management in goats or kids, and by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Use	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
For identifying or culling worm-susceptible goats or kids	6.3	(2.6)	11.4	(1.8)	4.3	(1.6)
To selectively deworm goats (e.g., only goats or kids with certain scores are dewormed)	16.5	(3.6)	12.0	(1.8)	6.0	(1.8)
Other	2.5	(1.6)	1.0	(0.7)	0.3	(0.3)
Use for any reason	18.2	(3.7)	15.1	(2.0)	7.1	(1.9)
Do not use	81.8	(3.7)	84.9	(2.0)	92.9	(1.9)
Total	100.0		100.0		100.0	

2. Use of dewormers

Overall, only 8.1 percent of operations did not treat goats for worms during the previous 3 years. Nearly a third of operations treated goats for worms at least 10 times in the previous 3 years. Few differences were seen by operation size.

a. Percentage of operations by frequency that goats were treated for worms (with medications or natural dewormers) during the previous 3 years, and by herd size:

Percent Operations

	Herd Size (number of goats and kids)							
	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Frequency	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
None	13.0	(2.5)	4.4	(1.5)	7.2	(2.8)	8.1	(1.3)
Once	4.2	(1.4)	4.2	(1.5)	6.7	(3.5)	4.5	(1.0)
2–5 times	21.3	(3.2)	20.3	(2.8)	29.1	(4.7)	21.7	(1.9)
6–10 times	37.0	(3.8)	36.9	(3.3)	34.2	(4.8)	36.6	(2.3)
More than 10 times	24.5	(3.4)	34.2	(3.3)	22.8	(3.7)	29.1	(2.2)
Total	100.0		100.0		100.0		100.0	

More than 3 of 10 operations in the Southeast region (36.7 percent) and less than 2 of 10 operations in the West region (17.5 percent) had treated goats for worms more than 10 times in the previous 3 years.

b. Percentage of operations by frequency that goats were treated for worms (with medications or natural dewormers) during the previous 3 years, and by region:

	Percent Operations					
	Region					
	West		Southeast		Northeast	
Frequency	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
None	8.7	(2.2)	9.1	(2.2)	5.4	(1.8)
Once	8.2	(2.5)	2.5	(1.2)	3.3	(1.5)
2–5 times	30.9	(4.0)	15.5	(2.8)	21.2	(3.3)
6–10 times	34.7	(4.0)	36.2	(3.6)	40.0	(4.1)
More than 10 times	17.5	(3.4)	36.7	(3.7)	30.1	(3.8)
Total	100.0		100.0		100.0	

There were no substantial differences by primary production in the percentages of operations by frequencies that goats were treated for worms during the previous 3 years.

c. Percentage of operations by frequency that goats were treated for worms (with medications or natural dewormers) during the previous 3 years, and by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Frequency	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
None	6.9	(2.7)	6.5	(1.5)	13.2	(3.1)
Once	5.1	(2.6)	4.7	(1.4)	3.7	(1.8)
2–5 times	17.3	(3.9)	24.3	(2.6)	16.6	(3.3)
6–10 times	40.3	(5.4)	36.0	(2.9)	36.7	(4.6)
More than 10 times	30.4	(5.3)	28.5	(2.8)	29.8	(4.5)
Total	100.0		100.0		100.0	

Photograph courtesy of Judy Rodriguez

3. Deworming products used

Note: Tables in this section are for operations that dewormed during the previous 3 years.

The three most commonly used dewormers were the macrolides ivermectin or doramectin (68.3 percent of operations), the benzimidazoles fenbendazole, albendazole, or oxfendazole (55.0 percent of operations) and the macrolide moxidectin (40.3 percent of operations).

a. Percentage of operations by whether the following natural or chemical dewormers were used during the previous 12 months:

Percent Operations

Use of Dewormer

	Yes		No		Don't know		
Dewormer	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Total**
High tannin concentrate plants (lespedezo)	2.6	(0.8)	93.3	(1.3)	4.1	(1.1)	100.0
Natural or alternative dewormers*	11.5	(1.6)	85.5	(1.8)	3.0	(0.9)	100.0
Ivermectin or doramectin	68.3	(2.3)	29.7	(2.3)	2.0	(0.7)	100.0
Moxidectin	40.3	(2.4)	57.4	(2.5)	2.3	(0.8)	100.0
Fenbendazole, albendazole, or oxfendazole	55.0	(2.5)	42.4	(2.5)	2.6	(0.8)	100.0
Morantel or pyrantel	10.9	(1.6)	85.7	(1.8)	3.4	(0.9)	100.0
Levamisole	14.7	(1.8)	81.9	(2.0)	3.4	(1.0)	100.0
Other	3.8	(0.9)	96.2	(0.9)	0.0	(—)	100.0

*E.g., diatomaceous earth, botanicals, herbs, cayenne pepper, copper oxide wire particles.

There were few herd size differences in the use of various natural or chemical dewormers during the previous 12 months. A higher percentage of large operations (60.2 percent) used moxidectin than small operations (33.6 percent).

b. Percentage of operations that used the following natural or chemical dewormers to treat goats for worms during the previous 12 months, by herd size:

Percent Operations

Herd Size (number of goats and kids)

	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Dewormers	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
High tannin concentrate plants (lespedezo)	2.9	(1.6)	2.0	(0.9)	4.0	(1.6)	2.6	(0.8)
Natural or alternative dewormers*	11.4	(2.8)	11.4	(2.3)	12.4	(3.1)	11.5	(1.6)
Ivermectin or doramectin	64.1	(4.0)	72.9	(3.2)	62.2	(5.4)	68.3	(2.3)
Moxidectin	33.6	(4.1)	40.7	(3.5)	60.2	(5.3)	40.3	(2.4)
Fenbendazole, albendazole, or oxfendazole	52.4	(4.2)	57.5	(3.6)	52.6	(5.3)	55.0	(2.5)
Morantel or pyrantel	9.8	(2.8)	12.2	(2.4)	8.8	(2.9)	10.9	(1.6)
Levamisole	13.2	(3.0)	13.4	(2.6)	24.5	(4.7)	14.7	(1.8)
Other	4.1	(1.6)	4.1	(1.4)	1.3	(0.9)	3.8	(0.9)
Any drug	92.6	(2.3)	96.3	(1.4)	98.6	(0.6)	95.2	(1.1)
Any natural dewormer	12.9	(3.0)	12.6	(2.3)	14.3	(3.2)	12.9	(1.7)

*E.g., diatomaceous earth, botanicals, herbs, cayenne pepper, copper oxide wire particles.

There were few regional differences in the use of natural or chemical dewormers during the previous 12 months. A higher percentage of operations in the Southeast region (48.6 percent) used moxidectin than operations in the Northeast region (30.3 percent).

c. Percentage of operations that used the following natural or chemical dewormers to treat goats for worms during the previous 12 months, by region:

	Percent Operations					
	Region					
	West		Southeast		Northeast	
Dewormers	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
High tannin concentrate plants (lespedezo)	1.4	(0.9)	4.2	(1.6)	1.2	(0.7)
Natural or alternative dewormers*	13.9	(3.4)	10.5	(2.3)	10.5	(2.4)
Ivermectin or doramectin	75.2	(3.7)	63.1	(3.9)	69.2	(3.9)
Moxidectin	36.3	(4.4)	48.6	(4.0)	30.3	(3.8)
Fenbendazole, albendazole, or oxfendazole	53.3	(4.5)	50.5	(4.0)	65.0	(4.0)
Morantel or pyrantel	8.3	(2.6)	13.4	(2.8)	9.5	(2.6)
Levamisole	13.9	(3.3)	16.0	(3.0)	13.1	(3.0)
Other	2.4	(1.2)	5.7	(1.8)	2.2	(1.3)
Any drug	93.4	(2.3)	95.4	(1.7)	97.2	(1.6)
Any natural dewormer	13.9	(3.4)	13.3	(2.6)	11.1	(2.5)

*E.g., diatomaceous earth, botanicals, herbs, cayenne pepper, copper oxide wire particles.

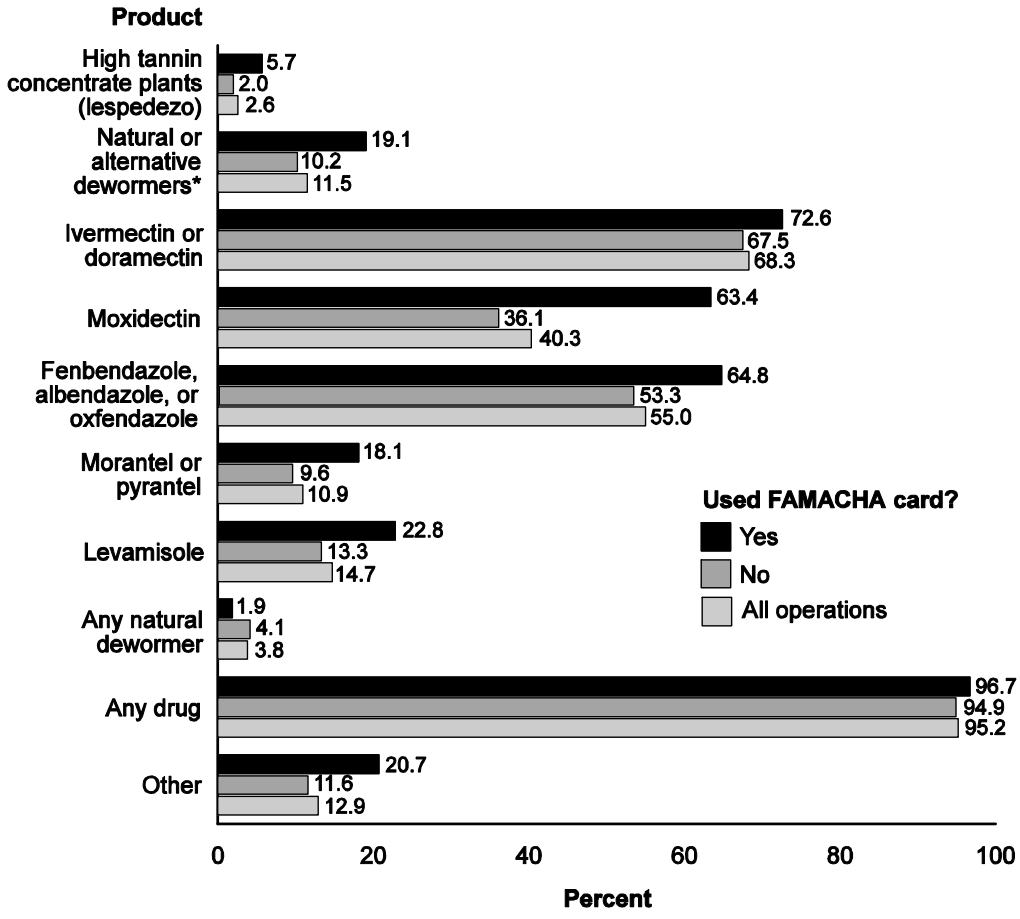
A higher percentage of operations that used the FAMACHA used moxidectin (63.4 percent) compared with operations that did not use the card (36.1 percent). The use of moxidectin was the only substantial difference between operations that used the card and those that did not.

d. Percentage of operations that used the following natural or chemical dewormers to treat goats for worms during the previous 12 months, by use of FAMACHA card:

	Percent Operations Used FAMACHA Card?					
	Yes		No		All operations	
Dewormer	Percent	Std. error	Percent	Std. error	Percent	Std. error
High tannin concentrate plants (lespedezo)	5.7	(2.4)	2.0	(0.8)	2.6	(0.8)
Natural or alternative dewormers*	19.1	(4.4)	10.2	(1.7)	11.5	(1.6)
Ivermectin or doramectin	72.6	(5.6)	67.5	(2.5)	68.3	(2.3)
Moxidectin	63.4	(5.6)	36.1	(2.6)	40.3	(2.4)
Fenbendazole, albendazole, or oxfendazole	64.8	(5.8)	53.3	(2.7)	55.0	(2.5)
Morantel or pyrantel	18.1	(4.9)	9.6	(1.7)	10.9	(1.6)
Levamisole	22.8	(5.1)	13.3	(1.9)	14.7	(1.8)
Other	1.9	(1.4)	4.1	(1.1)	3.8	(0.9)
Any drug	96.7	(2.1)	94.9	(1.3)	95.2	(1.1)
Any natural dewormer	20.7	(4.5)	11.6	(1.8)	12.9	(1.7)

*E.g., diatomaceous earth, botanicals, herbs, cayenne pepper, copper oxide wire particles.

Percentage of operations that used the following natural or chemical dewormers to treat goats for worms during the previous 12 months, by use of FAMACHA card



E.g., diatomaceous earth, botanicals, herbs, cayenne pepper, copper oxide wire particles.

The most common method used to administer any of the following dewormers was directly into mouth or in feed.

e. For operations that used the following dewormers, percentage of operations by method of administration:

Percent Operations

Method of Administration

Dewormer	Directly into mouth or in feed		Injection		Pour-on	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Ivermectin or doramectin	67.8	(3.7)	31.1	(3.7)	13.7	(2.5)
Moxidectin	92.5	(2.3)	3.8	(1.7)	11.2	(3.2)
Levamisole	93.0	(4.6)	11.3	(5.5)	NA	

4. Testing goats for worms resistant to dewormers

A higher percentage of large operations (25.3 percent) used a fecal-egg-count reduction test to determine whether goats had worms resistant to dewormers compared with medium operations (11.2 percent) and small operations (6.9 percent).

a. Percentage of operations by fecal tests used to determine whether goats had worms resistant to dewormers, and by herd size:

Percent Operations

Herd Size (number of goats and kids)

Test used	Small (10–19)		Medium (20–99)		Large (100 or more)		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Fecal-egg-count reduction	6.9	(2.1)	11.2	(2.0)	25.3	(4.9)	11.3	(1.4)
DrenchRite®	0.0	(—)	0.3	(0.3)	0.3	(0.3)	0.2	(0.2)
Other	1.9	(1.4)	0.0	(—)	0.0	(—)	0.7	(0.5)

There were no regional differences in the use of fecal tests to determine if goats had worms resistant to dewormers.

b. Percentage of operations by fecal tests used to determine whether goats had worms resistant to dewormers, and by region:

	Percent Operations					
	Region					
	West		Southeast		Northeast	
Test used	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Fecal-egg-count reduction	12.9	(2.5)	8.6	(2.1)	14.1	(3.0)
DrenchRite	0.0	(—)	0.0	(—)	0.8	(0.6)
Other	0.0	(—)	1.1	(1.1)	0.8	(0.8)

There were no substantial differences by primary production in the use of fecal tests to determine whether goats had worms resistant to dewormers.

c. Percentage of operations by fecal tests used to determine whether goats had worms resistant to dewormers, and by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Test used	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Fecal egg count reduction	22.2	(5.0)	10.2	(1.8)	9.3	(2.7)
DrenchRite	1.5	(1.5)	0.1	(0.1)	0.0	(—)
Other	1.9	(1.8)	0.7	(0.7)	0.0	(—)

About 3 of 10 operations that used the FAMACHA card (31.1 percent) used the fecal-egg-count reduction test to determine whether goats had worms resistant to dewormers compared with less than 1 of 10 operations that did not use the FAMACHA card (7.5 percent).

d. Percentage of operations by fecal tests used to determine whether goats had worms resistant to dewormers, and by use of FAMACHA card:

	Percent Operations Used FAMACHA Card			
	Yes		No	
Test used	Percent	Std. error	Percent	Std. error
Fecal-egg-count reduction	31.1	(5.3)	7.5	(1.3)
DrenchRite	0.0	(—)	0.2	(0.2)
Other	0.0	(—)	0.8	(0.6)

5. Deworming practices

Note: Tables in this section are for operations that dewormed goats any time during the previous 3 years.

Nearly one-half of operations (49.7 percent) used a regular deworming schedule as the primary factor for deciding when to deworm goats. One-fourth of operations reported “other” as the primary factor for deciding when to deworm goats. More than 90 percent of these “other” reasons were a combination of two or more of the reasons listed in the following table.

a. Percentage of operations by primary factor used to decide when to treat goats for worms, and by region:

	Percent Operations							
	Region							
	West		Southeast		Northeast		All operations	
Factor	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
When the hair, coat, or body condition are poor	13.5	(3.1)	9.6	(2.3)	6.4	(2.0)	10.0	(1.5)
Fecal consistency (diarrhea)	0.9	(0.6)	9.4	(2.5)	2.4	(1.2)	5.0	(1.2)
A regular schedule	58.1	(4.4)	38.9	(3.9)	58.2	(4.1)	49.7	(2.5)
Based on fecal tests	3.5	(1.4)	1.2	(0.6)	4.2	(1.9)	2.7	(0.7)
Based on FAMACHA card system/eye anemia score	2.7	(1.5)	9.7	(2.2)	7.7	(2.3)	7.0	(1.2)
Bottlejaw	0.0	(—)	0.9	(0.7)	0.0	(—)	0.4	(0.3)
Other	21.3	(3.8)	30.3	(3.6)	21.1	(3.3)	25.2	(2.2)
Total	100.0		100.0		100.0		100.0	

Over half of operations (53.8 percent) rotated pasture as a means of parasite control. Selecting for parasite-resistant goats or culling worm-susceptible goats help reduce the use of dewormers. Less than one-fourth of operations (22.8 percent) selected parasite-resistant goats or culled worm-susceptible goats as a means of parasite control.

b. Percentage of operations by deworming practices and by region:

Percent Operations

	Region							
	West		Southeast		Northeast		All operations	
Practice	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Give a combination of two or more dewormer drugs at once	8.4	(2.3)	14.6	(2.8)	10.6	(2.7)	11.7	(1.6)
Use a higher dose of dewormer in goats than the labeled dose recommended for sheep	40.0	(4.4)	39.7	(3.9)	39.9	(4.2)	39.8	(2.4)
Rotate pasture	54.2	(4.5)	57.1	(4.0)	47.3	(4.4)	53.8	(2.5)
Selected for parasite-resistant goats or cull worm-susceptible goats	14.5	(2.8)	28.0	(3.5)	23.5	(3.5)	22.8	(2.0)

Overall, operations that used the FAMACHA card dewormed a lower percentage of their herd (68.8 percent of goats) compared with operations that did not use the FAMACHA card (91.1 percent). This finding represents a substantial savings in parasite-control costs for operations that used the FAMACHA card.

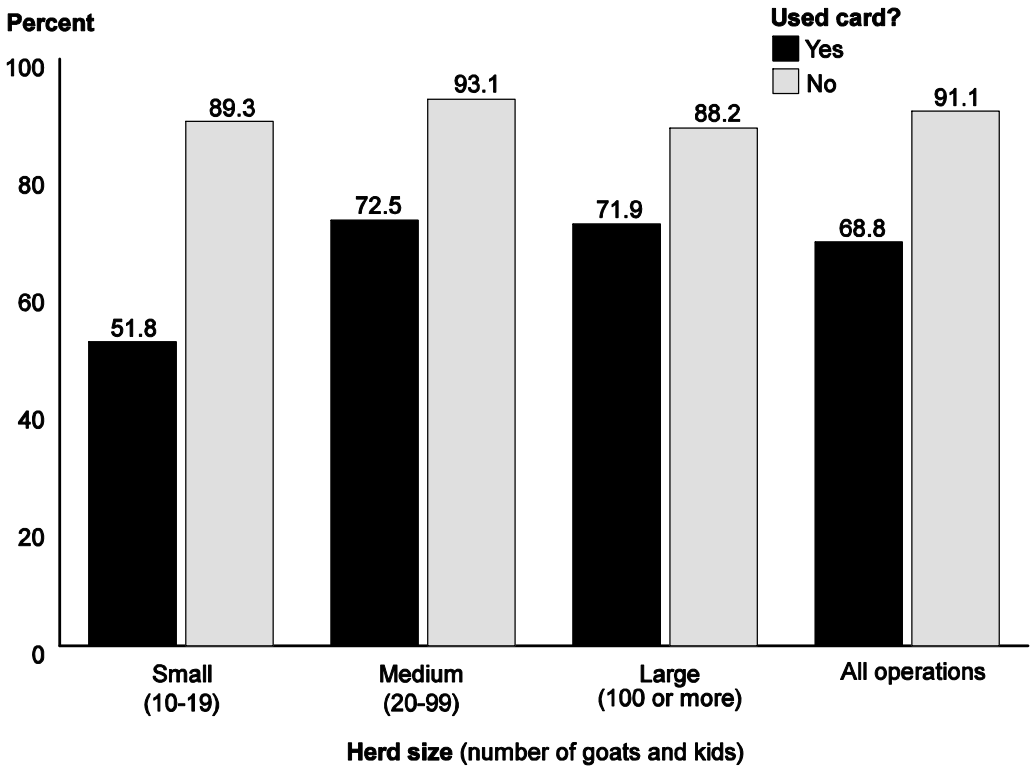
c. Operation average percentage of goats dewormed at the most recent deworming, by use of FAMACHA card and by herd size:

Operation Average Percent Goats

Herd Size (number of goats and kids)

	Small (10–19)		Medium (20–99)		Large (100 or more)		All operations	
Used card?	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Yes	51.8	(12.4)	72.5	(5.2)	71.9	(6.3)	68.8	(4.3)
No	89.3	(1.9)	93.1	(1.5)	88.2	(4.8)	91.1	(1.2)

Operation average percentage of goats dewormed at the most recent deworming, by use of FAMACHA card and by herd size



Operations that used the FAMACHA card in the Northeast and Southeast regions dewormed a lower percentage of goats than those that did not use the card.

d. Operation average percentage of goats dewormed at the most recent deworming, by use of FAMACHA card and by region:

	Operation Average Percent Goats					
	Region					
	West		Southeast		Northeast	
Used card?	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Yes	83.7	(5.8)	71.7	(6.3)	51.1	(7.9)
No	93.2	(1.9)	90.2	(2.1)	89.7	(2.1)

Meat goat and “other” goat operations that used the FAMACHA card dewormed a lower percentage of goats (69.0 and 59.7 percent, respectively) than meat goat operations that did not use the FAMACHA card (90.7 and 93.5 percent, respectively).

e. Operation average percentage of goats dewormed during the most recent deworming, by use of FAMACHA card and by primary production:

	Operation Average Percent Goats					
	Primary Production					
	Dairy		Meat		Other	
Used card?	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Yes	76.0	(9.1)	69.0	(5.2)	59.7	(11.0)
No	88.0	(3.4)	90.7	(1.6)	93.5	(1.8)

6. Sources of deworming information

Veterinarian and other goat producer or owner were very important sources of deworming information on 37.3 and 35.0 percent of operations, respectively). Sales representatives were very important sources of deworming information on just 5.8 percent of operations.

a. For operations that dewormed goats or kids during the previous 3 years, percentage of operations by importance of the following sources of deworming information:

Percent Operations

	Importance						
	Very important		Somewhat important		Not important		
Source	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Total
Veterinarian	37.3	(2.4)	26.7	(2.2)	36.0	(2.5)	100.0
Other producer or goat owner	35.0	(2.4)	42.6	(2.5)	22.4	(2.1)	100.0
Sales representative	5.8	(1.2)	20.0	(2.1)	74.2	(2.3)	100.0
Extension/ university personnel	15.2	(1.8)	29.2	(2.3)	55.6	(2.5)	100.0
Magazine/journal/ club or 4-H publication	14.7	(1.8)	44.9	(2.5)	40.4	(2.5)	100.0
Other	6.0	(1.2)	7.5	(1.4)	86.5	(1.8)	100.0

Overall, the three top sources of deworming information considered to be very or somewhat important were other producer or goat owner, veterinarian, and magazine/ journal/club or 4-H publication (77.6, 64.0, and 59.6 percent of operations, respectively).

b. For operations that dewormed goats or kids during the previous 3 years, percentage of operations that considered the following sources of deworming information to be **very or somewhat important**, by herd size:

Percent Operations

Herd Size (number of goats and kids)

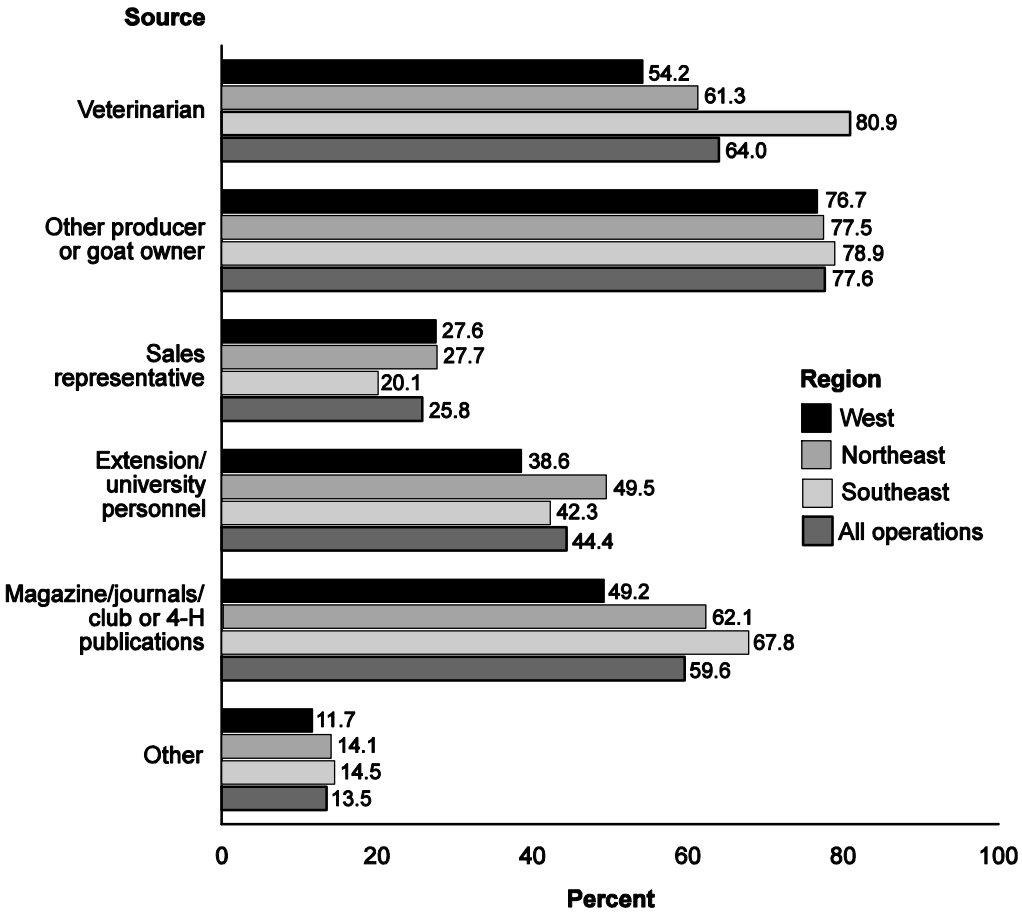
	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Source	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Veterinarian	67.9	(4.0)	61.1	(3.6)	64.2	(5.1)	64.0	(2.5)
Other producer or goat owner	80.6	(3.1)	76.1	(3.2)	75.0	(4.4)	77.6	(2.1)
Sales representative	23.9	(3.8)	25.3	(3.2)	33.7	(5.4)	25.8	(2.3)
Extension/ university personnel	46.0	(4.2)	42.7	(3.5)	46.8	(5.4)	44.4	(2.5)
Magazine/journal/ club or 4-H publication	58.4	(4.2)	62.4	(3.5)	50.4	(5.4)	59.6	(2.5)
Other	16.1	(3.4)	12.2	(2.3)	10.8	(2.8)	13.5	(1.8)

A higher percentage of operations in the Northeast region (80.9 percent) considered veterinarians a very or somewhat important source of deworming information compared with operations in the Southeast and West regions (61.3 and 54.2 percent, respectively).

c. For operations that dewormed goats or kids during the previous 3 years, percentage of operations that considered the following sources of deworming information **very or somewhat important**, by region:

	Percent Operations					
	Region					
	West		Southeast		Northeast	
Source	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Veterinarian	54.2	(4.6)	61.3	(3.9)	80.9	(3.5)
Other producer or goat owner	76.7	(3.8)	77.5	(3.3)	78.9	(3.4)
Sales representative	27.6	(4.2)	27.7	(3.7)	20.1	(3.4)
Extension/ university personnel	38.6	(4.5)	49.5	(4.0)	42.3	(4.3)
Magazine/journal/ club or 4-H publication	49.2	(4.6)	62.1	(3.9)	67.8	(4.1)
Other	11.7	(2.9)	14.1	(3.0)	14.5	(3.1)

For operations that dewormed goats or kids during the previous 3 years, percentage of operations that considered the following sources of deworming information very or somewhat important, by region



There were no differences by primary production in the percentages of operations that considered the listed sources of deworming information very or somewhat important.

d. For operations that dewormed goats or kids during the previous 3 years, percentage of operations that considered the following sources of deworming information **very or somewhat important**, by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Source	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Veterinarian	77.0	(4.6)	60.9	(3.2)	66.7	(5.0)
Other producer or goat owner	78.9	(4.7)	79.3	(2.6)	72.2	(4.6)
Sales representative	18.4	(4.6)	27.6	(2.9)	24.0	(4.5)
Extension/ university personnel	45.7	(5.6)	44.1	(3.2)	44.5	(5.0)
Magazine/journals/ club or 4-H publications	67.8	(5.1)	59.9	(3.2)	54.6	(5.2)
Other	11.1	(4.0)	12.4	(2.2)	17.9	(4.0)

About 6 of 10 operations that used the FAMACHA card (68.7 percent) considered extension/university personnel important sources of deworming information compared with about 4 of 10 operations that did not use the card (40.1 percent).

e. For operations that dewormed goats or kids during the previous 3 years, percentage of operations that considered the following sources of deworming information **very or somewhat important**, by use of FAMACHA card:

	Percent Operations Used FAMACHA Card?			
	Yes		No	
Source	**Percent**	**Std. error**	**Percent**	**Std. error**
Veterinarian	76.5	(5.5)	61.8	(2.7)
Other producer or goat owner	86.0	(3.9)	76.2	(2.3)
Sales representative	17.4	(5.1)	27.3	(2.5)
Extension/university personnel	68.7	(5.5)	40.1	(2.7)
Magazine/journals/ club or 4-H publications	67.6	(5.5)	58.2	(2.7)
Other	13.0	(4.1)	13.6	(2.0)

7. Veterinarian involvement in deworming decisions

Only 38.2 percent of operations consulted a veterinarian about what parasite treatments to use; 26.2 percent of operations did not have a veterinarian.

a. Percentage of operations by whether a veterinarian was consulted about what parasite treatments (dewormers) to use, and by herd size:

Percent Operations

Herd Size (number of goats and kids)

	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Veterinarian consulted?	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Yes	37.5	(4.0)	39.3	(3.4)	35.3	(4.8)	38.2	(2.4)
No	39.7	(4.1)	31.0	(3.2)	42.6	(5.4)	35.6	(2.4)
Did not have a veterinarian	22.8	(3.5)	29.7	(3.4)	22.1	(4.6)	26.2	(2.3)
Total	100.0		100.0		100.0		100.0	

The percentage of operations that consulted a veterinarian about parasite treatments ranged from 30.2 percent of operations in the West region to 56.1 percent of operations in the Northeast region. There were no regional differences in the percentage of operations that did not consult a veterinarian about parasite treatments. A lower percentage of operations in the Northeast region did not have a veterinarian compared with the other regions.

b. Percentage of operations by whether a veterinarian was consulted about what parasite treatments (dewormers) to use, and by region:

	Percent Operations					
	Region					
	West		Southeast		Northeast	
Veterinarian consulted?	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Yes	30.2	(4.0)	33.9	(3.7)	56.1	(4.2)
No	39.5	(4.4)	34.5	(3.8)	32.7	(3.9)
Did not have a veterinarian	30.3	(4.3)	31.6	(3.8)	11.2	(2.8)
Total	100.0		100.0		100.0	

A higher percentage of meat goat operations than dairy goat operations did not have a veterinarian (28.9 and 13.7 percent, respectively).

c. Percentage of operations by whether a veterinarian was consulted about what parasite treatments (dewormers) to use, and by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Veterinarian consulted?	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Yes	48.3	(5.7)	36.4	(3.0)	38.4	(4.8)
No	38.0	(5.5)	34.7	(3.0)	36.9	(4.9)
Did not have a veterinarian	13.7	(3.7)	28.9	(3.0)	24.7	(4.6)
Total	100.0		100.0		100.0	

8. Use of fly/lice control

Over one of three operations (38.7 percent) used a pour-on product or topical spray for fly and/or lice control during the previous 12 months. There was no difference by herd size in the percentage of operations that used a pour-on product or topical spray.

a. Percentage of operations that used a pour-on product or topical spray for fly and/or lice control during the previous 12 months, by herd size:

Percent Operations							
Herd Size (number of goats and kids)							
Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
31.8	(3.6)	41.8	(3.3)	48.2	(4.8)	38.7	(2.2)

There were no regional differences in the percentage of operations that used a pour-on product or tropical spray for fly and/or lice control.

b. Percentage of operations that used a pour-on product or topical spray for fly and/or lice control during the previous 12 months, by region:

Percent Operations					
Region					
West		**Southeast**		**Northeast**	
Percent	**Std. error**	**Percent**	**Std. error**	**Percent**	**Std. error**
39.4	(4.0)	36.4	(3.5)	42.3	(4.0)

E. Goat and Herd Health

1. Abortions

Overall, 41.5 percent of operations had does that had abortions or stillbirths during the previous 12 months. As expected, the larger the herd size the higher the percentage of operations with does that had abortions or stillbirths

a. For operations with does, percentage of operations on which does had any abortions or stillbirths during the previous 12 months, by herd size:

Percent Operations

	Herd Size (number of goats and kids)							
	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Had abortions or stillbirths?	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Yes	26.4	(3.5)	47.8	(3.4)	64.0	(4.6)	41.5	(2.3)
No	69.2	(3.6)	45.7	(3.4)	21.3	(3.9)	51.8	(2.3)
Don’t know	4.4	(1.7)	6.5	(1.8)	14.7	(3.8)	6.7	(1.2)
Total	100.0		100.0		100.0		100.0	

None of the operations on which does had abortions or stillbirths reported that Q fever was the cause, although over half did not know whether Q fever was the cause.

b. For operations on which does had abortions or stillbirths during the previous 12 months, percentage of operations by whether or not Q fever was the cause of one or more of the abortions or stillbirths:

Caused by Q fever?	**Percent operations**	**Std. error**
Yes	0.0	(—)
No	44.6	(3.6)
Don’t know	55.4	(3.6)
Total	100.0	

Operators on only 0.3 percent of operations believed that they, family members, or employees had ever been infected with Q fever.

c. Percentage of operations on which the operator believed that they, family members, or employees had ever been infected with Q fever:

Infected with Q fever?	Percent operations	Std. error
Yes	0.3	(0.2)
No	87.6	(1.5)
Don't know	12.1	(1.5)
Total	100.0	

2. Mastitis

Across herd sizes, a similar percentage of does had clinical mastitis during the previous 12 months.

a.Percentage of does that had clinical mastitis during the previous 12 months, by herd size

Percent Does*

Herd Size (number of goats and kids)

Small (10–19)		Medium (20–99)		Large (100 or more)		All operations	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
3.5	(0.8)	2.8	(0.5)	2.7	(0.5)	2.8	(0.3)

*Number of does with clinical mastitis as a percentage of the total number of does in milk during the previous 12 months.

The percentage of does with clinical mastitis did not vary by region.

b. Percentage of does with clinical mastitis during the previous 12 months, by region:

Percent Does*					
Region					
West		Southeast		Northeast	
Percent	Std. error	Percent	Std. error	Percent	Std. error
2.8	(0.5)	3.1	(0.6)	2.5	(0.4)

*Number of does with clinical mastitis as a percentage of the total number of does in milk.

The percentage of does with clinical mastitis did not vary by primary production.

c. Percentage of does with clinical mastitis during the previous 12 months, by primary production:

Percent Does*					
Primary Production					
Dairy		Meat		Other	
Percent	Std. error	Percent	Std. error	Percent	Std. error
3.6	(0.5)	2.6	(0.4)	3.0	(0.3)

*Number of does with clinical mastitis as a percentage of the total number of does in milk.

Across herd sizes, a similar percentage of operations with one or more does in milk had at least one doe with clinical mastitis.

d. For operations with does in milk, percentage of operations on which one or more does had clinical mastitis during the previous 12 months, by region:

Percent Operations

Region

West		Southeast		Northeast		All operations	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
34.7	(4.5)	29.1	(4.1)	28.4	(4.0)	30.7	(2.5)

The percentage of operations that had one or more does with clinical mastitis did not differ by primary production.

e. For operations with does in milk, percentage of operations on which one or more does had clinical mastitis during the previous 12 months, by primary production:

Percent Operations

Primary Production

Dairy		Meat		Other	
Percent	Std. error	Percent	Std. error	Percent	Std. error
38.5	(5.5)	29.8	(3.2)	30.7	(2.5)

Visual observation of udder and/or milk was the most common method used for diagnosing mastitis (92.6 percent of operations). Visual observation of the udder and/or milk was the only method used for diagnosing mastitis on operations with 10 to 19 goats.

f. For operations that had at least one doe with clinical mastitis during the previous 12 months, percentage of operations by method most often used to diagnose mastitis, and by herd size:

Percent Operations

Herd Size (number of goats and kids)

Method	Small (10–19) Pct.	Small (10–19) Std. error	Medium (20–99) Pct.	Medium (20–99) Std. error	Large (100 or more) Pct.	Large (100 or more) Std. error	All operations Pct.	All operations Std. error
California mastitis test (CMT) or somatic cell count (SCC)	0.0	(—)	4.9	(2.5)	9.1	(4.5)	4.6	(1.7)
Visual observation of udder and/or milk	100.0	(—)	92.2	(2.9)	85.4	(4.8)	92.6	(1.9)
Culture of milk	0.0	(—)	2.9	(1.7)	2.3	(1.3)	2.0	(0.9)
Other	0.0	(—)	0.0	(—)	3.2	(1.8)	0.8	(0.4)
Total	100.0		100.0		100.0		100.0	

g. For operations that had at least one doe with clinical mastitis during the previous 12 months, percentage of operations by method most often used to diagnose mastitis, and by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Method	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
California mastitis test (CMT) or somatic cell count (SCC)	12.3	(5.6)	4.1	(2.1)	0.0	(—)
Visual observation of udder and/or milk	77.1	(7.1)	94.3	(2.3)	100.0	(—)
Culture of milk	8.9	(4.7)	0.8	(0.6)	0.0	(—)
Other	1.7	(1.6)	0.8	(0.5)	0.0	(—)
Total	100.0		100.0		100.0	

3. Disease presence

The highest percentage of operations (21.5 percent) reported that caseous lymphadenitis was suspected or confirmed on the operation during the previous 3 years. Of those operations, 20.2 percent reported that the disease was diagnosed by a veterinarian or laboratory. Caseous lymphadenitis—also known as boils or cheesy gland—is an important cause of economic loss to goat and sheep producers due to loss of condition in live animals, loss of sales of breeding stock, condemnation and trim of carcasses, and devaluation of hides. Animals are usually infected with the bacteria through superficial wounds caused during shearing or by sharp objects such as nails, barbed wire, and slivers from wooden feeders or fences, etc. Abscesses occur at the wound site, the regional lymph node, or deeper in the body.

The second highest percentage of operations (14.9 percent) reported that sore mouth was suspected or confirmed on the operation in the previous 3 years. Of these operations, 19.4 percent reported that the disease was diagnosed by a veterinarian or laboratory. Sore mouth—also known as scabby mouth, orf, or contagious ecthyma—often appears first as vesicles and then thick scabs on the mouth, lips, nose, teats, udders, and feet of infected animals. Kids are most likely to be affected by sore mouth. Affected kids may eat less than normal or refuse to eat at all. Does, when affected on their udders, may refuse to allow kids to nurse and might even abandon their kids. Sore mouth is a zoonotic infection; therefore, producers should take precautions not to touch scabs and should always wear gloves when working with infected animals. (For more information on sore mouth, see CDC Web site: http://www.cdc.gov.)

a. Percentage of operations on which the following diseases were present (suspected or confirmed) during the previous 3 years, and percentage of these operations on which the disease was diagnosed by a veterinarian or laboratory:

Disease	Percent operations	Std. error	If disease present, percent of operations on which disease diagnosed	Std. error
Brucellosis	0.0	(—)	NA	
Caprine arthritis encephalitis (CAE)	4.8	(0.8)	64.8	(8.0)
Caseous lymphadenitis (boils, CL, abscesses)	21.5	(1.9)	20.2	(4.7)
Johne's (paratuberculosis)	1.7	(0.5)	45.1	(14.5)
Scrapie	0.9	(0.5)	96.6	(3.2)
Tuberculosis (TB)	0.1	(0.1)	77.3	(23.1)
Q fever	0.4	(0.3)	100.0	
Sore mouth (orf)	14.9	(1.6)	19.4	(5.3)

Regional percentages for operations and goats with sore mouth were similar.

b. Percentage of operations on which sore mouth was present during the previous 12 months, and percentage of goats and kids with sore mouth, by region:

	Percent*							
	Region							
	West		Southeast		Northeast		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Operations	9.2	(2.3)	6.9	(1.8)	9.3	(2.2)	8.2	(1.2)
Goats and kids	1.8	(0.5)	2.6	(1.2)	5.4	(2.3)	2.7	(0.7)

*As a percentage of goat and kid inventory on day of interview.

Of the goats and kids infected with sore mouth during the previous 12 months, 2.2 percent died.

c. Mortality rate for goats and kids with sore mouth during the previous 12 months:

Percent mortality*	Std. error
2.2	(1.7)

*Number of goats and kids that died from sore mouth as a percentage of all goats affected by sore mouth.

For operations on which sore mouth was present during the previous 12 months, 16.0 percent used a vaccine on at least one of their goats. The sore mouth vaccine is a live virus that causes disease in the vaccinated animals. The idea is to vaccinate the animals during a time when the disease will not cause production losses. For example, does vaccinated 1 to 2 months prior to kidding will have antibodies to sore mouth in their colostrum, which will protect newborn kids from the disease. It is important to note that since the vaccine actually introduces the infection to the herd, it should not be given unless sore mouth is already in the herd. In addition, care should be taken when vaccinating, as the sore mouth vaccine can also cause disease in humans. Use of gloves is recommended.

d. For operations on which sore mouth was present during the previous 12 months, percentage of operations that used a sore mouth vaccine for any goats:

Percent operations	Std. error
16.0	(5.2)

4. Death loss

Overall, 59.7 percent of operations had goats that died or were euthanized from July 1, 2008, to June 30, 2009. In addition, 65.9 percent of operations had kids that died or were euthanized during the same time period. About three-quarters of meat goat operations (74.1 percent) had kids that died compared with about half of dairy goat operations (55.0 percent).

a. Percentage of operations that had goats and kids that died or were euthanized from July 1, 2008, to June 30, 2009, by primary production:

	Percent Operations							
	Primary Production							
	Dairy		Meat		Other		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Goats died	52.1	(5.5)	62.2	(3.1)	56.7	(4.6)	59.7	(2.4)
Kids died	55.0	(5.5)	74.1	(2.8)	49.2	(4.7)	65.9	(2.3)

Overall, 13.8 percent of kids and 7.2 percent of goats died or were euthanized from July 1, 2008, to June 30, 2009. Only 1.8 percent of kids and 0.7 percent of goats were lost or stolen.

b. Percentage of goats[1] and kids[2] that died or were euthanized or were lost or stolen from July 1, 2008, to June 30, 2009, by herd size:

Percent Goats/Kids

Herd Size (number of goats and kids)

	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
	Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Goats died/euthanized	9.2	(1.1)	8.6	(1.1)	5.5	(0.8)	7.2	(0.6)
Goats lost or stolen	1.1	(0.6)	0.7	(0.3)	0.6	(0.3)	0.7	(0.2)
Kids died	17.8	(2.3)	12.9	(1.4)	13.6	(1.4)	13.8	(0.9)
Kids lost or stolen	3.1	(0.9)	1.6	(0.6)	1.6	(0.9)	1.8	(0.5)

[1]Number of adult goats 1 year of age and older that died between July 1, 2008, and June 30, 2009, as a percentage of the July 1, 2009, adult goat and kid inventory.
[2]Number of kids less than 1 year of age that died between July 1, 2008, and June 30, 2009, as a percentage of the July 1, 2009, kid inventory.

The Northeast region had lowest percentage of kids lost or stolen (0.4 percent), while the West region had the highest percentage (2.5 percent).

c. Percentage of goats[1] and kids[2] that died or were euthanized or were lost or stolen from July 1, 2008, to June 30, 2009, by region:

	Percent Goats/Kids					
	Region					
	West		Southeast		Northeast	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Goats died/euthanized	5.4	(0.7)	10.2	(1.4)	7.9	(0.9)
Goats lost or stolen	0.5	(0.2)	1.1	(0.4)	0.7	(0.5)
Kids died	10.7	(1.1)	17.5	(1.8)	16.1	(2.3)
Kids lost or stolen	2.5	(1.0)	1.6	(0.5)	0.4	(0.2)

[1]Number of adult goats 1 year of age and older that died between July 1, 2008, and June 30, 2009, as a percentage of the July 1, 2009, adult goat and kid inventory.
[2]Number of kids less than 1 year of age that died between July 1, 2008, and June 30, 2009, as a percentage of the July 1, 2009, kid inventory.

No goats or kids were lost or stolen on dairy operations. On meat goat operations, 0.6 percent of goats and 1.7 percent of kids were lost or stolen. On “other” goat operations, 3.0 percent of goats and 4.4 percent of kids were lost or stolen. There were no differences by primary production in the percentage of kids that died.

d. Percentage of goats[1] and kids[2] that died or were euthanized or were lost or stolen from July 1, 2008, to June 30, 2009, by operation type:

	Percent Goats/Kids					
	Primary Production					
	Dairy		Meat		Other	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Goats died	6.3	(0.9)	6.5	(0.7)	14.6	(2.3)
Goats lost or stolen	0.0	(0.0)	0.6	(0.2)	3.0	(1.3)
Kids died	13.0	(2.0)	13.8	(1.1)	15.3	(3.8)
Kids lost or stolen	0.0	(0.0)	1.7	(0.6)	4.4	(2.1)

[1]Number of adult goats 1 year of age and older that died between July 1, 2008, and June 30, 2009, as a percentage of the July 1, 2009, adult goat and kid inventory.
[2]Number of kids less than 1 year of age that died between July 1, 2008, and June 30, 2009, as a percentage of the July 1, 2009, kid inventory.

5. Carcass disposal

Note: Tables in this section represent operations with any goat or kid deaths.

Prompt removal and disposal of dead animals from pens before other animals, rodents, or birds have contact with them reduces the risk that disease agents from the carcasses will be spread to other animals.

The majority of all operations (55.3 percent) and the majority of small operations (57.2 percent) and medium operations (58.6 percent) buried carcasses on the premises. The majority of large operations (50.3 percent) left carcasses for scavengers.

a. Percentage of operations by method used to dispose of carcasses from July 1, 2008, to June 30, 2009, and by herd size:

	Percent Operations							
	Herd Size (number of goats and kids)							
	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Method	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Landfill or municipal dump	8.9	(2.9)	13.1	(2.6)	5.2	(2.0)	10.6	(1.7)
Incinerate (burn)	19.5	(4.1)	16.5	(2.9)	11.5	(2.9)	16.7	(2.1)
Bury on premises	57.2	(4.9)	58.6	(3.8)	38.9	(4.8)	55.3	(2.7)
Render	0.5	(0.5)	0.9	(0.7)	0.8	(0.6)	0.8	(0.4)
Compost	7.0	(2.5)	8.6	(1.9)	11.5	(2.5)	8.5	(1.4)
Leave for scavengers (e.g., coyotes, bears, vultures)	26.8	(4.4)	20.6	(3.2)	50.3	(5.1)	26.9	(2.4)
Other	3.9	(2.3)	3.0	(1.3)	4.1	(2.0)	3.5	(1.1)

A similar percentage of operations in the West region buried carcasses on the premises or left carcasses for scavengers (47.7 and 38.7 percent, respectively). Composting carcasses was most prevalent in the Northeast region.

b. Percentage of operations by method used to dispose of carcasses from July 1, 2008, to June 30, 2009, by region:

	Percent Operations					
	Region					
	West		Southeast		Northeast	
Method	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Landfill or municipal dump	11.0	(3.0)	13.3	(2.9)	4.5	(1.8)
Incinerate (burn)	14.3	(3.5)	18.0	(3.3)	18.0	(3.8)
Bury on premises	47.7	(4.7)	64.7	(4.1)	48.1	(4.9)
Render	0.6	(0.6)	0.7	(0.7)	1.1	(0.8)
Compost	5.3	(2.3)	1.5	(1.0)	27.4	(4.2)
Leave for scavengers (e.g., coyotes, bears, vultures)	38.7	(4.6)	22.5	(3.6)	17.7	(3.7)
Other	5.3	(2.4)	3.9	(1.5)	0.0	(—)

The most common method of carcass disposal for all operation types was burial on the premises; 53.0 percent of dairy, 54.2 percent of meat, and 60.0 percent of “other” goat operations buried carcasses on the premises.

c. Percentage of operations by method used to dispose of carcasses from July 1, 2008, to June 30, 2009, by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Method	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Landfill or municipal dump	6.1	(2.8)	9.9	(1.9)	14.7	(4.5)
Incinerate (burn)	18.9	(5.3)	17.8	(2.7)	12.3	(3.5)
Bury on premises	53.0	(6.3)	54.2	(3.3)	60.0	(5.6)
Render	2.9	(2.1)	0.5	(0.4)	0.8	(0.7)
Compost	23.3	(5.0)	8.3	(1.8)	2.5	(1.4)
Leave for scavengers (e.g., coyotes, bears, vultures)	16.4	(5.0)	28.9	(3.0)	25.5	(5.1)
Other	2.0	(1.7)	2.9	(1.2)	6.2	(2.9)

Overall, 48.6 percent of goats that died from July 1, 2008, to June 30, 2009, were buried on the premises.

d. For **goats** that died from July 1, 2008, to June 30, 2009, percentage of goats by method used to dispose of carcasses, and by herd size:

Percent Goats

Herd Size (number of goats and kids)

Method	Small (10–19)		Medium (20–99)		Large (100 or more)		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Landfill or municipal dump	2.6	(1.5)	6.6	(2.7)	3.4	(3.0)	4.7	(1.7)
Incinerate (burn)	12.8	(4.9)	6.6	(2.1)	4.3	(1.5)	6.8	(1.4)
Bury on premises	53.8	(6.8)	53.0	(6.3)	40.7	(7.6)	48.6	(4.2)
Render	0.4	(0.4)	0.4	(0.3)	0.4	(0.3)	0.4	(0.2)
Compost	8.3	(4.4)	10.2	(4.3)	18.5	(7.0)	13.0	(3.4)
Leave for scavengers (e.g., coyotes, bears, vultures)	19.8	(4.8)	21.0	(4.6)	30.8	(6.3)	24.4	(3.3)
Other	2.3	(1.6)	2.2	(1.5)	1.9	(1.3)	2.1	(0.9)
Total	100.0		100.0		100.0		100.0	

About one-third of kids that died and were disposed of from July 1, 2008, to June 30, 2009, were buried on the premises (33.4 percent) and about one-third were left for scavengers (32.0 percent).

e. For **kids** that died and were disposed of from July 1, 2008, to June 30, 2009, percentage of kids by method used to dispose of carcasses and by herd size:

Percent Kids

Herd Size (number of goats and kids)

	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Method	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Landfill or municipal dump	5.1	(2.1)	10.4	(2.7)	5.6	(3.8)	7.3	(2.1)
Incinerate (burn)	12.0	(4.1)	16.5	(4.5)	3.9	(1.1)	9.8	(2.0)
Bury on premises	55.8	(7.4)	41.0	(5.2)	19.6	(4.0)	33.3	(3.4)
Render	0.4	(0.5)	0.1	(0.1)	0.1	(0.0)	0.1	(0.1)
Compost	4.3	(1.6)	12.9	(4.9)	20.8	(5.3)	15.2	(3.1)
Leave for scavengers (e.g., coyotes, bears, vultures)	19.6	(4.6)	18.1	(4.0)	46.8	(7.1)	32.0	(4.1)
Other	2.8	(2.5)	1.0	(0.8)	3.2	(2.8)	2.3	(1.4)
Total	100.0		100.0		100.0		100.0	

F. Biosecurity

1. Biosecurity for new arrivals

Good biosecurity can substantially reduce the risk of introducing new diseases to an operation. Keeping a closed herd and not adding new goats (other than through kidding) help prevent diseases from entering the herd. The percentages of operations that added new animals to the herd during the previous 12 months were similar across herd sizes.

a. Percentage of operations that added the following types of goats during the previous 12 months, by herd size:

	Percent Operations							
	Herd Size (number of goats and kids)							
	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Goat type	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Does or doe kids	27.3	(3.4)	29.2	(3.1)	27.4	(4.2)	28.1	(2.1)
Bucks or buck kids	28.0	(3.4)	36.3	(3.2)	42.1	(4.7)	33.8	(2.1)
Any	39.8	(3.7)	49.1	(3.4)	50.8	(4.8)	45.7	(2.3)

b. Percentage of operations that added the following types of goats during the previous 12 months, by primary production:

	Percent Operations					
	Primary Production					
	Dairy		**Meat**		**Other**	
Goat type	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Does or doe kids	34.5	(5.1)	29.2	(2.7)	22.2	(3.7)
Bucks or buck kids	34.0	(4.8)	38.2	(2.9)	21.7	(3.5)
Any	51.3	(5.3)	49.7	(3.0)	32.1	(4.1)

Most operations had added does or doe kids sometime during the previous 9 years. About 4 of 10 operations (40.6 percent) added does or doe kids in the last 1 to 2 years.

c. For operations that did not add any does or doe kids during the previous 12 months, percentage of operations by number of years since **does or doe kids** were added, and by herd size:

Percent Operations

Herd Size (number of goats and kids)

	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Number of years	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
1–2	48.8	(5.7)	35.6	(4.6)	36.1	(6.1)	40.6	(3.2)
3–9	47.9	(5.6)	60.0	(4.7)	55.1	(6.4)	54.8	(3.3)
10 or more	3.3	(2.3)	4.4	(1.8)	8.8	(3.5)	4.6	(1.3)
Total	100.0		100.0		100.0		100.0	

d. For operations that did not add any does or doe kids during the previous 12 months, percentage of operations by number of years since **does or doe kids** were added, and by primary production:

Percent Operations

Primary Production

	Dairy		**Meat**		**Other**	
Number of years	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
1–2	37.7	(7.4)	43.3	(4.1)	33.5	(6.6)
3–9	51.7	(7.5)	52.0	(4.1)	64.5	(6.7)
10 or more	10.6	(4.3)	4.7	(1.8)	2.0	(1.2)
Total	100.0		100.0		100.0	

Most operations had added bucks or buck kids sometime during the last 9 years. About 4 of10 operations (43.8 percent) added bucks or buck kids in the last 1 to 2 years.

e. For operations that did not add any bucks or buck kids during the previous 12 months, percentage of operations by number of years since **bucks, buck kids, or wethers** were added, and by herd size:

Percent Operations

Herd Size (number of goats and kids)

	Small (10–19)		Medium (20–99)		Large (100 or more)		All operations	
Number of years	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
1–2	41.8	(5.6)	44.4	(4.9)	47.6	(7.4)	43.8	(3.4)
3–9	57.4	(5.6)	54.1	(4.9)	48.8	(7.5)	54.7	(3.4)
10 or more	0.8	(0.8)	1.5	(0.9)	3.6	(2.9)	1.5	(0.6)
Total	100.0		100.0		100.0		100.0	

f. For operations that did not add any bucks or buck kids during the previous 12 months, percentage of operations by number of years since **bucks, buck kids, or wethers** were added, and by region:

Percent Operations

Region

	West		Southeast		Northeast	
Number of years	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
1–2	41.8	(5.9)	42.5	(5.2)	49.7	(5.9)
3–9	53.9	(5.9)	57.5	(5.2)	49.2	(5.9)
10 or more	4.3	(2.0)	0.0	(—)	1.1	(1.1)
Total	100.0		100.0		100.0	

g. For operations that did not add any bucks or buck kids during the previous 12 months, percentage of operations by number of years since **bucks, buck kids, or wethers** were added, and by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Number of years	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
1–2	45.1	(8.2)	43.6	(4.3)	43.8	(6.6)
3–9	49.2	(8.2)	55.3	(4.3)	55.0	(6.6)
10 or more	5.7	(3.4)	1.1	(0.7)	1.2	(1.1)
Total	100.0		100.0		100.0	

Before new goats are added to the rest of the herd, it is always a good idea to implement certain health management practices. For operations that added goats to their herd in the previous 12 months, 82.3 percent required at least one of the health management practices listed in the following table.

Overall, 66.2 percent of operations that had added goats in the previous 12 months inspected new arrivals for abscesses and/or scars from previous abscesses. Deworming new arrivals was conducted on 65.5 percent of operations. Only 9.0 percent of operations had new arrivals examined by a veterinarian.

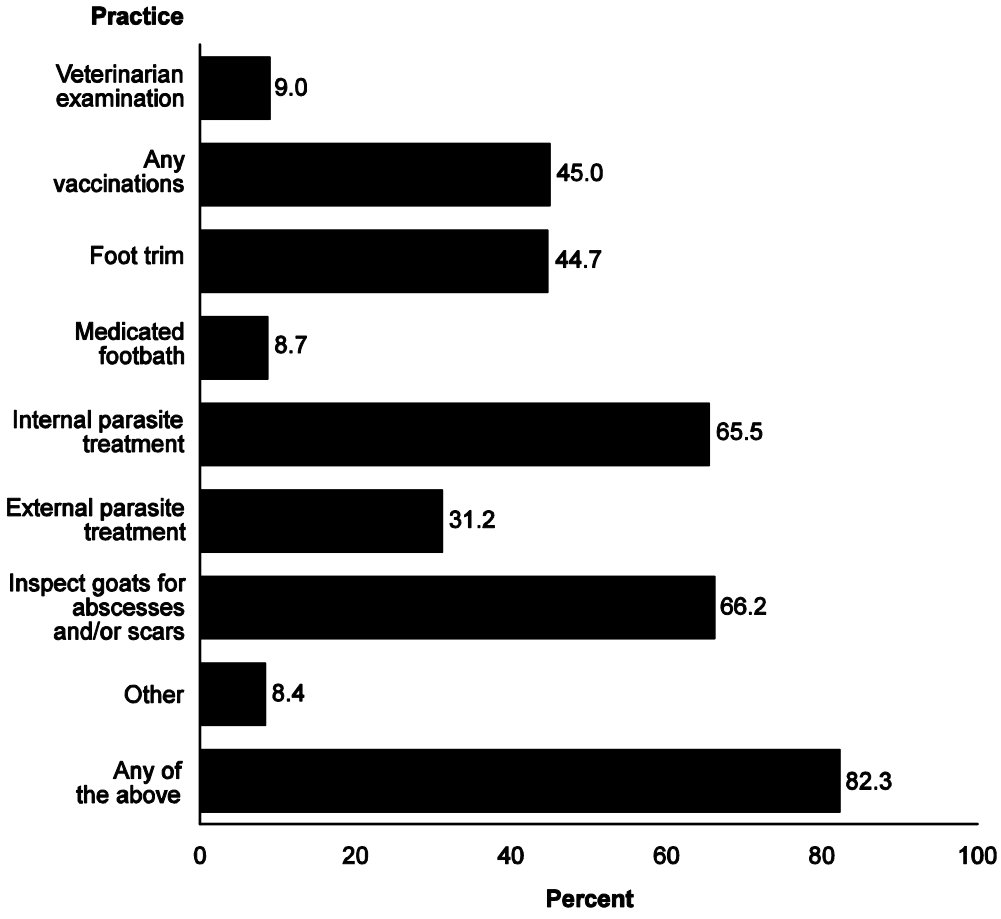
h. For operations that added goats during the previous 12 months, percentage of operations by health management practices required for new arrivals, and by herd size:

Percent Operations

Herd Size (number of goats and kids)

	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Practice	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Veterinarian examination	7.2	(3.0)	8.0	(2.3)	17.7	(5.1)	9.0	(1.7)
Any vaccinations	46.7	(6.0)	44.1	(4.8)	43.9	(6.2)	45.0	(3.3)
Foot trim	45.3	(6.0)	47.9	(4.9)	30.9	(5.4)	44.7	(3.4)
Medicated footbath	11.9	(4.1)	7.8	(2.4)	4.4	(2.2)	8.7	(1.9)
Internal parasite treatment (deworming)	69.9	(5.3)	66.4	(4.7)	51.2	(6.4)	65.5	(3.2)
External parasite treatment	30.8	(5.7)	32.3	(4.5)	27.8	(5.7)	31.2	(3.1)
Inspect goats for abscesses and/or scars from previous abscesses	72.3	(5.1)	63.7	(4.8)	60.6	(6.6)	66.2	(3.2)
Other	8.1	(3.0)	8.8	(2.5)	7.9	(3.5)	8.4	(1.7)
Any of the above	84.8	(3.9)	79.5	(4.3)	86.9	(4.7)	82.3	(2.7)

For operations that added goats during the previous 12 months, percentage of operations by health management practices required for new arrivals



i. For operations that added goats during the previous 12 months, percentage of operations by health management practices required for new arrivals, and by region:

	Percent Operations					
	Region					
	West		Southeast		Northeast	
Practice	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Veterinarian examination	8.4	(2.6)	6.7	(2.6)	13.5	(3.9)
Any vaccinations	41.8	(6.0)	42.8	(5.5)	52.0	(5.5)
Foot trim	31.2	(5.5)	47.9	(5.6)	55.1	(5.5)
Medicated footbath	7.9	(3.2)	11.3	(3.5)	5.5	(2.6)
Internal parasite treatment (deworming)	53.1	(6.2)	69.5	(5.1)	73.4	(4.7)
External parasite treatment	34.6	(5.9)	32.0	(5.2)	25.9	(4.8)
Inspect goats for abscesses and/or scars from previous abscesses	60.9	(6.2)	66.4	(5.3)	72.0	(4.9)
Other	5.1	(2.1)	9.2	(3.0)	10.9	(3.5)
Any of the above	79.2	(5.5)	81.7	(4.4)	86.9	(3.7)

The percentages of operations by health management practices required for new arrivals did not vary by primary production.

j. For operations that added goats during the previous 12 months, percentage of operations by health management practices required for new arrivals, and by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Practice	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Veterinarian examination	23.3	(6.3)	7.7	(2.1)	4.2	(2.1)
Any vaccinations	46.1	(7.2)	47.2	(4.2)	34.9	(7.1)
Foot trim	47.0	(7.4)	43.5	(4.2)	47.8	(7.6)
Medicated footbath	6.9	(3.4)	8.8	(2.4)	9.8	(4.7)
Internal parasite treatment (deworming)	50.9	(7.2)	69.1	(4.0)	60.8	(7.5)
External parasite treatment	28.5	(6.7)	32.3	(4.0)	28.3	(6.4)
Inspect goats for abscesses and/or scars from previous abscesses	73.5	(6.5)	65.5	(4.1)	64.0	(7.4)
Other	12.5	(5.3)	8.8	(2.2)	3.9	(2.4)
Any of the above	86.6	(4.7)	83.3	(3.4)	75.2	(6.6)

A small percentage of operations required individual-animal testing before new animals were brought onto the operation. Overall, 6.6 and 5.9 percent of operations required testing for caprine arthritis and encephalitis and caseous lymphadenitis, respectively.

k. For operations that added goats during the previous 12 months, percentage of operations by individual-animal testing required before bringing new goats onto the operation, and by herd size:

Percent Operations

	Herd Size (number of goats and kids)							
	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Testing required	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
CAE (caprine arthritis and encephalitis)	4.3	(2.2)	6.6	(1.8)	12.5	(4.0)	6.6	(1.3)
Johne's disease (paratuberculosis)	2.5	(1.8)	2.8	(1.3)	2.0	(1.9)	2.6	(1.0)
Brucellosis	2.1	(1.7)	2.9	(1.3)	7.8	(3.5)	3.3	(1.0)
Q fever	1.7	(1.6)	0.5	(0.5)	0.8	(0.6)	1.0	(0.6)
Caseous lymphadenitis (boils, CL, abscesses)	6.7	(3.0)	5.2	(2.1)	6.8	(2.2)	5.9	(1.5)
Other	1.7	(1.6)	0.7	(0.7)	7.1	(3.2)	1.9	(0.8)
Any	8.1	(3.2)	12.1	(2.7)	18.9	(4.4)	11.6	(1.9)

The percentages of operations by individual-animal testing required for new arrivals were similar across regions.

I. For operations that added goats during the previous 12 months, percentage of operations by individual-animal testing required before bringing new goats onto the operation, and by region:

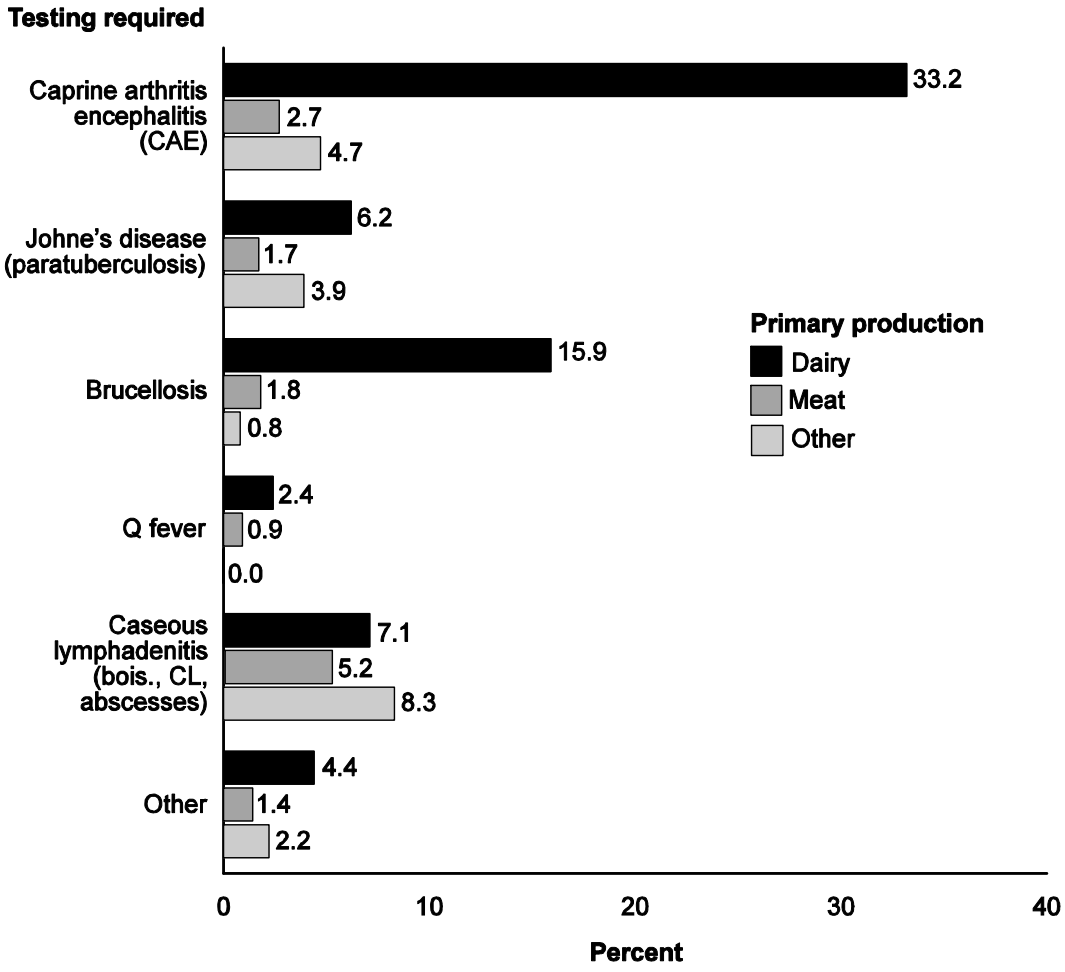
	Percent Operations					
	Region					
	West		Southeast		Northeast	
Testing required	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
CAE (caprine arthritis and encephalitis)	12.2	(3.3)	3.1	(1.4)	5.7	(2.2)
Johne's disease (paratuberculosis)	4.1	(2.4)	1.1	(0.8)	3.2	(1.9)
Brucellosis	4.0	(2.3)	2.8	(1.4)	3.2	(1.6)
Q fever	1.8	(1.8)	0.7	(0.6)	0.4	(0.3)
Caseous lymphadenitis (boils, CL, abscesses)	8.9	(3.2)	4.7	(2.3)	4.2	(2.5)
Other	2.7	(1.9)	1.3	(0.9)	1.8	(1.4)
Any	15.5	(3.8)	8.7	(2.7)	11.7	(3.4)

A higher percentage of dairy goat operations required that new arrivals be tested individually for CAE and brucellosis compared with meat goat or “other” goat operations.

m. For operations that added goats during the previous 12 months, percentage of operations by individual-animal testing required before bringing new goats onto the operation, and by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Testing required	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
CAE (caprine arthritis and encephalitis)	33.2	(6.6)	2.7	(1.1)	4.7	(2.8)
Johne’s disease (paratuberculosis)	6.2	(3.4)	1.7	(1.0)	3.9	(2.7)
Brucellosis	15.9	(5.4)	1.8	(1.0)	0.8	(0.7)
Q fever	2.4	(2.3)	0.9	(0.8)	0.0	(—)
Caseous lymphadenitis (boils, CL, abscesses)	7.1	(3.4)	5.2	(1.8)	8.3	(4.7)
Other	4.4	(3.2)	1.4	(0.8)	2.2	(2.1)
Any	37.8	(6.9)	6.4	(1.8)	15.4	(5.5)

For operations that added goats during the previous 12 months, percentage of operations by individual-animal testing required before bringing new goats onto the operation, and by primary production



The percentage of operations that required that new additions come from herds that tested negative for scrapie was unexpectedly high for all operation size groups. It is likely, however, that many of these operations only required that new additions were identified with official scrapie ear tags. These tags allow for scrapie surveillance of the herd when the animals are moved to slaughter.

n. For operations that added goats during the previous 12 months, percentage of operations that required that new additions come from herds test-negative for the following diseases, by herd size:

Percent Operations

Herd Size (number of goats and kids)

	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Disease	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
CAE (caprine arthritis and encephalitis)	9.8	(3.3)	12.0	(2.7)	18.6	(4.7)	12.1	(1.9)
Johne's disease (paratuberculosis)	6.3	(2.9)	6.0	(2.2)	8.8	(3.6)	6.5	(1.6)
Brucellosis	5.5	(2.8)	6.9	(2.2)	14.4	(4.5)	7.4	(1.7)
Q fever	4.1	(2.5)	3.0	(1.6)	5.4	(3.0)	3.7	(1.3)
Caseous lymphadenitis (boils, CL, abscesses)	9.0	(3.3)	6.6	(2.2)	10.0	(3.5)	7.9	(1.7)
Scrapie	7.6	(3.0)	12.7	(3.1)	9.4	(3.7)	10.5	(2.0)
TB	4.1	(2.5)	6.7	(2.2)	16.5	(4.7)	7.1	(1.6)
Other	1.7	(1.6)	1.6	(1.1)	2.8	(2.7)	1.8	(0.9)
Any of the above	13.2	(3.8)	19.3	(3.5)	20.8	(4.7)	17.4	(2.4)

A high percentage of dairy goat operations (45.2 percent) required that new additions come from herds with CAE test-negative status. In addition, an unexpectedly high percentage of operations required that new additions come from herds that tested negative for scrapie. It is likely, however, that many of these operations only required that new additions were identified with official scrapie ear tags. These tags allow for scrapie surveillance of the herd when the animals are moved to slaughter.

o. For operations that added goats during the previous 12 months, percentage of operations that required that new additions come from herds test-negative for the following diseases, by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Disease	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
CAE (caprine arthritis and encephalitis)	45.2	(7.0)	8.0	(2.2)	6.1	(3.1)
Johne's (paratuberculosis)	10.2	(3.9)	6.5	(2.0)	3.9	(2.7)
Brucellosis	25.0	(6.4)	6.2	(2.0)	0.0	(—)
Q fever	6.4	(3.2)	4.1	(1.7)	0.0	(—)
Caseous lymphadenitis	19.7	(5.2)	7.4	(2.2)	1.6	(1.5)
Scrapie	16.9	(5.4)	10.9	(2.6)	4.7	(2.3)
TB	27.4	(6.5)	5.4	(1.9)	0.0	(—)
Other	3.7	(3.5)	1.9	(1.1)	0.0	(—)
Any disease	56.5	(7.1)	12.8	(2.8)	9.4	(3.6)

2. Needle usage

The majority of operations (61.8 percent) gave at least one injection during the previous 12 months.

a. Percentage of operations that gave any injections during the previous 12 months, by herd size:

Percent Operations							
Herd Size (number of goats and kids)							
Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
53.0	(3.8)	68.1	(3.2)	64.2	(4.8)	61.8	(2.2)

About 7 of 10 dairy goat operations (74.5 percent), 6 of 10 meat goat operations (65.1 percent), and 5 of 10 “other” goat operations gave any injection in the previous 12 months.

b. Percentage of operations that gave any injections during the previous 12 months, by primay production:

Percent Operations					
Primary Production					
Dairy		**Meat**		**Other**	
Percent	**Std. error**	**Percent**	**Std. error**	**Percent**	**Std. error**
74.5	(4.6)	65.1	(2.9)	47.0	(4.4)

On average, large operations injected 12.5 goats using the same needle compared with 3.6 goats for small operations, and 4.4 goats for medium operations.

c. For operations that gave injections, operation average number of goats injected with the same needle, by herd size:

Operation Average Number

Herd Size (number of goats and kids)

Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
3.6	(0.5)	4.4	(0.5)	12.5	(2.6)	5.1	(0.5)

Meat goat operations had a higher average number of goats injected with the same needle (6.3) than did dairy goat operations (3.0) or “other” goat operations (2.5).

d. For operations that gave injections, operation average number of goats injected with the same needle, by primary production:

Operation Average Number

Primary Production

Dairy		**Meat**		**Other**	
Average	**Std. error**	**Average**	**Std. error**	**Average**	**Std. error**
3.0	(0.5)	6.3	(0.7)	2.5	(0.4)

Nearly half of operations (49.6 percent) used the same needle on more than one goat.

e. For operations that gave injections, percentage of operations that used the same needle to inject more than one goat, by herd size:

Percent Operations

Herd Size (number of goats and kids)

Small (10–19)		Medium (20–99)		Large (100 or more)		All operations	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
38.1	(5.0)	52.4	(4.0)	67.0	(4.9)	49.6	(2.8)

Over half of operations that used the same needle on more than one goat (59.8 percent) never chemically disinfected needles between animals. Less than one-fourth of operations (22.8 percent) always disinfected needles between animals. The percentage of operations that always chemically disinfected needles between goats differed by herd size, ranging from 34.2 percent of small operations to 4.6 percent of large operations.

f. For operations that used the same needle on more than one goat, percentage of operations by frequency that the needle was chemically disinfected between animals, and by herd size:

Percent Operations

Herd Size (number of goats and kids)

	Small (10–19)		Medium (20–99)		Large (100 or more)		All operations	
Frequency	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Always	34.2	(8.2)	23.2	(4.9)	4.6	(1.9)	22.8	(3.6)
Sometimes	14.2	(5.5)	16.4	(4.1)	25.5	(6.2)	17.4	(3.0)
Never	51.6	(8.4)	60.4	(5.6)	69.9	(6.3)	59.8	(4.0)
Total	100.0		100.0		100.0		100.0	

g. For operations that used the same needle on more than one goat, percentage of operations by frequency that the needle was chemically disinfected between animals, and by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Frequency	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Always	17.1	(6.8)	23.8	(4.2)	19.1	(8.3)
Sometimes	29.8	(10.0)	17.7	(3.5)	8.5	(5.0)
Never	53.1	(10.3)	58.5	(4.6)	72.4	(9.4)
Total	100.0		100.0		100.0	

3. Shared equipment

Sharing equipment with other livestock producers can introduce new pathogens to an operation if the equipment is not cleaned and disinfected. Overall, 15.8 percent of operations shared equipment with other livestock producers in the previous 12 months.

a. Percentage of operations that shared equipment (e.g., tractors, feeding equipment, etc.) with other livestock operations during the previous 12 months, by herd size:

Percent Operations							
Herd Size (number of goats and kids)							
Small (10–19)		Medium (20–99)		Large (100 or more)		All operations	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
18.3	(3.0)	14.8	(2.4)	11.8	(2.8)	15.8	(1.7)

b. Percentage of operations that shared equipment (e.g., tractors, feeding equipment, etc.) with other livestock operations during the previous 12 months, by primary production:

Percent Operations					
Primary Production					
Dairy		Meat		Other	
Percent	Std. error	Percent	Std. error	Percent	Std. error
28.0	(5.0)	14.8	(2.1)	12.9	(3.0)

Of operations that shared equipment with other livestock operations, 52.5 percent performed no cleaning procedures before using the equipment again on their own operation.

c. For operations that shared equipment (e.g., tractors, feeding equipment, etc.) with other livestock operations, percentage of operations by primary cleaning procedure performed prior to use of shared equipment, and by herd size:

Cleaning procedure	Percent operations	Std. error
Wash equipment with water or steam only	17.1	(4.0)
Chemically disinfect only	5.0	(2.3)
Wash equipment and chemically disinfect	21.0	(4.6)
Other	4.4	(2.5)
No procedures done	52.5	(5.6)
Total	100.0	

4. Manure management

A higher percentage of operations (70.4 percent) applied manure to land owned, rented, or leased by the operation than any other method of manure disposal. Composting was the second most frequently cited manure disposal method (36.7 percent of operations).

a. Percentage of operations by method used for manure disposal during the previous 12 months, and by herd size:

Percent Operations

Herd Size (number of goats and kids)

	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Disposal method	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Applied to land owned, rented, or leased by this operation	68.4	(3.7)	74.7	(3.1)	59.6	(4.8)	70.4	(2.2)
Applied to land not owned, rented, or leased by this operation	2.3	(1.0)	6.0	(1.5)	5.4	(1.3)	4.5	(0.9)
Sold or received other compensation	0.8	(0.5)	1.3	(0.6)	4.3	(1.8)	1.5	(0.4)
Given away	6.7	(1.7)	12.3	(2.1)	16.2	(2.9)	10.6	(1.3)
Composted	34.3	(3.5)	39.8	(3.3)	31.8	(4.1)	36.7	(2.2)

A higher percentage of operations in the Northeast region (85.2 percent) applied manure to land owned, rented, or leased by the operation compared with operations in the West region (56.9 percent) or Southeast region (72.2 percent).

b. Percentage of operations by method used for manure disposal during the previous 12 months, and by region:

	Percent Operations					
	Region					
	West		Southeast		Northeast	
Disposal method	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Applied to land owned, rented, or leased by this operation	56.9	(4.2)	72.2	(3.3)	85.2	(2.9)
Applied to land not owned, rented, or leased by this operation	6.0	(1.9)	3.1	(1.1)	5.2	(1.6)
Sold or received other compensation	1.5	(0.7)	1.2	(0.7)	2.2	(0.9)
Given away	11.4	(2.3)	9.3	(1.9)	11.8	(2.5)
Composted	33.8	(3.6)	32.9	(3.5)	47.6	(4.1)

Six of 10 dairy goat operations (60.0 percent) composted manure compared with about 3 of 10 meat goat operations (32.2 percent) and nearly 4 of 10 “other” goat operations (38.1 percent).

c. Percentage of operations by method used for manure disposal during the previous 12 months, and by primary production:

	Percent Operations					
	Primary Production					
	Dairy		Meat		Other	
Disposal method	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Applied to land owned, rented, or leased by this operation	79.4	(4.1)	73.4	(2.7)	58.1	(4.6)
Applied to land not owned, rented, or leased by this operation	7.5	(2.2)	4.1	(1.1)	4.2	(1.7)
Sold or received other compensation	6.7	(2.6)	0.7	(0.4)	1.2	(0.9)
Given away	19.3	(4.0)	8.7	(1.5)	11.9	(2.7)
Composted	60.0	(5.2)	32.2	(2.8)	38.1	(4.4)

The majority of operations (84.5 percent) never used the same equipment to handle both manure and goat feed in the previous 12 months.

d. Percentage of operations by frequency that the same equipment was used to handle both manure and goat feed during the previous 12 months, and by herd size:

	Percent Operations							
	Herd Size (number of goats and kids)							
	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Frequency	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Routinely	3.3	(1.3)	3.7	(1.2)	8.8	(3.3)	4.1	(0.9)
Rarely	9.7	(2.4)	12.9	(2.3)	10.2	(2.5)	11.4	(1.5)
Never	87.0	(2.7)	83.4	(2.5)	81.0	(3.8)	84.5	(1.7)
Total	100.0		100.0		100.0		100.0	

e. Percentage of operations by frequency that the same equipment was used to handle both manure and goat feed during the previous 12 months, and by primary production:

	Percent Operations					
	Primary Production					
	Dairy		**Meat**		**Other**	
Frequency	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Routinely	5.4	(2.9)	4.8	(1.2)	1.8	(0.8)
Rarely	17.5	(3.9)	11.3	(1.9)	8.7	(2.7)
Never	77.1	(4.5)	83.9	(2.2)	89.5	(2.8)
Total	100.0		100.0		100.0	

Nearly half of operations that used the same equipment to handle both manure and goat feed (45.2 percent) performed no cleaning procedure on the shared equipment. Over one-third of operations that used the same equipment to handle both manure and goat feed (33.9 percent) washed the equipment with water or steam only.

f. For operations that used the same equipment to handle both manure and goat feed, percentage of operations by usual cleaning procedure for equipment after handling manure and prior to handling feed:

Procedure	Percent operations	Std. error
Wash equipment with water or steam only	33.9	(5.6)
Chemically disinfect only	5.1	(2.1)
Wash equipment and chemically disinfect	6.6	(3.1)
Use separate loader buckets for manure and feed	7.0	(2.3)
Other	2.2	(1.5)
No procedure done	45.2	(5.9)
Total	100.0	

G. Operations that Milked Goats

Note: The following tables refer only to operations that milked goats to produce milk or milk products during the previous 12 months.

1. Milk production

Overall, only 11.8 percent of goat operations milked goats to produce milk or milk products. A lower percentage of operations in the Southeast region (5.6 percent) milked goats to produce milk or milk products than operations in the West region (13.4 percent) and Northeast region (21.9 percent).

a. Percentage of operations that milked any goats to produce milk or milk products, by region:

Percent Operations

Region

West		Southeast		Northeast		All operations	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
13.4	(1.9)	5.6	(1.3)	21.9	(3.1)	11.8	(1.1)

The operation average annual milk production per doe was 1,399 pounds, while the doe average was 1,617 pounds. The doe average exceeded the operation average because large operations had higher producing animals than small operations.

b. Operation average and doe average annual milk production (lb/doe), by herd size:

Average Annual Milk Production

Herd Size (number of goats and kids)

	Small (10–19)		Medium (20–99)		Large (100 or more)		All operations	
	Lb/ doe	Std. error	Lb/ doe	Std. error	Lb/ doe	Std. error	Lb/ doe	Std. error
Operation average	1,202	(176)	1,450	(146)	1,651	(109)	1,399	(94)
Doe average	1,186	(149)	1,488	(155)	1,718	(98)	1,617	(80)

Nearly half of operations (45.4 percent) had an average annual milk production yield of 1,500 or more pounds per doe.

c. Percentage of operations by average annual milk production:

Milk production (lb/doe)	**Percent operations**	**Std. error**
Less than 1,000	25.5	(5.7)
1,000–1,499	29.1	(5.9)
1,500–1,999	20.6	(4.6)
2,000–2,499	18.0	(4.5)
2,500–2,999	2.6	(1.7)
3,000 or more	4.2	(2.3)
Total	100.0	

Only 13.3 percent of operations participated in the Dairy Herd Improvement Association (DHIA).

d. Percentage of operations that participated in the following programs during the previous 12 months, by herd size:

	Percent Operations							
	Herd Size (number of goats and kids)							
	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Program	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Dairy Herd Improvement Association (DHIA)	7.4	(4.2)	22.9	(7.0)	6.9	(3.2)	13.3	(3.3)
Quality Assurance*	0.0	(—)	11.0	(4.8)	21.2	(7.3)	8.5	(2.6)

*Program to improve milk product quality through assessments and monitoring.

A lower percentage of operations in the Northeast region than in the West region participated in DHIA (3.2 and 24.7 percent, respectively).

e. Percentage of operations that participated in the following programs during the previous 12 months, by region:

	Percent Operations					
	Region					
	West		Southeast		Northeast	
Program	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Dairy Herd Improvement Association (DHIA)	24.7	(7.2)	13.6	(6.9)	3.2	(2.5)
Quality Assurance*	8.3	(4.7)	10.2	(6.0)	7.9	(3.3)

*Program to improve milk product quality through assessments and monitoring.

2. Milk quality

Culturing milk has many benefits, including identifying the most prevalent causes of clinical mastitis, helping to direct mastitis therapy, and screening purchased herds or milking strings for contagious mastitis pathogens. Bulk tank somatic cell count (BTSCC) refers to the number of white blood cells (leukocytes) and secretory cells per milliliter of raw milk and is used as a measure of milk quality and udder health. Increased BTSCCs are generally associated with increased intramammary infection and decreased milk production.

Approximately one-tenth of dairy operations (10.1 percent) performed a pooled milk somatic cell count during the previous 12 months.

a. Percentage of dairy goat operations that performed the following milk tests during the previous 12 months, by region:

	Percent Operations							
	Region							
	West		Southeast		Northeast		All operations	
Test	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Individual-goat-milk culture	28.8	(7.4)	14.6	(7.4)	9.8	(3.8)	17.8	(3.6)
Individual-goat-milk SCC	27.2	(7.4)	14.6	(7.4)	11.5	(4.2)	18.0	(3.7)
Pooled milk culture (bulk tank, bucket, etc.)	6.3	(3.0)	6.5	(5.5)	13.8	(3.9)	9.6	(2.3)
Pooled milk SCC (bulk tank, bucket, etc.)	5.9	(3.0)	6.5	(5.5)	15.4	(4.0)	10.1	(2.3)

Of the 10.1 percent of operations that conducted a pooled milk somatic cell count, 85.7 percent had somatic cell counts less than 1 million.

b. For operations that tested for BTSCC during the previous 12 months, percentage of operations by most recent BTSCC and by herd size:

BTSCC (cells/ml)	**Percent operations**	**Std. error**
Less than 500,000	38.5	(13.8)
500,000–999,999	47.2	(12.8)
1,000,000–1,499,999	7.8	(4.5)
1,500,000 or more	6.5	(6.3)
Total	100.0	

3. Milking personnel

On 87.0 percent of operations, the owner/operator milked the majority of does during the previous 12 months. The owner/operator milked the majority of does regardless of herd size.

a. Percentage of operations by personnel who milked the majority of does during the previous 12 months, and by herd size:

	Percent Operations							
	Herd Size (number of goats and kids)							
	Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Personnel	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Owner/operator	87.2	(6.0)	83.8	(6.2)	61.8	(8.1)	80.7	(3.9)
Family member(s) of owner	4.0	(3.9)	16.2	(6.2)	26.5	(7.0)	13.4	(3.3)
Hired worker(s) (nonfamily member)	0.0	(—)	0.0	(—)	9.8	(3.7)	2.0	(0.7)
Other	8.8	(4.8)	0.0	(—)	1.9	(1.4)	3.9	(2.0)
Total	100.0		100.0		100.0		100.0	

In all three regions, the owner/operator milked the majority of does. The percentage of operations on which the majority of does were milked by family members of the owner ranged from 5.8 percent in the Southeast region to 18.4 percent in the West region.

b. Percentage of operations by personnel who milked the majority of does during the previous 12 months, and by region:

	Percent Operations					
	Region					
	West		Southeast		Northeast	
Personnel	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Owner/operator	68.7	(7.7)	94.2	(5.1)	84.3	(5.3)
Family member(s) of owner	18.4	(6.6)	5.8	(5.1)	12.8	(4.6)
Hired worker(s) (nonfamily member)	5.5	(2.1)	0.0	(—)	0.0	(—)
Other	7.4	(4.3)	0.0	(—)	2.9	(2.8)
Total	100.0		100.0		100.0	

4. Milking procedures

Cleaning and disinfecting teats prior to milking reduces environmental bacteria on the teat surface, bacterial counts in the milk, and the incidence of new intramammary infections. Over half of operations in summer and winter (56.8 and 55.1 percent, respectively) used an udder wash solution, disinfectant solution, or teat dip as part of premilking teat preparation.

a. Percentage of operations by premilking teat preparation and by season:

	Percent Operations			
	Season			
	Summer		Winter	
Teat preparation	Percent	Std. error	Percent	Std. error
Udder wash solution, disinfectant solution, or teat dip	56.8	(5.2)	55.1	(5.3)
Washed with water only	10.7	(3.5)	8.5	(3.2)
Wiped with dry cloth	10.1	(3.1)	18.7	(4.3)
No preparation	15.7	(3.5)	13.2	(3.4)
Other	6.7	(2.7)	4.5	(2.3)
Total	100.0		100.0	

There were no seasonal differences in the percentages of operations by methods used to dry teats prior to milking. The majority of operations in summer and winter (66.9 and 65.8 percent, respectively) used a single-use cloth or paper towel to dry teats before milking.

b. Percentage of operations by method used to dry teats prior to milking, and by season:

	Percent Operations			
	Season			
	Summer		Winter	
Teat drying	Percent	Std. error	Percent	Std. error
Not applicable—teats not wet prior to milking	17.6	(4.9)	15.3	(4.7)
Single-use cloth or paper towel	66.9	(6.2)	65.8	(6.4)
Multiple-use cloth or paper towel	14.3	(4.7)	17.6	(5.3)
Other	1.2	(1.1)	1.3	(1.3)
Total	100.0		100.0	

The use of postmilking teat disinfectant reduces the incidence of contagious mastitis. There were no seasonal differences in methods used to disinfect teats postmilking. About 4 of 10 operations did not disinfect teats in summer or winter (40.1 and 41.3 percent of operations, respectively).

c. Percentage of operations by method used to disinfect teats postmilking, and by season:

	Percent Operations			
	Season			
	Summer		Winter	
Teat disinfection method	Percent	Std. error	Percent	Std. error
Dip teats with labeled postdip product	21.1	(4.2)	21.1	(4.1)
Dip teats with nonlabeled/ homemade solution	9.4	(3.3)	9.9	(3.5)
Spray teats with commercial postdip product	27.7	(4.8)	26.1	(4.8)
No disinfection	40.1	(5.1)	41.3	(5.2)
Other	1.7	(1.1)	1.6	(1.1)
Total	100.0		100.0	

Overall, 11.9 percent of operations reported that milkers wore gloves when milking.

d. Percentage of operations on which milkers wore gloves when milking, by herd size:

Percent Operations							
Herd Size (number of goats and kids)							
Small (10–19)		Medium (20–99)		Large (100 or more)		All operations	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
4.4	(4.2)	15.2	(6.5)	20.7	(6.7)	11.9	(3.4)

No regional differences were seen in the practice of milkers wearing gloves while milking.

e. Percentage of operations on which milkers wore gloves when milking, by region

Percent					
Region					
West		Southeast		Northeast	
Percent	Std. error	Percent	Std. error	Percent	Std. error
15.2	(4.9)	24.3	(11.9)	3.1	(2.2)

Milking younger or healthier goats before older or sicker goats can reduce the exposure of noninfected animals to mastitis-causing organisms. The majority of operations, regardless of herd size, did not milk in any particular order. Overall, 70.6 percent of operations did not milk in any particular order.

f. Percentage of operations by method used to determine milking order, and by herd size:

	Percent Operations							
	Herd Size (number of goats and kids)							
	Small (10–19)		Medium (20–99)		Large (100 or more)		All operations	
Method	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Not milked in any particular order	73.6	(8.3)	68.3	(7.6)	69.2	(7.0)	70.6	(4.6)
Based on age	2.1	(2.1)	15.6	(6.0)	16.0	(5.5)	10.2	(2.9)
Based on health	0.0	(—)	9.6	(4.1)	2.7	(2.3)	4.3	(1.7)
Based on production	9.2	(5.3)	2.3	(2.3)	5.2	(2.7)	5.7	(2.4)
Something else	15.2	(7.1)	4.2	(3.0)	6.9	(3.3)	9.2	(3.3)
Total	100.0		100.0		100.0		100.0	

5. Dry-off procedures

Over one-fourth of operations (28.6 percent) had used an antibiotic intramammary therapy/infusion at dry-off for at least some does during the previous 12 months.

a. Percentage of operations that used an antibiotic intramammary therapy/infusion at dry-off for at least some does during the previous 12 months, by herd size:

Percent Operations

Herd Size (number of goats and kids)

Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
21.1	(8.0)	33.5	(7.9)	34.4	(8.6)	28.6	(4.9)

A higher percentage of operations in the West region (50.3 percent) used an antibiotic intramammary therapy/infusion at dry-off compared with operations in the Northeast region (16.6 percent).

b. Percentage of operations that used an antibiotic intramammary therapy/infusion at dry-off for at least some does during the previous 12 months, by region:

Percent Operations

Region

West		**Southeast**		**Northeast**	
Percent	**Std. error**	**Percent**	**Std. error**	**Percent**	**Std. error**
50.3	(8.9)	17.4	(8.5)	16.6	(6.5)

Overall, 19.3 percent of does received antibiotic therapy at dry-off.

c. Operation average percentage of does that received antibiotic intramammary therapy/ infusion at dry-off during the previous 12 months, by herd size:

Operation Average Percent Does

Herd Size (number of goats and kids)

Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
19.3	(7.4)	19.6	(6.4)	18.8	(6.7)	19.3	(4.3)

The general recommendation is to give does at least a 60-day dry period, which allows the mammary system time to prepare for the next lactation. Goats that do not have a long enough dry period will have a lower milk production in the next lactation cycle. Overall, the operation average days dry for does during the previous 12 months was 113 days.

d. Operation average number of days dry for does during the previous 12 months, by herd size:

Operation Average Days Dry

Herd Size (number of goats and kids)

Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Avg. (days)	**Std. error**	**Avg.** (days)	**Std. error**	**Avg.** (days)	**Std. error**	**Avg.** (days)	**Std. error**
121	(14)	112	(9)	102	(9)	113	(7)

There were no regional differences for operation average number of days dry for does.

e. Operation average number of days dry for does during the previous 12 months, by region:

Operation Average Days Dry					
Region					
West		Southeast		Northeast	
Average (days)	**Std. error**	**Average** (days)	**Std. error**	**Average** (days)	**Std. error**
116	(10)	131	(22)	103	(10)

Does on over 90 percent of operations (91.3 percent) had an average days dry of 60 days or more.

f. Percentage of operations by average number of days dry:

Average (days)	**Percent operations**	**Std. error**
1–29	1.5	(1.4)
30–39	2.6	(2.6)
40–49	3.3	(2.1)
50–59	1.3	(0.7)
60–69	20.6	(4.1)
70 or more	70.7	(5.0)
Total	100.0	

6. Presence of dairy cows

Overall, 7.5 percent of operations milked dairy cows in addition to goats.

a. Percentage of operations that milked dairy cows in addition to goats during the previous 12 months, by herd size:

Percent Operations							
Herd Size (number of goats and kids)							
Small (10–19)		**Medium** (20–99)		**Large** (100 or more)		**All operations**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
10.0	(4.9)	4.5	(3.1)	8.2	(4.1)	7.5	(2.5)

b. Percentage of operations that milked dairy cows in addition to goats during the previous 12 months, by region:

Percent Operations					
Region					
West		**Southeast**		**Northeast**	
Percent	**Std. error**	**Percent**	**Std. error**	**Percent**	**Std. error**
7.6	(4.2)	3.5	(3.4)	9.5	(4.2)

7. Mastitis

About 3 of 10 operations (30.8 percent) had does with clinical mastitis during the previous 12 months.

a. [v313,v315] Percentage of operations with clinical mastitis during the previous 12 months:

Percent operations	Std. error
30.8	(4.8)

About 5 of 10 operations (53.6 percent) milked does with clinical mastitis at the end of milking in the milking unit.

b. For operations that had at least one doe with clinical mastitis during the previous 12 months, percentage of operations by milking procedures for does with mastitis:

Milking procedure	Percent operations	Std. error
Used a separate milking unit from healthy goats	39.9	(9.0)
In a separate string from healthy goats	35.2	(9.4)
At the end of milking in the milking unit	53.6	(9.4)

Section II: Methodology

A. Needs Assessment

NAHMS develops study objectives by exploring existing literature and contacting industry members about their informational needs and priorities during a needs assessment phase. The needs assessment for the NAHMS Goat 2009 study collected information from U.S. goat producers and other goat specialists about what they perceived to be the most important goat health and productivity issues. A driving force of the needs assessment was the desire of NAHMS to receive as much input as possible from a variety of producers, industry experts and representatives, veterinarians, extension specialists, universities, and industry organizations. Information was collected through a Needs Assessment Survey, and top issues were prioritized by teleconferences with representatives of the dairy, fiber, and meat segments of the goat industry, along with extension agents and other university affiliates.

The Needs Assessment Survey was designed to ascertain the top-three management issues, diseases/disorders, and producer incentives from producers, veterinarians, extension personnel, university researchers, and allied industry groups. The survey, created in SurveyMonkey, was available online from October 2007 to February 2008 via electronic newsletters, magazines, and Web sites. Organizations promoting the study included the American Dairy Goat Association, American Meat Goat Association, individual State goat associations, and the newly formed National Goat Federation. E-mail messages were also sent to State and Federal personnel asking for input and identifying the online site. A total of 1,253 people responded to the survey questionnaire and, of those, 1,022 completed the entire survey. Meat goat producers accounted for 32.7 percent of the respondents, while dairy goat producers accounted for 32.0 percent. Another 9.9 percent were both meat and dairy producers, and 2.1 percent were fiber producers. Thus, producers accounted for 76.7 percent of survey respondents. The remaining survey participants were university researchers or extension agents, veterinarians, State or Federal personnel, associates of an allied industry such as pharmaceutical or nutrition companies, or otherwise identified as none of the above.

Once the most important issues were identified, the study objectives were created by prioritizing the needs during discussions with producers, veterinarians, university extension agents, and government personnel. These discussions culminated in the study objectives:

- Determine producer awareness of Veterinary Services program diseases and describe management and biosecurity practices important for the control of infectious diseases (including brucellosis, scrapie, caprine arthritis encephalitis (CAE), Johne’s disease, and caseous lymphadenitis). Provide a baseline description of animal health, nutrition, and management practices in the U.S. goat industry.

- Estimate the prevalence of:
  - *Mycobacterium paratuberculosis* (Johne's) infection;
  - Internal parasitism.

- Characterize contagious ecthyma (sore mouth) in U.S. goats. Determine producer awareness of zoonotic potential and practices to prevent sore mouth transmission, and assess producer interest in an improved vaccine for sore mouth.

B. Sampling and Estimation

1. State selection

The preliminary selection of States to be included in the study was done March through May 2008, using the National Agricultural Statistics Service (NASS) 2002 Census of Agriculture and the February 1, 2008, "Sheep and Goat Report." A goal for NAHMS national studies is to include States that account for at least 70 percent of animals and operations in the United States. The initial review of States identified 21 major States representing 82.2 percent of the U.S. January 1 goat inventory and 75.5 percent of the goat operations. The States were Alabama, California, Colorado, Florida, Georgia, Indiana, Iowa, Kentucky, Michigan, Missouri, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Tennessee, Texas, Virginia, Washington, and Wisconsin.

A memo identifying these 21 States was provided in June 2008 to the USDA–APHIS–VS CEAH Director and, in turn, the VS Regional Directors. Each Regional Director sought input from the respective States about being included or excluded from the study. In December 2008, another memo showing predicted workload was sent to the VS Regional Directors. The 21 States were included in the study. In April 2009, a memo was sent to the field sharing the decision that no VS field force would be available for the study.

2. Operation selection

The list sampling frame was provided by NASS. Within each State a stratified random sample was selected. The size stratum was the number of goats and kids for each operation on the list sampling frame at the time of sample selection. NASS selected a sample of goat producers in each State. Among producers on the list frame with fewer than 10 goats, 2,000 operations were selected for Phase Ia. For operations on the list frame with 10 or more goats, a total of 3,501 operations were selected for contact during Phase Ib.

Operations in the sample selected for Phase Ia (those with fewer than 10 goats) were contacted by mail, with telephone follow-up. For operations with 10 or more goats that participated in the Phase Ib, personal interviews were conducted by NASS enumerators.

3. Population inferences

a. Phases Ia and Ib: General Goat Management Reports

Inferences cover the population of goat producers with at least 1 goat or kid in the 21 participating States. As of December 31, 2007 (2007 Census of Agriculture), these States accounted for 82.2 percent of all goats (2,580,616 head) and 75.5 percent of operations (109,116) with goats in the United States. (See Appendix II for respective data on individual States.) All respondent data were statistically weighted to reflect the population from which they were selected. The inverse of the probability of selection for each operation was the initial selection weight. This selection weight was adjusted for nonresponse within each State and size group to allow for inferences back to the original population from which the sample was selected.

C. Data Collection

1. Data collectors and data collection period

a. Phase I: General Goat Management Report

From July 1 to 30, 2009, NASS enumerators administered the General Goat Management Report questionnaire. For producers with fewer than 10 goats, the telephone interview took approximately 10 minutes. For producers with 10 or more goats the in-person interview took approximately 1 hour.

b. Phase II: Mail-in Questionnaire

Operations that participated in the Phase I NASS enumerator visit were asked if they would participate in the completion of a mail-in questionnaire which was left with the producer. Data collection was from July 1, 2009, to September 1, 2009.

D. Data Analysis

1. Phase I: Validation—General Goat Management Report

Telephone interviews were conducted via computer-assisted telephone interview software at a NASS office. For the in-person administered questionnaire, initial data entry and validation for the General Goat Management Report were performed in the individual NASS State offices. Data were entered into a SAS data set. NAHMS national staff performed additional data validation on the entire data set after data from all States were combined.

E. Sample Evaluation

The purpose of this section is to provide various performance measurement parameters. Historically, the term “response rate” was used as a catchall parameter, but there are many ways to define and calculate response rates. Therefore, the following table presents an evaluation based upon a number of response measurement parameters, which are defined with an *x* in categories that contribute to the measurement.

1. Phase Ia: General Goat Management Report—fewer than 10 goats

A total of 2,000 operations were selected for the survey. Of these operations, 1,591 (79.5 percent) were contacted. There were 1,429 operations that provided usable inventory information (71.5 percent of the total selected and 89.8 percent of those contacted). Of these, 649 operations (32.5 percent of the total sample) provided “complete” information for the questionnaire. None of these operations, regardless of reported number of head, was eligible to participate in Phase II of the study.

			Measurement parameter		
Response category	Number operations	Percent operations	Contacts	Usable[1]	Complete[2]
Survey complete	649	32.5	x	x	x
No goats on July 1, 2009	780	39.0	x	x	
Out of business	0	0.0	x	x	
Out of scope	0	0.0			
Refusal of GGMR	162	8.1	x		
Office hold (NASS elected not to contact)	1	0.0			
Inaccessible	408	20.4			
Total	2,000	100.0	1,591	1,429	649
Percent of total operations			79.5	71.5	32.5
Percent of total operations weighted[3]			78.9	70.6	30.9

[1]Useable operation—respondent provided answers to inventory questions for the operation (either zero or positive number on hand).
[2]Survey complete operation—respondent provided answers to all or nearly all questions.
[3]Weighted response—the rate was calculated using the initial selection weights.

2. Phase Ib: General Goat Management Report—10 or more goats

A total of 3,501 operations were selected for the survey. Of these operations, 3,189 (91.1 percent) were contacted. There were 2,873 operations that provided usable inventory information (82.1 percent of the total selected and 90.1 percent of those contacted). In addition, there were 1,835 operations (52.4 percent) that provided "complete" information for the questionnaire. Of 1,835 operations that provided complete information, 1,438 (78.4 percent) planned to complete the mail-in questionnaire.

			Measurement parameter		
Response category	**Number operations**	**Percent operations**	**Contacts**	**Usable[1]**	**Complete[2]**
Survey complete and plan 2nd questionnaire	1,438	41.1	x	x	x
Survey complete, do not plan 2nd questionnaire	397	11.3	x	x	x
No goats on July 1, 2007	797	22.8	x	x	
Out of business	241	6.9	x	x	
Out of scope	9	0.3			
Refusal of GGMR	316	9.0	x		
Office hold (NASS elected not to contact)	19	0.5			
Inaccessible	284	8.1			
Total	3,501	100.0	3,189	2,873	1,835
Percent of total operations			91.1	82.1	52.4
Percent of total operations weighted[4]			91.7	84.1	50.8

[1]Useable operation—respondent provided answers to inventory questions for the operation (either zero or positive number on hand).
[2]Survey complete operation—respondent provided answers to all or nearly all questions.
[3]Weighted response—the rate was calculated using the initial selection weights.

3. Phase II: Mail-in Questionnaire

Of the 1,438 operations that indicated during Phase Ib that they planned to complete the mail-in questionnaire for Phase II, 634 (44.1 percent) completed the questionnaire (11 of the 634 actually had not planned to mail in the second questionnaire but did anyway).

			Measurement parameter		
Response category	**Number operations**	**Percent operations**	**Contacts**	**Usable[1]**	**Complete[2]**
Survey complete	634	44.1	x	x	x
Survey refused	804	55.9	x		
Total	1,438	100.0	1,438	634	
Percent of total operations			100.0	44.1	44.1
Percent of total operations weighted[3]					

[1]Useable operation—respondent provided answers to inventory questions for the operation (either zero or positive number on hand).
[2]Survey complete operation—respondent provided answers to all or nearly all questions..
[3]Weighted response—the rate was calculated using the turnover weights.

Appendix I: Sample Profile

A. Responding Operations

1. Number of responding operations, by herd size

	Phase Ia: General Goat Management Report—fewer than 10 goats	Phase Ib: General Goat Management Report—10 or more goats	Phase II: Mail-in questionnaire
Herd Size (number of goats and kids)	**Number of Responding Operations**		
Fewer than 10	649		
10 to 19		532	207
20 to 99		739	261
100 or more		564	166
Total	649	1,835	634

2. Number of responding operations, by region

	Phase Ia: General Goat Management Report—fewer than 10 goats	Phase Ib: General Goat Management Report—10 or more goats	Phase II: Mail-in questionnaire
Region	**Number of Responding Operations**		
West	169	594	201
Southeast	238	728	234
Northeast	242	513	199
Total	649	1,835	634

Appendix II: U.S. Goat Population and Farms

Note: The eastern halves of Oklahoma and Texas included the following counties:

Oklahoma: Adair, Bryan, Cherokee, Choctaw, Coal, Craig, Creek, Delaware, Haskell, Hughes, Johnston, Latimer, Le Flore, Lincoln, Marshall, Mayes, McCurtain, McIntosh, Muskogee, Nowata, Okfuskee, Okmulgee, Osage, Ottawa, Pawnee, Pittsburg, Pontotoc, Pottawatomie, Pushmataha, Rogers, Sequoyah, Tulsa, Wagoner, Washington

Texas: Anderson, Angelina, Atascosa, Austin, Bastrop, Bee, Bowie, Brazoria, Brazos, Brooks, Burleson, Cameron, Cass, Cherokee, Collin, Colorado, Dallas, De Witt, Duval, Ellis, Fannin, Franklin, Galveston, Gonzales, Grayson, Gregg, Grimes, Hall, Hardin, Harris, Henderson, Hidalgo, Hopkins, Houston, Hunt, Jackson, Jasper, Jefferson, Jim Wells, Karnes, Kaufman, Kenedy, Kleberg, Lamar, Lavaca, Lee, Leon, Liberty, Limestone, Live Oak, Madison, Matagorda, Milam, Montgomery, Morris, Nacogdoches, Navarro, Nueces, Orange, Panola, Rains, Red River, Refugio, Robertson, Rusk, San Jacinto, Shelby, Smith, Starr, Titus, Tyler, Upshur, Van Zandt, Victoria, Walker, Waller, Washington, Wilson, Wood

A. All Goats

Region	State	Number of Goats*		Number of Farms	
		Goats on farms with 1 or more head	Goats on farms with 1–9 head	Farms with 1 or more head	Farms with 1–9 head
West	CA	130,823	10,272	4,985	2,894
	CO	48,978	5,732	2,720	1,746
	OK (west)	51,410	3,545	2,165	968
	OR	38,111	6,981	3,127	2,067
	TX (west)	998,833	21,758	17,369	5,200
	WA	32,840	7,269	3,143	2,131
	Total	1,300,995	55,557	33,509	15,006
Southeast	AL	80,436	7,017	4,120	1,528
	FL	57,696	8,304	4,040	2,124
	GA	83,976	7,973	4,283	1,880
	KY	98,166	10,003	5,298	2,497
	NC	98,356	10,279	5,589	2,411
	OK (east)	73,893	6,316	3,551	1,601
	TN	130,968	13,953	6,828	3,295
	TX (east)	141,129	17,476	8,997	4,487
	VA	63,091	8,042	3,934	2,113
	Total	827,711	89,363	46,640	21,936
Northeast	IN	47,090	7,543	3,385	1,971
	IA	55,950	4,412	2,257	1,166
	MI	27,841	7,962	3,186	2,398
	MO	96,449	8,421	4,476	2,188
	NY	39,920	5,831	2,707	1,748
	OH	69,505	10,935	4,910	3,166
	PA	59,214	10,722	4,844	3,237
	WI	55,941	7,428	3,202	2,378
	Total	451,910	63,254	28,967	18,252
Total (21 States)		2,580,616	208,174	109,116	55,194
Percent of U.S.		82.2	73.2	75.5	72.9
Total U.S. (50 States)		3,140,529	284,477	144,466	75,695

*Source: NASS 2007 Census of Agriculture.

B. Milk Goats

Region	State	Number of Milk Goats*		Number of Farms	
		Goats on farms with 1 or more head	Goats on farms with 1–9 head	Farms with 1 or more head	Farms with 1–9 head
West	CA	39,198	3,333	1,402	914
	CO	7,713	1,815	783	571
	OK (west)	2,735	777	323	241
	OR	8,300	2,259	901	637
	TX (west)	12,002	2,750	1,155	795
	WA	8,168	2,579	1,076	843
	Total	78,116	13,513	5,640	4,001
Southeast	AL	4,032	1,185	444	320
	FL	6,632	1,912	778	571
	GA	4,513	1,107	453	302
	KY	6,129	1,824	747	560
	NC	9,379	1,799	786	505
	OK (east)	4,500	1,219	525	390
	TN	5,751	1,189	587	382
	TX (east)	8,090	2,296	969	707
	VA	5,344	1,401	617	452
	Total	54,370	13,932	5,906	4,189
Northeast	IN	10,301	2,667	1,070	782
	IA	22,269	1,409	652	397
	MI	9,883	2,903	1,144	863
	MO	8,866	2,444	951	733
	NY	11,968	2,321	1,030	713
	OH	10,072	2,896	1,258	956
	PA	14,297	3,136	1,342	990
	WI	36,367	2,420	1,088	745
	Total	124,023	20,196	8,535	6,179
Total (21 States)		256,509	47,641	20,081	14,369
Percent of U.S.		76.6	72.5	73.1	72.9
Total U.S. (50 States)		334,754	65,742	27,481	19,722

*Source: NASS 2007 Census of Agriculture.

C. Angora Goats

Region	State	Number of Angora Goats*		Number of Farms	
		Goats on farms with 1 or more head	Goats on farms with 1–9 head	Farms with 1 or more head	Farms with 1–9 head
West	CA	3,400	560	262	202
	CO	1,007	391	182	148
	OK (west)	232	69	27	23
	OR	1,750	577	245	203
	TX (west)	131,178	608	600	215
	WA	1,197	389	200	159
	Total	138,764	2,594	1,516	950
Southeast	AL	262	210	57	53
	FL	236	90	54	45
	GA	814	240	106	80
	KY	810	324	129	108
	NC	1,418	391	174	130
	OK (east)	512	154	66	53
	TN	250	121	49	42
	TX (east)	1,519	461	183	146
	VA	1,533	300	158	107
	Total	7,354	2,291	976	764
Northeast	IN	367	232	66	59
	IA	780	220	78	61
	MI	1,058	373	164	140
	MO	1,334	186	102	73
	NY	886	321	152	126
	OH	1,361	382	160	129
	PA	1,298	555	227	192
	WI	790	390	179	158
	Total	7,874	2,659	1,128	938
Total (21 States)		153,992	7,544	3,620	2,652
Percent of U.S.		75.4	56.5	50.2	61.1
Total U.S. (50 States)		204,106	13,361	7,215	4,339

*Source: NASS 2007 Census of Agriculture.

D. Other (Meat) Goats

Region	State	Number of Other (Meat) Goats*		Number of Farms	
		Goats on farms with 1 or more head	Goats on farms with 1–9 head	Farms with 1 or more head	Farms with 1–9 head
West	CA	88,225	8,210	4,016	2,434
	CO	40,258	4,555	2,183	1,438
	OK (west)	48,443	3,077	1,962	843
	OR	28,061	5,539	2,453	1,709
	TX (west)	855,653	20,004	16,413	4,818
	WA	23,475	6,110	2,478	1,795
	Total	1,084,115	47,495	29,505	13,037
Southeast	AL	76,142	6,151	3,810	1,347
	FL	50,828	7,106	3,588	1,877
	GA	78,649	7,268	3,959	1,741
	KY	91,227	8,797	4,808	2,211
	NC	87,559	9,167	5,037	2,164
	OK (east)	68,881	5,588	3,243	1,438
	TN	124,967	13,586	6,549	3,238
	TX (east)	131,520	16,057	8,338	4,135
	VA	56,214	7,089	3,452	1,856
	Total	765,987	80,809	42,784	20,007
Northeast	IN	36,422	6,096	2,711	1,617
	IA	32,901	3,443	1,793	955
	MI	16,900	6,128	2,449	1,988
	MO	86,249	7,050	3,859	1,829
	NY	27,066	4,228	1,993	1,356
	OH	58,072	9,168	4,094	2,703
	PA	43,619	8,694	3,864	2,674
	WI	18,784	5,615	2,354	1,891
	Total	320,013	50,422	23,117	15,013
Total (21 States)		2,170,115	178,726	95,406	48,057
Percent of U.S.		83.4	74.3	77.4	73.9
Total U.S. (50 States)		2,601,669	240,498	123,278	65,063

*Source: NASS 2007 Census of Agriculture.

E. U.S. Goat Population, January 1, 2010, Inventory

Region	State	All Goats	Milk Goats	Meat and Other Goats	Angora Goats
West	CA	NA	38,000	93,000	3,500
	CO	NA	8,400	38,000	NA
	OK (west)*	NA			NA
	OR	NA	9,100	30,000	1,900
	TX (west)*	NA			95,000
	WA	NA	7,300	22,000	1,000
	Total	NA	NA	NA	NA
Southeast	AL	NA	4,200	60,000	NA
	FL	NA	5,000	60,000	NA
	GA	NA	3,000	79,000	NA
	KY	NA	6,500	79,000	NA
	NC	NA	8,000	95,000	NA
	OK (east)*				
	TN	NA	6,400	125,000	NA
	TX (east)*				
	VA	NA	5,800	52,000	1,400
	Total	NA	NA	NA	NA
Northeast	IN	NA	11,800	33,500	NA
	IA	NA	29,500	25,000	NA
	MI	NA	10,900	16,000	NA
	MO	NA	9,000	84,600	1,400
	NY	NA	13,000	35,000	NA
	OH	NA	8,000	50,000	1,300
	PA	NA	17,000	42,000	NA
	WI	NA	46,000	21,000	1,000
	Total	NA	145,200	307,100	NA
Total (21 States)		NA	275,200	2,120,100	NA
Percent of U.S.		NA	77.5	83.5	NA
Total U.S. (50 States)		3,043,000	355,000	2,538,000	150,000

Source: NASS Sheep and Goats report, January 28, 2010.

*Inventory split between eastern half and western half of State is not available for January 1, 2010, inventory. State-level published inventories for Oklahoma and Texas are shown below.

	All Goats	Milk Goats	Meat and Other Goats	Angora Goats
Oklahoma	NA	8,300	90,000	NA
Texas	NA	20,000	990,000	95,000

Appendix III: Study Objectives and Related Outputs

1. Provide a baseline description of animal health, nutrition, and management practices in the U.S. goat industry
   - Part I: Reference of Goat Management Practices in the United States, 2009, November 2010
   - Part II: Reference of Goat Health and Marketing Practices in the United States, 2009, April 2011
   - Part III: Biosecurity and Disease-prevention Practices on U.S. Goat Operations, 2009, January 2012
   - Small-scale Farming: U.S. Goat Operations, June 2011
   - Biosecurity on U.S. Goat Operations, information sheet, January 2012
   - Goat Disease and Death, information sheet, January 2012

2. Determine producer awareness of VS program diseases
   - Part II: Reference of Goat Health and Marketing Practices in the United States, 2009, April 2011
   - Producer Knowledge of Production Limiting Diseases on Goat Operations, information sheet, January 2012
   - Part III: Biosecurity and Disease-prevention Practices on U.S. Goat Operations, 2009, January 2012
   - Identification Practices on U.S. Goat Operations, information sheet, January 2012

3. Describe producer-reported occurrence of infectious diseases (including brucellosis, scrapie, caprine arthritis encephalitis, Johne's disease, and caseous lymphadenitis) and the management and biosecurity practices important for controlling them
   - Part II: Reference of Goat Health and Marketing Practices in the United States, 2009, April 2011
   - Part III: Biosecurity and Disease-prevention Practices on U.S. Goat Operations, 2009, January 2012
   - Biosecurity on Goat Operations, information sheet, January 2012

4. Describe practices important for controlling internal parasites and reducing anthelmintic resistance
   - Part II: Reference of Goat Health and Marketing Practices in the United States, 2009, April 2011
   - Part III: Biosecurity and Disease-prevention Practices on U.S. Goat Operations, 2009, January 2012
   - Parasites and Anthelmintic Resistance on U.S. Goat Operations, information sheet, January 2012

5. Determine producer awareness of sore mouth (contagious ecthyma) and practices to prevent its transmission

- Part I: Reference of Goat Management Practices in the United States, 2009, July 2010
- Part II: Reference of Goat Health and Marketing Practices in the United States, 2009, April 2011
- Part III: Biosecurity and Disease-prevention Practices on U.S. Goat Operations, 2009, January 2012