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Animal and Plant Health Inspection Service

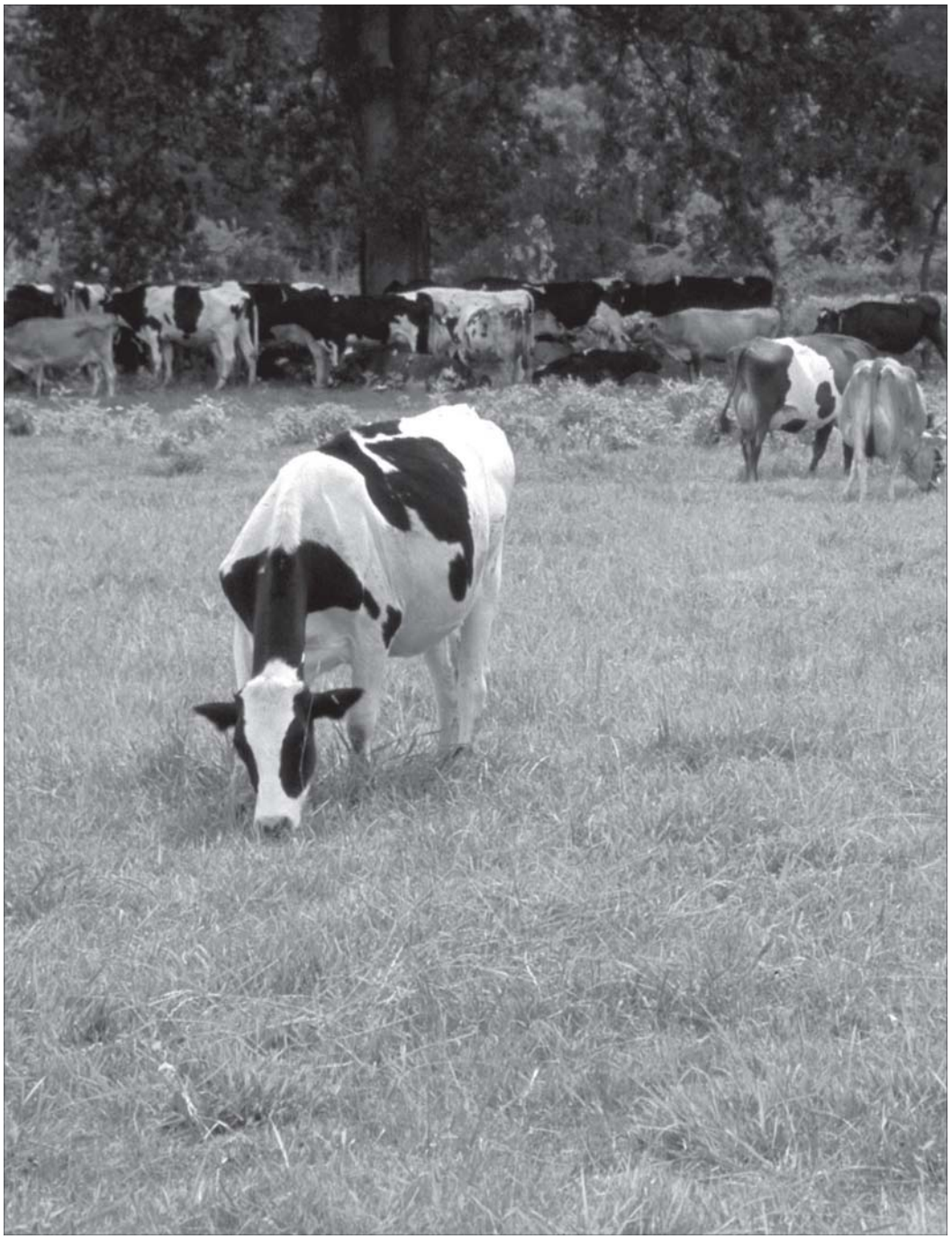
Veterinary Services

National Animal Health Monitoring System

October 2007

Dairy 2007

Part I: Reference of Dairy Cattle Health and Management Practices in the United States, 2007



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Introduction

The National Animal Health Monitoring System (NAHMS) is a nonregulatory program of the United States Department of Agriculture's (USDA) Animal and Plant Health Inspection Service. NAHMS is designed to help meet the Nation's animal-health information needs and has collected data on dairy health and management practices through three previous studies.

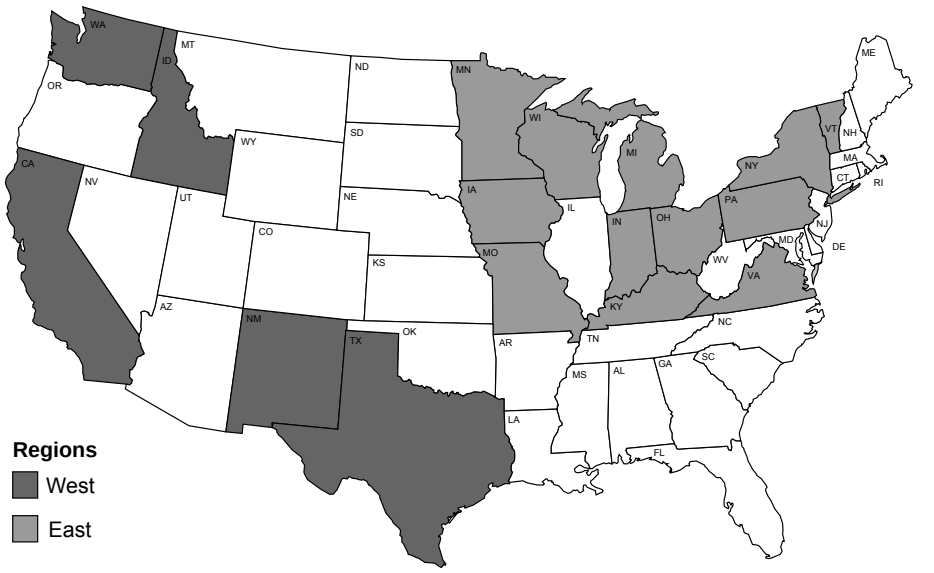
The NAHMS 1991-92 National Dairy Heifer Evaluation Project (NDHEP) provided the dairy industry's first national information on the health and management of dairy cattle in the United States. Just months after the study's first results were released in 1993, cases of acute bovine viral diarrhea (BVD) surfaced in the United States following a 1993 outbreak in Canada. NDHEP information on producer vaccination and biosecurity practices helped officials address the risk of disease spread and target educational efforts on vaccination protocols. An outbreak of human illness was reported in 1993 in the Pacific Northwest, this time related to *Escherichia coli* 0157:H7. NDHEP data on the bacteria's prevalence in dairy cattle helped officials define public risks as well as research needs. This baseline picture of the industry also helped identify additional research and educational efforts in various production areas, such as feed management and weaning age.

Information from the NAHMS Dairy '96 Study helped the U.S. dairy industry identify educational needs and prioritize research efforts on such timely topics as antibiotic usage and Johne's disease, as well as digital dermatitis, bovine leukosis virus, and potential food-borne pathogens, including *E. coli*, *Salmonella*, and *Campylobacter.*

A major focus of the Dairy 2002 Study was to describe management strategies that prevent and reduce Johne's disease and to determine management factors associated with *Mycoplasma* and *Listeria* in bulk-tank milk. Additionally, levels of participation in quality assurance programs, the incidence of digital dermatitis, a profile of animal waste handling systems used on U.S. dairy operations, and industry changes since the NDHEP in 1991 and Dairy '96 were examined.

The Dairy 2007 Study was conducted in 17 of the Nation's major dairy States (see map) and provides participants, stakeholders, and the industry as a whole with valuable information representing 79.5 percent of U.S. dairy operations and 82.5 percent of U.S. dairy cows. Part 1: Reference of Dairy Cattle Health and Management Practices in the United States, 2007 is the first in a series of reports containing national information from the NAHMS Dairy 2007 Study. This report contains information collected from 2,194 dairy operations.

Dairy 2007 Participating States



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

Further information on NAHMS studies and reports is available at: http://nahms.aphis.usda.gov.

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Terms Used In This Report

Bovine viral diarrhea–persistent infection (BVD–PI): Cattle infected with BVD in utero. These animals continuously shed large quantities of the virus via nasal discharge, saliva, semen, urine, feces, tears, and milk, thereby serving as a source of persistently–infected (PI) cattle.

Cow: Female dairy bovine that has calved at least once.

Cow average: The average value for all cows (milking and dry); the reported value for each operation multiplied by the number of cows on that operation is summed over all operations and divided by the number of cows on all operations. This way, results are adjusted for the number of cows on each operation. For instance, on p. 21, the rolling herd average milk production (lb/cow) is multiplied by the number of cows for each operation. This product is then summed over all operations and divided by the sum of cows over all operations. The result is the average milk production for all cows.

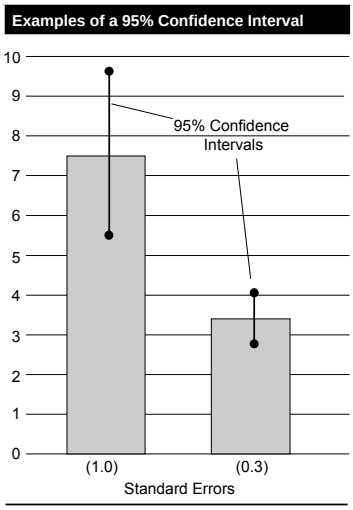
Dairy Herd Improvement Association (DHIA): An organization with programs and objectives intended to improve the production and profitability of dairy farming. DHIA also aids farmers in keeping milk production and management records.

Heifer: Female dairy bovine that has not yet calved.

Herd size: Herd size is based on January 1, 2007, cow inventory. Small herds are those with fewer than 100 cows; medium herds are those with 100 to 499 cows; and large herds are those with 500 or more cows.

Operation: Premises with at least one dairy cow on January 1, 2007.

Operation average: The average value for all operations; a single value for each operation is summed over all operations reporting divided by the number of operations reporting. For example, operation average age of heifers at first calving (shown on p. 23) is calculated by summing reported average age over all operations divided by the number of operations.



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 (—).

Sample profile: Information that describes characteristics of the operations from which Dairy 2007 data were collected.

Regions:
West: California, Idaho, New Mexico, Texas, and Washington
East: Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, New York, Ohio, Pennsylvania, Vermont, Virginia, and Wisconsin

Rolling Herd Average (RHA): Average milk production per cow (lb/cow) in the herd during the previous 12 months.

Section I: Population Estimates

A. Dairy Herd Information and Management Practices

1. Operation types

Producers were asked to identify their operations by type, i.e., conventional, grazing, combination, and organic. On conventional operations, the majority of forage was harvested and “delivered” to cows; on grazing operations, the majority of forage was “harvested” by cows; combination operations used both conventional and grazing practices; and organic operations met USDA organic standards. The majority of operations (63.9 percent) were conventional operations, and the majority of cows (82.2 percent) were on these operations. Grazing and organic operations accounted for only 3.1 and 1.7 percent of operations, respectively, and together represented less than 3.0 percent of cows.

a. Percentage of operations (and percentage of cows on these operations) by operation type:

Operation Type	Percent Operations	Standard Error	Percent Cows	Standard Error
Conventional	63.9	(1.4)	82.2	(0.9)
Grazing	3.1	(0.6)	1.7	(0.4)
Combination of conventional and grazing	31.1	(1.3)	14.9	(0.8)
Organic	1.7	(0.4)	1.2	(0.3)
Other	0.2	(0.1)	0.0	(0.0)
Total	100.0		100.0	

The percentage of conventional operations increased as herd size increased, while the percentage of combination operations decreased as herd size increased.

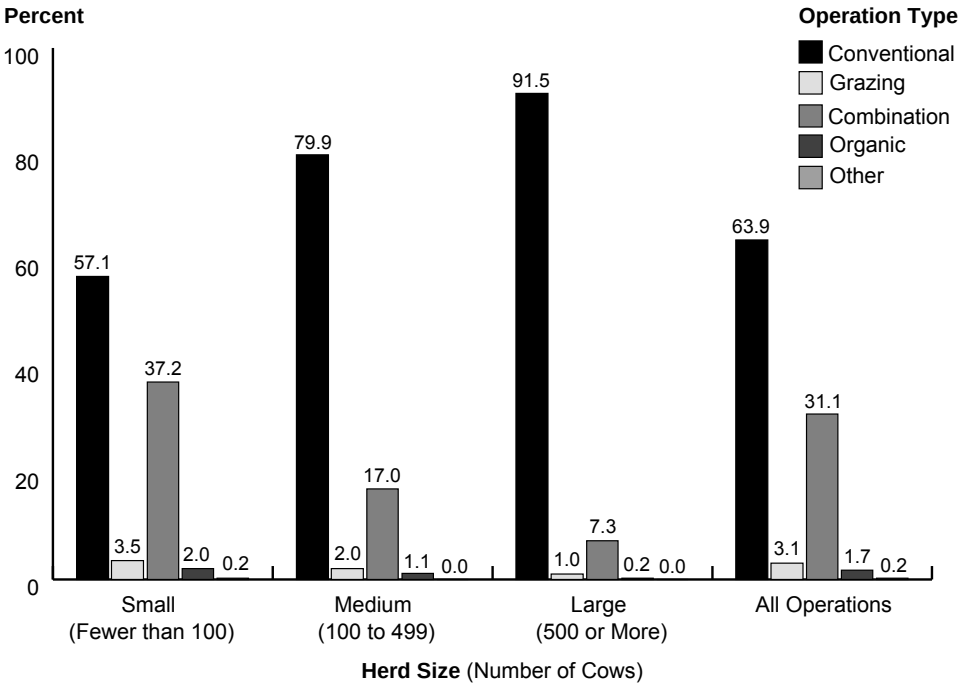
b. Percentage of operations by operation type and by herd size:

Percent Operations

Herd Size (Number of Cows)

Operation Type	Small (Fewer than 100) Pct.	Std. Error	Medium (100-499) Pct.	Std. Error	Large (500 or More) Pct.	Std. Error
Conventional	57.1	(1.8)	79.9	(1.7)	91.5	(1.4)
Grazing	3.5	(0.7)	2.0	(0.7)	1.0	(0.4)
Combination of conventional and grazing	37.2	(1.7)	17.0	(1.6)	7.3	(1.3)
Organic	2.0	(0.6)	1.1	(0.3)	0.2	(0.1)
Other	0.2	(0.1)	0.0	(0.0)	0.0	(0.0)
Total	100.0		100.0		100.0	

Percentage of Operations by Operation Type and by Herd Size



The West region had a higher percentage of conventional operations than the East region (72.4 and 63.2 percent, respectively). Conversely, the East region had a higher percentage of combination operations than the West region (32.4 and 15.8 percent, respectively). The percentages of grazing and organic operations were similar in the West and East regions.

c. Percentage of operations by operation type and by region:

	Percent Operations			
	Region			
	West		East	
Operation Type	**Percent**	**Std. Error**	**Percent**	**Std. Error**
Conventional	72.4	(2.9)	63.2	(1.4)
Grazing	8.0	(2.4)	2.7	(0.6)
Combination	15.8	(2.0)	32.4	(1.4)
Organic	3.8	(1.3)	1.5	(0.4)
Other	0.0	(0.0)	0.2	(0.1)
Total	100.0		100.0	

Conventional operations and the cows on these operations had the highest RHA milk production (20,253 and 22,182 lb/cow, respectively). RHA milk production was similar for grazing, organic, and other operations.

d. Operation average (and cow average) RHA milk production (lb/cow), by operation type:

	RHA Milk Production			
Operation Type	**Operation Average** (lb/cow)	**Standard Error**	**Cow Average** (lb/cow)	**Standard Error**
Conventional	20,253	(135)	22,182	(126)
Grazing	15,146	(608)	15,903	(457)
Combination	17,587	(213)	18,696	(217)
Organic	15,266	(714)	16,369	(728)
All*	19,175	(112)	21,483	(115)

* “Other” operation types included in “all” operation types.

2. Record-keeping systems

Dairy record-keeping systems are commonly used to track milk production, reproduction, and the health of cows. The use of hand-written records decreased as herd size increased, while the use of on-farm computer records increased as herd size increased. The highest percentage of small and medium operations (77.9 and 67.2 percent, respectively) used hand-written records, while the highest percentage of large operations (82.7 percent) used on-farm computer records. Almost all operations (95.1 percent) had some form of record-keeping system to track individual animals. Operations could have used more than one system. The majority of operations (73.5 percent) used hand-written records to track animals, while almost half (45.9 percent) used the Dairy Herd Improvement Association (DHIA) record-keeping system. Although only 19.4 percent of operations used on-farm computer record-keeping systems, 56.9 percent of cows were on these operations.

a. Percentage of operations by type of individual animal record-keeping systems used for the operation, by herd size:

Percent Operations

Herd Size (Number of Dairy Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
System	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Hand written, such as a ledger or notebook	77.9	(1.5)	67.2	(2.1)	38.1	(2.8)	73.5	(1.2)
DHIA	42.4	(1.7)	56.5	(2.3)	50.5	(2.9)	45.9	(1.4)
Off-farm computer record system other than DHIA	2.7	(0.5)	10.9	(1.4)	10.0	(1.5)	4.9	(0.5)
On-farm computer record system	9.3	(1.0)	37.8	(2.2)	82.7	(2.1)	19.4	(0.9)
Other system	4.0	(0.7)	5.9	(1.2)	3.2	(1.0)	4.4	(0.6)
Any record-keeping system	94.2	(0.9)	97.0	(0.9)	99.8	(0.1)	95.1	(0.7)

b. Percentage of cows by type of individual animal record-keeping systems used for the operation:

System	Percent Cows	Standard Error
Hand written, such as a ledger or notebook	54.0	(1.5)
DHIA	48.7	(1.5)
Off-farm computer record system other than DHIA	9.0	(0.9)
On-farm computer record system	56.9	(1.2)
Other system	4.0	(0.6)
Any record-keeping system	98.4	(0.2)

For operations using on- or off-farm computer data record systems, 34.9 percent used Dairy Comp 305 as their primary system, accounting for 60.3 percent of cows. “Other” computer programs were used on 30.8 percent of operations but accounted for only 13.6 percent of cows. Dairy Quest and Dairy Plan were the most common other computer programs.

c. For operations using on- or off-farm computer data record systems, percentage of operations (and percentage of cows on these operations) by primary computer record system used:

Primary System	Percent Operations	Standard Error	Percent Cows	Standard Error
Dairy Comp 305	34.9	(2.3)	60.3	(2.0)
PC Dart	19.3	(1.9)	10.2	(0.9)
DHI Plus	15.0	(1.7)	15.9	(1.7)
Other	30.8	(2.4)	13.6	(1.3)
Total	100.0		100.0	

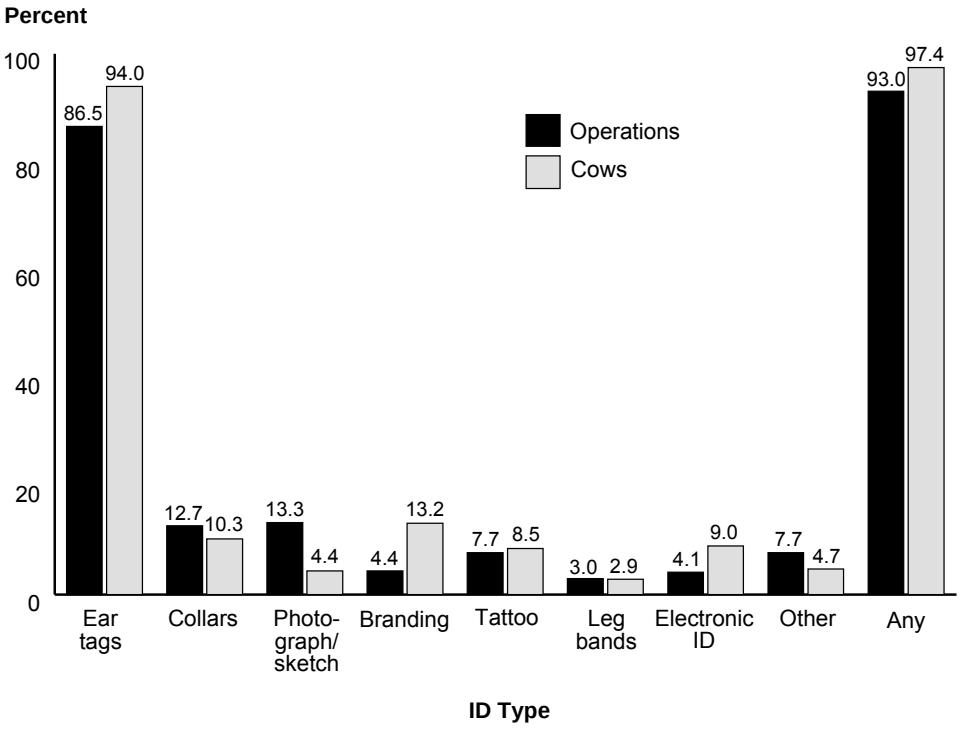
3. Individual animal identification

Individual animal identification (ID) is crucial for managing the health and performance of cattle. Approximately 9 of 10 operations (93.0 percent) used some form of individual animal ID, and almost all cows (97.4 percent) had some form of individual animal ID. Most operations (86.5 percent) used ear tags on cows as a form of individual ID, and most cows (94.0 percent) had individual ear tags. Branding as a type of individual ID was used on only 4.4 percent of operations: however, 13.2 percent of cows were branded, suggesting that branding was more common on larger operations. Various methods of electronic ID were used on 4.1 percent of operations, accounting for 9.0 percent of cows.

a. Percentage of operations (and percentage of cows), by type of individual animal ID used on at least some cows:

ID Type	Percent Operations	Standard Error	Percent Cows	Standard Error
Ear tags (all kinds)	86.5	(1.0)	94.0	(0.5)
Collars	12.7	(0.9)	10.3	(0.9)
Photograph or sketch	13.3	(1.0)	4.4	(0.4)
Branding (all methods)	4.4	(0.5)	13.2	(1.1)
Tattoo (other than tattoo for brucellosis)	7.7	(0.6)	8.5	(0.9)
Leg bands	3.0	(0.4)	2.9	(0.5)
Electronic (pedometers, bar code, RFD, etc.)	4.1	(0.5)	9.0	(0.9)
Other	7.7	(0.8)	4.7	(0.6)
Any identification	93.0	(0.8)	97.4	(0.4)

Percentage of Operations (and Percentage of Cows) by Type of Individual Animal ID Used on at Least Some Cows



On operations that used individual animal ID, evaluating milk production and evaluating genetic improvements were the two most common primary reasons for using ID (38.1 and 30.4 percent of operations, respectively). Approximately 2 of 10 operations (21.1 percent) listed “other” as a primary reason, with many of these operations noting that all choices given were primary reasons for using individual animal ID.

b. For operations that used individual animal ID, percentage of operations by primary reason ID was used:

Primary Reason	Percent Operations	Standard Error
Evaluating milk production	38.1	(1.4)
Evaluating animal health	8.8	(0.8)
Disease or residue traceback	1.6	(0.4)
Evaluating genetic improvements	30.4	(1.4)
Other	21.1	(1.2)
Total	100.0	

4. Herd identification

More than one-third of operations (36.4 percent)—representing 54.0 percent of cows—used some form of unique herd ID. The highest percentage of operations (34.5 percent) used ear tags for herd ID, and the highest percentage of cows (41.0 percent) had ear tags as a form of herd ID. Branding as a type of herd ID was used on 3.1 percent of operations and 18.7 percent of cows.

Percentage of operations (and percentage of cows) by type of ***herd*** identification used on at least some cows:

ID Type	Percent Operations	Standard Error	Percent Cows	Standard Error
Ear tags (all kinds)	34.5	(1.3)	41.0	(1.5)
Collars	2.8	(0.4)	2.9	(0.5)
Branding (all methods)	3.1	(0.3)	18.7	(1.4)
Tattoo (other than tattoo for brucellosis)	2.5	(0.4)	4.6	(0.8)
Electronic (pedometers, bar code, RFD, etc.)	1.8	(0.3)	3.9	(0.6)
Other	2.0	(0.4)	1.7	(0.4)
Any identification	36.4	(1.3)	54.0	(1.5)

5. National Animal Identification System (NAIS) and U.S. Animal Identification Number (AIN)

NAIS is a voluntary program that facilitates the collection of information about all livestock operations, regardless of livestock species. This information is stored in a database for use during animal disease events. NAIS is designed to allow animal tracking during disease outbreaks so that sick or exposed animals can be located quickly to help contain the disease. Although the program was designed by USDA, each State is responsible for its implementation. A unique premises ID is assigned by each State's Department of Agriculture to all operations enrolled in NAIS.

Almost half of operations (46.7 percent) had a unique premises ID. A lower percentage of large operations (32.8 percent) had a unique premises ID compared to medium and small operations (48.3 and 47.2 percent, respectively).

a. Percentage of operations with a unique premises ID assigned by their State Department of Agriculture as part of NAIS, by herd size:

Percent Operations							
Herd Size (Number of Cows)							
Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Pct.	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
47.2	(1.5)	48.3	(2.1)	32.8	(2.5)	46.7	(1.1)

A lower percentage of operations in the West region (16.5 percent) had a unique premises ID compared to operations in the East region (49.1 percent).

b. Percentage of operations with a unique premises ID assigned by their State Department of Agriculture as part of NAIS, by region:

Percent Operations			
Region			
West		East	
Percent	Standard Error	Percent	Standard Error
16.5	(1.8)	49.1	(1.2)

Operations enrolled in NAIS cannot obtain individual animal identification without a unique premises ID. Once a premises ID is obtained, an operation has the option of obtaining officially recognized individual animal ID, as outlined in AIN guidelines. Only 7.8 percent of all operations had implemented individual animal ID. A higher percentage of large operations (12.5 percent) implemented an individual animal ID system or technology utilizing AIN guidelines compared to small operations (7.0 percent).

c. Percentage of operations that had implemented an individual animal ID system or technology that utilizes AIN guidelines, by herd size:

Percent Operations							
Herd Size (Number of Cows)							
Small (Fewer than 100)		Medium (100-499)		Large (500 or More)		All Operations	
Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error
7.0	(0.9)	9.6	(1.3)	12.5	(1.8)	7.8	(0.7)

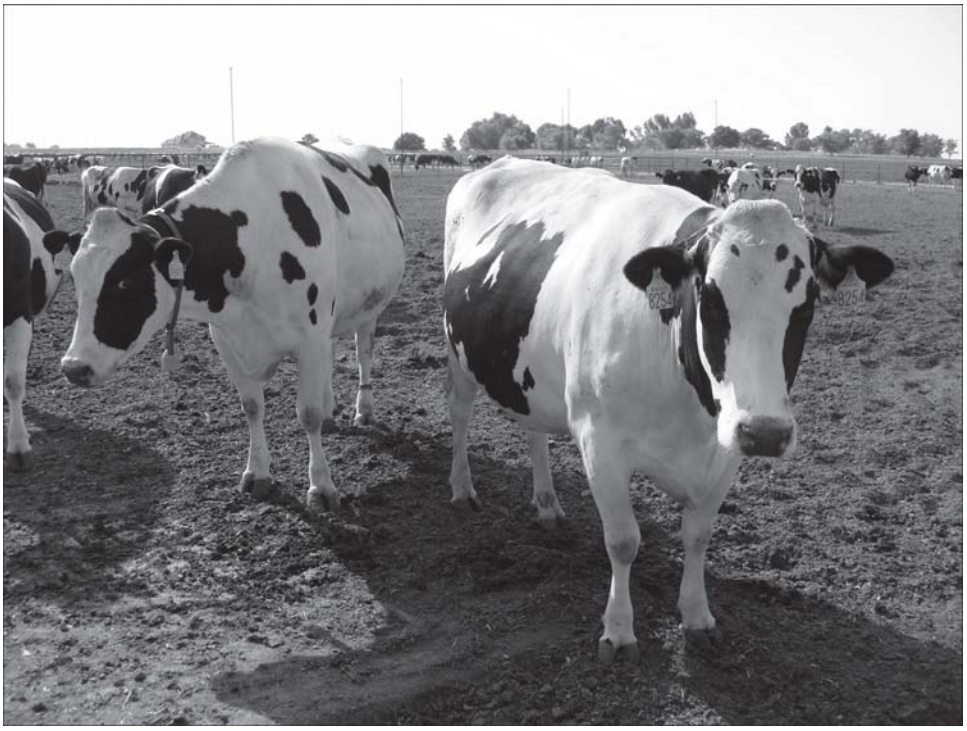


Photo by Dr. Jason Lombard

For operations assigned a unique premises ID, 16.8 percent had implemented individual animal ID. A higher percentage of large operations (38.2 percent) with a unique premises ID had implemented an individual animal ID system utilizing AIN guidelines compared to small operations (14.8 percent).

d. For operations that had a unique premises ID assigned, percentage of operations that had implemented an individual animal ID system that utilizes AIN guidelines, by herd size:

Percent Operations

Herd Size (Number of Cows)

Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Pct.	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
14.8	(1.8)	19.8	(2.6)	38.2	(4.9)	16.8	(1.5)

6. Breed of cows

Holsteins continue to be the predominant dairy breed in the United States. Approximately 95 percent of operations housed at least one Holstein cow, and Holsteins represented 90.1 percent of all cows. Although 18.1 percent of operations reported having Jerseys on-hand, only 5.3 percent of all cows were Jerseys. “Other” breeds, which generally included cross-breed cattle, were reported on 21.4 percent of operations.

a. Percentage of operations (and percentage of cows) by breed:

Breed	Percent Operations	Standard Error	Percent Cows	Standard Error
Holstein	95.1	(0.6)	90.1	(0.7)
Jersey	18.1	(1.1)	5.3	(0.6)
Ayrshire	3.4	(0.5)	0.3	(0.1)
Brown Swiss	7.6	(0.7)	0.6	(0.1)
Guernsey	3.0	(0.5)	0.4	(0.1)
Other	21.4	(1.2)	3.3	(0.4)
Total			100.0	

Primary breed for each operation was defined as the most prevalent dairy breed reported on the January 1, 2007, cattle inventory. Holsteins were the primary dairy breed on more than 9 of 10 operations (92.2 percent) operations.

b. Percentage of operations by primary breed:

Breed	Percent Operations	Standard Error
Holstein	92.2	(0.7)
Jersey	3.5	(0.4)
Ayrshire	0.3	(0.1)
Brown Swiss	0.9	(0.3)
Guernsey	0.9	(0.3)
Other	2.2	(0.5)
Total	100.0	

7. Cow registration

A higher percentage of cows on small and medium operations (16.8 and 18.7 percent, respectively) were registered with a breed association compared to cows on large operations (8.9 percent). Overall, 13.6 percent of cows were registered.

a. Percentage of cows registered with a breed association, by herd size:

Percent Cows

Herd Size (Number of Cows)

Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Pct.	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
16.8	(1.2)	18.7	(1.5)	8.9	(1.3)	13.6	(0.8)

Photo by Judy Rodriguez

All cows were registered with a breed association on 8.9 percent of operations, while 71.7 percent of operations had no cows registered. The percentages of operations with less than 10 percent of their cows registered with a breed association were similar across herd sizes. A higher percentage of small and medium operations (14.2 and 15.6 percent, respectively) had 75 percent or more of their cows registered compared to large operations (6.5 percent).

b. Percentage of operations by registration level (percentage of cows registered with a breed association) and by herd size:

Percent Operations

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Percent of Dairy Cows Registered	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
0	73.6	(1.6)	65.5	(2.2)	70.9	(2.7)	71.7	(1.3)
0.1 to 9.9	5.2	(0.8)	6.4	(1.2)	7.7	(1.5)	5.6	(0.6)
10.0 to 49.9	5.2	(0.8)	9.8	(1.5)	11.5	(1.8)	6.5	(0.7)
50.0 to 74.9	1.8	(0.4)	2.7	(0.8)	3.4	(1.3)	2.1	(0.4)
75.0 to 99.9	4.8	(0.7)	7.1	(1.2)	2.9	(1.2)	5.2	(0.6)
100	9.4	(1.1)	8.5	(1.2)	3.6	(1.0)	8.9	(0.8)
Total	100.0		100.0		100.0		100.0	

8. Quality assurance programs

Quality assurance programs are designed to educate producers and provide them with guidelines to ensure the highest quality products. Nearly half of operations (47.3 percent) participated in any quality assurance program during 2006. The highest percentage of operations (42.2 percent) participated in a local milk cooperative/processor-sponsored assurance program. A higher percentage of medium and large operations (58.4 and 65.2 percent, respectively) participated in any quality assurance program compared to small operations (42.6 percent).

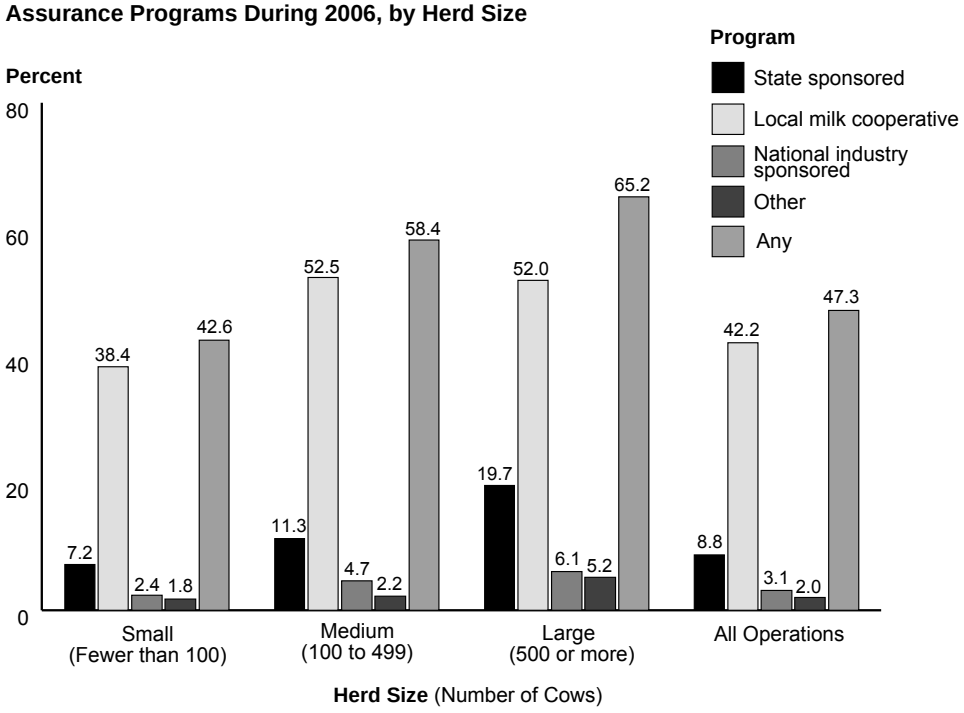
a. Percentage of operations that participated in the following types of quality assurance programs during 2006, by herd size:

Percent Operations

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Quality Assurance Program	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
State sponsored	7.2	(0.9)	11.3	(1.3)	19.7	(2.6)	8.8	(0.7)
Local milk cooperative/ processor sponsored	38.4	(1.8)	52.5	(2.3)	52.0	(2.9)	42.2	(1.4)
National industry sponsored	2.4	(0.5)	4.7	(1.1)	6.1	(1.2)	3.1	(0.4)
Other	1.8	(0.4)	2.2	(0.6)	5.2	(1.4)	2.0	(0.3)
Any of the above	42.6	(1.8)	58.4	(2.3)	65.2	(2.5)	47.3	(1.4)

Percentage of Operations that Participated in the Following Types of Quality Assurance Programs During 2006, by Herd Size



The percentages of operations that participated in individual programs were similar between regions, but a higher percentage of operations in the West region (59.5 percent) participated in any program compared to operations in the East region (46.3 percent).

b. Percentage of operations that participated in the following types of quality assurance programs during 2006, by region:

	Percent Operations			
	Region			
	West		East	
Quality Assurance Program	Pct.	Std. Error	Pct.	Std. Error
State sponsored	11.8	(1.9)	8.5	(0.8)
Local milk cooperative/ processor sponsored	50.4	(3.0)	41.6	(1.5)
National industry sponsored	6.1	(1.6)	2.8	(0.5)
Other	3.9	(1.1)	1.9	(0.4)
Any of the above	59.5	(2.9)	46.3	(1.5)

B. Productivity

1. RHA milk production

RHA milk production is the amount of milk (lb/cow) produced by the average cow during the last 12 months. Producers were asked to report the RHA for their operation. The average of this reported number across all operations—referred to as the operation average—was 19,175 lb/cow.

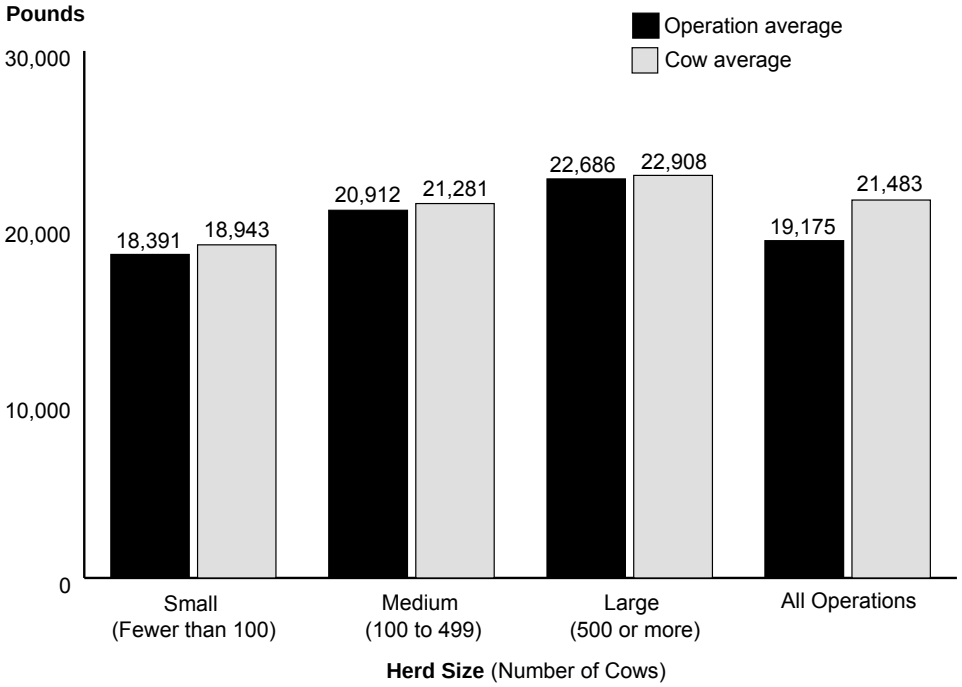
a. Operation average (and cow average) RHA milk production (lb/cow), by herd size:

Average

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Measure	**Lb/Cow**	**Std. Error**	**Lb/Cow**	**Std. Error**	**Lb/Cow**	**Std. Error**	**Lb/Cow**	**Std. Error**
Operation	18,391	(142)	20,912	(171)	22,686	(215)	19,175	(112)
Cow	18,943	(135)	21,281	(170)	22,908	(202)	21,483	(115)

Operation Average (and Cow Average) RHA Milk Production (Lb/Cow), by Herd Size



More than one-quarter of operations (26.9 percent) had an RHA milk production of 22,000 lb/cow or more.

b. Percentage of operations by RHA milk production (lb/cow):

Pounds/Cow	Percent Operations	Standard Error
Fewer than 14,000	8.3	(0.8)
14,000 to 15,999	11.7	(1.0)
16,000 to 17,999	14.8	(1.0)
18,000 to 19,999	21.0	(1.2)
20,000 to 21,999	17.3	(1.0)
22,000 or more	26.9	(1.2)
Total	100.0	

Operations that used computer record-keeping systems—either on- or off-farm—had higher RHA milk production than operations that did not use a computer system. Operations with on-farm computer systems had higher operation and cow average RHAs (21,425 and 22,785 lb/cow, respectively) compared to operations using off-farm computers or no computers.

c. Operation average (and cow average) RHA milk production (lb/cow), by computer usage:

Computer Usage	Operation Average (lb/cow)	Standard Error	Cow Average (lb/cow)	Standard Error
Off-farm	20,522	(176)	21,267	(175)
On-farm	21,425	(205)	22,785	(171)
No computer	17,094	(168)	17,992	(166)

Holsteins are known for producing the most milk per cow of all dairy breeds. Operations comprised of primarily Holsteins (more than 50 percent of dairy cows were Holsteins) had higher RHA milk production than operations with primary breeds other than Holstein. Operations with primarily Holsteins had an operation and cow average RHA milk production of approximately 4,000 lb/cow higher than operations where Holsteins were not the primary breed.

d. Operation average (and cow average) RHA milk production (lb/cow), by primary breed (over 50.0 percent of herd was Holstein):

Breed	Operation Average (lb/cow)	Standard Error	Cow Average (lb/cow)	Standard Error
Primarily Holstein	19,482	(115)	21,807	(114)
Not primarily Holstein	15,637	(381)	17,137	(418)

2. Age at first calving

Age at first calving is important in determining the lifetime productivity of heifers. In general, the earlier heifers calve after reaching the recommended height and weight, the more productive they are throughout their lifetime. The recommended age at first calving is 22 to 24 months. Overall, the average age at first calving was 25.2 months. Large operations reported the earliest average age for heifers at first calving at 24.0 months.

a. Operation average age of heifers at first calving, by herd size:

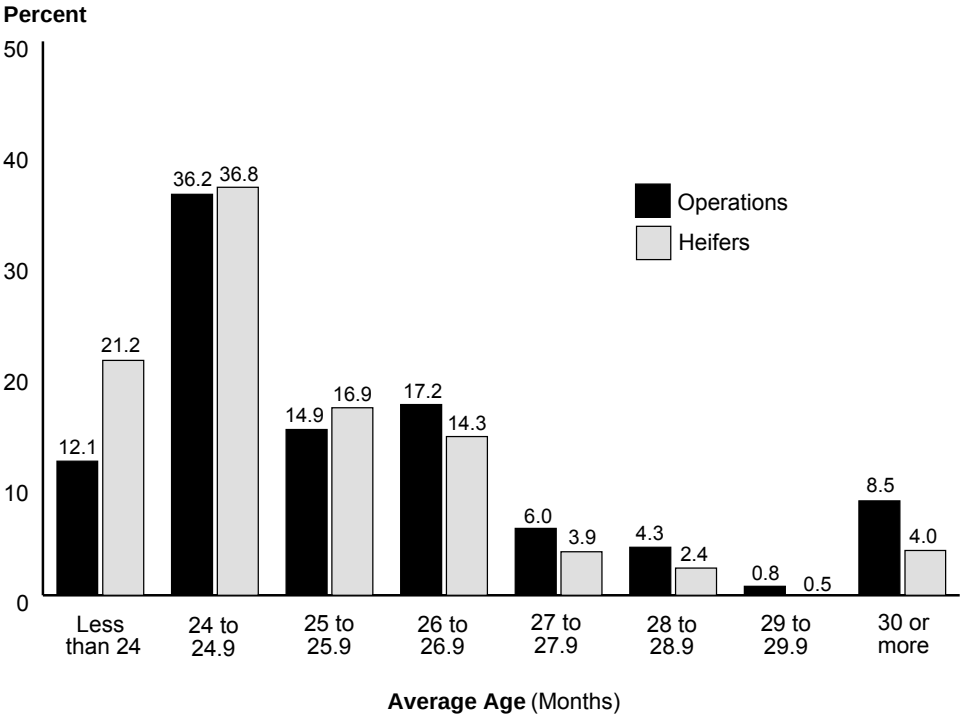
Operation Average Age (Months)							
Herd Size (Number of Cows)							
Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Avg.	**Std. Error**	**Avg.**	**Std. Error**	**Avg.**	**Std. Error**	**Avg.**	**Std. Error**
25.4	(0.1)	24.8	(0.1)	24.0	(0.1)	25.2	(0.1)

Although 48.3 percent of operations reported an average age at first calving of less than 25 months, these operations accounted for 58.0 percent of heifers. Almost 1 in 10 operations (8.5 percent) reported an average age at first calving of 30 or more months, but these operations accounted for only 4.0 percent of heifers.

b. Percentage of operations (and percentage of heifers on these operations) by average age of heifers at first calving:

Average Age (Months)	**Percent Operations**	**Standard Error**	**Percent Heifers**	**Standard Error**
Less than 24	12.1	(0.9)	21.2	(1.4)
24 to 24.9	36.2	(1.4)	36.8	(1.7)
25 to 25.9	14.9	(1.0)	16.9	(1.3)
26 to 26.9	17.2	(1.1)	14.3	(1.1)
27 to 27.9	6.0	(0.7)	3.9	(0.5)
28 to 28.9	4.3	(0.6)	2.4	(0.3)
29 to 29.9	0.8	(0.2)	0.5	(0.1)
30 or more	8.5	(0.9)	4.0	(0.4)
Total	100.0		100.0	

Percentage of Operations (and Percentage of Heifers on These Operations), by Average Age of Heifers at First Calving



3. Days dry

The dry period is a time for the cow and her mammary glands to rejuvenate and prepare for the next lactation. Traditionally, a 60-day dry period has been recommended, but recent research evaluating the optimal dry period length suggests that 40 days may improve cow health and be more profitable. An advantage of a 40-day dry period is that cows can be fed a consistent high-energy diet through the dry period, which has been shown to improve energy balance and decrease fat mobilization during the first month of the subsequent lactation.

The operation average dry period on medium operations (56.3 days) was about three days shorter than the average on large operations (59.6 days). The overall average days dry was 57.8 days.

a. Operation average days dry during 2006, by herd size:

Operation Average Days Dry

Herd Size (Number of Cows)

Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Avg.	**Std. Error**	**Avg.**	**Std. Error**	**Avg.**	**Std. Error**	**Avg.**	**Std. Error**
58.2	(0.4)	56.3	(0.4)	59.6	(0.7)	57.8	(0.3)

The majority of operations (51.8 percent) reported average days dry of 60 to 69 days. A total of 2.5 percent of operations reported average days dry of fewer than 40 days, and 14.1 percent reported average days dry of 40 to 49 days.

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

Average Days Dry	Percent Operations	Standard Error
Less than 40	2.5	(0.4)
40 to 49	14.1	(1.0)
50 to 59	21.1	(1.1)
60 to 69	51.8	(1.4)
70 or more	10.5	(0.9)
Total	100.0	

4. Calving interval

Calving interval is the time from one calving to the next and is dependent on how quickly a cow conceives after calving. The longer a cow is open (not pregnant), the longer the calving interval. Ideally, with a 12-month calving interval, a cow would become pregnant approximately 90 days after calving. For all operations, the average calving interval was 13.2 months. No differences were observed in calving intervals across herd sizes.

a. Operation average calving interval for cows during 2006, by herd size:

Operation Average (Months)							
Herd Size (Number of Cows)							
Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Avg.	**Std. Error**	**Avg.**	**Std. Error**	**Avg.**	**Std. Error**	**Avg.**	**Std. Error**
13.2	(0.0)	13.3	(0.1)	13.3	(0.1)	13.2	(0.0)

Almost one-third of operations (29.4 percent) reported a calving interval of 12 months or less. A similar percentage of operations reported a calving interval of 13 or 14 months (30.1 and 28.8 percent of operations, respectively). Approximately 1 in 9 operations (11.7 percent) reported a calving interval of 15 or more months.

b. Percentage of operations by calving interval for cows:

Calving Interval (Months)	**Percent Operations**	**Standard Error**
Less than 12	5.5	(0.7)
12	23.9	(1.3)
13	30.1	(1.3)
14	28.8	(1.3)
15	8.5	(0.8)
16 or more	3.2	(0.5)
Total	100.0	

C. Heifer Management

1. Source of heifer inventory

Nearly all operations (96.5 percent) had at least some heifers that were born and raised on the operation. Almost 9 of 10 heifers (87.4 percent) were born and raised on the operation. Although 4.7 percent of operations had heifers born on the operation but raised elsewhere, these operations accounted for 11.5 percent of all heifers.

Percentage of operations and percentage of heifers, by source of heifers:

Heifer Source	**Percent Operations**	**Standard Error**	**Percent Heifers***	**Standard Error**
Born and raised on operation	96.5	(0.4)	87.4	(1.2)
Born on operation raised off operation	4.7	(0.5)	11.5	(1.2)
Born off operation	6.6	(0.8)	1.1	(0.2)
Total			100.0	

*As a percentage of January 1, 2007, heifer inventory.

2. Heifers raised off the operation

Raising heifers at a separate site (calf ranches) from the milking string has many potential advantages. Calf-ranch personnel are usually dedicated to working only with calves, which can result in increased attention to the feeding and health of calves and also decreased exposure to adult cow disease. If calves are not commingled with older animals or animals from other operations, their exposure to disease agents such as *Mycobacterium avium* subspecies *paratuberculosis*—the causative agent of Johne's disease—is reduced. Raising heifers off-site also reduces the amount of manure produced at single sites and/or may allow producers to maintain larger milking herds on the same acreage.

Fewer than 1 of 10 operations (9.3 percent) raised any heifers off the operation. The percentage of operations that raised heifers off-site increased as herd size increased for all heifer classes. Less than 5 percent of small operations raised any heifers off-site, compared to 15.5 percent of medium operations and 46.0 percent of large operations. Almost one-third of large operations (35.3 percent) raised unweaned calves off-site, compared to 7.1 percent of medium operations and 1.7 percent of small operations. Similar herd-size differences in the percentages of operations that raised heifers off-site were observed among all heifer classes.

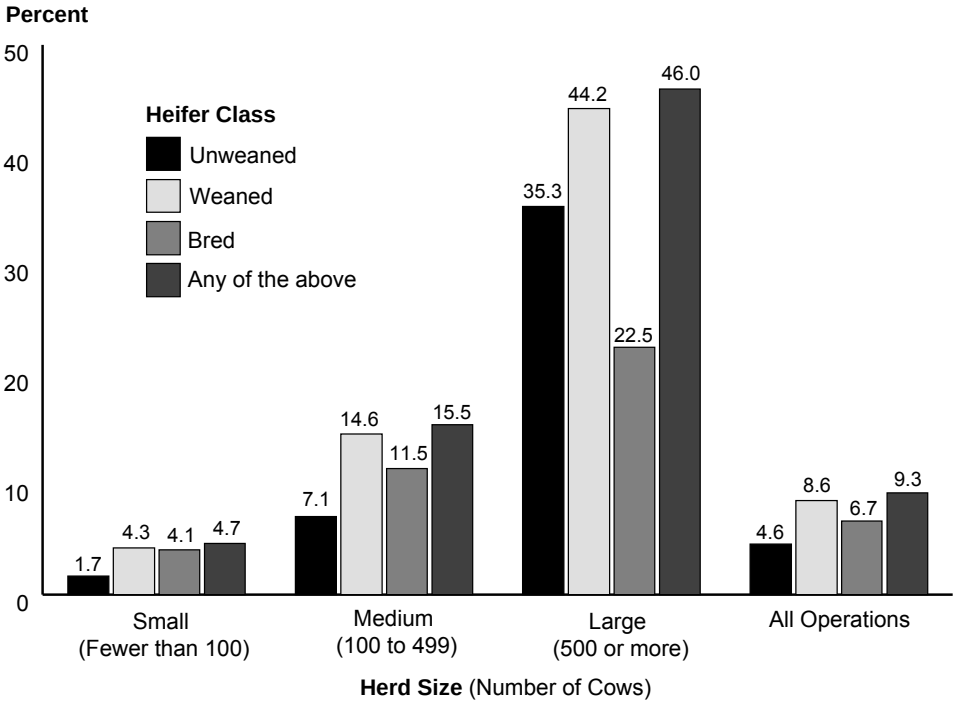
a. Percentage of operations that raised any heifers off-site, by heifer class and by herd size:

Percent Operations

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Heifer Class	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Unweaned	1.7	(0.5)	7.1	(1.2)	35.3	(2.9)	4.6	(0.5)
Weaned	4.3	(0.7)	14.6	(1.6)	44.2	(2.9)	8.6	(0.7)
Bred	4.1	(0.7)	11.5	(1.5)	22.5	(2.3)	6.7	(0.6)
Any of the above	4.7	(0.7)	15.5	(1.7)	46.0	(2.9)	9.3	(0.7)

Percentage of Operations That Raised Any Heifers Off-Site, by Heifer Class and by Herd Size



For operations that raised any heifers off the operation, unweaned, weaned, and bred heifers were sent off-site at an operation average age of 4.9, 189.8, and 413.8 days, respectively. The average age at which any calves left to be raised off-site was 110.3 days.

b. For operations that raised any heifers off-site, operation average age of heifers when leaving operation, by heifer class:

Operation Average Age (Days)

Heifer Class							
Unweaned		Weaned		Bred		All Operations	
Avg.	Std. Error	Avg.	Std. Error	Avg.	Std. Error	Avg.	Std. Error
4.9	(0.7)	189.8	(15.7)	413.8	(25.3)	110.3	(11.2)

Producers were asked to identify the primary class of heifers sent off-site. Almost half of all operations that sent any heifers off-site to be raised sent unweaned or weaned calves (50.1 and 44.1 percent of operations, respectively). Only 5.8 percent of operations sent bred heifers off-site to be raised. Small operations most commonly sent weaned heifers off-site (54.3 percent); medium operations sent similar percentages of unweaned and weaned calves off-site (45.6 and 49.7 percent, respectively); and large operations most frequently sent unweaned heifers off-site (77.2 percent).

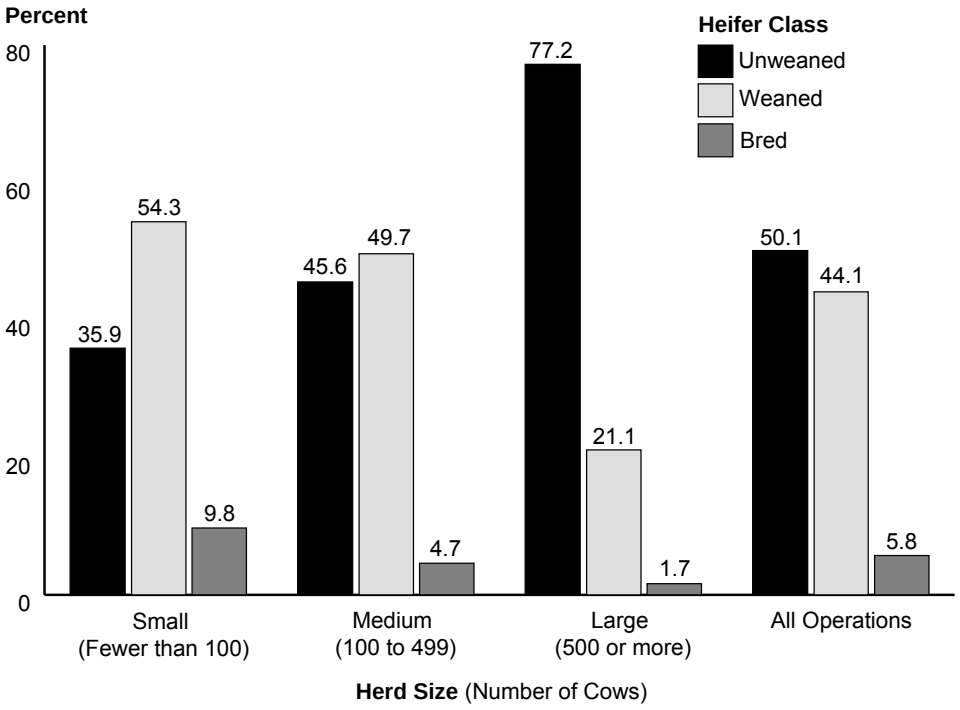
c. For operations that raised any heifers off-site, percentage of operations by primary heifer class sent off-site and by herd size:

Percent Operations

Herd Size (Number of Cows)

Heifer Class	Small (Fewer than 100) Pct.	Small Std. Error	Medium (100-499) Pct.	Medium Std. Error	Large (500 or More) Pct.	Large Std. Error	All Operations Pct.	All Operations Std. Error
Unweaned	35.9	(7.7)	45.6	(5.8)	77.2	(3.3)	50.1	(3.8)
Weaned	54.3	(7.9)	49.7	(5.9)	21.1	(3.2)	44.1	(3.8)
Bred	9.8	(4.0)	4.7	(2.4)	1.7	(0.6)	5.8	(1.7)
Total	100.0		100.0		100.0		100.0	

For Operations That Raised Any Heifers Off-Site, Percentage of Operations by Primary Heifer Class Sent Off-Site and by Herd Size



Approximately 8 of 10 operations (81.1 percent) that sent heifers off-site to be raised retained ownership of the heifers sent. A total of 9.4 percent of operations sold the heifers sent off-site and repurchased the same animals, and 9.5 percent of operations sold the animals sent and replaced them with different animals.

d. For operations that sent heifers off-site to be raised, percentage of operations by ownership of the majority of heifers and by herd size:

Percent Operations

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Ownership	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Ownership retained	72.3	(7.5)	83.8	(4.1)	89.6	(2.1)	81.1	(3.3)
Same animals sold and then repurchased	11.1	(6.1)	10.0	(3.2)	6.0	(1.6)	9.4	(2.6)
Animals sold outright, replaced with different animals	16.6	(5.6)	6.2	(2.8)	4.4	(1.4)	9.5	(2.4)
Total	100.0		100.0		100.0		100.0	

For operations that sent heifers off-site to be raised, the highest percentage of small and medium operations transported heifers less than 20 miles to the off-site rearing facility, while the highest percentage of large operations transported heifers between 5 and 50 miles. A total of 10.6 percent of operations transported heifers 50 miles or more.

e. For operations that sent heifers off-site to be raised, percentage of operations by number of miles heifers were transported to the off-site rearing facility, and by herd size:

Percent Operations

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Miles	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Fewer than 5.0	43.5	(8.4)	26.0	(5.4)	10.1	(2.8)	27.6	(3.7)
5.0 to 19.9	35.3	(8.7)	47.5	(6.1)	37.7	(4.4)	40.8	(3.9)
20.0 to 49.9	12.8	(5.2)	18.8	(4.7)	34.5	(4.7)	21.0	(3.0)
50 or more	8.4	(4.3)	7.7	(2.7)	17.7	(2.7)	10.6	(2.0)
Total	100.0		100.0		100.0		100.0	

Very few operations (4.1 percent) transported heifers out of State for rearing.

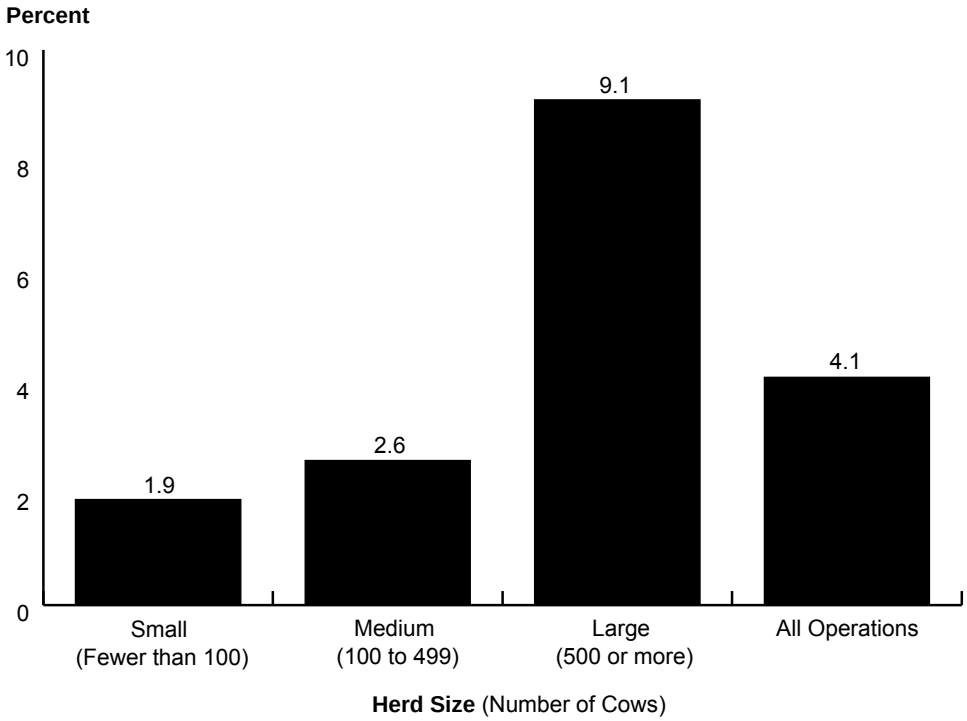
f. For operations that sent heifers off-site to be raised, percentage of operations where heifers were ever transported out of State for off-site rearing, by herd size:

Percent Operations

Herd Size (Number of Cows)

Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Pct.	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
1.9	(1.8)	2.6	(1.5)	9.1	(1.8)	4.1	(1.0)

For Operations that Sent Heifers Off-Site to be Raised, Percentage of Operations Where Heifers were Ever Transported Out of State for Off-Site Rearing, by Herd Size



Producers were asked to choose the description that best described their primary off-site rearing facility. Ideally, heifer-raising facilities would only house animals from a single operation. More than one-quarter of operations (27.7 percent) sent heifers to a single rearing facility where heifers did not have contact with cattle from other operations, but the majority (51.3 percent) sent heifers to a single rearing facility where heifers had contact with cattle from other operations.

g. For operations that sent heifers off-site to be raised, percentage of operations by primary off-site rearing facility:

Off-Site Rearing Facility	Percent Operations	Standard Error
Heifers sent to a single rearing facility and did not have contact with cattle from other operations	27.7	(3.3)
Heifers sent to multiple rearing facilities and did not have contact with cattle from other operations	8.5	(2.1)
Heifers sent to a single rearing facility and had contact (commingled) with cattle from other operations	51.3	(4.0)
Heifers sent to multiple rearing facilities and had contact (commingled) with cattle from other operations	12.5	(3.0)
Total	100.0	

On average, weaned and bred heifers returned to the operation from the rearing facility at 7.0 and 21.6 months of age, respectively. The operation average age of any heifers returning was 17.3 months.

h. For operations that sent heifers off-site to be raised, operation average age that replacements returned to the operation, by heifer class:

Operation Average Age (Months)

Heifer Class*

Weaned		Bred		Other**		All Operations	
Avg.	Std. Error	Avg.	Std. Error	Avg.	Std. Error	Avg.	Std. Error
7.0	(0.6)	21.6	(0.3)	28.6	(1.0)	17.3	(0.6)

*No operations reported unweaned heifers returning from an off-site rearing facility.
**Heifers that had calved.

Producers were asked to identify the primary class of heifer replacements usually arriving or returning to the operation. Approximately two of three operations (67.6 percent) that sent any heifers off-site brought bred heifers back to the operation from the rearing facility. Approximately one in three operations (30.3 percent) brought back weaned heifers, while just 2.1 percent brought back “other” heifers (heifers that had calved). A higher percentage of large operations (53.4 percent) brought back weaned heifers compared to medium and small operations (27.3 and 15.1, respectively). A higher percentage of small and medium operations (79.1 and 72.2 percent, respectively) brought back bred heifers compared to large operations (46.6 percent).

i. For operations that sent heifers off-site to be raised, percentage of operations by primary class of heifers arriving or returning to the operation, and by herd size:

Percent Operations

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Heifer Class*	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Weaned	15.1	(6.0)	27.3	(5.1)	53.4	(4.7)	30.3	(3.4)
Bred	79.1	(6.7)	72.2	(5.2)	46.6	(4.7)	67.6	(3.5)
Other**	5.8	(3.4)	0.5	(0.5)	0.0	(0.0)	2.1	(1.2)
Total	100.0		100.0		100.0		100.0	

*No operations reported unweaned heifers returning from an off-site rearing facility.
**Heifers that had calved.

3. Colostrum management

Removing a newborn calf from the calving area and providing quality colostrum immediately after birth are recommended practices to maximize calf health. Isolating calves from adult cows reduces the potential for disease transmission, and providing quality colostrum within 1 hour after birth helps ensure that calves have antibodies to withstand disease challenges.

Administering colostrum to calves allows providers to determine colostrum quality and monitor when and how much calves receive. Calves that get colostrum only during nursing may not receive the proper quality or amount of colostrum in a timely manner. In addition, if the calving area is not properly maintained, calves are likely to ingest manure from the environment while searching for teats and suckling colostrum. Recommendations for colostrum feeding can be found in “A Guide to Colostrum and Colostrum Management for Dairy Calves” published by the Bovine Alliance on Management and Nutrition (BAMN). Calves should receive 3 quarts of high quality colostrum within 1 hour of birth and an additional 3 quarts in 12 hours, or 4 quarts administered by esophageal feeder within 1 hour of birth.

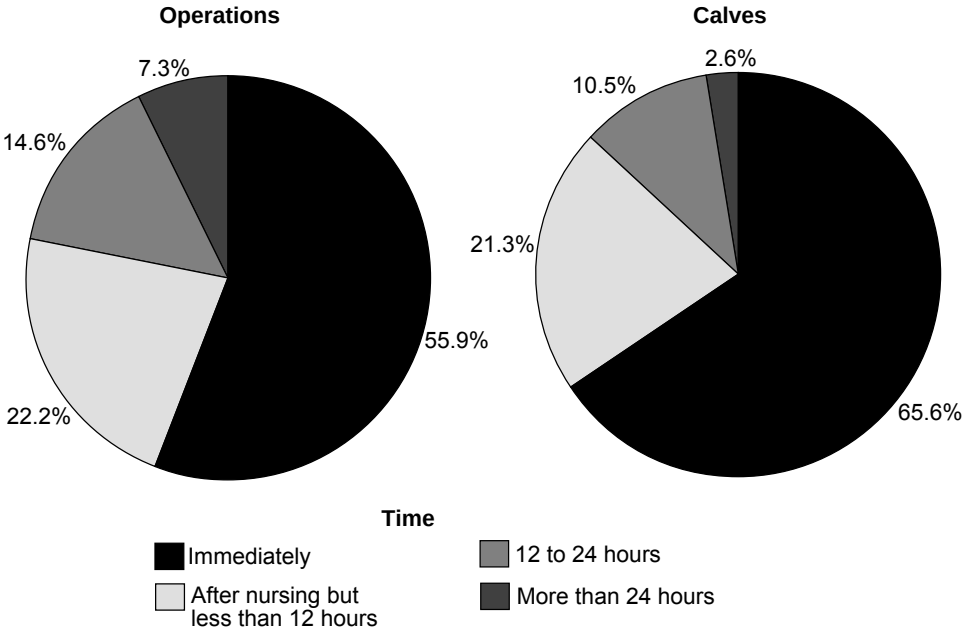
More than half the operations (55.9 percent) removed newborn heifer calves immediately after calving. These operations accounted for 65.6 percent of all heifer calves. One in five operations (22.2 percent)—accounting for 21.3 percent of newborn calves—removed calves after they nursed their dams but prior to 12 hours of age. Fewer than 1 in 10 operations (7.3 percent)—representing 2.6 percent of calves— allowed calves to stay with their dams for more than 24 hours.

a. Percentage of operations (and percentage of heifers born on these operations during 2006 and alive at 48 hours) by time following birth that calves were normally separated from their dams:

Time	Percent Operations	Standard Error	Percent Heifer Calves*	Standard Error
Immediately (no nursing)	55.9	(1.4)	65.6	(1.5)
After nursing but less than 12 hours	22.2	(1.2)	21.3	(1.3)
12 to 24 hours	14.6	(1.0)	10.5	(0.9)
More than 24 hours	7.3	(0.8)	2.6	(0.3)
Total	100.0		100.0	

*Born during 2006 and alive at 48 hours.

Percentage of Operations (and Percentage of Heifer Calves Born on These Operations During 2006 and Alive at 48 Hours) by Time Following Birth that Calves Were Normally Separated from Their Dams



On average, calves received hand-fed colostrum 3.3 hours following birth.

b. For operations that immediately removed calves from their dams and hand-fed colostrum, operation average number of hours after birth that calves got their first colostrum feeding, by herd size:

Operation Average Hours

Herd Size (Number of Cows)

Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Hours	**Std. Error**	**Hours**	**Std. Error**	**Hours**	**Std. Error**	**Hours**	**Std. Error**
3.4	(0.1)	3.3	(0.1)	2.8	(0.2)	3.3	(0.1)

Photo by Dr. Jason Lombard

The majority of operations (59.2 percent) hand-fed colostrum to calves from a bucket or bottle. These operations accounted for 59.6 percent of heifer calves. About one-third of operations (36.3 percent) allowed calves to ingest colostrum during first nursing of the dam. A total of 4.3 percent of operations accounting for 13.7 percent of calves used an esophageal feeder to administer colostrum.

c. Percentage of operations (and percentage of heifers born on these operations during 2006 and alive at 48 hours) by method normally used for calves' first feeding of colostrum: (Table revised 2-13-2008)

Colostrum Delivery Method	Percent Operations	Standard Error	Percent Heifer Calves*	Standard Error
During first nursing of dam	36.3	(1.4)	26.5	(1.3)
Hand-fed from bucket or bottle	59.2	(1.4)	59.6	(1.6)
Hand-fed using esophageal feeder	4.3	(0.5)	13.7	(1.2)
Did not get colostrum	0.2	(0.1)	0.2	(0.1)
Total	100.0		100.0	

*Born during 2006 and alive at 48 hours.

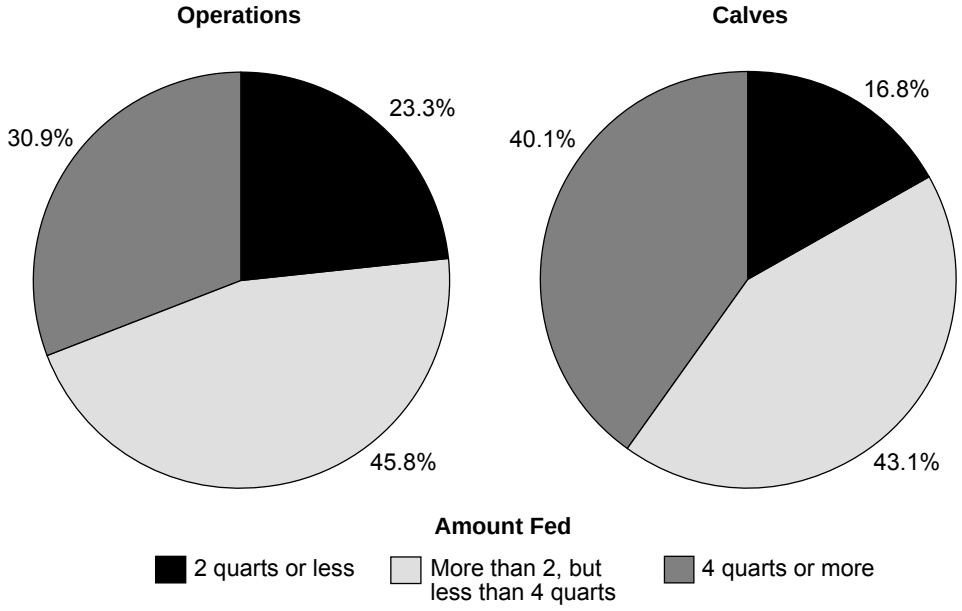
For operations that normally hand-fed colostrum, a total of 45.8 percent of operations representing 43.1 percent of heifer calves fed calves more than 2 but less than 4 quarts of colostrum during the first 24 hours of life. About 4 in 10 calves (40.1 percent) received 4 quarts or more, while 16.8 percent of calves received 2 quarts or less during the first 24 hours.

d. For operations that normally hand-fed colostrum, percentage of operations (and percentage of heifers born on these operations during 2006 and alive at 48 hours) by amount of colostrum normally fed during the first 24 hours:

Amount	Percent Operations	Standard Error	Percent Heifer Calves*	Standard Error
2 quarts or less	23.3	(1.6)	16.8	(1.4)
More than 2 but less than 4 quarts	45.8	(1.9)	43.1	(2.1)
4 quarts or more	30.9	(1.7)	40.1	(2.0)
Total	100.0		100.0	

*Born during 2006 and alive at 48 hours.

For Operations that Normally Hand-Fed Colostrum, Percentage of Operations (and Percentage of Heifer Calves Born and Alive at 48 Hours on These Operations During 2006) by Amount of Colostrum Normally Fed During the First 24 Hours



About one in eight operations that hand-fed colostrum (13.0 percent) estimated the immunoglobulin levels of the colostrum or evaluated its quality before feeding. The percentage of operations that evaluated colostrum more than doubled from one herd size to the next, ranging from 7.6 percent of small operations to 45.2 percent of large operations.

e. For operations that normally hand-fed colostrum, percentage of operations that estimated the immunoglobulin levels of the colostrum or evaluated its quality, by herd size:

Percent Operations

Herd Size (Number of Cows)

Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Pct.	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
7.6	(1.3)	19.8	(2.3)	45.2	(3.2)	13.0	(1.1)

The most commonly used methods of evaluating colostrum were a colostrometer and visual appearance (43.7 and 41.6 percent of operations, respectively).

f. For operations that estimated immunoglobulin levels in colostrum or evaluated its quality, percentage of operations by primary method used for measuring immunoglobulin:

Primary Method	**Percent Operations**	**Standard Error**
Colostrometer	43.7	(4.2)
Visual appearance	41.6	(4.3)
Volume of first milking colostrum (pounds)	9.7	(2.8)
Other	5.0	(2.7)
Total	100.0	

Pooling colostrum may increase calves' exposure to pathogens. About one in five operations (21.0 percent) pooled colostrum. As herd size increased so did the percentage of operations that pooled colostrum, ranging from 16.0 percent of small operations to 56.9 percent of large operations.

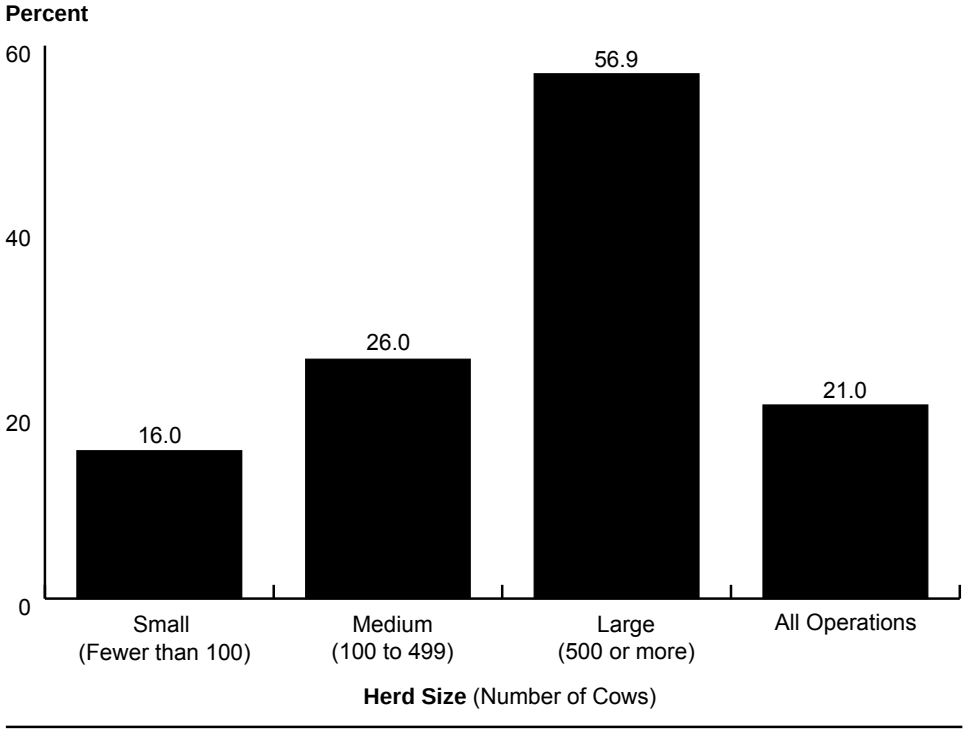
g. For operations that normally hand-fed colostrum, percentage of operations that pooled colostrum from more than one cow, by herd size:

Percent Operations

Herd Size (Number of Cows)

Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Pct.	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
16.0	(1.7)	26.0	(2.4)	56.9	(3.1)	21.0	(1.3)

For Operations that Normally Hand-Fed Colostrum, Percentage of Operations that Pooled Colostrum from More Than One Cow, by Herd Size



Proper collection, handling, storage, and administration of colostrum are important in reducing the potential for exposing calves to pathogens. The method of storing colostrum prior to feeding can dramatically impact its quality and pathogen load. Studies have shown that storing colostrum at warm ambient temperatures results in a rapid increase of bacterial growth. Refrigerating colostrum results in intermediate rates of bacterial proliferation compared to using a preservative and refrigeration to store colostrum.

The majority of small operations (64.8 percent) did not store colostrum, while only 11.8 percent of large operations did not store colostrum. The highest percentage of large operations either stored colostrum in a refrigerator (50.5 percent) or freezer (34.7 percent).

h. For operations that normally hand-fed colostrum, percentage of operations by primary method of storing colostrum and by herd size:

Percent Operations

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Primary Method*	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Stored without refrigeration	4.4	(1.0)	2.8	(0.9)	3.0	(0.9)	3.9	(0.7)
Stored in refrigerator	6.0	(1.1)	15.2	(1.9)	50.5	(3.5)	11.1	(0.9)
Stored in freezer	24.8	(2.1)	36.2	(2.8)	34.7	(3.0)	28.2	(1.6)
Not stored	64.8	(2.3)	45.8	(3.0)	11.8	(2.8)	56.8	(1.8)
Total	100.0		100.0		100.0		100.0	

*No operations reported “other” as a primary method for storing colostrum.

Pasteurizing colostrum is one method of reducing the potential for transmitting disease to calves. A high-temperature, short-time (HTST) system is one method of pasteurizing colostrum. However, HTST pasteurizers cause colostrum to gel and significantly reduce the amount of antibodies present, particularly immunoglobulin G (IgG). A batch pasteurizer uses a relatively low temperature and a longer heating time (60°C for 60-120 minutes). Batch pasteurizers do not cause colostrum to gel or significantly reduce IgG concentrations. It is important to note that pasteurization decreases pathogens found in colostrum but does not improve the quality of colostrum in terms of increased maternal antibodies. Although pasteurization is commonly used for milk and can be used for colostrum, the technical issues inherent in pasteurization may be one reason that dairies have been slow to adopt this management practice.

Less than 1 percent of operations that hand-fed colostrum (0.8 percent) pasteurized the colostrum before feeding it to calves. A higher percentage of large operations (6.4 percent) pasteurized colostrum compared to medium and small operations (0.9 and 0.2 percent, respectively).

i. For operations that normally hand-fed colostrum, percentage of operations that pasteurized colostrum, by herd size:

Percent Operations

Herd Size (Number of Cows)							
Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Pct.	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
0.2	(0.2)	0.9	(0.4)	6.4	(1.6)	0.8	(0.2)

Measuring IgG levels or total serum proteins in calves within the first 3 days of life is a relatively simple method for evaluating colostrum management programs. Overall, 2.1 percent of operations routinely measured passive transfer via serum proteins. A higher percentage of large operations (14.5 percent) routinely evaluated passive transfer compared to medium and small operations (2.4 and 1.1 percent, respectively).

j. Percentage of operations that routinely monitored serum proteins (as a measure of passive transfer) in heifers within the first 3 days of life, by herd size:

Percent Operations

Herd Size (Number of Cows)							
Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Pct.	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
1.1	(0.4)	2.4	(0.6)	14.5	(1.7)	2.1	(0.3)

4. Heifer nutrition

A variety of liquid diets are commonly offered to unweaned calves. Recent literature suggests that feeding medicated milk replacer increases weaning weights and decreases morbidity and mortality. However, the most important factor in reducing morbidity and mortality was high levels of passive transfer provided through colostrum.

Properly pasteurizing and handling waste (nonsaleable) milk or saleable milk reduces pathogen loads without affecting milk quality. However, managing a pasteurization system that consistently provides high-quality nutrition to the calf with decreased pathogens is an intensive process and requires daily monitoring of equipment and the feeding system.

A higher percentage of large operations (26.4 percent) fed nonmedicated milk replacer than medium and small operations (14.2 and 11.4 percent, respectively). Alternatively, small and medium operations (55.2 and 68.2 percent, respectively) were more likely to feed medicated milk replacer than large operations (43.6 percent). Overall, medicated milk replacer was fed on more than half of all operations (57.5 percent). A higher percentage of large operations (28.7 percent) fed pasteurized waste milk compared to medium and small operations (3.0 and 1.0 percent, respectively). Small operations (32.2 percent) were more likely to feed unpasteurized whole (saleable) milk than medium and large operations (17.4 and 12.1 percent, respectively). Similar percentages of operations fed unpasteurized waste milk and unpasteurized whole (saleable) milk (30.6 and 28.0 percent, respectively).

a. Percentage of operations that fed a liquid diet to heifers at any time prior to weaning during 2006, by type of diet and by herd size:

Percent Operations

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Liquid Diet	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Nonmedicated milk replacer	11.4	(1.2)	14.2	(1.7)	26.4	(2.4)	12.7	(0.9)
Medicated milk replacer	55.2	(1.8)	68.2	(2.1)	43.6	(3.1)	57.5	(1.4)
Unpasteurized waste milk	32.2	(1.7)	25.7	(2.0)	27.6	(2.8)	30.6	(1.3)
Pasteurized waste milk	1.0	(0.3)	3.0	(0.9)	28.7	(2.7)	2.8	(0.3)
Unpasteurized whole (saleable) milk	32.2	(1.7)	17.4	(1.7)	12.1	(1.9)	28.0	(1.3)
Pasteurized whole (saleable) milk	1.3	(0.4)	1.6	(0.8)	2.0	(0.7)	1.4	(0.3)
Other	2.6	(0.6)	3.5	(0.9)	4.9	(1.8)	2.9	(0.5)

The percentage of heifers that received liquid diets was similar to the percentage of operations that fed a liquid diet. Almost half of all heifers (49.9 percent) received medicated milk replacer at some point prior to weaning.

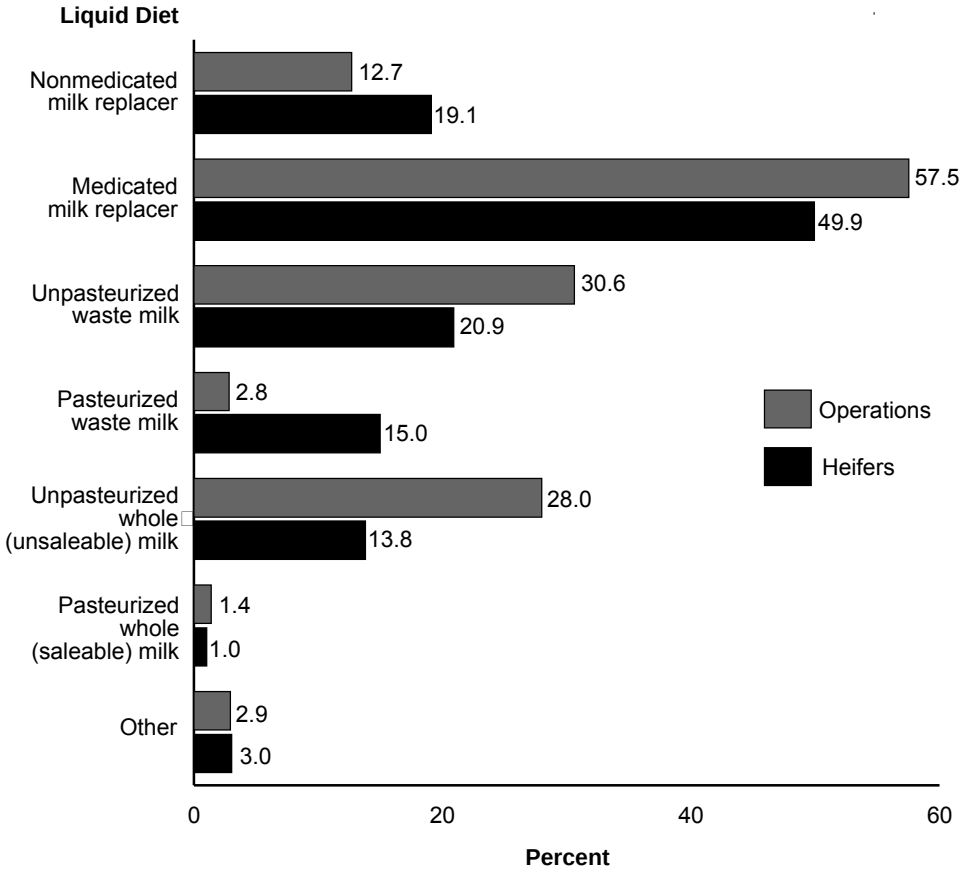
b. Percentage of heifers that received a liquid diet any time prior to weaning during 2006, by type of diet and by herd size:

Percent Heifers

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Liquid Diet	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Nonmedicated milk replacer	10.4	(1.1)	13.7	(1.7)	27.9	(2.6)	19.1	(1.3)
Medicated milk replacer	57.9	(1.8)	63.0	(2.2)	36.4	(3.0)	49.9	(1.5)
Unpasteurized waste milk	23.2	(1.5)	20.3	(1.8)	19.9	(2.5)	20.9	(1.3)
Pasteurized waste milk	1.2	(0.3)	2.6	(0.6)	31.5	(2.6)	15.0	(1.2)
Unpasteurized whole (saleable) milk	25.5	(1.6)	13.3	(1.5)	6.9	(1.3)	13.8	(0.8)
Pasteurized whole (saleable) milk	0.9	(0.3)	0.6	(0.3)	1.4	(0.6)	1.0	(0.3)
Other	1.6	(0.4)	3.1	(0.9)	3.7	(1.3)	3.0	(0.6)

Percentage of Operations that Fed a Liquid Diet to Heifers at Any Time Prior to Weaning During 2006, and Percentage of Heifers that Received a Liquid Diet Any Time Prior to Weaning, by Type of Liquid Diet



The most common medication in milk replacer at the operation level was oxytetracycline in combination with neomycin (49.5 percent of operations). Oxytetracycline and/or decoquinate were fed on nearly one in five operations (21.9 and 18.8 percent, respectively).

c. Percentage of operations that fed a medicated milk replacer to heifers during 2006, by medication used:

Medication	Percent Operations	Standard Error
Chlortetracycline (CTC)	12.1	(1.1)
Oxytetracycline (OTC)	21.9	(1.5)
Oxytetracycline in combination with Neomycin (Oxy NEO)	49.5	(1.9)
Decoquinate	18.8	(1.4)
Lasalocid	7.2	(0.9)
Other	5.4	(0.9)
Any medication	57.5	(1.4)

Calf-feeding equipment should be cleaned between calves to prevent the spread of disease from one calf to another. Approximately one in four operations (24.4 percent) cleaned calf-feeding equipment between calves. A higher percentage of large and medium operations (39.1 and 30.9 percent, respectively) cleaned equipment between calves compared to small operations (21.4 percent). The majority of operations (58.5 percent) cleaned equipment daily, and there was no difference in percentages across herd sizes. Small and medium operations were more likely to clean equipment weekly (7.0 and 5.2 percent, respectively) than large operations (1.3 percent). “Other” frequency accounted for 7.5 percent of operations, and a high percentage of these operations reported cleaning equipment twice daily, but not between calves.

d. Percentage of operations by frequency milk feeding equipment* was cleaned and disinfected, and by herd size:

Percent Operations

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Frequency	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Between calves	21.4	(1.5)	30.9	(2.2)	39.1	(2.7)	24.4	(1.2)
Daily	59.8	(1.8)	55.9	(2.3)	51.8	(2.8)	58.5	(1.4)
Weekly	7.0	(1.0)	5.2	(0.9)	1.3	(0.9)	6.4	(0.8)
Monthly	3.8	(0.7)	1.4	(0.6)	2.2	(1.0)	3.2	(0.5)
Other	8.0	(1.0)	6.6	(1.1)	5.6	(1.3)	7.5	(0.8)
Total	100.0		100.0		100.0		100.0	

*Bottles, buckets, nipples.

Current recommendations for providing water, starter, and hay to calves can be found in “A Guide to Dairy Calf Feeding and Management,” published by the BAMN. This publication recommends that calves have fresh water available from 1 day of age. Starter should be introduced at 4 days of age, and calves should be consuming 1.5 to 2.0 pounds per day prior to weaning. Hay should not be fed prior to weaning since—compared to calves fed a high quality, properly balanced starter— it may slow rumen development and growth.

Across all operations, water was offered to calves at 15.3 days of age. Large operations offered water earlier (8.2 days) than medium and small operations (13.3 and 16.3 days, respectively). Starter was routinely offered at 8.5 days of age, and there were no differences in average days across herd sizes. Hay was offered at increasing days of age as herd size increased, with the average age operations offered hay at 24.5 days old.

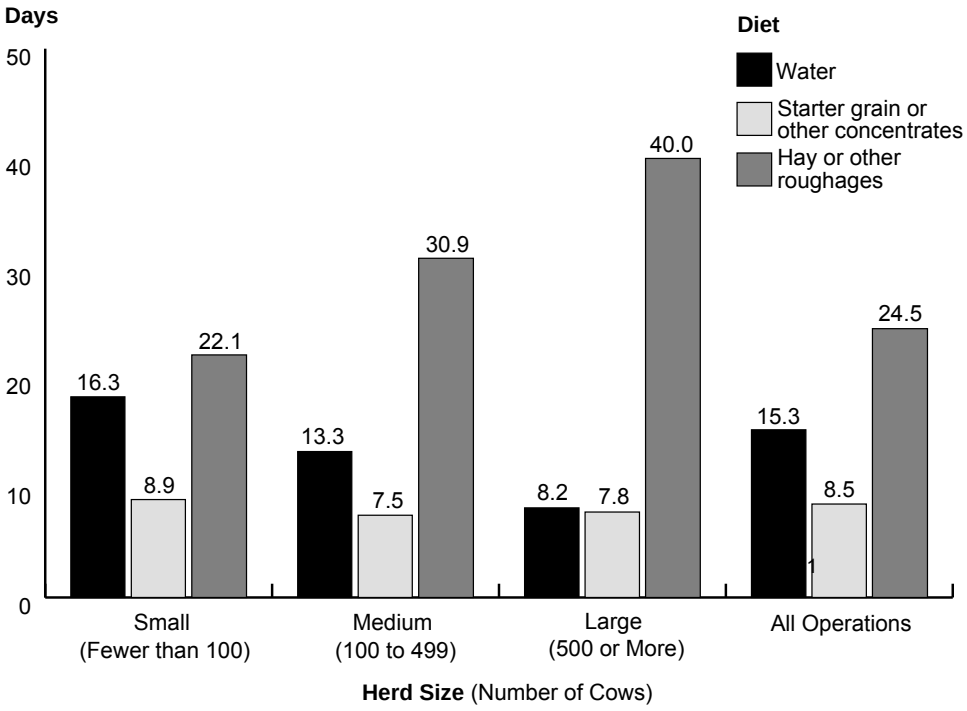
e. Operation average age (days) of unweaned heifers when heifers were routinely offered the following diets, by herd size:

Operation Average Age (Days)

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Diet	**Avg.**	**Std. Error**	**Avg.**	**Std. Error**	**Avg.**	**Std. Error**	**Avg.**	**Std. Error**
Water	16.3	(0.7)	13.3	(0.8)	8.2	(0.9)	15.3	(0.6)
Starter grain or other concentrate	8.9	(0.3)	7.5	(0.4)	7.8	(0.7)	8.5	(0.3)
Hay or other roughage	22.1	(0.7)	30.9	(1.1)	40.0	(1.9)	24.5	(0.6)

Operation Average Age (Days) of Unweaned Heifers When Heifers were Routinely Offered the Following Diets, by Herd Size



5. Weaning age

The recommended weaning age for heifers is 6 to 8 weeks and should occur when calves are consuming 1.5 to 2.0 pounds of starter daily. The operation average age at weaning was 8.2 weeks, with large operations weaning calves at an older age (9.1 weeks) than medium and small operations (7.9 and 8.2 weeks, respectively).

a. Operation average age of heifers at weaning, by herd size:

Operation Average Age (Weeks)

Herd Size (Number of Cows)

Small (Fewer than 100)		Medium (100-499)		Large (500 or More)		All Operations	
Avg.	Std. Error	Avg.	Std. Error	Avg.	Std. Error	Avg.	Std. Error
8.2	(0.1)	7.9	(0.1)	9.1	(0.2)	8.2	(0.1)

Approximately one-third of operations (33.2 percent) weaned heifers at 8 weeks, while another 20.5 percent weaned heifers at 6 weeks. Less than 5 percent of operations (4.8 percent) weaned heifers at 4 weeks of age.

b. Percentage of operations by operation average weaning age of heifers:

Operation Average Weaning Age (Weeks)	**Percent Operations**	**Standard Error**
4	4.8	(0.6)
5	5.6	(0.6)
6	20.5	(1.2)
7	10.3	(0.8)
8	33.2	(1.4)
9	4.5	(0.6)
10	5.9	(0.6)
11	1.1	(0.3)
12	8.9	(0.9)
13 or more	5.2	(0.7)
Total	100.0	

6. Preventive practices

Preventive practices were commonly used for heifers: 94.6 percent of operations administered at least one preventive practice to heifers, and 94.6 percent of heifers were on these operations. Nearly 7 of 10 operations (69.4 percent) dewormed heifers, and similar percentages of operations provided vitamin A-D-E or selenium in feed (74.4 and 69.3 percent, respectively).

Percentage of operations (and percentage of heifers on these operations) by preventive practices normally used for heifers:

Preventive Practice	Percent Operations	Standard Error	Percent Heifers*	Standard Error
Dewormers	69.4	(1.3)	55.2	(1.5)
Coccidiostats in feed	46.5	(1.4)	56.5	(1.6)
Vitamins A-D-E injection	10.4	(0.7)	17.4	(1.3)
Vitamins A-D-E in feed	74.4	(1.2)	71.9	(1.5)
Selenium injection	13.2	(0.9)	17.2	(1.2)
Selenium in feed	69.3	(1.3)	65.4	(1.6)
Ionophores in feed (e.g., Rumensin®, Bovatec®)	45.2	(1.4)	58.1	(1.6)
Probiotics	20.0	(1.1)	27.7	(1.6)
Anionic salts in feed	20.9	(1.1)	28.1	(1.5)
Other	4.6	(0.7)	2.5	(0.4)
Any preventive	94.6	(0.7)	94.6	(0.9)

*As a percentage of January 1, 2007, heifer inventory.

Photo by Dr. Jason Lombard

7. Vaccination practices

More than 60 percent of operations vaccinated heifers against bovine viral diarrhea (BVD), infectious bovine rhinotracheitis (IBR), parainfluenza Type 3 (PI3), bovine respiratory syncytial virus (BRSV), and leptospirosis. With the exception of IBR, PI3, BRSV, *Haemophilus somnus*, and *Mycobacterium avium* subspecies *paratuberculosis*, a higher percentage of large operations vaccinated against the listed diseases compared to medium or small operations. Less than half of operations (41.6 percent) normally vaccinated heifers against brucellosis. For heifers, a lower percentage of small operations vaccinated against each of the listed diseases than medium or large operations.

a. Percentage of operations that normally vaccinated heifers against the following diseases, by herd size:

Percent Operations

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Disease	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Bovine viral diarrhea (BVD)	69.0	(1.7)	84.5	(1.7)	94.1	(1.4)	73.7	(1.3)
Infectious bovine rhinotracheitis (IBR)	65.7	(1.7)	81.7	(1.8)	88.4	(1.8)	70.4	(1.3)
Parainfluenza Type 3 (PI3)	57.1	(1.8)	70.2	(2.1)	76.2	(2.4)	61.0	(1.4)
Bovine respiratory syncytial virus (BRSV)	60.6	(1.8)	75.4	(2.0)	80.8	(2.2)	64.9	(1.4)
Haemophilus somnus	31.1	(1.7)	42.4	(2.3)	43.0	(2.6)	34.2	(1.3)
Leptospirosis	63.2	(1.7)	78.1	(1.9)	86.7	(1.9)	67.7	(1.3)
Salmonella	15.5	(1.3)	34.4	(2.2)	52.5	(3.0)	21.5	(1.1)
E. coli mastitis	17.6	(1.4)	36.6	(2.2)	61.8	(3.0)	24.1	(1.1)
Clostridia	28.3	(1.6)	48.8	(2.2)	63.4	(2.9)	34.6	(1.3)
Brucellosis	37.4	(1.7)	49.5	(2.2)	66.7	(2.5)	41.6	(1.3)
Mycobacterium avium subspecies *paratuberculosis* (Johne's disease)	3.4	(0.7)	8.7	(1.3)	10.6	(2.1)	5.0	(0.6)
Neospora	3.8	(0.7)	11.3	(1.6)	20.5	(2.4)	6.3	(0.6)
Other	6.9	(0.9)	6.3	(1.0)	7.8	(1.4)	6.8	(0.7)
Any disease	79.3	(1.5)	92.0	(1.3)	97.1	(0.8)	83.0	(1.1)

Operations in the West region were more likely to vaccinate heifers for the majority of the listed diseases than operations in the East region. Almost twice the percentage of operations in the West region vaccinated against *Salmonella, E. coli* mastitis, clostridia, brucellosis, and *Neospora* compared to operations in the East region.

b. Percentage of operations that normally vaccinated heifers for the following diseases, by region:

	Percent Operations			
	Region			
	West		East	
Disease	**Percent**	**Std. Error**	**Percent**	**Std. Error**
Bovine viral diarrhea (BVD)	85.6	(2.3)	72.8	(1.4)
Infectious bovine rhinotracheitis (IBR)	78.4	(2.7)	69.8	(1.4)
Parainfluenza Type 3 (PI3)	67.0	(3.0)	60.5	(1.5)
Bovine respiratory syncytial virus (BRSV)	72.3	(2.9)	64.4	(1.5)
Haemophilus somnus	36.6	(3.0)	34.1	(1.4)
Leptospirosis	78.8	(2.4)	66.9	(1.4)
Salmonella	41.5	(2.9)	20.0	(1.1)
E. coli mastitis	48.3	(2.9)	22.1	(1.2)
Clostridia	65.3	(3.0)	32.2	(1.3)
Brucellosis	87.0	(1.8)	38.0	(1.4)
Mycobacterium avium subspecies *paratuberculosis* (Johne's disease)	8.3	(1.7)	4.7	(0.6)
Neospora	17.9	(2.5)	5.4	(0.6)
Other	7.5	(1.8)	6.8	(0.7)
Any disease	97.8	(0.7)	81.2	(1.2)

c. For operations that gave BVD vaccinations to heifers, percentage of operations by type of BVD vaccine given:

Type of Vaccine	Percent Operations	Standard Error
Killed	43.1	(1.6)
Modified live	62.2	(1.5)

8. BVD testing

Animals persistently infected (PI) with BVD become infected while in utero and shed large quantities of BVD virus following birth. This high shedding can infect susceptible animals and create the next generation of PI animals. The most efficient method of determining if the dam and her calf are PI with BVD is to test the calf. Since a PI cow will always produce a PI calf, the dam is negative if the calf tests negative. Few operations (4.0 percent) routinely tested heifer replacements for PI with BVD. The percentage of operations that did test increased as herd size increased.

a. Percentage of operations that routinely tested heifer replacements to determine if animals were PI with BVD, by herd size:

Percent Operations							
Herd Size (Number of Cows)							
Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Pct.	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
1.9	(0.5)	6.7	(1.1)	21.2	(2.4)	4.0	(0.4)

Of operations that tested heifers, the majority (66.8 percent) used individual ear-notch tests, while 21.1 percent tested individual serum samples.

b. For operations that routinely tested heifer replacements to determine if animals were PI with BVD, percentage of operations by testing method used:

Testing Method	Percent Operations	Standard Error
Individual ear notch	66.8	(5.7)
Pooled ear notch	11.4	(4.0)
Individual serum sample	21.1	(5.4)
Pooled serum sample	6.0	(3.0)
Other	6.5	(2.4)

D. Heifer Health

1. Births, stillbirths, and dystocia

Delivery of a calf is an important event for both the health of the cow and the calf. Current literature suggests that the number of stillborn calves appears to be increasing, with bull calves more likely to be born dead than heifer calves. Additionally, calves born to older cows are less likely to be stillborn or require assistance during calving, compared to first-calf heifers.

During 2006, almost 9 of 10 cows and heifers (86.0 percent) delivered a calf that was alive at 48 hours. Of the calves born during 2006, 93.5 percent were alive at 48 hours, while 6.5 percent were either born dead or died prior to 48 hours of age. Almost one in five calves (17.2 percent) needed assistance during delivery. Essentially, half the calves born and alive at 48 hours (50.8 percent) were heifer calves.

a. Calves born during 2006 and alive at 48 hours, as a percentage of the January 1, 2007, cow inventory:

Percent	Standard Error
86.0	(0.6)

b. Calves born alive and dead, as a percentage of calves born during 2006:

Calf Status	Percent Calves	Standard Error
Born and alive at 48 hours	93.5	(0.1)
Stillborn (born dead or died within 48 hours of birth)	6.5	(0.1)
Total	100.0	

c. Calves that required any assistance during birth (dystocia), as a percentage of calves born during 2006:

Percent	Standard Error
17.2	(0.6)

d. Heifer calves as a percentage of all calves born during 2006 and alive at 48 hours:

Percent	Standard Error
50.8	(0.3)

E. Cow Management

1. Source of cow replacements

Cow replacements born and raised on the operation entered the milking string during 2006 on the majority of operations (89.8 percent). Replacements accounted for over one-third of cow inventory (38.4 percent). Almost all operations (97.0 percent) had some replacements enter the milking string during 2006.

Percentage of operations (and percentage of cow inventory) by source of cow replacements that entered the milking string in 2006:

Replacement Source	Percent Operations	Standard Error	Percent Cows*	Standard Error
Born and raised on operation	89.8	(0.8)	27.8	(0.8)
Born on operation raised off operation	6.8	(0.6)	8.0	(0.7)
Born off operation	14.1	(1.0)	2.6	(0.2)
Any replacements	97.0	(0.5)	38.4	(0.8)

*Number of replacements that entered the milking string during 2006, as a percentage of the January 1, 2007, cow inventory

Photo by Judy Rodriguez

2. Housing facilities

Animal housing designs play an important role in maximizing animal health, especially with the diverse climates across the United States. Housing for unweaned calves should provide a dry area with shelter that does not allow contact with other calves or older animals, especially. Hutches or individual animal pens usually are recommended for unweaned calves. Weaned heifers are more commonly grouped with animals of similar age. Lactating and dry cows are typically housed in facilities somewhat determined by local climate.

The majority of operations (74.9 percent) housed unweaned heifers in individual animal pens or hutches at some point during 2006. Approximately half the operations housed weaned heifers on pasture and/or in inside or outside multiple-animal areas (49.2, 55.6, and 44.6 percent of operations, respectively). Lactating cows were frequently housed in tie stall/stanchion barns, pasture, and freestalls (62.6, 49.4, and 41.1 percent of operations, respectively). Dry cows commonly had access to pasture on 60.1 percent of operations and to drylot/ multiple-animal outside areas on 40.0 percent of operations.

a. Percentage of operations by type of housing used for any length of time during 2006, and by cattle class:

Percent Operations

	Cattle Class							
	Unweaned Heifers		**Weaned Heifers**		**Lactating Cows**		**Dry Cows** (Nonlactating)	
Housing Type	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Tie stall/stanchion	12.1	(1.0)	12.2	(1.0)	62.6	(1.0)	32.7	(1.3)
Freestall	5.6	(0.7)	20.9	(1.2)	41.1	(1.2)	30.9	(1.2)
Individual pen/hutch	74.9	(1.3)	15.6	(1.1)	3.2	(0.5)	4.4	(0.6)
Drylot/multiple animal outside area	5.2	(0.7)	44.6	(1.4)	26.8	(1.2)	40.0	(1.3)
Multiple animal inside area	23.6	(1.3)	55.6	(1.5)	14.7	(1.0)	27.3	(1.2)
Pasture	6.3	(0.7)	49.2	(1.5)	49.4	(1.4)	60.1	(1.4)
Other	1.5	(0.3)	1.8	(0.4)	0.4	(0.1)	1.1	(0.2)

The most common primary housing types were individual-animal pens/hutches for unweaned heifers, multiple-animal inside areas for weaned heifers, and tie stall/stanchion barns for lactating cows. The percentages of dry cow primary housing were similar for tie stall/stanchion, freestall, drylot/multiple-animal outside housing, and pasture.

b. Percentage of operations by primary housing facility/outside area used during 2006, and by cattle class:

Percent Operations

Cattle Class

	Unweaned Heifers		Weaned Heifers		Lactating Cows		Dry Cows (Nonlactating)	
Housing Type	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Tie stall/stanchion	8.9	(0.8)	5.9	(0.7)	49.2	(1.3)	23.3	(1.3)
Freestall	2.7	(0.5)	12.1	(0.9)	32.6	(1.1)	22.8	(1.1)
Individual pen/hutch	67.9	(1.3)	5.3	(0.7)	0.1	(0.1)	1.0	(0.3)
Drylot/multiple animal outside area	0.6	(0.2)	22.9	(1.1)	4.6	(0.5)	18.7	(1.0)
Multiple animal inside area	14.2	(1.1)	34.6	(1.4)	3.4	(0.6)	12.9	(0.9)
Pasture	0.6	(0.2)	10.8	(0.9)	9.9	(0.8)	20.5	(1.1)
Not housed on operation	4.7	(0.5)	7.7	(0.7)	0.0	(--)	0.2	(0.1)
Other	0.4	(0.2)	0.7	(0.2)	0.2	(0.1)	0.6	(0.2)
Total	100.0		100.0		100.0		100.0	

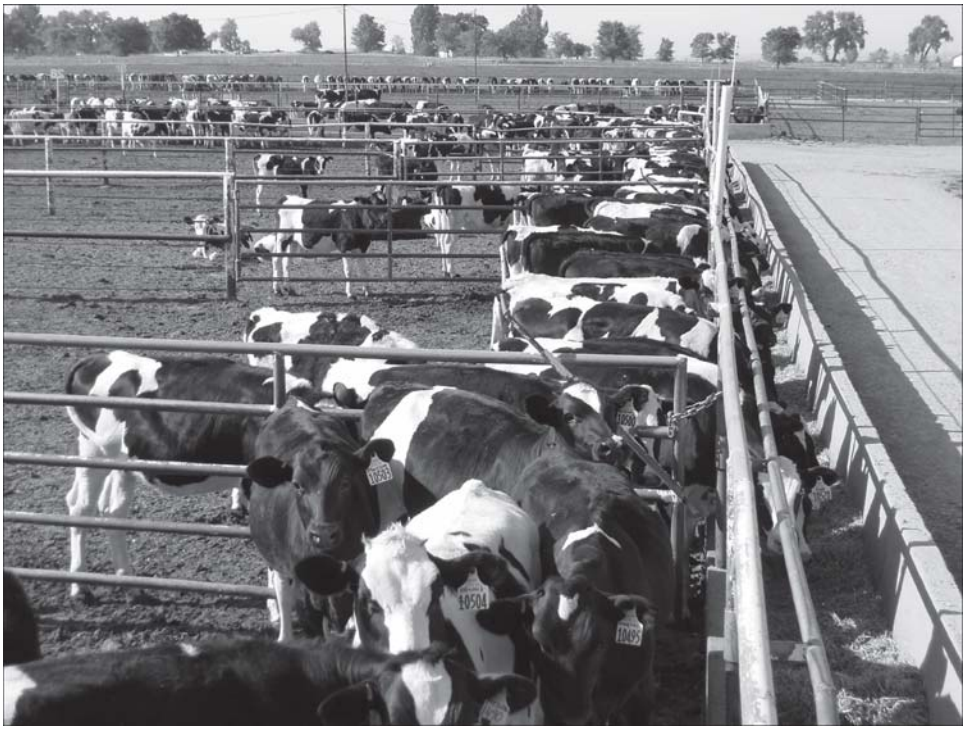


Photo by Dr. Jason Lombard

Separating dry cows from lactating cows allows the producer to formulate different diets to meet the specific needs of each group. Limiting potassium intake and providing anionic salts to dry cows are two preventive practices for milk fever that can be implemented when dry cows are housed separately from lactating cows. Dry cow or maternity housing was separate from lactating cow housing on 60.0 percent of operations, and the percentage of operations that used separate housing increased as herd size increased.

c. Percentage of operations where maternity housing was separate from housing used for lactating cows, by herd size:

Percent Operations

Herd Size (Number of Cows)							
Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Pct.	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
51.5	(1.7)	80.8	(1.8)	90.4	(2.0)	60.0	(1.3)

3. Milking facilities

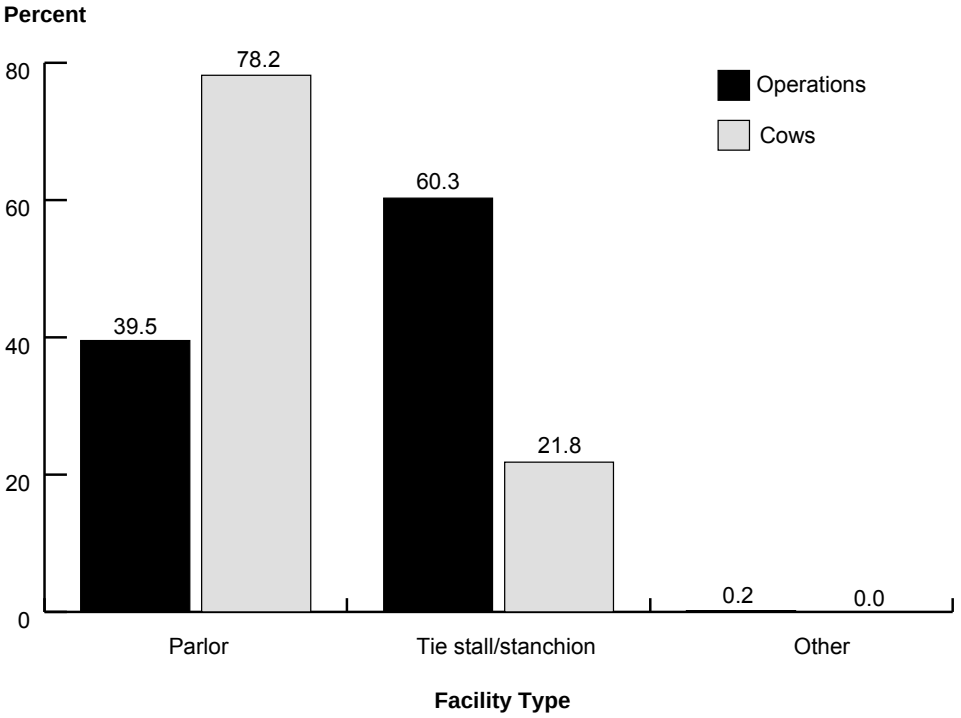
The majority of operations (60.3 percent) had a tie stall/stanchion milking facility. Although just 39.5 percent of operations used parlors, 78.2 percent of cows were on operations that milked in parlors.

a. Percentage of operations (and percentage of cows on these operations) by primary milking facility used in 2006:

Facility Type	Percent Operations	Standard Error	Percent Cows*	Standard Error
Parlor	39.5	(1.0)	78.2	(0.6)
Tie stall/stanchion	60.3	(1.0)	21.8	(0.6)
Other	0.2	(0.1)	0.0	(0.0)
Total	100.0		100.0	

*As a percentage of January 1, 2007, cow inventory.

Percentage of Operations (and Percentage of Cows* on These Operations) by Primary Milking Facility Used in 2006



As a percentage of January 1, 2007, cow inventory

Herringbone and parallel parlors were the two most common parlor types. Over half of operations that used parlors (54.4 percent) used a herringbone parlor, and these operations accounted for 48.7 percent of cows. Approximately one-fifth of operations (19.7 percent) used a parallel parlor to milk, and 30.6 percent of cows were on these operations.

b. For operations that primarily used a parlor milking facility, percentage of operations (and percentage of cows on these operations) by parlor type:

Parlor Type	Percent Operations	Standard Error	Percent Cows*	Standard Error
Side-opening (tandem)	6.6	(0.9)	3.7	(0.7)
Herringbone (fishbone)	54.4	(1.8)	48.7	(1.9)
Parallel (side-by-side)	19.7	(1.3)	30.6	(1.7)
Parabone (herringbone-parallel hybrid)	3.8	(0.6)	3.8	(0.6)
Swing	2.2	(0.6)	0.8	(0.2)
Rotary (carousel)	1.1	(0.3)	5.2	(1.3)
Flat barn	9.9	(1.2)	6.2	(0.8)
Other	2.3	(0.6)	1.0	(0.3)
Total	100.0		100.0	

*As a percentage of January 1, 2007, cow inventory.

4. Cow nutrition

Nutrition is an important component of herd health and productivity. The majority of operations used either a feed company nutritionist or the owner/operator for balancing rations fed to cows (41.6 and 36.1 percent of operations, respectively). The percentage of operations that used an independent nutritionist to balance rations increased as herd size increased. The percentage of operations that used the owner/operator to balance rations decreased from 42.2 percent of small operations to 16.6 percent of large operations. Very few operations used an employee or veterinarian to balance feed rations.

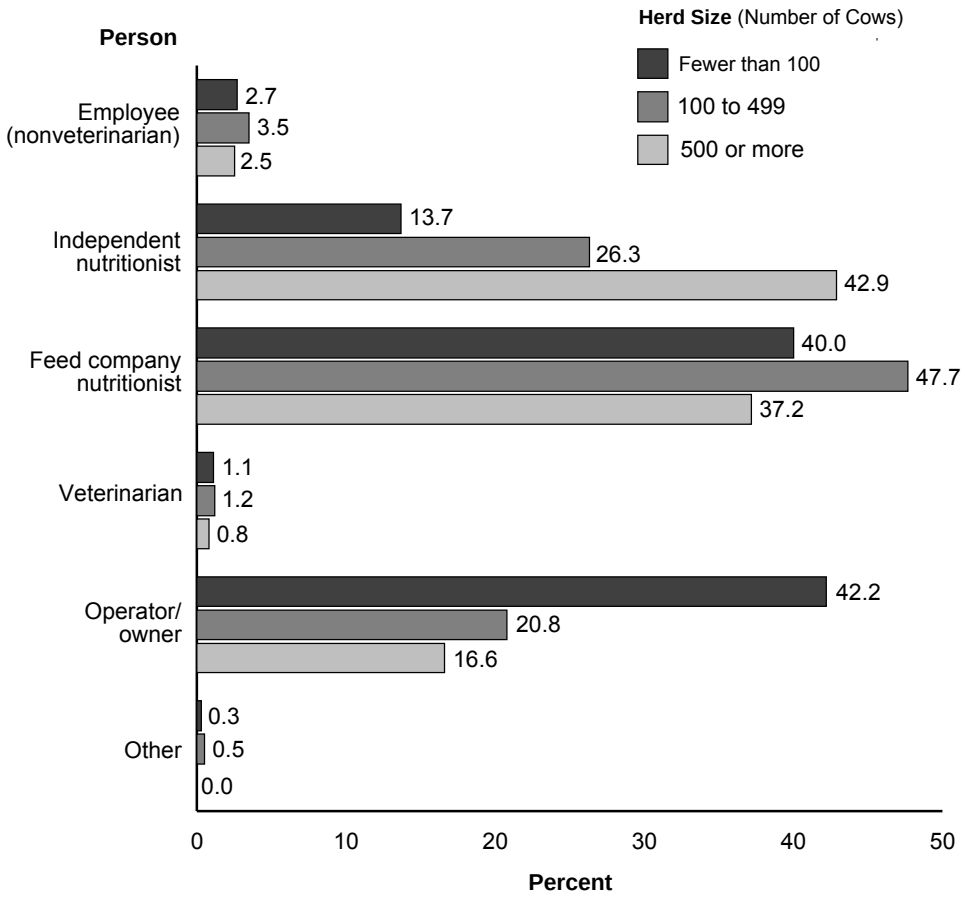
a. Percentage of operations by person primarily responsible for balancing feed rations, and by herd size:

Percent Operations

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Person	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Employee (nonveterinarian)	2.7	(0.6)	3.5	(1.0)	2.5	(1.0)	2.8	(0.5)
Independent nutritionist	13.7	(1.3)	26.3	(2.1)	42.9	(2.6)	18.0	(1.0)
Feed company nutritionist	40.0	(1.7)	47.7	(2.3)	37.2	(2.9)	41.6	(1.4)
Veterinarian	1.1	(0.3)	1.2	(0.5)	0.8	(0.3)	1.1	(0.3)
Operator/owner	42.2	(1.8)	20.8	(1.9)	16.6	(2.5)	36.1	(1.4)
Other	0.3	(0.2)	0.5	(0.4)	0.0	(0.0)	0.4	(0.1)
Total	100.0		100.0		100.0		100.0	

Percentage of Operations by Person Primarily Responsible for Balancing Feed Rations, and by Herd Size



Approximately half of operations (51.1 percent) fed a total mixed ration. Feeding a total mixed ration has the advantage of providing a consistent mixture of feeds to the cow and her rumen environment. Only 37.8 percent of small operations fed a total mixed ration, compared to 94.1 percent of large operations. This practice may be much more common in large herds because there are enough cows in a similar stage of lactation and/or level of milk production, and the facility design usually accommodates the efficient formulation of a total mixed ration.

b. Percentage of operations that fed a total mixed ration, by herd size:

Percent Operations

Herd Size (Number of Cows)

Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Pct.	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
37.8	(1.6)	84.7	(1.7)	94.1	(1.4)	51.1	(1.3)

A higher percentage of operations with RHA milk production of 20,000 lb/cow or more (70.7 percent) fed a total mixed ration, compared to 23.5 percent of operations with an RHA milk production of less than 16,000 lb/cow.

c. Percentage of operations that fed a total mixed ration, by RHA milk production (lb/cow):

Percent Operations

RHA Milk Production (lb/cow)

Less Than 16,000		**16,000 to 19,999**		**20,000 or More**	
Pct.	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
23.5	(2.4)	42.7	(2.3)	70.7	(1.9)

Forage test results were used to balance feed rations on three of four operations (75.5 percent). A lower percentage of small operations (70.1 percent) used forage test results to balance feed rations compared to medium and large operations (89.9 and 90.7 percent, respectively).

d. Percentage of operations that used forage test results to balance feed rations, by herd size:

Percent Operations

Herd Size (Number of Cows)

Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Pct.	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
70.1	(1.7)	89.9	(1.4)	90.7	(1.8)	75.5	(1.2)

The use of pasture decreased as herd size increased. The majority of small operations (68.7 percent) relied on pasture for forage while less than 1 in 5 large operations (18.6 percent) allowed cows access to pasture during the growing season. More than half of operations (58.9 percent) used pasture during the growing season to provide part of the ration forage component. The percentage of cows that had access to pasture also decreased as herd size increased, with 33.0 percent of all cows having access to pasture.

e. Percentage of operations (and percentage of cows on these operations) that relied on pasture during the growing season to provide part of the ration forage component for cows, by herd size:

Percent Operations

Herd Size (Number of Dairy Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
	Pct.	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Operations	68.7	(1.6)	36.6	(2.2)	18.6	(2.3)	58.9	(1.3)
Cows	64.3	(1.7)	34.5	(2.1)	16.1	(2.0)	33.0	(1.3)

5. Number of bulls

The percentage of operations that used bulls for breeding increased as herd size increased. Approximately half of small operations (46.3 percent) used bulls for breeding compared to 82.6 percent of large operations.

a. Percentage of operations by the number of bulls in the January 1, 2007, inventory used for breeding dairy cows or heifers, and by herd size:

	Percent Operations							
	Herd Size (Number of Dairy Cows)							
	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Number of Bulls	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
0	53.7	(1.8)	38.1	(2.3)	17.4	(1.7)	48.3	(1.4)
1	31.9	(1.7)	22.6	(1.9)	6.5	(1.6)	28.5	(1.3)
2 to 4	14.2	(1.2)	31.8	(2.1)	22.8	(2.2)	18.6	(1.0)
5 or more	0.2	(0.1)	7.5	(0.9)	53.3	(2.5)	4.6	(0.3)
Total	100.0		100.0		100.0		100.0	

b. Of all bulls present on January 1, 2007, used for breeding dairy cows and heifers, percentage of bulls that were dairy bulls:

Percent Bulls*	**Standard Error**
87.3	(2.1)

*Number of dairy bulls used for breeding dairy cattle, as a percentage of all bulls used for breeding dairy cattle.

6. Adverse drug reactions

Adverse reactions, which include a lump or swelling at the injection site, hives, abortion, collapse, or death, can occur following the administration of preventive or therapeutic products. Only 12.7 percent of operations had at least one adverse reaction on their operation during 2006.

a. Percentage of operations with at least one cow that had an adverse reaction to an injection during 2006:

Percent Operations	Standard Error
12.7	(0.8)

The most common adverse reaction was a lump or swelling at the injection site (75.9 percent of operations). Loss of milk production was observed on 31.4 percent of operations reporting an adverse reaction.

b. For operations with at least one cow that had an adverse reaction to an injection, percentage of operations with any cows displaying clinical signs:

Clinical Sign	Percent Operations	Standard Error
Collapse	19.7	(2.8)
Hives	12.7	(2.1)
Abortion	13.2	(2.1)
Lump or swelling at injection site	75.9	(3.0)
Loss of milk production	31.4	(3.3)
Lack of product efficacy	5.4	(1.7)
Fever	11.1	(2.3)
Lethargy	9.4	(2.1)
Respiratory disease	6.3	(1.6)
Infertility	4.5	(1.4)
Other	6.0	(1.5)

For operations with at least one cow that had an adverse reaction to an injection, approximately one in three operations (29.8 percent) had a veterinarian examine any cows with adverse reactions.

c. For operations with at least one cow that had an adverse reaction to an injection, percentage of operations that had a veterinarian examine any cows with an adverse reaction:

Percent Operations	Standard Error
29.8	(3.2)

Vaccines, veterinary drugs, and medicated feeds are regulated by two different governmental agencies: vaccines and other biologics are regulated by the USDA's Centers for Veterinary Biologics; veterinary drugs, medicated feeds, and animal devices are regulated by the Food and Drug Administration, Center for Veterinary Medicine. Both agencies strongly encourage producers encountering any problems with veterinary products, including adverse reactions in animals, to contact the manufacturer and report the event prior to contacting the appropriate regulatory agency. Both agencies have Web sites where the adverse event can be reported.

To report adverse events associated with vaccines and other biologics, contact USDA—Center for Veterinary Biologics: http://www.aphis.usda.gov/vs/cvb/html/adverseeventreport.html.

Adverse events associated with drugs, medicated feeds, and animal devices should be reported to the FDA—Center for Veterinary Medicine: http://www.fda.gov/cvm/adetoc.htm.

Nearly half of operations (47.1 percent) reported the adverse reaction to their veterinarian. No producers reported reactions to either USDA or FDA, and only 3.9 percent of operations reported adverse reactions to the manufacturer. More than half of operations (52.4 percent) did not report the adverse reaction.

d. For operations with at least one cow that had an adverse reaction to an injection, percentage of operations that reported any adverse reaction, by official reported to:

Official	Percent Operations	Standard Error
Veterinarian	47.1	(3.5)
Manufacturer	3.9	(1.1)
USDA's Center for Veterinary Biologics	0.0	(--)
FDA's Center for Veterinary Medicine	0.0	(--)
Other	0.3	(0.3)
Did not report adverse reaction	52.4	(3.5)

7. Preventive practices

Almost all operations (95.3 percent) used some preventive practice for cows. Providing vitamin A-D-E or selenium in feed and deworming were the most frequently practiced preventives given on 80.2, 76.1, and 63.3 percent of operations, respectively.

Percentage of operations (and percentage of cows on these operations) by preventive practices normally used for cows:

Preventive Practice	Percent Operations	Standard Error	Percent Cows*	Standard Error
Dewormers	63.3	(1.4)	46.0	(1.3)
Ionophores in feed (e.g., Rumensin®)	26.8	(1.1)	40.0	(1.5)
Vitamins A-D-E injection	12.9	(0.8)	20.2	(1.2)
Vitamins A-D-E in feed	80.2	(1.2)	79.3	(1.2)
Selenium injection	14.9	(0.9)	19.8	(1.2)
Selenium in feed	76.1	(1.2)	73.5	(1.3)
Probiotics	26.1	(1.2)	34.8	(1.6)
Anionic salts in close-up dry cow feed	26.7	(1.2)	44.5	(1.5)
Limited potassium in dry cow ration	46.9	(1.4)	62.8	(1.4)
Other	3.6	(0.6)	2.8	(0.4)
Any preventive	95.3	(0.7)	96.0	(0.7)

*As a percentage of January 1, 2007, cow inventory.

8. Vaccination practices

Approximately four of five operations (82.2 percent) vaccinated cows. With the exception of “other” disease, a lower percentage of small operations vaccinated against any single disease listed in the table below compared to medium and large operations. Compared to medium operations, a higher percentage of large operations vaccinated against BVD, *Salmonella*, *E. coli* mastitis, and clostridia. Vaccinating for any disease increased as herd size increased, with 77.8, 92.7, and 98.4 percent of small, medium, and large operations, respectively, vaccinating for any disease.

a. Percentage of operations that normally vaccinated cows against the following diseases, by herd size:

Percent Operations

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Disease	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Bovine viral diarrhea (BVD)	69.8	(1.7)	87.2	(1.6)	95.7	(1.0)	75.0	(1.3)
Infectious bovine rhinotracheitis (IBR)	66.1	(1.7)	84.3	(1.7)	88.0	(2.1)	71.3	(1.3)
Parainfluenza Type 3 (PI3)	58.0	(1.8)	72.3	(2.0)	72.9	(2.5)	61.9	(1.4)
Bovine respiratory syncytial virus (BRSV)	59.9	(1.8)	78.1	(1.8)	79.4	(2.5)	65.0	(1.4)
Haemophilus somnus	30.8	(1.7)	41.3	(2.3)	40.8	(2.9)	33.6	(1.3)
Leptospirosis	65.6	(1.7)	81.1	(1.8)	84.3	(2.4)	70.0	(1.3)
Salmonella	16.2	(1.3)	37.9	(2.3)	55.1	(3.0)	23.0	(1.1)
E. coli mastitis	25.3	(1.5)	50.0	(2.3)	79.1	(2.5)	33.5	(1.2)
Clostridia	20.7	(1.5)	42.7	(2.2)	60.8	(2.9)	27.7	(1.2)
Neospora	3.6	(0.7)	10.7	(1.6)	17.8	(2.3)	5.9	(0.6)
Other	7.6	(0.9)	6.6	(1.1)	7.7	(1.5)	7.4	(0.7)
Any vaccination	77.8	(1.5)	92.7	(1.2)	98.4	(0.5)	82.2	(1.1)

b. Percentage of operations that normally vaccinated cows against the following diseases, by region:

	Percent Operations			
	Region			
	West		East	
Disease	Pct.	Std. Error	Pct.	Std. Error
Bovine viral diarrhea (BVD)	82.2	(2.5)	74.4	(1.3)
Infectious bovine rhinotracheitis (IBR)	73.6	(2.8)	71.1	(1.4)
Parainfluenza Type 3 (PI3)	59.7	(3.0)	62.1	(1.5)
Bovine respiratory syncytial virus (BRSV)	66.8	(3.0)	64.8	(1.5)
Haemophilus somnus	30.9	(2.8)	33.8	(1.4)
Leptospirosis	74.7	(2.8)	69.6	(1.4)
Salmonella	44.5	(3.0)	21.3	(1.2)
E. coli mastitis	62.1	(2.9)	31.2	(1.3)
Clostridia	53.7	(3.1)	25.6	(1.3)
Neospora	14.2	(2.3)	5.3	(0.6)
Other	6.6	(1.4)	7.4	(0.8)
Any disease	89.7	(2.2)	81.6	(1.2)

9. Types of BVD vaccine

A higher percentage of operations administered killed versus modified live vaccines to cows (56.3 and 48.9 percent, respectively).

a. For operations that gave BVD vaccinations to cows, percentage of operations by type of BVD vaccine given:

Type of Vaccine	Percent Operations	Standard Error
Killed	56.3	(1.6)
Modified live	48.9	(1.6)

For operations that administered BVD vaccine, 60.8 percent reported that the vaccine contained both Type I and Type II strains. Approximately one-quarter of operations (27.2 percent) did not know which strain was included in the vaccine.

b. For operations that gave BVD vaccinations, percentage of operations by strain of BVD contained in vaccine administered:

BVD Strain	Percent Operations	Standard Error
Type I only	4.3	(0.6)
Type II only	7.7	(0.8)
Combination (Type I and Type II)	60.8	(1.5)
Did not know	27.2	(1.4)
Total	100.0	

More than four of five operations that administered BVD vaccine to cows (80.2 percent) reported giving annual booster vaccines.

c. For operations that gave BVD vaccinations to cows, percentage of operations that gave annual BVD booster injections:

Percent Operations	Standard Error
80.2	(1.3)

10. Bovine somatotropin (bST)

A total of 15.2 percent of operations used bST on 17.2 percent of cows. As herd size increased so did the percentage of operations that used bST, ranging from 9.1 percent of small operations to 42.7 percent of large operations.

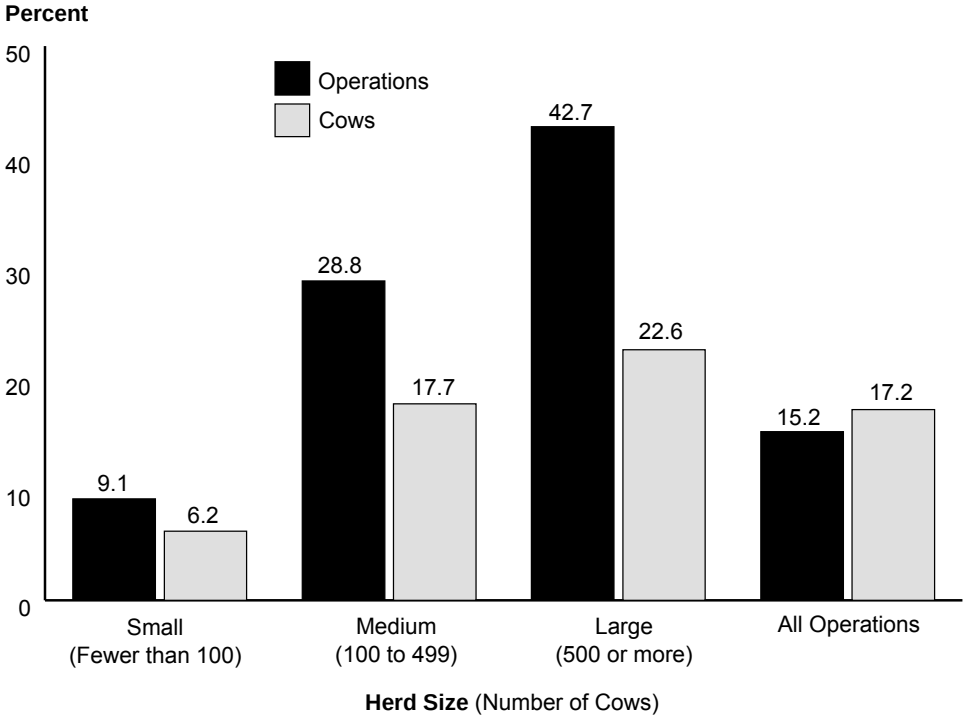
a. Percentage of operations (and percentage of cows milked on January 1, 2007) that used bST in cows during the current lactation (at the time of the Dairy 2007 interview), by herd size:

Percent

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Measure	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Operations	9.1	(0.9)	28.8	(2.0)	42.7	(2.5)	15.2	(0.8)
Cows	6.2	(0.7)	17.7	(1.4)	22.6	(1.5)	17.2	(0.8)

Percentage of Operations (and Percentage of Cows Milked on January 1, 2007) that Used bST in Cows During the Current Lactation (at the Time of the Dairy 2007 Interview), by Herd Size



Although the percentages of operations that used bST were similar between regions, a higher percentage of cows in the East region (20.8 percent) received bST compared to 12.3 percent in the West region.

b. Percentage of operations (and percentage of cows milked on January 1, 2007) that used bST in cows during the current lactation (at the time of the Dairy 2007 interview), by region:

	Percent			
	Region			
	West		East	
Measure	Percent	Std. Error	Percent	Std. Error
Operations	16.3	(1.6)	15.1	(0.9)
Cows	12.3	(1.3)	20.8	(1.1)

Operations that used bST on at least some cows had a RHA milk production of 3,000 to 5,000 lb/cow more milk compared to operations that did not use bST. Operations that used bST had a RHA of 23,304 lb/cow compared to 18,433 lb/cow for operations that did not use bST.

c. Operation average RHA milk production (lb/cow) by bST use and by herd size:

	Operation Average							
	Herd Size (Number of Dairy Cows)							
	Small (Fewer than 100)		Medium (100-499)		Large (500 or More)		All Operations	
bST Used	Lb/Cow	Std. Error	Lb/Cow	Std. Error	Lb/Cow	Std. Error	Lb/Cow	Std. Error
Yes	22,490	(392)	23,705	(281)	24,576	(249)	23,304	(210)
No	17,980	(142)	19,783	(184)	21,278	(275)	18,433	(118)

F. Cow Health

1. Abortions

Abortion is a term generally used to describe the expulsion of a dead fetus from 45 to 265 days of gestation. A goal is to have less than 2 percent of cows and heifers abort each year, although up to 5 percent is considered normal. The overall abortion percentage (including both heifers and cows) was 4.5 percent during 2006. The abortion percentage was higher for cows than for heifers (5.0 and 3.3 percent, respectively). Large operations had a higher percentage of abortions than medium and small operations.

a. Percentage of heifers, cows, and both heifers and cows (number aborted divided by inventory) that aborted during 2006, by herd size:

Percent Abortions

Herd Size (Number of Cows)

Cattle Class	Small (Fewer than 100)		Medium (100-499)		Large (500 or More)		All Operations	
	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error
Heifers*	2.4	(0.2)	2.8	(0.2)	4.1	(0.4)	3.3	(0.2)
Cows**	4.4	(0.2)	4.1	(0.2)	5.8	(0.4)	5.0	(0.2)
Both heifers and cows***	3.7	(0.1)	3.7	(0.1)	5.3	(0.3)	4.5	(0.2)

*Breeding age or older heifers on January 1, 2007
**Cow inventory minus breeding age and older heifers on January 1, 2007
***Cow inventory on January 1, 2007

Over one-third of operations (38.2 percent) reported an abortion percentage of less than 2.0 percent. Less than 5 percent of cows and heifers aborted on 72.5 of operations, while on 6.9 percent of operations 10 percent or more of cows and heifers aborted during 2006.

b. Percentage of operations by reported total abortion percentage:

Abortion Percentage	Percent Operations	Standard Error
Less than 2.0	38.2	(1.4)
2.0 to 4.9	34.3	(1.3)
5.0 to 9.9	20.6	(1.1)
10.0 to 14.9	4.9	(0.6)
15.0 or more	2.0	(0.4)
Total	100.0	

2. Cow morbidity

During 2006, more than 80 percent of operations identified at least one case of clinical mastitis, lameness, retained placenta, infertility problems, or milk fever. With the exception of “other” health related problems, a higher percentage of large operations than small operations observed at least one cow with health problems. Large operations would be expected to observe more health problems due to the larger numbers of cows at risk for developing any health problem. All medium and large operations (100.0 percent) observed at least one case of clinical mastitis, lameness, and milk fever. Neurological problems and “other” health-related problems were identified on 10.7 and 7.7 percent of all operations, respectively.

a. Percentage of operations by producer-identified health problems occurring in cows during 2006, and by herd size:

Percent Operations

	Herd Size (Number of Cows)							
	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Producer-Identified Health Problem	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Clinical mastitis	93.0	(1.0)	100.0	(--)	100.0	(--)	94.9	(0.8)
Lameness	83.4	(1.4)	100.0	(--)	100.0	(--)	87.9	(1.0)
Respiratory problems	38.0	(1.7)	98.1	(0.8)	100.0	(--)	51.5	(1.4)
Retained placenta (more than 24 hours)	76.9	(1.5)	99.7	(0.2)	100.0	(--)	82.6	(1.2)
Infertility problems (not pregnant 150 days after calving)	78.2	(1.5)	99.2	(0.4)	100.0	(--)	83.5	(1.1)
Other reproductive problems (e.g., dystocia, metritis)	31.0	(1.6)	58.1	(2.2)	67.4	(2.7)	38.8	(1.3)
Diarrhea for more than 48 hours	28.7	(1.6)	51.0	(2.3)	72.6	(2.8)	35.7	(1.3)
Milk fever	77.9	(1.5)	100.0	(--)	100.0	(--)	83.5	(1.2)
Displaced abomasum	51.2	(1.7)	98.9	(0.4)	100.0	(--)	62.3	(1.4)
Neurological problems	7.6	(1.0)	18.1	(1.7)	23.5	(2.3)	10.7	(0.8)
Other health-related problems	7.4	(1.0)	8.3	(1.3)	10.0	(1.7)	7.7	(0.8)

The three most prevalent diseases reported in cows were clinical mastitis, lameness, and infertility problems (16.5, 14.0, and 12.9 percent of cows, respectively). Small operations reported a lower percentage of cows with infertility problems and other reproductive problems compared to medium and large operations, while large operations reported a lower percentage of cows with retained placenta, diarrhea for more than 48 hours, milk fever, and displaced abomasum compared to medium and small operations.

b. Percentage of cows* by producer-identified health problems occurring in cows during 2006, and by herd size:

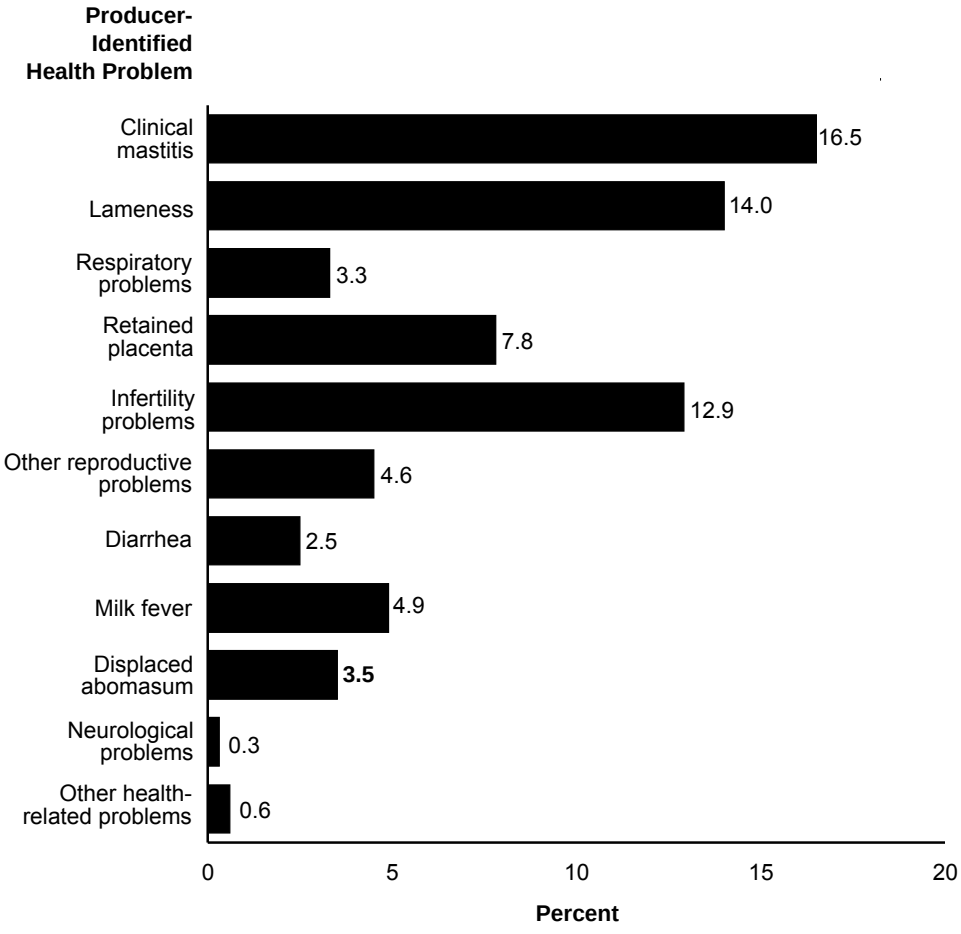
Percent Cows*

Herd Size (Number of Cows)

Producer-Identified Health Problem	Small (Fewer than 100)		Medium (100-499)		Large (500 or More)		All Operations	
	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error
Clinical mastitis	16.5	(0.5)	14.8	(0.6)	17.5	(1.0)	16.5	(0.5)
Lameness	13.2	(0.5)	15.6	(0.6)	13.5	(0.8)	14.0	(0.4)
Respiratory problems	2.5	(0.2)	4.1	(0.3)	3.4	(0.3)	3.3	(0.1)
Retained placenta (more than 24 hours)	8.9	(0.3)	8.9	(0.3)	6.4	(0.4)	7.8	(0.2)
Infertility problems (not pregnant 150 days after calving)	10.8	(0.4)	13.2	(0.5)	14.1	(0.6)	12.9	(0.3)
Other reproductive problems (e.g., dystocia, metritis)	3.4	(0.2)	5.0	(0.3)	5.0	(0.5)	4.6	(0.3)
Diarrhea for more than 48 hours	3.9	(0.5)	2.5	(0.3)	1.6	(0.1)	2.5	(0.2)
Milk fever	6.6	(0.2)	5.9	(0.3)	3.0	(0.2)	4.9	(0.1)
Displaced abomasum	3.6	(0.2)	4.8	(0.2)	2.5	(0.2)	3.5	(0.1)
Neurological problems	0.3	(0.0)	0.3	(0.0)	0.2	(0.0)	0.3	(0.0)
Other health-related problems	0.8	(0.2)	1.0	(0.4)	0.2	(0.0)	0.6	(0.1)

*As a percentage of January 1, 2007, cow inventory

Percentage of Cows* by Producer-Identified Health Problems Occuring in Cows During 2006



*As a percentage of January 1, 2007, cow inventory

3. Permanently removed cows

The vast majority of operations permanently removed at least one cow during 2006, regardless of herd size.

a. Percentage of operations that permanently removed any cows from the operation (excluding cows that died) during 2006, by herd size:

Percent Operations

Herd Size (Number of Cows)

Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Pct.	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
96.5	(0.8)	98.7	(0.7)	97.3	(0.8)	97.0	(0.6)

There were no differences by region in the percentages of operations that permanently removed at least one cow during 2006.

b. Percentage of operations that permanently removed any cows from the operation (excluding cows that died) during 2006, by region:

Percent Operations

Region

West		**East**	
Percent	**Std. Error**	**Percent**	**Std. Error**
94.7	(2.2)	97.2	(0.6)

Approximately one in four cows (23.6 percent) was permanently removed from operations (excluding cows that died) during 2006. The percentages of permanently removed cows were not different across herd sizes or between regions.

c. Percentage of cows permanently removed from operations (excluding cows that died) during 2006, by herd size:

Percent Cows*

Herd Size (Number of Cows)

Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Pct.	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
24.1	(0.6)	23.7	(0.5)	23.4	(0.7)	23.6	(0.4)

*As a percentage of January 1, 2007, cow inventory.

d. Percentage of cows permanently removed from operations (excluding cows that died) during 2006, by region:

Percent Cows*

Region

West		**East**	
Percent	**Std. Error**	**Percent**	**Std. Error**
22.8	(0.7)	24.3	(0.4)

*As a percentage of January 1, 2007, cow inventory

For operations that permanently removed cows during 2006, the majority (85.5 percent) sent some cows to a market, auction, or stockyard. Of permanently removed cows, the majority (76.2 percent) were sent to a market, auction, or stockyard.

e. For operations that permanently removed cows (excluding cows that died) during 2006, percentage of operations and percentage of cows removed, by destination of removed cows:

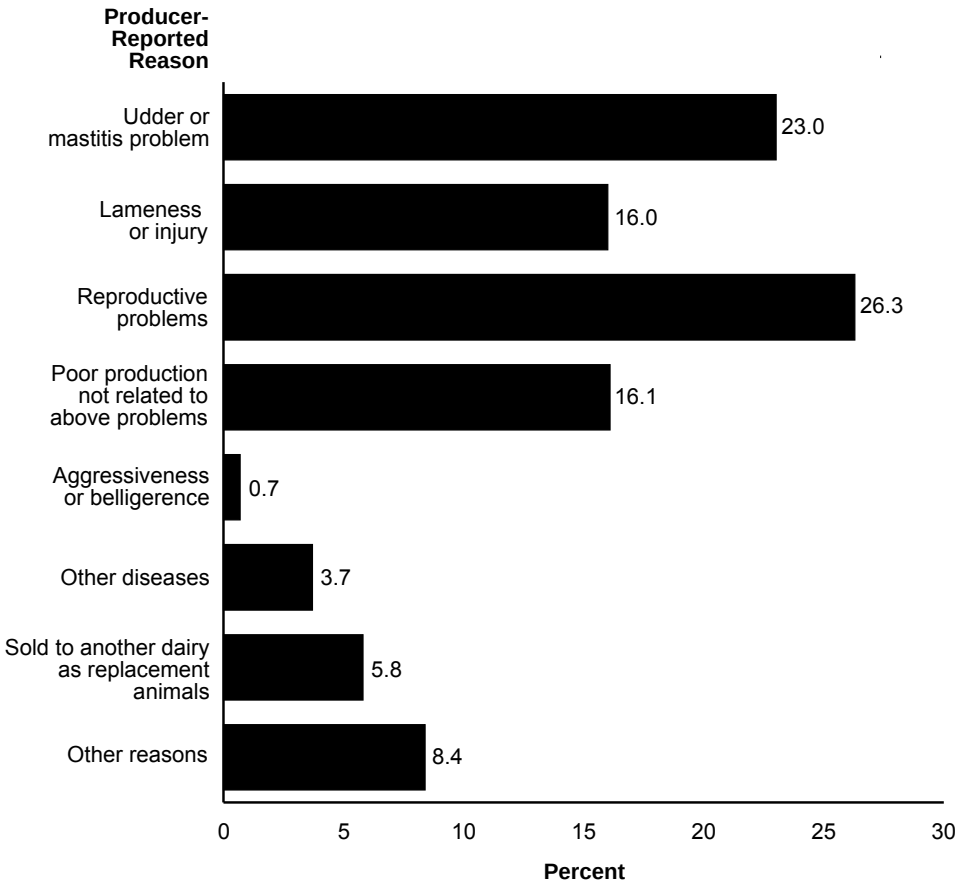
	Percent			
	Operations		Cows	
Destination	Percent	Std. Error	Percent	Std. Error
Directly to another dairy	14.3	(1.0)	5.5	(0.7)
Market, auction, or stockyard	85.5	(1.0)	76.2	(1.1)
Directly to a packer or slaughter plant	26.5	(1.2)	17.5	(1.3)
Sent elsewhere	3.7	(0.6)	0.8	(0.3)
Total	NA		100.0	

For operations that permanently removed cows, the highest percentages removed some cows because of udder or mastitis problems, reproductive problems, and lameness or injury (79.2, 78.8, and 65.6 percent of operations, respectively). Of permanently removed cows, 26.3 percent were removed for reproductive problems and 23.0 percent for udder or mastitis problems. Lameness or injury and poor production not related to other listed problems led to the permanent removal of 16.0 and 16.1 percent of cows, respectively. Only 5.8 percent of permanently removed cows were sold to another dairy as replacement animals. Almost one in six operations (16.8 percent) reported "other" as a reason for permanently removing cows. These operations accounted for 8.4 percent of the cows permanently removed. Reasons listed in the "other" category included specific diseases such as Johne's disease or reductions in herd size, but the majority of operations did not specify a reason.

f. For operations that permanently removed cows (excluding cows that died) during 2006, percentage of operations and percentage of cows removed, by producer-reported reason:

Producer-Reported Reason	Percent Operations	Standard Error	Percent Cows	Standard Error
Udder or mastitis problem	79.2	(1.2)	23.0	(0.6)
Lameness or injury	65.6	(1.4)	16.0	(0.4)
Reproductive problems	78.8	(1.2)	26.3	(0.7)
Poor production not related to above problems	47.2	(1.4)	16.1	(0.7)
Aggressiveness or belligerence (kickers)	9.6	(0.9)	0.7	(0.1)
Other diseases	15.4	(1.0)	3.7	(0.2)
Sold as replacement animals to another dairy	14.7	(1.0)	5.8	(0.7)
Other reasons	16.8	(1.1)	8.4	(1.1)
Total	NA		100.0	

For Operations That Permanently Removed Cows, Percentage of Cows Removed, by Producer-Reported Reason



G. Heifer and Cow Mortality

1. Mortality

Compared to small operations, large operations had a lower percentage of unweaned heifer deaths but a higher percentage of cow deaths. Unweaned heifer deaths during 2006 accounted for the highest percentage of deaths among the animal classes at 7.8 percent, while 5.7 percent of cows and 1.8 percent of weaned heifers died.

a. Percentage of unweaned heifers, weaned heifers, and cows that died during 2006, by herd size:

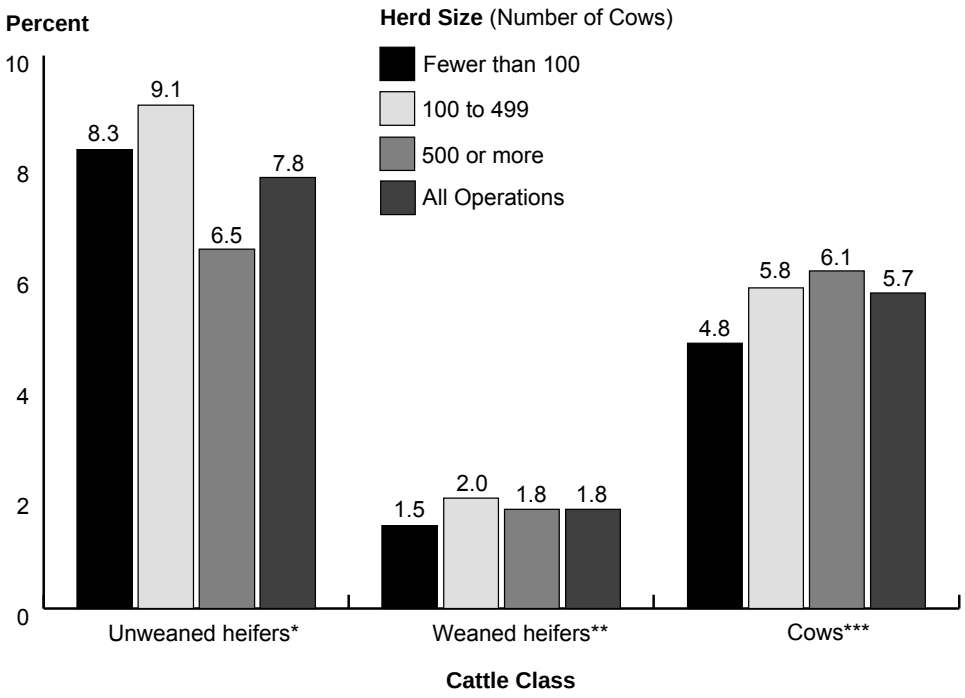
Percent

Herd Size (Number of Cows)

Cattle Class	Small (Fewer than 100)		Medium (100-499)		Large (500 or More)		All Operations	
	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error
Unweaned heifers*	8.3	(0.4)	9.1	(0.4)	6.5	(0.4)	7.8	(0.2)
Weaned heifers**	1.5	(0.1)	2.0	(0.1)	1.8	(0.1)	1.8	(0.1)
Cows***	4.8	(0.1)	5.8	(0.2)	6.1	(0.2)	5.7	(0.1)

*As a percentage of heifers born during 2006 and alive at 48 hours.
**As a percentage of January 1, 2007, heifer inventory (weaning age to calving).
***As a percentage of January 1, 2007, cow inventory.

Percentage of Unweaned Heifers, Weaned Heifers, and Cows that Died During 2006, by Herd Size



*As a percentage of heifers born during 2006 and alive at 48 hours.
**As a percentage of January 1, 2007, heifer inventory (weaning age to calving).
***As a percentage of January 1, 2007, cow inventory.

Determining the cause of death is important in preventing future deaths and improving the health of the herd. A relatively small percentage of operations performed necropsies on unweaned heifers, weaned heifers, or cows (8.0, 7.1, and 13.0 percent, respectively) in order to determine cause of death. With the exception of weaned heifers, the percentage of operations that performed any necropsy for a particular cattle class increased as herd size increased. Less than 1 in 10 small operations (8.4 percent) performed necropsies on cows compared to 33.3 percent of large operations.

b. For operations that had at least one death in the following cattle classes, percentage of operations that performed necropsies to determine the cause of death, by herd size:

Percent Operations

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Cattle Class	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Unweaned heifers	4.4	(0.9)	11.9	(1.4)	22.6	(2.5)	8.0	(0.7)
Weaned heifers	5.8	(1.4)	6.9	(1.2)	13.5	(2.1)	7.1	(0.9)
Cows	8.4	(1.0)	20.2	(1.8)	33.3	(2.7)	13.0	(0.9)

Approximately 4 percent of deaths within any cattle class were necropsied to determine the cause of death. There were no substantial differences in the percentages of deaths necropsied among animal classes or herd sizes.

c. For operations that had at least one death in the following cattle classes, percentage of unweaned heifer deaths, weaned heifer deaths, and cow deaths where necropsies were performed to determine cause of death, by herd size:

Percent Deaths Necropsied

Herd Size (Number of Dairy Cows)

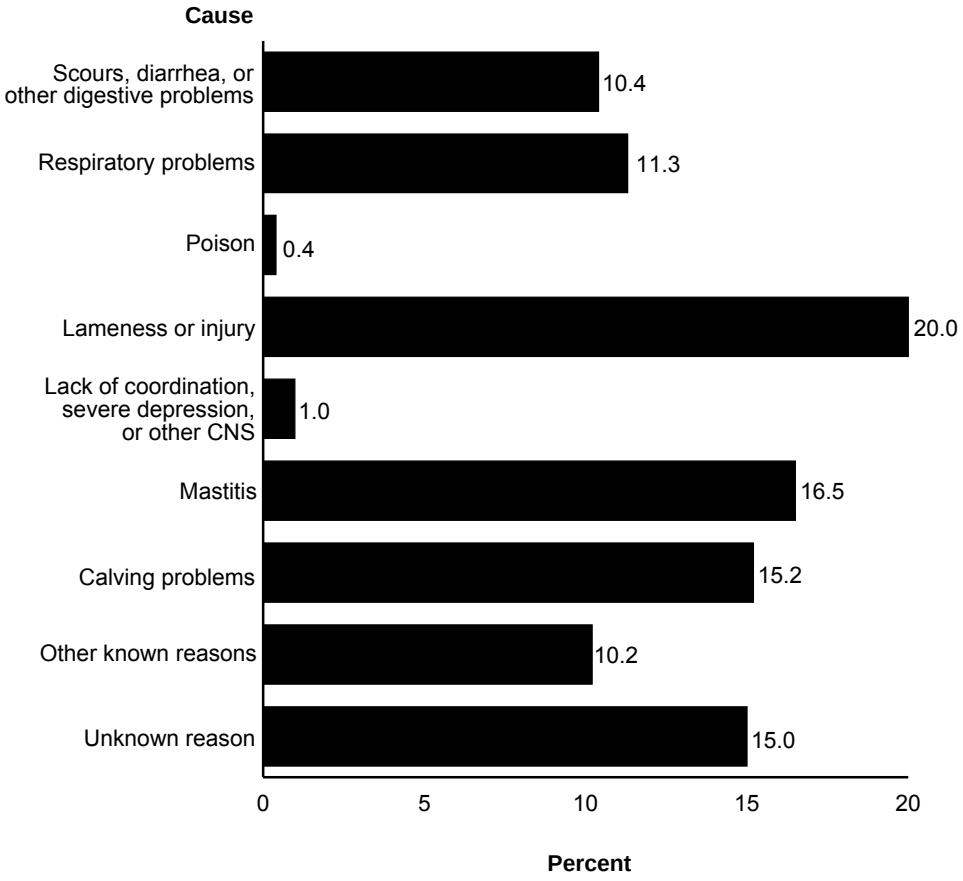
	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Cattle Class	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Unweaned heifers	1.8	(0.4)	4.7	(1.1)	3.8	(0.5)	3.5	(0.4)
Weaned heifers	3.9	(1.0)	4.8	(1.5)	3.7	(0.7)	4.1	(0.6)
Cows	4.4	(0.7)	6.0	(0.9)	3.5	(0.4)	4.4	(0.4)

Scours, diarrhea, or other digestive problems accounted for the highest percentage of unweaned heifer deaths (56.5 percent), followed by respiratory problems (22.5 percent). For weaned heifers, respiratory disease was the single largest cause of death (46.5 percent), with unknown reasons, lameness or injury, scours, diarrhea or other digestive problems each accounting for between 12 and 15 percent of deaths. The single largest cause of cow deaths was lameness or injury (20.0 percent), followed by mastitis (16.5 percent), calving problems (15.2 percent), and unknown reasons (15.0 percent).

d. Percentage of unweaned heifer deaths, weaned heifer deaths, and cow deaths, by producer-attributed cause:

	Percent Deaths					
	Unweaned Heifers		Weaned Heifers		Cows	
Producer-Attributed Cause	Percent	Std. Error	Percent	Std. Error	Percent	Std. Error
Scours, diarrhea, or other digestive problems	56.5	(1.3)	12.6	(1.0)	10.4	(0.5)
Respiratory problems	22.5	(0.9)	46.5	(1.7)	11.3	(0.7)
Poison	0.0	(0.0)	1.9	(0.9)	0.4	(0.1)
Lameness or injury	1.7	(0.3)	12.8	(1.0)	20.0	(0.8)
Lack of coordination, severe depression, or other CNS	0.3	(0.1)	0.7	(0.2)	1.0	(0.1)
Mastitis					16.5	(0.7)
Calving problems	5.3	(0.7)			15.2	(0.7)
Joint or navel problems	1.6	(0.3)	1.0	(0.3)		
Other known reasons	4.3	(0.7)	9.9	(1.0)	10.2	(0.8)
Unknown reason	7.8	(0.9)	14.6	(1.2)	15.0	(1.1)
Total	100.0		100.0		100.0	

Percentage of Cow Deaths, by Producer-Attributed Cause



2. Carcass disposal

Rendering and burial were the two most common forms of disposing of dead calves (36.5 and 32.6 percent of operations, respectively). Burial as a disposal method decreased as herd size increased. Conversely, rendering increased as herd size increased. Almost two of three large operations (65.4 percent) disposed of dead calves by rendering. Composting calf carcasses was more common on medium operations (29.5 percent) than on large operations (21.8 percent).

a. Percentage of operations by primary method used to dispose of ***dead calves,*** and by herd size:

Percent Operations

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Disposal Method	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Buried	36.5	(1.7)	25.5	(1.9)	7.8	(1.2)	32.6	(1.3)
Burned/ incinerated	2.5	(0.6)	0.8	(0.3)	0.3	(0.1)	2.0	(0.4)
Rendered	33.5	(1.7)	39.6	(2.2)	65.4	(2.2)	36.5	(1.3)
Composted	22.8	(1.5)	29.5	(1.9)	21.8	(1.8)	24.2	(1.2)
Landfill	1.6	(0.4)	2.2	(0.5)	1.4	(0.5)	1.7	(0.3)
Other	3.1	(0.6)	2.4	(0.7)	3.3	(1.1)	3.0	(0.5)
Total	100.0		100.0		100.0		100.0	

Rendering was the most common method of disposing of dead cows on all operations (56.9 percent). A lower percentage of large operations (6.2 percent) buried cow carcasses compared to medium or small operations (17.9 and 22.1 percent, respectively). A higher percentage of large operations (71.9 percent) had cow carcasses rendered compared to medium and small operations (55.6 and 56.2 percent, respectively). A lower percentage of small operations (15.0 percent) composted cow carcasses compared to medium operations (22.5 percent).

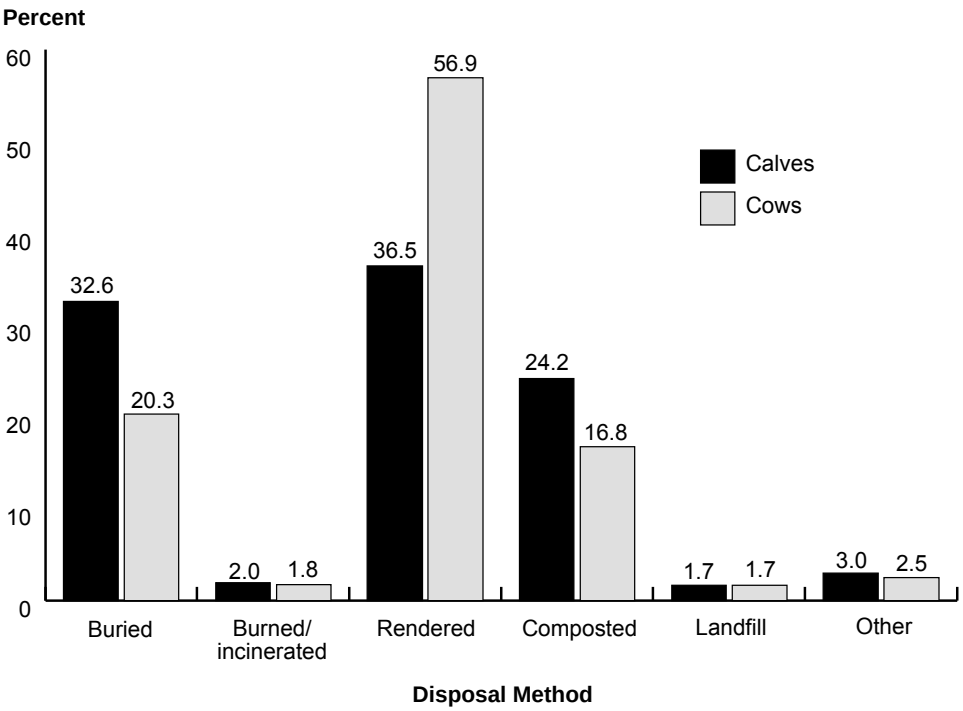
b. Percentage of operations by primary method used to dispose of ***dead cows,*** and by herd size:

Percent Operations

Herd Size (Number of Dairy Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Disposal Method	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Buried	22.1	(1.4)	17.9	(1.5)	6.2	(1.1)	20.3	(1.1)
Burned/ incinerated	2.4	(0.5)	0.2	(0.2)	0.2	(0.1)	1.8	(0.4)
Rendered	56.2	(1.7)	55.6	(2.1)	71.9	(2.4)	56.9	(1.3)
Composted	15.0	(1.2)	22.5	(1.7)	17.0	(2.0)	16.8	(1.0)
Landfill	1.6	(0.3)	2.1	(0.4)	1.4	(0.5)	1.7	(0.3)
Other	2.7	(0.6)	1.7	(0.6)	3.3	(1.1)	2.5	(0.4)
Total	100.0		100.0		100.0		100.0	

Percentage of Operations by Primary Method Used to Dispose of Dead Calves and Dead Cows



H. Biosecurity

1. Physical contact with unweaned calves

Unweaned calves are the most susceptible animals to illness on the operation. Separating calves from older animals is an effective management practice used to reduce disease exposure to unweaned calves. Seventy-six percent of operations representing 84.4 percent of calves did not allow unweaned calves to have physical contact with weaned calves, and approximately 85 percent of operations did not allow contact with bred heifers or adult cattle. More than two of three operations (69.5 percent) housing 78.7 percent of heifer calves did not allow weaned calves to have contact with older animals.

Percentage of operations (and percentage of heifer calves born on these operations) where after separation from the dam unweaned heifer calves did not have physical contact* with the following cattle classes:

Cattle Class	Percent Operations	Standard Error	Percent Calves	Standard Error
Weaned calves not yet of breeding age	76.0	(1.2)	84.4	(1.1)
Bred heifers not yet calved	86.8	(1.0)	91.3	(0.8)
Adult cattle	84.3	(1.1)	89.2	(0.9)
No contact with above classes	69.5	(1.3)	78.7	(1.2)

*Physical contact is defined as nose-to-nose contact or sniffing/touching/licking each other, including through a fence

2. Physical contact with other animals

Cattle can contract disease agents directly from other animals or by ingesting fecal material from other animals that have contaminated their feed or water. For example, *Neospora,* which can cause abortions, is transmitted via the feces of dogs and other canids.

More than 40 percent of operations reported that cats, dogs, and deer or other members of the deer family had contact with cattle, their feed, and/or water supply. Cattle on operations in the East region were more likely to have contact with sheep, beef cattle, cats, and deer compared to cattle on operations in the West region. Almost 4 of 5 operations in the West region (79.2 percent) and 9 of 10 operations in the East region (95.2 percent) reported that at least one of the listed animals had physical contact with cattle and/or contact with their feed, minerals, or water.

a. Percentage of operations where the following animals had physical contact with cattle and/or contact with their feed, minerals, or water supply, by region:

	Percent Operations					
	Region					
	West		East		All Operations	
Animal Type	Percent	Std. Error	Percent	Std. Error	Percent	Std. Error
Chickens or other poultry	9.2	(2.1)	8.3	(0.8)	8.3	(0.8)
Horses or other equids	10.2	(2.2)	13.6	(1.1)	13.3	(1.0)
Pigs	2.0	(0.6)	2.0	(0.5)	2.0	(0.4)
Sheep	0.1	(0.1)	1.0	(0.3)	0.9	(0.3)
Goats	4.8	(1.6)	2.3	(0.4)	2.5	(0.4)
Beef cattle	5.1	(1.5)	11.8	(1.0)	11.3	(1.0)
Exotic species (e.g., llamas, alpacas, emus, etc.)	1.0	(0.6)	0.7	(0.2)	0.7	(0.2)
Dogs	63.4	(2.7)	69.4	(1.4)	68.9	(1.3)
Cats	62.1	(2.8)	87.1	(1.0)	85.2	(0.9)
Deer or other members of the deer family (e.g., elk, moose, etc.)	20.9	(2.9)	51.6	(1.5)	49.3	(1.4)
Any animal	79.2	(2.0)	95.2	(0.6)	94.0	(0.6)

Cattle that have direct contact with deer could pose a risk of transmitting diseases such as tuberculosis (TB). TB is transmitted most commonly by the respiratory route, whereby invisible droplets (aerosols) containing TB bacteria are exhaled or coughed by infected animals and then inhaled by susceptible animals or humans. The risk of exposure is greatest in enclosed areas, such as barns; however, livestock can become infected if they share a common watering place contaminated with saliva and other discharges from infected deer or other animals.

For operations where deer or members of the deer family had contact with cattle, their feed, or water, the majority of operations (90.8 percent) reported that cattle could possibly or sometimes have face-to-face contact with deer. There were no differences by region in the percentages of operations that reported face-to-face contact with deer.

b. For operations where deer had physical contact with cattle and/or contact with their feed, minerals, or water supply, percentage of operations by frequency with which members of the deer family had face-to-face contact with cattle, and by region:

	Percent Operations					
	Region					
	West		East		All Operations	
Frequency	Percent	Std. Error	Percent	Std. Error	Percent	Std. Error
Never	4.8	(2.1)	9.4	(1.2)	9.2	(1.2)
Possibly	56.3	(8.0)	64.3	(2.1)	64.1	(2.0)
Sometimes	38.9	(7.9)	26.3	(1.9)	26.7	(1.9)
Total	100.0		100.0		100.0	

3. Biosecurity for new arrivals

NOTE: The percentage of operations that brought bred dairy heifers onto the operation (12.2 percent) [table a.] is similar to the percentage of operations where dairy cow replacements were born off the operation (14.1 percent), see “Source of cow replacements” p. 62. However, these percentages are higher than the percentage of heifers born off the operation (6.6 percent), see “Source of heifer inventory” p. 28. This discrepancy between the percentage of operations and the source of heifers and cow replacements could be due to a difference in the survey questions, since the source of heifers in the herd on January 1, 2007, may not be representative of the source of heifers brought on over the course of 2006.

The introduction of new animals can introduce diseases to the herd, especially if the new additions are not properly screened for disease prior to introduction. Almost 4 of 10 operations (38.9 percent) brought at least 1 new addition onto the operation during 2006. Approximately one in eight operations brought on bred dairy heifers, lactating dairy cows, or dairy bulls (12.2, 13.8, and 12.5 percent, respectively). A lower percentage of large operations brought on unweaned calves compared to small operations (1.0 and 3.8 percent, respectively), but a higher percentage of large operations brought on dairy heifers, bred dairy heifers, dairy bulls, and “any beef or dairy cattle” compared to medium or small operations.

a. Percentage of operations that brought the following classes of cattle onto the operation during 2006, by herd size:

Percent Operations

Herd Size (Number of Cows)

Cattle Class	**Small** (Fewer than 100) Pct.	Std. Error	**Medium** (100-499) Pct.	Std. Error	**Large** (500 or More) Pct.	Std. Error	**All Operations** Pct.	Std. Error
Unweaned calves (dairy or beef)	3.8	(0.8)	2.5	(0.6)	1.0	(0.3)	3.4	(0.6)
Dairy heifers (weaned but not bred)	5.3	(0.8)	7.6	(1.2)	16.3	(2.6)	6.4	(0.7)
Bred dairy heifers	8.9	(1.0)	18.1	(1.8)	34.7	(2.6)	12.2	(0.9)
Lactating dairy cows	13.2	(1.3)	16.0	(1.7)	13.0	(1.9)	13.8	(1.0)
Dry dairy cows	4.1	(0.8)	4.3	(0.9)	5.5	(1.5)	4.3	(0.6)
Beef heifers and cows	0.9	(0.3)	2.5	(0.7)	1.1	(0.6)	1.3	(0.3)
Dairy bulls (weaned)	11.4	(1.1)	14.1	(1.6)	22.5	(2.4)	12.5	(0.9)
Beef bulls (weaned)	1.5	(0.4)	2.2	(0.6)	1.5	(0.5)	1.7	(0.3)
Steers (weaned)	2.0	(0.5)	1.3	(0.5)	0.7	(0.6)	1.8	(0.4)
Any cattle	35.6	(1.7)	44.3	(2.3)	61.6	(2.8)	38.9	(1.4)

Although more operations in the West region brought on animals during 2006 compared to operations in the East region (49.3 and 38.0 percent, respectively), a higher percentage of operations in the East region brought on unweaned calves, lactating dairy cows, and steers.

b. Percentage of operations that brought the following classes of cattle onto the operation during 2006, by region:

	Percent Operations			
	Region			
	West		East	
Cattle Class	Percent	Std. Error	Percent	Std. Error
Unweaned calves (dairy or beef)	0.6	(0.3)	3.6	(0.6)
Dairy heifers (weaned but not bred)	12.6	(2.2)	5.9	(0.7)
Bred dairy heifers	21.1	(2.3)	11.5	(0.9)
Lactating dairy cows	8.5	(1.5)	14.3	(1.1)
Dry dairy cows	2.3	(0.7)	4.4	(0.7)
Beef heifers and cows	1.5	(0.7)	1.3	(0.3)
Dairy bulls (weaned)	21.8	(2.6)	11.8	(0.9)
Beef bulls (weaned)	2.8	(0.9)	1.6	(0.3)
Steers (weaned)	0.3	(0.3)	1.9	(0.4)
Any cattle	49.3	(3.0)	38.0	(1.5)

For operations that introduced bred heifers, the percentage of cow inventory brought on as bred heifers was similar across herd sizes, ranging from 15.1 percent on small operations to 17.3 percent on large operations. For operations that introduced dry cows, the percentage of inventory brought on as dry cows ranged from 3.5 percent on medium operations to 9.5 percent on small operations.

c. For operations that brought the specified cattle classes onto the operation during 2006, percentage of cow inventory that was brought on as bred heifers, lactating cows, and dry cows, by herd size:

Percent Inventory*

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Cattle Class	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Bred heifers	15.1	(1.7)	15.6	(1.8)	17.3	(1.4)	16.7	(1.1)
Lactating cows	15.1	(1.7)	14.0	(2.2)	10.9	(1.4)	13.1	(1.1)
Dry cows	9.5	(1.1)	3.5	(1.0)	4.2	(2.1)	5.0	(1.0)

*As a percentage of January 1, 2007, cow inventory

The most common herd additions—bred dairy heifers, lactating cows, and dairy bulls—were quarantined on less than 20 percent of operations (14.5, 12.1, and 17.1 percent, respectively). Approximately one in five operations (20.3 percent) that brought cattle onto the operation during 2006 quarantined new additions. For operations that quarantined new additions, the operation average number of days quarantined ranged from 15 to 45 days. One-sixth of cattle brought on were quarantined upon arrival at the operation.

d. For operations that brought the following classes of cattle onto the operation during 2006, percentage of operations that quarantined the following classes of cattle upon arrival, percentage of arriving cattle quarantined, and operation average number of days quarantined:

Cattle Class	Percent Operations	Standard Error	Percent Cattle Quarantined	Standard Error	Operation Average Days Quarantined	Standard Error
Unweaned calves (dairy or beef)	44.2	(8.3)	20.1	(12.6)	42.4	(4.8)
Dairy heifers (weaned but not bred)	23.0	(4.7)	7.1	(2.6)	20.0	(3.6)
Bred dairy heifers	14.5	(2.3)	19.7	(3.5)	22.0	(3.1)
Lactating dairy cows	12.1	(2.4)	17.4	(3.9)	15.6	(2.5)
Dry dairy cows	15.9	(4.8)	39.5	(14.8)	16.5	(4.3)
Beef heifers and cows	30.1	(9.8)	14.7	(7.2)	33.3	(12.1)
Dairy bulls (weaned)	17.1	(2.9)	25.6	(6.3)	25.3	(3.5)
Beef bulls (weaned)	20.3	(6.5)	53.2	(14.6)	31.9	(12.6)
Steers (weaned)	30.0	(9.6)	32.7	(14.5)	40.7	(18.7)
Any cattle	20.3	(1.7)	16.7	(2.4)	31.2	(3.5)

Less than 50 percent of operations that brought cattle onto the operation during 2006 required vaccination of new additions prior to arrival. Cattle were required to be vaccinated against BVD, IBR, and leptospirosis on 42.9, 41.9, and 38.8 percent of all operations, respectively. For all diseases listed below, a lower percentage of small operations required vaccination of new additions prior to arrival compared to medium and large operations.

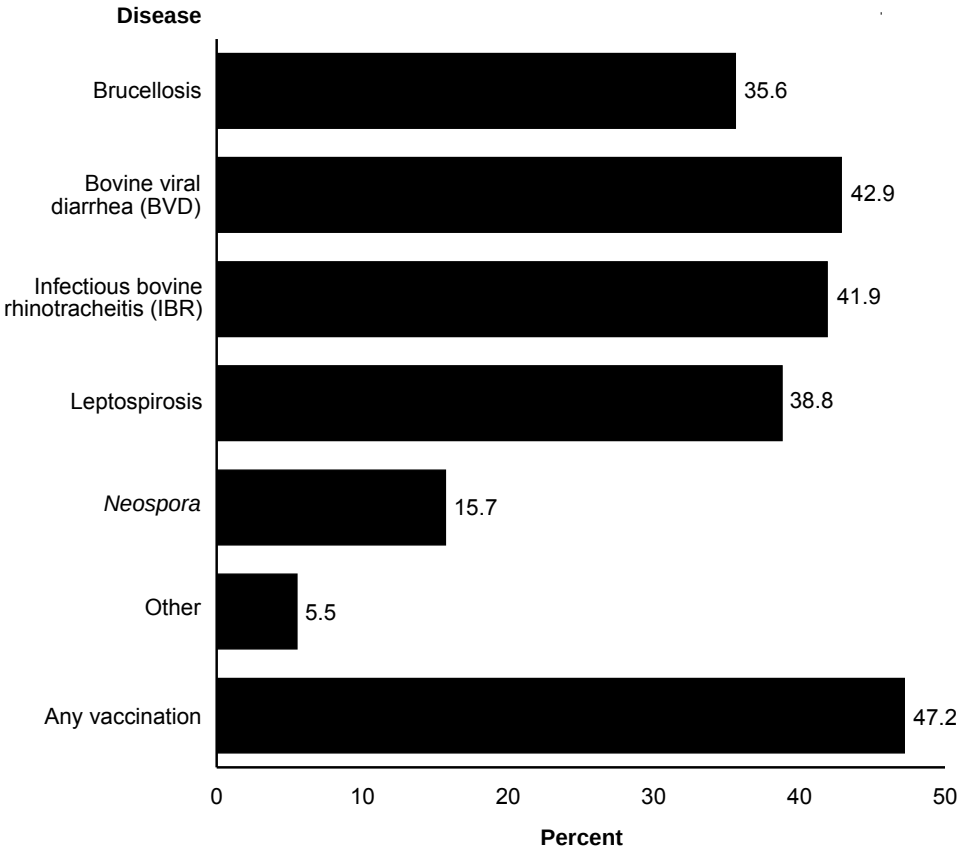
e. For operations that brought any dairy cattle onto the operation during 2006, percentage of operations that normally required vaccination against the following diseases before bringing animals onto the operation, by herd size:

Percent Operations

Herd Size (Number of Cows)

	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Disease	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Brucellosis	28.0	(2.6)	50.2	(3.5)	52.2	(3.9)	35.6	(2.0)
Bovine viral diarrhea (BVD)	34.8	(2.8)	59.9	(3.4)	56.7	(3.7)	42.9	(2.1)
Infectious bovine rhinotracheitis (IBR)	34.2	(2.8)	57.3	(3.4)	57.1	(3.7)	41.9	(2.1)
Leptospirosis	32.0	(2.7)	53.6	(3.4)	48.4	(3.8)	38.8	(2.1)
Neospora	10.8	(1.7)	26.6	(3.1)	22.4	(3.3)	15.7	(1.5)
Other	4.2	(1.1)	8.7	(1.8)	6.5	(1.6)	5.5	(0.9)
Any vaccination	37.7	(2.9)	65.2	(3.3)	68.5	(3.2)	47.2	(2.2)

For Operations That Brought Any Cattle onto the Operation During 2006, Percentage of Operations That Normally Required Vaccination Against the Following Diseases Before Bringing Animals onto the Operation



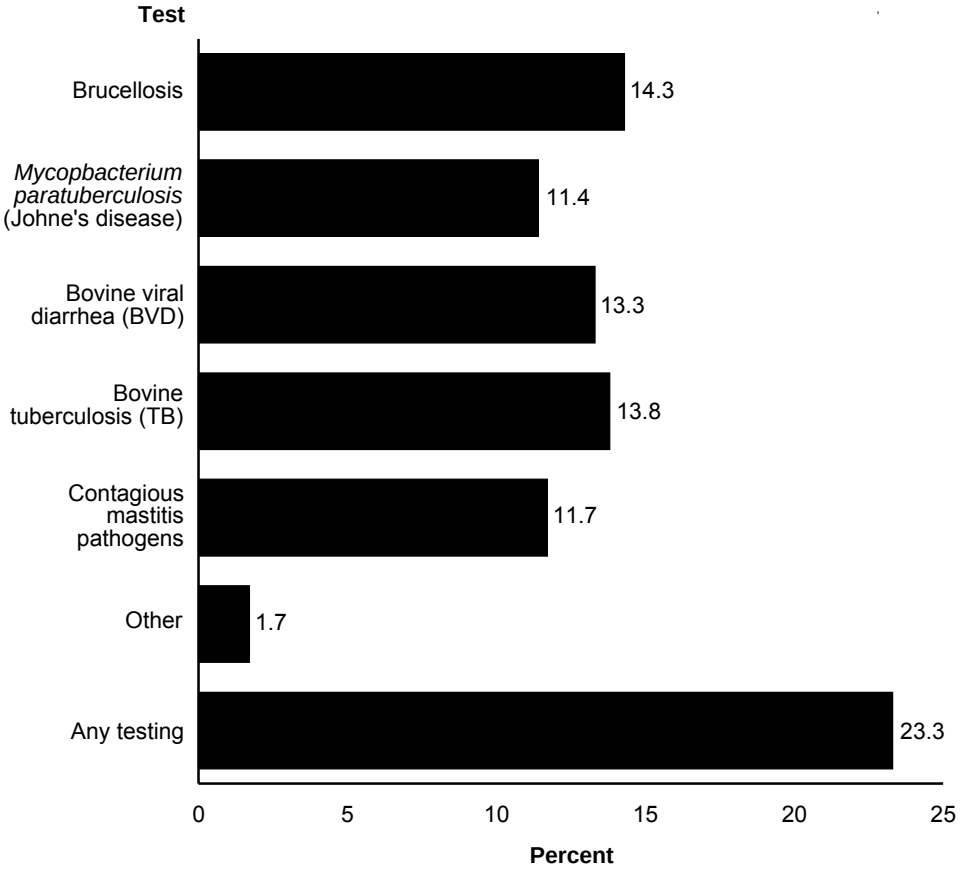
Testing individual animals prior to purchase can reduce the chances of bringing new diseases to an operation. Almost one-fourth of operations (23.3 percent) required testing of animals brought onto the operation.

f. For operations that brought beef or dairy cattle onto the operation during 2006, percentage of operations that tested individual animals brought onto the operation, by testing normally required by operation and by herd size:

Percent Operations

	Herd Size (Number of Cows)							
	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Test	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Brucellosis	11.6	(1.9)	19.8	(2.8)	19.0	(3.0)	14.3	(1.5)
Mycobacterium avium subspecies *paratuberculosis* (Johne's disease)	9.9	(1.8)	16.6	(2.7)	7.2	(1.8)	11.4	(1.4)
Bovine viral diarrhea (BVD)	10.7	(1.8)	19.4	(2.8)	15.8	(2.7)	13.3	(1.4)
Bovine tuberculosis (TB)	12.0	(1.8)	17.8	(2.7)	15.8	(2.3)	13.8	(1.4)
Contagious mastitis pathogens	10.5	(1.8)	13.1	(2.3)	16.3	(3.3)	11.7	(1.4)
Other	1.6	(0.6)	2.2	(1.0)	0.4	(0.2)	1.7	(0.5)
Any testing	20.2	(2.4)	28.2	(3.2)	34.7	(3.8)	23.3	(1.8)

For Operations that Brought any Beef or Dairy Cattle Onto the Operation During 2006, Percentage of Operations That Tested Individual Animals Brought Onto the Operation, by Testing Normally Required by Operation



Approximately 25 percent of operations reported that testing was already performed at the herd of origin or that the disease was not a concern to their operation. “Other” reasons included animals not eligible for testing or were not at risk for disease transmission (such as testing weaned heifers or bulls for contagious mastitis pathogens), owners trusted the herd of origin, owners vaccinated and tested after the animals arrived, owners did not know to vaccinate and/or test, and owners were bringing back their own cattle.

g. For operations that brought beef or dairy cattle onto the operation during 2006 and did not require individual animal testing, percentage of operations by reason for not testing and by disease:

Percent Operations

	Disease									
	Brucellosis		Johne’s Disease		BVD		TB		Contagious Mastitis Pathogens	
Reason	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error
Tests already performed by herd of origin	25.6	(2.0)	22.3	(1.9)	25.9	(2.1)	25.1	(2.0)	23.8	(1.9)
Too expensive to test	4.3	(1.1)	5.9	(1.3)	4.1	(1.0)	4.2	(1.1)	4.3	(1.0)
Not enough time to test	9.5	(1.7)	8.9	(1.5)	9.9	(1.6)	9.4	(1.6)	10.7	(1.7)
Not recommended by veterinarian	7.7	(1.3)	6.8	(1.2)	6.1	(1.2)	7.4	(1.3)	5.7	(1.1)
Too many sources to test	2.5	(0.9)	1.8	(0.6)	2.7	(0.9)	2.3	(0.9)	2.8	(0.9)
Tests not reliable	0.2	(0.2)	4.4	(1.0)	1.0	(0.4)	0.7	(0.3)	0.7	(0.3)
Disease is not a concern to my operation	28.0	(2.3)	28.6	(2.2)	27.5	(2.2)	29.1	(2.3)	27.9	(2.2)
Other	22.2	(1.9)	21.3	(1.9)	22.8	(2.0)	21.8	(1.9)	24.1	(2.0)
Total	100.0		100.0		100.0		100.0		100.0	

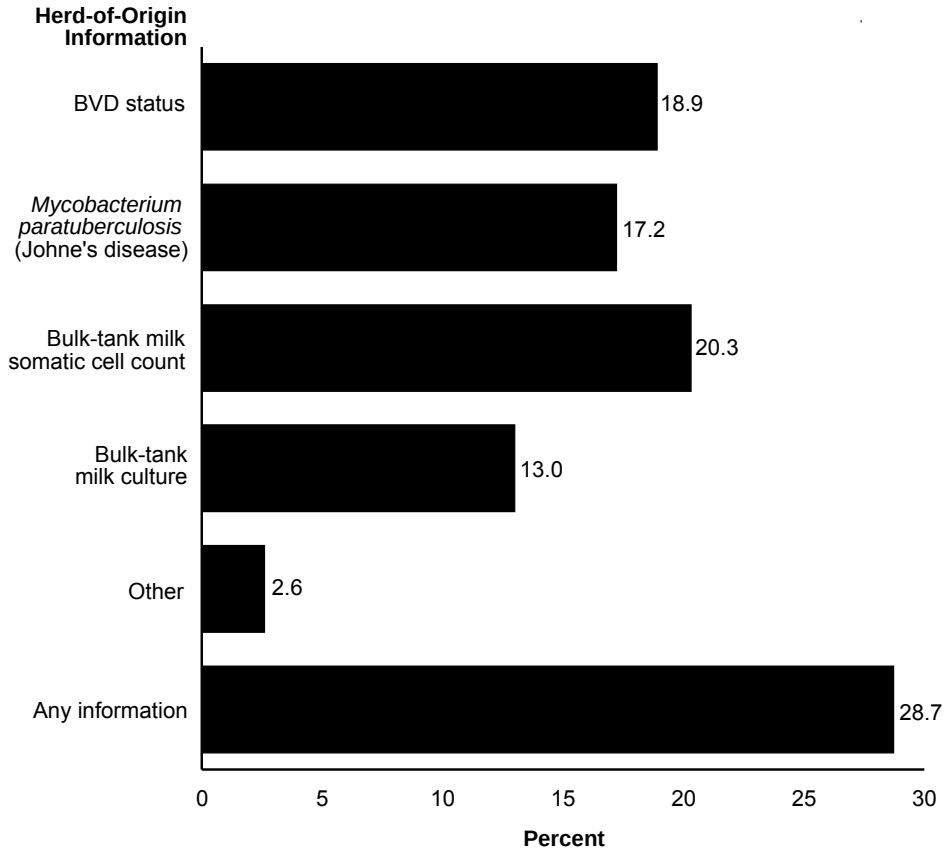
For many diseases, such as Johne's diseaseand contagious mastitis, knowing the status of the herd of origin can be more reliable than testing individual animals. Almost 3 of 10 operations (28.7 percent) required herd-of-origin information on disease status prior to purchasing cattle. The only herd-size difference was in the percentage of operations performing bulk-tank milk cultures for contagious mastitis pathogens, where a lower percentage of small operations performed the culture compared to large operations (10.1 and 20.9 percent, respectively).

h. For operations that brought beef or dairy cattle onto the operation during 2006, percentage of operations by information on herd of origin normally required by operation, and by herd size:

Percent Operations

	Herd Size (Number of Cows)							
	Small (Fewer than 100)		**Medium** (100-499)		**Large** (500 or More)		**All Operations**	
Herd-of-origin Information	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
BVD status	16.7	(2.3)	24.5	(3.0)	19.8	(3.0)	18.9	(1.7)
Mycobacterium avium subspecies *paratuberculosis* (Johne'sdisease) status	16.0	(2.2)	21.9	(2.9)	12.7	(2.3)	17.2	(1.7)
Bulk-tank milk somatic cell count	18.8	(2.4)	24.4	(3.1)	19.8	(2.9)	20.3	(1.8)
Bulk-tank milk culture	10.1	(1.7)	17.8	(2.8)	20.9	(2.9)	13.0	(1.4)
Other	2.8	(1.0)	2.3	(1.2)	1.3	(0.8)	2.6	(0.7)
Any information	25.4	(2.7)	36.0	(3.4)	32.9	(3.3)	28.7	(2.0)

For Operations that Brought Beef or Dairy Cattle Onto the Operation During 2006, Percentage of Operations by Information on Herd-of-Origin Normally Required by Operation



The most common reason given for not requiring herd-of-origin information on disease status was that the disease was not a concern to the operation (approximately 30 percent of operations). Interestingly, mastitis was the most prevalent disease causing illness in cows, the second highest reported reason for removing cows from the herd, and the second highest reported cause of cattle death during 2006. A percentage of these mastitis cases would be due to contagious pathogens. Infertility, which could be associated with BVD, was the third most prevalent disease on operations, and reproductive problems, such as infertility, was the most common reason that cows were permanently removed from the operation. Close to 25 percent of operations listed “other” as the reason for not evaluating herd-of-origin information. Other reasons for not evaluating herd-of-origin information were similar to reasons for not testing incoming cattle: trusted the herd of origin, owned the herd of origin, would address disease issues after cattle arrived, and didn’t know to test or inquire about diseases.

i. For operations that brought beef or dairy cattle onto the operation during 2006 and did not require herd-of-origin information on the status of the following diseases and bulk-tank milk, percentage of operations by reason for not normally requiring information:

Percent Operations

Herd-of-Origin Information

	BVD Status		Johne’s Disease Status		Bulk-Tank Milk Somatic Cell Count		Bulk-Tank Milk Culture	
Reason Not Required	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**	**Pct.**	**Std. Error**
Tests already performed by herd of origin	18.6	(1.8)	15.2	(1.6)	15.2	(1.6)	15.7	(1.6)
Too expensive to test	3.9	(1.1)	4.4	(1.2)	3.2	(1.0)	3.8	(1.1)
Not enough time to test	9.3	(1.6)	9.3	(1.5)	9.2	(1.6)	10.6	(1.6)
Not recommended by veterinarian	8.1	(1.4)	8.9	(1.4)	8.6	(1.4)	8.4	(1.4)
Too many sources to test	3.0	(1.0)	3.0	(1.0)	3.5	(1.1)	3.1	(1.0)
Tests not reliable	1.1	(0.4)	3.3	(0.9)	1.5	(0.5)	1.4	(0.5)
Disease is not a concern to the operation	30.5	(2.4)	31.6	(2.3)	30.2	(2.3)	30.0	(2.3)
Other	25.5	(2.2)	24.3	(2.1)	28.6	(2.2)	27.0	(2.1)
Total	100.0		100.0		100.0		100.0	

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 objective of the needs assessment for the NAHMS Dairy 2007 study was to collect information from U.S. dairy producers and other dairy specialists about what they perceived to be the most important dairy 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 dairy organizations. Information was collected via focus groups and through a Needs Assessment Survey.

Focus group teleconferences and meetings were held to help determine the focus of the study.

Teleconference, March 30, 2006
National Johne's Working Group

Louisville, KY, April 2, 2006
National Johne's Working Group
National Institute for Animal Agriculture

Louisville, KY, April 3, 2006
National Milk Producers Federation
Animal Health Committee

Teleconference, December 15, 2006
Bovine Alliance on
Management and Nutrition

In addition, a 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 early February through late April 2006. The survey was promoted via electronic newsletters, magazines, and Web sites. Organizations/magazines promoting the study included Vance Publishing's "Dairy Herd Management, Dairy Alert", "Dairy Today", "Hoard's Dairyman", NMC, "Journal of the American Veterinary Medical Association", and the American Association of Bovine Practitioners. E-mail messages were also sent to cooperative members of the National Milk Producers Federation as well as State and Federal personnel asking for input and identifying the online site. A total of 313 people completed the questionnaire.

Universities/extension personnel accounted for 23 percent of respondents, while producers accounted for 22 percent, and veterinarians/consultants accounted for another 20 percent.

Fort Collins, CO, May 18, 2006
CEAH Focus Group meeting

Draft objectives for the Dairy 2007 study, using input from teleconferences, face-to-face meetings, and the online survey, were drafted prior to the CEAH focus group meeting. Attendees included producers, university/extension personnel, veterinarians, and government personnel. The day-long meeting culminated in the formulation of eight objectives for the study:

- Describe trends in dairy cattle health and management practices,
- Evaluate management factors related to cow comfort and removal rates,
- Describe dairy-calf health and nutrition from birth to weaning and evaluate heifer disease prevention practices,
- Estimate the prevalence of herds infected with bovine viral diarrhea virus (BVD),
- Describe current milking procedures and estimate the prevalence of contagious mastitis pathogens,
- Estimate the herd-level prevalence and associated costs of *Mycobacterium avium* subspecies *paratuberculosis* (Johne's disease),
- Describe current biosecurity practices and determine producer motivation for implementing or not implementing biosecurity practices, and
- Determine the prevalence of specific food-safety pathogens and describe antimicrobial resistance patterns.

B. Sampling and Estimation

1. State selection

The preliminary selection of States to be included in the study was done in February 2006, using the National Agricultural Statistics Service (NASS) January 27, 2006, "Cattle Report". A goal for NAHMS national studies is to include States that account for at least 70 percent of the animals and producer population in the United States. The initial review of States identified 16 major States representing 82.0 percent of the milk cow inventory and 79.3 percent of the operations with milk cows (dairy herds). The States were: California, Idaho, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, New Mexico, New York, Ohio, Pennsylvania, Texas, Vermont, Washington, and Wisconsin.

A memo identifying these 16 States was provided in March 2006 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. Virginia expressed interest in participating and was included, bringing the total number of participating States to 17.

2. Operation selection

The list sampling frame was provided by NASS. Within each State a stratified random sample was selected. The size indicator was the number of milk cows for each operation. NASS selected a sample of dairy producers in each State for making their January 1 cattle estimates. The list sample from the January 2006 survey was used as the screening sample. Those producers in the 17 States reporting one or more milk cows on January 1, 2006, were included in the sample for contact in January 2007.

3. Population inferences

a. Phase I: General Dairy Management Report

Inferences cover the population of dairy producers with at least 1 milk cow in the 17 participating States. As of January 1, 2007, these States accounted for 82.5 percent (7,533,000 head) of milk cows and 79.5 percent (59,740) of operations with milk cows in the United States. (See Appendix II for respective data on individual States.) All respondent data were statistically weighted to allow the sample to reflect the population from which it was 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 Dairy Management Report

From January 1-31, 2007, NASS enumerators administered the General Dairy Management Report. The interview took slightly over 1 hour.

D. Data Analysis

1. Phase I: Validation—General Dairy Management Report

Initial data entry and validation for the General Dairy Management Report were performed in 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 catch-all parameter, but there are many ways to define and calculate response rates. Therefore, the table below presents an evaluation based upon a number of measurement parameters, which are defined with an “x” in categories that contribute to the measurement.

1. Phase I: General Dairy Management Report

A total of 3,554 operations were selected for the survey. Of these operations, 3,304 (93.0 percent) were contacted. There were 2,519 operations that provided usable inventory information (70.9 percent of the total selected and 76.2 percent of those contacted). In addition, there were 2,194 operations (61.7 percent) that provided “complete” information for the questionnaire. Of operations that provided complete information and were eligible to participate in the VMO phase of the study (2,067 operations), 1,077 (52.1 percent) consented to be contacted for consideration/discussion about further participation.

			Measurement Parameter		
Response Category	**Number Operations**	**Percent Operations**	**Contacts**	**Usable[1]**	**Complete[2]**
Survey complete and VMO consent	1,077	30.3	x	x	x
Survey complete, refused VMO consent	990	27.9	x	x	x
Survey complete, ineligible[4] for VMO	127	3.6	x	x	x
No dairy cows on January 1, 2007	214	6.0	x	x	
Out of business	111	3.1	x	x	
Out of scope	6	0.2			
Refusal of GDMR	785	22.1	x		
Office hold (NASS elected not to contact)	126	3.5			
Inaccessible	118	3.3			
Total	3,554	100.0	3,304	2,519	2,194
Percent of total operations			93.0	70.9	61.7
Percent of total operations weighted[3]			94.0	74.1	59.6

[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 for at least one site.
[3] Weighted response—the rate was calculated using the initial selection weights.
[4]Ineligible—less than 30 head of milk cows on January 14, 2007.

Appendix I: Sample Profile

A. Responding Operations

1. Total inventory, by herd size

Herd Size (Total Inventory)	**Number of Responding Sites**
Less than 100	1,028
100 to 499	691
500 or more	475
Total	2,194

2. Number of responding operations, by region

Region	**Number of Responding Sites**
West	426
East	1768
Total	2,194

Appendix II: U.S. Milk Cow Population and Operations

Number of milk cows on January 1, 2007*

Region	State	Number of Milk Cows (Thousand Head)		Number of Operations 2006	
		Milk cows on operations with 1 or more head	Milk cows on operations with 30 or more head	Operations with 1 or more head	Operations with 30 or more head
West	California	1,790	1,788.2	2,300	1,950
	Idaho	502	501.0	800	620
	New Mexico	360	359.3	450	180
	Texas	347	344.2	1,300	660
	Washington	235	234.3	790	540
	Total	3,234	3,227.0	5,640	3,950
East	Indiana	166	154.4	2,100	1,150
	Iowa	210	203.7	2,400	1,870
	Kentucky	93	86.5	2,000	1,180
	Michigan	324	317.5	2,700	1,910
	Minnesota	455	441.3	5,400	4,800
	Missouri	114	108.3	2,600	1,400
	New York	628	612.3	6,400	5,100
	Ohio	274	252.1	4,400	2,500
	Pennsylvania	550	536.3	8,700	7,000
	Vermont	140	137.2	1,200	1,060
	Virginia	100	97.5	1,300	820
	Wisconsin	1,245	1,213.9	14,900	12,800
	Total	4,299	4,161.0	54,100	41,590
Total (17 States)		7,533	7,388.0	59,740	45,540
Percentage of U.S.		82.5	82.5	79.5	84.6
Total U.S. (50 States)		9,129.0	8,955.5	75,140	53,860

*Source: NASS Cattle report, February 2, 2007, and NASS Farms, Land in Farms, and Livestock Operations 2006 Summary report, February 2007. An operation is any place having one or more head of milk cows, excluding cows used to nurse calves, on hand at any time during the year.

Appendix III: Study Objectives and Related Outputs

1. Describe trends in dairy cattle health and management practices
- Part II: Changes in the United States Dairy Cattle Industry 1991-2007, expected December 2008
- Part V: Changes in Dairy Cattle Health and Management in the United States, 1991-2007, expected May 2008

2. Evaluate management factors related to cow comfort and removal rates
- Dairy Facilities and Cow Comfort on U.S Dairy Operations, 2007 interpretive report, expected spring 2008
- Info sheets, expected spring 2008

3. Describe dairy calf health and nutrition from birth to weaning and evaluate heifer disease prevention practices
- **Part I: Reference of Dairy Cattle Health and Management Practices in the United States, 2007, October 2007**
- Colostrum Management info sheet, October 2007
- Off-Site Heifer Raising info sheet, October 2007
- Part IV: Reference of Dairy Cattle Health and Management Practices in the United States, 2007, expected April 2008
- Calf Health and Management Practices on U.S. Dairy Operations, 2007 interpretive report, expected spring 2008
- Additional info sheets, expected spring 2008

4. Estimate the prevalence of herds infected with bovine viral diarrhea virus (BVD)
- Info sheets, expected spring 2008.

5. Describe current milking procedures and estimate the prevalence of contagious mastitis pathogens
- Part III: Reference of Dairy Cattle Health and Management Practices in the United States, 2007, expected February 2008.
- Info sheets, expected spring 2008.

6. Estimate the herd-level prevalence and associated costs of *Mycobacterium avium* subspecies *paratuberculosis*
- Info sheets, expected spring 2008.

7. Describe current biosecurity practices and determine producer motivation for implementing or not implementing biosecurity practices
- **Part I: Reference of Dairy Cattle Health and Management Practices in the United States, 2007, October 2007**

- Part III: Reference of Dairy Cattle Health and Management Practices in the United States, 2007, expected February 2008
- Interpretive report and info sheets, expected spring 2008

8. Determine the prevalence of specific food-safety pathogens and describe antimicrobial resistance patterns
- Info sheets, expected spring 2008