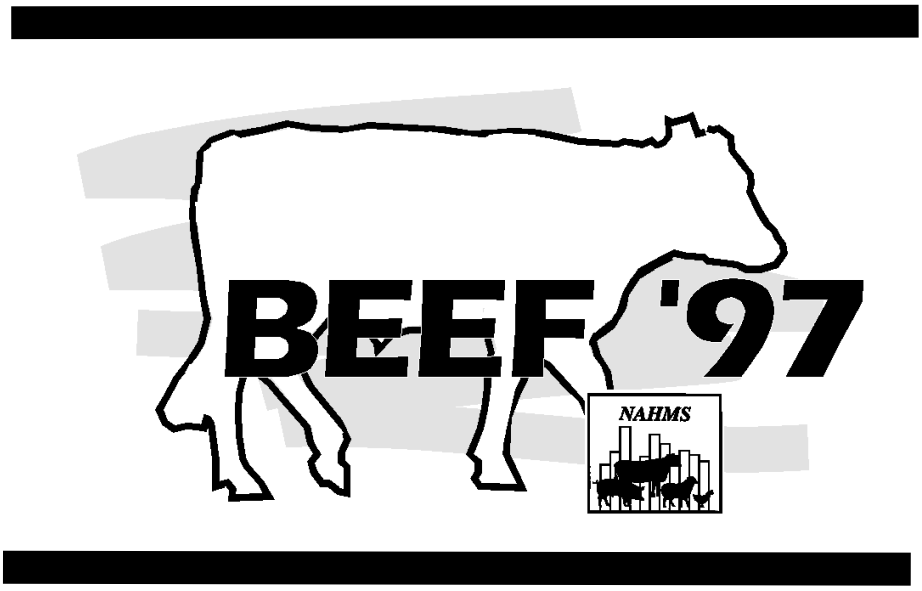
United States
Department
of Agriculture

Animal and
Plant Health
Inspection
Service

**Veterinary
Services**

Part 1: Reference of 1997 Beef Cow-Calf Management Practices

National Animal Health Monitoring System



June 1997

Acknowledgements

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

The Beef ‘97 study was a cooperative effort between State and Federal agricultural statisticians, animal health officials, university researchers, and extension personnel. We want to thank the National Agricultural Statistics Service (NASS) enumerators and State and Federal Veterinary Medical Officers (VMO’s) and Animal Health Technician’s (AHT’s) who visited the operations and collected the data for their hard work and dedication to the National Animal Health Monitoring System (NAHMS).

The roles of the producer, Area Veterinarian in Charge (AVIC), NAHMS Coordinator, VMO, AHT, and NASS enumerator were critical in providing quality data for Beef ‘97 reports. Thanks also to the staff at the Centers for Epidemiology and Animal Health (CEAH) for their efforts in generating timely reports from Beef ‘97 data. All participants are to be commended for their efforts, particularly the producers whose voluntary efforts made the study possible.

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Dr. Nora Wineland, NAHMS Program Leader

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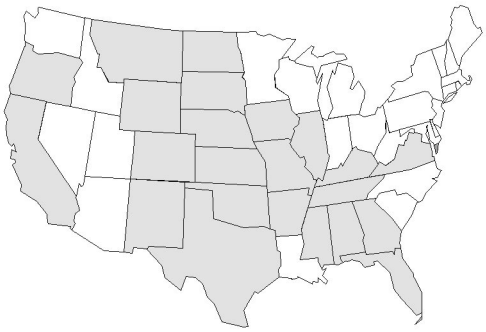
Introduction

The National Animal Health Monitoring System's (NAHMS) Beef '97 study was designed to provide both participants and the industry with information on the nation's cow-calf population for education and research. NAHMS is sponsored by the USDA:APHIS:Veterinary Services (VS).

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

The USDA's National Agricultural Statistics Service (NASS) collaborated with VS to select a statistically-valid sample yielding 2,713 producers from 23 states for Beef '97 (see map at right). The 23-state target population represented 85.7 percent of U.S. beef cows on January 1, 1997, and 77.6 percent of U.S. beef operations.

Beef '97 Participating States



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Part I: Reference of 1997 Beef Cow-Calf Management Practices is the first in a series of releases documenting Beef '97 study results. NASS enumerators collected data for this report via a questionnaire administered on-farm from December 30, 1996, through February 3, 1997.

Results of Beef '97, NAHMS' first beef cow-calf study (the 1993 NAHMS Beef Cow/Calf Health and Productivity Audit), and other NAHMS studies are accessible on the World Wide Web at *http://www.aphis.usda.gov/vs/ceah/cahm* (menu choices for beef information: National Animal Health Monitoring System and Beef Cow/Calf or Beef Feedlot).

Discussions of selected topics are also accessible on the Internet through *gopher.aphis.usda.gov* (menu choices: APHIS Information, Animal Health Information; Animal Health Monitoring, Risk Assessments, and Emerging Issues).

For questions about this report, please contact:

Centers for Epidemiology and Animal Health
USDA:APHIS:VS, attn. NAHMS
555 South Howes
Fort Collins, CO 80521
Telephone: (970) 490-8000
Internet: NAHMS_INFO@aphis.usda.gov

Web Page: http//www.aphis.usda.gov/vs/ceah/cahm

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

Terms Used in This Report

Animal average: The average value for all animals; the reported value for each operation multiplied by the number of animals on that operation is summed over all operations and divided by the number of animals on all operations. This way, the result is adjusted for the number of animals on each operation.

Calf crop percent: Cows calving divided by cows exposed (adjusted for inventory changes).

Beef cow: Female that has calved at least once.

Beef heifer: Female not yet calved.

Herd size: Size groupings based on number of beef cows on hand January 1, 1997.

N/A: Not applicable.

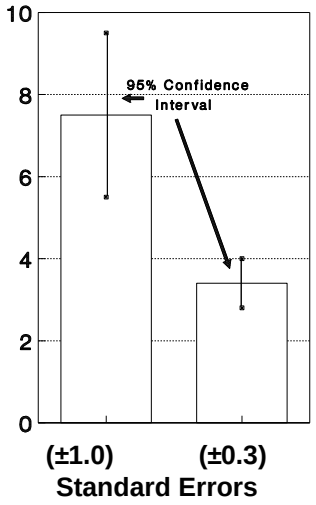
Operation average: A single value for each operation is summed over all operations reporting divided by the number of operations reporting.

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

Physical contact: Animals occupying the same housing unit or with nose-to-nose contact or sniffing/touching/licking each other through a fence.

Population estimates: Averages and proportions weighted to represent the population. For this report, the reference population was all cow-calf operations in the 23 selected States. Most of the estimates in this report are provided with a measure of variability called the *standard error* and denoted by (±). Chances are 95 out of 100 that the interval created by the estimate plus or minus two standard errors will contain the true population value. In the example at right, an estimate of 7.5 with a standard error of ±1.0 results in a range of 5.5 to 9.5 (two times the standard error above and below the estimate). The second estimate of 3.4 shows a standard error of ±0.3 and results in a range of 2.8 and 4.0. Most estimates in this report are rounded to the nearest tenth.

Examples of 95% Confidence Intervals



Regions (also see map on page 14):

West: California, Colorado, Montana, New Mexico, Oregon, and Wyoming.
Northcentral: Kansas, Nebraska, North Dakota, and South Dakota.
Southcentral: Oklahoma and Texas.
Central: Arkansas, Illinois, Iowa, and Missouri.
Southeast: Alabama, Florida, Georgia, Kentucky, Mississippi, Tennessee, and Virginia.

Sample profile: Information that describes characteristics of the operations from which Beef '97 data were collected.

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Section I: Population Estimates

A. Beef Herd Information and Management Practices

1. Record-keeping systems

These data indicate that most operations (81.3 percent) maintained some sort of records for their beef herds. Most of these records were hand written. Use of the computer (on operation or off operation) was much more common in larger operations. Still, only about half of the largest operations, those with 300 or more beef cows, used a computer (on or off the operation) for record keeping.

a. Percent of operations by record-keeping systems used and herd size:

	Percent Operations Number Cows									
System	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Hand-written records	75.7	(±2.3)	87.5	(±1.6)	90.3	(±1.5)	95.6	(±1.5)	79.1	(±1.7)
Computer located on operation	7.7	(±1.1)	11.4	(±1.6)	21.6	(±2.1)	44.6	(±4.4)	10.2	(±0.9)
Computer located off operation	2.9	(±0.7)	3.6	(±1.0)	7.1	(±1.3)	12.0	(±2.5)	3.5	(±0.6)
Computer located on OR off operation	10.2	(±1.3)	14.1	(±1.8)	26.0	(±2.3)	50.5	(±4.4)	13.0	(±1.0)
Any of the above	77.5	(±2.3)	90.8	(±1.3)	92.3	(±1.4)	99.3	(±0.3)	81.3	(±1.7)

2. Primary reason for cow-calf operation

The beef herd was the primary source of income on only 14 percent of all operations represented by the Beef ‘97 study. As would be expected, the percentage was higher for larger operations (78.9 percent) than the smallest operations (less than 50 beef cows, 5.5 percent). Over one-fifth (21.8 percent) of the smallest operations had beef cows for some reason other than as a source of income such as pleasure or excess forage control.

a. Percent of operations by reason for operating the cow-calf operation and herd size:

	Percent Operations Number Cows									
Reason	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Primary source of income	5.5	(±1.0)	26.4	(±2.2)	49.6	(±2.9)	78.9	(±3.1)	14.0	(±0.9)
Supplemental source of income	72.7	(±2.4)	69.5	(±2.4)	47.1	(±2.9)	16.8	(±2.6)	68.8	(±1.8)
Other reason	21.8	(±2.3)	4.1	(±0.9)	3.3	(±1.0)	4.3	(±1.9)	17.2	(±1.7)
Total	100.0		100.0		100.0		100.0		100.0	

3. Labor inputs

Over all cow-calf operations, the operators devoted approximately one-third (34.5 percent) of their work time to managing the beef herd. (Note: Operation average percent is the average of the value [weight, number, percentage, etc.] reported by each participant.) This time would exclude that spent in other enterprises on the farm such as haying, other livestock management (e.g., stockers), or other cropping activities.

a. Operation average percent of operator's work time devoted to cow-calf operation by herd size:

Operation Average Percent									
Number Cows									
Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
29.1	(±1.5)	42.9	(±1.6)	55.8	(±1.7)	78.0	(±2.1)	34.5	(±1.2)

The operator was able to devote 100 percent of time to the beef cow-calf operation on very few operations (10.2 percent). As would be expected, more of the operators with larger herds spent all of their work time with the cow herd; although even in these larger operations, less than half (41.9 percent) of the operators were able to spend all of their work time managing the beef cow herd.

b. Percent of operations by percent of operator's work time devoted to cow-calf operation by herd size:

	Percent Operations									
	Number Cows									
Percent Time	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Less than 25.0	56.7	(±2.6)	26.9	(±2.7)	17.0	(±2.0)	5.7	(±1.5)	47.7	(±2.0)
25.0 - 49.9	21.1	(±1.8)	32.6	(±2.6)	21.2	(±2.5)	8.4	(±2.3)	22.6	(±1.4)
50.0 - 74.9	10.8	(±1.8)	22.1	(±2.1)	27.0	(±2.7)	15.6	(±2.9)	14.1	(±1.4)
75.0 - 99.9	3.1	(±0.8)	7.6	(±1.4)	16.6	(±1.9)	28.4	(±4.1)	5.4	(±0.7)
100.0	8.3	(±1.5)	10.8	(±1.6)	18.2	(±2.2)	41.9	(±4.3)	10.2	(±1.2)
Total	100.0		100.0		100.0		100.0		100.0	

4. Sources of information

The top three sources of information cited by producers as "very important" were, in descending order: 1) veterinarians, 2) Extension Service/universities/vo-ag instructors, and 3) other producers. Nearly two-thirds (60.8 percent) of all producers indicated that the veterinarian was a 'very important' source of information, the highest of any category. Only 8.2 percent of producers rated the veterinarian as 'not important' to their operation, the lowest of any category.

a. Percent of operations by importance of the following information sources for operating the cow-calf operation:

	Percent Operations						
Source	Not Important	Standard Error	Somewhat Important	Standard Error	Very Important	Standard Error	Total
Extension Service/universities/ Vo-Ag instructors	32.4	(±1.8)	43.5	(±1.9)	24.1	(±1.8)	100.0
Veterinarians	8.2	(±1.1)	31.0	(±1.9)	60.8	(±2.0)	100.0
Beef magazines or agricultural journals	30.7	(±2.0)	53.9	(±2.0)	15.4	(±1.3)	100.0
Producer associations	58.0	(±1.9)	32.2	(±1.7)	9.8	(±1.1)	100.0
Other producers	30.4	(±1.9)	46.9	(±2.0)	22.7	(±1.6)	100.0
Salespersons	41.7	(±2.0)	42.3	(±2.0)	16.0	(±1.3)	100.0
Consultants	77.5	(±1.6)	16.1	(±1.5)	6.4	(±0.8)	100.0
Radio, television, or newspapers	55.5	(±2.0)	36.5	(±1.9)	8.0	(±1.2)	100.0

While only 6.4 percent of operations considered consultants to be very important as a source of information for managing the cow-calf herd, more larger operations (14.4 percent) than small operations (5.6 percent) perceived the high value of this information source. Support for radio, television, and newspapers as a very important information source seemed to decline as herd size increased. Support for other categories of information sources being very important was relatively consistent across herd sizes.

b. Percent of operations where the following sources of information were ***very important*** for operating the cow-calf operation by herd size:

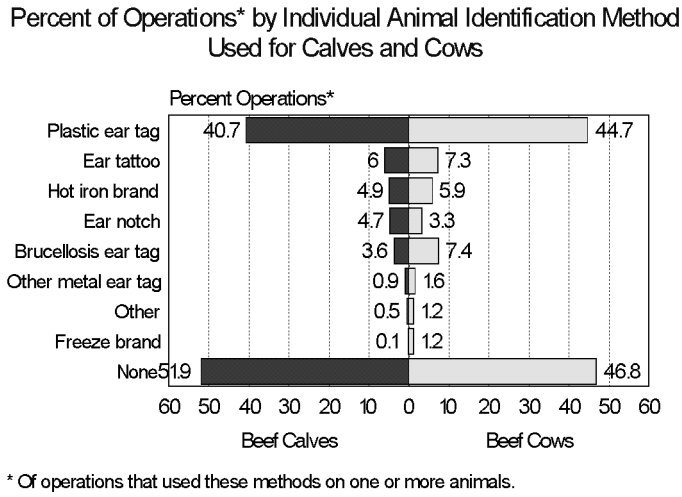
	Percent Operations									
	Number Cows									
Source	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Extension Service/universities/ Vo-Ag instructors	24.4	(±2.4)	23.6	(±2.9)	23.1	(±2.8)	19.1	(±3.2)	24.1	(±1.8)
Veterinarians	59.6	(±2.5)	64.2	(±2.9)	64.8	(±3.0)	63.7	(±4.3)	60.8	(±2.0)
Beef magazines or agricultural journals	14.7	(±1.7)	18.3	(±2.1)	17.2	(±1.9)	14.0	(±2.8)	15.4	(±1.3)
Producer associations	8.9	(±1.5)	13.5	(±1.8)	11.4	(±1.7)	9.4	(±2.3)	9.8	(±1.1)
Other producers	22.7	(±2.1)	21.9	(±2.1)	24.7	(±2.6)	22.2	(±3.5)	22.7	(±1.6)
Salespersons	15.7	(±1.7)	17.9	(±2.1)	15.5	(±1.7)	17.5	(±3.2)	16.0	(±1.3)
Consultants	5.6	(±1.0)	7.7	(±1.2)	9.4	(±1.5)	14.4	(±2.9)	6.4	(±0.8)
Radio, television, or newspapers	8.8	(±1.5)	5.2	(±1.0)	6.9	(±1.3)	3.9	(±1.7)	8.0	(±1.2)

5. Animal identification

The majority of operations (51.9 percent) used no individual calf identification. However the use of some form of individual calf identification was much more common on larger operations (78.1 percent) than for the smallest operations (40.8 percent). Overall, most of those that did use some individual identification used plastic ear tags (40.7 percent) and this was true for each herd size category. The next most frequently used form of individual identification of calves was ear tattoos (6.0 percent). Over one-fifth (21.3 percent) of the largest herds used hot iron brands for individual identification of calves. In collecting the data, it was stressed to producers that individual identification meant that each animal was given a unique number or identifying mark rather than all animals having the same identifier (herd identification). This number was much smaller than the 89.8 percent of large operations that reported using hot iron brands as a herd identification tool (see 6.a.). (Note: operations may have used more than one form of individual identification, so columns may not sum to 100.)

a. Percent of operations that used the following ***individual calf*** identification methods by herd size:

	Percent Operations									
	Number Cows									
Method	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Hot iron brand	2.8	(±0.5)	7.7	(±1.2)	14.2	(±2.1)	21.3	(±3.8)	4.9	(±0.5)
Freeze brand	0.0	(±0.0)	0.2	(±0.1)	1.0	(±0.4)	1.6	(±1.4)	0.1	(±0.1)
Ear notch	3.2	(±0.6)	6.2	(±1.4)	12.9	(±2.2)	10.6	(±2.3)	4.7	(±0.6)
Microchip transponder/ Electronic ID	0.0	(±0.0)	0.1	(±0.1)	0.0	(±0.0)	0.0	(±0.0)	0.0	(±0.0)
Brucellosis ear tag	2.9	(±1.0)	6.0	(±1.3)	4.5	(±1.2)	13.1	(±3.2)	3.6	(±0.8)
Other metal ear tag	0.6	(±0.2)	1.5	(±0.5)	2.4	(±0.8)	3.7	(±1.9)	0.9	(±0.2)
Plastic ear tag	35.1	(±2.5)	54.3	(±2.9)	60.5	(±3.1)	61.4	(±4.2)	40.7	(±1.9)
Ear tattoo	5.4	(±1.3)	7.3	(±1.4)	7.6	(±1.2)	13.1	(±3.5)	6.0	(±1.0)
Other method	0.5	(±0.2)	0.2	(±0.1)	0.3	(±0.2)	0.9	(±0.6)	0.5	(±0.1)
None	59.2	(±2.5)	34.4	(±2.8)	26.7	(±3.0)	21.9	(±3.2)	51.9	(±1.9)



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Overall, 52.0 percent of the beef calves born alive in 1996 were born on operations that used plastic ear tags for individual calf identification. Over one-third (35.3 percent) of the calves born alive were born on operations that used no individual calf identification.

b. Percent of beef calves born alive during 1996 on operations that used the following ***individual calf*** identification methods on one or more calves:

Method	Percent Beef Calves	Standard Error
Hot iron brand	12.9	(±1.7)
Freeze brand	0.6	(±0.3)
Ear notch	8.5	(±1.0)
Microchip transponder/Electronic ID	0.0	(±0.0)
Brucellosis ear tag	6.3	(±1.0)
Other metal ear tag	1.8	(±0.4)
Plastic ear tag	52.0	(±1.8)
Ear tattoo	7.6	(±0.9)
Other method	0.6	(±0.2)
None	35.3	(±1.7)

More operations (53.2 percent) used some form of individual cow identification than used some form of individual calf identification (48.1 percent) (see 5.a. above). Use of individual cow identification was related to herd size with more larger herds (83.8 percent) than small herds (45.4 percent) applying some individual identification to cows. Again the most common form of individual cow identification used was plastic ear tags (44.7 percent). Less than 8 percent of operations used each of the other forms of individual cow identification. More frequently used on large operations were hot iron brands (23.1 percent of operations), brucellosis ear tags (21.1 percent of operations), and ear tattoos (14.6 percent of operations). In this case for brucellosis ear tags to be considered an individual form of identification, they had to be recorded and linked to an individual cow.

c. Percent of operations that used the following ***individual cow*** identification methods by herd size:

	Percent Operations									
	Number Cows									
Method	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Hot iron brand	3.8	(±0.6)	8.1	(±1.2)	16.5	(±2.2)	23.1	(±3.6)	5.9	(±0.6)
Freeze brand	0.9	(±0.4)	1.0	(±0.4)	2.8	(±0.9)	6.9	(±2.3)	1.2	(±0.3)
Ear notch	2.3	(±0.6)	4.9	(±1.3)	8.6	(±2.0)	7.5	(±2.0)	3.3	(±0.5)
Microchip transponder/ Electronic ID	0.0	(±0.0)	0.1	(±0.1)	0.0	(±0.0)	0.0	(±0.0)	0.0	(±0.0)
Brucellosis ear tag	5.3	(±1.2)	12.4	(±1.8)	14.1	(±2.1)	21.1	(±4.1)	7.4	(±0.9)
Other metal ear tag	1.4	(±0.6)	1.4	(±0.5)	2.8	(±1.1)	2.4	(±1.1)	1.6	(±0.4)
Plastic ear tag	38.5	(±2.5)	58.4	(±2.9)	67.3	(±2.9)	68.6	(±3.7)	44.7	(±1.9)
Ear tattoo	6.4	(±1.4)	9.5	(±1.6)	9.9	(±1.4)	14.6	(±3.8)	7.3	(±1.1)
Other method	0.9	(±0.2)	1.5	(±0.6)	2.5	(±0.9)	3.5	(±1.4)	1.2	(±0.2)
None	54.6	(±2.6)	28.0	(±2.8)	20.3	(±2.5)	16.2	(±2.6)	46.8	(±2.0)

Since the use of identification for individual cows was more common on larger operations (see 5.c. above), it is not surprising that 69.8 percent of the cows represented by the study were on operations that used some form of individual cow identification. Over half (56.8 percent) of the cows were on operations that used plastic ear tags for cows.

d. Percent of beef cows on January 1, 1997, on operations that used the following ***individual cow*** identification methods on one or more cows:

Method	Percent Cows	Standard Error
Hot iron brand	14.0	(±1.5)
Freeze brand	2.7	(±0.5)
Ear notch	6.2	(±1.1)
Microchip transponder/Electronic ID	0.0	(±0.0)
Brucellosis ear tag	13.1	(±1.4)
Other metal ear tag	1.9	(±0.4)
Plastic ear tag	56.8	(±1.7)
Ear tattoo	9.6	(±1.0)
Other method	2.2	(±0.4)
None	30.2	(±1.5)

The average percent of cows with some form of individual identification (average of each operation's percentage) was 49.4 percent. Accounting for the number of beef cows on each operation, the percent of all beef cows with some form of individual identification was 65.4 percent. This difference is due to large operations, which account for the majority of beef cows, using individual identification more frequently than small operations, which account for the majority of operations.

e. Operation average percent of beef cows and percent of beef cows that had some form of ***individual cow*** identification by herd size:

	Percent Number Cows									
Measure	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Operation average percent	41.9	(±2.4)	67.5	(±2.7)	75.1	(±2.9)	79.7	(±2.9)	49.4	(±1.9)
Percent of cows	47.1	(±2.2)	67.4	(±2.6)	73.4	(±3.7)	76.9	(±3.3)	65.4	(±1.5)

When cow-calf operations opted to individually identify cows, they tended to identify all cows on the operation. Very few operations (8.7 percent) identifying some beef cows reported less than 100 percent were individually identified.

f. Percent of operations by percent of beef cows with individual identification:

Percent Beef Cows with individual Identification	Percent Operations	Standard Error
0	46.8	(±2.0)
0.1-24.9	1.1	(±0.4)
25.0-49.9	1.8	(±0.5)
50.0-74.9	2.7	(±0.6)
75.0-99.9	3.1	(±0.8)
100.0	44.5	(±1.8)
Total	100.0	

6. Herd identification

Herd identification is becoming increasingly important as quality assurance efforts by the industry progress. Nearly half (49.0 percent) of operations used no herd identification (each animal in the herd has the same identifier). Of those that did use some herd identification, approximately equal proportions used plastic ear tags (27.0 percent) and hot iron brands (26.6 percent). Relatively few operations (less than 10 percent) used other forms of herd identification. Use of herd identification was highly related to herd size. Virtually all (98.9 percent) of large operations (300 or more cows) used some form of herd identification compared to only 42.5 percent of the smallest operations (less than 50 cows). The large operations tended to use hot iron brands (89.8 percent of operations), plastic ear tags (39.0 percent), or ear notches (27.4 percent) for herd identification. (Note: operations may have used more than one form of herd identification, so columns may not sum to 100.)

a. Percent of operations that used the following ***herd*** identification (all animals have the same identification) methods by herd size:

	Percent Operations Number Cows									
Method	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Hot iron brand	17.6	(±1.4)	39.7	(±2.7)	65.3	(±2.6)	89.8	(±3.2)	26.6	(±1.2)
Freeze brand	1.2	(±0.5)	1.2	(±0.5)	1.1	(±0.4)	4.3	(±1.8)	1.3	(±0.3)
Ear notch	4.2	(±0.7)	15.5	(±2.8)	22.5	(±3.0)	27.4	(±3.7)	8.0	(±0.8)
Microchip transponder/ Electronic ID	0.0	(±0.0)	0.1	(±0.1)	0.0	(±0.0)	0.0	(±0.0)	0.0	(±0.0)
Other metal ear tag	1.7	(±0.7)	1.0	(±0.4)	2.2	(±1.0)	1.4	(±0.9)	1.6	(±0.5)
Plastic ear tag	24.9	(±2.3)	31.2	(±2.5)	34.5	(±2.5)	39.0	(±4.3)	27.0	(±1.7)
Ear tattoo	5.5	(±1.5)	6.4	(±1.3)	5.5	(±1.0)	10.3	(±3.1)	5.7	(±1.1)
Other method	0.2	(±0.1)	0.7	(±0.4)	0.7	(±0.3)	2.0	(±1.0)	0.3	(±0.1)
None	57.5	(±2.5)	32.5	(±2.5)	17.4	(±2.2)	1.1	(±0.6)	49.0	(±1.9)

Nearly three-quarters (74.1 percent) of the cows represented by this study were on operations that used some form of herd identification for at least some of their cows. Over half (54.5 percent) of the cows were on operations using hot iron brands for herd identification.

b. Percent of beef cows on January 1, 1997, on operations that used the following ***herd*** identification (all animals have the same identification) methods by herd size:

	Percent Beef Cows								
	Number Cows								
Method	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Hot iron brand	21.5	(±1.9)	41.2	(±2.6)	69.5	(±2.6)	91.0	(±2.8)	54.5	(±1.5)
Freeze brand	1.1	(±0.5)	1.2	(±0.5)	1.0	(±0.4)	4.3	(±1.6)	1.7	(±0.4)
Ear notch	5.8	(±1.1)	15.4	(±2.6)	26.0	(±4.0)	33.9	(±4.7)	19.7	(±1.8)
Microchip transponder/ Electronic ID	0.0	(±0.0)	0.1	(±0.1)	0.0	(±0.0)	0.0	(±0.0)	0.0	(±0.0)
Other metal ear tag	2.1	(±0.9)	1.1	(±0.4)	1.8	(±0.7)	1.0	(±0.6)	1.6	(±0.4)
Plastic ear tag	28.2	(±2.1)	30.5	(±2.4)	32.0	(±2.6)	33.4	(±4.3)	30.9	(±1.4)
Ear tattoo	5.5	(±1.2)	6.3	(±1.2)	5.8	(±1.1)	9.0	(±2.9)	6.4	(±0.8)
Other method	0.2	(±0.1)	0.7	(±0.4)	0.8	(±0.4)	1.8	(±1.0)	0.8	(±0.3)
None	50.7	(±2.3)	32.2	(±2.4)	14.9	(±2.0)	1.2	(±0.7)	25.9	(±1.1)

Because of the distribution of large herds in the West, it is not surprising that most western herds (98.7 percent) used some form of herd identification. Also, for operations that graze cattle on Forest Service lands, cattle are required to be branded. The largest percentage of herds with no herd identification were in the Central (55.8 percent) and Southeast (52.7 percent) regions.

c. Percent of beef cows on January 1, 1997, on operations that used the following ***herd*** identification (all animals have the same identification) methods by region:

	Percent Beef Cows									
	Region									
Method	West	Standard Error	North-central	Standard Error	South-central	Standard Error	Central	Standard Error	Southeast	Standard Error
Hot iron brand	96.9	(±0.7)	68.4	(±3.3)	70.1	(±3.0)	14.3	(±2.9)	16.0	(±2.3)
Freeze brand	2.6	(±1.4)	2.7	(±1.1)	1.0	(±0.5)	1.4	(±0.6)	1.2	(±0.5)
Ear notch	35.0	(±4.7)	11.7	(±3.1)	30.2	(±4.5)	7.7	(±2.2)	11.6	(±2.3)
Microchip transponder/Electronic ID	0.0	(±0.0)	0.0	(±0.0)	0.1	(±0.1)	0.0	(±0.0)	0.0	(±0.0)
Other metal ear tag	1.1	(±0.5)	1.3	(±0.7)	1.5	(±0.8)	1.7	(±1.0)	2.3	(±1.0)
Plastic ear tag	35.6	(±3.6)	41.3	(±3.7)	22.1	(±2.6)	25.9	(±3.2)	30.2	(±2.5)
Ear tattoo	7.0	(±1.6)	8.6	(±2.5)	5.2	(±1.3)	5.5	(±1.8)	5.9	(±1.5)
Other method	2.4	(±1.0)	0.7	(±0.4)	0.7	(±0.6)	0.1	(±0.1)	0.4	(±0.2)
None	1.3	(±0.4)	10.1	(±1.6)	15.5	(±2.1)	55.8	(±3.6)	52.7	(±2.8)

7. Source of female replacements

On the average, 11.7 percent of the replacement heifers on cow-calf operations were purchased. After considering operation size and the numbers of replacement heifers that were purchased, 12.8 percent of all replacement heifers on cow-calf operations were purchased. For cows, these numbers were larger with the average operation having purchased 24 percent of their cows which results in 22.2 percent of all beef cows on cow-calf operations having been purchased rather than raised on the operation.

a. Of females that calved in 1996, operation average percent of females (and percent of females) purchased and raised:

	Replacement Heifers				Cows			
Origin	Operation Average Percent	Standard Error	Percent Replace. Heifers	Standard Error	Operation Average Percent	Standard Error	Percent Cows	Standard Error
Purchased	11.7	(±1.7)	12.8	(±2.2)	24.0	(±1.4)	22.2	(±1.4)
Raised	88.3	(±1.7)	87.2	(±2.2)	76.0	(±1.4)	77.8	(±1.4)
Total	100.0		100.0		100.0		100.0	

8. Dehorning

Horns on cattle can be a significant cause of bruising which results in increased losses due to carcass trim. Cattle with horns also require more bunk space for feeding.

a. Percent of calves born (and operation average percent born) during 1996 that had or were expected to have horns:

Percent Calves Born	Standard Error	Operation Average Percent Born	Standard Error
27.8	(±1.0)	26.4	(±1.3)

i. Percent of calves born (and operation average percent born) during 1996 that had or were expected to have horns by region:

	Region									
Measure	West	Standard Error	North-central	Standard Error	South-central	Standard Error	Central	Standard Error	Southeast	Standard Error
Percent calves born	24.9	(±1.9)	22.8	(±1.8)	45.0	(±3.0)	19.4	(±1.3)	21.2	(±1.4)
Operation average percent calves born	24.9	(±2.1)	21.9	(±1.8)	41.7	(±3.6)	21.1	(±2.7)	18.7	(±1.9)

b. Percent of operations with one or more non-polled calves born in 1996:

Percent Operations	Standard Error
62.1	(±1.9)

Only about one-half (49.8 percent) of the operations in the Southeast had any calves born in 1996 that were expected to have horns. Each of the other regions had a higher proportion of operations with at least some non-polled calves born in 1996.

i. Percent of operations with one or more non-polled calves born in 1996 by region:

Percent Operations									
Region									
West	Standard Error	North-central	Standard Error	South-central	Standard Error	Central	Standard Error	Southeast	Standard Error
69.3	(±3.8)	67.4	(±3.2)	72.4	(±4.7)	60.8	(±3.8)	49.8	(±3.5)

Relatively few operations (7.7 percent) expected all of their calves to have horns. Over one-third (21.2 + 14.8 = 36.0 percent) expected more than none but less than 50 percent of their calves born in 1996 to have horns.

c. Percent of operations by percent of calves born in 1996 that had or were expected to be horned:

Percent Calves Born non-polled	Percent Operations	Standard Error
0	37.9	(±1.9)
0.1-24.9	21.2	(±1.3)
25.0-49.9	14.8	(±1.5)
50.0-74.9	12.5	(±1.3)
75.0-99.9	5.9	(±1.1)
100.0	7.7	(±1.2)
Total	100.0	

The Southcentral region had the highest proportion of operations (15.0 percent) where 100 percent of the 1996 calf crop was expected to have horns. This percentage was 6.3 percent or less for each of the other regions. The Southcentral region also had the lowest percentage of operations (27.6 percent) where the entire 1996 calf crop was expected to be polled.

i. Percent of operations by percent of calves born in 1996 that had or were expected to be horned by region:

	Percent Operations									
	Region									
Percent Calves Born non-polled	West	Standard Error	North-central	Standard Error	South-central	Standard Error	Central	Standard Error	Southeast	Standard Error
0	30.7	(±3.8)	32.6	(±3.2)	27.6	(±4.7)	39.3	(±3.8)	50.2	(±3.5)
0.1-24.9	30.2	(±4.1)	32.2	(±3.0)	10.6	(±2.1)	25.5	(±2.9)	20.9	(±2.7)
25.0-49.9	19.0	(±3.3)	15.8	(±2.3)	13.9	(±3.7)	19.3	(±3.6)	11.1	(±2.3)
50.0-74.9	10.3	(±1.8)	12.4	(±1.9)	21.5	(±3.9)	6.7	(±1.4)	9.1	(±1.8)
75.0-99.9	3.5	(±1.4)	3.6	(±0.9)	11.4	(±3.4)	2.9	(±1.1)	4.5	(±1.6)
100.0	6.3	(±1.6)	3.4	(±1.4)	15.0	(±3.4)	6.3	(±3.1)	4.2	(±1.4)
Total	100.0		100.0		100.0		100.0		100.0	

Overall, 61.1 percent of the non-polled calves born in 1996 were expected to be dehorned prior to leaving the operation.

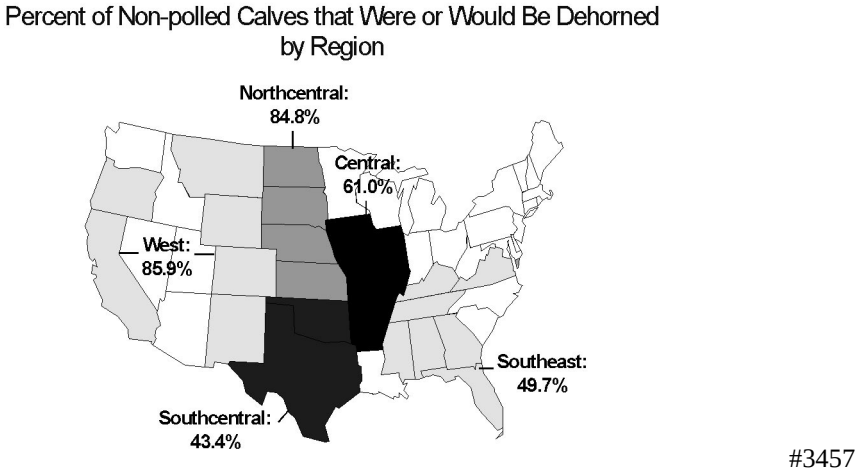
d. Of non-polled calves born in 1996, percent that were or would be dehorned:

Percent Calves	Standard Error
61.1	(±2.2)

Less than one-half of the non-polled calves born in 1996 in the Southcentral and Southeast regions were expected to be dehorned prior to leaving the operation. A very high percentage of the non-polled calves from the West and Northcentral regions were expected to be dehorned.

i. Of non-polled calves born in 1996, percent that were or would be dehorned by region:

Percent Non-polled									
Region									
West	Standard Error	North-central	Standard Error	South-central	Standard Error	Central	Standard Error	Southeast	Standard Error
85.9	(±3.0)	84.8	(±2.4)	43.4	(±4.0)	61.0	(±4.6)	49.7	(±4.2)



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Most operations that had non-polled calves in 1996 dehorned either none (48.0 percent) or all (42.6 percent) of them. This was true in each of the regions (see 8.e.i. below).

e. For operations with non-polled calves, percent of operations by percent of non-polled calves born during 1996 that were or would be dehorned:

Percent Calves Born Non-polled	Percent Operations	Standard Error
0	48.0	(±2.3)
0.1-24.9	3.0	(±0.6)
25.0-49.9	1.5	(±0.3)
50.0-74.9	3.3	(±0.6)
75.0-99.9	1.6	(±0.6)
100.0	42.6	(±2.2)
Total	100.0	

For operations with non-polled calves, over one-half (57.3 percent) of the operations in the Southcentral region and nearly three-fourths (70.4 percent) in the Southeast region did not expect to dehorn any non-polled calves born in 1996.

i. Percent of operations by percent of calves born during 1996 that were or would be dehorned by region:

Percent Operations

Percent Calves Born/Dehorned	Region West	Standard Error	North-central	Standard Error	South-central	Standard Error	Central	Standard Error	Southeast	Standard Error
0	27.1	(±5.9)	21.3	(±2.9)	57.3	(±5.1)	33.3	(±4.7)	70.4	(±3.4)
0.1-24.9	4.2	(±2.6)	4.4	(±2.1)	3.6	(±1.0)	2.5	(±1.1)	1.2	(±0.5)
25.0-49.9	0.8	(±0.5)	1.5	(±0.6)	2.8	(±0.9)	1.1	(±0.6)	0.5	(±0.3)
50.0-74.9	3.6	(±1.3)	2.1	(±1.0)	4.1	(±1.2)	3.2	(±1.4)	2.8	(±1.1)
75.0-99.9	2.5	(±1.4)	1.1	(±0.5)	2.9	(±1.9)	0.6	(±0.4)	0.8	(±0.3)
100.0	61.8	(±5.5)	69.6	(±3.4)	29.3	(±4.7)	59.3	(±4.9)	24.3	(±3.1)
Total	100.0		100.0		100.0		100.0		100.0	

Across all operations with some non-polled calves, the average age calves were dehorned was 162 days. When size of the operation is taken into account (i.e., the operation average age at dehorning is weighted by the number of calves born on the operation), the average age at dehorning for all calves on operations with some horned calves was 130 days. This difference suggests that larger operations tended to dehorn calves at a younger age (confirmed in the next table [8.g.] which shows that the average age of dehorning on large operations was 108 days compared to the average age at dehorning on smaller operations of 176 days).

f. For operations with non-polled calves, average age (and operation average age), in days, calves were dehorned:

Measure	Age (Days)	Standard Error
Average age	130	(±4)
Operation average	162	(±4)

Larger operations tended to dehorn calves at younger ages. On average the largest operations (300 or more cows) dehorned calves at 3.6 months (108 days) of age. The smallest operations (less than 50 cows) on average dehorned calves approximately 2 months later.

g. For operations with non-polled calves, operation average age (in days) calves were dehorned by herd size:

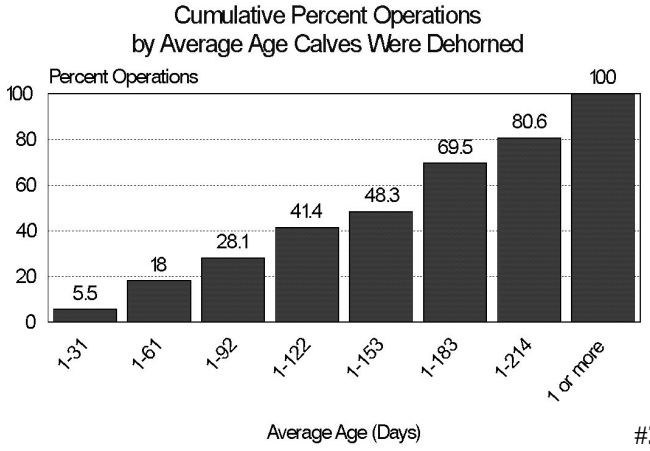
Operation Average Age (Days)

Number Cows: Less Than 50	Standard Error	50-99	Standard Error	100-299	Standard Error	300 or More	Standard Error
176	(±8)	163	(±6)	134	(±6)	108	(±7)

Few operations (5.5 percent) dehorned calves in the first month of life. More than one-fourth (28.1 percent) of operations dehorned calves at an average age of 3 months or less. However, nearly one-fifth (19.4 percent) of operations reported an average age of calves at dehorning of 7 months or more.

h. For operations that dehorned calves, percent of operations by average age (in days) calves were dehorned:

Age (Days)	Percent Operations	Standard Error
1-31	5.5	(±0.7)
32-61	12.5	(±1.5)
62-92	10.1	(±1.3)
93-122	13.3	(±2.8)
123-153	6.9	(±1.1)
154-183	21.2	(±2.6)
184-214	11.1	(±1.4)
215- or more	19.4	(±2.1)
Total	100.0	



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9. Castration

The average percent of male calves castrated prior to sale across all operations was 64.0 percent. Accounting for the number of calves born on each operation, 79.9 percent of male calves were castrated prior to time of sale. These results indicate that larger operations tended to castrate a higher proportion of male calves. (When producers reported the *number* of head to be castrated rather than a *percentage*, the percentage was calculated by dividing the number to be castrated by one-half the calf crop. Therefore, some producers with small herds may have intended that 100 percent of male calves would be castrated, but the calculated percentage could be lower. See 9.b. below.)

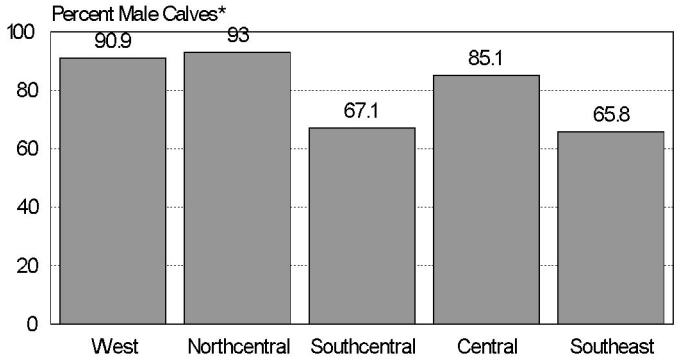
a. Of male calves born in 1996, percent (and operation average percent) of male calves that were or would be castrated before sale:

Percent Male Calves	Standard Error	Operation Average Percent Male Calves	Standard Error
79.9	(±1.2)	64.0	(±1.8)

i. Of male calves born in 1996, percent (and operation average percent) of male calves that were or would be castrated before sale by region:

	Percent Male Calves									
	Region									
Measure	West	Standard Error	North-central	Standard Error	South-central	Standard Error	Central	Standard Error	Southeast	Standard Error
Percent	90.9	(±2.1)	93.0	(±0.9)	67.1	(±3.9)	85.1	(±2.0)	65.8	(±2.2)
Operation average percent	85.5	(±3.6)	91.3	(±1.6)	48.9	(±4.5)	80.9	(±2.9)	49.5	(±3.1)

Percent Male Calves* Castrated Before Sale by Region



*Of male calves born in 1996.

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Most operations castrated all (49.8 percent) or none (29.4 percent) of their male calves prior to sale. Because of the way in which this percentage was calculated for some producers (those that reported the number to be castrated rather than a percentage), by dividing the number to be castrated by one-half the reported calf crop, it is likely that some of the producers in the 75.0 to 99.9 percent group (10.9 percent of operations) may in fact have castrated all of their male calves prior to sale. This was most likely to occur in smaller operations because they were more likely to report the actual number of calves to be castrated and because it is more likely that the number of male calves could be something other than 50 percent of the calf crop.

b. Percent of operations by percent of male calves that were or would be castrated before sale:

Percent Castrated	Percent Operations	Standard Error
0	29.4	(±1.9)
0.1-24.9	1.0	(±0.4)
25.0-49.9	2.7	(±0.6)
50.0- 74.9	6.2	(±0.9)
75.0- 99.9	10.9	(±1.1)
100.0	49.8	(±1.9)
Total	100.0	

10. Weaning weight

Each operation reported an average weaning weight for each of the types of calves. The average of these reports across all operations for bulls and steers was 514 pounds. After accounting for the number of calves weaned with the reported weaning weights the average weaning weight for bulls and steer calves weaned in 1996 was 529 pounds. As expected heifer calves had lighter weaning weights than bulls and steers. There is some indication that producers were selecting larger heifers for replacements since the average weaning weight for this group of calves was heavier than for non-replacement heifers. This could occur because producers are selecting calves born earlier in the season and therefore older at weaning time or because they are selecting heifers with larger frame sizes to be replacements. These data will not allow a determination of which is the correct interpretation.

a. Average weight (lbs) (and operation average weight) of calves weaned in 1996 by calf type:

Type	Average Weight (lbs.)	Standard Error	Operation Average Weight (lbs.)	Standard Error
Bull and steer calves	529	(±4)	514	(±4)
Nonreplacement heifer calves	494	(±3)	480	(±4)
Replacement heifer calves	513	(±4)	506	(±4)
All calves	515	(±3)	497	(±4)

Larger operations tended to wean heavier calves than smaller operations. However, they also tended to wean calves at an older age (see 11.b., also 12.a. for estimates of weight per day of age at weaning).

b. Operation average weight (lbs.) of calves weaned in 1996 by herd size:

	Operation Average Weight (lbs) Number Cows							
Type	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error
Bull/steer calves	504	(±5)	533	(±4)	542	(±5)	540	(±6)
Nonreplacement heifer calves	471	(±5)	497	(±4)	505	(±5)	499	(±6)
Replacement heifer calves	500	(±6)	515	(±5)	520	(±6)	537	(±5)
All calves	489	(±4)	516	(±4)	524	(±4)	526	(±5)

Relatively few operations weaned calves at an average weight of less than 400 pounds. Only 6.4 percent of operations weaned bull and steer calves with an average weight of less than 400 pounds. A similar percentage (6.9 percent) reported an average weaning weight of replacement heifers of less than 400 pounds. Nearly one-quarter (24.5 percent) of operations reported an average weaning weight for bulls and steers of 600 pounds or more.

c. Percent of operations by average weight (lbs.) of calves weaned in 1996:

	Percent Operations					
			Nonreplacement		Replacement	
Weight Weaned (lbs)	Bull & Steer Calves	Standard Error	Heifer Calves	Standard Error	Heifer Calves	Standard Error
Less than 400	6.4	(±1.2)	11.4	(±1.7)	6.9	(±1.2)
400-449	11.2	(±1.5)	15.0	(±1.8)	11.4	(±1.6)
450-499	17.0	(±1.7)	22.9	(±1.9)	20.0	(±2.2)
500-549	25.4	(±1.7)	27.2	(±1.9)	23.4	(±1.7)
550-599	15.5	(±1.1)	12.2	(±1.3)	19.3	(±2.3)
600 or more	24.5	(±1.8)	11.3	(±1.4)	19.0	(±2.0)
Total	100.0		100.0		100.0	

11. Weaning age

The overall average weaning age for beef operations was 215 days. Weighting the reported average age at weaning by the number of calves weaned in 1996 gives an average weaning age of 221 days suggesting that larger operations wean at slightly older ages than smaller operations (see 11.b. below).

a. Average age (and operation average age), in days of calves at weaning:

Average Age (Days)	Standard Error	Operation Average Age (Days)	Error
221	(±1)	215	(±2)

Larger operations (300 or more cows) weaned at slightly older average ages (224 days) than the smallest operations (less than 50 cows) (213 days). Intermediate size operations (50-299 cows) were more like large operations in average weaning age.

b. Operation average age (days) of calves at weaning by herd size:

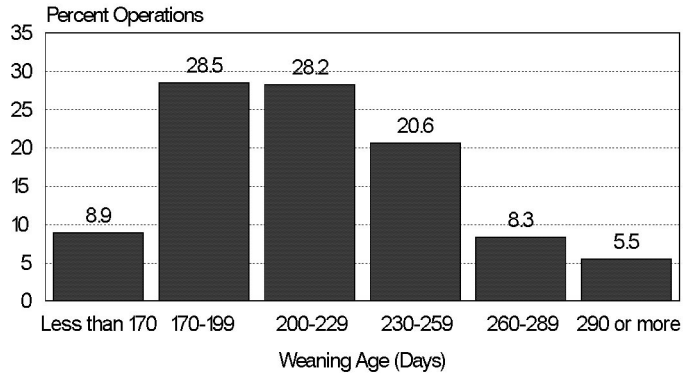
Operation Average Age (Days)							
Number Cows							
Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error
213	(±2)	222	(±3)	221	(±2)	224	(±3)

Most operations (77.3 percent) had an average weaning age between 170 and 259 days. Approximately equal percentages of operations had average weaning ages within the age intervals with midpoints of 6 months (28.5 percent), 7 months (28.2 percent), and 8 months (20.6 percent).

c. Percent of operations by average weaning age (days):

Age (Days)	Percent Operations	Standard Error
Less than 170	8.9	(±1.4)
170-199	28.5	(±1.9)
200-229	28.2	(±1.7)
230-259	20.6	(±1.5)
260-289	8.3	(±0.8)
290 or more	5.5	(±0.8)
Total	100.0	

Percent Operations by Average Weaning Age (Days)



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12. Weight per day of age at weaning

Weight per day of age at weaning was calculated based on producer reports of average age and weight at weaning for each calf group. The weight per day of age at weaning was relatively consistent across herd sizes.

a. Operation average weight (lbs) per day of age of calves at weaning in 1996 by calf group and herd size:

	Operation Average Weight (lbs.) Number Cows									
Calf Group	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Bulls and steers	2.4	(±0.0)	2.5	(±0.0)	2.5	(±0.0)	2.5	(±0.0)	2.4	(±0.0)
Nonreplacement heifers	2.3	(±0.0)	2.3	(±0.0)	2.3	(±0.0)	2.3	(±0.0)	2.3	(±0.0)
Replacement heifers	2.4	(±0.0)	2.4	(±0.0)	2.4	(±0.0)	2.4	(±0.0)	2.4	(±0.0)
All calves	2.4	(±0.0)	2.4	(±0.0)	2.4	(±0.0)	2.4	(±0.0)	2.4	(±0.0)

Weight per day of age at weaning was similar for all regions.

b. Operation average weight (lbs) per day of age of calves at weaning in 1996 by calf group and region:

	Operation Average Weight (lbs.)									
	Region									
Calf Group	West	Standard Error	North-central	Standard Error	South-central	Standard Error	Central	Standard Error	Southeast	Standard Error
Bulls and steers	2.5	(±0.0)	2.5	(±0.0)	2.5	(±0.1)	2.4	(±0.0)	2.4	(±0.0)
Nonreplacement heifers	2.3	(±0.0)	2.3	(±0.0)	2.3	(±0.0)	2.2	(±0.0)	2.2	(±0.1)
Replacement heifers	2.4	(±0.1)	2.4	(±0.0)	2.5	(±0.1)	2.4	(±0.1)	2.2	(±0.0)
All calves	2.4	(±0.0)	2.4	(±0.0)	2.5	(±0.0)	2.3	(±0.0)	2.3	(±0.0)

Overall and within each herd size group, the largest percentage of operations had a weight per day of age at weaning in the range of 2.0 to 2.4 pounds. Few operations (14.1 percent) had a calculated weight per day of age at weaning outside of the range of 1.5 to 2.9 pounds.

c. Percent of operations by weight (lbs) per day of age of ***all calves*** at weaning in 1996 by herd size:

	Percent Operations									
	Number Cows									
Weight (lbs) per Day of Age	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Less than 1.5	2.7	(±0.7)	2.6	(±1.0)	1.6	(±0.7)	0.6	(±0.4)	2.5	(±0.5)
1.5 - 1.9	22.5	(±2.0)	19.2	(±2.0)	12.6	(±1.5)	14.1	(±2.5)	20.9	(±1.5)
2.0 - 2.4	39.2	(±2.7)	37.8	(±2.5)	45.0	(±3.0)	50.9	(±4.4)	39.8	(±2.0)
2.5 - 2.9	23.4	(±2.4)	29.7	(±2.6)	31.4	(±2.7)	27.9	(±4.1)	25.2	(±1.8)
3.0 or more	12.2	(±1.9)	10.7	(±2.6)	9.4	(±2.2)	6.5	(±2.1)	11.6	(±1.4)
Total	100.0		100.0		100.0		100.0		100.0	

The largest percentages of operations with a weight per day of age at weaning of less than 1.5 pounds were from the Southcentral (2.3 percent) and the Southeast (4.7 percent) regions. The Southcentral region also had the largest percentage of operations (16.3 percent) with a weight per day of age at weaning of 3.0 pounds or more.

d. Percent of operations by weight (lbs) per day of age of ***all calves*** at weaning in 1996 by region:

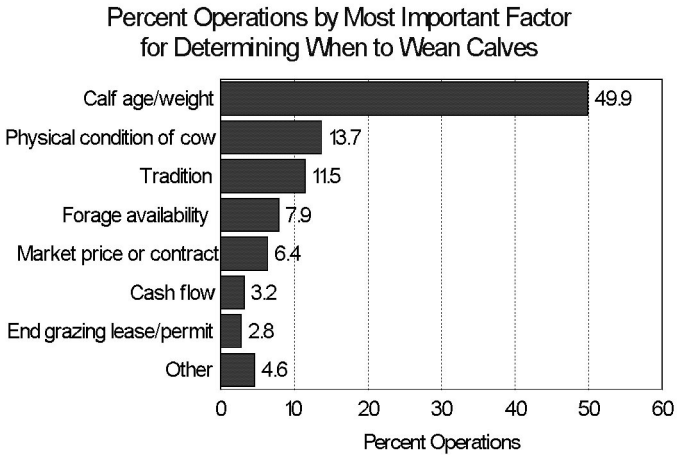
	Percent Operations									
	Region									
Weight (lbs) per Day of Age	West	Standard Error	North-central	Standard Error	South-central	Standard Error	Central	Standard Error	Southeast	Standard Error
Less than 1.5	1.8	(±1.0)	0.7	(±0.4)	2.3	(±0.8)	1.2	(±0.8)	4.7	(±1.4)
1.5 - 1.9	16.8	(±3.9)	22.1	(±3.0)	12.2	(±2.1)	21.5	(±3.3)	29.4	(±3.5)
2.0 - 2.4	45.0	(±4.1)	37.7	(±3.0)	38.0	(±4.9)	44.1	(±4.3)	37.7	(±3.6)
2.5 - 2.9	28.8	(±4.3)	29.1	(±2.9)	31.2	(±4.8)	24.3	(±3.9)	17.5	(±2.3)
3.0 or more	7.6	(±1.8)	10.4	(±2.0)	16.3	(±4.0)	8.9	(±2.4)	10.7	(±2.4)
Total	100.0		100.0		100.0		100.0		100.0	

13. Factors in determining when to wean calves

Relatively few producers (7.9 percent) used forage availability to determine when to wean calves, although another 13.7 percent used cow condition, a related criterion, to determine the timing of weaning. Weaning of the calf can be a useful tool to ensure that cows enter the winter feeding period (for spring calving herds) with adequate condition. Cows that are in poor condition entering the winter feeding period require extra feed, which can be expensive, to achieve optimal condition at calving and ensure good reproductive performance in the next breeding season. Still, most producers are using other criteria that are usually based on some externally set conditions to determine the time to wean calves. This fact suggests a lack of flexibility in mangement of the weaning event to address environmental or market conditions.

a. Percent of operations by most important factor for determining when to wean calves:

Reason	Percent Operations	Standard Error
Calf age/weight	49.9	(±2.0)
End of grazing lease or permit	2.8	(±0.3)
Forage availability	7.9	(±0.8)
Physical condition of cow	13.7	(±1.4)
Market price or contract	6.4	(±1.0)
Cash flow	3.2	(±0.8)
Tradition	11.5	(±1.2)
Other	4.6	(±0.7)
Total	100.0	



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14. Marketing

Only 10.2 percent of operations did not sell any animals in 1996. Steers were sold from the highest proportion (67.4 percent) of operations followed by heifers intended for slaughter (52.1 percent) and cows intended for slaughter (51.7 percent). In all animal classes the larger operations were more likely to sell some animals than smaller operations. Virtually all (94.1 percent) of the largest operations (300 or more cows) sold some cull cows intended for slaughter in 1996 while less than half (43.8 percent) of the smallest operations (less than 50 cows) did so.

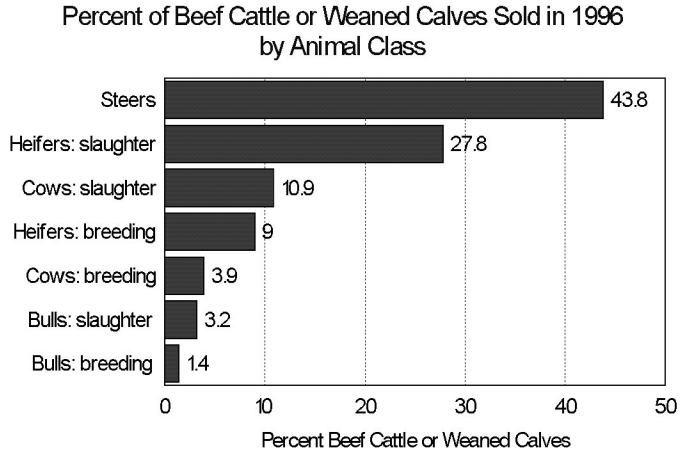
a. Percent of operations that sold the following classes of beef animals, weaned or older, in 1996 by animal class and herd size:

	Percent Operations									
	Number Cows									
Animal Class	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Steers	61.2	(±2.6)	83.3	(±1.9)	86.9	(±1.8)	91.5	(±2.2)	67.4	(±2.0)
Heifers intended for breeding	23.4	(±2.3)	23.6	(±2.3)	22.9	(±2.5)	29.3	(±4.1)	23.5	(±1.7)
Heifers intended for slaughter	46.8	(±2.6)	64.3	(±2.6)	69.9	(±2.8)	75.5	(±3.6)	52.1	(±2.0)
Cows intended for breeding	7.2	(±1.3)	6.8	(±1.4)	12.1	(±2.4)	13.6	(±3.2)	7.7	(±1.0)
Cows intended for slaughter	43.8	(±2.6)	67.9	(±2.8)	80.4	(±2.6)	94.1	(±1.6)	51.7	(±2.0)
Bulls intended for breeding	10.7	(±1.5)	11.8	(±1.6)	13.3	(±1.6)	17.2	(±3.7)	11.2	(±1.1)
Bulls intended for slaughter	25.0	(±2.3)	31.5	(±2.4)	52.8	(±2.9)	74.9	(±3.6)	29.5	(±1.8)
None sold	12.9	(±1.7)	2.8	(±0.7)	2.3	(±0.7)	0.0	(±0.0)	10.2	(±1.3)

Across all operations 43.8 percent of the animals sold were steers. Another 27.8 percent of the animals sold were heifers intended for slaughter and 10.9 percent were cows intended for slaughter. The relative percentages sold in each animal class were similar across herd size categories. However, smaller operations tended to sell a larger percentage of heifers intended for breeding (10.8 percent of animals sold) and cows intended for breeding (5.0 percent of animals sold). This may be because seedstock producers tend not to be the very largest cow-calf operations. It may also be that in some parts of the country there is an active trade of breeding females from and perhaps among smaller operations.

b. Percent of beef cattle or weaned calves sold in 1996 by animal class and herd size:

	Percent Animals									
	Number Cows									
Animal Class	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Steers	39.5	(±1.9)	46.0	(±1.6)	44.6	(±2.2)	46.9	(±2.1)	43.8	(±1.0)
Heifers intended for breeding	10.8	(±1.1)	9.3	(±1.1)	8.5	(±2.1)	6.5	(±1.1)	9.0	(±0.8)
Heifers intended for slaughter	23.5	(±1.5)	29.2	(±1.5)	29.9	(±3.4)	30.0	(±3.2)	27.8	(±1.4)
Cows intended for breeding	5.0	(±1.6)	1.3	(±0.4)	4.9	(±2.4)	2.6	(±0.8)	3.9	(±1.0)
Cows intended for slaughter	14.1	(±1.4)	9.7	(±0.7)	8.6	(±1.0)	11.2	(±0.9)	10.9	(±0.6)
Bulls intended for breeding	1.5	(±0.2)	1.8	(±0.4)	1.2	(±0.2)	1.2	(±0.4)	1.4	(±0.1)
Bulls intended for slaughter	5.6	(±0.6)	2.7	(±0.4)	2.3	(±0.4)	1.6	(±0.4)	3.2	(±0.3)
Total	100.0		100.0		100.0		100.0		100.0	



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Most operations (85.0 percent) used auctions to sell most of the animals sold in 1996. Direct sales under private treaty was used to sell most of the animals on 10.4 percent of operations. Other methods predominated on less than 1.5 percent of operations each. The method of sale most used was related to herd size. Larger operations used direct sales under private treaty as the most used method more frequently (28.7 percent) than did the smallest producers (9.5 percent). Consignment and auctions were the only methods of sale that were used less frequently among larger operations.

c. For operations that sold beef cattle or weaned calves in 1996, percent of operations by method most animals were sold and herd size:

	Percent Operations									
	Number Cows									
Method	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Auction	86.9	(±1.9)	84.8	(±1.8)	78.9	(±2.0)	49.9	(±4.4)	85.0	(±1.4)
Direct - video	0.4	(±0.3)	0.4	(±0.2)	1.4	(±0.7)	7.0	(±2.1)	0.7	(±0.2)
Direct - private treaty	9.5	(±1.7)	10.1	(±1.5)	13.8	(±1.6)	28.7	(±3.7)	10.4	(±1.3)
Consignment	1.2	(±0.5)	1.3	(±0.5)	1.1	(±0.7)	0.5	(±0.5)	1.2	(±0.4)
Forward contract	0.2	(±0.1)	0.3	(±0.3)	2.6	(±0.7)	5.6	(±2.1)	0.5	(±0.1)
Carcass basis	1.0	(±0.4)	1.9	(±0.8)	1.3	(±0.5)	6.8	(±2.6)	1.3	(±0.3)
Other	0.8	(±0.3)	1.2	(±0.5)	0.9	(±0.3)	1.5	(±0.6)	0.9	(±0.3)
Total	100.0		100.0		100.0		100.0		100.0	

For each of the individual classes of animals sold, a high proportion of the operations (61.5 to 91.8 percent) made use of auctions as the primary method of sales. Since auctions tended to be used less frequently by larger operations (see 14.c. above), it is not surprising that the percentage of animals sold through auctions was smaller than the percentage of operations primarily using auctions. Still, in all cases the proportion of animals sold on operations where auctions were the primary method of sales was greater than for any other method.

d. Of operations that sold ***weaned steers*** in 1996, percent of operations (and percent of ***weaned steers*** sold by those operations) by method most animals were sold:

Method	Percent Operations	Standard Error	Percent Weaned Steers	Standard Error
Auction	84.9	(±1.4)	68.4	(±2.2)
Direct - video	0.6	(±0.2)	2.7	(±0.6)
Direct - private treaty	10.4	(±1.3)	18.2	(±1.7)
Consignment	1.2	(±0.4)	1.5	(±0.4)
Forward contract	0.7	(±0.1)	3.8	(±1.3)
Carcass basis	1.7	(±0.4)	3.8	(±1.4)
Other	0.5	(±0.1)	1.6	(±0.6)
Total	100.0		100.0	

e. Of operations that sold ***weaned heifers intended for breeding*** in 1996, percent of operations (and percent of ***weaned heifers intended for breeding*** sold by those operations) by method most animals were sold:

Method	Percent Operations	Standard Error	Percent Weaned Heifers for Breeding	Standard Error
Auction	72.6	(±3.8)	71.6	(±4.3)
Direct - video	0.7	(±0.4)	1.9	(±0.9)
Direct - private treaty	20.6	(±3.7)	22.3	(±4.0)
Consignment	3.3	(±1.3)	1.1	(±0.4)
Forward contract	0.4	(±0.1)	1.1	(±0.5)
Carcass basis	0.0	(±0.0)	0.0	(±0.0)
Other	2.4	(±0.9)	2.0	(±0.7)
Total	100.0		100.0	

f. Of those operations that sold ***weaned heifers intended for slaughter*** in 1996, percent of operations (and percent of ***weaned heifers intended for slaughter*** sold by those operations) by method most animals were sold:

Method	Percent Operations	Standard Error	Percent Weaned Heifers for Slaughter	Standard Error
Auction	87.5	(±1.3)	67.4	(±4.4)
Direct - video	0.8	(±0.4)	2.4	(±0.7)
Direct - private treaty	7.7	(±1.0)	16.5	(±2.7)
Consignment	1.0	(±0.4)	1.6	(±0.6)
Forward contract	0.6	(±0.2)	2.1	(±0.7)
Carcass basis	1.6	(±0.5)	8.2	(±5.2)
Other	0.8	(±0.2)	1.8	(±0.6)
Total	100.0		100.0	

g. Of operations that sold ***cows intended for breeding*** in 1996, percent of operations (and percent of ***cows intended for breeding*** sold by those operations) by method most animals were sold:

Method	Percent Operations	Standard Error	Percent Cows Intended for Breeding	Standard Error
Auction	67.2	(±6.3)	49.9	(±13.4)
Direct - video	0.0	(±0.0)	0.0	(±0.0)
Direct - private treaty	30.8	(±6.2)	49.2	(±13.5)
Consignment	0.8	(±0.6)	0.3	(±0.2)
Forward contract	0.6	(±0.4)	0.2	(±0.2)
Carcass basis	0.0	(±0.0)	0.0	(±0.0)
Other	0.6	(±0.4)	0.4	(±0.3)
Total	100.0		100.0	

h. Of operations that sold ***cows intended for slaughter*** in 1996, percent of operations (and percent of ***cows intended for slaughter*** sold by those operations) by method most animals were sold:

Method	Percent Operations	Standard Error	Percent Cows Intended for Slaughter	Standard Error
Auction	91.8	(±1.3)	86.5	(±2.1)
Direct - video	0.2	(±0.1)	0.0	(±0.0)
Direct - private treaty	3.6	(±0.8)	5.6	(±1.0)
Consignment	0.5	(±0.4)	0.5	(±0.3)
Forward contract	0.1	(±0.1)	0.0	(±0.0)
Carcass basis	3.0	(±0.9)	6.0	(±1.9)
Other	0.8	(±0.3)	1.4	(±0.5)
Total	100.0		100.0	

i. Of operations that sold ***weaned bulls intended for breeding*** in 1996, percent of operations (and percent of ***weaned bulls intended for breeding*** sold by those operations) by method most animals were sold:

Method	Percent Operations	Standard Error	Percent Weaned Bulls Intended for Breeding	Standard Error
Auction	61.5	(±5.0)	54.2	(±5.1)
Direct - video	0.3	(±0.3)	0.0	(±0.0)
Direct - private treaty	35.4	(±4.9)	41.3	(±5.0)
Consignment	1.2	(±0.6)	1.1	(±0.6)
Forward contract	0.1	(±0.1)	0.5	(±0.5)
Carcass basis	0.0	(±0.0)	0.0	(±0.0)
Other	1.5	(±0.6)	2.9	(±1.2)
Total	100.0		100.0	

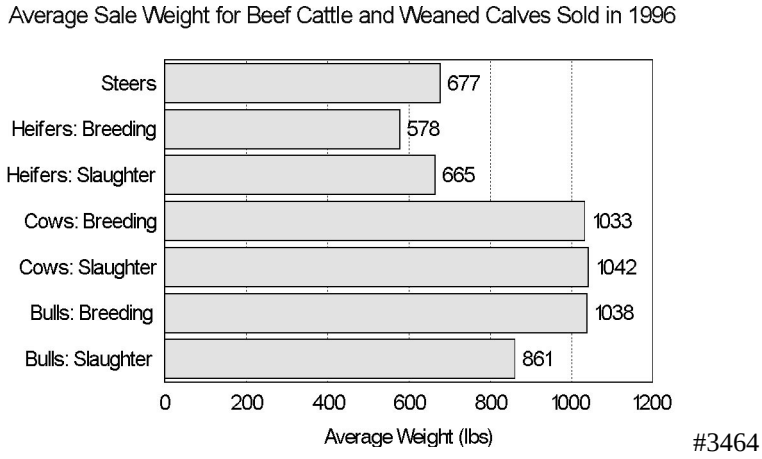
j. Of operations that sold ***weaned bulls intended for slaughter*** in 1996, percent of operations (and percent of ***weaned bulls intended for slaughter*** sold by those operations) by method most animals were sold:

Method	Percent Operations	Standard Error	Percent Weaned Bulls Intended for Slaughter	Standard Error
Auction	91.3	(±1.9)	92.7	(±2.0)
Direct - video	0.6	(±0.6)	1.7	(±1.7)
Direct - private treaty	2.9	(±0.6)	2.7	(±0.8)
Consignment	1.5	(±0.9)	0.5	(±0.3)
Forward contract	0.0	(±0.0)	0.0	(±0.0)
Carcass basis	3.0	(±1.5)	2.1	(±0.7)
Other	0.7	(±0.3)	0.3	(±0.1)
Total	100.0		100.0	

Each operation reported an average sale weight for classes of animals that had been sold in 1996. The average of the weights reported for steers across all operations was 606 pounds. Accounting for the number of steers sold from each operation gives an average sale weight for steers of 677 pounds indicating that larger operations tended to report heavier average sale weights. This finding is consistent with heavier average weaning weights for calves on larger operations (see 10.b.). The relatively light average sale weight for bulls intended for breeding (compared to expected mature weights for bulls) may indicate that many of these bulls are sold as yearlings. The low animal average sale weight for bulls sold for slaughter compared to the operation average weight is likely a reflection of some operations not castrating male calves intended for slaughter.

k. Average sale weight (and operation average sale weight) for beef cattle and weaned calves sold in 1996:

Animal Class	Average Weight (lbs)	Standard Error	Operation Average Weight (lbs.)	Standard Error
Steers	677	(±11)	606	(±7)
Heifers intended for breeding	578	(±17)	542	(±10)
Heifers intended for slaughter	665	(±28)	579	(±8)
Cows intended for breeding	1,033	(±49)	1,038	(±23)
Cows intended for slaughter	1,042	(±11)	1,019	(±10)
Bulls intended for breeding	1,038	(±39)	1,165	(±47)
Bulls intended for slaughter	861	(±36)	1,232	(±39)



For all animal classes sold, the average sale weight for larger operations was generally heavier than for smaller operations. Again, the relatively light average sale weight for bulls intended for slaughter for the smallest operations (less than 50 cows) is likely associated with fewer of these operations castrating calves prior to sale even though they were intended for slaughter.

l. Operation average sale weight (lbs) for beef cattle and weaned calves sold in 1996 by animal class and herd size:

	Operation Average Sale Weight (lbs)							
	Number Cows							
Animal Class	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error
Steers	584	(±9)	645	(±12)	660	(±13)	674	(±22)
Heifers intended for breeding	519	(±12)	600	(±19)	603	(±20)	685	(±34)
Heifers intended for slaughter	557	(±11)	611	(±14)	625	(±13)	689	(±24)
Cows intended for breeding	1,023	(±32)	1,058	(±29)	1,071	(±39)	1,147	(±29)
Cows intended for slaughter	996	(±15)	1,055	(±10)	1,055	(±8)	1,073	(±13)
Bulls intended for breeding	1,145	(±63)	1,141	(±64)	1,305	(±62)	1,239	(±71)
Bulls intended for slaughter	1,040	(±57)	1,476	(±48)	1,600	(±32)	1,670	(±31)

Most of the steers and heifers sold from cow-calf operations weighed less than 600 pounds. Most of the cows and bulls sold from cow-calf operations weighed 900 pounds or more. However, 24.3 percent of the bulls intended for slaughter weighed less than 600 pounds showing why the overall average weight for bulls intended for slaughter was only 861 pounds (see 14.k.).

m. For operations that sold the following classes of beef animals, weaned or older, in 1996, percent of operations by animal class and average sale weight:

	Percent Operations						
Animal Class	Less than 600 Pounds	Standard Error	600 - 899 Pounds	Standard Error	900 or More Pounds	Standard Error	Total
Steers	53.0	(±2.2)	39.6	(±2.1)	7.4	(±0.8)	100.0
Heifers intended for breeding	69.9	(±3.2)	24.8	(±3.0)	5.3	(±1.1)	100.0
Heifers intended for slaughter	64.0	(±2.4)	28.5	(±2.3)	7.5	(±1.0)	100.0
Cows intended for breeding	0.1	(±0.1)	23.3	(±7.9)	76.6	(±7.9)	100.0
Cows intended for slaughter	1.7	(±1.3)	12.6	(±2.1)	85.7	(±2.3)	100.0
Bulls intended for breeding	12.7	(±3.6)	16.3	(±4.5)	71.0	(±5.1)	100.0
Bulls intended for slaughter	24.3	(±2.8)	12.7	(±2.9)	63.0	(±3.5)	100.0

15. Forward pricing

Some producers (1.5 percent) used forward pricing for at least some of their calves presumably in an effort to offset market volatility. Forward pricing of some calves was much more common (13.4 percent) in the largest operations (300 or more cows) compared to the smallest operations (0.7 percent). Because of this, approximately 3.5 percent of the 1996 calf crop was forward priced by some means.

a. Percent of operations (and percent of 1996 calf crop) using forward pricing of calves by herd size:

	Percent									
	Number Cows									
Measure	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Operations	0.7	(±0.2)	1.6	(±0.7)	4.6	(±0.9)	13.4	(±2.7)	1.5	(±0.2)
Calf crop	0.9	(±0.3)	1.0	(±0.4)	4.0	(±0.8)	8.9	(±1.8)	3.5	(±0.5)

Of the calf crop originating on operations that used some forward pricing (1.5 percent of operations and 3.5 percent of the calf crop), about half (53.8 percent) of the calves were forward priced.

b. For operations using forward-pricing, percent of calf crop forward priced:

Percent Calf Crop	Standard Error
53.8	(±8.8)

Most operations that used forward pricing did not forward price all of their calves. Only 11.8 percent of the operations using forward pricing did so for 100 percent of their calves.

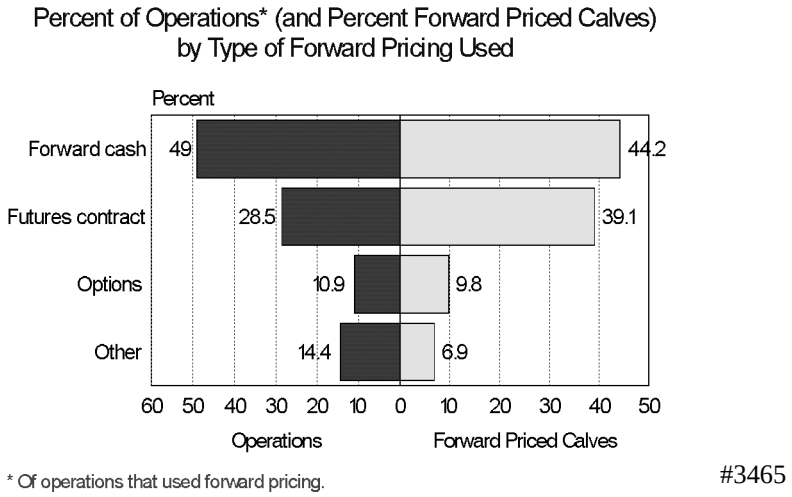
c. For operations using forward-pricing, percent of operations by percent of calf crop that was forward-priced:

Percent Calf Crop Forward Priced	Percent Operations	Standard Error
0.1-24.9	5.1	(±2.4)
25.0-49.9	26.5	(±7.8)
50.0-74.9	24.1	(±5.5)
75.0-99.9	32.5	(±6.2)
100.0	11.8	(±4.6)
Total	100.0	

Multiple methods of forward pricing are available. Nearly half (49.0 percent) of operations that used forward pricing used a forward cash method.

d. For operations using forward pricing, percent of operations (and percent forward priced calves) by type of forward pricing used:

Type of Forward Pricing	Percent Operations	Standard Error	Percent Forward Priced Calves	Standard Error
Forward cash	49.0	(±7.2)	44.2	(±6.2)
Futures contract	28.5	(±6.3)	39.1	(±6.5)
Options	10.9	(±3.8)	9.8	(±3.4)
Other	14.4	(±5.1)	6.9	(±2.9)
Total			100.0	



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16. Reasons for culling

Most operations (57.8 percent) that sold any cows for slaughter in 1996 sold some cows based on age or bad teeth. Approximately one-quarter (25.6 percent) sold some cows because of pregnancy status. As the number of cows on the operation increased, the likelihood that they sold at least one cow for a specific reason listed increased. Large operations were less likely to sell cows because of economics or some other reason than smaller operations.

a. Of operations that sold at least one cow for slaughter in 1996, percent of operations that sold cows for each of the following reasons by herd size:

	Percent Operations									
	Number Cows									
Reason	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Pregnancy status	16.2	(±2.3)	29.9	(±2.9)	50.9	(±3.1)	69.4	(±4.2)	25.6	(±1.7)
Other reproductive problem	6.4	(±1.3)	12.6	(±2.1)	8.7	(±1.6)	15.2	(±3.1)	8.2	(±1.0)
Producing poor calves	8.6	(±1.8)	13.4	(±2.7)	19.7	(±2.9)	25.5	(±4.0)	11.7	(±1.4)
Age or bad teeth	51.4	(±3.9)	67.0	(±3.1)	69.2	(±2.8)	76.0	(±3.8)	57.8	(±2.6)
Physical soundness	5.1	(±1.6)	6.8	(±1.8)	8.0	(±1.4)	22.9	(±3.8)	6.4	(±1.1)
Bad eye(s)	1.5	(±0.5)	5.6	(±1.6)	9.9	(±1.7)	19.4	(±3.6)	4.1	(±0.5)
Digestive problem	0.3	(±0.2)	0.0	(±0.0)	0.5	(±0.3)	1.6	(±1.0)	0.3	(±0.1)
Respiratory problem	1.3	(±1.0)	0.1	(±0.1)	0.6	(±0.4)	2.2	(±1.1)	1.0	(±0.6)
Udder problem	4.6	(±1.4)	6.2	(±1.5)	9.2	(±2.6)	12.1	(±2.6)	5.8	(±1.0)
Temperament	6.4	(±1.5)	5.0	(±1.3)	6.0	(±1.3)	16.4	(±3.4)	6.4	(±1.0)
Economics (drought, herd reduction, or market conditions)	19.0	(±3.7)	6.4	(±1.3)	5.8	(±2.4)	2.1	(±1.0)	14.1	(±2.4)
Other	7.0	(±1.8)	3.1	(±0.9)	2.7	(±0.7)	3.4	(±1.8)	5.5	(±1.1)

Overall 39.8 percent of cows culled were culled because of age or bad teeth. Another 24.3 percent of culls were due to pregnancy status. The third largest category of culled animals was due to economics with 18.5 percent of cows culled.

b. Of operations that sold at least one cow for slaughter in 1996, percent of cows (and operation average percent of cows) sold for slaughter by reason for selling:

Reason	Percent Cows	Standard Error	Operation Average Percent	Standard Error
Pregnancy status	24.3	(±3.1)	16.7	(±1.3)
Other reproductive problem	2.9	(±0.5)	5.0	(±0.8)
Producing poor calves	5.7	(±1.0)	6.1	(±1.1)
Age or bad teeth	39.8	(±2.5)	46.1	(±2.4)
Physical soundness	2.1	(±0.4)	3.1	(±0.6)
Bad eye(s)	0.8	(±0.1)	1.1	(±0.2)
Digestive problem	0.0	(±0.0)	0.0	(±0.0)
Respiratory problem	0.2	(±0.1)	0.4	(±0.2)
Udder problem	1.5	(±0.3)	2.0	(±0.5)
Temperament	1.3	(±0.3)	2.6	(±0.7)
Economics (drought, herd reduction, or market conditions)	18.5	(±2.8)	12.5	(±2.4)
Other	2.9	(±0.6)	4.4	(±1.1)
Total	100.0		100.0	

The percentage of cows culled for pregnancy status was much lower in the Southcentral region (6.0 percent) than for other regions. However, the percentage culled due to economic factors such as drought, herd reduction, or market conditions, was much larger (47.8 percent) in the Southcentral region. This difference was likely due to severe drought conditions in this region in 1996.

i. Percent of cows sold for slaughter by reason for selling by region:

	Percent Cows									
	Region									
Reason	West	Standard Error	North-central	Standard Error	South-central	Standard Error	Central	Standard Error	Southeast	Standard Error
Pregnancy status	45.9	(±9.4)	36.9	(±3.0)	6.0	(±1.3)	22.1	(±3.5)	18.6	(±4.2)
Other reproductive problem	3.3	(±1.2)	2.8	(±1.1)	0.8	(±0.2)	5.9	(±1.5)	4.1	(±1.5)
Producing poor calves	3.2	(±1.0)	13.4	(±4.0)	2.7	(±1.1)	8.0	(±2.1)	4.8	(±1.1)
Age or bad teeth	36.7	(±6.6)	37.3	(±4.6)	37.2	(±4.6)	50.9	(±4.4)	42.5	(±4.2)
Physical soundness	1.6	(±0.5)	1.6	(±0.4)	1.1	(±0.4)	4.7	(±2.2)	2.8	(±0.8)
Bad eye(s)	0.8	(±0.2)	1.3	(±0.3)	0.4	(±0.1)	1.1	(±0.4)	1.2	(±0.4)
Digestive problem	0.0	(±0.0)	0.0	(±0.0)	0.0	(±0.0)	0.1	(±0.1)	0.1	(±0.1)
Respiratory problem	0.1	(±0.1)	0.0	(±0.0)	0.0	(±0.0)	0.6	(±0.5)	0.3	(±0.3)
Udder problem	0.7	(±0.2)	1.7	(±0.4)	1.8	(±0.7)	1.1	(±0.5)	2.1	(±1.0)
Temperament	0.9	(±0.3)	2.5	(±1.3)	1.0	(±0.3)	1.3	(±0.3)	1.2	(±0.5)
Economics (drought, herd reduction, or market conditions)	5.2	(±1.7)	1.8	(±1.1)	47.8	(±6.0)	0.6	(±0.4)	12.9	(±3.8)
Other	1.6	(±0.7)	0.7	(±0.3)	1.2	(±0.8)	3.6	(±1.2)	9.4	(±2.9)
Total	100.0		100.0		100.0		100.0		100.0	

ii. Operation average percent of cows sold for each of the following reasons by herd size:

Reason	Operation Average Percent Cows, Number Cows: Less Than 50	Standard Error	50-99	Standard Error	100-299	Standard Error	300 or More	Standard Error
Pregnancy status	11.5	(±1.8)	18.9	(±2.1)	31.4	(±2.4)	38.9	(±3.4)
Other reproductive problem	4.5	(±1.2)	8.2	(±1.7)	3.6	(±0.9)	4.2	(±1.4)
Producing poor calves	6.2	(±1.6)	5.7	(±2.1)	6.3	(±1.1)	5.1	(±1.6)
Age or bad teeth	44.3	(±3.6)	52.1	(±2.8)	47.1	(±2.4)	42.0	(±3.4)
Physical soundness	3.1	(±0.9)	4.1	(±1.3)	2.2	(±0.5)	2.1	(±0.5)
Bad eye(s)	0.6	(±0.2)	1.9	(±0.5)	1.9	(±0.4)	2.8	(±1.4)
Digestive problem	0.0	(±0.0)	0.0	(±0.0)	0.1	(±0.1)	0.2	(±0.1)
Respiratory problem	0.6	(±0.4)	0.0	(±0.0)	0.1	(±0.1)	0.1	(±0.1)
Udder problem	2.2	(±0.8)	1.5	(±0.5)	1.4	(±0.4)	0.8	(±0.2)
Temperament	3.4	(±1.1)	1.2	(±0.4)	0.9	(±0.2)	2.1	(±1.2)
Economics (drought, herd reduction, or market conditions)	17.6	(±3.7)	4.5	(±1.0)	3.5	(±1.0)	1.5	(±0.7)
Other	6.0	(±1.7)	1.9	(±0.6)	1.5	(±0.4)	0.2	(±0.2)
Total	100.0		100.0		100.0		100.0	

B. Breeding and Calving Management

1. Breeding seasons

More than half (53.6 percent) of all cow-calf operations represented by this study had no set calving season. These operations with no set calving season represented 35.3 percent of the cows indicating that it was principally the smaller operations that did not manage the time of calving. Of those operations with a set calving season (46.4 percent), the majority had a single season. Operations with a single or multiple defined calving seasons represented 51.1 percent and 13.6 percent of the cows, respectively.

a. Percent of operations (and percent of beef cows on these operations on January 1, 1997) by number of breeding seasons:

Number Breeding Seasons	Percent Operations	Standard Error	Percent Beef Cows	Standard Error
One season	36.6	(±1.7)	51.1	(±1.5)
Two or more seasons	9.8	(±1.0)	13.6	(±1.0)
No set season	53.6	(±1.7)	35.3	(±1.5)
Total	100.0		100.0	

More than half (55.3 percent) of the operations with a single breeding season began the last breeding season in May or June with an additional 11.5 percent starting the breeding season in April.

b. ***For operations with one breeding season***, percent of operations (and percent of beef cows on these operations on January 1, 1997) by month the last breeding season began:

Month	Percent Operations	Standard Error	Percent Beef Cows	Standard Error
January	4.8	(±0.9)	4.3	(±0.6)
February	4.3	(±0.8)	5.0	(±1.2)
March	4.6	(±0.8)	5.0	(±0.8)
April	11.5	(±1.7)	12.8	(±1.7)
May	26.6	(±2.7)	26.3	(±1.8)
June	28.7	(±2.2)	33.3	(±2.3)
July	8.8	(±1.6)	5.4	(±0.8)
August	0.5	(±0.2)	0.2	(±0.1)
September	0.9	(±0.6)	0.1	(±0.1)
October	1.5	(±0.8)	0.7	(±0.2)
November	2.6	(±1.3)	1.9	(±0.6)
December	5.2	(±2.0)	5.0	(±1.8)
Total	100.0		100.0	

Nearly all (94.1 percent) operations with one breeding season completed their calving season within 5 months. However, only 69.8 percent of operations completed their calving season in 90 days.

c. ***For operations with one breeding season***, percent of operations with calves born by number of birth months:

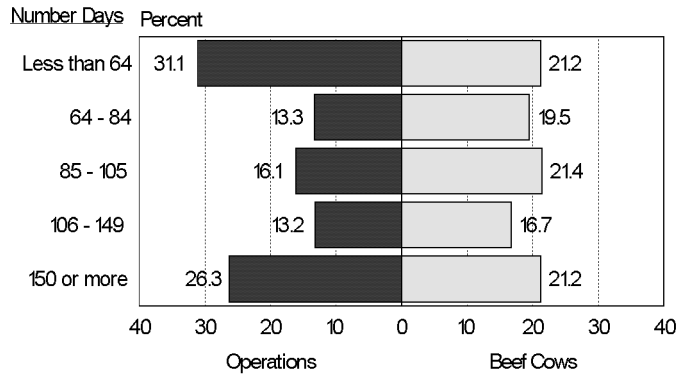
Number Month(s)	Percent Operations	Standard Error
1	10.3	(±2.1)
2	33.9	(±2.9)
3	25.6	(±2.0)
4	15.3	(±1.8)
5	9.0	(±1.7)
6	3.2	(±0.7)
7	1.3	(±0.4)
8	0.5	(±0.2)
9	0.3	(±0.2)
10	0.4	(±0.2)
11	0.1	(±0.0)
12	0.1	(±0.0)
Total	100.0	

Although 31.1 percent of opeations with one breeding season had a breeding season lasting less than 64 days, only 21.2 percent of cows resided on those operations, indicating these were primarily smaller operations.

d. ***For operations with one breeding season***, percent of operations (and percent of beef cows on these operations January 1, 1997) by length of the last breeding season:

Days	Percent Operations	Standard Error	Percent Beef Cows	Standard Error
Less than 64	31.1	(±2.9)	21.2	(±1.7)
64 - 84	13.3	(±1.5)	19.5	(±2.0)
85 - 105	16.1	(±1.6)	21.4	(±2.2)
106 - 149	13.2	(±1.7)	16.7	(±2.2)
150 or more	26.3	(±2.6)	21.2	(±1.6)
Total	100.0		100.0	

Percent of Operations* (and Percent Beef Cows on these Operations) by Length of Last Breeding Season



* For operations with one breeding season.

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The average length of breeding season among those operations with a single breeding season was not remarkably different by herd size. This is likely due to the relatively wide variation in breeding season length reported by operations in each herd size category.

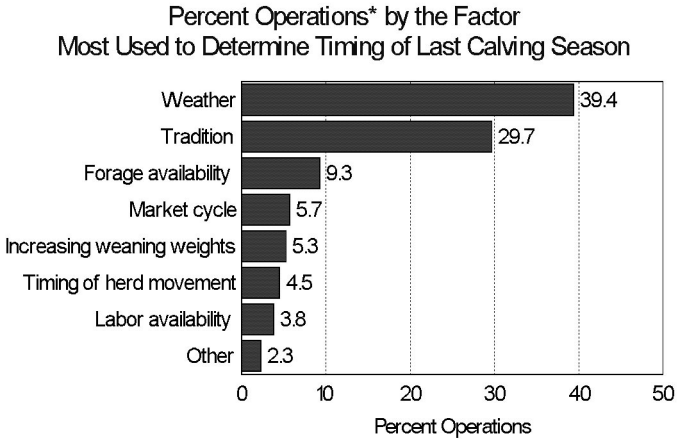
e. ***For operations with one breeding season***, operation average number of days in the breeding season by herd size:

Number Cows	Operation Average (Days)	Standard Error
Less than 50	110.9	(±5.9)
50 - 99	118.4	(±4.7)
100-299	113.4	(±3.5)
300 or more	99.4	(±5.1)
All operations	110.9	(±3.9)

Operations with a single breeding season tended to focus on weather and tradition in setting timing of the breeding and calving seasons. More than two-thirds (69.1 percent) of operations used these two criteria for setting the breeding and calving seasons. However, only 61.1 percent of the cows were on operations using either of these criteria as the primary factor to set the breeding and calving seasons indicating these operations tended to be slightly smaller. It is interesting to note that for other factors used to set the breeding season, such as forage availability and market cycle, the percentage of cows represented on these operations is larger than the percentage of operations indicating that these are factors more commonly employed by larger operations.

f. ***For operations with one breeding season***, percent of operations (and percent of beef cows on these operations on January 1, 1997) by the factor most used to determine timing of the last calving season:

Factor	Percent Operations	Standard Error	Percent Beef Cows	Standard Error
Tradition	29.7	(±2.4)	27.3	(±1.9)
Weather	39.4	(±2.8)	33.8	(±2.2)
Forage availability	9.3	(±1.4)	13.6	(±2.5)
Increasing weaning weights	5.3	(±0.8)	6.9	(±1.0)
Market cycle	5.7	(±1.3)	7.6	(±1.5)
Labor availability	3.8	(±0.5)	4.6	(±0.7)
Timing of herd movement	4.5	(±1.8)	4.4	(±1.2)
Other	2.3	(±0.9)	1.8	(±0.4)
Total	100.0		100.0	



2. Breeding methods

Most operations (91.9 percent) only used natural service for breeding cows and heifers to calve in 1996. Only 7.1 percent of operations used any artificial insemination. Most of these (6.2 percent) used artificial insemination and natural service.

a. Percent of operations that used the following breeding methods for females calving in 1996:

Breeding Method Used by Operation	Percent Operations	Standard Error
Artificially inseminated, no natural service	0.9	(±0.3)
Natural service, not artificially inseminated	91.9	(±0.7)
Artificially inseminated and natural service	6.2	(±0.7)
Neither artificially inseminated, nor natural service, brought on bred females	1.0	(±0.3)
Total	100.0	

Most operations (96.3 percent) had some females where only natural service was used in 1996. Only 4.8 percent of operations had any females that were both artificially inseminated and exposed to bulls. The smallest percentage of operations (2.9 percent) had some animals that were only artificially inseminated. Since these numbers sum to more than 100 percent, it is apparent that some operations (relatively few) have some females in each of two or three of the categories.

b. Percent of operations where any individual female was bred using the following methods for calving in 1996:

Breeding Method per Female	Percent Operations	Standard Error
Both artificially inseminated and exposed to bulls	4.8	(±0.6)
Only artificially inseminated	2.9	(±0.5)
Only exposed to a bull	96.3	(±0.6)
Brought onto operation already exposed or artificially inseminated	3.7	(±0.6)

Most cows and heifers (92.8 percent) on cow-calf operations represented by this study were bred by natural service only. Another 4.8 percent of females were artificially inseminated and exposed to bulls. Less than 1 percent (0.8 percent) of females were only artificially inseminated.

c. Percent of females bred or intended to be bred for calving in 1996 by breeding method:

Breeding Method per Female	Percent Females	Standard Error
Both artificially inseminated and exposed to bulls	4.8	(±0.7)
Only artificially inseminated	0.8	(±0.2)
Only exposed to a bull	92.8	(±0.8)
Brought onto operation already exposed or artificially inseminated	1.6	(±0.2)
Total	100.0	

3. Bull management

Some research would indicate that under certain conditions producers underutilize the mating capacity of bulls on cow-calf operations. This may be especially true in multi-sire mating groups where the bulls have been subjected to a breeding soundness examination prior to the start of the breeding season. The number of females that bulls can be expected to service was relatively consistent across herd sizes. Across all operations, the average number of females expected to be serviced by yearling bulls was 17.5 compared to 25.3 for mature bulls. The smallest operations tended to have slightly lighter mating loads for bulls.

a. Average number of females expected to be mated or serviced per bull by herd size:

	Average Number Females									
	Number Cows									
Type of Bull	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Yearling	14.5	(±0.7)	17.5	(±0.8)	19.8	(±0.4)	19.5	(±0.8)	17.5	(±0.4)
Mature	22.9	(±0.6)	27.1	(±0.5)	27.4	(±0.7)	26.3	(±0.6)	25.3	(±0.3)

A breeding soundness examination of bulls prior to the start of the breeding season leads to enhanced fertility in the herd compared to using bulls that have not been tested. The breeding soundness examination usually involves collection of a semen sample for evaluation and measurement of the scrotal circumference. Only 17.3 percent of operations reported using semen testing of bulls (excluding purchased, leased, and borrowed bulls) prior to the last breeding season. Use of semen testing was highly related to herd size with larger herds more likely to use the procedure (53.6 percent) compared to the smallest herds (11.0 percent). Fewer herds (9.8 percent) reported use of scrotal measurements. It may be that producers did not realize that scrotal measurements were being taken as part of the breeding soundness examination or perhaps scrotal measurements are not being used as part of the routine breeding soundness examinations. Infection with Trichomonas fetus, a protozoal parasite that causes infertility, can have devastating effects on productivity of cow-calf operations. Only 4.5 percent of operations are testing any herd bulls (excluding purchased, leased, and borrowed bulls) for this parasite. Again, use of this procedure was related to herd size, which was more common in larger herds.

b. For operations where bulls serviced female cattle during the most recent breeding season, percent of operations that performed the following reproductive examination procedures on these bulls (excluding purchased, leased, and borrowed bulls) by herd size:

	Percent Operations									
	Number Cows									
Procedure	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Semen test	11.0	(±1.3)	28.3	(±2.8)	39.7	(±2.8)	53.6	(±4.3)	17.3	(±1.1)
Scrotal measurement	5.7	(±1.0)	14.8	(±1.9)	25.7	(±2.4)	41.8	(±4.4)	9.8	(±0.8)
Culture for Trichomonas fetus	3.3	(±0.8)	5.2	(±1.1)	9.2	(±1.6)	20.7	(±3.6)	4.5	(±0.6)

c. For operations where bulls serviced female cattle during the most recent breeding season, percent of bulls on those operations where the following reproductive examination procedures on bulls were performed (excluding purchased, leased, and borrowed bulls) by herd size:

	Percent Bulls									
	Number Cows									
Procedure	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Semen test	14.3	(±2.0)	29.9	(±2.7)	38.3	(±4.1)	50.7	(±5.2)	29.6	(±1.8)
Scrotal measurement	6.2	(±1.0)	17.2	(±2.3)	23.5	(±2.7)	40.7	(±5.4)	18.7	(±1.4)
Culture for Trichomonas fetus	4.5	(±1.2)	5.5	(±1.3)	9.6	(±1.6)	18.3	(±3.4)	8.5	(±0.9)

Addition of new animals into the herd can present an animal health risk since new disease agents can be introduced with the new animals. Still, since most operations use natural service in their herds, introduction of bulls into the herd is a way of bringing in new genetics to the herd. Over one-quarter (26.8 percent) of operations that used bulls reported that new bulls were introduced (purchased, leased, or borrowed) for the last breeding season. As expected, more larger operations (68.3 percent) introduced new bulls for the last breeding season than smaller operations (22.0 percent).

d. For operations where bulls serviced female cattle during the most recent breeding season, percent of operations that purchased, leased, or borrowed bulls to breed females for the last breeding season by herd size:

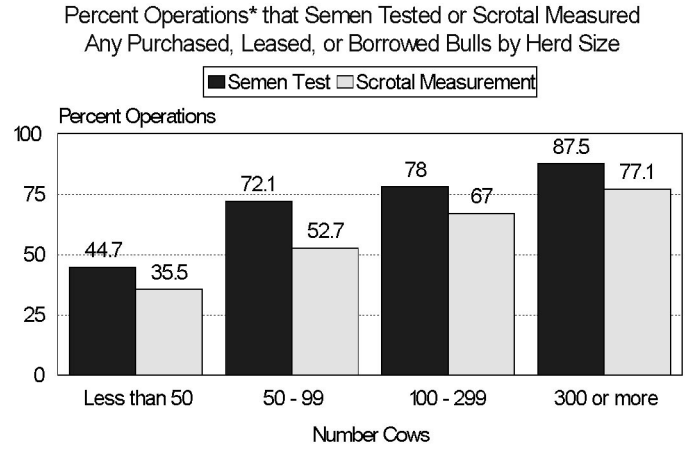
	Percent Operations									
	Number Cows									
Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
22.0	(±2.0)	31.7	(±2.4)	48.0	(±2.9)	68.3	(±3.8)	26.8	(±1.6)

A complete breeding soundness examination of bulls, including an evaluation of a semen sample and measuring the scrotum, is a way to increase the likelihood that the bull being examined is highly fertile at the time of evaluation. Larger operations were more likely to have a semen test or scrotal measurements performed on bulls that were purchased, leased or borrowed than smaller operations. Overall, only 57.3 percent of operations that purchased, leased, or borrowed bulls for the last breeding season had a semen test performed on any of the newly introduced bulls. Fewer operations (45.9 percent) reported that scrotal measurements were made for any of the newly introduced bulls. The relatively low percentage of producers that reported testing bulls newly introduced to the herd would indicate that they are overlooking an opportunity to enhance the fertility of their herds.

e. For operations that puchased, leased, or borrowed bulls for the last breeding season, percent of operations that semen tested or scrotal measured any purchased, leased, or borrowed bulls by herd size:

Percent Operations

	Number Cows									
Procedure	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Semen test	44.7	(±5.1)	72.1	(±3.6)	78.0	(±2.9)	87.5	(±3.5)	57.3	(±3.3)
Scrotal measurement	35.5	(±5.0)	52.7	(±4.2)	67.0	(±3.5)	77.1	(±4.2)	45.9	(±3.2)



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Trichomonas fetus is a protozoan parasite that causes infertility in cattle. The organism is venereally transmitted from bulls that are inapparent carriers to cows where it causes early embryonic deaths and thus delayed or failed conception. Bulls younger than 18 months are generally thought to not harbor the organism for any length of time and therefore pose lower risk for introducting the parasite into a new herd. However, bulls that are older than 18 months or those no longer considered to be virgin represent a higher risk for introducing the parasite into the herd if the herd of origin is infected. Many (61.3 percent) of the operations that purchased, leased, or borrowed bulls for the last breeding season introduced new bulls that were older than 18 months or no longer considered to be virgin bulls. The practice was less common in large operations (37.6 percent) than the smallest operations (72.1 percent). It appears that a significant proportion of operations are at risk for the introduction of Trichomonas fetus to their herd unless they use some sort of testing protocol (see 3.g. below).

f. For operations that puchased, leased, or borrowed bulls for the last breeding season, percent of operations that added bulls older than 18 months of age or no longer considered virgin by herd size:

Percent Operations

Number Cows: Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
72.1	(±3.8)	53.0	(±4.1)	38.1	(±3.4)	37.6	(±5.1)	61.3	(±2.8)

A rigorous testing protocol for Trichomonas fetus could be one means of minimizing the risk of introduction of this organism with newly introduced bulls over 18 months old or no longer considered virgin. However, less than one-quarter (24.5 percent) of operations that introduced older or non-virgin bulls tested all of them for Trichomonas fetus. Even among larger operations, relatively few (32.4 percent) tested all older or non-virgin bulls for Trichomonas fetus though a smaller percentage of these large operations introduced this type of bull in the first place (see 3.f. above).

g. For operations that introduced bulls older than 18 months of age or no longer considered virgin, percent of operations that cultured all these bulls for Trichomonas fetus by herd size:

Percent Operations

Number Cows: Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
23.7	(±6.2)	24.2	(±5.4)	27.8	(±5.0)	32.4	(±7.5)	24.5	(±4.5)

4. Calving location

Most operations (74.1 percent) had at least one cow or heifer that calved in pastures or locations other than the specialized areas mentioned. Very few operations (4.3 percent) had any cows or heifers that calved in individual calving pens. Larger herds were more likely to have at least some animals calve in various locations than smaller herds. Larger herds were more likely (40.2 percent) to have some heifers or cows calve in specialized pastures that allowed increased observation and/or shelter than the smallest operations (17.6 percent). The smallest operations were most likely (77.1 percent) to calve some animals in 'other pastures' compared to operations of other sizes. It appears that larger operations are more likely to be able to designate special use areas of the operation than smaller operations.

a. For operations where at least one ***replacement heifer or cow*** calved in 1996, percent of operations by calving location and herd size:

	Percent Operations Number Cows									
Location	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Individual calving pens (covered or uncovered)	2.6	(±0.6)	6.4	(±1.1)	11.5	(±1.5)	17.2	(±3.5)	4.3	(±0.5)
Covered sheds or barns (without individual pens or outside access)	6.8	(±1.0)	9.4	(±1.3)	14.0	(±1.5)	17.9	(±3.6)	8.1	(±0.8)
Calving lots (corrals or pens that do not allow grazing)	5.7	(±0.7)	13.2	(±1.6)	24.3	(±2.4)	29.7	(±4.2)	9.0	(±0.6)
Special calving pastures that allow increased observation and/or shelter	17.6	(±1.9)	27.0	(±2.3)	35.5	(±2.6)	40.2	(±4.4)	21.1	(±1.4)
Other pastures, open range, or other locations	77.1	(±1.9)	68.8	(±2.3)	61.3	(±2.6)	60.1	(±4.4)	74.1	(±1.5)

In general, by comparing this table with the table that follows (4.c.), it is apparent that it is more likely for operations to use specialized facilities to calve heifers than to calve cows.

b. For operations where at least one ***replacement heifer*** calved in 1996, percent of operations by calving location and herd size:

	Percent Operations Number Cows									
Location	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Individual calving pens (covered or uncovered)	5.3	(±1.8)	9.7	(±2.1)	13.7	(±2.0)	18.8	(±4.0)	8.2	(±1.2)
Covered sheds or barns (without individual pens or outside access)	6.9	(±1.8)	12.0	(±2.3)	14.6	(±1.9)	17.7	(±4.0)	9.7	(±1.2)
Calving lots (corrals or pens that do not allow grazing)	7.7	(±1.6)	19.2	(±2.6)	27.3	(±3.1)	32.5	(±4.8)	14.4	(±1.3)
Special calving pastures that allow increased observation and/or shelter	22.6	(±3.6)	26.9	(±3.2)	29.7	(±3.0)	30.9	(±4.5)	25.1	(±2.3)
Other pastures, open range, or other locations	62.7	(±4.1)	45.7	(±3.6)	31.9	(±3.7)	29.1	(±3.9)	52.6	(±2.8)

c. For operations where at least one ***cow*** calved in 1996, percent of operations by calving location and herd size:

Location	Percent Operations Number Cows: Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Individual calving pens (covered or uncovered)	1.9	(±0.5)	4.9	(±1.0)	8.1	(±1.3)	11.6	(±3.1)	3.1	(±0.4)
Covered sheds or barns (without individual pens or outside access)	6.3	(±1.0)	7.7	(±1.2)	10.2	(±1.3)	12.0	(±3.0)	7.0	(±0.8)
Calving lots (corrals or pens that do not allow grazing)	4.8	(±0.6)	9.7	(±1.4)	13.9	(±1.8)	14.1	(±3.2)	6.6	(±0.5)
Special calving pastures that allow increased observation and/or shelter	16.4	(±1.9)	24.1	(±2.2)	30.8	(±2.5)	30.2	(±4.4)	19.2	(±1.4)
Other pastures, open range, or other locations	77.2	(±1.9)	68.6	(±2.3)	61.2	(±2.6)	60.1	(±4.4)	74.1	(±1.5)

The largest percentage of heifers (36.4 percent) that calved in 1996 did so in 'other pastures, open range, or other locations'. This can be compared to the percentage of cows (62.8 percent) that calved in similar locations, again indicating that specialized facilities are more likely to be used for heifers than for cows.

d. For operations where at least one ***replacement heifer or cow*** calved, percent of calvings by calving location:

Location	Percent Calvings: Percent Replacement Heifers	Standard Error	Percent Cows	Standard Error	Percent All Females	Standard Error
Individual calving pens (covered or uncovered)	7.3	(±1.0)	2.0	(±0.3)	2.5	(±0.3)
Covered sheds or barns (without individual pens or outside access)	9.3	(±1.2)	3.7	(±0.4)	4.2	(±0.4)
Calving lots (corrals or pens that do not allow grazing)	21.0	(±2.0)	7.3	(±0.7)	8.5	(±0.7)
Special calving pastures that allow increased observation and/or shelter	26.0	(±2.2)	24.2	(±1.5)	24.4	(±1.5)
Other pastures, open range, or other locations	36.4	(±2.5)	62.8	(±1.5)	60.4	(±1.5)
Total	100.0		100.0		100.0	

5. Calving observation

Most operations observed calving females on a regular basis during the calving season.

a. Percent of operations observing females during calving on a regular basis in 1996:

Percent Operations			
Replacement Heifers	Standard Error	Cows	Standard Error
93.3	(±2.0)	91.6	(±1.2)

When operations observed calving females on a regular basis, they tended to observe heifers more frequently (more times per day) than cows. The average number of times heifers were observed in a 24-hour period was 3.6 (every 6.7 hours), whereas cows were observed 2.5 times per day (every 9.6 hours).

b. For operations that observed females regularly, operation average number of times females were observed during calving in 1996 over an average 24-hour period:

Operation Average Number Times			
Replacement Heifers	Standard Error	Cows	Standard Error
3.6	(±0.1)	2.5	(±0.1)

Some operations (7.0 percent) observed heifers less than once per day during the calving period. Over half (55.7 percent) reported observing heifers two times per day or less. Larger operations tended to observe calving heifers more frequently than smaller operations which may reflect the total amount of time available to dedicate to the calving operation. Operators with fewer cows may be more likely to have an off-farm job which limits the frequency that they can observe their animals during the calving season.

c. For operations where at least one ***replacement heifer*** calved in 1996, percent of operations by number of times replacement heifers were observed during an average 24-hour period when calving and herd size:

	Percent Operations									
	Number Cows									
	Less	Standard		Standard	100	Standard	300	Standard	All	Standard
Number Times	Than 50	Error	50-99	Error	-299	Error	or More	Error	Ops.	Error
Less than 1	8.1	(±3.3)	5.4	(±1.7)	5.1	(±1.3)	6.1	(±1.9)	7.0	(±2.0)
1	24.4	(±4.4)	16.4	(±2.9)	12.3	(±2.8)	9.0	(±2.2)	20.1	(±2.7)
2	32.4	(±4.7)	27.5	(±3.2)	19.3	(±3.4)	18.9	(±3.3)	28.6	(±2.9)
3 - 4	23.5	(±3.7)	21.7	(±3.0)	17.7	(±2.6)	10.7	(±3.1)	21.6	(±2.3)
5 or more	11.6	(±2.3)	29.0	(±3.1)	45.6	(±3.4)	55.3	(±4.7)	22.7	(±1.8)
Total	100.0		100.0		100.0		100.0		100.0	

Cows were checked less frequently than heifers (as shown in 5.b.). Far fewer operations reported checking cows five or more times per day (8.0 percent) compared to heifers (22.7 percent).

d. For operations where at least one ***cow*** calved in 1996, percent of operations by number of times cows were observed during an average 24-hour period when calving and herd size:

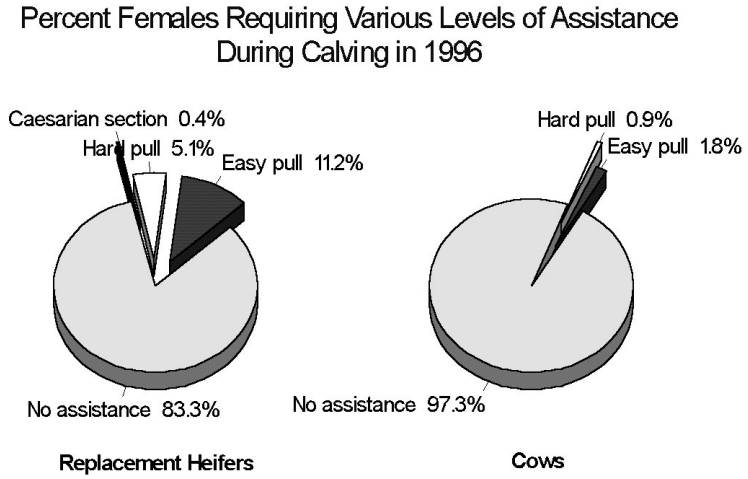
	Percent Operations									
	Number Cows									
Number Times	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Less than 1	9.2	(±1.6)	6.7	(±1.2)	10.2	(±2.2)	13.0	(±2.4)	9.0	(±1.2)
1	34.2	(±2.6)	27.3	(±2.3)	22.4	(±2.4)	23.1	(±3.2)	31.8	(±1.9)
2	33.5	(±2.6)	30.8	(±2.9)	24.6	(±2.7)	21.2	(±3.4)	32.1	(±1.9)
3 - 4	18.2	(±1.7)	21.4	(±2.0)	21.7	(±2.2)	23.2	(±4.0)	19.1	(±1.3)
5 or more	4.9	(±0.7)	13.8	(±1.6)	21.1	(±2.0)	19.5	(±3.9)	8.0	(±0.6)
Total	100.0		100.0		100.0		100.0		100.0	

6. Calving assistance

As would be expected, cows required less assistance in calving than heifers. Most cows (97.3 percent) calved without any assistance, whereas only 83.3 percent of heifers required no assistance. In most cases where heifers required assistance, producers classified it as an 'easy pull' (11.2 percent of heifer calvings).

a. Percent of females requiring various levels of assistance during calving in 1996:

	Percent Females					
Level of Assistance	Percent Replacement Heifers	Standard Error	Percent Cows	Standard Error	Percent All Females	Standard Error
Easy pull	11.2	(±0.8)	1.8	(±0.1)	2.7	(±0.2)
Hard pull	5.1	(±0.4)	0.9	(±0.1)	1.2	(±0.1)
Caesarian section	0.4	(±0.1)	0.0	(±0.0)	0.1	(±0.0)
No assistance	83.3	(±0.9)	97.3	(±0.2)	96.0	(±0.2)
Total	100.0		100.0		100.0	



In the event of a difficult birth (dystocia), chances for survival of both calf and dam can be improved with early intervention. Generally, heifers were allowed to labor a shorter period of time (2.8 hours) than cows (3.5 hours) prior to being given assistance.

b. Operation average number of hours females were allowed to labor before given assistance:

Operation Average Number Hours					
Replacement Heifers	Standard Error	Cows	Standard Error	All Females	Standard Error
2.8	(±0.1)	3.5	(±0.1)	3.5	(±0.1)

Over half (60.7 percent) of all operations (and operations in each size group) allowed heifers to labor for 2 hours or less before assistance was given. Most sources would recommend this practice as a good rule of thumb.

c. Percent of operations by average number of hours ***replacement heifers*** were normally allowed to labor before given assistance and herd size:

	Percent Operations Number Cows									
Number Hours	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
1	24.8	(±3.9)	28.1	(±3.5)	36.2	(±3.3)	35.7	(±4.8)	27.9	(±2.5)
2	30.2	(±3.9)	36.1	(±3.4)	35.4	(±3.3)	45.1	(±4.9)	32.8	(±2.5)
3	16.3	(±3.4)	14.4	(±2.5)	10.8	(±3.0)	9.0	(±2.6)	14.7	(±2.1)
4	15.7	(±4.1)	9.1	(±2.2)	6.9	(±1.9)	3.3	(±1.2)	12.4	(±2.5)
5 - 6	6.9	(±1.8)	7.7	(±1.8)	8.9	(±2.7)	4.1	(±2.9)	7.3	(±1.2)
7 or more	6.1	(±2.2)	4.6	(±1.4)	1.8	(±0.7)	2.8	(±1.4)	4.9	(±1.3)
Total	100.0		100.0		100.0		100.0		100.0	

Less than one-half (45.5 percent) of operations intervened with laboring cows within 2 hours. It may be that producers are relying on the fact that cows have had at least one calf previously and generally have larger birth canals and assume that eventually the cow will deliver her calf without assistance. However, a lengthy delivery in cows can be just as damaging to the calf's chances of survival and may actually signal a more serious problem in calf positioning than for heifers.

d. Percent of operations by average number of hours ***cows*** were normally allowed to labor before given assistance and herd size:

	Percent Operations Number Cows									
Number Hours	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
1	16.3	(±1.8)	19.9	(±2.1)	27.9	(±2.5)	27.4	(±4.2)	18.2	(±1.3)
2	25.3	(±2.1)	32.2	(±2.5)	31.5	(±2.7)	44.7	(±4.6)	27.3	(±1.6)
3	17.6	(±1.9)	16.0	(±1.8)	14.4	(±2.5)	12.1	(±3.0)	16.9	(±1.4)
4	16.8	(±2.2)	16.9	(±3.1)	10.4	(±1.6)	7.5	(±2.7)	16.0	(±1.6)
5 - 6	14.4	(±2.3)	8.9	(±1.7)	9.1	(±2.2)	2.1	(±0.9)	12.8	(±1.7)
7 or more	9.6	(±1.8)	6.1	(±1.4)	6.7	(±2.3)	6.2	(±2.1)	8.8	(±1.3)
Total	100.0		100.0		100.0		100.0		100.0	

Relatively few (11.8 percent) of all assisted calvings were attended by a veterinarian. The percent of assisted heifer and cow calvings attended by a veterinarian was similar for cows (13.0 percent) and heifers (9.9 percent).

e. Percent of assisted calvings attended by a veterinarian:

Percent Calvings					
Replacement Heifers	Standard Error	Cows	Standard Error	All Females	Standard Error
9.9	(±1.0)	13.0	(±1.2)	11.8	(±0.9)

On nearly two-thirds (64.0 percent) of operations that had assisted calvings during the year, none were attended by a veterinarian. However, on 16.3 percent of operations with some assisted calvings, a veterinarian attended all of the assisted calvings. A veterinarian was more likely to attend 100 percent of the assisted calvings for cows (18.8 percent of operations with assisted calvings for cows) compared to heifers (9.7 percent of operations with assisted calvings of heifers). This difference may be a reflection of more serious problems (malpositioning, fetal deformities, etc.) in cows than heifers when assistance during deliveries is needed.

f. For operations with assisted calvings, percent of operations by percent of assisted calvings attended by a veterinarian:

	Percent Operations					
Percent of Assisted Calvings	Replacement Heifers	Standard Error	Cows	Standard Error	All Females	Standard Error
0	74.2	(±2.7)	65.6	(±2.4)	64.0	(±2.2)
0.1-24.9	9.9	(±2.1)	5.0	(±0.9)	9.4	(±1.2)
25.0-49.9	3.0	(±0.8)	5.2	(±0.9)	4.8	(±0.8)
50.0-74.5	2.6	(±0.7)	5.1	(±0.9)	5.2	(±0.8)
75.0-99.9	0.6	(±0.3)	0.3	(±0.2)	0.3	(±0.2)
100	9.7	(±1.7)	18.8	(±2.1)	16.3	(±1.8)
Total	100.0		100.0		100.0	

7. Monthly calving distribution

Nearly two-thirds (63.9 percent) of calves born in 1996 were born in the months of February, March, and April.

a. Percent of beef calves born by month in 1996:

Month	Percent Calves	Standard Error
January	7.1	(±0.5)
February	15.2	(±0.8)
March	27.2	(±0.8)
April	21.5	(±0.7)
May	7.6	(±0.3)
June	2.3	(±0.2)
July	1.4	(±0.1)
August	1.6	(±0.2)
September	3.7	(±0.3)
October	4.5	(±0.3)
November	4.2	(±0.4)
December	3.7	(±0.4)
Total	100.0	

Monthly calving distribution was related to geographic region. Higher percentages of calves were born in the fall in Southcentral, Central, and Southeast states than in other areas of the country. Still, the majority of calves in all regions were born in the early part of the calendar year.

i. Percent of beef calves born by month in 1996 by region:

	Percent Calves									
	Region									
Month	West	Standard Error	North-central	Standard Error	South-central	Standard Error	Central	Standard Error	Southeast	Standard Error
January	5.6	(±1.8)	1.7	(±0.4)	11.1	(±1.0)	3.9	(±0.6)	12.7	(±1.1)
February	15.3	(±2.5)	12.7	(±1.8)	17.5	(±1.1)	12.9	(±1.5)	17.2	(±1.0)
March	33.8	(±2.1)	35.6	(±2.0)	20.2	(±1.0)	26.1	(±1.4)	20.0	(±0.9)
April	25.4	(±2.1)	33.8	(±1.7)	12.0	(±1.1)	24.1	(±1.4)	13.0	(±0.9)
May	5.5	(±0.7)	9.6	(±0.8)	6.4	(±0.7)	11.0	(±1.0)	5.9	(±0.6)
June	1.1	(±0.3)	1.2	(±0.2)	3.4	(±0.5)	2.8	(±0.4)	3.2	(±0.4)
July	1.0	(±0.3)	0.3	(±0.1)	2.3	(±0.5)	1.6	(±0.2)	1.8	(±0.2)
August	1.6	(±0.7)	0.5	(±0.2)	2.2	(±0.3)	1.9	(±0.3)	2.0	(±0.3)
September	2.5	(±0.8)	1.2	(±0.3)	5.2	(±0.9)	4.9	(±0.7)	4.8	(±0.6)
October	2.2	(±0.6)	1.5	(±0.3)	6.8	(±0.8)	5.3	(±0.7)	6.8	(±0.7)
November	3.1	(±1.7)	1.2	(±0.3)	6.9	(±0.6)	2.9	(±0.6)	6.7	(±0.6)
December	2.9	(±1.7)	0.7	(±0.2)	6.0	(±0.6)	2.6	(±0.7)	5.9	(±0.6)
Total	100.0		100.0		100.0		100.0		100.0	

During 1996, over two-thirds (68.4 percent) of operations had some calves born in the month of March. Nearly as many (60.8 percent) had some calves born in April. Less than 50 percent of operations had calves born in each of the other months.

b. Percent of operations with one or more beef calves born in the month listed:

Month	Percent Operations	Standard Error
January	29.6	(±1.8)
February	49.7	(±2.0)
March	68.4	(±2.0)
April	60.8	(±2.0)
May	38.2	(±1.9)
June	23.8	(±1.7)
July	15.4	(±1.4)
August	14.1	(±1.3)
September	20.2	(±1.4)
October	24.7	(±1.7)
November	23.9	(±1.7)
December	18.6	(±1.5)

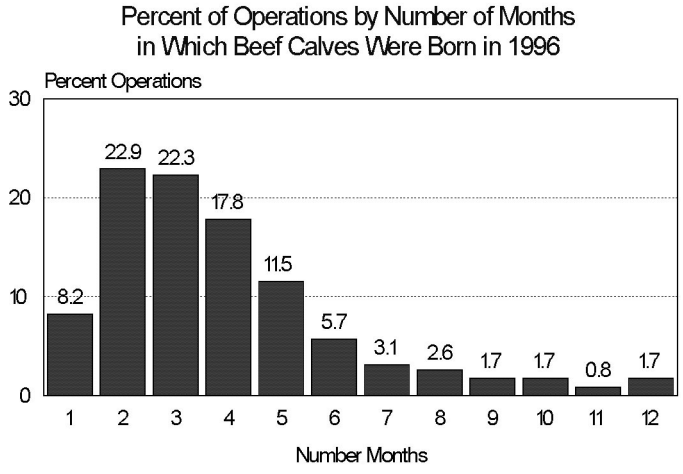
i. Percent of operations with one or more beef calves born in the month listed by region:

	Percent Operations									
	Region									
Month	West	Standard Error	North-central	Standard Error	South-central	Standard Error	Central	Standard Error	Southeast	Standard Error
January	23.0	(±3.2)	12.4	(±2.0)	39.8	(±4.6)	20.1	(±3.3)	35.7	(±3.3)
February	55.1	(±4.5)	34.8	(±3.1)	53.1	(±5.1)	43.4	(±4.3)	55.2	(±3.5)
March	76.7	(±3.8)	73.1	(±2.9)	67.0	(±5.1)	69.0	(±4.2)	65.2	(±3.5)
April	62.2	(±4.8)	74.8	(±3.2)	64.4	(±4.8)	64.1	(±4.2)	49.8	(±3.5)
May	36.9	(±4.4)	43.7	(±3.1)	37.4	(±4.9)	43.2	(±4.0)	34.0	(±3.3)
June	12.9	(±2.6)	16.2	(±2.5)	28.5	(±4.4)	24.9	(±3.4)	25.0	(±3.0)
July	11.9	(±2.7)	6.6	(±1.5)	19.3	(±3.7)	16.2	(±2.4)	16.0	(±2.6)
August	9.5	(±2.7)	5.6	(±1.3)	17.4	(±3.3)	14.5	(±2.3)	15.6	(±2.5)
September	12.7	(±3.0)	10.6	(±2.0)	22.5	(±3.4)	21.4	(±2.7)	23.5	(±2.8)
October	14.7	(±3.1)	13.3	(±2.3)	34.9	(±4.8)	24.0	(±3.2)	23.7	(±2.8)
November	12.7	(±2.8)	11.7	(±2.3)	34.8	(±4.7)	19.9	(±3.4)	25.1	(±2.8)
December	14.7	(±3.0)	7.6	(±1.8)	28.0	(±4.1)	13.6	(±2.5)	19.3	(±2.3)

Nearly two-thirds (63.0 percent) of operations had calves born in 2, 3, or 4 months of the year during 1996. Relatively few operations (28.8 percent) had calves born in each of 5 or more months.

c. Percent of operations by number of months in which beef calves were born in 1996:

Month	Percent Operations	Standard Error
1	8.2	(±1.3)
2	22.9	(±1.8)
3	22.3	(±1.6)
4	17.8	(±1.6)
5	11.5	(±1.4)
6	5.7	(±0.8)
7	3.1	(±0.5)
8	2.6	(±0.5)
9	1.7	(±0.5)
10	1.7	(±0.4)
11	0.8	(±0.4)
12	1.7	(±0.3)
Total	100.0	



#3473

i. Percent of operations by number of months in which beef calves were born in 1996 by herd size:

Percent Operations

Month	Number Cows: Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error
1	10.6	(±1.8)	1.8	(±0.7)	0.7	(±0.3)	0.3	(±0.3)
2	25.8	(±2.4)	15.2	(±1.8)	13.5	(±2.1)	14.3	(±3.2)
3	20.6	(±2.1)	25.4	(±2.2)	28.2	(±2.5)	36.8	(±4.4)
4	17.1	(±2.1)	20.7	(±2.4)	18.4	(±2.2)	22.7	(±3.7)
5	11.5	(±1.9)	10.7	(±1.5)	12.1	(±2.0)	11.4	(±2.7)
6	5.5	(±1.0)	6.6	(±1.1)	6.5	(±1.2)	5.4	(±1.7)
7	2.6	(±0.6)	3.4	(±0.8)	6.4	(±2.2)	3.2	(±1.4)
8	2.1	(±0.6)	5.2	(±1.3)	3.3	(±0.8)	1.2	(±0.7)
9	1.2	(±0.4)	4.3	(±2.6)	1.1	(±0.4)	1.2	(±0.7)
10	1.3	(±0.5)	1.6	(±0.6)	5.6	(±2.2)	0.9	(±0.5)
11	0.8	(±0.5)	1.2	(±0.6)	0.5	(±0.2)	0.0	(±0.0)
12	0.9	(±0.2)	3.9	(±1.1)	3.7	(±0.9)	2.6	(±1.1)
Total	100.0		100.0		100.0		100.0	

ii. Percent of operations by number of months in which beef calves were born in 1996 by region:

Percent Operations

Month	Region: West	Standard Error	North-central	Standard Error	South-central	Standard Error	Central	Standard Error	Southeast	Standard Error
1	8.3	(±3.3)	5.6	(±1.4)	4.5	(±2.6)	10.8	(±3.5)	10.6	(±2.5)
2	32.1	(±5.0)	34.7	(±3.1)	18.0	(±4.4)	26.5	(±4.3)	17.6	(±2.7)
3	25.0	(±3.8)	31.0	(±3.1)	22.9	(±4.2)	15.5	(±2.1)	21.9	(±3.1)
4	14.4	(±2.2)	13.5	(±2.1)	19.9	(±4.5)	16.9	(±2.7)	19.4	(±2.8)
5	6.5	(±2.3)	7.8	(±1.5)	12.7	(±3.8)	14.1	(±3.2)	11.6	(±2.2)
6	4.6	(±1.3)	4.2	(±1.2)	4.2	(±1.5)	5.9	(±1.5)	7.8	(±1.9)
7	4.0	(±1.7)	1.5	(±0.9)	3.9	(±0.9)	2.1	(±0.9)	3.5	(±1.1)
8	1.1	(±0.4)	1.4	(±0.9)	1.6	(±0.4)	4.5	(±1.6)	3.2	(±1.0)
9	0.5	(±0.3)	0.3	(±0.2)	3.4	(±1.6)	1.0	(±0.5)	1.5	(±0.6)
10	2.4	(±2.2)	0.0	(±0.0)	2.6	(±0.9)	0.8	(±0.4)	2.0	(±0.8)
11	0.3	(±0.2)	0.0	(±0.0)	2.4	(±1.5)	0.1	(±0.1)	0.4	(±0.2)
12	0.8	(±0.3)	0.0	(±0.0)	3.9	(±0.7)	1.8	(±0.7)	0.5	(±0.2)
Total	100.0		100.0		100.0		100.0		100.0	

8. Calf crop

The number of calves born per 100 females exposed is a measure of production efficiency on the beef operation. It accounts for fertility of the herd and embryo and fetal losses. However, the component data used to calculate this percentage is not easy to obtain from producers. Overall, producers reported a 92.6 percent calving rate for all females (heifers and cows) exposed (natural service or artificial insemination) for calves to be born in 1996. This percentage was similar across all herd size groups. It may reflect the optimism of producers in reporting numbers on a retrospective basis as it is generally higher than has been reported by most applications of the Standardized Performance Analysis (SPA) system elsewhere.

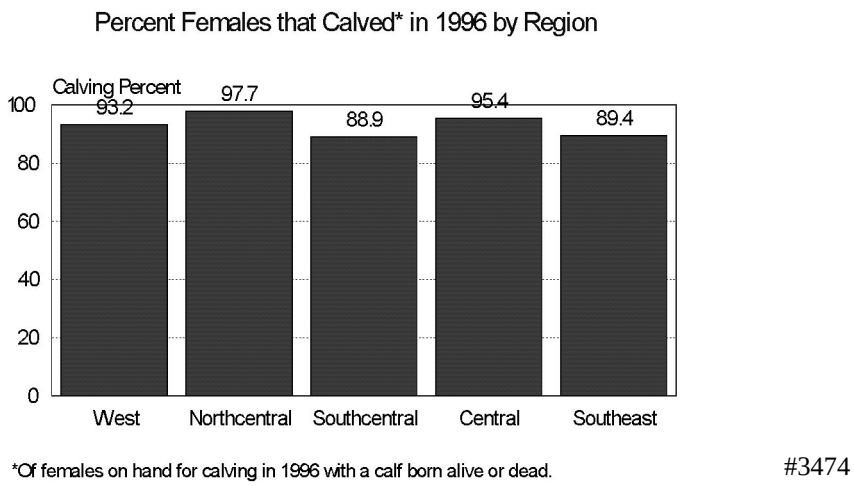
a. Of females on hand for calving in 1996, percent that calved (calf born alive or dead) by herd size[1]:

				Calving Percent					
				Number Cows					
Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
92.2	(±0.8)	95.1	(±0.4)	91.4	(±1.6)	92.8	(±0.9)	92.6	(±0.6)

Calving percentages tended to be slightly lower in the Southcentral and Southeast regions than other regions of the U.S.

b. Of females on hand for calving in 1996, percent that calved (calf born alive or dead) by region[1]:

				Calving Percent					
				Region					
West	Standard Error	North-central	Standard Error	South-central	Standard Error	Central	Standard Error	Southeast	Standard Error
93.2	(±2.7)	97.7	(±0.5)	88.9	(±1.0)	95.4	(±0.8)	89.4	(±0.8)



1 (Females calved divided by females exposed to bulls or artificially inseminated [including purchases] minus those sold or moved off the operation before calving that were pregnant) x 100.

Section II: Sample Profile

A. Responding operations

1. Total cattle and calves on hand, January 1, 1997:

	Number Responding Operations
Less than 50	664
50 - 99	638
100 - 399	1,061
400 or more	350
Total	2,713

2. Total beef cows on hand, January 1, 1997:

Less than 50	1,231
50 - 99	645
100 - 299	641
300 or more	196
Total	2,713

3. Total operations by region:

West	460
Northcentral	443
Southcentral	628
Central	437
Southeast	745
Total	2,713

Section III: U.S. Inventory of Beef Cows and Number of Operations Estimates[1]

Region	State	Number Beef Cows, January 1, 1997 (Thousand Head)		Operations with Beef Cows, 1996 (Thousands)	
West:					
	California	820		15.0	
	Colorado	826		9.5	
	Montana	1,570		11.7	
	New Mexico	533		6.5	
	Oregon	607		16.8	
	Wyoming	794		4.9	
	Total	5,150		64.4	
Northcentral:					
	Kansas	1,489		30.0	
	Nebraska	1,932		22.0	
	North Dakota	940		12.4	
	South Dakota	1,660		18.0	
	Total	6,021		82.4	
Southcentral:					
	Oklahoma	1,965		54.0	
	Texas	5,460		133.0	
	Total	7,425		187.0	
Central:					
	Arkansas	954		26.0	
	Illinois	460		17.8	
	Iowa	1,030		28.0	
	Missouri	2,075		64.0	
	Total	4,519		135.8	
Southeast:					
	Alabama	829		32.0	
	Florida	1,072		18.0	
	Georgia	692		25.0	
	Kentucky	1,160		45.0	
	Mississippi	682		29.0	
	Tennessee	1,085		54.0	
	Virginia	740		26.0	
	Total	6,260		229.0	
Total (23 states):		29,375	(85.7% of U.S.)	698.6	(77.6% of U.S.)
Total U.S. (50 states):		34,280		900.7	

1 Source: USDA, National Agricultural Statistics Service. Cattle. January 31, 1997.

Expected Products

and

Related Study Objectives

1. **Support global trade by estimating the prevalence of important animal pathogens.**
    - Johnes disease (interpretive summary), expected summer 1998.
    - Bovine leukosis virus and Salmonella (info sheets), expected summer 1998.

2. **Support efforts of the industry to supply quality products.**
    - ***Part I: Reference of 1997 Beef Cow-Calf Management Practices***, June 1997.
    - Part II: Reference of 1997 Beef Cow-Calf Health & Health Management Practices, July 1997.
    - Quality assurance (info sheet), expected fall 1997.
    - Calving management (info sheet), expected summer 1997.
    - Injection sites (info sheet), expected fall 1997.
    - Implants (info sheet), expected fall 1997

3. **Support the efforts of APHIS to achieve a high level of emergency preparedness.**
    - ***Part I: Reference of 1997 Beef Cow-Calf Management Practices***, June 1997.

4. **Describe trends in animal health.**
    - Part III: Changes in Beef Cow-Calf Management Practices, expected summer 1998.

5. **Support disease control efforts.**
    - Vaccinations (info sheet), expected fall 1997.
    - Johnes disease (interpretive summary), expected summer 1998.
    - Bovine leukosis virus and Salmonella (info sheets), expected summer 1998.
    - Part II: Reference of 1997 Beef Cow-Calf Health & Health Management Practices, July 1997.

6. ***Sup*port efforts of the beef industry to become more efficient.**
    - ***Part I: Reference of 1997 Beef Cow-Calf Management Practices***, June 1997.
    - Part II: Reference of 1997 Beef Cow-Calf Health & Health Management Practices, July 1997.
    - Cost of production (info sheet), expected fall 1997.

Centers for Epidemiology and Animal Health
USDA:APHIS:VS, attn. NAHMS
2150 Centre Ave., Bldg. B, MS 2E7
Fort Collins, CO 80526-8117
Telephone: (970) 494-7000
NAHMSweb@aphis.usda.gov
http//www.aphis.usda.gov/vs/ceah/cahm

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