United States
Department
of Agriculture

Animal and
Plant Health
Inspection
Service

**Veterinary
Services**

Part II:

Baseline Reference of Feedlot Health and Health Management, 1999

November 2000

Acknowledgments

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

The Feedlot '99 study was a cooperative effort between State and Federal agricultural statisticians, animal health officials, university researchers, extension personnel, and feedlot owners and operators. We want to thank the hundreds of industry members and others who helped determine the direction and objectives of this study by participating in focus groups.

Thanks to 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 feedlots 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 Feedlot '99 reports. Special recognition goes to Dr. Guy Loneragan from the Integrated Livestock Management program at Colorado State University for his contribution to the design and implementation of the Feedlot '99 study and analysis and interpretation of these data. Thanks also to the Centers for Epidemiology and Animal Health (CEAH) personnel for their efforts in generating and distributing timely reports from Feedlot '99 data.

All participants are to be commended for their efforts, particularly the producers whose voluntary efforts made the Feedlot '99 study possible.

Thomas E. Walton,
Director
Centers for Epidemiology and Animal Health

Suggested bibliographic citation for this report:
USDA. 2000. Part II: Baseline Reference of Feedlot Health and Health Management, 1999. USDA:APHIS:VS, CEAH, National Animal Health Monitoring System. Fort Collins, CO. #N335.1000.

Contacts for further information:
Questions or comments on Feedlot '99 study methodology or data analysis: Dr. David Dargatz.
Information on reprints or other NAHMS reports: Ms. Nina Stanton.
Telephone: (970) 490-8000 E-mail: NAHMSweb@usda.gov

Table of Contents

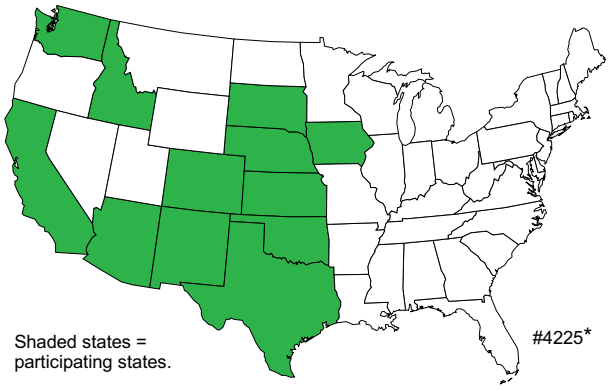
Introduction

The National Animal Health Monitoring System's (NAHMS) Feedlot '99 study was designed to provide both participants and those affiliated with the cattle feeding industry with information on the nation's feedlot cattle 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 and others about their informational needs and priorities.

The USDA's National Agricultural Statistics Service (NASS) collaborated with VS to select a statistically-valid sample such that inferences can be made to 100 percent of the cattle on feed in feedlots with a capacity of 1,000 head or more on January 1, 1999, in the 12 participating states (see map at right). NASS enumerators collected on-site data from the 520 feedlots for the initial report via a questionnaire administered from August 16, 1999, through September 22, 1999.

States Participating in the Feedlot '99 Study



Part I: Baseline Reference of Feedlot Management Practices, 1999 was the first in a series of releases documenting Feedlot '99 study results. A report on trends in beef feedlot management and health, released in August 2000, compares results of NAHMS' 1994 Cattle on Feed Evaluation (COFE) and initial results of the Feedlot '99 study.

Estimates related to health and health management of cattle on feedlots are documented in *Part II: Baseline Reference of Feedlot Health and Health Management, 1999*. Part II and Part III (expected to be released in December 2000) report results from a second phase of Feedlot '99 data collection done by Federal and state Veterinary Medical Officers (VMO's) and Animal Health Technicians (AHT's) in the 12 states. Data were collected on site from October 12, 1999, through January 7, 2000, from the feedlots that responded to the NASS questionnaire and agreed to continue participating.

Results of the Feedlot '99 and other NAHMS studies are accessible on the World Wide Web at http://www.aphis.usda.gov/vs/ceah/cahm (see Beef Feedlot).

For questions about this report or additional Feedlot '99 and NAHMS results, please contact:

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

Cattle placed/placement: Cattle put into a feedlot, fed a high-energy ration and intended for the slaughter market.

Cattle on feed: Animals being fed a high-energy ration of grain, silage, hay, and/or protein supplement for the slaughter market, excluding cattle being "backgrounded only" (for later sale as feeders or later placement in another feedlot).

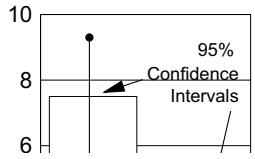
N/A: Not applicable.

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

Percent cattle: The total number of cattle with a certain attribute divided by the total number of cattle on all feedlots (or on all feedlots within a certain category such as by feedlot capacity or region).

Percent feedlots: The number of feedlots with a certain attribute divided by the total number of feedlots. Percentages will sum to 100 where the attributes are mutually exclusive (i.e., percentage of feedlots located within each region). Percentages will ***not*** sum to 100 where the attributes are not mutually exclusive (i.e., the percentage of feedlots using treatment methods where feedlots may have used more than one method).

Examples of a 95% Confidence Interval



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

Regions for NAHMS Feedlot '99: The Central region encompasses the states with the largest populations of feedlot cattle. The other states were grouped, rather than split into additional regions, as the number of observations in other areas were not sufficient to provide reliable estimates for individual areas or to assure producer confidentiality in reporting results.

- **Central**: Colorado, Kansas, Nebraska, Oklahoma, and Texas.
- **Other**: Arizona, California, Idaho, Iowa, New Mexico, South Dakota, and Washington.

Sample profile: Information that describes characteristics of the feedlots from which Feedlot '99 data were collected.

Feedlot capacity: Size groupings based on feedlot capacity on January 1, 1999. The capacity is the total number of head of cattle that could be accommodated in the feedlot at one time.

Section I: Population Estimates

A. Pre-arrival Processing

1. Procedures performed

Certain pre-arrival procedures, sometimes called ***preconditioning***, are perceived as being effective in decreasing health problems in feedlot cattle, especially in cattle weighing less than 700 lbs at arrival (*Feedlot '99 Part I: Baseline Reference of Feedlot Management Practices, 1999*). With knowledge of what preconditioning has been performed, feedlots can modify management of new arrivals for animal health and economic advantages.

Estimates in the table below relate to the last group or shipment of cattle that arrived at feedlots represented by the Feedlot '99 study. Although the exact time of arrival of the last group at a feedlot was not collected, it is reasonable to assume that it was close to the time of questionnaire administration from mid-October 1999 to mid-January 2000.

The last group or shipment of cattle that arrived at the feedlot was vaccinated against either respiratory or clostridial diseases on just over one-half of feedlots. Approximately one-third of feedlots did not know the respiratory and clostridial vaccination history of the last group or shipment of cattle. Similar proportions did not receive information regarding administration of an implant or if the cattle had been introduced to a feed bunk. History of mineral supplementation was unknown to a majority of feedlots.

a. Percent of feedlots by pre-arrival processing procedures performed on the last group or shipment of cattle that arrived at the feedlot:

	Percent Feedlots								
	Pre-arrival Processing Procedure Performed								
	Yes		No		Don't Know		Does Not Apply Because of Animal Gender		Total
Pre-arrival Processing Procedure	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent
Vaccinated against any respiratory disease	53.1	(3.3)	16.2	(2.3)	30.7	(3.0)	--	(--)	100.0
Vaccinated against clostridial diseases	51.0	(3.4)	13.8	(2.2)	35.2	(3.2)	--	(--)	100.0
Given a dewormer	32.2	(2.9)	31.6	(3.2)	36.2	(3.1)	--	(--)	100.0
Given mineral supplementation	23.8	(2.9)	19.7	(2.3)	56.5	(3.1)	--	(--)	100.0
Introduced to a feed bunk	39.2	(3.2)	29.9	(3.1)	30.9	(3.1)	--	(--)	100.0
Implanted	26.6	(2.8)	38.7	(3.3)	34.7	(3.0)	--	(--)	100.0
Checked for pregnancy	7.0	(1.5)	40.1	(3.2)	18.6	(2.4)	34.3	(3.1)	100.0
Heifers spayed	2.9	(1.0)	45.5	(3.2)	13.6	(2.2)	38.0	(3.2)	100.0
Bulls castrated	61.5	(3.0)	13.6	(2.0)	2.2	(0.7)	22.7	(2.6)	100.0
Other	6.9	(1.9)	90.9	(2.0)	2.2	(0.7)	--	(--)	100.0

2. Pre-arrival processing information

The availability of pre-arrival processing information was similar for large and small feedlots. Overall, 32.4 percent of feedlots received information regarding pre-arrival processing ***always or most of the time.***

a. Percent of feedlots by availability of pre-arrival processing information (e.g., vaccinations, implants, deworming history or mineral supplementation) and by feedlot capacity:

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Availability	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Always or most of the time	34.9	(3.9)	26.1	(3.6)	32.4	(3.0)
Sometimes	49.6	(4.2)	56.1	(4.2)	51.4	(3.2)
Never or almost never	15.5	(3.1)	17.8	(3.7)	16.2	(2.5)
Total	100.0		100.0		100.0	

the time

Although large and small feedlots tended to receive pre-arrival processing information with the same frequency, a greater percentage of large feedlots (70.2 percent) compared to small feedlots (54.6 percent) considered pre-arrival processing information ***very*** important.

A majority of feedlots considered this information ***very*** important, although only one-third felt that it was available always or most of the time (Table I.A.2.a). Only 9.3 percent of all feedlots considered pre-arrival processing information ***not*** important.

b. Percent of feedlots by level of importance of pre-arrival processing information (e.g., vaccinations, implants, deworming history or mineral supplementation) and by feedlot capacity:

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Level of Importance	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Very important	54.6	(4.0)	70.2	(4.1)	59.0	(3.1)
Somewhat important	29.9	(3.7)	22.1	(3.7)	27.7	(2.9)
Not important	11.5	(2.8)	3.6	(1.6)	9.3	(2.1)
Information not available	4.0	(1.5)	4.1	(1.6)	4.0	(1.2)
Total	100.0		100.0		100.0	

Pre-arr

Of those feedlots that received pre-arrival processing information (Table I.A.2.a), more than two-thirds of feedlots (69.5 percent) changed management or processing procedures based on pre-arrival processing information. A greater percentage of small feedlots (35.5 percent) than large feedlots (17.5 percent) ***never or almost never*** changed their management or processing procedures in response to pre-arrival processing information.

c. For those feedlots that received pre-arrival processing information, percent of feedlots by how often they changed their management or processing procedures because of pre-arrival processing information (e.g., vaccinations, implants, deworming, history, mineral supplementation) and by feedlot capacity:

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Frequency	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Always or most of the time	37.3	(4.1)	36.4	(4.0)	37.0	(3.1)
Sometimes	27.2	(3.7)	46.1	(4.3)	32.5	(2.9)
Never or almost never	35.5	(4.0)	17.5	(3.2)	30.5	(3.1)
Total	100.0		100.0		100.0	

ty

Note: The time frame for estimates dealing with injectable compounds (Section I.B) was the year ending June 30, 1999.

B. Injections

1. Vitamin injections

During the year ending June 30, 1999, a greater proportion of large feedlots than small feedlots administered a vitamin A, D, and/or E injection (oil-soluble). Approximately three out of five feedlots administered a vitamin injection.

In 1994, 58.1 percent of feedlots administered a vitamin injection *(NAHMS Cattle on Feed Evaluation [COFE] Part II: Feedlot Health Management Report)*.

a. Percent of feedlots that gave vitamin injections to cattle by type of vitamin and by feedlot capacity**:**

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Vitamin	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
A, D and/or E	26.8	(3.7)	53.2	(4.1)	34.2	(2.9)
B and/or C	43.5	(4.1)	50.9	(4.1)	45.6	(3.2)
Any vitamin injection	55.5	(4.2)	74.6	(3.5)	60.8	(3.2)

Greater percentages of cattle on large feedlots than on small feedlots were administered a vitamin A, D and/or E injection (oil-soluble, 23.1 percent compared to 13.4 percent), a vitamin B and/or C injection (water-soluble, 13.3 percent compared to 4.3 percent), and any injectable vitamin (31.2 percent compared to 17.3 percent). Overall, 29.0 percent of cattle placed received a vitamin injection of either type.

In 1994, 42.5 percent of feedlot cattle received an oil-soluble vitamin injection and 44.3 percent of cattle received any injection (COFE Part II). A similar percentage of feedlots were using vitamin injections in 1999 but were administering them to fewer animals.

b. Of cattle placed on feed, percent of cattle that were given the following vitamin injections by feedlot capacity:

Percent Cattle

	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Vitamin	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
A, D and/or E	13.4	(2.9)	23.1	(3.6)	21.6	(3.0)
B and/or C	4.3	(1.0)	13.3	(5.0)	11.9	(4.3)
Any vitamin injection	17.3	(3.1)	31.2	(4.8)	29.0	(4.1)

The majority of feedlots that administered vitamin injections administered injectable oil-soluble (92.6 percent) and water-soluble (approximately 93 percent) vitamins in the neck region. Greater proportions of large feedlots than small feedlots administered injections subcutaneously in the neck region.

The locations and routes listed in the table below are not mutually exclusive.

c. For feedlots that administered specific vitamin injections, percent of feedlots by type of vitamin given, location and route of vitamin injection administration, and by feedlot capacity:

	Percent Feedlots					
	Vitamin and Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Location and Route	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Vitamin A, D and/or E						
Intramuscularly (IM) in neck region	53.1	(7.6)	46.6	(5.2)	50.3	(4.9)
Subcutaneously (SQ) in neck region	35.7	(7.4)	50.7	(5.2)	42.3	(4.8)
Intramuscularly (IM) in any other location	10.2	(4.4)	2.7	(1.6)	6.9	(2.6)
Any other route or location	1.0	(0.8)	0.0	(--)	0.5	(0.4)
Vitamin B and/or C						
Intramuscularly (IM) in neck region	63.9	(6.1)	55.5	(5.8)	61.3	(4.6)
Subcutaneously (SQ) in neck region	28.5	(5.7)	37.8	(5.6)	31.4	(4.3)
Intramuscularly (IM) in any other location	3.9	(2.2)	3.2	(2.1)	3.7	(1.7)
Any other route or location	4.6	(2.6)	3.5	(2.1)	4.3	(1.9)

Of those cattle that received specific vitamin injections (Table I.B.1.b), similar proportions on large and small feedlots received injections administered in the neck region. Of the cattle that received a water-soluble vitamin, 95.6 percent received the injection in the neck region. A greater proportion of animals that received water-soluble vitamins received them intramuscularly than did those that received oil-soluble vitamins.

The locations and routes in the following table are not mutually exclusive as cattle may have been administered vitamin injections via more than one location and/or route either at the same time or on separate occasions.

d. For cattle that received the specific vitamin injections, percent of cattle by location and route of administration, and by feedlot capacity:

	Percent Cattle					
	Vitamin and Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Location and Route	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Vitamin A, D and/or E						
Intramuscularly (IM) in neck region	51.7	(11.9)	54.8	(7.7)	54.5	(7.0)
Subcutaneously (SQ) in neck region	31.9	(10.6)	43.2	(7.6)	42.1	(6.9)
Intramuscularly (IM) in any other location	15.5	(11.1)	2.1	(1.4)	3.4	(1.8)
Any other route or location	0.9	(0.7)	0.0	(--)	0.1	(0.1)
Vitamin B and/or C						
Intramuscularly (IM) in neck region	70.7	(8.9)	65.6	(16.0)	65.9	(15.0)
Subcutaneously (SQ) in neck region	25.8	(8.3)	34.1	(15.9)	33.6	(14.8)
Intramuscularly (IM) in any other location	0.5	(0.3)	0.3	(0.2)	0.3	(0.2)
Any other route or location	3.0	(1.8)	0.0	(0.0)	0.2	(0.1)

The majority of feedlots administered all vitamin injections in one location and by one route (96.6 percent). For all feedlots that administered vitamin injections, 90.4 percent of feedlots gave all vitamin injections in the neck region.

e. For feedlots that administered vitamin injections, percent of feedlots that gave ***all*** vitamin injections in one location by location and route of administration and by feedlot capacity:

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Location and Route	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Intramuscularly (IM) in neck region	63.3	(5.2)	48.9	(4.8)	58.4	(3.9)
Subcutaneously (SQ) in neck region	26.8	(4.8)	42.2	(4.7)	32.0	(3.6)
Intramuscularly (IM) in any other location	4.2	(2.0)	2.2	(1.4)	3.5	(1.4)
Any other route or location	2.9	(2.0)	2.4	(1.5)	2.7	(1.4)
Total	97.2	(1.3)	95.7	(1.7)	96.6	(1.1)

2. Clostridial vaccinations

A slightly higher percentage of large feedlots than small feedlots administered clostridial toxoids to cattle. Overall, 86.1 percent vaccinated some cattle against clostridial disease.

a. Percent of ***feedlots*** that gave clostridial vaccinations to at least some of the animals by feedlot capacity:

Percent Feedlots

Feedlot Capacity (Number Head)					
1,000 - 7,999		8,000 or More		All Feedlots	
Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
84.1	(3.0)	91.4	(2.4)	86.1	(2.3)

Slightly less than one-half of feedlots that gave any clostridial toxoids gave at least one animal two or more clostridial vaccinations in 1999. In 1994, a similar percentage of feedlots gave two or more clostridial vaccinations to at least one animal (COFE Part II).

i. Of feedlots that gave clostridial vaccinations, percent of feedlots that gave any animal two or more clostridial vaccinations by feedlot capacity:

Percent Feedlots

Feedlot Capacity (Number Head)					
1,000 - 7,999		8,000 or More		All Feedlots	
Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
46.1	(4.5)	43.0	(4.4)	45.2	(3.5)

Almost three-quarters (72.3 percent) of placements were vaccinated against clostridial diseases by the feedlot. A greater percentage of cattle on small feedlots (21.3 percent) received two or more clostridial vaccinations than cattle on large feedlots (14.9 percent).

b. Of all cattle placed, percent of ***cattle*** that were given clostridial vaccinations by number given and by feedlot capacity:

	Percent Cattle					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Number Vaccinations Given	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Only one	61.4	(3.4)	55.4	(5.7)	56.4	(4.8)
Two or more (either at the same time or as a follow-up)	21.3	(2.6)	14.9	(2.7)	15.9	(2.3)
None	17.3	(3.0)	29.7	(6.4)	27.7	(5.5)
Total	100.0		100.0		100.0	

Nearly all of the feedlots that vaccinated against clostridial diseases administered clostridial toxoids in the neck region. A majority (86.7 percent) of feedlots that vaccinated against clostridial diseases administered them subcutaneously in the neck region. Between 12 and 13 percent of feedlots administered clostridial vaccinations intramuscularly, findings similar to the 1994 NAHMS study (COFE Part II).

Locations and routes listed in the table below are not mutually exclusive.

c. For feedlots where clostridial vaccinations were given, percent of ***feedlots*** by location and route of any clostridial vaccination administration and by feedlot capacity:

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Location and Route	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Intramuscularly (IM) in neck region	10.9	(2.9)	12.3	(2.7)	11.3	(2.2)
Subcutaneously (SQ) in neck region	86.6	(3.3)	86.8	(2.8)	86.7	(2.5)
Intramuscularly (IM) in any other location	2.3	(1.5)	0.0	(--)	1.6	(1.0)
Any other route or location	0.8	(0.7)	2.5	(1.2)	1.3	(0.6)

Of the cattle that were administered a clostridial toxoid, only 0.2 percent received it intramuscularly at a location other than the neck region. Apparently, no cattle on large feedlots received intramuscular clostridial toxoid injections in locations other than the neck. Nearly 85 percent of cattle that were administered a clostridial toxoid were injected subcutaneously in the neck region.

Locations and routes in the following table are not mutually exclusive as cattle may have been administered injections at more than one location and/or route either at the same time or on separate occasions.

d. Of cattle on feed that were administered a clostridial toxoid, percent of ***cattle*** that received clostridial vaccines by location and route of clostridial vaccination administration and by feedlot capacity:

	Percent Cattle					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Location and Route	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Intramuscularly (IM) in neck region	9.9	(2.8)	13.4	(4.0)	12.8	(3.3)
Subcutaneously (SQ) in neck region	88.6	(3.0)	83.8	(4.1)	84.7	(3.4)
Intramuscularly (IM) in any other location	1.2	(1.0)	0.0	(--)	0.2	(0.2)
Any other route or location	0.3	(0.3)	2.8	(1.4)	2.3	(1.1)

3. Non-clostridial vaccinations

All large feedlots (100.0 percent) and almost all small feedlots (95.7 percent) administered injectable vaccines against infectious bovine rhinotracheitis (IBR), a disease caused by bovine herpesvirus 1. Small feedlots were more likely to vaccinate against *Haemophilus somnus* than large feedlots, whereas large feedlots were more likely to administer *Leptospira* spp. injectable bacterins than small feedlots. Over 94 percent of all feedlots gave injectable vaccinations against BVD. More than 85 percent of feedlots vaccinated cattle against bovine respiratory syncytial virus (BRSV) and parainfluenza type 3 (PI3) using injectable preparations.

Percentages of feedlots that vaccinated at least some cattle against the respiratory diseases listed below were similar in 1994 and 1999, except for BVD. In 1994, 87.5 percent of feedlots vaccinated against BVD (COFE Part II) compared to 94.4 percent in 1999.

a. Percent of ***feedlots*** that gave any cattle the following injectable vaccines by feedlot capacity:

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Vaccination	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Bovine viral diarrhea (BVD)	93.5	(1.8)	96.8	(1.4)	94.4	(1.4)
Injectable infectious bovine rhinotracheitis (IBR)	95.7	(1.4)	100.0	(--)	96.9	(1.0)
Parainfluenza type 3 (PI3)	86.2	(2.5)	86.6	(3.3)	86.3	(2.0)
Bovine respiratory syncytial virus (BRSV)	87.3	(2.7)	87.6	(2.7)	87.4	(2.1)
Haemophilus somnus	65.1	(3.9)	54.1	(4.1)	62.1	(3.0)
Pasteurella	52.9	(4.3)	54.3	(4.1)	53.3	(3.3)
Leptospira spp.	20.8	(2.9)	48.3	(4.1)	28.5	(2.4)
Any non-clostridial vaccinations	96.6	(1.2)	100.0	(--)	97.5	(0.9)

Almost all cattle placed (96.9 percent) were vaccinated against IBR with injectable vaccines. Injectable BVD vaccines were administered to 87.7 percent of all cattle placed. A greater percentage of cattle placed on small feedlots than on large feedlots were vaccinated using injectable products against BRSV and *H. somnus*. A greater percentage of placements on large feedlots than on small feedlots were administered *Leptospira* bacterins.

Similar percentages of cattle placed were vaccinated against the respiratory diseases listed below in 1994 (COFE Part II) and 1999, except that a higher percentage of placements were vaccinated against BVD in 1999 than in 1994 (79.0 percent in 1994 compared to 87.7 percent in 1999).

b. For all cattle placed, percent of ***cattle*** that were given the following injectable vaccines by the feedlot by feedlot capacity:

	Percent Cattle					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Vaccination	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Bovine viral diarrhea (BVD)	89.5	(2.6)	87.3	(3.3)	87.7	(2.8)
Injectable infectious bovine rhinotracheitis (IBR)	95.1	(1.7)	97.3	(0.9)	96.9	(0.8)
Parainfluenza, type 3 (PI3)	79.8	(3.6)	72.3	(6.4)	73.5	(5.5)
Bovine respiratory syncytial virus (BRSV)	87.3	(2.7)	67.8	(5.0)	70.9	(4.2)
Haemophilus somnus	49.7	(4.0)	30.7	(4.5)	33.8	(4.0)
Pasteurella	34.9	(3.6)	26.1	(3.9)	27.5	(3.4)
Leptospira spp.	19.1	(3.2)	34.7	(4.9)	32.2	(4.1)
Any non-clostridial vaccinations	95.5	(1.7)	98.3	(0.8)	97.9	(0.7)

The majority of feedlots that injected some cattle with non-clostridial vaccines/bacterins administered them intramuscularly in the neck region (64.4 percent). Almost one-half (46.7 percent) of feedlots administered vaccines/bacterins subcutaneously in the neck region. Only 5.1 percent of feedlots used an intramuscular site other than the neck region. In 1994, only 31.6 percent of feedlots administered non-clostridial vaccines subcutaneously (COFE Part II).

Locations and routes listed in the table below are not mutually exclusive.

c. For feedlots where injectable vaccines (other than clostridial vaccines) were given, percent of ***feedlots*** by location and route of vaccination administration and by feedlot capacity:

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Location and Route	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Intramuscularly (IM) in neck region	65.1	(4.0)	62.6	(3.9)	64.4	(3.1)
Subcutaneously (SQ) in neck region	46.9	(4.4)	46.3	(4.0)	46.7	(3.4)
Intramuscularly (IM) in any other location	5.3	(1.7)	4.7	(1.6)	5.1	(1.3)
Any other route or location	1.7	(0.9)	0.8	(0.7)	1.4	(0.7)

Of the cattle that were vaccinated against diseases other than clostridial disease, the majority were injected in the neck region and primarily intramuscularly. A small percentage of cattle that were vaccinated were injected in an intramuscular site at a location other than the neck region.

Locations and routes in the following table are not mutually exclusive as cattle may have been vaccinated against diseases (other than clostridial diseases) with injectable products using more than one location and/or route.

d. For cattle placed on feedlots where injectable vaccines and bacterins (other than clostridial toxoids) were given, percent of ***cattle*** that received non-clostridial vaccinations by location and route of vaccination administration and by feedlot capacity:

	Percent Cattle					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Location and Route	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Intramuscularly (IM) in neck region	64.3	(4.3)	60.3	(5.4)	60.9	(4.6)
Subcutaneously (SQ) in neck region	45.4	(4.5)	39.8	(5.4)	40.7	(4.7)
Intramuscularly (IM) in any other location	1.8	(0.6)	2.3	(0.9)	2.2	(0.8)
Any other route or location	0.9	(0.5)	0.7	(0.6)	0.8	(0.5)

The majority of all feedlots that administered injectable vaccines and bacterins (82.4 percent) administered them in one location. Approximately 48 percent of feedlots that administered injectable vaccines and bacterins only gave them intramuscularly in the neck region.

e. For feedlots where injectable vaccines and bacterins (other than clostridial toxoids) were given, percent of feedlots that gave ***all*** non-clostridial vaccinations in one location by site of administration and by feedlot capacity:

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Site	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Intramuscularly (IM) in neck region	47.5	(4.4)	49.8	(4.0)	48.1	(3.4)
Subcutaneously (SQ) in neck region	28.7	(3.8)	32.7	(3.7)	29.9	(2.9)
Intramuscularly (IM) in any other location	4.0	(1.6)	2.3	(1.1)	3.5	(1.2)
Any other route or location	0.9	(0.6)	0.8	(0.7)	0.9	(0.5)
Total	81.1	(3.4)	85.6	(3.0)	82.4	(2.5)

Thirty-nine percent of all feedlots administered intranasal vaccines against IBR, a disease caused by bovine herpesvirus 1, to some cattle.

f. Percent of ***feedlots*** that used an intranasal infectious bovine rhinotracheitis (IBR) vaccine for any cattle by feedlot capacity:

Percent Feedlots

Feedlot Capacity (Number Head)					
1,000 - 7,999		8,000 or More		All Feedlots	
Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
37.2	(4.1)	43.6	(4.2)	39.0	(3.2)

A greater percentage of placements on small feedlots (14.1 percent) than on large feedlots (7.7 percent) received intranasal vaccines against IBR. Because 96.9 percent of placements were administered an injectable IBR vaccine (Table I.B.3.b) and 8.7 percent of placements received an intranasal vaccination against IBR, it appears that some cattle received both intranasal and injectable vaccines against IBR.

g. For all cattle placed, percent of ***cattle*** that were given an intranasal infectious bovine rhinotracheitis (IBR) vaccine by feedlot capacity:

Percent Cattle

Feedlot Capacity (Number Head)					
1,000 - 7,999		8,000 or More		All Feedlots	
Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
14.1	(2.3)	7.7	(1.5)	8.7	(1.3)

All large feedlots (100 percent) and almost all small feedlots (96.6 percent) administered a vaccine, either injectable or intranasal, against IBR to any cattle. In 1994, a similar percentage of cattle (98.0 percent) were vaccinated against IBR (COFE Part II).

h. Percent of feedlots that used any vaccine against infectious bovine rhinotracheitis (IBR) (intranasal and/or injectable) during the year ending June 30, 1999, by feedlot capacity:

Percent Feedlots

Feedlot Capacity (Number Head)					
1,000 - 7,999		8,000 or More		All Feedlots	
Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
96.6	(1.3)	100.0	(--)	97.5	(0.9)

4. Injectable antimicrobials

Antimicrobials were classified based on the claimed (label) duration of effect. If the duration of action was claimed to be greater than 24 hours, they were classified as long-acting. Antimicrobials of up to 24 hours duration of action were classified as short-acting. Within each duration of action category, antimicrobials were classified as ***new*** or ***conventional***.

Almost all feedlots (97.3 percent) used injectable antimicrobials as a disease treatment or preventative after a suspected infection had occurred. The greatest proportion of feedlots used new, long-acting antimicrobials. Small feedlots were less likely to use new antimicrobials than large feedlots.

a. Percent of ***feedlots*** by class of injectable antimicrobial administered as a disease treatment or preventative of any cattle by feedlot capacity:

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Antimicrobial Class	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
New long-acting (label specifies effect of greater than 24 hours, e.g., Excenel®, Micotil®, Nuflor®, Baytril®)	84.6	(3.1)	97.4	(1.3)	88.2	(2.2)
Conventional long-acting (label specifies effect of greater than 24 hours, e.g., LA 200®)	63.7	(3.7)	62.3	(3.8)	63.3	(2.9)
New short-acting (label specifies effect of less than 24 hours, e.g., Naxcel®)	37.6	(3.7)	66.3	(3.9)	45.6	(2.9)
Conventional short-acting (label specifies effect of less than 24 hours, e.g., Tylan®, penicillin, Oxy-Tet100^{TM})	66.5	(4.0)	62.9	(4.1)	65.5	(3.1)
Any antimicrobial	96.7	(1.7)	99.1	(0.8)	97.3	(1.3)

Overall, 19.0 percent of cattle received an injectable antimicrobial as a disease treatment or preventative after a suspected infection had occurred. New long-acting antimicrobials were administered to more cattle (13.6 percent) than any other classification of antimicrobial.

b. Percent of all ***cattle*** placed that received the following classes of injectable antimicrobial administered as a disease treatment or preventative by feedlot capacity:

	Percent Cattle					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Antimicrobial Class	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
New long-acting (label specifies effect of greater than 24 hours, e.g., Excenel®, Micotil®, Nuflor®, Baytril®)	9.6	(1.1)	14.3	(1.7)	13.6	(1.4)
Conventional long-acting (label specifies effect of greater than 24 hours, e.g., LA 200®)	2.9	(0.4)	4.8	(1.3)	4.5	(1.1)
New short-acting (label specifies effect of less than 24 hours, e.g., Naxcel®)	1.5	(0.3)	4.4	(1.5)	3.9	(1.3)
Conventional short-acting (label specifies effect of less than 24 hours, e.g., Tylan®, penicillin, Oxy-Tet100^{TM})	4.3	(1.3)	3.4	(0.7)	3.5	(0.6)
Any antimicrobial	16.1	(1.7)	19.5	(1.6)	19.0	(1.4)

The predominant route and location for administering long-acting antimicrobials was subcutaneously in the neck region. Feedlots tended to administer short-acting antimicrobials intramuscularly in the neck region. The category of ***any other route or location*** included such sites as subcutaneous (at a location other than the neck region) and intravenous administration of antimicrobials.

In 1994, 62 percent of feedlots administered some long-acting antimicrobials intramuscularly and 54.4 percent used a subcutaneous route (COFE Part II). Additionally, 84.3 percent of feedlots administered short-acting antimicrobials intramuscularly in 1994 (COFE Part II). Although direct comparisons are not possible, 1994 and 1999 results suggest that more feedlots selected a subcutaneous route over an intramuscular route in 1999.

Locations and routes listed in the following table are not mutually exclusive.

c. For feedlots that administered any of the specific antimicrobials, percent of ***feedlots*** that gave the injections by location and route of administration:

	Percent Feedlots							
	Location and Route of Administration							
	Intramuscularly (IM) in Neck Region		Subcutaneously (SQ) in Neck Region		Intramuscularly (IM) in Any Other Location		Any Other Route or Location	
Antimicrobial Class	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
New long-acting (label specifies effect of greater than 24 hours, e.g., Excenel®, Micotil®, Nuflor®, Baytril®)	28.2	(3.1)	77.2	(2.9)	0.7	(0.5)	2.4	(0.7)
Conventional long-acting (label specifies effect of greater than 24 hours, e.g., LA 200®)	37.3	(4.0)	59.3	(3.9)	5.1	(1.4)	6.3	(1.7)
New short-acting (label specifies effect of less than 24 hours, e.g., Naxcel®)	52.6	(4.4)	44.4	(4.4)	4.9	(1.5)	1.3	(0.6)
Conventional short-acting (label specifies effect of less than 24 hours, e.g., Tylan®, penicillin, Oxy-Tet100^{TM})	52.4	(3.6)	37.5	(3.6)	3.9	(1.1)	21.5	(3.4)

When cattle were administered long-acting antimicrobials (both new and conventional), the preferred route and location were subcutaneous in the neck region. The percentage of cattle administered conventional short-acting antimicrobials intramuscularly in the neck region was 53.1 percent compared to subcutaneously in the neck region at 34.9 percent. This classification of antimicrobials includes preparations that are commonly administered intravenously.

Since 13.6 percent of all cattle received a new long-acting antimicrobial injection (Table I.B.4.b) and only 0.2 percent of those cattle received injections intramuscularly in locations other than the neck, less than 0.1 percent of all cattle (.136 x .02 <.01) received these types of injections. Similarly, less than 0.1 percent of cattle received conventional long-acting antimicrobial injections, less than 0.2 percent received new short-acting antimicrobial injections, and less than 0.1 percent received short-acting antimicrobial injections intramuscularly in locations other than the neck region. The sum of these percentages (less than 0.4 percent) is an estimate of the percentage of all antimicrobial injections that were given intramuscularly in locations other than the neck region.

Categories in the following table are not mutually exclusive as cattle may have been administered antimicrobial injections at more than one location and/or route either at the same time or on separate occasions.

d. For cattle that received the specified class of antimicrobial, percent of ***cattle*** that received the injection by injectable antimicrobial given and by location and route of administration:

	Percent Cattle							
	Location and Route of Administration							
	Intramuscularly (IM) in Neck Region		Subcutaneously (SQ) in Neck Region		Intramuscularly (IM) in Any Other Location		Any Other Route or Location	
Antimicrobial Class	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
New long-acting (label specifies effect of greater than 24 hours, e.g., Excenel®, Micotil®, Nuflor®, Baytril®)	21.8	(8.3)	72.1	(8.1)	0.2	(0.2)	6.2	(2.8)
Conventional long-acting (label specifies effect of greater than 24 hours, e.g., LA 200®)	15.2	(6.2)	78.2	(7.1)	1.9	(1.0)	4.7	(3.0)
New short-acting (label specifies effect of less than 24 hours, e.g., Naxcel®)	42.6	(14.6)	49.6	(16.9)	4.3	(2.9)	3.5	(2.6)
Conventional short-acting (label specifies effect of less than 24 hours, e.g., Tylan®, penicillin, Oxy-Tet100^{TM})	53.1	(8.3)	34.9	(7.6)	3.2	(1.6)	12.4	(3.9)

Large feedlots were more likely than small feedlots to administer conventional long-acting antimicrobials subcutaneously (administered to 82.5 percent of cattle on large feedlots compared to 39.6 percent of cattle on small feedlots).

e. For cattle that received the specified class of antimicrobial, percent of ***cattle*** that received the injection by injectable antimicrobial given, location and route of administration, and by feedlot capacity:

	Percent Cattle							
	Location and Route of Administration and Feedlot Capacity (Number Head)							
	Intramuscularly (IM) in Neck Region		Subcutaneously (SQ) in Neck Region		Intramuscularly (IM) in Any Other Location		Any Other Route or Location	
Antimicrobial Class	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
1,000 - 7,999								
New long-acting (label specifies effect of greater than 24 hours, e.g., Excenel®, Micotil®, Nuflor®, Baytril®)	12.8	(3.5)	85.9	(3.5)	0.0	(0.0)	3.3	(1.4)
Conventional long-acting (label specifies effect of greater than 24 hours, e.g., erythromycin, LA 200®)	46.7	(8.8)	39.6	(8.0)	9.6	(5.9)	4.1	(2.0)
New short-acting (label specifies effect of less than 24 hours, e.g., Naxcel®)	32.5	(8.9)	63.9	(9.5)	3.6	(3.2)	0.0	(--)
Conventional short-acting (label specifies effect of less than 24 hours, e.g., Tylan®, penicillin, Oxy-Tet100™)	57.1	(14.0)	25.9	(9.8)	3.8	(2.8)	14.1	(5.6)
8,000 or More								
New long-acting (label specifies effect of greater than 24 hours, e.g., Excenel®, Micotil®, Nuflor®, Baytril®)	22.9	(9.2)	70.3	(9.0)	0.3	(0.2)	6.5	(3.1)
Conventional long-acting (label specifies effect of greater than 24 hours, e.g., LA 200®)	11.7	(6.3)	82.5	(6.9)	1.1	(0.8)	4.7	(3.4)
New short-acting (label specifies effect of less than 24 hours, e.g., Naxcel®)	43.3	(15.7)	48.7	(18.2)	4.3	(3.1)	3.7	(2.8)
Conventional short-acting (label specifies effect of less than 24 hours, e.g., Tylan®, penicillin, Oxy-Tet100™)	52.2	(10.0)	37.1	(8.9)	3.1	(1.9)	12.0	(4.6)

5. Other injectable products

The tables in section I.B.5 refer to injectable products other than vitamins, vaccines, bacterins, toxoids, and antimicrobials. These injectables may be administered to feedlot cattle as a treatment, preventative, or for other management reasons. For example, dexamethasone, a corticosteroid, may be used in combination with prostaglandin as an abortifacient regimen.

Large feedlots were more likely to use each category of injectable products than small feedlots. More than three out of five large feedlots used anthelmintics, prostaglandins, corticosteroids, or non-steroidal anti-inflammatory drugs (NSAID) for some cattle, whereas less than one out of two small feedlots reported using each of these injectable products.

a. Percent of ***feedlots*** by injectable product given either as a treatment or preventative (excluding vitamins, vaccines, and antimicrobials) and by feedlot capacity:

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Injectable Product	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Anthelmintic injection (e.g., Ivomec®)	35.7	(4.0)	80.2	(3.3)	48.1	(3.0)
Prostaglandin injection (e.g., Lutalyse®)	22.2	(3.2)	59.9	(3.9)	32.7	(2.6)
Corticosteroid injection (e.g., dexamethasone, Azium®)	47.9	(3.8)	70.1	(3.8)	54.1	(2.9)
Non-steroidal anti-inflammatory drug (NSAID, e.g., Banamine®)	46.8	(4.2)	75.3	(3.8)	54.8	(3.2)
Other injectables (excluding vaccines, antibiotics, vitamins)	4.6	(1.6)	8.4	(2.3)	5.7	(1.3)

Overall, 66.4 percent of placements were administered an injectable anthelmintic. Seventy-three percent of placements on large feedlots were administered an injectable anthelmintic compared to 31.3 percent of placements on small feedlots.

A greater percentage of cattle on large feedlots (4.1 percent) compared to those on small feedlots (1.6 percent) were administered prostaglandin.

b. Of all cattle placed, percent of ***cattle*** given an injectable product (excluding vitamins, vaccines, and antimicrobials) by type of injectable product administered and by feedlot capacity:

Percent Cattle

	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Injectable Product	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Anthelmintic injection (e.g., Ivomec®)	31.3	(3.9)	73.0	(3.7)	66.4	(3.1)
Prostaglandin injection (e.g., Lutalyse®)	See Table I.B.5.b.i (below).					
Corticosteroid injection (e.g., dexamethasone, Azium®)	2.0	(0.4)	2.7	(0.5)	2.6	(0.4)
Non-steroidal anti-inflammatory drug (NSAID, e.g., Banamine®)	3.2	(0.6)	2.9	(0.4)	3.0	(0.4)
Other injectables (excluding vaccines, antimicrobials, vitamins)	0.1	(0.1)	0.8	(0.5)	0.7	(0.4)

Producers were asked to indicate the percentage of total placements that were administered a prostaglandin injection. However, prostaglandin usage in cattle is only labeled for administration to females. To calculate the percentage of heifer placements administered a prostaglandin injection, the original response was multiplied by the total cattle placed then divided by the number of female cattle placed in the feedlot, i.e.:

Calculated estimate = Original response * (total placements/female placements).

This calculation assumes that:
- prostaglandin injections were only administered to female cattle, and
- each producer's original response was actually the percentage of total placements and not the percentage of female cattle that were administered a prostaglandin injection.

If these assumptions do not hold, the true estimate of the percentage of female cattle administered a prostaglandin injection is between the original producer response and the calculated estimate.

i. Of all cattle placed, percent of ***cattle*** (and percent of female cattle) given a prostaglandin injectable product by feedlot capacity:

Percent Cattle

	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Measure	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Percent all cattle (original response)	1.6	(0.4)	4.1	(0.7)	3.7	(0.6)
Percent of female cattle (calculated estimate)	4.3	(1.1)	9.8	(1.6)	8.9	(1.4)

Most feedlots that administered injectable anthelmintics did so subcutaneously in the neck region (76.5 percent). A substantial percentage of feedlots (nearly one in three) reported using a route other than intramuscularly or subcutaneously and a location other than the neck for administering non-steroidal anti-inflammatory drugs (NSAID) and corticosteroidal injections.

The products, locations, and routes listed in the following table are not mutually exclusive. Since few feedlots used other injectables (see previous page), standard errors in the following table are relatively large.

c. For feedlots that administered the specified injectable products, percent of ***feedlots*** by injectable product administered and by location and route of administration:

	Percent Feedlots							
	Location and Route of Administration							
	Intramuscularly (IM) in Neck Region		Subcutaneously (SQ) in Neck Region		Intramuscularly (IM) in Any Other Location		Any Other Route or Location	
Injectable Product	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Anthelmintic injection (e.g., Ivomec®)	18.1	(3.1)	76.5	(3.4)	1.5	(1.0)	6.1	(2.1)
Prostaglandin injection (e.g., Lutalyse®)	72.5	(4.6)	20.8	(4.3)	6.7	(2.2)	0.0	(--)
Corticosteroid injection (e.g., dexamethasone, Azium®)	66.1	(3.9)	22.0	(3.5)	2.9	(1.2)	16.3	(3.1)
Non-steroidal anti-inflammatory drug (NSAID, e.g., Banamine®)	52.5	(4.0)	22.5	(3.6)	1.6	(0.9)	29.7	(3.5)
Other injectables (excluding vaccines, antibiotics, vitamins)	57.1	(12.3)	33.3	(12.8)	0.0	(--)	12.9	(6.2)

Except for injectables in the Other injectables category, the majority of cattle were injected with pharmaceuticals in the neck region, either intramuscularly or subcutaneously.

Lists in the following table are not mutually exclusive as cattle may have been injected with a product at more than one route and/or location either at the same time or on separate occasions. Since few cattle received other injectables (see Table I.B.5.b), standard errors in the following table are relatively large. Note: cattle may have received a product by more than one route or location.

d. For cattle that received the specified injectable products, percent of ***cattle*** by injectable product administered and location and by route of administration:

Percent Cattle

	Location and Route of Administration							
	Intramuscularly (IM) in Neck Region		Subcutaneously (SQ) in Neck Region		Intramuscularly (IM) in Any Other Location		Any Other Route or Location	
Injectable Product	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Anthelmintic injection (e.g., Ivomec®)	21.8	(4.6)	76.0	(4.6)	0.3	(0.2)	2.0	(0.8)
Prostaglandin injection (e.g., Lutalyse®)	91.2	(3.1)	7.6	(2.9)	1.2	(0.5)	0.0	(--)
Corticosteroid injection (e.g., dexamethasone, Azium®)	88.0	(3.2)	8.1	(2.6)	0.8	(0.5)	3.1	(0.9)
Non-steroidal anti-inflammatory drug (NSAID, e.g., Banamine®)	48.3	(6.2)	24.8	(5.5)	1.6	(1.4)	25.4	(4.8)
Other injectables (excluding vaccines, antibiotics, vitamins)	16.8	(11.7)	0.9	(0.7)	0.0	(--)	82.5	(12.1)

A greater percentage of cattle on small feedlots (11.2 percent) received corticosteroids via ***any other route or location*** than cattle on large feedlots (1.9 percent). Cattle that received prostaglandin were more likely to have been injected intramuscularly at a location other than the neck region on small feedlots (6.1 percent) compared to large feedlots (0.8 percent). Note that since few cattle on small feedlots received prostaglandin injections, the 6.1 percent of injections given intramuscularly in a location other than the neck region were given to approximately 0.1 percent of cattle on small operations.

i. For cattle that received the specified injectable products (excluding vitamins, vaccines and antimicrobials), percent of ***cattle*** by injectable product administered, location and route of administration, and by feedlot capacity:

Percent Cattle

	Location and Route of Administration and Feedlot Capacity (Number Head)							
	Intramuscularly (IM) in Neck Region		Subcutaneously (SQ) in Neck Region		Intramuscularly (IM) in Any Other Location		Any Other Route or Location	
Injectable Product	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
1,000 - 7,999								
Anthelmintic injection (e.g., Ivomec®)	13.6	(5.1)	75.5	(6.7)	1.2	(1.0)	9.7	(5.0)
Prostaglandin injection (e.g., Lutalyse®)	69.8	(10.2)	24.1	(9.3)	6.1	(3.2)	0.0	(--)
Corticosteroid injection (e.g., dexamethasone, Azium®)	71.7	(7.8)	15.8	(5.7)	1.3	(0.7)	11.2	(3.9)
Non-steroidal anti-inflammatory drug (NSAID, e.g., Banamine®)	52.9	(10.9)	23.2	(12.7)	0.3	(0.2)	23.6	(7.6)
Other injectables (excluding vaccines, antibiotics, vitamins)	68.5	(16.3)	31.5	(16.3)	0.0	(--)	7.4	(5.6)
8,000 or More								
Anthelmintic injection (e.g., Ivomec®)	22.4	(4.9)	76.1	(5.0)	0.2	(0.2)	1.4	(0.7)
Prostaglandin injection (e.g., Lutalyse®)	92.8	(3.1)	6.4	(3.0)	0.8	(0.5)	0.0	(--)
Corticosteroid injection (e.g., dexamethasone, Azium®)	90.3	(3.2)	7.0	(2.7)	0.8	(0.5)	1.9	(0.8)
Non-steroidal anti-inflammatory drug (NSAID, e.g., Banamine®)	47.4	(7.1)	25.1	(6.1)	1.8	(1.8)	25.7	(5.6)
Other injectables (excluding vaccines, antibiotics, vitamins)	15.2	(11.2)	0.0	(--)	0.0	(--)	84.8	(11.2)

6. Injections greater than 10cc

Intramuscular injections of greater than 10cc at one site (without redirecting the needle) may result in injection site blemishes. Various beef quality assurance (BQA) programs have been developed to educate producers on issues that include following label instructions, selecting subcutaneous over intramuscular routes, and, where appropriate, using separate injection sites when more than 10cc of a product is to be given. Special emphasis has been paid to intramuscular injections because of the potential for injection site defects in the end product.

Small feedlots (21.8 percent) were more likely than large feedlots (13.7 percent) to give volumes greater than 10cc of a product. No large feedlots administered an injection of greater than 10cc at an intramuscular site other than the neck region. Additionally, large feedlots were more likely to choose a subcutaneous route over an intramuscular route when giving these injections. Guidelines for injections in BQA programs seem to be followed in the industry.

a. Percent of ***feedlots*** that gave more than 10cc of an injectable product in one intramuscular (IM) or subcutaneous (SQ) site (excluding those products that specify that a larger volume may be given in one site, e.g., Micotil®) by location and route of administration of the products and by feedlot capacity:

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Location and Route	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Intramuscularly (IM) in neck region	13.6	(2.9)	4.1	(1.6)	10.9	(2.1)
Subcutaneously (SQ) in neck region	12.5	(2.5)	9.6	(2.4)	11.7	(1.9)
Intramuscularly (IM) in any other location	1.3	(0.7)	0.0	(--)	0.9	(0.5)
Any other route or location	0.2	(0.2)	0.0	(--)	0.2	(0.2)
Any intramuscular (IM) or subcutaneous (SQ) injection	21.8	(3.4)	13.7	(2.8)	19.6	(2.6)

Overall, only 2.2 percent of cattle were administered an injection greater than 10cc at one or more intramuscular or subcutaneous site without redirecting the needle.

b. Percent of all ***cattle*** that received more than 10cc of an injectable product in one intramuscular (IM) or subcutaneous (SQ) site (excluding those products that specify that a larger volume may be given in one site, e.g., Micotil®) by feedlot capacity:

Percent Cattle

Feedlot Capacity (Number Head)					
1,000 - 7,999		8,000 or More		All Feedlots	
Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
4.8	(1.5)	1.7	(0.6)	2.2	0.6

All of the cattle in large feedlots that received more than 10cc of an injectable product in one intramuscular or subcutaneous site were given these injections in the neck region. On both large and small feedlots, cattle that received injections of greater than 10cc in one intramuscular or subcutaneous site were primarily injected subcutaneously in the neck region.

Note that the 1.1 percent of cattle on small feedlots that received an injection of greater than 10cc at one intramuscular or subcutaneous site represented 0.05 percent of cattle placed on small feedlots.

The locations and routes in the following table are not mutually exclusive as cattle may have been administered injections of greater than 10cc at more than one route and/or location either at the same time or on separate occasions.

c. For cattle that received more than 10cc of an injectable product in one intramuscular (IM) or subcutaneous (SQ) site (excluding those products that specify that a larger volume may be given in one site, e.g., Micotil®), percent of ***cattle*** by location and route of administration of the products and by feedlot capacity:

	Percent Cattle					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Location and Route	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Intramuscularly (IM) in neck region	39.5	(10.0)	19.4	(11.0)	26.4	(8.9)
Subcutaneously (SQ) in neck region	65.4	(9.4)	80.6	(11.0)	75.3	(8.5)
Intramuscularly (IM) in any other location	1.1	(0.6)	0.0	(--)	0.4	(0.2)
Any other route or location	1.9	(1.8)	0.0	(--)	0.7	(0.6)

7. Injection information recording

Data relating to administration of any injectable products can provide feedlots with important information and safeguards. For example, if a group of cattle are sold on a formula basis to a packing plant and a substantial percentage of the cattle have injection site blemishes in the top butt, records of injections administered to those cattle could be examined. If the records indicate that only subcutaneous injections in the neck region were administered at the feedlot, the injections of concern likely occurred prior to the cattle's arrival at the feedlot. Records also allow for mortality rates and accurate determination of withdrawal period and treatment success for specific drugs.

The majority of feedlots ***always or most of the time*** recorded the date, type, and amount of injection that was given. About one-third of feedlots recorded route and location of injection ***always or most of the time*** or ***some of the time***.

Some feedlots may have standard operating procedures that require a specific route and location, and amount, and therefore, personnel may not need to record this information if they follow standard operating procedures.

a. Percent of feedlots by the frequency with which the following injection-related information was recorded when ***clinically normal cattle*** were given an injection (e.g., vaccination, vitamin, antimicrobial):

	Percent Feedlots						
	Frequency						
	Always or Most of the Time		Some of the Time		Never		Total
Injection-related Information	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent
Date injection was given	79.6	(2.8)	4.1	(1.5)	16.3	(2.6)	100.0
Type of injectable product	74.6	(3.0)	8.1	(2.1)	17.3	(2.7)	100.0
Amount that was given	69.3	(3.1)	3.1	(1.3)	27.6	(3.1)	100.0
Route of injection (e.g., intramuscular or subcutaneous)	35.7	(2.8)	8.9	(1.8)	55.4	(3.0)	100.0
Location of injection (e.g., neck or shoulder)	34.9	(2.9)	8.2	(1.7)	56.9	(3.0)	100.0
Product lot/serial number	28.2	(2.4)	10.1	(1.9)	61.7	(2.7)	100.0
Other	12.4	(1.8)	1.2	(0.6)	86.4	(1.9)	100.0

A greater percentage of large feedlots than small feedlots ***always or most of the time*** recorded each type of information specified below.

i. Percent of feedlots that recorded the following injection-related information ***always or most of the time*** when clinically normal cattle were given an injection (e.g., vaccination, vitamin, antimicrobial) by feedlot capacity:

	Percent Feedlots			
	Feedlot Capacity (Number Head)			
	1,000 - 7,999 Head		8,000 or More Head	
Injection-related Information	Percent	Standard Error	Percent	Standard Error
Date injection was given	72.1	(3.9)	99.1	(0.8)
Type of injectable compound	65.4	(4.1)	98.3	(1.0)
Amount that was given	58.7	(4.2)	96.7	(1.5)
Route of injection (e.g., intramuscular or subcutaneous)	29.6	(4.1)	51.3	(4.1)
Location of injection (e.g., neck or shoulder)	28.5	(3.6)	51.6	(4.1)
Product lot/serial number	19.0	(2.8)	52.0	(4.2)
Other	8.7	(2.2)	21.9	(3.3)

C. Nutrition

1. Processing grain

Not all starch consumed in grains and kernels is available for ruminal microbial degradation, so some energy can escape ruminal fermentation and even intestinal digestion. Processing grains allows greater microbial access and fermentation within the rumen. The need and extent of processing will vary with the energy source used.

Nearly 4 percent of large feedlots and 29.5 percent of small feedlots fed unprocessed whole grain. Generally, large feedlots processed grains to a greater extent than small feedlots. Over 61 percent of large feedlots and 4.2 percent of small feedlots steam flaked or rolled grain. A greater percentage of small feedlots than large feedlots utilized ground high moisture corn.

The list of methods in the following table is not mutually exclusive as feedlots may have utilized more than one form of grain processing.

a. Percent of feedlots by method used to process grain fed to cattle and by feedlot capacity:

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Grain Processing Method	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Steam flaked and rolled	4.2	(1.1)	61.3	(3.8)	20.2	(1.4)
Dry rolled	51.2	(3.7)	36.1	(3.9)	47.0	(2.9)
Cracked	40.9	(3.6)	23.1	(3.3)	35.9	(2.8)
Ground high moisture corn	57.0	(4.1)	39.4	(4.0)	52.0	(3.2)
Unprocessed whole grain	29.5	(3.9)	3.7	(1.4)	22.3	(2.8)
Other method	4.3	(1.8)	5.6	(1.8)	4.6	(1.4)

2. Energy concentrates

Almost all (98.2 percent) small feedlots and all large feedlots used at least some corn in the finishing ration during the year ending June 30, 1999. A greater percentage of small feedlots (43.6 percent) used corn byproducts compared to large feedlots (29.9 percent). Large feedlots were more likely than small feedlots to utilize milo, and wheat. Byproducts in the Other category included, but were not limited to, wheat middlings, bakery waste, distillers grains, molasses, and potato waste.

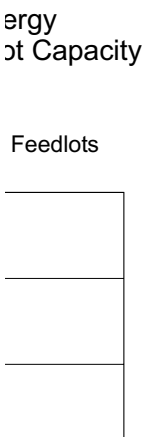
a. Percent of feedlots by sources of energy concentrates used in the finishing ration and by feedlot capacity:

	Percent Feedlots			
	Feedlot Capacity (Number Head)			
	1,000 - 7,999		8,000 or More	
Source	Percent	Standard Error	Percent	Standard Error
Corn	98.2	(1.0)	100.0	(--)
Milo	5.9	(1.4)	16.3	(2.6)
Wheat	5.4	(1.2)	23.2	(3.2)
Barley	3.7	(1.0)	8.1	(2.2)
Oats	6.6	(2.4)	3.8	(1.5)
Other grains	0.4	(0.4)	2.5	(1.2)
Corn byproducts (e.g., corn gluten meal)	43.6	(3.8)	29.9	(3.7)
Beet pulp	8.5	(2.3)	9.2	(2.3)
Other byproduct	16.5	(2.9)	21.2	(3.6)

The majority of all feedlots (94.3 percent) used corn as the primary source of non-structural carbohydrates (energy concentrate) for rations. Nearly 5 percent of large feedlots and 1.7 percent of small feedlots utilized milo as a primary energy source.

b. Percent of feedlots by the ***primary*** source of energy concentrates used in the finishing ration and by feedlot capacity:

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Source	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Corn	94.9	(1.3)	92.6	(2.0)	94.3	(1.0)
Milo	1.7	(0.8)	4.8	(1.6)	2.5	(0.7)
Wheat	1.6	(0.8)	1.6	(1.0)	1.6	(0.6)
Barley	1.2	(0.8)	1.0	(0.9)	1.2	(0.6)
Oats	0.0	(--)	0.0	(--)	0.0	(--)
Other grains	0.0	(--)	0.0	(--)	0.0	(--)
Corn byproducts (e.g., corn gluten meal)	0.0	(--)	0.0	(--)	0.0	(--)
Beet pulp	0.0	(--)	0.0	(--)	0.0	(--)
Other byproduct	0.6	(0.6)	0.0	(--)	0.4	(0.4)
Total	100.0		100.0		100.0	



3. Protein source

Protein is an important component in feedlot rations. Some dietary protein is provided by energy concentrates such as corn. However, this protein is usually not sufficient for optimal animal performance. Therefore, protein supplements such as soybean meal, cotton seed meal, and urea are used to provide supplemental protein. These supplements may arrive at the feedlot as individual commodities or as inclusions in a prepared supplement premix.

The majority of feedlots used some protein supplements as a premix (83.4 percent). Most feedlots (82.3 percent) used at least some non-protein nitrogen such as urea. Over 55 percent of feedlots used soybean products and 26.9 percent used cottonseed products. Protein sources in the Other category included, but were not limited to, sunflower products, feather meal, unspecified plant protein, and alfalfa.

a. Percent of feedlots by form and by type of protein source received:

Percent Feedlots

	Type of Protein Source										
	Individual Component		Premix		Both Individual Component and Premix		Don't know		None Received		Total
Protein Source	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error	Percent	Stand. Error	Percent
Soybean products	8.9	(1.8)	45.6	(3.3)	0.7	(0.3)	7.8	(1.6)	37.0	(3.0)	100.0
Cottonseed products	3.4	(0.7)	22.2	(2.3)	1.3	(0.4)	13.4	(2.3)	59.7	(2.9)	100.0
Poultry litter	0.5	(0.3)	0.4	(0.3)	0.0	(--)	10.4	(2.1)	88.7	(2.2)	100.0
Non-protein nitrogen (e.g., urea)	4.9	(1.5)	76.2	(2.8)	1.2	(0.8)	2.6	(1.0)	15.1	(2.4)	100.0
Beet pulp	0.0	(--)	3.7	(1.0)	0.0	(--)	17.1	(2.4)	79.2	(2.5)	100.0
Canola meal	0.3	(0.2)	3.5	(0.9)	0.2	(0.2)	21.5	(2.7)	74.5	(2.9)	100.0
Fish meal	0.2	(0.2)	4.8	(1.0)	0.0	(--)	16.2	(2.5)	78.8	(2.7)	100.0
Other	4.8	(1.3)	10.7	(1.7)	0.5	(0.3)	14.0	(2.4)	70.0	(3.0)	100.0
Any protein source	19.1	(2.3)	83.4	(2.3)	3.4	(1.0)	N/A	N/A	N/A	N/A	

D. Labor

1. Full-time employees

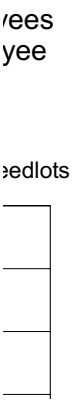
Full-time employees included paid and unpaid personnel. Full-time employees that only handled cattle may include cowboys or pen checkers, processing crew personnel, and doctoring crew personnel. Estimates do not include part-time employees.

Labor constitutes a significant proportion of the operating expenditure for feedlots. Large feedlots had approximately one-half the total full-time employees per 1,000 head of cattle than small feedlots. Similarly, large feedlots had fewer full-time employees per 1,000 head of cattle who only handled cattle than small feedlots.

a. For feedlots with inventory on July 1, 1999, average number of paid or unpaid, full-time employees per 1,000 head of cattle on July 1, 1999, by employee category and by feedlot capacity:

Average Number Employees per 1,000 Head of Cattle

	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Employee Category	Number per 1,000 Head	Standard Error	Number per 1,000 Head	Standard Error	Number per 1,000 Head	Standard Error
All employees including clerical and management personnel and those who handled cattle	2.18	(0.14)	1.21	(0.04)	1.36	(0.04)
Employees who only handled cattle (such as pen riders, doctoring crew, processors)	0.93	(0.07)	0.43	(0.02)	0.51	(0.02)



Full-time employees who left their jobs may have retired, quit, or been fired or injured. Replacement of employees represents considerable costs to feedlots in terms of training, orientation, etc. Estimates do not include part-time employees.

The number of full-time employees per 1,000 head that left their jobs during the year ending June 30, 1999, was higher for small feedlots than large feedlots. Twenty-four percent of the full-time employees per 1,000-head of cattle who only handled cattle left their job, whereas 18 percent of all full-time employees left their job. Calculations:

$$\frac{0.12}{0.51} \approx 24.0\% \qquad \frac{0.24}{1.36} \approx 18.0\%$$

The turnover rate appears greater for full-time employees who only handled cattle compared to all full-time employees.

b. For feedlots with cattle inventory on July 1, 1999, average number of paid or unpaid, full-time employees per 1,000 head of cattle on July 1, 1999, that left their job for any reason, e.g., retired, quit, fired, or injured, by feedlot capacity and by employee category:

	Average Number Employees per 1,000 Head of Cattle					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Employee Category	Number per 1000 Head	Standard Error	Number per 1000 Head	Standard Error	Number per 1000 Head	Standard Error
All employees including clerical and management personnel and those who handled cattle	0.33	(0.06)	0.22	(0.02)	0.24	(0.02)
Employees who only handled cattle (such as pen riders, doctoring crew, processors)	0.16	(0.04)	0.11	(0.01)	0.12	(0.01)

E. Information Flow

1. Information from packing plants

Carcass characteristics can directly or indirectly affect the value of finished animals, depending on the marketing strategy used by feedlots. Feedlots that sell on a formula, grid, or carcass basis are directly affected by at least dressing percentage, whereas those selling on a live basis are indirectly affected.

Dressing percentage was ***almost always*** available to three-fourths (72.2 percent) of feedlots and was ***never*** available to only 2.7 percent of feedlots. Other characteristics that were commonly ***almost always*** available were percentage of under- or overweight carcasses (55.8 percent), carcasses in each yield grade (42.9 percent), carcasses in each quality grade (40.6 percent), dark cutters (40.3 percent), and carcasses not given USDA grades (no-roll, 35.4 percent). Information on the presence of hide defects was ***almost always*** or ***sometimes*** available to nearly one-third (31.1 percent) of feedlots. Almost 60 and 70 percent of feedlots reported that information regarding the presence of injection site blemishes and hide defects, respectively, was never available or they didn't know whether or not it was available.

a. Percent of feedlots by availability of information from the packing plant where cattle were sent for slaughter during the year ending June 30, 1999, and by type of information:

	Percent Feedlots										
	Availability										
	Almost Always Available		Sometimes Available		Never Available		Didn't Know		No Heifers or Cows Slaughtered		Total
Type of Information	Pct.	Stand. Error	Pct.	Stand. Error	Pct.	Stand. Error	Pct.	Stand. Error	Pct.	Stand. Error	Pct.
Dressing percentage	72.2	(2.5)	24.2	(2.4)	2.7	(1.0)	0.9	(0.6)	N/A	N/A	100.0
Percentage of out-weights (under- or overweight carcasses)	55.8	(3.0)	35.5	(3.0)	5.2	(1.5)	3.5	(1.4)	N/A	N/A	100.0
Percent of cattle in each yield grade	42.9	(3.1)	48.5	(3.1)	6.4	(1.6)	2.2	(1.0)	N/A	N/A	100.0
Percent of cattle in each quality grade	40.6	(3.1)	48.6	(3.2)	8.8	(2.0)	2.0	(1.0)	N/A	N/A	100.0
Percent no-roll (not USDA graded)	35.4	(3.1)	42.2	(3.2)	15.8	(2.5)	6.6	(1.9)	N/A	N/A	100.0
Percent dark cutters	40.3	(3.2)	41.8	(3.2)	12.0	(2.1)	5.9	(1.7)	N/A	N/A	100.0
Presence of injection site lesions	13.6	(2.2)	27.0	(2.5)	37.9	(3.1)	21.5	(2.9)	N/A	N/A	100.0
Presence of hide defects	11.2	(2.2)	19.9	(2.3)	44.9	(3.3)	24.0	(3.0)	N/A	N/A	100.0
Liver condemnations	20.5	(2.6)	42.2	(3.0)	26.4	(2.9)	10.9	(2.4)	N/A	N/A	100.0
Percent pregnant (if heifers or cows sent to slaughter)	11.9	(2.1)	31.8	(2.6)	30.6	(3.0)	12.3	(2.3)	13.4	2.4	100.0
Other	5.2	(1.1)	1.2	(0.5)	79.0	(2.6)	14.6	(2.4)	N/A	N/A	100.0

Dressing percentage was ***almost always*** available to a larger percentage of small feedlots (77.0 percent) than large feedlots (60.0 percent). Percentages for small and large feedlots were similar for other carcass characteristics.

b. Percent of feedlots where information was ***almost always*** available from the packing plant where cattle were sent for slaughter during the year ending June 30, 1999, by type of information and by feedlot capacity:

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Type of Information	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Dressing percentage	77.0	(3.2)	60.0	(3.8)	72.2	(2.5)
Percentage of out-weights (under- or overweight carcasses)	58.1	(3.9)	50.0	(4.0)	55.8	(3.0)
Percent of cattle in each yield grade	43.0	(4.1)	42.9	(3.9)	42.9	(3.1)
Percent of cattle in each quality grade	39.3	(4.1)	43.9	(3.9)	40.6	(3.1)
Percent no-roll (not USDA graded)	33.1	(4.0)	32.5	(3.9)	35.4	(3.1)
Percent dark cutters	40.9	(4.1)	38.7	(4.1)	40.3	(3.2)
Presence of injection site lesions	11.8	(2.8)	18.3	(3.3)	13.6	(2.2)
Presence of hide defects	10.9	(2.8)	12.0	(2.9)	11.2	(2.2)
Liver condemnations	19.3	(3.4)	23.6	(3.4)	20.5	(2.6)
Percent pregnant (if heifers or cows sent to slaughter)	11.0	(2.7)	14.1	(3.0)	11.9	(2.1)
Other	3.8	(1.4)	9.1	(2.1)	5.2	(1.1)

Information from the packing plant was ***very important*** to 80.3 percent of feedlots and ***not important*** to only 1.4 percent of feedlots. Packing plant information was equally important to large and small feedlots.

c. Percent of feedlots by level of importance of information from the packing plant and by feedlot capacity:

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Importance of Information	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Very Important	80.9	(3.3)	78.7	(3.3)	80.3	(2.6)
Somewhat important	17.5	(3.1)	20.5	(3.3)	18.3	(2.4)
Not important	1.6	(1.2)	0.8	(0.6)	1.4	(0.9)
Total	100.0		100.0		100.0	

2. Returning information to sources of cattle

Information returned to the source of the cattle may include disease occurrence and death losses, animal performance, and carcass characteristics. Identification of the original source of cattle may not be possible and information may go to the immediate source, e.g., ranch owner or person providing cattle for custom feeding.

Feedlots in the Central region were more likely than those in the Other region to provide information back to the sources of cattle. Over one-third of all feedlots (38.7 percent) ***never or almost never*** returned any information which may indicate that many cattle were bought in such a way that the source was not readily identifiable, e.g., traded through sale barns. Approximately one-third of cattle were reported to be purchased through auctions (Feedlot '99 Part I).

a. Percent of feedlots by frequency that any information (e.g., occurrence of disease, performance or carcass quality) was returned to sources of the cattle placed on the feedlot and by region:

	Percent Feedlots					
	Region					
	Central		Other		All Feedlots	
Frequency	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Always or most of the time	28.3	(2.9)	17.3	(5.2)	24.7	(2.6)
Sometimes	39.9	(3.4)	29.6	(5.9)	36.6	(3.0)
Never or almost never	31.8	(3.4)	53.1	(6.6)	38.7	(3.1)
Total	100.0		100.0		100.0	

Large feedlots were more likely than small feedlots to provide information back to the sources of cattle. Only 9.5 percent of large feedlots ***never or almost never*** returned information. For nearly 84 percent of feedlots, pre-arrival processing information was available ***always or most of the time*** or ***sometimes*** (see Table I.A.2.a). These results along with estimates in the table below may indicate that feedlots and their cattle sources provided constructive information to each other on a regular basis.

b. Percent of feedlots by frequency of returning any information (e.g., occurrence of disease, performance or carcass quality) to sources of cattle and by feedlot capacity:

Percent Feedlots

	Feedlot Capacity (Number Head)			
	1,000 - 7,999		8,000 or More	
Frequency	Percent	Standard Error	Percent	Standard Error
Always or most of the time	17.9	(3.2)	42.3	(4.1)
Sometimes	32.1	(3.8)	48.2	(4.2)
Never or almost never	50.0	(4.2)	9.5	(2.5)
Total	100.0		100.0	

3. Location of packing plants

On average, large feedlots shipped finished cattle fewer miles to a packing plant than small feedlots (100 miles compared to 144 miles, respectively). These estimates may indicate that packing plants are located closer to large feedlots or that small feedlots chose a more distant plant over a closer one. Additionally, feedlots in the Central region shipped cattle, on average, 69 miles less to the packing plant than feedlots in the Other region.

a. Average distance (in miles) that feedlots shipped finished cattle to the packing plant during the year ending June 30, 1999, by feedlot capacity:

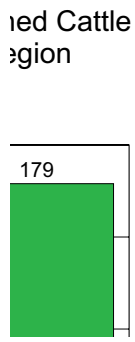
Average Distance (In Miles)

Feedlot Capacity (Number Head)					
1,000 - 7,999		8,000 or More		All Feedlots	
Average	Standard Error	Average	Standard Error	Average	Standard Error
144	(9)	100	(7)	132	(7)

i. Average distance (in miles) that feedlots shipped finished cattle to the packing plant during the year ending June 30, 1999, by region:

Average Distance (in Miles)

Region			
Central		Other	
Average	Standard Error	Average	Standard Error
110	(6)	179	(16)



F. Familiarity with Quality Assurance Programs

Quality assurance programs may be organized and administered at the state level or through the National Cattlemen's Beef Association (NCBA). Collectively, these programs are often, but not always, referred to as Beef Quality Assurance (BQA) programs. These programs provide recommendations regarding optimal practices for animal handling, drug residue avoidance, record keeping, and maintaining a high quality product for the consumer.

The majority of both large (96.7 percent) and small feedlots (86.3 percent) were familiar with BQA programs. A small segment of large (3.3 percent) and small feedlots (10.3 percent) characterized their level of familiarity as having heard of the name only. Just over 3 percent of feedlots with a capacity of less than 8,000 head were unfamiliar with such programs.

a. Percent of feedlots by level of familiarity with the Beef Quality Assurance program ***either*** of their state ***or*** of the National Cattlemen's Beef Association (NCBA) and by feedlot capacity:

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Level of Familiarity	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Very familiar	43.7	(3.9)	63.1	(4.0)	49.1	(3.0)
Somewhat familiar	42.6	(4.2)	33.6	(3.9)	40.1	(3.2)
Heard name only	10.3	(2.5)	3.3	(1.7)	8.4	(1.9)
Unfamiliar	3.4	(1.7)	0.0	(--)	2.4	(1.2)
Total	100.0		100.0		100.0	

The NCBA has conducted several National Beef Quality Audits including audits of beef produced by the feedlot industry. The publications are available from the NCBA. Almost 90 percent of large feedlots and 63.9 percent of small feedlots were familiar with at least one National Beef Quality Audit. Approximately the same percentage of small and large feedlots were ***somewhat*** familiar with National Beef Quality Audit results.

b. Percent of feedlots by level of familiarity with the results of any of the beef industry's National Beef Quality Audits and by feedlot capacity:

	Percent Feedlots					
	Feedlot Capacity (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Level of Familiarity	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Very familiar	19.6	(3.4)	39.2	(4.2)	25.1	(2.7)
Somewhat familiar	44.3	(4.1)	50.3	(4.2)	45.9	(3.2)
Heard name only	18.6	(3.3)	4.1	(1.8)	14.6	(2.4)
Unfamiliar	17.5	(3.3)	6.4	(2.1)	14.4	(2.4)
Total	100.0		100.0		100.0	

Section II: Methodology

A. Needs Assessment

Objectives were developed for the Feedlot '99 study from input obtained over a period of several months via a number of focus groups and individual contacts. Participants included producer representatives, government personnel, veterinary consultants, researchers, and animal health officials.

Feedlot '99 study objectives were to:

1) Describe animal health management practices in feedlots and their relationship to cattle health.

2) Describe changes in management practices and animal health in feedlots from 1994 to 1999.

3) Identify factors associated with shedding of specified pathogens by feedlot cattle, such as:
   - *E. coli* 0157
   - *Salmonella* spp.
   - *Campylobacter* spp.

4) Describe antimicrobial usage in feedlots.

5) Identify priority areas for pre-arrival processing of cattle and calves.

6) Describe the management in feedlots that impacts product quality.

B. Sampling and Estimation

1. State selection

A goal of the NAHMS national studies is to include states that account for at least 70 percent of the animal and producer population. The National Agricultural Statistics Service (NASS) publishes the number of cattle on feed and the number of feedlots in the U.S. The February 1999 report shows that 2 percent of the feedlots had over 80 percent of the U.S. inventory. These feedlots were those with 1,000 head or more one-time capacity. Therefore, to enhance prudent use of available resources, our goal of focusing on animal health was achieved by concentrating efforts where most of the animals were located. This plan meant examining those feedlots with 1,000-head or more capacity. On a monthly and quarterly basis, the NASS surveys these large feedlots in 12 key cattle feeding states, which in general are those states with the largest inventories. To minimize respondent burden on these large feedlots, NAHMS chose to direct efforts in these same 12 feedlot states which were Arizona, California, Colorado, Idaho, Iowa, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Washington. The number of feedlots published for these 12 states in 1998 was 1,746. On January 1, 1999, they had 10,217,000 head on feed.

2. Feedlot selection

A total of 1,250 feedlots were selected from a population of 1,782 feedlots based on NASS' May 1999 Cattle on Feed survey. In eight of the 12 NAHMS states, all feedlots were selected. In the remaining four states (Colorado, Iowa, Kansas, and Nebraska), a sample of operations was selected to match resource availability both within the state and nationally. These four states were chosen for subsampling because of their relatively large number of smaller feedlots. In these four states, all

feedlots with more than 4,000 head were included in the sample, while the sampling interval varied between one in 1.61 (Colorado) to one in 4.39 (Nebraska) for smaller feedlots.

3. Population inferences

Inferences cover the population of feedlots with 1,000 head or more one-time capacity in the 12 study states since these feedlots were the only ones eligible for sample selection. These states accounted for 84.3 percent of the feedlots with a 1,000-head or more capacity in the U.S. and 95.8 percent of the U.S. cattle on feed inventory on those feedlots as of January 1, 1999, or 77.3 percent of all cattle on feed in the U.S. *All respondent data were properly weighted to reflect the population from which it was selected.* The inverse of the probability of selection for each of the 1,250 feedlots was the initial selection weight. This selection weight was adjusted for non-response within each of two regions and two size groups to allow for inferences back to the original population from which the sample was selected.

C. Data Collection

1. Phase I: Feedlot Management Report, August 16 - September 22 , 1999

NASS enumerators administered the Feedlot Management Report. The interview took approximately 1 hour to complete.

2. Phase II: Veterinary Services Visit, October 12 - January 7, 1999

Farms for which the operation had signed a consent form were contacted by Veterinary Services (VS) for the second phase of the study. Veterinary Medical Officers (VMO's) contacted each feedlot, explained the program, and, if the feedlot agreed to continue in the study, administered a questionnaire. Feedlot '99 Parts II and III report the results of this phase of the study.

D. Data Analysis

1. Validation and estimation

Initial data entry and validation for the Feedlot Management Report (results reported in Feedlot '99 Part I) were performed in each individual NASS state office. Data were entered into a SAS data set. NAHMS national staff performed additional data validation on the entire data set after data from all states were combined.

Data entry and editing for the VS visit phase of Feedlot '99 were done by the NAHMS national staff in Fort Collins, CO. VS field staff followed up with producers, where necessary, to ensure data validation. Summarization and estimation for Parts II and III were performed by NAHMS national staff using SUDAAN software (1996. Research Triangle Park, NC).

2. Response rates

A total of 520 of the initially selected 1,250 feedlots completed the Feedlot Management Report (Part I). There were 130 selected feedlots (10.4 percent) that had zero cattle on feed, were out of business, or were otherwise out of scope for the study (Table 1). These two groups combined (n=650) represented the respondents to the survey. The response rate (650/1,250 = 52.0%) was similar to the response rate from the NAHMS' 1994 Cattle on Feed Evaluation (43.5 percent for feedlots with a ca-

pacity of 1,000 or more head). Forty-one selected feedlots were inaccessible or could not be contacted within the study timelines.

There were 341 of the 520 respondents to the Feedlot Management Report, conducted by NASS enumerators, who consented to have their names turned over to VS for potential participation in the second phase of the Feedlot '99 study. Of these 341 feedlots, 275 participated in the VS phase of the study. The overall response rate for Phase II was 52.9 percent (275/520).

Response Category	Number Feedlots	Percent Feedlots
Completed survey	520	41.6
Had zero cattle on feed	83	6.6
Out of business	40	3.2
Out of scope of survey	7	0.6
Refusals	559	44.7
Inaccessible	41	3.3
Total	1,250	100.0

Appendix I: Sample Profile

A. Responding Feedlots

1. Number and percent of feedlots by feedlot capacity and by region:

Number and Percent Feedlots

	Size of Feedlot (Number Head)					
	1,000 - 7,999		8,000 or More		All Feedlots	
Region	Number	Percent	Number	Percent	Number	Percent
Central	115	41.8	97	35.3	212	77.1
Other	48	17.5	15	5.4	63	22.9
Total	163	59.3	112	40.7	275	100.0

2. Number and percent of feedlots by number of placements

Number Placements	Number Feedlots	Percent Feedlots
1-2,499	70	25.4
2,500-9,999	85	30.9
10,000-39,999	72	26.2
40,000 or more	48	17.5
Total	275	100.0

NAHMS FEEDLOT '99 Study: Completed and Expected Outputs and Related Study Objectives

1. Describe changes in management practices and animal health in feedlots from 1994 to 1999.
   - Changes in the U.S. Beef Feedlot Industry, 1994-1999, August 2000

2. Describe the management in feedlots that impacts product quality.
   - Part I: Baseline Reference of Feedlot Management Practices, 1999, May 2000
   - ***Part II: Baseline Reference of Feedlot Health and Health Management, 1999***, November 2000
   - Part III: Health Management and Biosecurity in U.S. Feedlots, 1999, expected December 2000
   - Quality assurance (interpretive report), expected 2001
   - Water quality (info sheet), November 2000
   - Feed quality (info sheet), expected 2001

3. Identify factors associated with shedding by feedlot cattle of specified pathogens, such as *E. coli* 0157, *Salmonella* spp., and *Campylobacter* spp.
   - *E. coli* 0157:H7 (info sheet), expected 2001
   - *Salmonella* (info sheet), expected 2001
   - *Campylobacter* (info sheet), expected 2001

4. Describe antimicrobial usage in feedlots.
   - Part I: Baseline Reference of Feedlot Management Practices*, 1999*, May 2000
   - ***Part II: Baseline Reference of Feedlot Health and Health Management, 1999***, November 2000
   - Part III: Health Management and Biosecurity in U.S. Feedlots, 1999, expected December 2000
   - Injection practices (info sheet), November 2000
   - Antimicrobial usage in feedlots (interpretive report), expected 2001

5. Identify priority areas for pre-arrival processing of cattle and calves.
   - Part I: Baseline Reference of Feedlot Management Practices, 1999, May 2000
   - ***Part II: Baseline Reference of Feedlot Health and Health Management, 1999***, November 2000
   - Implants (info sheet), May 2000
   - Attitudes toward pre-arrival processing (info sheet), November 2000
   - Vaccination against respiratory disease pathogens (info sheet), November 2000

Centers for Epidemiology and Animal Health
USDA:APHIS:VS, attn. NAHMS
555 South Howes
Fort Collins, CO 80521
Telephone: (970) 490-8000
www.aphis.usda.gov/vs/ceah/cahm

#N335.1100