United States
Department
of Agriculture

Animal and
Plant Health
Inspection
Service

**Veterinary
Services**

Changes
Changes

Part II: Changes in the U.S. Dairy Industry: 1991-1996

Changes
Changes
Changes
Changes
Changes
Changes
Changes
Changes
Changes
Changes
Changes
Changes
Changes
Changes
Changes
Changes
Changes
Changes
Changes

NAHMS

September 1996

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).

The 1991 National Dairy Heifer Evaluation Project and Dairy '96 study were cooperative efforts 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, State and Federal Veterinary Medical Officers (VMO's), and Animal Health Technicians (AHT's) who visited the farms 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 enumerators were critical in providing quality data for study reports. All participants are to be commended for their efforts, particularly the producers whose voluntary efforts made the study possible.

Dr. Al Strating, Director
Centers for Epidemiology & Animal Health

Table of Contents

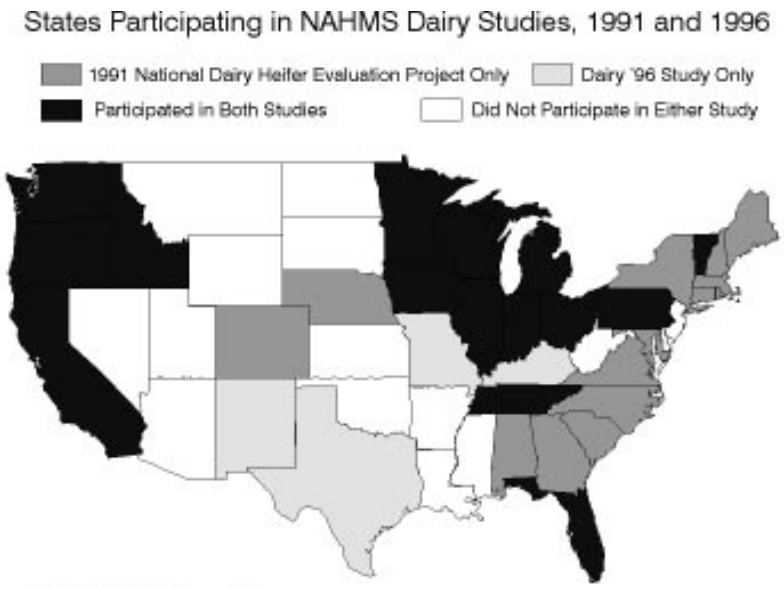
Introduction

In 1983, promoters of the concept that would become the USDA's National Animal Health Monitoring System (NAHMS) envisioned a program that would monitor changes and trends in national animal health and management. They hoped to provide periodic snapshots of U.S. food animal industries. With these industry overviews, members could identify opportunities for improvement, provide changing foundations for research and special studies, and detect emerging problems.

Section I of this report shows demographic changes of the U.S. and world dairy industry from a historical perspective from data provided by the National Agricultural Statistics Service (NASS), Census of Agriculture, and Foreign Agriculture Service. Results of two NAHMS national studies in Section II complete the overview of change in the U.S. dairy industry during the 5-year period of 1991 to 1996.

NAHMS' first national study of the United States' dairy industry, 1991's National Dairy Heifer Evaluation Project (NDHEP), provided the snapshot of animal health and management that would serve as a baseline from which to measure industry changes in animal health and management. NAHMS' Dairy '96 study has begun to fulfill the vision of the program's early years.

The 1991 National Heifer Evaluation Project (NDHEP) included herds of 30 or more milk cows and heifer-rearing operations in 28 states representing 83 percent of U.S. milk cows (see map at right). Dairy '96 described dairy production for operations with one or more milk cows in 20 states representing 83 percent of the nation's milk cows. This report provides national estimates of animal health and health management practices for comparable populations from both studies. Results in Section II include comparisons for operations with 30 or more milk cows and the Dairy '96 study overall results.



Dairy '96 questions either referred to producer practices and production during 1995 (presented in the text of this report as "1995" results) or practices and production at the time of data collection in early 1996 (presented in this report as "1996" results). NDHEP questions generally referred to producer activities and production during 1991.

All NAHMS dairy study results are accessable on the World Wide Web (through the Centers for Epidemiology and Animal Health Home Page) at http://www.aphis.usda.gov/vs/ceah. Discussions on selected topics are accessable through gopher.aphis.usda.gov (menu choices: APHIS Information: Animal Health Information; Animal Health Monitoring, Risk Assessments, and Emerging Issues).

Terms Used in This Report

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

Dairy '96 comparable results: national estimates from the Dairy '96 study were created based on reports from operations with 30 or more milk cows so the estimates would be comparable to the first study (1991 National Dairy Heifer Evaluation Project). No attempt was made to generate estimates specifically for the states in both studies.

Heifer: female dairy bovine not yet calved.

Cow average: the average value for all cows; the reported value for each operation multiplied by the number of cows on that operation is summed over all operations and divided by the number of cows on all operations. This way, the result is adjusted for the number of cows on each operation. For instance, on page 16, the average age at first calving is multiplied by the number of cows for each operation. This product is then summed over all operations and divided by the sum of cows over all operations. The result is the average age at weaning.

Operation average: a single value for each operation is summed over all operations reporting divided by the number of operations reporting. For instance, operation average age at first calving (shown on page 16) is calculated by summing reported average age over all operations divided by the number of operations.

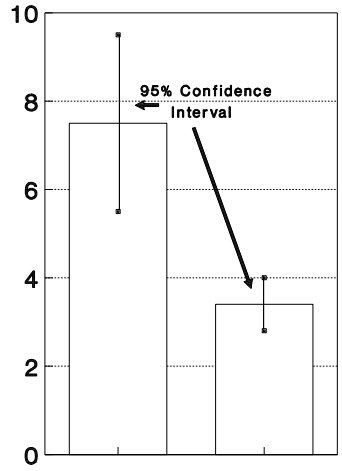
Population estimates: averages and proportions weighted to represent the population. Most of the estimates in this report are provided with a measure of variability called the *standard error* and denoted by (±). Changes are 95 out of 100 that the interval created by the estimate plus or minus two standard errors will contain the true population value. In the example above, an estimate of 7.5 with a standard error of ±1.0 results in a range of 5.5 to 9.5 (two times the standard error above and below the estimate.) The second estimate of 3.4 shows a standard error of ±0.3 results with a range of 2.8 and 4.0.

Producer-perceived cause: Causes of illnesses and deaths derived from observations of clinical signs reported by participating producers and may or may not have been substantiated by a veterinarian or laboratory.

Physical contact: Possible nose-to-nose contact or sniffing/touching/licking each other, including through a fence.

Standard error: see description under population estimates above.

Examples of 95% Confidence Intervals



(±1.0) (±0.3)
Standard Errors

I: Demographics, 1991-1996

A. Historical Changes in the U.S. Dairy Industry

1. Milk Cow Inventory

The Census of Agriculture has collected and reported milk cow numbers at 5-year intervals since 1850. The table below shows inventory numbers based on approximately 10-year intervals (every other Census).

Milk cow numbers steadily increased from 1850 to a peak in 1940 at 24.1 million head. Numbers declined for the next 50 years with the current level at only 39 percent of the 1940 peak. The number of milk cows as a proportion of all cattle fluctuated around 30 percent for the first 100 years, then steadily declined from a high of 39.7 percent in 1940 to a low of 9.8 percent in 1978. The proportion levelled off at around 10 percent over the 23-year period from 1969 through 1992.

a. Changes in U.S. milk cow inventories, 1850-1992.

Year	Milk Cows (1,000 Head)	All Cattle & Calves (1,000 Head)	Milk Cows as Percent of All Cattle & Calves
1850	6,385	18,379	34.7
1860	8,586	25,620	33.5
1870	8,935	23,821	37.5
1880	12,443	39,676	31.4
1890	16,512	57,649	28.6
1900	17,136	67,719	25.3
1910	17,125	61,804	27.7
1920	19,675	66,640	29.5
1930	20,499	63,896	32.1
1940	24,074	60,675	39.7
1950	21,233	76,762	27.7
1959	16,522	92,534	17.9
1969	11,174	106,346	10.5
1978	10,222	103,886	9.8
1987	10,085	95,847	10.5
1992	9,492	96,136	9.9

* Census of Agriculture, 1850-1950. Includes all states except Alaska and Hawaii.

Each year, the USDA's National Agricultural Statistics Service (NASS) surveys a random sample of producers to provide national estimates of animal populations and food production. This section reports NASS' demographics of the U.S. dairy industry as estimated from their January surveys.

The following tables show changes over the past 5 years in numbers of milk cows and operations, size of operations, and milk production. The period is characterized by a continued year-to-year decline in number of milk cows with a 3.3 percent drop over the 5 years. Replacement numbers have remained rather stable.

b. Changes in the U.S. dairy inventory January 1, 1992-1996.*

	Milk Cows that Have Calved			Milk Cow Replacement Heifers		
Year	1,000 Head	Percent Previous Year	Percent of 1992	1,000 Head	Percent Previous Year	Percent of 1992
1992	9,728.2	97.6	100.0	4,131.4	100.9	100.0
1993	9,658.1	99.3	99.3	4,176.2	101.1	101.1
1994	9,528.0	98.7	97.9	4,143.5	99.2	100.3
1995	9,486.8	99.6	97.5	4,141.3	99.9	100.2
1996	9,412.0	99.2	96.7	4,105.3	99.1	99.4

* National Agriculture Statistics Service (NASS) data.

2. Number of Dairy Operations and Herd Size

Almost one in four dairy herds have disappeared since 1991 with roughly a 5 percent decrease per year. Combined with the relatively slower decline in milk cow numbers, the result is nearly a 25 percent increase in average herd size.

a. Changes in the number of U.S. dairy operations, 1991-1995.*

Year	Number	Percent Previous Year	Percent of 1991
1991	180,640	93.8	100.0
1992	170,500	94.4	94.4
1993	159,450	93.5	88.3
1994	148,690	93.3	82.3
1995	140,090	94.2	77.6

* National Agriculture Statistics Service (NASS) data. An operation is any place having one or more milk cows, excluding cows used to nurse calves, on hand any time during the year.

The proportion of the smallest herds has consistently diminished each year, while the proportion of larger herds has consistently increased.

b. Percent of U.S. dairy operations by herd size, 1991-1995.*

Year	1-29 Head	30-49 Head	50-99 Head	100-199 Head	200 or More Head
1991	39.8	22.8	25.9	11.5**	**
1992	38.9	22.1	26.0	13.0**	**
1993	37.2	22.2	26.9	9.3	4.4
1994	35.8	22.0	27.7	9.9	4.6
1995	34.4	22.2	27.9	10.5	5.0

* National Agriculture Statistics Service (NASS) data.
** The 100-199 size group includes 200 or more head.

A larger proportion of the U.S. inventory is shifting to large herds.

c. Percent of U.S. milk cow inventory by herd size, 1991-1995.*

Year	1-29 Head	30-49 Head	50-99 Head	100-199 Head	200 or More Head
1991	6.3	16.6	31.7	45.4**	**
1992	5.5	15.2	30.0	49.3**	**
1993	5.0	14.8	29.2	19.2	31.8
1994	4.6	14.0	28.7	19.3	33.4
1995	4.0	13.0	28.0	20.0	35.0

* National Agriculture Statistics Service (NASS) data.
** The 100-199 size group includes 200 or more head.

3. Milk Production

During the 5-year period beginning in 1991, total annual U.S. milk production increased 5 percent. This increase was achieved with a concurrent 4 percent decline in number of milk cows and 9 percent increase in milk production per cow.

Changes in U.S. production, 1991-1995.*

		Milk Per Cow			Total Milk Production		
Year	Average Number of Milk Cows** (1,000 Head)	Pounds Per Cow	Percent of Previous Year	Percent of 1991	Total Milk*** (Million lbs.)	Percent Previous Year	Percent of 1991
1991	9,826	15,031	101.7	100.0	147,697	100.0	100.0
1992	9,688	15,574	103.6	103.6	150,885	102.2	102.2
1993	9,589	15,704	100.8	104.5	150,582	99.8	102.0
1994	9,500	16,175	103.0	107.6	153,664	102.0	104.0
1995	9,461	16,451	101.7	109.4	155,644	101.3	105.4

* National Agriculture Statistics Service (NASS) data.

** Average number during the year, excluding heifers not yet fresh.

*** Excludes milk sucked by calves.

B. Changes in World Dairy Production

Change from 1991 through 1995 in total milk cows in 32 selected countries was similar to U.S. change, but total world production declined slightly while U.S. production increased.

a. Changes in number of milk cows and milk production in selected countries, 1991-1995.*

	Milk Cows			Total Milk Production		
Year	1,000 Head	Percent of Previous Year	Percent of 1991	1,000 Metric Tons	Percent Previous Year	Percent of 1991
1991	139,822	N/A	100.0	385,197	N/A	100.0
1992	138,783	99.3	99.3	379,379	98.5	98.5
1993	138,202	99.6	98.8	379,732	100.1	98.6
1994	136,988	99.1	98.0	381,892	100.6	99.1
1995	135,643	99.0	97.0	382,774	100.2	99.4

* USDA:Foreign Agriculture Service (FAS) data covers 32 countries.

b. Changes in milk cow inventories and milk production in selected countries.*						
	# of Milk Cows (Thousand Head)			Milk Production (Thousand Metric Tons)		
Country	1991	1995	1995 as Percent of 1991	1991	1995	1995 as Percent of 1991
Canada	1,328	1,276	96.1	7,790	7,920	101.7
Mexico	6,440	6,440	100.0	10,200	11,120	109.0
United States	9,826	9,461	96.3	66,994	70,599	105.4
Total: North America	17,594	17,177	97.6	84,984	89,639	105.5
Argentina	2,000	2,350	117.5	6,400	8,300	129.7
Brazil	17,600	17,600	100.0	14,200	17,400	122.5
Chile	645	770	119.4	1,490	2,025	135.9
Peru	563	580	103.0	645	665	103.1
Venezuela	1,120	1,100	98.2	1,505	1,300	86.4
Total: South America	21,928	22,400	102.2	24,240	29,690	122.5
Austria	865	792	91.6	3,296	3,286	99.7
Belgium-Luxembourg	890	746	83.8	3,808	3,595	94.4
Denmark	769	683	88.8	4,640	4,673	100.7
Finland	441	408	92.5	2,555	2,486	97.3
France	5,200	4,754	91.4	25,700	25,491	99.2
Germany	6,016	5,273	87.6	28,916	28,800	99.6
Greece	245	210	85.7	695	690	99.3
Ireland	1,322	1,269	96.0	5,539	5,689	102.7
Italy	2,881	2,070	71.9	11,400	10,400	91.2
Netherlands	1,775	1,709	96.3	11,047	11,294	102.2
Portugal	403	356	88.3	1,542	1,560	101.2
Spain	1,650	1,374	83.3	6,100	5,800	95.1
Sweden	505	475	94.1	3,220	3,250	100.9
United Kingdom	2,365	2,268	95.9	14,503	14,700	101.4
Total: European Union	25,327	22,387	88.4	122,961	121,714	99.0
Switzerland	781	760	97.3	3,931	3,890	99.0
Total: Other Western Europe	781	760	97.3	3,931	3,890	99.0
Poland	4,577	3,500	76.5	14,504	11,410	78.7
Romania	1,600	1,778	111.1	4,391	5,885	134.0
Total: Eastern Europe	6,177	5,278	85.4	18,895	17,295	91.5
Russia	20,557	18,600	90.5	51,971	39,400	75.8
Ukraine	8,378	7,818	93.3	22,409	17,050	76.1
Total: Former Soviet Union	28,935	26,418	91.3	74,380	56,450	75.9
China	2,946	3,500	118.8	4,646	5,600	120.5
India**	30,700	32,000	104.2	28,200	32,000	113.5
Japan	1,082	1,034	95.6	8,260	8,382	101.5
Total: Asia	34,728	36,534	105.2	41,106	45,982	111.9
Australia***	1,629	1,789	109.8	6,578	8,430	128.2
New Zealand****	2,723	2,900	106.5	8,122	9,684	119.2
Total: Oceania	4,352	4,689	107.7	14,700	18,114	123.2
TOTAL	139,822	135,643	97.0	385,197	382,774	99.4

* USDA:Foreign Agriculture Service (FAS) data covers 32 countries.
**Year beginning April 1 of year shown.
***Year ending June 30 of year shown.
****Year ending May 31 of year shown.

C. Dairy Industry Changes by State

The following tables describe U.S. dairy industry changes by state between 1991 and 1996, based on USDA:National Agricultural Statistics Service data. The tables also identify which states were in two NAHMS national dairy studies, the 1991 National Dairy Heifer Evaluation Project and the Dairy '96 study.

Among the geographical shifts shown are an increase in number of milk cows in the western states, notably New Mexico and Idaho, and reduction in number of milk cows in most other states. Individual state results echo national trends in reduction of number of operations, except in Alaska and New Hampshire, and increases in milk production per cow, except in Indiana, Louisiana, New Jersey, and New Mexico. Note also the large increases in herd size for most of the western states.

a. Changes in milk cow inventories and operations by state (NASS data).								
	Study Participation		# of Milk Cows that Calved (Thousand Head)			Number Operations with Milk Cows		
State	NDHEP (Y=Yes)	Dairy '96 (Y=Yes)	Jan. 1, 1992	Jan. 1, 1996	1996 as Percent of 1992	1991	1995	1995 as Percent of 1991
Alabama	Y		43	32	74.4	1,100	350	31.8
Alaska			0.8	0.8	100.0	30	30	100.0
Arizona			96	118	122.9	500	350	70.0
Arkansas			69	58	84.1	2,000	1,700	85.0
California	Y	Y	1,160	1,260	108.6	4,200	3,300	78.6
Colorado	Y		77	82	106.5	1,400	1,000	71.4
Connecticut	Y		33	31	93.9	500	350	70.0
Delaware			9	10	111.1	160	150	93.7
Florida	Y	Y	179	155	86.6	1,000	800	80.0
Georgia	Y		105	100	95.2	1,400	900	64.3
Hawaii			10	10	100.0	80	60	75.0
Idaho	Y	Y	178	245	137.6	1,900	1,500	78.9
Illinois	Y	Y	170	160	94.1	3,000	2,600	86.7
Indiana	Y	Y	145	140	96.6	4,500	3,900	86.7
Iowa	Y	Y	270	250	92.6	7,000	5,300	75.7
Kansas			95	83	87.4	2,300	1,400	60.9
Kentucky		Y	185	160	86.5	5,500	4,000	72.7
Louisiana			79	79	100.0	1,800	1,300	72.2
Maine	Y		41	39	95.1	1,100	1,000	90.9
Maryland	Y		95	91	95.8	1,600	1,100	68.7
Massachusetts	Y		31	28	90.3	800	600	75.0
Michigan	Y	Y	332	328	98.8	6,000	4,700	78.3
Minnesota	Y	Y	660	600	90.9	15,000	12,000	80.0
Mississippi			60	52	86.7	1,300	700	53.8
Missouri		Y	210	185	88.1	6,900	4,500	65.2
Montana			24	20	83.3	1,600	900	56.3
Nebraska	Y		90	70	77.8	2,700	1,900	70.4
Nevada			20	23	115.0	260	200	76.9
New Hampshire	Y		21	19	90.5	400	400	100.0
New Jersey			24	23	95.8	450	400	88.9
New Mexico		Y	101	190	188.1	1,300	1,100	84.6
New York	Y	Y	740	700	94.6	12,200	10,000	82.0
North Carolina	Y		99	86	86.9	1,800	1,300	72.2
North Dakota			80	64	80.0	2,100	1,600	76.2
Ohio	Y	Y	320	285	89.1	8,900	7,500	84.3
Oklahoma			97	97	100.0	3,000	2,500	83.3
Oregon	Y	Y	100	95	95.0	1,900	1,400	73.7
Pennsylvania	Y	Y	663	648	97.7	14,500	11,800	81.4
Rhode Island	Y		2.4	2.2	91.7	60	50	83.3
South Carolina			33	26	78.8	800	250	31.3
South Dakota			132	115	87.1	3,300	2,400	72.7
Tennessee	Y	Y	165	120	72.7	3,500	2,100	60.0
Texas		Y	385	400	103.9	5,300	3,700	69.8
Utah			76	80	105.3	1,500	1,100	73.3
Vermont	Y	Y	163	158	96.9	2,600	2,200	84.6
Virginia	Y		140	128	91.4	2,800	2,200	78.6
Washington	Y	Y	238	264	110.9	3,000	2,000	66.7
West Virginia			23	21	91.3	2,000	1,100	55.0
Wisconsin	Y	Y	1,650	1,475	89.4	33,000	28,000	84.8
Wyoming			9	6	66.7	600	400	66.7
U.S.	28	20	9,728.2	9,412.0	96.7	180,640	140,090	77.6

b. Changes in average herd size and milk per cow by state (NASS data).								
	Study Participation		Average Herd Size			Milk per Cow (lbs.)		
State	NDHEP (Y=Yes)	Dairy '96 (Y=Yes)	1991	1995	1995 as Percent of 1991	1991	1995	1995 as Percent of 1991
Alabama	Y		39.1	91.4	233.8	12,707	14,176	111.6
Alaska			26.7	26.7	100.0	13,300	17,000	127.8
Arizona			192.0	337.1	175.6	18,032	19,561	108.5
Arkansas			34.5	34.1	98.8	11,687	12,200	104.4
California	Y	Y	276.2	381.8	138.2	18,534	20,197	109.0
Colorado	Y		55.0	82.0	149.1	17,338	18,687	107.8
Connecticut	Y		66.0	88.6	134.2	15,848	16,438	103.7
Delaware			56.3	66.7	118.5	14,130	14,600	103.3
Florida	Y	Y	179.0	193.7	108.2	13,933	14,698	105.5
Georgia	Y		75.0	111.1	148.1	13,523	15,550	115.0
Hawaii			125.0	166.7	133.4	13,056	13,654	104.6
Idaho	Y	Y	93.7	163.3	174.3	16,399	18,147	110.7
Illinois	Y	Y	56.7	61.5	108.5	14,936	15,613	104.5
Indiana	Y	Y	32.2	35.9	111.5	15,439	15,375	99.6
Iowa	Y	Y	38.6	47.2	122.3	15,095	16,088	106.6
Kansas			41.3	59.3	143.6	12,680	14,390	113.5
Kentucky		Y	33.6	40.0	119.0	11,231	12,469	111.0
Louisiana			43.9	60.8	138.5	11,675	11,456	98.1
Maine	Y		37.3	39.0	104.6	14,786	16,025	108.4
Maryland	Y		59.4	82.7	139.2	14,480	14,587	100.7
Massachusetts	Y		38.7	46.7	120.7	15,000	16,000	106.7
Michigan	Y	Y	55.3	69.8	126.2	15,690	17,071	108.8
Minnesota	Y	Y	44.0	50.0	113.6	14,354	15,763	109.8
Mississippi			46.2	74.3	160.8	12,098	12,909	106.7
Missouri		Y	30.4	41.1	135.2	13,451	14,158	105.3
Montana			15.0	22.2	148.0	13,750	15,000	109.1
Nebraska	Y		33.3	36.8	110.5	13,913	14,797	106.4
Nevada			76.9	115.0	149.5	17,500	18,085	103.3
New Hampshire	Y		52.5	47.5	90.5	15,143	16,300	107.6
New Jersey			53.3	57.5	107.9	14,160	13,913	98.3
New Mexico		Y	77.7	172.7	222.3	19,561	18,969	97.0
New York	Y	Y	60.7	70.0	115.3	15,005	16,562	110.4
North Carolina	Y		55.0	66.2	120.4	15,424	16,287	105.6
North Dakota			38.1	40.0	105.0	12,622	13,094	103.7
Ohio	Y	Y	36.0	38.0	105.6	14,446	15,917	110.2
Oklahoma			32.3	38.8	120.1	12,354	13,433	108.7
Oregon	Y	Y	52.6	67.9	129.1	16,590	17,289	104.2
Pennsylvania	Y	Y	45.7	54.9	120.1	15,263	16,511	108.2
Rhode Island	Y		40.0	44.0	110.0	14,333	14,773	103.1
South Carolina			41.3	104.0	251.8	12,273	14,481	118.0
South Dakota			40.0	47.9	119.7	12,309	13,483	109.5
Tennessee	Y	Y	47.1	57.1	121.2	11,863	13,849	116.7
Texas		Y	72.6	108.1	148.9	14,036	15,244	108.6
Utah			50.7	72.7	143.4	15,975	16,739	104.8
Vermont	Y	Y	62.7	71.8	114.5	14,683	16,166	110.1
Virginia	Y		50.0	58.2	116.4	14,614	15,116	103.4
Washington	Y	Y	79.3	132.0	166.5	18,814	19,932	105.9
West Virginia			11.5	19.1	166.1	11,739	12,667	107.9
Wisconsin	Y	Y	50.0	52.7	105.4	14,140	15,397	108.9
Wyoming			15.0	15.0	100.0	12,563	14,100	112.2
Total U.S.			53.9	67.2	124.7	15,031	16,451	109.4

II: Management, NAHMS Population Estimates 1991-1996

A. General

1. Breed

The main breed of dairy cattle on U.S. dairy operations changed very little from 1991 to January 1, 1996. Holsteins remain the primary breed.

Percent operations by main breed of dairy herd.

Breed	1991 NDHEP*	Standard Error	Dairy '96 Comparable*	Standard Error	Dairy '96 Total	Standard Error
Holstein	94.9	±0.7	94.4	±0.6	93.0	±0.8
Jersey	2.4	±0.4	3.4	±0.4	4.1	±0.6
Ayrshire	0.6	±0.3	0.3	±0.1	0.3	±0.1
Brown Swiss	1.0	±0.4	0.3	±0.1	0.4	±0.2
Guernsey	0.9	±0.3	1.2	±0.3	1.7	±0.4
Other	0.2	±0.2	0.4	±0.2	0.5	±0.2
Total	100.0		100.0		100.0	

*Population: Operations with at least 30 dairy cows.

2. Registration

The percentage of U.S. dairy operations with 100 percent of dairy cows registered increased slightly to approximately 8.4 percent on January 1, 1996, in herds with at least 30 milk cows. Nearly two out of three dairy herds had no registered cows.

Percent operations by percent of dairy cows registered.

Percent of Dairy Cows Registered	1991 NDHEP*	Standard Error	Dairy '96 Comparable*	Standard Error	Dairy '96 Total	Standard Error
0	59.6	±1.7	61.1	±1.2	65.5	±1.2
1-9	10.8	±1.1	13.4	±0.8	11.5	±0.7
10-50	16.3	±1.3	7.4	±0.7	6.4	±0.6
51-75	3.2	±0.6	3.5	±0.5	3.8	±0.6
76-99	4.2	±0.6	6.2	±0.6	5.2	±0.5
100	5.9	±0.7	8.4	±0.7	7.6	±0.7

*Population: Operations with at least 30 dairy cows.

3. Record Keeping

Fewer dairy operations relied on hand-written records and participated in Dairy Herd Improvement Association in 1996[1], while the number of operations with on-farm computers increased to 18.0 percent in herds with at least 30 milk cows.

Percent operations by...						
	...type of record keeping systems used for the dairy operation.		...type of individual animal record-keeping systems used.			
System	1991 NDHEP*	Standard Error	Dairy '96 Comparable*	Standard Error	Dairy '96 Total	Standard Error
Hand-written, such as a ledger or notebook	88.3	±1.0	80.2	±1.0	80.7	±1.0
Dairy Herd Improvement Association (DHIA)	57.5	±1.8	49.9	±1.2	43.4	±1.2
Computer located on the operation	13.7	±1.1	18.0	±0.9	15.1	±0.8
Computer located off the operation	11.8	±1.2	11.1	±0.8	9.9	±0.8
Other system	11.4	±1.1	5.9	±0.6	6.0	±0.7
Any	99.9	±0.1	100.0	±0.0	100.0	±0.0
*Population: Operations with at least 30 dairy cows.						

1 Dairy '96 questions either referred to the time of data collection in early 1996 (presented in this report as "1996" results, as in the text for A3 above) or during 1995 (presented in this report as "1995" results as in B1 on page 14). NDHEP questions generally referred to producer activities and production during 1991.

B. Productivity

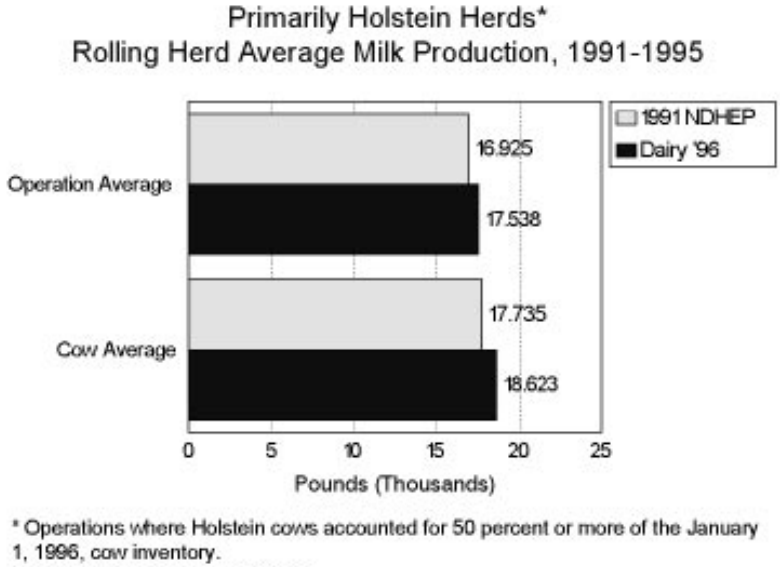
1. Rolling Herd Average

From 1991 to 1995, reported rolling herd average (RHA) milk production (cow average) increased 869 lbs. in herds with at least 30 milk cows. Producer-reported RHA's for milk production per cow exceeded milk per cow estimates produced by the National Agricultural Statistics Service by 2,501 lbs. in 1991 and 1,950 lbs in 1995 (see page 6 for official USDA estimates).

a. Rolling herd average milk production.

1991 NDHEP*				Dairy '96 Comparable*				Dairy '96 Total			
All Herds											
Operation Average	Standard Error	Cow Average	Standard Error	Operation Average	Standard Error	Cow Average	Standard Error	Operation Average	Standard Error	Cow Average	Standard Error
16,703	±96	17,532	±81	17,281	±82	18,401	±81	16,587	±100	18,198	±79
Primarily Holstein Herds**											
Operation Average	Standard Error	Cow Average	Standard Error	Operation Average	Standard Error	Cow Average	Standard Error	Operation Average	Standard Error	Cow Average	Standard Error
16,925	±96	17,735	±80	17,538	±80	18,623	±79	16,925	±99	18,442	±78

* Population: Operations with at least 30 dairy cows.
** Operations where Holstein cows accounted for 50 percent or more of the January 1, 1996, cow inventory or was main breed of dairy herd (1991).



* Operations where Holstein cows accounted for 50 percent or more of the January 1, 1996, cow inventory.

Over one-half of U.S. dairy producers in both 1991 and 1996 used reliable methods to obtain rolling herd average for milk production, defined as "calculated" in 1991 and specified as "Dairy Herd Improvement Association (DHIA) or other computerized records" in 1996. Lack of available information of this type from some operations may be one source of bias in DHIA milk production estimates shown on page 14.

b. Percent operations by source of rolling herd average for milk production information.

Calculated		Dairy Herd Improvement Association (DHIA) or Other Computerized Records			
1991 NDHEP*	Standard Error	Dairy '96 Comparable*	Standard Error	Dairy '96 Total	Standard Error
59.3	±1.8	53.5	±1.2	46.8	±1.2

*Population: Operations with at least 30 dairy cows.

2. Days Dry

The table below shows essentially no difference in the average reported number of days cows were dry in 1991 and 1995.

Average days cows were dry.

1991 NDHEP				Dairy '96 Comparable*				Dairy '96 Total			
Operation Average	Standard Error	Cow Average	Standard Error	Operation Average	Standard Error	Cow Average	Standard Error	Operation Average	Standard Error	Cow Average	Standard Error
61.1	±0.5	61.5	±0.3	60.4	±0.3	61.7	±0.4	60.5	±0.3	61.7	±0.4

* Population: Operations with at least 30 dairy cows.

3. Calving Interval

The two NAHMS studies showed only minor differences in calving interval between 1991 and 1995.

Average calving interval (months).											
1991 NDHEP*				Dairy '96 Comparable*				Dairy '96 Total			
Operation Average	Standard Error	Cow Average	Standard Error	Operation Average	Standard Error	Cow Average	Standard Error	Operation Average	Standard Error	Cow Average	Standard Error
12.8	±0.0	12.9	±0.0	12.9	±0.0	13.0	±0.0	12.9	±0.0	13.0	±0.0
*Population: Operations with at least 30 dairy cows.											

4. Age at First Calving

There was essentially no change in reported age at first calving from 1991 to 1995.

Average age at first calving (months).											
1991 NDHEP*				Dairy '96 Comparable*				Dairy '96 Total			
Operation Average	Standard Error	Cow Average	Standard Error	Operation Average	Standard Error	Cow Average	Standard Error	Operation Average	Standard Error	Cow Average	Standard Error
25.9	±0.1	25.8	±0.1	25.8	±0.1	25.5	±0.1	25.8	±0.1	25.5	±0.1
*Population: Operations with at least 30 dairy cows.											

C. Heifer Health

1. Preweaning Mortality

Reported preweaning mortality was higher in Dairy '96 than mortality reported in the 1991 NDHEP, however a portion of this difference may have resulted because of a change in the question asked of participating producers. The 1991 study focused on the health of preweaned heifers, and as a result, the estimates reported included mortality for all heifers born alive and heifers moved onto the operation. Estimates reported for 1995 included mortality only for heifers born alive on the operation.

a. Number of unweaned heifer calf deaths by producer-perceived cause as percent of heifer calves born alive...

Cause	1991 NDHEP*		Dairy '96 Comparable*		Dairy '96 Total	
	...or moved onto the operation.					
	Percent Heifer Calves	Standard Error	Percent Heifer Calves	Standard Error	Percent Heifer Calves	Standard Error
Scours, diarrhea	4.4	±0.4	6.6	±0.2	6.5	±0.2
Respiratory problems	1.8	±0.1	2.7	±0.1	2.7	±0.1
Joint or naval problems	0.2	±0.1	0.1	±0.0	0.1	±0.0
Put down due to lameness or injury			0.1	±0.0	0.1	±0.0
Trauma	0.2	±0.1				
Lack of coordination/severe depression			0.1	±0.0	0.0	±0.0
Poison			0.0	±0.0	0.0	±0.0
Other known	1.0	±0.2	0.7	±0.1	0.7	±0.1
Unknown	0.8	±0.1	0.7	±0.1	0.7	±0.1
Total	8.4	±0.4	11.0	±0.4	10.8	±0.4

*Population: Operations with at least 30 dairy cows.

An increase in scours-related mortality may be related in part to the inclusion of heifer calves moved onto the operation as well as those born alive on the operation in the 1991 study. In Dairy '96, the question was changed to include only calves born alive. In the 1991 NDHEP, heifers brought on were slightly older and already past part of the period at risk for calf scours.

b. Percent of total unweaned heifer calf deaths by producer-perceived cause.

Cause	1991 NDHEP*		Dairy '96 Comparable*		Dairy '96 Total	
	Percent Deaths	Standard Error	Percent Deaths	Standard Error	Percent Deaths	Standard Error
Scours, diarrhea	52.2	±2.6	60.7	±1.2	60.5	±1.2
Respiratory problems	21.3	±1.6	24.5	±1.0	24.5	±1.0
Joint or naval problems	2.2	±0.7	1.0	±0.1	1.0	±0.1
Put down due to lameness or injury			0.6	±0.1	0.6	±0.1
Trauma	2.4	±0.8				
Lack of coordination/severe depression			0.4	±0.1	0.4	±0.1
Poison			0.3	±0.1	0.3	±0.1
Other known	11.7	±1.8	6.5	±1.2	6.4	±1.1
Unknown	10.2	±1.4	6.0	±0.9	6.3	±0.9
Total	100.0		100.0		100.0	

*Population: Operations with at least 30 dairy cows.

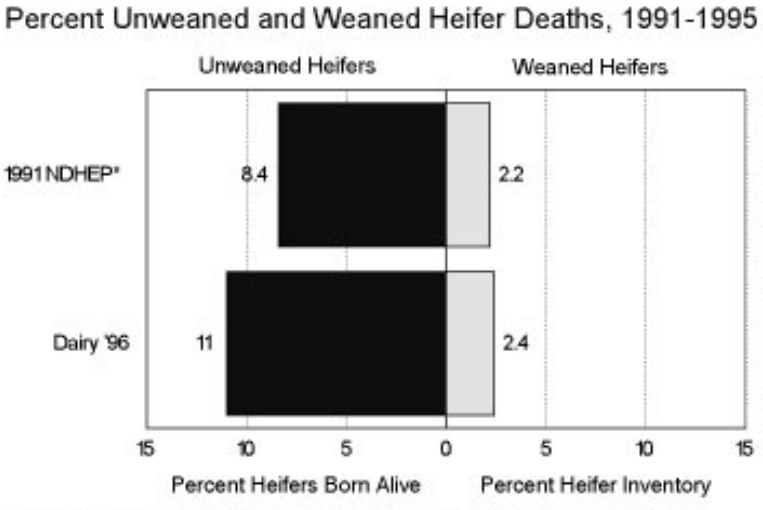
2. Weaned Heifer Mortality

Mortality of weaned heifers stayed at about the same level, ranging from 2.2 to 2.4 percent of the respective heifer inventories for 1991 and 1995. Mortality due to respiratory problems may have increased.

a. Number of weaned heifer deaths by producer-perceived cause as percent of heifer inventory (weaning age to calving):

Cause	1991 NDHEP*		Dairy '96 Comparable*		Dairy '96 Total	
	Percent Heifers	Standard Error	Percent Heifers	Standard Error	Percent Heifers	Standard Error
Scours, diarrhea	0.4	±0.1	0.3	±0.0	0.3	±0.0
Respiratory problems	0.8	±0.1	1.1	±0.1	1.1	±0.1
Joint or naval problems	0.0	±0.0	0.0	±0.0	0.0	±0.0
Put down due to lameness or injury			0.1	±0.0	0.1	±0.0
Trauma	0.1	±0.0				
Lack of coordination/severe depression			0.0	±0.0	0.0	±0.0
Poison			0.0	±0.0	0.0	±0.0
Other known	0.5	±0.0	0.4	±0.1	0.4	±0.1
Unknown	0.4	±0.0	0.4	±0.0	0.5	±0.0
Total	2.2	±0.1	2.4	±0.1	2.4	±0.1

*Population: Operations with at least 30 dairy cows.



*Denominator for unweaned heifer mortality included unweaned heifer calves moved onto the operation.

NAHMS results showed a decrease in digestive deaths in weaned heifers and increase in weaned heifer deaths due to respiratory problems.

b. Percent of total weaned heifer deaths by producer-perceived cause.

Cause	1991 NDHEP*		Dairy '96 Comparable*		Dairy '96 Total	
	Percent Deaths	Standard Error	Percent Deaths	Standard Error	Percent Deaths	Standard Error
Scours, diarrhea	18.4	±2.6	14.7	±1.7	14.1	±1.6
Respiratory problems	34.8	±3.5	45.4	±2.2	44.8	±2.1
Joint or naval problems	1.0	±0.4	1.2	±0.4	1.2	±0.5
Put down due to lameness or injury			4.2	±0.5	4.0	±0.5
Trauma	6.7	±0.9				
Lack of coordination/severe depression			0.5	±0.2	0.5	±0.1
Poison			1.2	±0.5	1.2	±0.3
Other known	20.8	±2.0	15.4	±2.4	15.8	±2.4
Unknown	18.3	±2.1	17.4	±1.3	18.4	±1.4
Total	100.0		100.0		100.0	

*Population: Operations with at least 30 dairy cows.

D. Heifer Management

A higher proportion of producers were using specific recommended calf management practices on U.S. dairy operations in 1996 compared to 1991, although there remains room for continued improvement in areas such as preweaning mortality.

1. Separation from Mothers

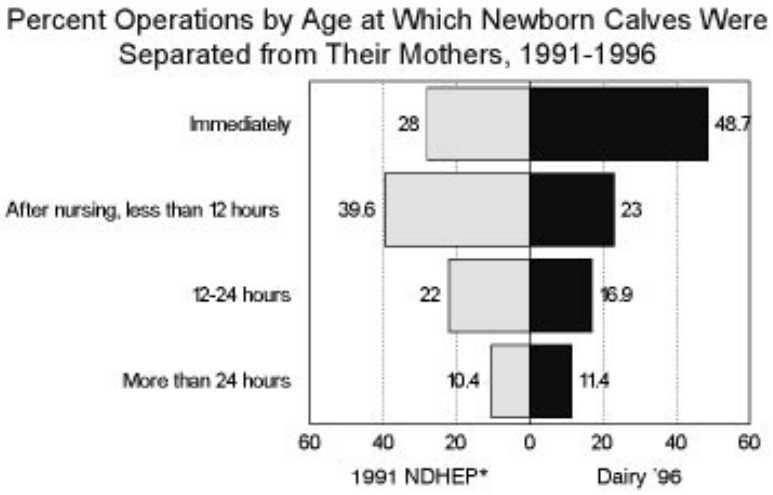
NAHMS' 1991 and 1996 studies showed a dramatic change in routine timing of heifer separation from the dam. A slight wording change in the Dairy '96 questionnaire may have contributed to the change, as producers who separated heifer calves from their dams after 0 hours, but before nursing, may have responded as "less than 12 hours" in 1991 and "immediately (no nursing)" in 1996.

Another contributor to the trend may have been the educational impact of dairy educators. The 1991 NDHEP provided background information that helped in this educational effort.

Percent operations by age at which newborn calves were separated from their mothers.

Age	1991 NDHEP*	Standard Error	Question Variation	Dairy '96 Comparable*	Standard Error	Dairy '96 Total	Standard Error
0 hours (before any nursing)	28.0	±1.7	Immediately (no nursing)	48.7	±1.2	47.9	±1.3
Less than 12 hours	39.6	±1.7	After nursing, but less than 12 hours	23.0	±1.1	20.8	±1.0
12-24 hours	22.0	±1.4		16.9	±0.9	17.4	±1.1
More than 24 hours	10.4	±1.0		11.4	±0.8	13.9	±1.0
Total	100.0			100.0		100.0	

*Population: Operations with at least 30 dairy cows.



* The first two categories were asked as, "0 hours (before any nursing)" and "Less than 12 hours" during the 1991 NAHMS study.

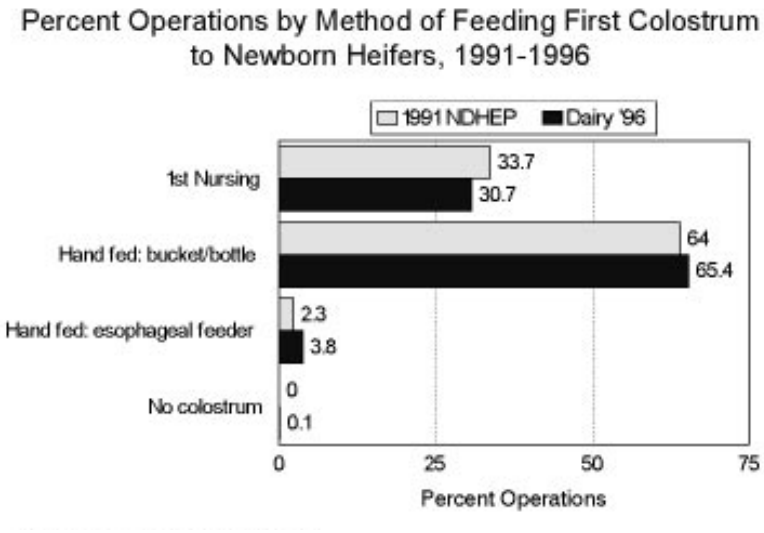
2. First Colostrum Feeding Management

Fewer producers relied on first nursing to deliver first colostrum to newborn heifers in 1996 than in 1991. More producers hand fed newborn heifers using an esophageal feeder.

a. Percent operations by method of feeding first colostrum to newborn heifers.

Method	1991 NDHEP*	Standard Error	Dairy '96 Comparable*	Standard Error	Dairy '96 Total	Standard Error
1st nursing	33.7	±1.7	30.7	±1.1	33.5	±1.2
Hand feeding from bucket or bottle	64.0	±1.7	65.4	±1.1	62.5	±1.2
Hand feeding using esophageal feeder	2.3	±0.6	3.8	±0.4	3.6	±0.4
No colostrum	0.0	±0.0	0.1	±0.1	0.4	±0.2
Total	100.0		100.0		100.0	

*Population: Operations with at least 30 dairy cows.



More dairy producers hand fed four or more quarts of colostrum to newborn dairy heifers in the first 24 hours of life compared to 1991.

b. Percent operations by amount of first colostrum hand fed to newborn heifers in the first 24 hours.

Amount	1991 NDHEP*	Standard Error	Dairy '96 Comparable*	Standard Error	Dairy '96 Total	Standard Error
2 quarts or less	25.6	±1.8	20.1	±1.1	21.4	±1.3
More than two, but less than four quarts	48.2	±2.1	45.5	±1.5	46.6	±1.6
Four or more quarts	26.2	±1.9	34.4	±1.5	32.0	±1.5
Total	100.0		100.0		100.0	

*Population: Operations with at least 30 dairy cows.

3. Contract Rearing

Although still not a common practice, the percentage of producers who contracted the rearing of dairy heifers approximately tripled over the 5-year period.

Percent operations that sent dairy heifers to someone else's operation on a contract basis.					
1991 NDHEP*	Standard Error	Dairy '96 Comparable*	Standard Error	Dairy '96 Total	Standard Error
1.6	±0.3	5.0	±0.5	4.1	±0.4
*Population: Operations with at least 30 dairy cows.					

4. Preweaned Heifer Housing

The two NAHMS studies showed several changes in preweaned heifer housing from 1991 to 1995. There were increases in use of multiple animal housing areas, drylots or pastures, and hutches, while the percentage of operations that used tied housing decreased.

Percent operations by housing facilities used for preweaned heifers:

	1991 NDHEP*				Dairy '96				
Housing Type	Winter	Standard Error	Summer	Standard Error	Question Variation	Comparable*	Standard Error	Total	Standard Error
Freestall						2.6	±0.4	2.5	±0.4
Individual Animal Area: Cow barn	14.6	±1.3	13.6	±1.3	Individual Animal Area	30.3	±1.2	29.7	±1.2
Individual Animal Area: Other barn	20.5	±1.4	19.1	±1.4					
Multiple Animal Area: Cow barn	21.8	±1.5	18.0	±1.4	Multiple Animal Area	37.8	±1.2	40.0	±1.3
Multiple Animal Area: Other barn	12.8	±1.1	14.0	±1.2					
Tied: Cow barn	15.9	±1.3	13.5	±1.2	Tied	9.7	±0.7	10.5	±0.7
Tied: Other barn	4.7	±0.8	4.4	±0.8					
Drylot	1.2	±0.3	5.6	±0.8		8.7	±0.7	9.1	±0.8
Pasture						5.4	±0.6	7.4	±0.9
Hutch	30.5	±1.6	32.4	±1.6		38.1	±1.2	32.5	±1.1
Super Hutch	2.2	±0.4	2.8	±0.5					

*Population: Operations with at least 30 dairy cows.

5. Weaning Age

The NDHEP and Dairy '96 studies indicated a slight increase in weaning age. This trend seems consistent with the shift toward larger herds that were more likely to use calf-raising systems that included feeding waste milk and extended preweaning periods (weaning calves at later ages).[1] The average age at weaning for herds with 200 or more cows was 9.2 weeks.

Percent operations by average age of heifers at weaning (weeks).

1991 NDHEP*				Dairy '96 Comparable*				Dairy '96 Total			
Operation Average	Standard Error	Heifer Average	Standard Error	Operation Average	Standard Error	Heifer Average	Standard Error	Operation Average	Standard Error	Heifer Average	Standard Error
7.9	±0.1	8.2	±0.1	8.2	±0.1	8.6	±0.1	8.4	±0.1	8.7	±0.1

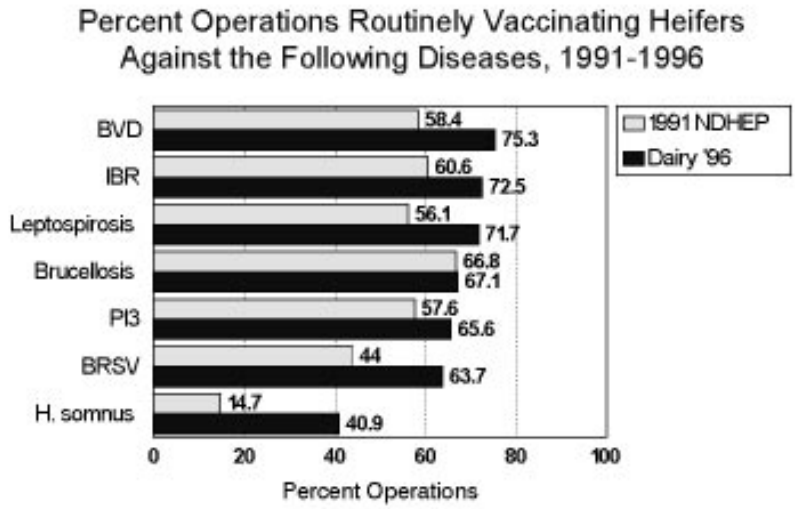
*Population: Operations with at least 30 dairy cows.

1 Heinrichs, A.J., et al. "A study of milk replacers for dairy calves." Journal of Dairy Science, 78 [1995]: 2831-2837.

6. Vaccination Practices: Heifers

The percent of operations vaccinating heifers against bovine viral diarrhea (BVD) rose by nearly 17 percent by 1996. Also increases were seen for use of vaccines against infectious bovine rhinotracheitis (IBR), parainfluenza type 3 (PI3), bovine respiratory syncytial virus (BRSV), H. somnus, and leptospirosis. Use of clostridial vaccines showed a small rise.

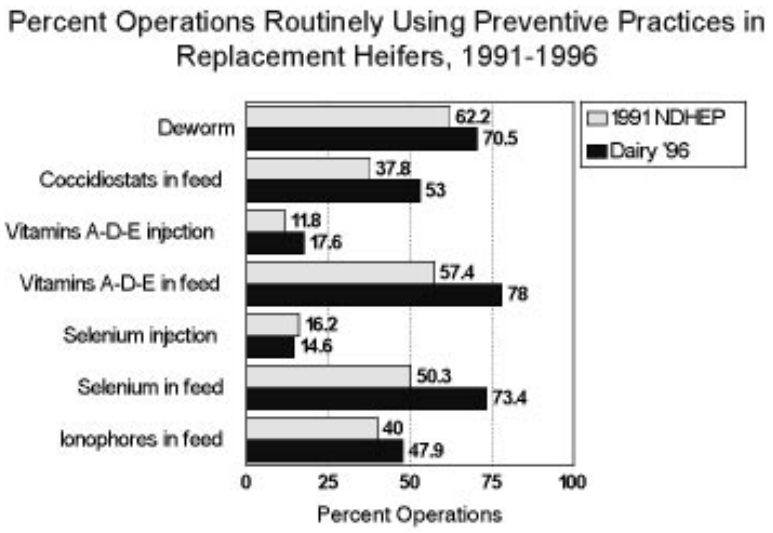
Percent operations routinely vaccinating heifers against:						
Vaccination/ Injectable Supplement	1991 NDHEP*	Standard Error	Dairy '96 Comparable*	Standard Error	Dairy '96 Total	Standard Error
Bovine viral diarrhea (BVD)	58.4	±2.1	75.3	±1.1	69.7	±1.3
Infectious Bovine Rhinotracheitis (IBR)	60.6	±2.1	72.5	±1.2	66.1	±1.3
Parainfluenza Type 3 (PI3)	57.6	±2.1	65.6	±1.2	60.1	±1.3
Bovine Respiratory Syncytial Virus (BRSV)	44.0	±2.1	63.7	±1.2	58.7	±1.3
Hemophilus somnus	14.7	±1.4	40.9	±1.2	37.3	±1.3
Leptospirosis	56.1	±2.2	71.7	±1.2	67.0	±1.3
Salmonella			20.1	±1.0	18.9	±1.0
Clostridia (Blackleg/malignant edema)	20.7	±1.4	33.9	±1.1	32.3	±1.1
Enterotoxemia	8.7	±0.9				
Brucellosis	66.8	±1.9	67.1	±1.1	63.8	±1.3
Mycobacterium paratuberculosis (Johne's disease)			5.9	±0.6	5.4	±0.6
None	8.7	±1.3	9.7	±0.8	13.6	±1.0
*Population: Operations with at least 30 dairy cows.						



7. Preventive Practices: Heifers

Reported use of vitamins A-D-E and selenium in feed rose by over 21 percent, while use of coccidiostats increased by over 15 percent from 1991. Use of dewormers and ionophores in feed also increased.

Percent operations routinely using preventive practices in replacement heifers.						
Preventive Practice	1991 NDHEP*	Standard Error	Dairy '96 Comparable*	Standard Error	Dairy '96 Total	Standard Error
Deworm	62.2	±2.2	70.5	±1.1	67.3	±1.3
Coccidiostats in feed	37.8	±2.0	53.0	±1.2	46.5	±1.2
Vitamins A-D-E injection	11.8	±1.3	17.6	±0.9	16.3	±1.0
Vitamins A-D-E in feed	57.4	±2.2	78.0	±1.0	76.9	±1.1
Selenium injection	16.2	±1.8	14.6	±0.9	12.7	±0.8
Selenium in feed	50.3	±2.2	73.4	±1.1	70.8	±1.2
Ionophores in feed (e.g., Rumensin-, Bovatec-)	40.0	±2.2	47.9	±1.2	42.2	±1.2
Probiotics			14.5	±0.9	13.1	±0.9
Magnet	8.8	±1.1				
No preventives given	8.3	±1.1	4.8	±0.5	6.4	±0.7
*Population: Operations with at least 30 dairy cows.						



E. Biosecurity

1. Physical Contact

More producers allowed physical contact between preweaned heifer calves and other cattle during 1996 compared to 1991, particularly bred heifers and adult cattle.

a. Percent operations where preweaned heifer calves had physical contact* with the following groups:

Age Group	1991 NDHEP**	Standard Error	Dairy '96 Comparable**	Standard Error	Dairy '96 Total	Standard Error
Weaned calves less than approximately 4 months of age	31.5	±2.0	30.1	±1.2	33.0	±1.3
Calves from approximately 4 months of age to breeding	10.4	±1.3				
Bred heifers not yet calved	4.6	±0.9	15.4	±0.9	18.8	±1.1
Adult cattle	10.2	±1.3	18.3	±1.0	20.2	±1.1

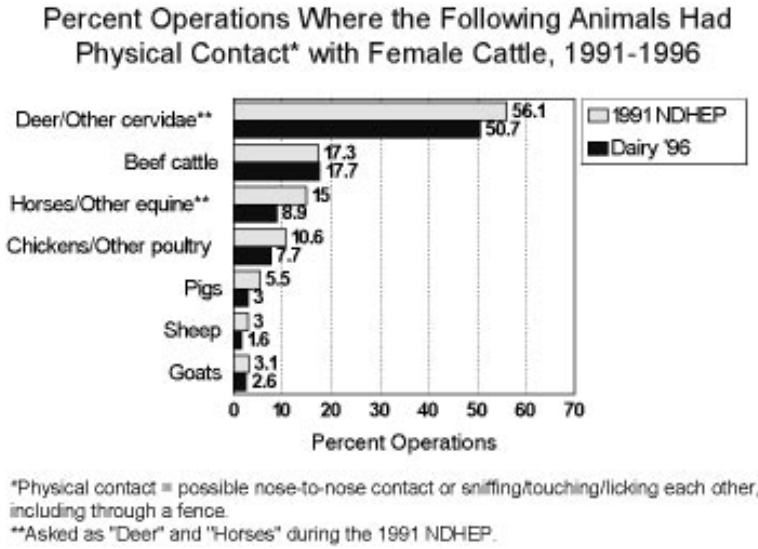
*Physical contact = possible nose-to-nose contact or sniffing/touching/licking each other, including through a fence.
**Population: Operations with at least 30 dairy cows.

Fewer operations allowed female dairy cattle to have physical contact with other animal species, particularly horses and deer, in 1996 than in 1991. There was little change in percentage of operations with opportunities for physical contacts between female dairy cattle and beef cattle.

b. Percent operations where the following animals had physical contact* with female dairy cattle...

	...and/or their feed:		Question Variation	...and/or their feed, minerals, or water:			
Animal Group	1991 NDHEP**	Standard Error		Dairy '96 Comparable**	Standard Error	Dairy '96 Total	Standard Error
Chickens/other poultry	10.6	±1.4		7.7	±0.7	7.5	±0.8
Horses	15.0	±1.6	Horses or other equine	8.9	±0.7	11.6	±0.9
Pigs	5.5	±1.0		3.0	±0.5	3.9	±0.6
Sheep	3.0	±0.6		1.6	±0.3	2.3	±0.5
Goats	3.1	±0.7		2.6	±0.4	3.0	±0.5
Beef cattle	17.3	±1.7		17.7	±1.0	18.5	±1.1
Exotic species				1.0	±0.3	0.8	±0.2
Deer	56.1	±2.2	Deer or other cervidae	50.7	±1.1	49.3	±1.1
Dogs				77.0	±1.0	77.8	±1.1
Cats				90.3	±0.7	90.2	±0.8

*Physical contact= possible nose-to-nose contact or sniffing/touching/licking each other, including through a fence.
**Population: Operations with at least 30 dairy cows.



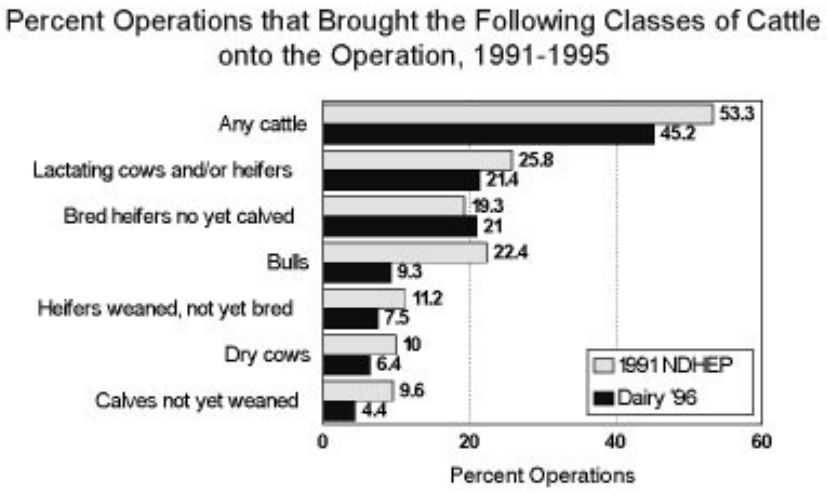
*Physical contact = possible nose-to-nose contact or sniffing/touching/licking each other, including through a fence.
**Asked as "Deer" and "Horses" during the 1991 NDHEP.

2. Bringing Cattle On-farm

A smaller percentage of dairy producers introduced cattle onto their operation in 1995 (45.2 percent) compared to 1991 (53.3 percent), down 8 percent. The largest percentage drop was for operations introducing bulls. Fewer producers also introduced preweaned calves, weaned heifers, lactating cows, and dry cows, therefore reducing risk of introducing diseases from these cattle.

The Dairy '96 study showed as herd herd size increased, a higher proportion of operations were bringing on cattle. For example, 65.5 percent of herds with 200 or more milk cows brought on any cattle in 1995 compared to an overall of 43.9 percent.

Percent operations that brought the following classes of cattle onto the operation:							
Animal Group	1991 NDHEP*	Standard Error	Question Variation	Dairy '96 Comparable*	Standard Error	Dairy '96 Total	Standard Error
Calves not yet weaned	9.6	±1.2		4.4	±0.6	5.0	±0.7
Heifers weaned but not yet bred	11.2	±1.3		7.5	±0.6	7.3	±0.7
Bred heifers not yet calved	19.3	±1.6		21.0	±1.0	18.5	±0.9
Lactating cows	25.8	±2.0		21.4	±1.0	19.9	±1.0
Dry cows	10.0	±1.4		6.4	±0.6	7.1	±0.8
Bulls	22.4	±1.7		9.3	±0.7	8.7	±0.7
Other cattle	3.3	±0.7	Other heifers/cows	2.0	±0.4	1.9	±0.4
			Steers (weaned)	2.1	±0.4	2.0	±0.3
Any cattle	53.3	±2.1		45.2	±1.2	43.9	±1.3
*Population: Operations with at least 30 dairy cows.							



3. Quarantine

There were no significant changes in the percentage of dairy producers quarantining or isolating new arrivals to the operation. This practice remained infrequent on U.S. dairy operations.

a. Percent operations that quarantined all new arrivals in the following categories upon arrival*:							
Category	1991 NDHEP**	Standard Error	Question Variation*	Dairy '96 Comparable**	Standard Error	Dairy '96 Total	Standard Error
Calves not yet weaned	27.9	±6.1		34.4	±5.9	26.8	±5.2
Heifers weaned but not yet bred	23.1	±5.1		20.8	±3.6	24.0	±4.7
Bred heifers not yet calved	12.8	±3.2		13.4	±1.6	15.0	±1.9
Lactating cows	5.5	±1.9		5.0	±1.1	5.8	±1.7
Dry dairy cows	9.0	±4.4		16.4	±4.1	17.9	±4.8
Bulls (weaned)	12.5	±3.0		13.1	±2.7	11.2	±2.4
Other cattle	34.0	±9.6	Other heifers/cows	18.1	±6.7	15.6	±6.0
			Steers (weaned)	24.4	±7.5	21.0	±6.6
* Number of head brought on and number of head quarantined were both asked in Dairy '96. ** Population: Operations with at least 30 dairy cows.							

Number of days quarantined varied only slightly from 1991 to 1995.

b. For operations that quarantined new arrivals, average number of days new animals in the following categories were quarantined:							
Number Days	1991 NDHEP*	Standard Error	Question Variation	Dairy '96 Comparable*	Standard Error	Dairy '96 Total	Standard Error
Calves not yet weaned	40.3	±8.0		44.0	±5.3	40.8	±5.7
Heifers weaned but not yet bred	24.3	±3.7		24.6	±4.8	21.5	±4.2
Bred heifers not yet calved	14.4	±2.4		18.1	±2.7	16.8	±2.3
Lactating cows	18.2	±7.3		13.3	±2.7	11.7	±2.3
Dry dairy cows	17.8	±4.4		11.6	±2.1	8.9	±2.1
Bulls	19.4	±4.0		21.0	±3.1	21.0	±3.1
Other cattle	65.8	±30.8	Other heifers/cows	24.3	±9.1	24.3	±9.1
			Steers (weaned)	41.5	±22.0	41.5	±22.0
*Population: Operations with at least 30 dairy cows.							