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Costs of Producing Milk, 1989 and 1990

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In this report... *The total economic cost of producing milk in the United States was \$14.74 per hundredweight (cwt) of milk in 1989 and \$14.98 in 1990. On a per cow basis, the U.S. cost of producing milk was \$2,171.70 in 1989 and \$2,274.83 in 1990. The average return (residual returns to management and risk) for U.S. dairy producers was higher in 1990, at \$0.14 per cwt compared with \$0.11 in 1989. Although the average economic cost of producing milk increased in 1990, producers received an increase of \$0.20 per cwt in U.S. milk prices, higher receipts for dairy cattle sold, and an increase of almost 500 pounds in milk output per cow, yielding average cash receipts of \$15.12 per cwt of milk sold.*

These estimates were based on the dairy cost of production version of the 1989 Farm Costs and Returns Survey (FCRS) data of dairy producers surveyed in February and March of 1990. The cost and return estimates for dairy production in seven production regions in the United States are the focus of this report. Dairy cost of production estimates were mandated in the Agriculture and Consumer Protection Act of 1973 and subsequent legislation. Although annual estimates are

made, production costs for dairy operations are actually surveyed on a 4-year rotation with other major crop and livestock enterprises.

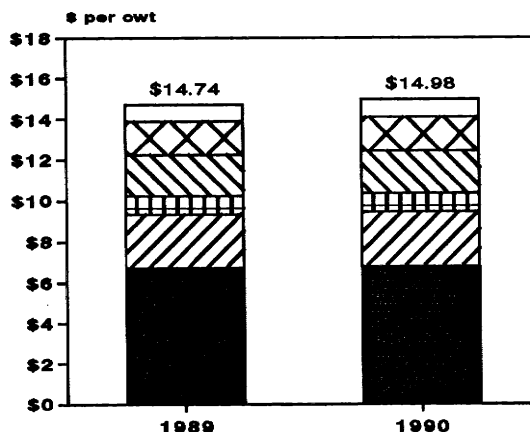
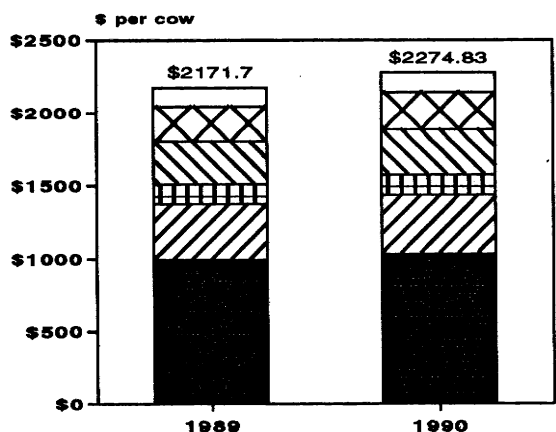
FCRS data obtained from 1,037 dairy producers in 26 States along with other National Agricultural Statistics Service (NASS) data and other data sources were used to establish a 1989 national cost base and to update production costs in subsequent years. The data neither represent a specific producer nor are they economically engineered to be "typical" of a dairy operation. The data reflect the 1989 average costs and returns of U.S. milk production for producers, with the 1990 updates indexed from the 1989 cost base. An individual farm may have different production costs and returns due to the mix of inputs and milk production output.

Changes in the estimation procedures for dairy cost of production since the last dairy FCRS was conducted in 1985 are noted in appendix figure 1. Additional information on methodology, procedures, terms, and definitions is also included in appendixes I and II.

U.S. dairy production costs, 1989 and 1990

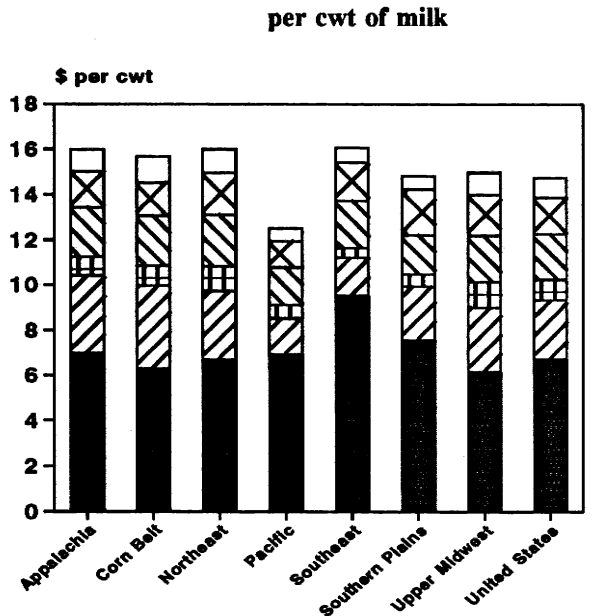
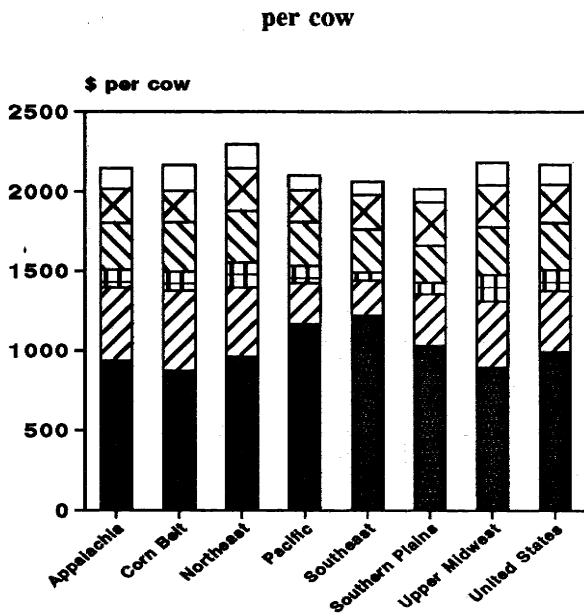
The average economic cost of producing milk was higher in 1990, at \$2,274.83 per cow ...

... or \$14.98 per cwt of milk, with feed costs, the largest cash expense input, increasing to \$6.81.



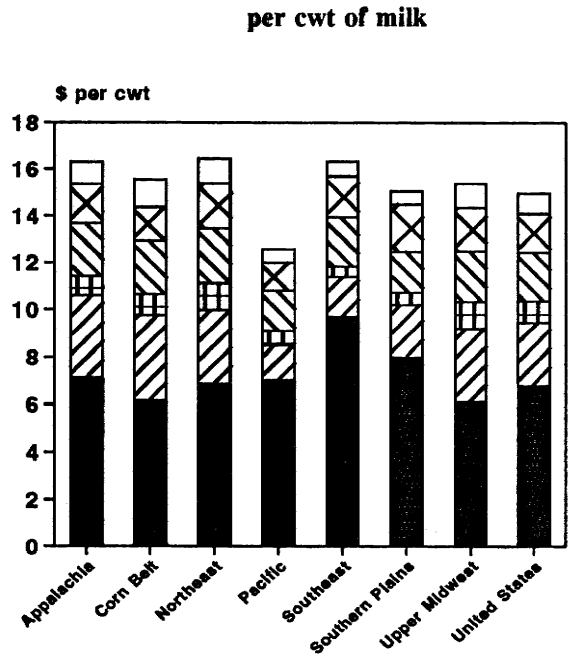
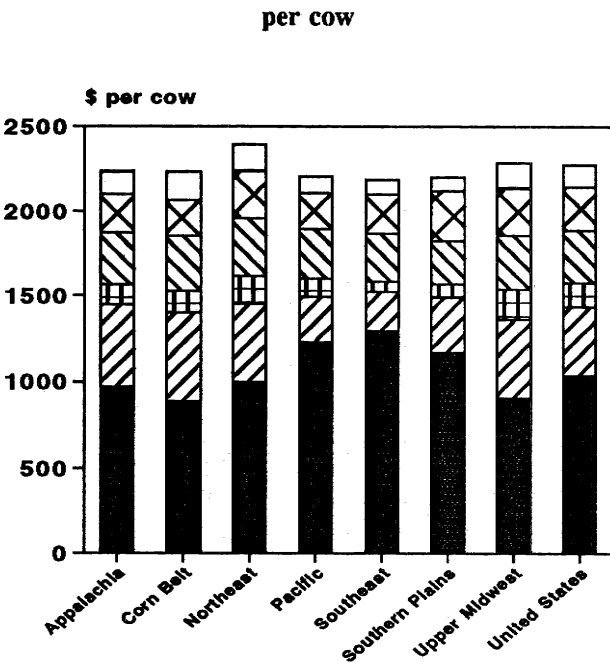
■ Feed
 ▨ General farm overhead
 ▤ Capital replacement
 ▩ Hired and unpaid labor
 ▧ Other cash expenses
 □ Capital and land

Regional 1989 dairy production costs



- Feed
- ▣ General farm overhead
- ▤ Capital replacement
- ▥ Hired and unpaid labor
- ▦ Other cash expenses
- Capital and land

Regional 1990 dairy production costs



- Feed
- ▣ General farm overhead
- ▤ Capital replacement
- ▥ Hired and unpaid labor
- ▦ Other cash expenses
- Capital and land

United States: Although most production costs increased in 1990 on a per cow and cwt of milk basis, higher returns and increased per cow milk production yielded larger returns to producers. U.S. dairy producers' returns to management and risk averaged \$0.11 per cwt of milk in 1989 compared with \$0.14 in 1990. Milk production increased from an average of 14,730 pounds in 1989 to 15,203 pounds in 1990. Feed costs, the largest cash expense input, increased from \$6.73 to \$6.81 per cwt of milk produced.

Item	1989	1990	1989	1990
	<i>Dollars per cow</i>		<i>Dollars per cwt</i>	
Cash receipts:				
Milk	1,988.55	2,082.81	13.50	13.70
Cattle	198.50	215.66	1.35	1.42
Total	2,187.05	2,298.47	14.85	15.12
Variable cash expenses:				
Feed--				
Concentrates	590.70	637.13	4.01	4.19
Byproducts	47.00	45.95	0.32	0.30
Hay	199.50	204.22	1.35	1.34
Silage	133.30	127.20	0.90	0.84
Pasture and other forage	21.50	20.59	0.15	0.14
Other--				
Milk hauling and marketing	85.70	91.01	0.58	0.60
Artificial insemination	17.70	18.72	0.12	0.12
Veterinary and medicine	30.60	31.96	0.21	0.21
Livestock hauling	3.80	4.00	0.03	0.03
Fuel, lube, and electricity	22.50	25.19	0.15	0.17
Machinery and building repairs	68.00	69.59	0.46	0.46
Hired labor	118.90	124.18	0.81	0.82
DHIA fees	7.60	8.04	0.05	0.05
Dairy supplies	30.90	31.94	0.21	0.21
Dairy assessment	0.00	0.81	0.00	0.01
Rent or lease dairy stock	1.10	1.18	0.01	0.01
Total	1,378.80	1,441.71	9.36	9.50
Fixed cash expenses:				
General farm overhead	132.90	137.39	0.90	0.90
Taxes and insurance	29.00	30.34	0.20	0.20
Interest	109.80	108.35	0.75	0.71
Total	271.70	276.08	1.85	1.81
Total, cash expenses	1,650.50	1,717.79	11.21	11.31
Cash receipts less cash expenses	536.55	580.68	3.64	3.81
Economic (full ownership) costs:				
Variable cash expenses	1,378.80	1,441.71	9.36	9.50
General farm overhead	132.90	137.39	0.90	0.90
Taxes and insurance	29.00	30.34	0.20	0.20
Capital replacement	238.60	253.52	1.62	1.67
Operating capital	13.90	13.46	0.09	0.09
Other nonland capital	82.30	88.88	0.56	0.58
Land	31.30	31.87	0.21	0.21
Unpaid labor	264.90	277.66	1.80	1.83
Total, economic costs	2,171.70	2,274.83	14.74	14.98
Residual returns to management and risk	15.35	23.64	0.11	0.14
Pounds of milk per unit	14,730	15,203	14,730	15,203
Price per 100 pounds	13.5	13.7	13.5	13.7

Appalachia: Average per cow milk production in Kentucky, North Carolina, Tennessee, and Virginia increased from 13,431 to 13,685 pounds in 1990. Cash receipts, although up almost 8 percent in 1990, failed to cover total economic costs. Residual returns to management and risk were negative both years, averaging $-\$0.60$ per cwt of milk in 1989 and $-\$0.04$ in 1990.

Item	1989	1990	1989	1990
	<i>Dollars per cow</i>		<i>Dollars per cwt</i>	
Cash receipts:				
Milk	1,880.34	2,025.38	14.00	14.80
Cattle	186.97	201.95	1.39	1.48
Total	2,067.31	2,227.33	15.39	16.28
Variable cash expenses:				
Feed--				
Concentrates	644.97	672.94	4.80	4.92
Byproducts	34.08	34.08	0.25	0.25
Hay	124.43	124.45	0.93	0.91
Silage	113.21	121.59	0.84	0.89
Pasture and other forage	21.69	20.78	0.16	0.15
Other--				
Milk hauling and marketing	110.89	114.18	0.82	0.83
Artificial insemination	16.29	17.23	0.12	0.13
Veterinary and medicine	29.08	30.42	0.22	0.22
Livestock hauling	2.62	2.74	0.02	0.02
Fuel, lube, and electricity	22.81	25.77	0.17	0.19
Machinery and building repairs	53.38	54.74	0.40	0.40
Hired labor	152.45	157.35	1.14	1.15
DHIA fees	5.56	5.88	0.04	0.04
Dairy supplies	38.93	40.35	0.29	0.29
Dairy assessment	0.00	0.73	0.00	0.01
Rent or lease dairy stock	2.85	2.95	0.02	0.02
Total	1,373.24	1,426.18	10.22	10.42
Fixed cash expenses:				
General farm overhead	111.22	115.27	0.83	0.84
Taxes and insurance	13.37	14.01	0.10	0.10
Interest	73.18	72.35	0.54	0.53
Total	197.77	201.63	1.47	1.47
Total, cash expenses	1,571.01	1,627.81	11.69	11.89
Cash receipts less cash expenses	496.30	599.52	3.70	4.39
Economic (full ownership) costs:				
Variable cash expenses	1,373.24	1,426.18	10.22	10.42
General farm overhead	111.22	115.27	0.83	0.84
Taxes and insurance	13.37	14.01	0.10	0.10
Capital replacement	213.32	228.11	1.59	1.67
Operating capital	13.80	13.32	0.10	0.10
Other nonland capital	68.49	74.16	0.51	0.54
Land	46.85	45.40	0.35	0.33
Unpaid labor	307.07	316.93	2.29	2.32
Total, economic costs	2,147.36	2,233.38	15.99	16.32
Residual returns to management and risk	-80.05	-6.05	-0.6	-0.04
Pounds of milk per unit	13,431	13,685	13,431	13,685
Price per 100 pounds	14.0	14.8	14.0	14.8

Corn Belt: Milk production in Illinois, Indiana, Iowa, and Missouri increased from 13,821 to 14,365 pounds per cow in 1990. Feed costs on a per cow basis were the lowest in this region during 1989 and 1990 because larger amounts of homegrown feeds were fed. Although milk production increased over 500 pounds per cow, the average per cwt price of milk was the same, \$13.40 in both years. Residual returns to management and risk were negative both years, averaging -\$0.69 per cwt of milk in 1989 and -\$0.49 in 1990.

Item	1989	1990	1989	1990
	<i>Dollars per cow</i>		<i>Dollars per cwt</i>	
Cash receipts:				
Milk	1,852.01	1,924.91	13.40	13.40
Cattle	218.89	236.95	1.58	1.65
Total	2,070.90	2,161.86	14.98	15.05
Variable cash expenses:				
Feed--				
Concentrates	582.85	626.35	4.22	4.36
Byproducts	16.98	14.46	0.12	0.10
Hay	173.91	156.01	1.26	1.09
Silage	69.92	63.34	0.51	0.44
Pasture and other forage	28.08	25.80	0.20	0.18
Other--				
Milk hauling and marketing	88.46	93.51	0.64	0.66
Artificial insemination	15.30	16.19	0.11	0.11
Veterinary and medicine	39.81	41.65	0.29	0.29
Livestock hauling	2.86	3.00	0.02	0.02
Fuel, lube, and electricity	31.34	35.41	0.23	0.25
Machinery and building repairs	64.32	65.96	0.47	0.46
Hired labor	86.03	87.88	0.62	0.61
DHIA fees	8.63	9.13	0.06	0.06
Dairy supplies	31.35	32.49	0.23	0.23
Dairy assessment	0.00	0.76	0.00	0.01
Rent or lease dairy stock	0.64	0.66	0.00	0.00
Total	1,240.48	1,272.60	8.98	8.87
Fixed cash expenses:				
General farm overhead	120.53	124.92	0.87	0.87
Taxes and insurance	26.49	27.77	0.19	0.19
Interest	128.81	127.34	0.93	0.89
Total	275.83	280.03	1.99	1.95
Total, cash expenses	1,516.31	1,552.63	10.97	10.82
Cash receipts less cash expenses	554.59	609.23	4.01	4.23
Economic (full ownership) costs:				
Variable cash expenses	1,240.48	1,272.60	8.98	8.87
General farm overhead	120.53	124.92	0.87	0.87
Taxes and insurance	26.49	27.77	0.19	0.19
Capital replacement	197.18	209.00	1.43	1.45
Operating capital	12.47	11.88	0.09	0.08
Other nonland capital	78.15	84.62	0.57	0.59
Land	69.54	71.65	0.50	0.50
Unpaid labor	419.81	428.86	3.04	2.99
Total, economic costs	2,164.65	2,231.30	15.67	15.54
Residual returns to management and risk	-93.75	-69.44	-0.69	-0.49
Pounds of milk per unit	13,821	14,365	13,821	14,365
Price per 100 pounds	13.4	13.4	13.4	13.4

Northeast: Milk production per cow in Connecticut, Maine, Massachusetts, New Hampshire, New York, Ohio, Pennsylvania, and Vermont increased slightly from 14,331 pounds to 14,546 pounds in 1990. The economic cost of producing milk was the second highest in this region in 1989, averaging \$16.00 per cwt of milk, and the highest in 1990, averaging \$16.46. In both years, production costs exceeded total cash receipts, averaging \$15.40 per cwt of milk in 1989 and \$16.00 in 1990.

Item	1989	1990	1989	1990
	<i>Dollars per cow</i>		<i>Dollars per cwt</i>	
Cash receipts:				
Milk	2,020.67	2,123.72	14.10	14.60
Cattle	186.50	203.57	1.30	1.40
Total	2,207.17	2,327.29	15.40	16.00
Variable cash expenses:				
Feed--				
Concentrates	647.98	688.88	4.52	4.74
Byproducts	12.06	10.27	0.08	0.07
Hay	140.80	147.31	0.98	1.01
Silage	140.34	130.99	0.98	0.90
Pasture and other forage	21.88	22.38	0.15	0.15
Other--				
Milk hauling and marketing	89.54	92.43	0.63	0.64
Artificial insemination	20.97	22.19	0.15	0.15
Veterinary and medicine	31.43	32.88	0.22	0.23
Livestock hauling	3.10	3.25	0.02	0.02
Fuel, lube, and electricity	16.67	18.84	0.12	0.13
Machinery and building repairs	85.73	87.92	0.60	0.60
Hired labor	88.05	91.96	0.61	0.63
DHIA fees	9.69	10.25	0.07	0.07
Dairy supplies	33.39	34.60	0.23	0.24
Dairy assessment	0.00	0.77	0.00	0.01
Rent or lease dairy stock	0.22	0.23	0.00	0.00
Total	1,341.85	1,395.15	9.36	9.59
Fixed cash expenses:				
General farm overhead	158.25	164.01	1.10	1.13
Taxes and insurance	35.76	37.48	0.25	0.26
Interest	117.42	116.08	0.82	0.80
Total	311.43	317.57	2.17	2.19
Total, cash expenses	1,653.28	1,712.72	11.53	11.78
Cash receipts less cash expenses	553.89	614.57	3.87	4.22
Economic (full ownership) costs:				
Variable cash expenses	1,341.85	1,395.15	9.36	9.59
General farm overhead	158.25	164.01	1.10	1.13
Taxes and insurance	35.76	37.48	0.25	0.26
Capital replacement	265.07	280.57	1.85	1.93
Operating capital	13.49	13.03	0.09	0.09
Other nonland capital	97.76	105.85	0.68	0.73
Land	37.17	36.21	0.26	0.25
Unpaid labor	344.72	360.03	2.41	2.48
Total, economic costs	2,294.07	2,392.33	16.00	16.46
Residual returns to management and risk	-86.90	-65.04	-0.60	-0.46
Pounds of milk per unit	14,331	14,546	14,331	14,546
Price per 100 pounds	14.1	14.6	14.1	14.6

Pacific: Milk production in California, Idaho, and Washington was the highest for all regions, averaging 16,810 pounds per cow in 1989 and 17,580 pounds in 1990. Although production costs increased slightly on a per cow basis, higher milk yields in 1990 offset increased expenses, with total economic costs averaging \$12.53 per cwt of milk in 1989 and \$12.57 in 1990. Despite lower milk receipts, which fell from \$12.50 to \$12.20, milk producers in this region averaged positive returns both years. Residual returns to management and risk averaged \$1.00 per cwt of milk in 1989 and \$0.70 in 1990.

Item	1989	1990	1989	1990
	<i>Dollars per cow</i>		<i>Dollars per cwt</i>	
Cash receipts:				
Milk	2,101.25	2,144.76	12.50	12.2
Cattle	173.22	188.31	1.03	1.07
Total	2,274.47	2,333.07	13.53	13.27
Variable cash expenses:				
Feed--				
Concentrates	544.17	575.18	3.24	3.27
Byproducts	125.99	123.15	0.75	0.70
Hay	349.92	375.73	2.08	2.14
Silage	129.23	136.83	0.77	0.78
Pasture and other forage	17.79	20.86	0.11	0.12
Other--				
Milk hauling and marketing	86.58	91.46	0.52	0.52
Artificial insemination	17.74	18.77	0.11	0.11
Veterinary and medicine	22.94	24.00	0.14	0.14
Livestock hauling	3.65	3.82	0.02	0.02
Fuel, lube, and electricity	33.46	36.37	0.20	0.21
Machinery and building repairs	55.09	56.49	0.33	0.32
Hired labor	166.71	167.73	0.99	0.95
DHIA fees	7.98	8.44	0.05	0.05
Dairy supplies	27.50	28.50	0.16	0.16
Dairy assessment	0.00	0.93	0.00	0.01
Rent or lease dairy stock	0.37	0.38	0.00	0.00
Total	1,589.12	1,668.64	9.47	9.50
Fixed cash expenses:				
General farm overhead	106.67	110.55	0.63	0.63
Taxes and insurance	21.17	22.19	0.13	0.13
Interest	97.12	96.01	0.58	0.55
Total	224.96	228.75	1.34	1.31
Total, cash expenses	1,814.08	1,897.39	10.81	10.81
Cash receipts less cash expenses	460.39	435.68	2.72	2.46
Economic (full ownership) costs:				
Variable cash expenses	1,589.12	1,668.64	9.47	9.50
General farm overhead	106.67	110.55	0.63	0.63
Taxes and insurance	21.17	22.19	0.13	0.13
Capital replacement	200.06	212.93	1.19	1.21
Operating capital	15.97	15.58	0.10	0.09
Other nonland capital	67.09	72.64	0.40	0.41
Land	10.78	11.54	0.06	0.07
Unpaid labor	92.43	92.99	0.55	0.53
Total, economic costs	2,103.29	2,207.06	12.53	12.57
Residual returns to management and risk	171.18	126.01	1.00	0.70
Pounds of milk per unit	16,810	17,580	16,810	17,580
Price per 100 pounds	12.5	12.2	12.5	12.2

Southeast: Milk production in Florida and Georgia averaged 12,836 pounds of milk per cow in 1989 and 13,393 in 1990. Feed costs were the highest in this region, averaging \$9.54 per cwt of milk in 1989 and \$9.70 in 1990, due to heavy reliance on purchased concentrates from outside the region. Although production costs are higher and milk per cow averages are lowest in this region, higher milk prices boosted returns in both 1989 and 1990. On a cwt basis, residual returns to management and risk increased from an average of \$0.82 in 1989 to \$1.37 in 1990.

Item	1989	1990	1989	1990
	<i>Dollars per cow</i>		<i>Dollars per cwt</i>	
Cash receipts:				
Milk	2,015.25	2,209.85	15.70	16.50
Cattle	151.37	161.30	1.18	1.20
Total	2,166.62	2,371.15	16.88	17.70
Variable cash expenses:				
Feed--				
Concentrates	966.36	1,021.33	7.53	7.63
Byproducts	60.93	60.93	0.47	0.45
Hay	132.12	145.92	1.03	1.09
Silage	52.19	55.06	0.41	0.41
Pasture and other forage	13.02	16.01	0.10	0.12
Other--				
Milk hauling and marketing	134.94	142.92	1.05	1.06
Artificial insemination	13.02	13.77	0.10	0.10
Veterinary and medicine	27.86	29.15	0.22	0.22
Livestock hauling	1.86	1.95	0.01	0.01
Fuel, lube, and electricity	13.69	15.38	0.11	0.11
Machinery and building repairs	32.89	33.73	0.26	0.25
Hired labor	141.64	148.31	1.10	1.11
DHIA fees	2.91	3.08	0.02	0.02
Dairy supplies	25.26	26.18	0.20	0.20
Dairy assessment	0.00	0.71	0.00	0.01
Rent or lease dairy stock	6.26	6.49	0.05	0.05
Total	1,624.95	1,720.92	12.66	12.84
Fixed cash expenses:				
General farm overhead	55.25	57.26	0.43	0.43
Taxes and insurance	11.30	11.84	0.09	0.09
Interest	49.18	48.62	0.38	0.36
Total	115.73	117.72	0.90	0.88
Total, cash expenses	1,740.68	1,838.64	13.56	13.72
Cash receipts less cash expenses	425.94	532.51	3.32	3.98
Economic (full ownership) costs:				
Variable cash expenses	1,624.95	1,720.92	12.66	12.84
General farm overhead	55.25	57.26	0.43	0.43
Taxes and insurance	11.30	11.84	0.09	0.09
Capital replacement	215.46	235.11	1.68	1.76
Operating capital	16.33	16.07	0.13	0.12
Other nonland capital	49.93	54.06	0.39	0.40
Land	13.61	14.74	0.11	0.11
Unpaid labor	73.63	77.10	0.57	0.58
Total, economic costs	2,060.46	2,187.10	16.06	16.33
Residual returns to management and risk	106.16	184.05	0.82	1.37
Pounds of milk per unit	12,836	13,393	12,836	13,393
Price per 100 pounds	15.7	16.5	15.7	16.5

Southern Plains: Milk production in Texas averaged 13,631 pounds per cow in 1989 and 14,634 in 1990. Feed costs increased from \$7.59 to \$8.00 per cwt of milk, due to a large increase in concentrate costs. Slightly higher milk receipts, along with increased yields, boosted total cash receipts from \$15.54 per cwt of milk in 1989 to \$15.96 in 1990. Returns to management and risk were positive both years, averaging \$0.72 per cwt of milk in 1989 and \$0.90 in 1990.

Item	1989	1990	1989	1990
	<i>Dollars per cow</i>		<i>Dollars per cwt</i>	
Cash receipts:				
Milk	1,949.23	2,151.20	14.30	14.70
Cattle	168.60	184.16	1.24	1.26
Total	2,117.83	2,335.36	15.54	15.96
Variable cash expenses:				
Feed--				
Concentrates	688.20	816.81	5.05	5.58
Byproducts	77.38	80.25	0.57	0.55
Hay	191.28	198.18	1.40	1.35
Silage	49.49	49.61	0.36	0.34
Pasture and other forage	28.41	26.36	0.21	0.18
Other--				
Milk hauling and marketing	103.29	115.28	0.76	0.79
Artificial insemination	4.38	4.63	0.03	0.03
Veterinary and medicine	24.22	25.34	0.18	0.17
Livestock hauling	1.51	1.58	0.01	0.01
Fuel, lube, and electricity	13.51	15.24	0.10	0.10
Machinery and building repairs	38.35	39.33	0.28	0.27
Hired labor	156.39	156.39	1.15	1.07
DHIA fees	2.57	2.72	0.02	0.02
Dairy supplies	39.25	40.68	0.29	0.28
Dairy assessment	0.00	0.78	0.00	0.01
Rent or lease dairy stock	0.11	0.11	0.00	0.00
Total	1,418.34	1,573.29	10.41	10.75
Fixed cash expenses:				
General farm overhead	73.07	75.73	0.54	0.52
Taxes and insurance	9.26	9.71	0.07	0.07
Interest	58.45	57.78	0.43	0.39
Total	140.78	143.22	1.04	0.98
Total, cash expenses	1,559.12	1,716.51	11.45	11.73
Cash receipts less cash expenses	558.71	618.85	4.09	4.23
Economic (full ownership) costs:				
Variable cash expenses	1,418.34	1,573.29	10.41	10.75
General farm overhead	73.07	75.73	0.54	0.52
Taxes and insurance	9.26	9.71	0.07	0.07
Capital replacement	274.87	298.20	2.02	2.04
Operating capital	14.25	14.69	0.10	0.10
Other nonland capital	49.83	53.96	0.37	0.37
Land	14.78	13.78	0.11	0.09
Unpaid labor	163.82	163.82	1.20	1.12
Total, economic costs	2,018.22	2,203.18	14.82	15.06
Residual returns to management and risk	99.61	132.18	0.72	0.90
Pounds of milk per unit	13,631	14,634	13,631	14,634
Price per 100 pounds	14.3	14.7	14.3	14.7

Upper Midwest: Milk production in Michigan, Minnesota, South Dakota, and Wisconsin increased slightly from 14,565 pounds per cow in 1989 to 14,854 pounds in 1990. Feed costs, averaging \$6.16 per cwt of milk in 1989 and \$6.11 in 1990, were low in this region because dairy farmers feed large amounts of homegrown feed. Although milk prices increased slightly from \$13.40 per cwt in 1989 to \$13.50 in 1990, residual returns to management and risk was negative in 1990. The average return fell from \$0.04 per cwt of milk in 1989 to -\$0.15 in 1990.

Item	1989	1990	1989	1990
	<i>Dollars per cow</i>		<i>Dollars per cwt</i>	
Cash receipts:				
Milk	1,951.71	2,005.29	13.40	13.50
Cattle	235.78	257.21	1.62	1.73
Total	2,187.49	2,262.50	15.02	15.23
Variable cash expenses:				
Feed--				
Concentrates	504.43	555.80	3.46	3.74
Byproducts	18.93	16.13	0.13	0.11
Hay	170.33	158.19	1.17	1.06
Silage	182.20	162.08	1.25	1.09
Pasture and other forage	21.47	16.73	0.15	0.11
Other--				
Milk hauling and marketing	64.37	70.90	0.44	0.48
Artificial insemination	19.63	20.77	0.13	0.14
Veterinary and medicine	35.24	36.87	0.24	0.25
Livestock hauling	5.84	6.12	0.04	0.04
Fuel, lube, and electricity	18.91	21.33	0.13	0.14
Machinery and building repairs	79.85	81.89	0.55	0.55
Hired labor	95.92	105.95	0.66	0.71
DHIA fees	7.61	8.05	0.05	0.05
Dairy supplies	27.84	28.85	0.19	0.19
Dairy assessment	0.00	0.79	0.00	0.01
Rent or lease dairy stock	1.71	1.77	0.01	0.01
Total	1,254.28	1,292.22	8.60	8.68
Fixed cash expenses:				
General farm overhead	164.72	170.72	1.13	1.15
Taxes and insurance	41.33	43.32	0.28	0.29
Interest	136.28	134.73	0.94	0.91
Total	342.33	348.77	2.35	2.35
Total, cash expenses	1,596.61	1,640.99	10.95	11.03
Cash receipts less cash expenses	590.88	621.51	4.07	4.20
Economic (full ownership) costs:				
Variable cash expenses	1,254.28	1,292.22	8.60	8.68
General farm overhead	164.72	170.72	1.13	1.15
Taxes and insurance	41.33	43.32	0.28	0.29
Capital replacement	261.83	277.86	1.80	1.87
Operating capital	12.61	12.07	0.09	0.08
Other nonland capital	97.60	105.68	0.67	0.71
Land	31.81	34.79	0.22	0.23
Unpaid labor	318.60	351.90	2.19	2.37
Total, economic costs	2,182.78	2,288.56	14.98	15.38
Residual returns to management and risk	4.71	-26.06	0.04	-0.15
Pounds of milk per unit	14,565	14,854	14,565	14,854
Price per 100 pounds	13.4	13.5	13.4	13.5

Appendix I—Dairy Cost of Production Methodology and Procedures

The Economic Research Service (ERS) develops cost of production data in the form of an enterprise budget that summarizes all operator and landlord costs and returns associated with milk production. Production costs are presented on a per cow and a per cwt of milk basis. Although categories are consistent across budgets prepared for other commodities by ERS, estimation procedures sometimes differ according to data collected on the FCRS.

Cost and return data are separated into three categories: cash receipts, cash expenses, and economic (full-ownership) costs.

- (1) Cash receipts include the value of milk sold plus the amount received from cattle and calves sold from the dairy herd.
- (2) Cash expenses consist of both variable and fixed expenses. Variable expenses include feed, milk hauling and marketing, artificial insemination, veterinary and medicine, livestock hauling, fuels, machinery and building repairs, hired labor, DHIA fees, dairy supplies, dairy assessment, and rent or lease of dairy stock. Fixed cash expenses include general farm overhead, taxes and insurance, and interest paid on farm business debt.
- (3) Economic costs are long-term costs that account for all production inputs, without regard to ownership or equity positions of farm operators.

Economic costs include variable cash expenses, fixed cash expenses (excluding interest payments), capital replacement, and opportunity costs. The four opportunity costs associated with owned inputs are: the imputed cost of capital invested in operation inputs during the production process; the imputed cost of capital invested in other nonland capital including dairy cows, machinery, and equipment; land; and the imputed cost of unpaid labor. These four costs cannot be determined during the production period through market transactions and therefore must be imputed.

Some estimation procedures were revised for the 1989 dairy estimates. Production costs, such as purchased feeds, were estimated by direct costs in 1989. Direct costing involves summarizing survey responses about the dollar amount paid for particular expense items.

Whole-farm expenses for inputs not specifically associated with the production of milk such as general farm overhead, interest, taxes and insurance, and capital replacement are allocated to dairy production. A combination of direct costing and allocating the dairy share of whole-farm expenses was used instead of the ERS budget generator for items such as fuel, lube, and electricity, machinery and building repairs, taxes and insurance, capital replacement, and return to nonland capital. Appendix figure 1 highlights some of the changes made from the 1985 database to the 1989 database.

Appendix II--Dairy Cost of Production Budget Terms and Definitions

Cash receipts are based on the amount of milk sold per cow plus the sale of dairy animals (dairy cattle, calves, and cull cows). Base year (1989) milk receipts for each region are the average pounds of milk sold per cow, from the FCRS survey, multiplied by the average regional all-milk price per 100 pounds of milk sold, derived from State milk estimates reported by NASS in *Milk Production, Disposition, and Income*. For nonsurvey year updates, the FCRS average pounds of milk sold per cow is adjusted by the regional change in NASS average pounds of milk sold per cow. NASS State average milk prices received by producers is used for the base year as well as nonsurvey years.

Cattle sales are valued at the operator-reported receipts for cull dairy cows, dairy calves, other dairy cattle, and dairy replacement heifers, dairy cows, and bulls, per milk cow (FCRS). Nonsurvey year updates are calculated using the NASS *Agricultural Prices* regional change in State prices for two series: (1) "milk cows"--cows sold for dairy herd replacement, plus (2) "cows"--beef cows and cull dairy cows for slaughter.

Feed expenses are based on the quantities fed for home produced feeds and on the total dollars spent for purchased feeds. The forages fed per milk cow remain the same as the base year; concentrate quantities change according to concentrates fed per cwt of milk produced, as reported by NASS in *Milk Production*.

Types of feed include:

- (1) **Purchased concentrates (commercial pre-mixes/complete feed, formula feeds, supplements, milk replacer, calf starter, grains, salts and minerals)** are valued at operator-reported expense for this feed item (FCRS). Custom feed processing, grinding, or mixing of feed costs (FCRS) are also included.

Homegrown concentrates (nutritional/protein supplements) are valued at NASS *Agricultural Prices* regional prices for dairy feed, 16-percent protein multiplied by the quantity fed (FCRS).

Homegrown concentrates (corn, oats, barley, sorghum, milo, and other grains) are valued at NASS *Agricultural Prices* State prices received for each of the grains multiplied by the quantity fed (FCRS).

Purchased and homegrown concentrates are reported on a cwt fed per milk cow basis. Nonsurvey year updates are based on NASS *Milk Production* State changes in the annual average feed value per cwt of

milk for grain and other concentrates fed to milk cows.

- (2) **Purchased byproducts** are valued at operator-reported expense for this feed item (FCRS).

Homegrown byproducts are valued at the regional weighted average FCRS price for five different types of purchased byproducts multiplied by the operator-reported quantity fed of homegrown byproducts (FCRS). Nonsurvey year updates for purchased and homegrown byproducts are based on changes in *Feedstuffs* magazine costs for dried pulp (citrus and beet).

- (3) **Purchased hay** is valued at operator-reported expense for this feed item (FCRS). Nonsurvey year updates are based on State changes in average prices received for "alfalfa hay" and "other hay" as reported by NASS in *Agricultural Prices*.

Homegrown hay (alfalfa and other hay) is valued at the regional forage production budgeted variable cost for hay multiplied by the operator-reported quantity fed (FCRS).

- (4) **Purchased silage** is valued at operator-reported expense for this feed item (FCRS). Nonsurvey year updates are based on State changes in prices received for "all hay" as reported by NASS in *Agricultural Prices*.

Homegrown silage (alfalfa, other, and corn) is valued at the regional forage production budgeted variable cost for silage multiplied by the operator-reported quantity fed (FCRS).

- (5) **Leased pasture and purchased green chop** are valued at the operator-reported expense for this feed item (FCRS). Expenses for purchased bedding and litter are also included (FCRS). Nonsurvey year updates are based on weighted average changes in price for pasture (ERS *Agricultural Resources: Agricultural Land Values*) and "all hay" (NASS *Agricultural Prices*).

Owned pasture and homegrown green chop are valued at the regional variable cost generated by a forage production budget multiplied by the operator-reported acres of pasture and quantity of green chop fed (FCRS).

Milk hauling costs are based on the operator-reported expense for milk hauling per cwt milk sold (FCRS). The rate per cwt of milk is updated in nonsurvey years by the

annual average changes in milk hauling rates from selected Federal milk marketing orders, as reported to USDA's Agricultural Marketing Service (AMS).

Milk marketing costs are based on the operator-reported expense for milk marketing per cwt milk sold (FCRS). The rate per cwt of milk is updated in nonsurvey years by the annual average changes in milk marketing rates from selected Federal milk marketing orders, as reported to the AMS.

Artificial insemination survey year costs are based on the operator-reported expense per milk cow (FCRS). Nonsurvey year updates are indexed by: 20 percent of the change in prices paid for fuels and energy, 30 percent of the change in prices paid index for autos and trucks, and 50 percent of the change in the wage rate index, as reported by NASS in *Agricultural Prices*.

Veterinary and medicine costs are based on the operator-reported expense per milk cow (FCRS). Nonsurvey year updates are indexed by: 30 percent of the change in the prices paid index for agricultural chemicals and 70 percent of the change in the wage rate index, as reported by NASS in *Agricultural Prices*.

Livestock hauling costs are based on the operator-reported expense per milk cow (FCRS). Nonsurvey year updates are indexed by: 30 percent of the change in the prices paid index for fuels and energy and 70 percent of the change in the prices paid index for farm and motor supplies, as reported by NASS in *Agricultural Prices*.

Fuel, lube, and electricity costs are based on the fuel cash expense for the operation reported on the FCRS. Fuel costs were allocated to the dairy enterprise according to its share of 1989 Firm Enterprise Data System (FEDS) based fuel, lube, and electricity costs for the operation. Nonsurvey year updates are indexed by the change in the prices paid index for fuels and energy, as reported by NASS in *Agricultural Prices* plus the annual average change in FCRS livestock farms electricity per farm expenses, as reported by NASS in *Farm Production Expenditures*.

Machinery and building repairs are based on the repair cash expense for the operation reported on the FCRS. Total repair costs for the operation were allocated to the dairy enterprise according to its share of 1989 FEDS-based repairs. Nonsurvey year updates are indexed by: 50 percent of the change in the prices paid index for farm and motor supplies and 50 percent of the change in the prices paid index for farm services and cash rent, as reported by NASS in *Agricultural Prices*.

Hired labor costs include expenses for contract labor, total cash wages, cash bonuses, benefits paid to workers,

paid management labor, and noncash benefits provided to workers (FCRS). Operator paid labor is included in unpaid labor. Total paid labor costs were allocated to the dairy enterprise according to the percent spent on dairy reported by FCRS dairy operations. Nonsurvey year updates are indexed by regional changes in the wage rates as reported by NASS in *Farm Labor*.

Dairy Herd Improvement Act (DHIA) fee costs are based on the operator-reported expense per milk cow (FCRS). Nonsurvey year updates are indexed by: 20 percent of the change in the prices paid index for fuels and energy, 30 percent of the change in the prices paid index for autos and trucks, and 50 percent of the change in the wage rate index as reported by NASS in *Agricultural Prices*.

Dairy supplies, including sprays, dips, detergents, milk line sanitizers, ear tags and chains, fly control sprays and dusts, are based on the operator-reported expense per milk cow (FCRS). Nonsurvey year updates are indexed by the change in the "production items" prices paid index, as reported by NASS in *Agricultural Prices*.

Dairy assessment costs are the dollars per cwt of milk sold times the portion of the year the assessment was in effect, announced by USDA. An assessment is not charged every year and the amount can vary from year to year.

General farm overhead includes items from the FCRS required for general business operations including: farm shop equipment; water, telephone, and electricity; general business expenses; registration and license fees; association and professional dues; blanket insurance and any damages paid; and fencing maintenance and repairs. Because these costs are paid for general farm maintenance they are allocated to dairy based on the dairy share of total farm value of production. Nonsurvey year changes are indexed by the "production items" prices paid index as reported by NASS in *Agricultural Prices*.

Taxes and insurance costs are based on the expense reported on the FCRS for all real estate and property taxes, FCIC insurance, and all other crop and livestock insurance. Total tax and insurance costs for the farm operation were allocated to dairy according to the dairy share of FEDS-based repair costs. Nonsurvey year updates are indexed by: 65 percent of the change in the prices paid index for taxes (NASS, *Prices Paid*) and 35 percent of the change in FCRS livestock farms insurance per farm expense.

Interest includes service fees and interest paid on debt secured by real estate and on operating loans, as reported on the FCRS. Because interest is paid on the total farm operation, a percentage is allocated to dairy based on the

dairy share of total farm value of production. Nonsurvey year interest cost is indexed by the "interest" prices paid index as reported by NASS in *Agricultural Prices*.

Capital replacement is the annualized amount spent to replace the machinery and buildings as they wear out and to replace dairy breeding livestock. Replacement costs for dairy operations were calculated by multiplying capital expenditures for each asset type as reported on the FCRS for: (1) buildings (actual FCRS expenditure multiplied by FEDS-based dairy share of repair costs), (2) machinery and equipment (actual FCRS expenditure multiplied by FEDS-based dairy share of repair costs plus capital replacement costs from the homegrown forage and pasture budgets), and (3) replacement livestock (actual FCRS expenditure for dairy breeding stock). This actual expense for each region is divided by regional dairy cow totals to obtain the expense on a per cow basis. Nonsurvey year updates are indexed by changes in NASS *Agricultural Prices* for items contained in each of the three asset types: (1) buildings are indexed by the "building and fencing" prices paid index, (2) machinery and equipment are indexed by 50 percent of the prices paid index for tractors and self-propelled machinery and 50 percent of the prices paid index for other machinery, and (3) milk cows are indexed by using the change in the price received for cows sold for dairy herd replacement.

Operating capital is an opportunity cost incurred when a producer invests money in variable production inputs and expects the money to earn at least as much as if it were placed in a savings account or similar financial instrument. The 6-month Treasury Bill rate is multiplied by total variable cash expenses multiplied by the length of time money is assumed to be borrowed for dairy (45 days).

Other nonland capital is the rate of return expected on capital invested in buildings, machinery, equipment, and cows used for the dairy herd for a given year. This opportunity cost is calculated by taking the imputed value of the assets (FCRS) multiplied by a 10-year moving average real rate of interest. Asset value in the base year consists of (1) the dairy share FCRS amount spent on new buildings and new machinery and equipment plus the capital replacement costs from the homegrown forage and

pasture budgets multiplied by the FCRS average years of life for buildings and equipment, plus (2) the estimated market value for dairy livestock based on the FCRS numbers of each type (milk cows, replacement heifers, and breeding bulls) multiplied by NASS prices for purchasing each type. Each regional capital investment amount is multiplied by a longrun real rate of return to production assets in the farm sector. Nonsurvey year asset value updates are obtained by multiplying their base year value by the proportional change in total farm assets, the values being reported by ERS in *Agricultural Outlook*.

Land costs are based on 2 acres (assumed for the farmstead) multiplied by the State land value per acre, as reported by ERS in *Agricultural Resources: Agricultural Land Values*. The acreage used to produce the homegrown forage fed to dairy stock is also included. Nonsurvey year updates are indexed by changes in State land values, as reported by ERS in *Agricultural Resources: Agricultural Land Values*.

Unpaid labor costs are based on the annual hours (FCRS) of paid and unpaid labor for the operator, unpaid family, and other unpaid labor multiplied by the annual average hourly wage rate for all hired farmworkers plus the employers' share of social security taxes (NASS, *Farm Labor*). Any additional return reflecting the operator's entrepreneurial skill appears in the residual return to management and risk. The amount of unpaid labor hours per dairy cow remain the same in nonsurvey years while the hourly wage rates are indexed by changes in regional wage rates, as reported by NASS *Farm Labor* data.

Residual returns to management and risk or average return for producing milk indicates the extent to which longrun production costs are covered by average cash receipts in a given year. This is the dollar amount per cow or per cwt of milk remaining after subtracting total economic costs from cash receipts. In the long run, the return to risk is expected to average near zero, although in any year the residual return to risk could be positive or negative depending on weather and supply and demand factors. The return to management should be positive. Therefore, in the long run, the returns to both management and risk are expected to average above zero.

Appendix table 1--Estimation procedure differences in milk production costs and returns

1985 Dairy survey	1989 Dairy survey
Cash expenses	Cash expenses
Feed costs:	Feed costs:
Purchased grains, forages, and byproducts: Quantities fed multiplied by market price or average cost.	Purchased grains, forages, and byproducts: Dairy share of total farm feed expenditure during the 1989 calendar year.
Homegrown grains, forages, and byproducts: Grain quantities fed multiplied by market prices. Forage quantities fed multiplied by variable cost of forage production. Byproduct quantities fed multiplied by market prices.	Homegrown grains, forages, and byproducts: Grain quantities fed multiplied by market prices. Forage quantities fed multiplied by variable cost of forage production. Byproduct quantities fed multiplied by market prices.
Fuel, lube, and electricity: ERS budget generator.	Fuel, lube, and electricity: Dairy share of total farm fuel, lube, and electricity expenditures during the 1989 calendar year.
Machinery and building repairs: ERS budget generator.	Machinery and building repairs: Dairy share of total building, machinery and equipment repair expenditures during the 1989 calendar year.
Paid labor: Includes expenses for contract labor, cash wages, cash and noncash expenses paid to family members and others. Includes partial payment to operator.	Paid labor: Includes expenses for contract labor, cash wages, cash and noncash expenses paid to family members and others. Excludes operator paid labor.
Taxes and insurance: ERS budget generator.	Taxes and insurance: Dairy share of total farm real estate and property taxes and crop insurance expenses during the 1989 calendar year.
Capital replacement: ERS budget generator.	Capital replacement: Capital invested in dairy breeding herd, plus dairy share of total farm expenditures for buildings, machinery, and equipment.
Economic (full ownership) costs	Economic (full ownership) costs
Return to nonland capital: ERS budget generator.	Return to nonland capital: Value of dairy livestock plus dairy share of capital invested in machinery and equipment in 1989, multiplied by the calculated 10-year average real rate of return to agricultural assets.
Unpaid labor: Imputed expenses for dairy share of unpaid operator and other unpaid worker's hours spent on dairy enterprise, valued at the annual average hourly wage rate for all hired farmworkers.	Unpaid labor: Imputed expenses for all operator labor and other unpaid worker's hours spent on dairy enterprise, valued at the annual average hourly wage rate for all hired farmworkers.

Appendix table 2--Milk production costs and returns, per cow, 1989

Item	Appalachia	Corn Belt	Northeast	Pacific	Southeast	Southern Plains	Upper Midwest	United States
<i>Dollars</i>								
Cash receipts:								
Milk	1,880.34	1,852.01	2,020.67	2,101.25	2,015.25	1,949.23	1,951.71	1,988.55
Cattle	186.97	218.89	186.50	173.22	151.37	168.60	235.78	198.50
Total	2,067.31	2,070.90	2,207.17	2,274.47	2,166.62	2,117.83	2,187.49	2,187.05
Variable cash expenses:								
Feed--								
Concentrates	644.97	582.85	647.98	544.17	966.36	688.20	504.43	590.70
Byproducts	34.08	16.98	12.06	125.99	60.93	77.38	18.93	47.00
Hay	124.43	173.91	140.8	349.92	132.12	191.28	170.33	199.50
Silage	113.21	69.92	140.34	129.23	52.19	49.49	182.20	133.30
Pasture and other forage	21.69	28.08	21.88	17.79	13.02	28.41	21.47	21.50
Total feed	938.38	871.74	963.06	1,167.10	1,224.62	1,034.76	897.36	992.00
Other--								
Milk hauling and marketing	110.89	88.46	89.54	86.58	134.94	103.29	64.37	85.70
Artificial insemination	16.29	15.30	20.97	17.74	13.02	4.38	19.63	17.70
Veterinary and medicine	29.08	39.81	31.43	22.94	27.86	24.22	35.24	30.60
Livestock hauling	2.62	2.86	3.10	3.65	1.86	1.51	5.84	3.80
Fuel, lube, and electricity	22.81	31.34	16.67	33.46	13.69	13.51	18.91	22.50
Machinery and building repairs	53.38	64.32	85.73	55.09	32.89	38.35	79.85	68.00
Hired labor	152.45	86.03	88.05	166.71	141.64	156.39	95.92	118.90
DHIA fees	5.56	8.63	9.69	7.98	2.91	2.57	7.61	7.60
Dairy supplies	38.93	31.35	33.39	27.50	25.26	39.25	27.84	30.90
Rent or lease dairy stock	2.85	0.64	0.22	0.37	6.26	0.11	1.71	1.10
Total	1,373.24	1,240.48	1,341.85	1,589.12	1,624.95	1,418.34	1,254.28	1,378.80
Fixed cash expenses:								
General farm overhead	111.22	120.53	158.25	106.67	55.25	73.07	164.72	132.90
Taxes and insurance	13.37	26.49	35.76	21.17	11.30	9.26	41.33	29.00
Interest	73.18	128.81	117.42	97.12	49.18	58.45	136.28	109.80
Total	197.77	275.83	311.43	224.96	115.73	140.78	342.33	271.70
Total, cash expenses	1,571.01	1,516.31	1,653.28	1,814.08	1,740.68	1,559.12	1,596.61	1,650.50
Cash receipts less cash expenses	496.30	554.59	553.89	460.39	425.94	558.71	590.88	536.55
Economic (full ownership) costs:								
Variable cash expenses	1,373.24	1,240.48	1,341.85	1,589.12	1,624.95	1,418.34	1,254.28	1,378.80
General farm overhead	111.22	120.53	158.25	106.67	55.25	73.07	164.72	132.90
Taxes and insurance	13.37	26.49	35.76	21.17	11.30	9.26	41.33	29.00
Capital replacement	213.32	197.18	265.07	200.06	215.46	274.87	261.83	238.60
Operating capital	13.80	12.47	13.49	15.97	16.33	14.25	12.61	13.90
Other nonland capital	68.49	78.15	97.76	67.09	49.93	49.83	97.60	82.30
Land	46.85	69.54	37.17	10.78	13.61	14.78	31.81	31.30
Unpaid labor	307.07	419.81	344.72	92.43	73.63	163.82	318.60	264.90
Total, economic costs	2,147.36	2,164.65	2,294.07	2,103.29	2,060.46	2,018.22	2,182.78	2,171.70
Residual returns to management and risk	-80.05	-93.75	-86.90	171.18	106.16	99.61	4.71	15.35
Pounds of milk per unit	13,431	13,821	14,331	16,810	12,836	13,631	14,565	14,730
Price per 100 pounds	14.0	13.4	14.1	12.5	15.7	14.3	13.4	13.5

Appendix table 3--Milk production costs and returns, per cwt, 1989

Item	Appalachia	Corn Belt	Northeast	Pacific	Southeast	Southern Plains	Upper Midwest	United States
<i>Dollars</i>								
Cash receipts:								
Milk	14.00	13.40	14.10	12.50	15.70	14.30	13.40	13.50
Cattle	1.39	1.58	1.30	1.03	1.18	1.24	1.62	1.35
Total	15.39	14.98	15.40	13.53	16.88	15.54	15.02	14.85
Variable cash expenses:								
Feed--								
Concentrates	4.80	4.22	4.52	3.24	7.53	5.05	3.46	4.01
Byproducts	0.25	0.12	0.08	0.75	0.47	0.57	0.13	0.32
Hay	0.93	1.26	0.98	2.08	1.03	1.40	1.17	1.35
Silage	0.84	0.51	0.98	0.77	0.41	0.36	1.25	0.90
Pasture and other forage	0.16	0.20	0.15	0.11	0.10	0.21	0.15	0.15
Total feed	6.98	6.31	6.71	6.95	9.54	7.59	6.16	6.73
Other--								
Milk hauling and marketing	0.82	0.64	0.63	0.52	1.05	0.76	0.44	0.58
Artificial insemination	0.12	0.11	0.15	0.11	0.10	0.03	0.13	0.12
Veterinary and medicine	0.22	0.29	0.22	0.14	0.22	0.18	0.24	0.21
Livestock hauling	0.02	0.02	0.02	0.02	0.01	0.01	0.04	0.03
Fuel, lube, and electricity	0.17	0.23	0.12	0.20	0.11	0.10	0.13	0.15
Machinery and building repairs	0.40	0.47	0.60	0.33	0.26	0.28	0.55	0.46
Hired labor	1.14	0.62	0.61	0.99	1.10	1.15	0.66	0.81
DHIA fees	0.04	0.06	0.07	0.05	0.02	0.02	0.05	0.05
Dairy supplies	0.29	0.23	0.23	0.16	0.20	0.29	0.19	0.21
Rent or lease dairy stock	0.02	0.00	0.00	0.00	0.05	0.00	0.01	0.01
Total	10.22	8.98	9.36	9.47	12.66	10.41	8.60	9.36
Fixed cash expenses:								
General farm overhead	0.83	0.87	1.10	0.63	0.43	0.54	1.13	0.90
Taxes and insurance	0.10	0.19	0.25	0.13	0.09	0.07	0.28	0.20
Interest	0.54	0.93	0.82	0.58	0.38	0.43	0.94	0.75
Total	1.47	1.99	2.17	1.34	0.90	1.04	2.35	1.85
Total, cash expenses	11.69	10.97	11.53	10.81	13.56	11.45	10.95	11.21
Cash receipts less cash expenses	3.70	4.01	3.87	2.72	3.32	4.09	4.07	3.64
Economic (full ownership) costs:								
Variable cash expenses	10.22	8.98	9.36	9.47	12.66	10.41	8.60	9.36
General farm overhead	0.83	0.87	1.10	0.63	0.43	0.54	1.13	0.90
Taxes and insurance	0.10	0.19	0.25	0.13	0.09	0.07	0.28	0.20
Capital replacement	1.59	1.43	1.85	1.19	1.68	2.02	1.80	1.62
Operating capital	0.10	0.09	0.09	0.10	0.13	0.10	0.09	0.09
Other nonland capital	0.51	0.57	0.68	0.40	0.39	0.37	0.67	0.56
Land	0.35	0.50	0.26	0.06	0.11	0.11	0.22	0.21
Unpaid labor	2.29	3.04	2.41	0.55	0.57	1.20	2.19	1.80
Total, economic costs	15.99	15.67	16.00	12.53	16.06	14.82	14.98	14.74
Residual returns to management and risk	-0.60	-0.69	-0.60	1.00	0.82	0.72	0.04	0.11
Pounds of milk per unit	13,431	13,821	14,331	16,810	12,836	13,631	14,565	14,730
Price per 100 pounds	14.0	13.4	14.1	12.5	15.7	14.3	13.4	13.5

Appendix table 4--Milk production costs and returns, per cow, 1990

Item	Appalachia	Corn Belt	Northeast	Pacific	Southeast	Southern Plains	Upper Midwest	United States
<i>Dollars</i>								
Cash receipts:								
Milk	2,025.38	1,924.91	2,123.72	2,144.76	2,209.85	2,151.20	2,005.29	2,082.81
Cattle	201.95	236.95	203.57	188.31	161.30	184.16	257.21	215.66
Total	2,227.33	2,161.86	2,327.29	2,333.07	2,371.15	2,335.36	2,262.50	2,298.47
Variable cash expenses:								
Feed--								
Concentrates	672.94	626.35	688.88	575.18	1,021.33	816.81	555.80	637.13
Byproducts	34.08	14.46	10.27	123.15	60.93	80.25	16.13	45.95
Hay	124.45	156.01	147.31	375.73	145.92	198.18	158.19	204.22
Silage	121.59	63.34	130.99	136.83	55.06	49.61	162.08	127.20
Pasture and other forage	20.78	25.80	22.38	20.86	16.01	26.36	16.73	20.59
Total feed	973.84	885.96	999.83	1,231.75	1,299.25	1,171.21	908.93	1,035.09
Other--								
Milk hauling and marketing	114.18	93.51	92.43	91.46	142.92	115.28	70.90	91.01
Artificial insemination	17.23	16.19	22.19	18.77	13.77	4.63	20.77	18.72
Veterinary and medicine	30.42	41.65	32.88	24.00	29.15	25.34	36.87	31.96
Livestock hauling	2.74	3.00	3.25	3.82	1.95	1.58	6.12	4.00
Fuel, lube, and electricity	25.77	35.41	18.84	36.37	15.38	15.24	21.33	25.19
Machinery and building repairs	54.74	65.96	87.92	56.49	33.73	39.33	81.89	69.59
Hired labor	157.35	87.88	91.96	167.73	148.31	156.39	105.95	124.18
DHIA fees	5.88	9.13	10.25	8.44	3.08	2.72	8.05	8.04
Dairy supplies	40.35	32.49	34.60	28.50	26.18	40.68	28.85	31.94
Rent or lease dairy stock	2.95	0.66	0.23	0.38	6.49	0.11	1.77	1.18
Dairy assessment	0.73	0.76	0.77	0.93	0.71	0.78	0.79	0.81
Total	1,426.18	1,272.60	1,395.15	1,668.64	1,720.92	1,573.29	1,292.22	1,441.71
Fixed cash expenses:								
General farm overhead	115.27	124.92	164.01	110.55	57.26	75.73	170.72	137.39
Taxes and insurance	14.01	27.77	37.48	22.19	11.84	9.71	43.32	30.34
Interest	72.35	127.34	116.08	96.01	48.62	57.78	134.73	108.35
Total	201.62	280.03	317.57	228.76	117.72	143.22	348.76	276.08
Total, cash expenses	1,627.80	1,552.63	1,712.72	1,897.40	1,838.64	1,716.51	1,640.98	1,717.79
Cash receipts less cash expenses	599.53	609.23	614.57	435.67	532.51	618.85	621.52	580.68
Economic (full ownership) costs:								
Variable cash expenses	1,426.18	1,272.60	1,395.15	1,668.64	1,720.92	1,573.29	1,292.22	1,441.71
General farm overhead	115.27	124.92	164.01	110.55	57.26	75.73	170.72	137.39
Taxes and insurance	14.01	27.77	37.48	22.19	11.84	9.71	43.32	30.34
Capital replacement	228.11	209.00	280.57	212.93	235.11	298.20	277.86	253.52
Operating capital	13.32	11.88	13.03	15.58	16.07	14.69	12.07	13.46
Other nonland capital	74.16	84.62	105.85	72.64	54.06	53.96	105.68	88.88
Land	45.40	71.65	36.21	11.54	14.74	13.78	34.79	31.87
Unpaid labor	316.93	428.86	360.03	92.99	77.10	163.82	351.90	277.66
Total, economic costs	2,233.38	2,231.30	2,392.33	2,207.06	2,187.10	2,203.18	2,288.56	2,274.83
Residual returns to management and risk	-6.05	-69.44	-65.04	126.01	184.05	132.18	-26.06	23.64
Pounds of milk per unit	13,685	14,365	14,546	17,580	13,393	14,634	14,854	15,203
Price per 100 pounds	14.8	13.4	14.6	12.2	16.5	14.7	13.5	13.7

Appendix table 5--Milk production costs and returns, per cwt, 1990

Item	Appalachia	Corn Belt	Northeast	Pacific	Southeast	Southern Plains	Upper Midwest	United States
<i>Dollars</i>								
Cash receipts:								
Milk	14.80	13.40	14.60	12.20	16.50	14.70	13.50	13.70
Cattle	1.48	1.65	1.40	1.07	1.20	1.26	1.73	1.42
Total	16.28	15.05	16.00	13.27	17.70	15.96	15.23	15.12
Variable cash expenses:								
Feed--								
Concentrates	4.92	4.36	4.74	3.27	7.63	5.58	3.74	4.19
Byproducts	0.25	0.10	0.07	0.70	0.45	0.55	0.11	0.30
Hay	0.91	1.09	1.01	2.14	1.09	1.35	1.06	1.34
Silage	0.89	0.44	0.90	0.78	0.41	0.34	1.09	0.84
Pasture and other forage	0.15	0.18	0.15	0.12	0.12	0.18	0.11	0.14
Total feed	7.12	6.17	6.87	7.01	9.70	8.00	6.11	6.81
Other--								
Milk hauling and marketing	0.83	0.66	0.64	0.52	1.06	0.79	0.48	0.60
Artificial insemination	0.13	0.11	0.15	0.11	0.10	0.03	0.14	0.12
Veterinary and medicine	0.22	0.29	0.23	0.14	0.22	0.17	0.25	0.21
Livestock hauling	0.02	0.02	0.02	0.02	0.01	0.01	0.04	0.03
Fuel, lube, and electricity	0.19	0.25	0.13	0.21	0.11	0.10	0.14	0.17
Machinery and building repairs	0.40	0.46	0.60	0.32	0.25	0.27	0.55	0.46
Hired labor	1.15	0.61	0.63	0.95	1.11	1.07	0.71	0.82
DHIA fees	0.04	0.06	0.07	0.05	0.02	0.02	0.05	0.05
Dairy supplies	0.29	0.23	0.24	0.16	0.20	0.28	0.19	0.21
Rent or lease dairy stock	0.02	0.00	0.00	0.00	0.05	0.00	0.01	0.01
Dairy assessment	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total	10.42	8.87	9.59	9.50	12.84	10.75	8.68	9.50
Fixed cash expenses:								
General farm overhead	0.84	0.87	1.13	0.63	0.43	0.52	1.15	0.90
Taxes and insurance	0.10	0.19	0.26	0.13	0.09	0.07	0.29	0.20
Interest	0.53	0.89	0.80	0.55	0.36	0.39	0.91	0.71
Total	1.47	1.95	2.19	1.31	0.88	0.98	2.35	1.81
Total, cash expenses	11.89	10.82	11.78	10.81	13.72	11.73	11.03	11.31
Cash receipts less cash expenses	4.39	4.23	4.22	2.46	3.98	4.23	4.2	3.81
Economic (full ownership) costs:								
Variable cash expenses	10.42	8.87	9.59	9.50	12.84	10.75	8.68	9.50
General farm overhead	0.84	0.87	1.13	0.63	0.43	0.52	1.15	0.90
Taxes and insurance	0.10	0.19	0.26	0.13	0.09	0.07	0.29	0.20
Capital replacement	1.67	1.45	1.93	1.21	1.76	2.04	1.87	1.67
Operating capital	0.10	0.08	0.09	0.09	0.12	0.10	0.08	0.09
Other nonland capital	0.54	0.59	0.73	0.41	0.40	0.37	0.71	0.58
Land	0.33	0.50	0.25	0.07	0.11	0.09	0.23	0.21
Unpaid labor	2.32	2.99	2.48	0.53	0.58	1.12	2.37	1.83
Total, economic costs	16.32	15.54	16.46	12.57	16.33	15.06	15.38	14.98
Residual returns to management and risk	-0.04	-0.49	-0.46	0.70	1.37	0.90	-0.15	0.14
Pounds of milk per unit	13,685	14,365	14,546	17,580	13,393	14,634	14,854	15,203
Price per 100 pounds	14.8	13.4	14.6	12.2	16.5	14.7	13.5	13.7

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