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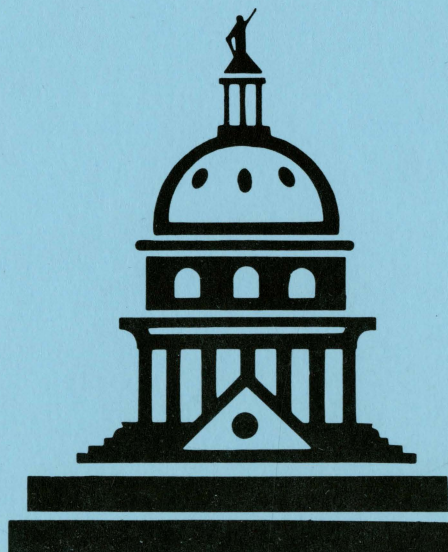
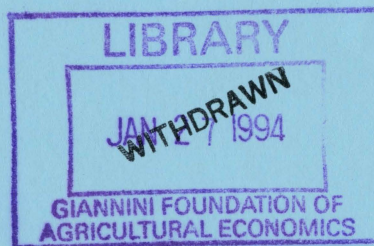
AFPC 92-3

POLICY WORKING PAPER

**STATUS AND PROSPECTS FOR DAIRYING
1992-1995**

Policy
AFPC Working Paper 92-3

Department of Agricultural Economics
Texas Agricultural Experiment Station
Texas Agricultural Extension Service
Texas A&M University *System*



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**STATUS AND PROSPECTS FOR DAIRYING
1992-1995**

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STATUS AND PROSPECTS FOR DAIRYING 1992-1995

Introduction

Each year, AFPC (Texas A&M University) and FAPRI (University of Missouri and Iowa State University) cooperate to develop a five year outlook for the dairy industry. In 1991, this outlook and related analyses formed the basis for extensive congressional deliberations over dairy policy.

In 1992, dairy policy appears unlikely to receive the same level of attention as last year. However, many questions relating to regional adjustments, competitiveness, and the provisions of Federal milk marketing orders remain to be answered. In addition, questions continuously arise regarding the economic viability of the dairy industry on a regional and national basis.

As part of its responsibility to the Congress, AFPC maintains a set of representative dairy farms located in each of the major U.S. milk production regions. These farms are developed with the assistance of dairy farmers, dairy management specialists, and agricultural Extension agents. Experience indicates that these representative farms do a very good job of reflecting regional economic conditions in the dairy industry, assuming no change in government policy.

Economic Factors Influencing Milk Production

Table 1 provides a summary of the major economic factors that are expected to influence milk production and the dairy industry over the next four years. The most significant cost factor is the projected 1992 soybean meal price jump; offset to a degree by the decline in corn prices. Perhaps more important is an anticipated tight grain stocks situation. This means that in the event of adverse weather conditions, feed costs could be substantially higher, and, in any event, more volatile. Throughout the next four years, therefore, dairymen who are dependent on purchased feed are well advised to consider forward contracting alternatives when economically warranted.

The all milk price reached a bottom in 1991 with modest improvement anticipated through 1995. The modestly improved price situation is anticipated to be precipitated by a supply-demand balance that

Table 1. Economic Factors Influencing Milk Production.

	1990	1991	1992	1993	1994	1995
Expenses						
Corn (\$/bu.)	2.28	2.45	2.19	2.26	2.30	2.39
Soybean Meal (\$/ton)	169.90	174.74	193.20	189.26	189.58	196.82
All Hay (\$/ton)	83.20	71.24	69.00	71.22	72.81	73.97
Inflation (%)	5.4	4.2	2.5	3.2	3.8	4.1
Interest Rate (%)	12.01	10.49	9.31	9.87	11.46	11.94
Receipts						
All-Milk (\$/cwt)	13.73	12.24	12.29	12.48	12.61	12.79
Cull Cows (\$/cwt)	53.13	52.29	51.55	50.71	47.32	43.79
Production						
Milk Output (Bil. lbs.)	148.3	148.6	149.5	151.4	152.9	154.2
Output/Cow (Cwt.)	14.64	14.85	15.13	15.47	15.83	16.08
Cow Numbers (Mil)	10.13	10.01	9.88	9.78	9.69	9.59

Source: FAPRI January 1992 Baseline.

continues to be burdened with butterfat surpluses. Cow numbers are anticipated to resume a general downward trend while milk output per cow enjoys an annual growth rate of just over 2.2 percent.

Representative Farms

During the past year, AFPC expanded its inventory of representative dairy farms to 20. These farms are located in each of the major milk producing regions (Figure 1).

The representative farms are developed with the assistance of panels of dairy farmers. The farmers on the panel are selected with the assistance of a state Extension dairy management specialist, a local county agent, and frequently involves the cooperation of a major cooperative serving the area.

In most production areas, two dairy farm panels are selected:

- A panel representative of a moderate size full-time family dairy farm.
- A panel representative of a large size dairy farm, normally 2-3 times the size of the moderate farm.

Names of the Extension facilitators and the members of the dairy panels are indicated in the Appendix.

This project would not be possible without their cooperation, data, experiences, and judgments.

The farm panels provide an extensive amount of data for what they judge to be a farm representative of dairy operations in their production area. This data generally includes:

- Size of operation (acres and cows)
- Tenure arrangements
- Management practices
- Physical facilities
- Machinery complement
- Output per cow and crop yield (if applicable)
- Cost of production
- Mailbox milk price

This farm description provides input for a computer simulation model developed and maintained by James Richardson and Clair Nixon at Texas A&M. The model utilizes the crop prices, milk prices, interest

Figure 1. Panel Dairy Farms



rates, and inflation rates projected in Table 1. For each farm, these prices are adjusted regionally to represent local conditions.

As an aid to making sure the farm described by the panel accurately represents a dairy farm located in their area, the results of the initial simulations are sent to each panel member and discussed with them via a conference call. Adjustments invariably result from these conference calls as the panel identifies problem areas and suggests solutions. After each adjustment of panel farm input data, another conference call is held until the panel agrees that the results are representative of the farm they initially developed and described. There have been only a few instances where the panel never comes to an agreement and has been forced to start over.

The major assumptions impacting the dairy results include:

- The initial debt for the panel farm was the average debt for all farms of similar size in the state, as determined from the ERS/USDA farm costs and returns survey for 1990.
- The dairy herd size was held constant over the planning horizon.
- The farm program parameters, crop prices, milk prices, interest rates, and input cost inflation were as described in the FAPRI January 1992 Baseline.
- Feed grown and fed on the dairy farm is valued at its cost of production, not at the spot market price.
- Family living withdrawals were assumed at a minimum of \$20,000 annually with a maximum of \$40,000, depending on the profitability of the dairy.
- No off-farm income was allowed, thus reflecting the farm's economic activity over the study period.

The simulation model is constructed in a manner which allows incorporation of historical variation in input prices, milk prices, milk per cow, and crop yields. Variability due to weather and market forces over the past ten years is thus incorporated into the analysis.

Table 2 provides a description of some of the important characteristics of the 20 panel dairy farms. Space limitation makes it necessary to abbreviate the name of each dairy. The dairies are ordered from west to east, across the United States. The first two letters in the abbreviated name are the standard

Table 2. Characteristics of Panel Farms Producing Milk.

	WAMD	WALD	CALD	NMLD	TXCM	TXCL	TXEM	TXEL
Number of Cows	160	800	2050	1600	300	720	180	812
Milk per Cow (cwts)	216.2	226.5	192.4	189.3	140.9	172.2	140.9	162.0
Assets	-- (\$1,000) --							
Real Estate	507.6	1853.4	3100.2	1974.8	408.4	614.0	403.3	1164.2
Machinery	90.6	327.4	126.3	293.5	178.3	233.2	131.6	345.9
Livestock	210.7	1077.7	3458.6	2672.0	444.0	650.9	166.0	747.5
Debt/Asset Ratio*	0.35	0.38	0.27	0.23	0.27	0.26	0.22	0.24
Machinery	0.45	0.45	0.21	0.21	0.37	0.37	0.37	0.37
Land	0.27	0.27	0.25	0.25	0.11	0.11	0.11	0.11
Total Acreage	120	428	320	150	606	460	400	600
Owned Acres	60	225	320	150	303	160	200	400
Leased Acres	60	203			303	300	200	200
1992 Gross Receipts**	-- (\$1,000) --							
Total	444.4	2347.6	5176.3	4738.6	658.5	1845.5	421.3	1990.3
Milk	404.6	2119.2	4322.7	3994.2	557.5	1635.1	334.5	1734.2
Livestock	38.1	222.6	853.6	744.4	101.0	210.4	54.4	234.0
Crop	1.7	5.8	0.0	0.0	0.0	0.0	32.4	22.1
1992 Planted Acreage	-- (Acres) --							
Total	114	385		110	303		250.0	300.0
Silage	114	385		110				
Alfalfa Hay								
Other Hay					303		250.0	300.0
Alfalfa Haylage								
Haylage								
Corn								
Acres/Cow	0.8	0.5	0.0	0.2	1.0	0.0	1.4	0.4

* Total debt/asset ratio reflects accrued taxes that are not reflected in machinery and land debt.

** Receipts for 1992 are included to indicate the importance of each enterprise to the farm; these values do not reflect price and yield risk so they differ from the average annual cash receipts in subsequent tables.

Table 2. Characteristics of Panel Farms Producing Milk - Cont.

	WIMD	WILD	VTMD	VTLD	NYCM	NYCL	NYWM	NYWL
Number of Cows	50	175	65	186	100	175	500	1000
Milk per Cow (cwts)	154.5	185.3	159.0	185.7	185.3	185.3	185.3	185.3
Assets	-- (\$1,000) --							
Real Estate	218.9	530.1	439.4	617.5	421.6	516.7	1146.3	1725.7
Machinery	126.8	272.2	140.8	272.8	118.7	236.0	292.8	718.4
Livestock	72.0	258.5	83.6	229.1	118.3	201.5	568.2	1105.7
Debt/Asset Ratio*	0.25	0.24	0.16	0.18	0.17	0.21	0.18	0.21
Machinery	0.12	0.12	0.31	0.31	0.31	0.31	0.31	0.31
Land	0.30	0.30	0.09	0.09	0.09	0.09	0.09	0.09
Total Acreage	190	550	262	385	358	713	1000	1500
Owned Acres	152	330	200	275	255	609	800	1067
Leased Acres	38	220	62	110	103	104	200	433
1992 Gross Receipts**	-- (\$1,000) --							
Total	116.1	454.5	154.3	491.4	272.0	464.5	1314.6	2622.0
Milk	91.7	384.8	130.2	435.1	230.6	403.6	1153.2	2306.4
Livestock	20.0	68.4	22.8	55.1	40.6	60.8	161.4	315.6
Crop	4.4	1.3	1.3	1.2	0.8	0.0	0.0	0.0
1992 Planted Acreage	-- (Acres) --							
Total	174	514	137	285	218	415	779	640
Silage	18	44	45	137	60	99	432	640
Alfalfa Hay	30		23	37		99		
Other Hay	48	125	22	29				
Alfalfa Haylage						117	229	
Haylage	42	252	47	82	47	11	118	
Corn	36	93			111	89		
Acres/Cow	3.5	3.0	2.0	1.5	2.2	2.3	1.6	0.64

* Total debt/asset ratio reflects accrued taxes that are not reflected in machinery and land debt.

** Receipts for 1992 are included to indicate the relative importance of each enterprise to the farm; these values do not reflect price and yield risk so they differ from the average annual cash receipts in subsequent tables.

Table 2. Characteristics of Panel Farms Producing Milk - Cont.

	MOMD	MOLD	GAMD	FLLD
Number of Cows	65	200	200	1000
Milk per Cow (cwts)	175.0	185.3	164.7	154.4
Assets		-- (\$1,000) --		
Real Estate	137.1	751.8	484.4	3163.7
Machinery	112.8	272.4	166.4	281.9
Livestock	90.7	247.5	260.7	1343.9
Debt/Asset Ratio*				
Machinery	0.21	0.25	0.43	0.29
Land	0.08	0.08	0.13	0.38
	0.33	0.33	0.70	0.24
Total Acreage				
Owned Acres	250	600	416	1340
Leased Acres	145	600	300	1340
	105		116	
1992 Gross Receipts**		-- (\$1,000) --		
Total	173.5	553.3	522.2	2686.5
Milk	141.4	460.5	456.8	2391.4
Livestock	27.5	74.7	65.4	294.0
Crop	4.6	18.1	0.0	1.1
1992 Planted Acreage		-- (Acres) --		
Total	218.0	600.0	223.0	540.0
Silage		108.0	107.0	259.0
Alfalfa Hay	97.0	102.0		
Other Hay	121.0	350.0	116.0	281.0
Alfalfa Haylage		40.0		
Haylage				
Corn				
Acres/Cow	3.4	3.0	1.2	0.5

* Total debt/asset ratio reflects accrued taxes that are not reflected in machinery and land debt.

** Receipts for 1992 are included to indicate the relative importance of each enterprise to the farm; these values do not reflect price and yield risk so they differ from the average annual cash receipts in subsequent tables.

abbreviation for the state where the farm is located. If there is more than one dairy location in the state, the third letter indicates where the dairy is located, such as E stands for east or C for central. If there is not more than one dairy location in the state, the third letter indicates whether it is a moderate size (M) or a large size (L) dairy. The last letter indicates it is a dairy farm or it may indicate whether it is a moderate or large farm when there is more than one dairy in the state. Listed in the same order as Table 2, the following are the abbreviations used, with a brief description of the farm:

WAMD a 160 cow Northern Washington (Whatcom County) moderate size dairy farm which has a herd average of 21,620 pounds of milk per cow. The farm grows 114 acres of silage and generates about 91 percent of its revenue from milk sales.

WALD an 800 cow Northern Washington (Whatcom County) large dairy farm which has a herd average of 22,650 pounds of milk per cow. The farm grows 385 acres of silage and generates about 90 percent of its revenue from milk sales.

CALD a 2,050 cow Central California (Tulare County) large dairy farm which has a herd average of 19,240 pounds of milk per cow. The farm grows no feed and generates about 84 percent of its revenue from milk sales.

NMLD a 1,600 cow Southern New Mexico (Dona Anna County) large dairy farm which has a herd average of 18,930 pounds of milk per cow. The farm grows 110 acres of silage and generates about 84 percent of its revenue from milk sales.

TXCM a 300 cow Central Texas (Erath County) moderate size dairy farm which has a herd average of 14,090 pounds of milk per cow. The farm grows 303 acres of hay and generates about 85 percent of its revenue from milk sales.

TXCL a 720 cow Central Texas (Erath County) large dairy farm which has a herd average of 17,220 pounds of milk per cow. The farm grows no feed and produces 89 percent of its receipts from milk sales.

- TXEM** a 180 cow Eastern Texas (Hopkins County) moderate size dairy farm which has a herd average of 14,090 pounds of milk per cow. The farm grows 250 acres of hay and generates about 79 percent of its receipts from milk sales.
- TXEL** an 812 cow Eastern Texas (Hopkins County) large dairy farm which has a herd average of 16,200 pounds of milk per cow. The farm grows 300 acres of hay and generates about 87 percent of its receipts from milk sales.
- WIMD** a 50 cow Eastern Wisconsin (Winnebago County) moderate size dairy farm which has a herd average of 15,450 pounds of milk per cow. The farm grows 18 acres of silage, 30 acres of alfalfa, 48 acres of hay, 42 acres of haylage, and 36 acres of corn for grain. The farm operation generates about 79 percent of its total revenue from milk sales.
- WILD** a 175 cow Eastern Wisconsin (Winnebago County) large dairy farm which has a herd average of 18,530 pounds of milk per cow. The farm grows 44 acres of silage, 125 acres of hay, 252 acres of haylage, and 93 acres of corn for grain. The farm generates 85 percent of its revenue from milk sales.
- VTMD** a 65 cow Vermont moderate size dairy farm which has a herd average of 15,900 pounds of milk per cow. The farm grows 45 acres of silage, 23 acres of alfalfa, 22 acres of hay, and 47 acres of haylage. The farm generates 84 percent of its revenue from milk sales.
- VTLD** a 186 cow Vermont large dairy farm which has a herd average of 18,570 pounds of milk per cow. The farm grows 137 acres of silage, 37 acres of alfalfa, 29 acres of hay, and 82 acres of haylage. The farm generates about 89 percent of its revenue from milk sales.
- NYCM** a 100 cow Central New York (Cayuga County) moderate size dairy farm which has a herd average of 18,530 pounds of milk per cow. The farm grows 60 acres of silage, 47 acres of haylage and 111 acres of corn for grain. About 85 percent of the farm's gross receipts come from milk sales.
- NYCL** a 175 cow Central New York (Cayuga County) large dairy which has a herd average of 18,530 pounds of milk per cow. The farm grows 99 acres of silage, 99 acres of alfalfa, 117 acres of

alfalfa haylage, 11 acres of haylage, and 89 acres of corn for grain. The farm generates 87 percent of its total receipts from milk sales.

NYWM a 500 cow Western New York (Wyoming County) moderate size dairy farm which has a herd average of 18,530 pounds of milk per cow. The farm grows 432 acres of silage, 229 acres of alfalfa haylage and 118 acres of haylage. About 88 percent of the total revenue on the farm comes from milk sales.

NYWL a 1,000 cow Western New York (Wyoming County) large dairy farm which has a herd average of 18,530 pounds of milk per cow. The farm grows 640 acres of silage and generates about 88 percent of its total receipts from milk sales.

MOMD a 65 cow Southeastern Missouri (Christian County) moderate size dairy farm which has a herd average of 17,500 pounds of milk per cow. The farm grows 97 acres of alfalfa and 121 acres of other hay, and generates about 81 percent of its revenue from milk sales.

MOLD a 200 cow Southeastern Missouri (Christian County) large dairy farm which has a herd average of 18,530 pounds of milk per cow. The farm grows 108 acres of silage, 102 acres of alfalfa, 350 acres of other hay, and 40 acres of alfalfa haylage. About 83 percent of the farm's revenue comes from milk sales.

GAMD a 200 cow Southern Georgia (Spalding County) moderate size dairy farm which has a herd average of 16,470 pounds of milk per cow. The farm grows 107 acres of silage and 116 acres of other hay. The farm generates about 87 percent of the total revenue from milk sales.

FLLD a 1,000 cow South Central Florida (Okeechobee County) large dairy farm which has a herd average of 15,440 pounds of milk per cow. The farm grows 259 acres of silage and 281 acres of other hay. About 89 percent of the farm's total revenue comes from milk sales.

Income and Growth Prospects

The results in terms of income and growth prospects are, perhaps, best reviewed in terms of the concepts of net cash income and the real change in net worth defined as follows:

- Net cash income includes all receipts from milk, livestock and crops sold, including any applicable government payments less all cash expenses. Out of net cash income, the farmer must pay family living, principal payments, cost of capital replacement, and state and/or federal income taxes.
- Real change in net worth is the percent change in the present value of ending net worth. It indicates whether the farmer is gaining or eroding equity over the study period, after adjusting for inflation.

Net Cash Income

Table 3 provides detailed data on the simulation results for each of the panel farms over the six year time horizon (1990-1995), utilizing the basic assumptions described previously and the data contained in Table 1. In terms of net income, these results can better be visualized in Figure 2 which presents each farm's net cash income experience over the period 1990-95. It is interesting and important to note that these differences are substantial among the dairies in the level of income as well as in the trend over time. All farms experienced substantial absolute income reduction in 1991 although there was also substantial variation among the dairies. For example, the decline is much more noticeable for the Washington dairies than for the larger California and New Mexico dairies.

Dairies consistently generating substantial net income with only a relatively small decline in 1990 include California, New Mexico and large Central Texas, although the large Wisconsin and large Western New York and large Missouri dairies also indicated superior income level and stability. It is important to note that all of these are large dairies in the context of the farm sizes in their region.

Yet, farm size alone does not guarantee a high and stable net cash income. For example, the Florida dairy with 1,000 cows experiences sharp income declines without recovery. This is also the case for the 186 cow Vermont dairy.

Three of the moderate size dairies (East Texas, Vermont, Georgia) fail to cash-flow after the 1990 milk price drop. Only the Wisconsin and Missouri moderate size dairies do comparatively well.

Table 3. Implications of the 1990 Farm Bill and FAPRI January 1992 Baseline on Panel Farms that Produce Milk.

	WAMD	WALD	CALD	NMLD	TXCM	TXCL	TXEM	TXEL
Probability of Lower Real Equity (%)	100.0	0.0	0.0	0.0	50.0	0.0	100.0	2.0
Average Change in Real Net Worth (%)	-35.39	30.77	57.69	94.79	-0.98	145.96	-45.89	25.96
Average Annual Ratio of Expenses to Receipts (%)	96.97	85.69	78.64	77.38	88.96	77.06	100.75	89.44
Average Present Value Ending Net Worth (\$1000)	343.36	2655.73	7881.40	7495.79	739.71	2721.52	287.01	2165.25
Average Annual Cash Receipts (\$1000)	465.62	2456.00	5389.48	4915.79	684.55	1924.63	439.71	2070.36
Average Annual Cash Expenses (\$1000)	451.39	2103.94	4238.41	3803.87	608.81	1482.77	442.77	1850.84
Average Annual Net Cash Income (\$1000)	14.24	352.06	1151.08	1111.92	75.74	441.87	-3.06	219.51
Coefficient of Variation Net Cash Income (%)	62.12	13.23	6.62	5.66	23.68	9.27	-453.93	27.19
Average Cash Receipts (\$1000)								
1990	486.16	2562.93	5648.55	5083.49	705.26	1986.52	460.52	2145.68
1991	439.66	2322.00	5125.66	4691.01	651.89	1825.23	418.93	1970.03
1992	445.27	2352.02	5186.72	4749.88	663.21	1859.16	421.08	1985.76
1993	462.31	2439.88	5339.52	4899.10	682.88	1918.12	437.47	2066.64
1994	475.34	2505.54	5470.46	5000.41	695.03	1956.71	447.32	2112.36
1995	485.00	2553.61	5565.98	5070.87	709.02	2002.06	452.92	2141.66
Average Net Cash Income (\$1000)								
1990	50.04	444.97	1104.26	1138.49	91.34	453.18	34.63	272.12
1991	11.78	285.63	1050.43	1055.94	62.94	389.25	-6.36	147.91
1992	0.10	276.17	1116.66	1065.02	65.98	404.73	-12.94	157.42
1993	11.36	354.20	1210.90	1138.93	82.02	456.49	-5.18	234.41
1994	10.30	383.28	1223.69	1149.53	79.47	467.98	-8.56	255.25
1995	1.84	368.10	1200.52	1123.63	72.69	479.57	-19.96	249.96

Probability of Lower Real Equity - Chance that the farm will experience a decrease in net worth after adjusting for inflation.

Change in Real Net Worth - Percentage change in real net worth over the simulation period, 1990-1995.

Average Annual Ratio of Expenses to Receipts - Ratio of all cash expenses to all farm receipts including government payments.

Present Value Ending Net Worth - Discounted value of net worth in the last year simulated.

Annual Cash Receipts - Total cash receipts from crops, dairy, livestock, government payments, and other farm related activities.

Annual Cash Expenses - Total cash costs for crops, dairy, and livestock production, including interest costs and fixed cash costs; excludes depreciation.

Annual Net Cash Income - Total cash receipts minus total cash expenses; excludes family living expenses, principal payments, and costs to replace capital assets.

Coefficient of Variation for Annual Net Cash Income - The relative variation in net cash farm income expressed as a percent for comparing relative risk across farms.

Table 3. Continued.

	WIMD	WILD	VTMD	VTLD	NYCM	NYCL	NYWM	NYWL
Probability of Lower Real Equity (%)	24.0	0.0	100.0	58.0	100.0	0.0	68.0	0.0
Average Change in Real Net Worth (%)	2.15	26.80	-49.22	-1.24	-14.37	14.57	-4.32	60.63
Average Annual Ratio of Expenses to Receipts (%)	57.81	69.71	106.47	87.00	85.42	79.26	91.44	74.58
Average Present Value Ending Net Worth (\$1000)	313.63	984.03	267.63	841.35	477.93	802.79	1538.08	4572.52
Average Annual Cash Receipts (\$1000)	121.24	476.75	160.85	512.73	284.80	485.44	1374.19	2741.81
Average Annual Cash Expenses (\$1000)	70.07	332.26	171.21	445.99	243.17	384.61	1256.11	2044.23
Average Annual Net Cash Income (\$1000)	51.17	144.49	-10.36	66.75	41.63	100.83	118.08	697.58
Coefficient of Variation Net Cash Income (%)	3.86	5.01	-25.00	12.11	13.45	10.70	24.86	8.24
Average Cash Receipts (\$1000)								
1990	126.12	491.60	166.74	529.14	292.68	501.00	1418.78	2858.84
1991	114.89	448.73	152.93	485.51	268.56	459.62	1299.71	2593.84
1992	117.03	461.08	155.27	494.43	275.15	468.11	1323.84	2635.37
1993	120.75	476.23	160.08	510.60	285.14	484.29	1372.22	2728.03
1994	123.58	488.67	163.48	522.75	290.73	495.19	1402.03	2791.11
1995	125.05	494.18	166.60	533.97	296.55	504.41	1428.57	2843.66
Average Net Cash Income (\$1000)								
1990	55.46	168.00	12.20	100.29	58.22	126.43	244.12	891.76
1991	47.19	130.55	-2.51	62.45	35.40	86.28	123.69	669.05
1992	49.88	134.57	-10.64	52.94	37.38	89.89	63.78	594.36
1993	51.40	143.93	-12.24	64.13	44.22	100.28	108.23	686.85
1994	50.85	146.74	-20.32	62.58	41.31	103.84	98.34	688.84
1995	52.22	143.13	-28.67	58.09	33.23	98.26	70.31	654.59

Probability of Lower Real Equity - Chance that the farm will experience a decrease in net worth after adjusting for inflation.

Change in Real Net Worth - Percentage change in real net worth over the simulation period, 1990-1995.

Average Annual Ratio of Expenses to Receipts - Ratio of all cash expenses to all farm receipts including government payments.

Present Value Ending Net Worth - Discounted value of net worth in the last year simulated.

Annual Cash Receipts - Total cash receipts from crops, dairy, livestock, government payments, and other farm related activities.

Annual Cash Expenses - Total cash costs for crops, dairy, and livestock production, including interest costs and fixed cash costs; excludes depreciation.

Annual Net Cash Income - Total cash receipts minus total cash expenses; excludes family living expenses, principal payments, and costs to replace capital assets.

Coefficient of Variation for Annual Net Cash Income - The relative variation in net cash farm income expressed as a percent for comparing relative risk across farms.

Table 3. Continued.

	MOMD	MOLD	GAMD	FLLD
Probability of Lower Real Equity (%)	0.0	0.0	100.0	48.0
Average Change in Real Net Worth (%)	13.70	18.06	-67.42	-0.18
Average Annual Ratio of Expenses to Receipts (%)	69.66	75.71	103.48	93.54
Average Present Value Ending Net Worth (\$1000)	302.94	1134.28	163.87	3415.68
Average Annual Cash Receipts (\$1000)	180.52	577.24	544.41	2793.08
Average Annual Cash Expenses (\$1000)	125.73	436.96	563.34	2612.62
Average Annual Net Cash Income (\$1000)	54.80	140.28	-18.93	180.46
Coefficient of Variation Net Cash Income (%)	5.15	5.31	-34.50	28.10
Average Cash Receipts (\$1000)				
1990	187.57	599.34	558.96	2853.00
1991	172.11	548.50	516.62	2656.48
1992	174.55	557.35	527.16	2706.42
1993	179.26	572.62	543.02	2794.38
1994	183.42	587.31	554.88	2845.15
1995	186.22	598.30	565.83	2903.05
Average Net Cash Income (\$1000)				
1990	67.17	177.42	34.41	340.40
1991	53.16	129.21	-7.20	156.87
1992	48.19	126.50	-26.98	115.57
1993	52.96	135.15	-19.97	166.91
1994	54.73	137.63	-37.65	175.58
1995	52.55	135.76	-56.17	127.43

Probability of Lower Real Equity - Chance that the farm will experience a decrease in net worth after adjusting for inflation.

Change in Real Net Worth - Percentage change in real net worth over the simulation period, 1990-1995.

Average Annual Ratio of Expenses to Receipts - Ratio of all cash expenses to all farm receipts including government payments.

Present Value Ending Net Worth - Discounted value of net worth in the last year simulated.

Annual Cash Receipts - Total cash receipts from crops, dairy, livestock, government payments, and other farm related activities.

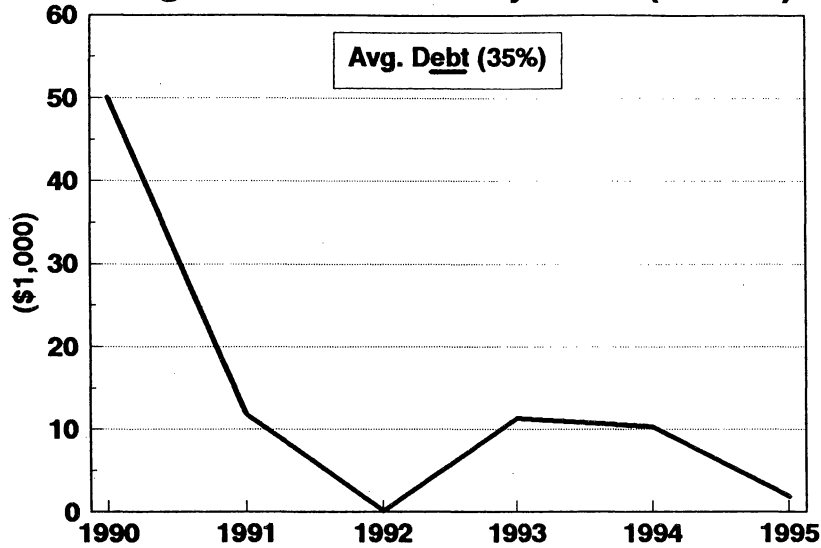
Annual Cash Expenses - Total cash costs for crops, dairy, and livestock production, including interest costs and fixed cash costs; excludes depreciation.

Annual Net Cash Income - Total cash receipts minus total cash expenses; excludes family living expenses, principal payments, and costs to replace capital assets.

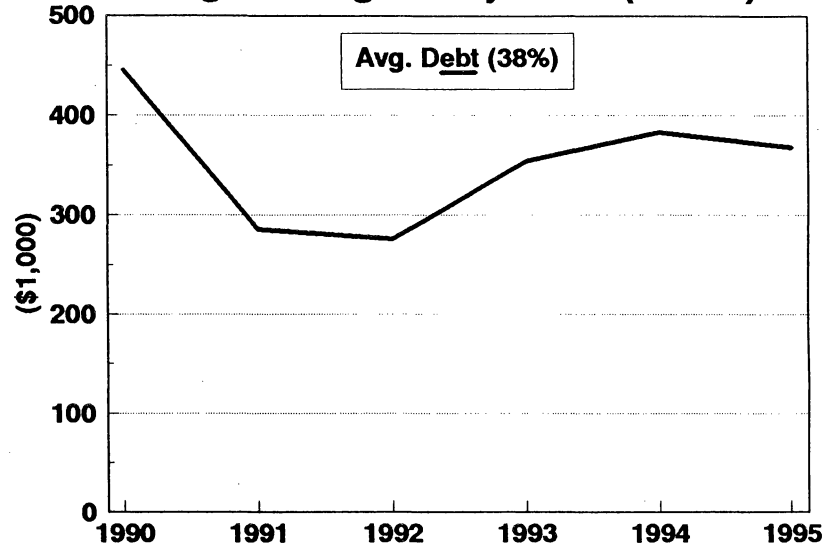
Coefficient of Variation for Annual Net Cash Income - The relative variation in net cash farm income expressed as a percent for comparing relative risk across farms.

Figure 2. Net Cash Income on Representative Dairy Farms

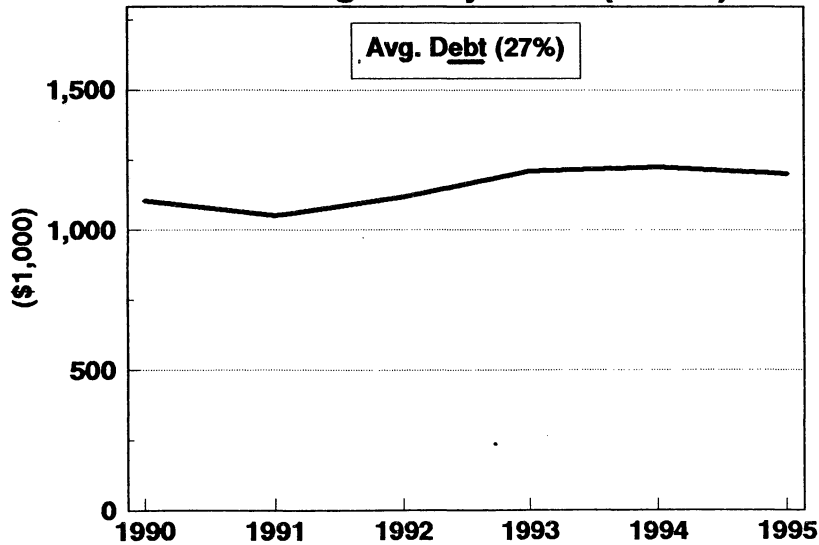
Washington Moderate Dairy Farm (WAMD)



Washington Large Dairy Farm (WALD)



California Large Dairy Farm (CALD)



New Mexico Large Dairy Farm (NMLD)

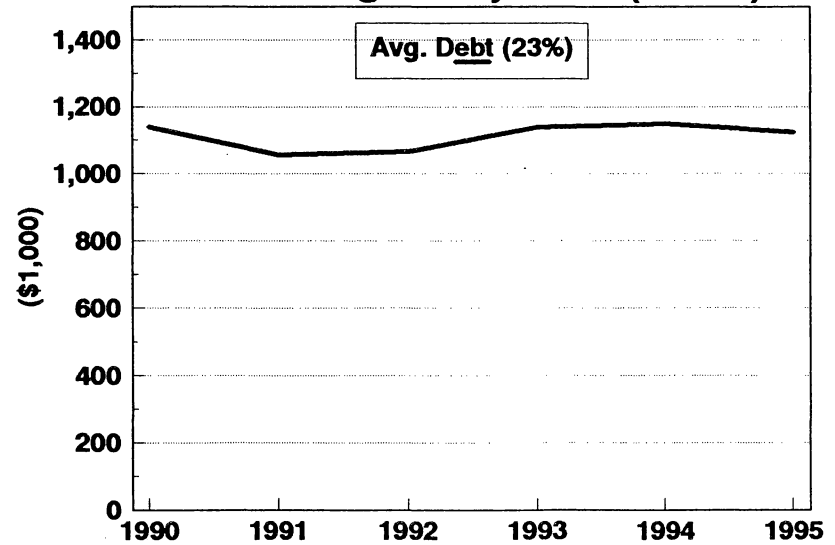
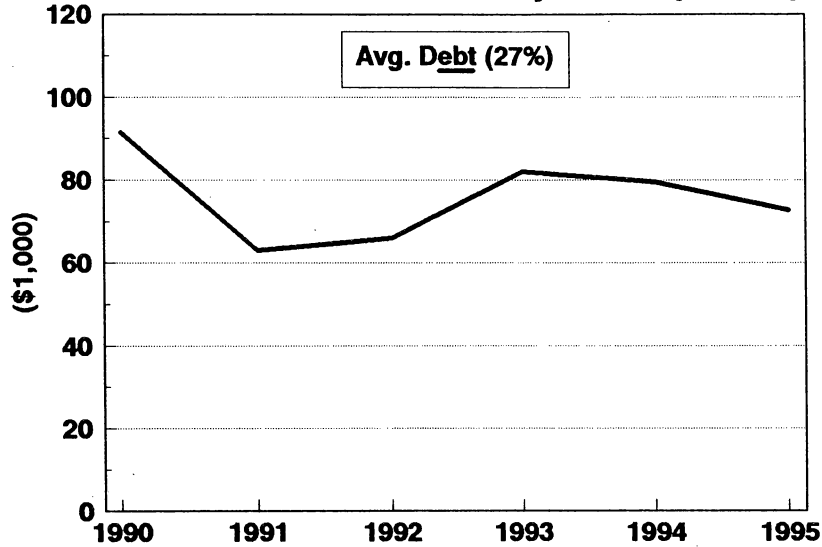
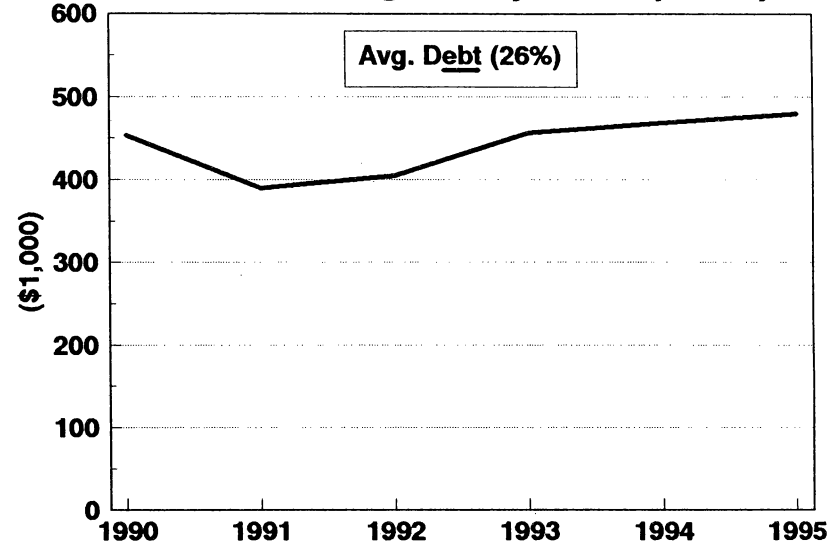


Figure 2. Net Cash Income on Representative Dairy Farms - continued

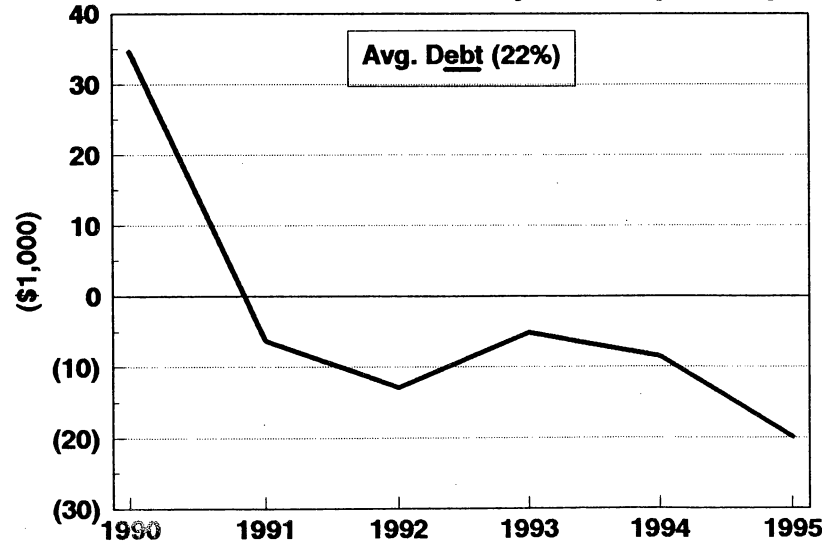
Central Texas Moderate Dairy Farm (TXCM)



Central Texas Large Dairy Farm (TXCL)



East Texas Moderate Dairy Farm (TXEM)



East Texas Large Dairy Farm (TXEL)

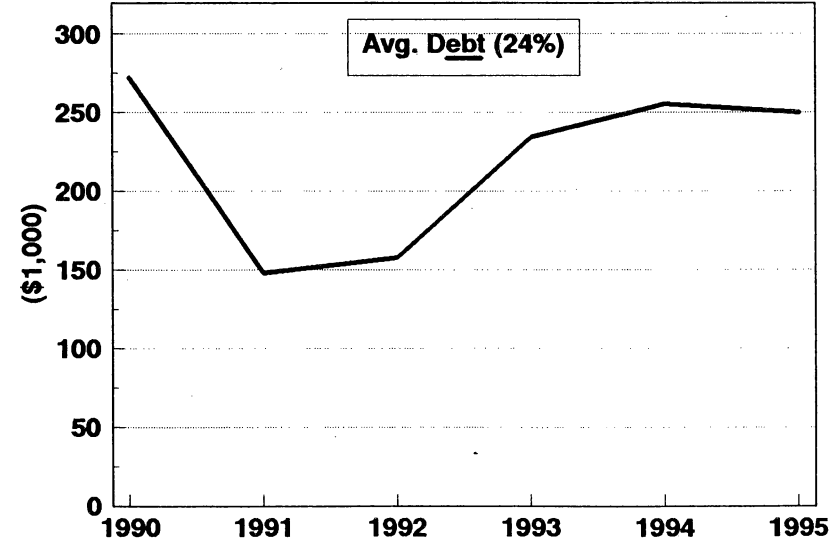


Figure 2. Net Cash Income on Representative Dairy Farms - continued

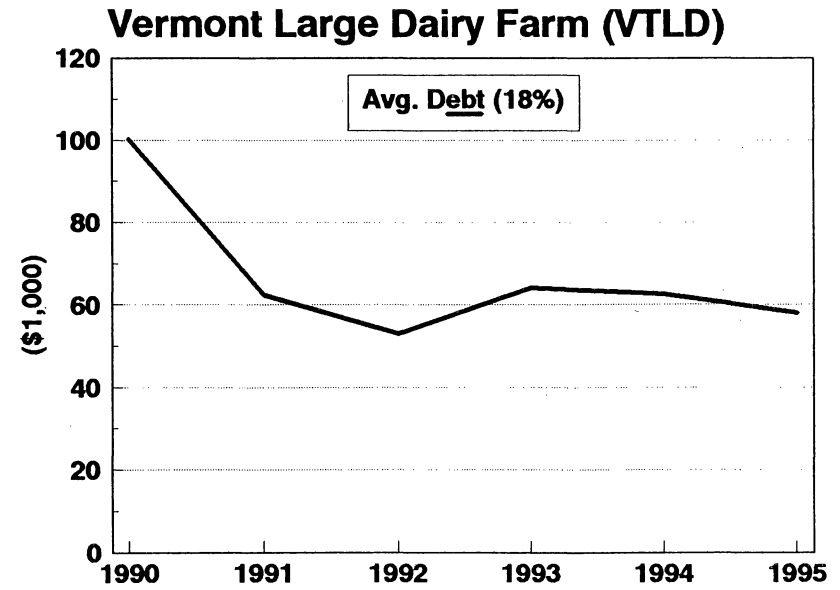
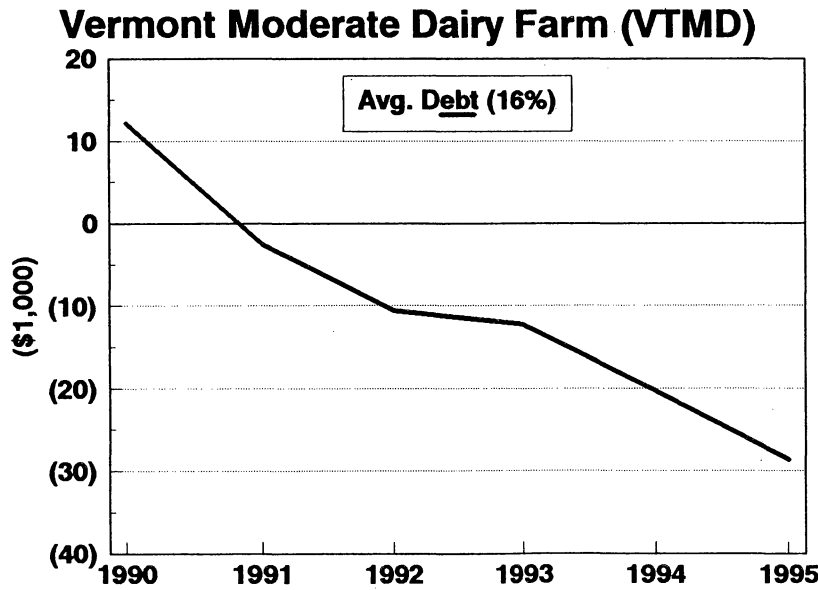
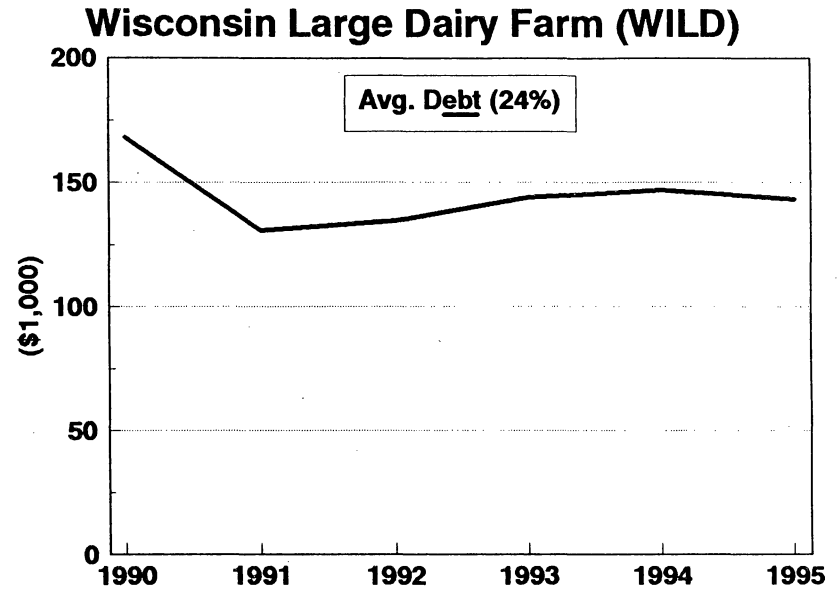
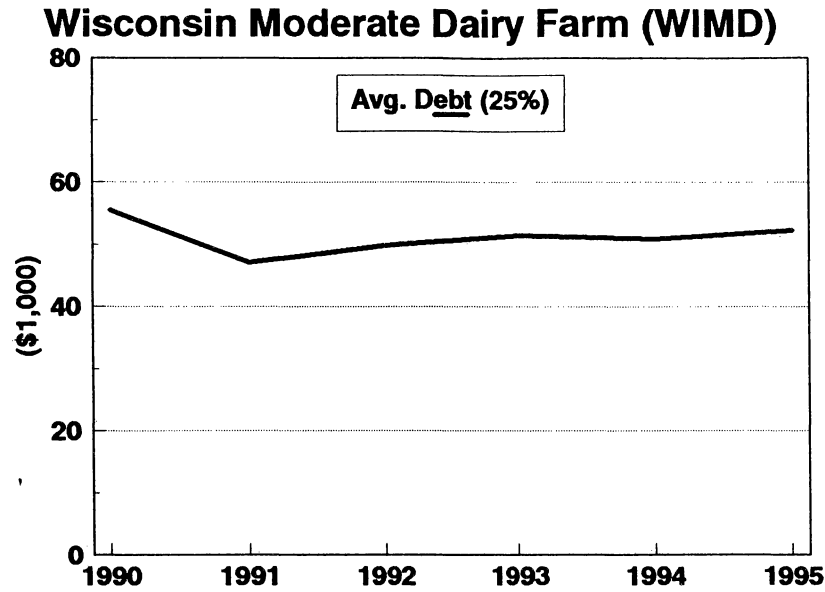
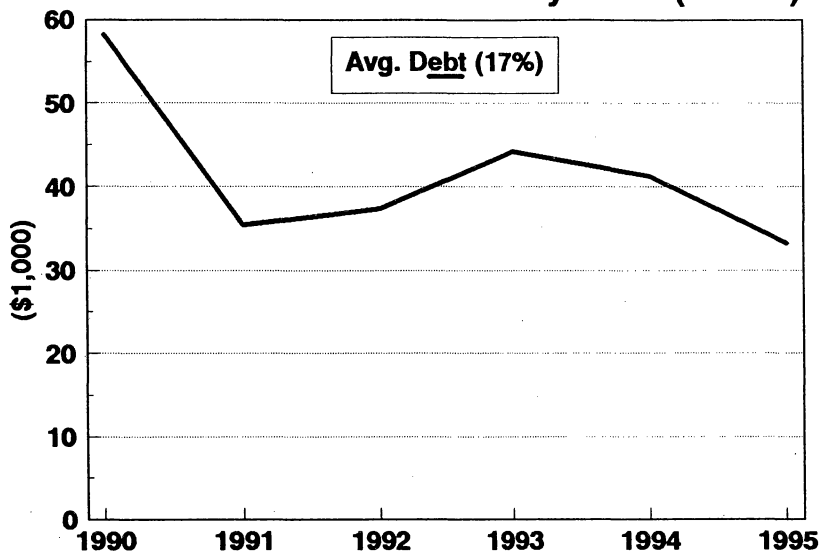
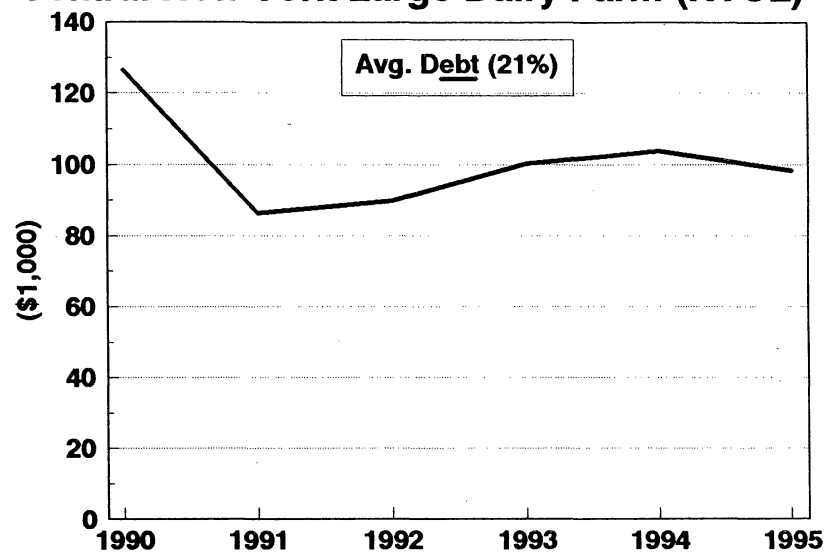


Figure 2. Net Cash Income on Representative Dairy Farms - continued

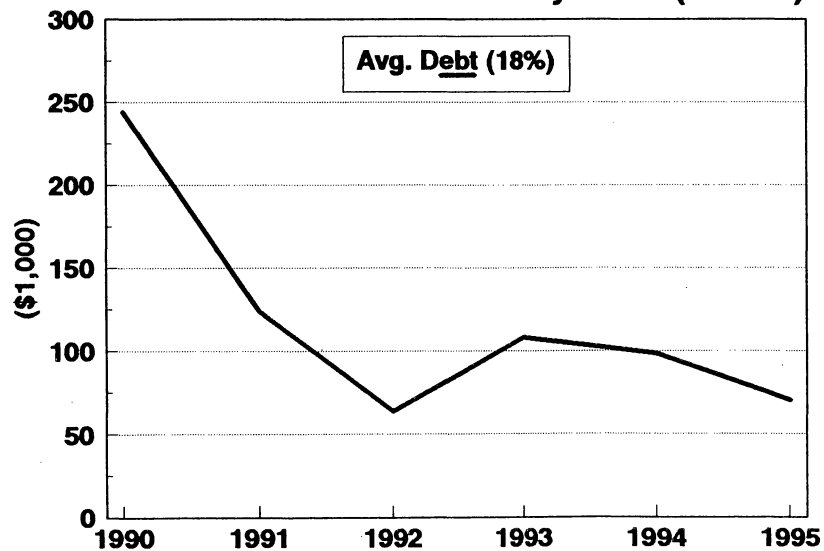
Central New York Moderate Dairy Farm (NYCM)



Central New York Large Dairy Farm (NYCL)



Western New York Moderate Dairy Farm (NYWM)



Western New York Large Dairy Farm (NYWL)

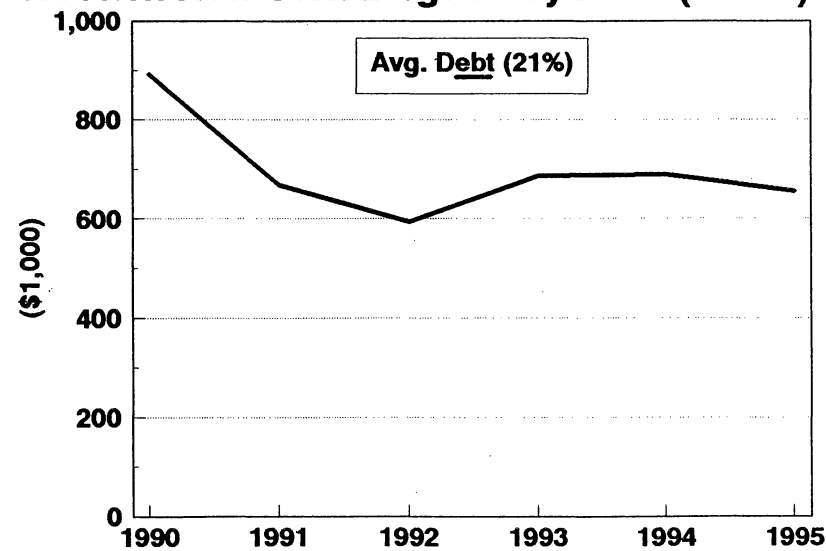
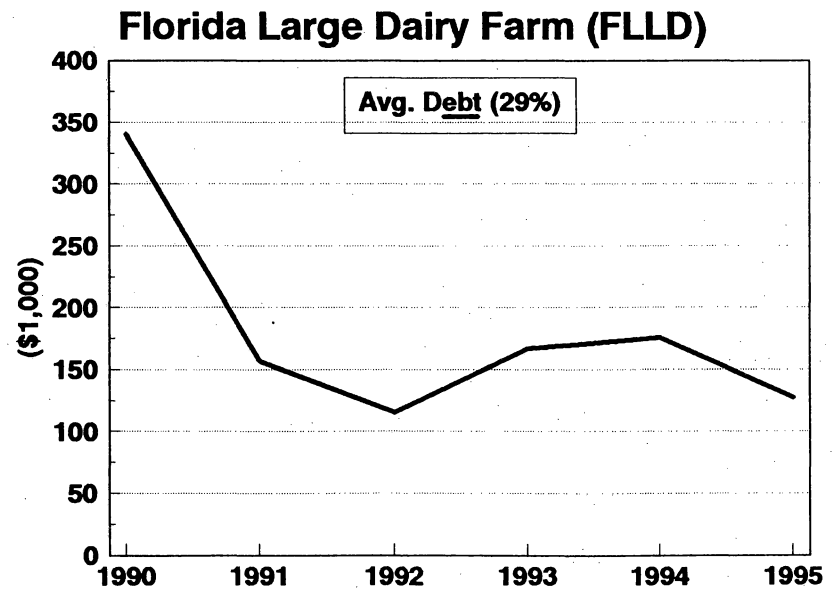
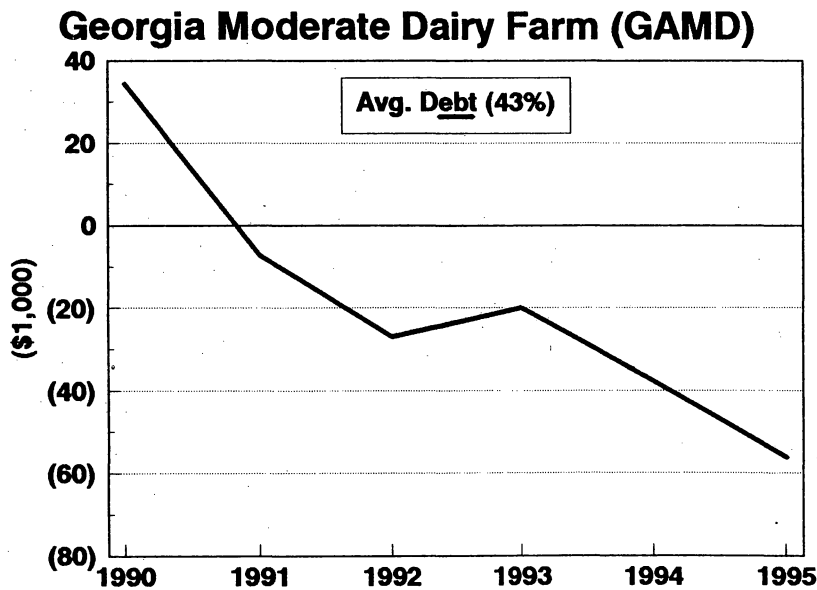
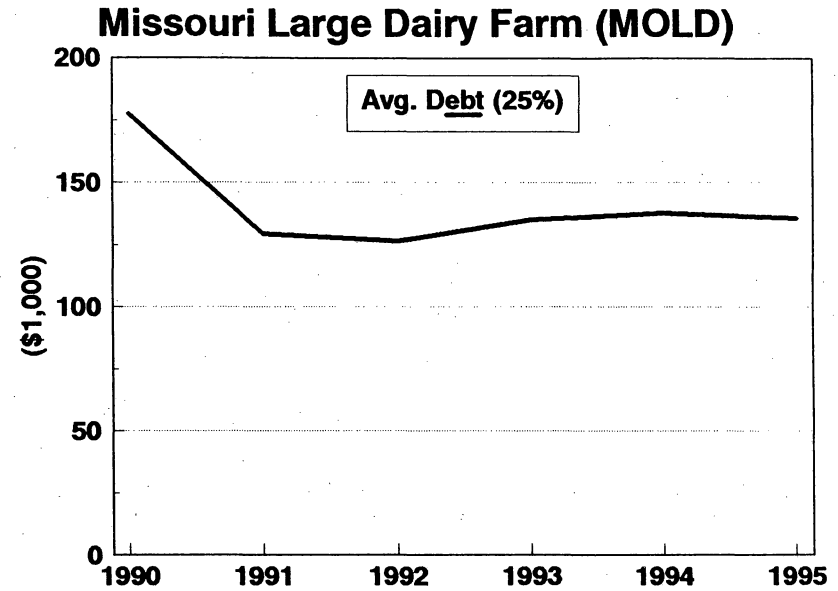
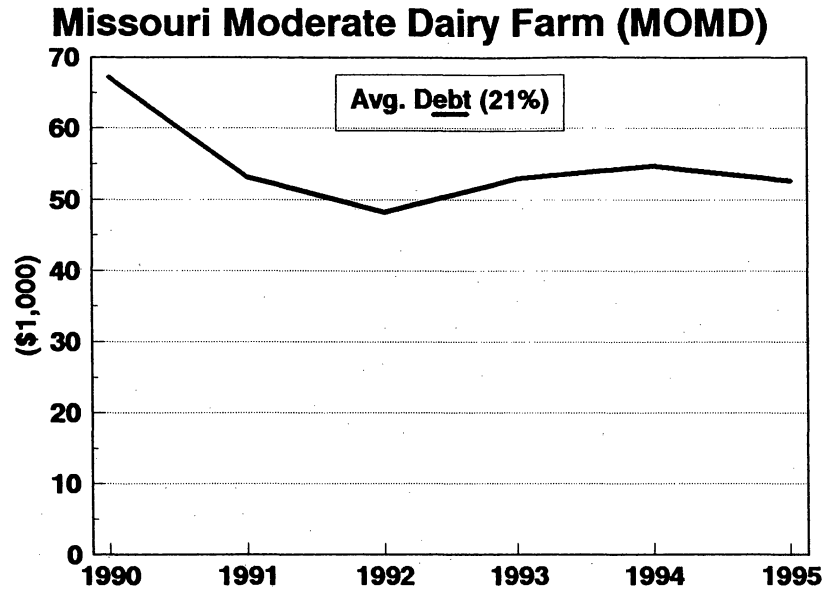


Figure 2. Net Cash Income on Representative Dairy Farms - continued



Real Change in Net Worth

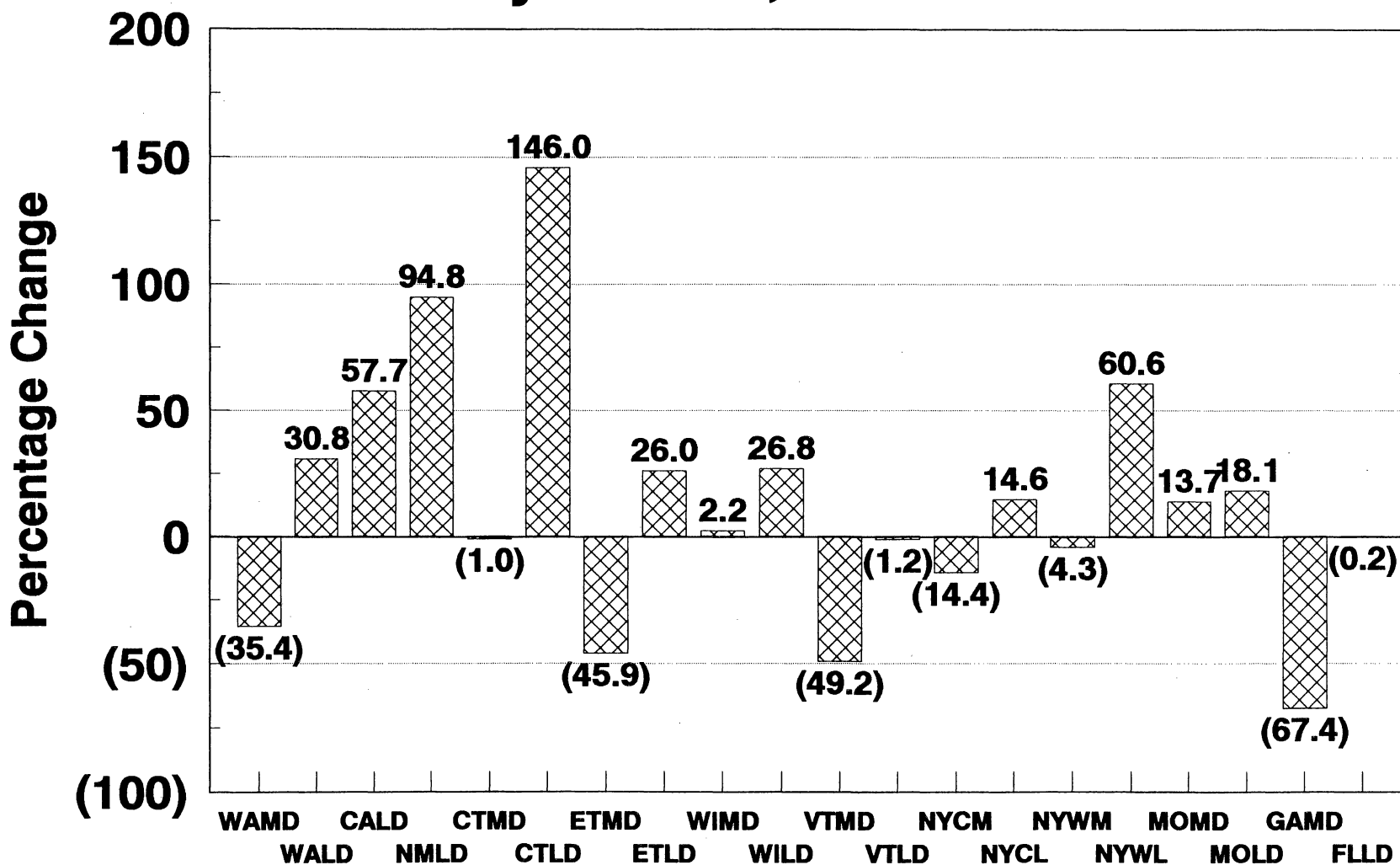
These results are better visualized in Figure 3 which indicates the percent change in real net worth over the period 1990-95. This value indicates whether the farm operation is contributing to the owner's capital formation, thus providing the basis for future growth, or drawing on capital; thus suggesting a declining equity situation or a change in farm structure.

The results reflect continued incentives for growth in milk production throughout the Southwest, including California, New Mexico, and Central Texas. A declining economic situation is suggested for the Southeast and New England. This result is significant in light of policy proposals which would reduce the distance differential in milk prices, thus lowering Federal milk marketing order prices in the South and the Northeast.

The most pervasive change indicated by the results in Figure 3 is a continuing shift toward fewer but larger dairies. Without exception, the large farms experienced greater growth in net worth than the moderate size farms in their local area. In five of nine regions where both moderate and large farm data was available, large farms gained equity capital while the moderate size farms lost capital. While it is not fair to argue that expansion of herd size is *the key* to success in dairying, it is certainly one of the keys. There is substantial evidence contained in the data in Tables 2 and 3 which indicate that larger farms are able to generate a higher output per cow than their moderate size counterparts. This was true of six of the nine regions where there were both moderate and large representative farms. Overall, increased output per cow appears to be at least as important a key to success as size of farm.

There is also some evidence in the representative farm results which suggests that the most successful dairies specialize in milk production -- placing no more emphasis on crop production other than what is necessary to deal with issues of waste disposal. Except in Central New York, the large farms invariably had fewer crop acres per cow than the moderate size farms. All of the farms experiencing more than 50 percent growth in net worth (CA, NM, TXCL, and NYWL) farm less than one cropland acre per cow, with two of the four (CA and TXCL) having no cropland. Of the farms experiencing more than 20 percent

Figure 3. Real Change in Net Worth for All Dairy Farms, 1990-1995.



growth in equity, only the large Wisconsin dairy farmed more than one cropland acre per cow. It would appear that money is made in milk and associated livestock sales, not in crops which are fed to cows.

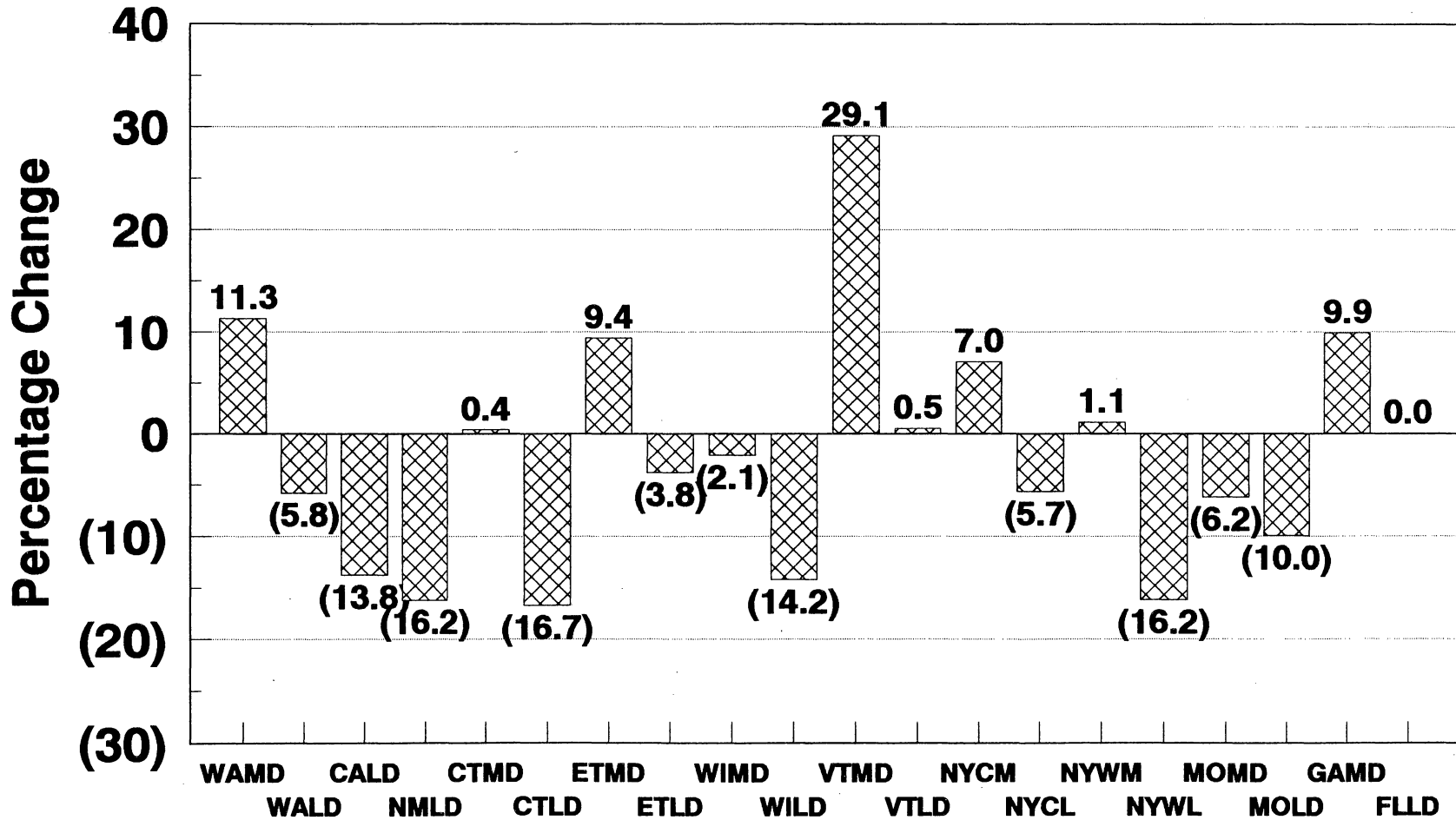
Dairy Policy

Suppose that one of the major goals of dairy policy was to raise the price of milk sufficiently that all of the representative farms could maintain their net worth. How much would the milk price support need to be increased? This question is answered in Figure 4. For all except the small Vermont farm, the price of milk would need to be increased by no more than 12 percent. For the small Vermont farm, it would take 29.1 percent. On the other side of the coin, six of the farms could withstand a 10 percent reduction in receipts and still maintain equity.

These results point up one of the major dilemmas of dairy policy. If milk receipts were increased, there would likely be significant accumulations of wealth on the larger and apparently more efficient farms within each region. While, as indicated previously, the dairy industry is presently in a relative supply-demand balance, except for butterfat, such a policy change would surely attract new capital investments including both the expansion of existing herds and new dairy farmers. The central problem facing the Congress and the Administration on dairy policy is to strike a balance among the very diverse segments of the dairy industry.

Pricing policy is not the only means of striking this balance. Alternatives to pricing policies include policies which facilitated the gradual adjustment of resources out of dairying and those that provide dairy the opportunity to be competitive by improving the efficiency of their operations. The latter option basically involves assistance in improving the quality of management, and on the ability to attract the capital necessary to accommodate the latest technology.

Figure 4. Annual Percentage Change in Receipts Needed to Maintain Real Net Worth from 1990 to 1995: Dairy Farms



Dairy Farms

Washington

Facilitator

Mr. David C. Grusenmeyer - Extension Dairy Agent, Bellingham, Washington

Panel Participants

Mrs. Star Hovander

Mr. & Mrs. Ron and Linda Bronsema

Mr. Keith Boon

Mr. Dave Buys

Mr. Rod DeJong

Mr. Duane Vander Griend

Mr. Dick Bengen

Mr. Jim Heeringa

Mr. Ed Pomeroy

Mr. & Mrs. Pete and Shelli DeJager

Mr. Greg McKay

Mr. & Mrs. Dale and Gina DeVries

California

Facilitators

Dr. Bees Butler - Agricultural Economist, University of California - Davis

Mr. Jim Grubele - Dairyman's Cooperative Creamery, Tulare, California

Panel Participants

Mr. Dave Ribeiro

Mr. John Zonneveld

Mr. Bill Van Beek

New Mexico

Facilitators

Mr. Alfred Gonzales - El Paso County Agricultural Extension Agent

Mr. Bob Smith - Associated Milk Producers, Inc., Amarillo, Texas

Mr. Mike Tallmon - Associated Milk Producers, Inc., Canutillo, Texas

Dr. Tom McGuckin - Associate Professor of Economics, New Mexico State University

Panel Participants

Mr. Von Hilburn

Mr. Joe Gonzales

Mr. Rick Silva

Mr. Steve Marasovich

Texas Erath County

Facilitators

Mr. Sonny Pride - Associated Milk Producers, Inc., Arlington, Texas

Mr. John Cowan - Associated Milk Producers, Inc., Arlington, Texas

Mr. Joe Pope - Erath County Agricultural Extension Agent

Dr. Robert Schwart - Dairy Economist, Texas Agricultural Extension Service, Texas A&M University

Panel Participants

Mr. Bryan Parrish

Mr. Larry Ricks

Mr. Von Scott

Mr. Jack Parks

Mr. S.L. Fine

Mr. J.M. Howle, Jr.

Mr. R.J. Kerr

Mr. Dan Paxton

Mr. Larry Dee Gibson

Texas Hopkins County

Facilitators

Dr. Robert Schwart - Dairy Economist, Texas Agricultural Extension Service, Texas A&M University

Mr. Raymond Haygood - Associated Milk Producers, Inc., Sulphur Springs, Texas

Panel Participants

Mr. E.G. Durgin

Mr. Hershel Kelsoe

Mr. Al Minter

Mr. Doyle Wood

Mr. Mike Hoybook

Mr. Dan Humphrey

Mr. Dwight Alexander

Missouri

Facilitator

Mr. Ron Young - Christian County Dairy Specialist, Ozark, Missouri

Panel Participants

Mr. John Mallonee

Mr. & Mrs. Doug and Marcia Ower

Mr. & Mrs. Ray and Margaret Schooley

Mr. & Mrs. David and Kathie Heds

Mr. & Mrs. Phil and June Barnhart

Mr. & Mrs. Freddie and Mary Mar

Mr. John Atkinson

Mr. Wayne Whitehead

Georgia

Facilitator

Dr. Dale H. Carley - Professor, Dept. of Agricultural Economics, University of Georgia

Panel Participants

Mr. Lamar Anthony

Mr. Bud Wiley

Mr. Everett Williams

Mr. Bud Butcher

Florida

Facilitator

Dr. Dan Webb - Extension Dairy Scientist, University of Florida

Panel Participants

Mr. Rick Dressel

Mr. John Peachey

Mr. Charles Williams

Wisconsin

Facilitators

Mr. Jeff Key - Winnebago County Agricultural Extension Agent

Dr. Gary Frank - Extension Farm Management Specialist, University of Wisconsin

Panel Participants

Mr. John Lenz

Mr. Joe Bonlender

Mr. Larry Engel

Mr. Pete Van Wychen

Mr. Ronald Miller

Mr. Doug Hodorff

Mr. Pete Knigge

Mr. Fred Kasten

Mr. Edwin Davis

Mr. Jerome Schmidt

Mr. Dean Hughes

Mr. Terry Madigan

Western New York

Facilitator

Dr. Wayne Knoblauch - Professor, Dept. of Agricultural Economics, Cornell University

Panel Participants

Mr. Gary Van Slyke
Mr. Willard DeGolyer
Mr. George Mueller
Mr. Dale Van Erden

Mr. Dick Popp
Mr. Bill Fitch
Mr. Mark Smith

Central New York

Facilitator

Dr. Wayne Knoblauch - Professor, Dept. of Agricultural Economics, Cornell University

Panel Participants

Mr. Gary Mutchler
Mr. Bill Head
Mr. David Shurtleff
Mr. and Mrs. Tom Brown

Mr. Ron Space, Jr.
Mr. Mike Learn
Mr. Leonard Kimmich

Vermont

Facilitators

Dr. Stu Gibson - Extension Dairy Specialist, University of Vermont

Dr. Chris Woelfel - Dairy Specialist, Texas Agricultural Extension Service, Texas A&M University

Panel Participants

Mr. Steve Hurd
Mr. Steven Jones
Mr. Richard Hall
Mr. John Osha
Mr. Tim Bisson
Mr. Ray Bisson
Mr. Kim Harvey

Mr. David Conant
Mr. Dave Tooley
Mr. Stanley Scribner
Mr. Albert Neddo
Mr. Paul Gingue
Mr. Paul Miller

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