January 1983 A.E. Res. 83-2

DAIRY MANAGEMENT PRACTICES AND NEW YORK DAIRY FARM INCOMES 1981

C.A. Bratton

Department of Agricultural Economics
Cornell University Agricultural Experiment Station
New York State College of Agriculture and Life Sciences
A Statutory College of the State University
Cornell University, Ithaca, New York, 14853

It is the policy of Cornell University actively to support equality of educational and employment opportunity. No person shall be denied admission to any educational program or activity or be denied employment on the basis of any legally prohibited discrimination involving, but not limited to, such factors as race, color, creed, religion, national or ethnic origin, sex, age or handicap. The University is committed to the maintenance of affirmative action programs which will assure the continuation of such equality of opportunity.

DAIRY MANAGEMENT PRACTICES AND NEW YORK DAIRY FARM INCOMES, 1981

C. A. Bratton

Foreward

This publication is part of a study supported by a special grant to the Agricultural Experiment Station at Cornell University by Agway, Inc., of Syracuse, New York.

Dairy management practices are one area of factors that affect dairy farm incomes. Data available from the New York dairy herd improvement records and the farm business management projects at Cornell have been merged since 1974 and used to study the effects of dairy management practices on farm incomes and related factors.

The 1981 report is similar to the studies done for the years 1974 through 1980.* Special factors examined for 1981 include somatic sell count, age and education of the operators, acres of grain corn per cow, value of crop production, and registered versus grade herds.

The author wishes to acknowledge the encouragement given by Dr. Lewellyn S. Mix of Agway to pursue the investigation and publish the findings related to dairy management practices and the apparent effects on the incomes from New York dairy farm businesses. Edward J. Underwood, a student in the College of Agriculture and Life Sciences at Cornell, did the statistical work on the 1981 data.

---

*Results from the earlier years are available in Cornell Agricultural Economics Staff Paper 75-27; A.E. Res. 77-20; A.E. Res. 78-19; A.E. Res. 79-5; A.E. Res. 79-14; A.E. Res. 80-1; A.E. Res. 81-2; and A.E. Res. 82-13.

TABLE OF CONTENTS

Introduction

Dairy farm incomes are affected by many things. Farm management studies have identified general factors such as size, rates of production, labor efficiency, capital efficiency, and cost control as being related to farm incomes. In addition there are many practices which affect or determine these "general" management factors. Dairy and crop management practices which affect rates of production and cost control are examples.

Computer technology has added new dimensions to farm management studies. Computer facilities have made it possible to expand the kind and amount of information available to dairyfarmers from their dairy herd improvement (DHI) production records. Likewise, farm business management summaries have been expanded since computer programs have been developed to summarize and analyze the data. These changes have brought new management "tools" to dairyfarmers.

The first project to merge for analysis purposes the DHI dairy management practice information with the farm management business summary information was initiated in 1974. The project proved to be workable and the procedure has been repeated each year since.

Purpose of the Study

The purpose of this study was to observe the relationships of dairy management practices to rate of production and dairy farm incomes. Selected dairy and crop practices were examined in relationship to the farm business as a unit. In short, the study aimed to determine how the dairy and crop management practices affect or are related to the incomes of operating dairy farms in New York State.

Methodology

Two sources of management information for individual dairy farm operations were merged on computer tapes for analysis purposes. The sources merged were the farm management business records (FBR) and the dairy herd improvement (DHI) records.

A computer listing was made of the 1981 dairy farm business records summarized by the Department of Agricultural Economics which indicated they had dairy production records. This list was matched with the DHI records available in the Department of Animal Science. Selected information from the DHI records was merged with the business management data for each farm. Computer programs were used to sort the data according to various groupings and average values for all factors in the group were computed. Highlights from these data are presented in this report in cross tabulation tables.

Definitions of Measures Used

Selected measures used in the farm business summaries and the dairy herd improvement records are defined below.

Labor and management income per operator reflects the dollar return to the farmer-operator for his time, knowledge, and skills in operating the farm business unit. For calculation details, see Cornell's A.E. Res. 82-24.

Labor and management income per cow is the total return to the operator(s) of the farm divided by the average number of cows.

Milk sold per cow is the total pounds of milk sold for the year divided by the average number of cows.

Milk sold per worker is the total pounds of milk sold for the year divided by the worker equivalent for the year.

Average number of cows measures herd size and is the 12 month average of the milk cows reported monthly in the farm business records.

Number of cows per worker is calculated by dividing herd size by the worker equivalent. This includes all persons working on the farm.

Age of operator is reported for all operators but for studying the effects of age on the business, only the "individual" operators are included (partnerships and corporations are excluded).

Education of operator is the year of formal schooling completed.

Milk produced per cow is the total pounds of milk produced by each cow as computed from the 12 monthly dairy herd improvement sample weights. The herd average was used in this study for all dairy management practices.

Butterfat test is the herd average for the 12 monthly dairy herd improvement samples tested.

Concentrates fed is the yearly average pounds of concentrates fed per cow in the herd. The DHI supervisor records the pounds of concentrates fed each month and these are aggregated for the yearly figures.

The percent net energy figures are calculated for concentrates, succulents (silages), dry hay, and pasture. It reflects the relative amount of available therms (calories) the cows get from each source.

Body weight of all cows is rounded to the nearest ten pounds. This measure indicates the average weights of all cows in the herd during the year.

Body weight at first calving is rounded to the nearest ten pounds. Weight at first calving is likely to be lower for heifers that calve earlier.

Age at first calving is expressed in months and is recorded by the DHI supervisor. The average age for the herd was used in this study.

Projected minimum calving interval is the herd average of the number of months between calves.

Breedings per conception is the number of times a cow is bred.

Days dry is the number of days a cow is not milked per calving interval.

Percent of days in milk is the number of days milked divided by the number of days on test (usually 365).

Percent leaving the herd is the number of cows leaving the herd for nondairy purposes divided by the herd size.

Age of all cows is the average age in months of all milk cows in the herd during the year. Heifers that have not freshened are not included.

The feeding index equals the reported total net energy fed per cow divided by the "calculated" maintenance and production requirements.

Income over value of feed is the computed value of the milk produced minus the value of all feed fed. Value of feed is calculated by the farmer and DHI supervisor. This measure is based on only one cost variable, namely feed.

Somatic cell count was developed to indicate Mastitis awareness. The count is obtained for each cow for each test period. The measure used here is the average count for the entire herd.

Acres of grain corn per cow is the total acres of corn harvested as grain corn divided by the average number of cows in the herd.

Value of crop production is the estimated value of crops harvested using the average New York farm prices reported by the Crop Reporting Service.

Farms Studied

Cooperators in the farm business management project participated on a voluntary basis. Consequently, the average of the farms in the project tends to be better than the average of all farms in the State. Similarly, cooperators who have DHI records tend to be operating somewhat better than "average farms". A comparison of the farms in the dairy management practice study with all farms in the business management summary for 1981 is shown in Table 1.

The pounds of milk produced per cow by the 362 farms in the 1981 dairy management practices study averaged 15,900 compared with 12,200 pounds per cow reported by the New York Crop Reporting Service for all herds in the State. Similarly, the dairy management practices summary farms sold 14,800 pounds of milk per cow compared with 14,500 for all farms in the business management summaries. In general, the farms included in the dairy management practices summary had considerably better production than the average of all farms in the State and slightly better than all farms in the business summary.

Nearly two-thirds of the farms in the business management summary were in the dairy practices summary group. Farms in the dairy practices group were slightly smaller, 78 cows versus 79. In identifying DHI farms some of the larger ones had two DHI reports on different herds which made it impossible to merge them for this study. In general, the dairy practices group was a reasonable sample of all farms in the business management summary.

Table 1. Comparison of All Farms in The Business Management Summary With Farms in The Dairy Management Practices Summary New York Dairy Farms, 1981

Item	Summary Group	
	Business Management	Dairy Practices
Number of farms	553	362
Operators:		
Average age	40	39
Years of education	12	13
Percent in partnerships or corporations	22%	21%
Barn Type:		
Percent with freestalls	31%	32%
Size of Business:		
Worker equivalent	2.7	2.7
Number of cows	79	78
Number of heifers	59	60
Total tillable acres	257	249
Total capital	$459,761	$460,461
Rates of Production:		
Pounds milk sold per cow	14,500	14,800
Tons hay crops per acre (H.E.)	2.5	2.6
Tons corn silage per acre	14.9	15.0
Labor Efficiency:		
Cows per worker	29	28
Pounds milk sold per worker	415,000	419,100
Capital Uses:		
Total capital per cow	$5,676	$5,756
Farm debt per cow	$2,212	$2,241
Total capital per worker	$164,200	$167,440
Percent equity	64%	64%
Cost Factors:		
Feed bought per cow	$508	$525
Crop expense per cow	$167	$168
Percent feed is of milk sales	26%	26%
Machinery cost per cow	$465	$467
Labor cost per cow	$335	$338
Real estate expense per cow	$148	$150
Total farm expense per cow	$2,351	$2,387
Cost per cwt. producing milk*	$15.88	$15.76
Price:		
Average price per cwt. milk sold	$13.66	$13.66
Income:		
Net cash income per farm	$37,136	$38,094
Net cash income per cow	$470	$488
Labor & management income per operator	$-4,261	$-3,374
Labor & management income per cow	$-67	$-54

*Including a management charge.

Analysis of Farm Business Management Variables

The relationship between production practices and financial or business management measures was examined by sorting for each of the various practices and observing the effects. Background material, such as percent of farms in each group and average herd size in each group, are given to orient the reader. The 1981 data are reported in the tables presented in this publication.

The findings of this study can be used for policy considerations in New York State, for use by individual farmers to compare their performance with that of others, and for showing the basic relationships of dairy management practices to milk sold per cow and to labor and management income per operator and net cash farm income.

Labor and Management Income Per Operator

Labor and management income per operator is the most common measure of success used in studying farm businesses. It is also an indication of the "managerial ability" of the operator since it is the result of his or her skill in combining all elements into a business unit. It measures the operator's ability to "put it all together".

Table 2. Distribution of Labor and Management Income Per Operator By Quintiles and Selected Characteristics of the Farms 362 New York Dairy Farms, 1981

Labor and Management Income Per Operator	Operators		Year End Inventory	Net Cash Farm Income
	Ave. Age	Ave. Number		
(Quintiles)				
1 (low)	41	1.1	$550,175	$22,319
2	40	1.2	456,950	33,020
3 (medium)	42	1.2	348,404	29,165
4	39	1.3	387,746	39,950
5 (high)	35	1.4	558,675	65,618

The 362 farms in the study were sorted into five equal groups (quintiles) according to the labor and management income per operator. In Table 2 the characteristics of the five groups are shown. The low and high income groups were larger farms than the three middle quintiles, as shown by year end inventory and cow number. The low income group, although larger than the three middle groups, had lower net cash farm income. The operators of the high income group were slightly younger than the other groups.

Table 3. Labor and Management Income Per Operator By Quintiles and Related Business Factors 362 New York Dairy Farms, 1981

Labor and Management Income Per Operator	Number of Cows	Pounds of Milk Sold		Total Farm Expenses Per Cow
		Per Cow	Per Worker	
(Quintiles)				
1 (low)	86	14,400	392,000	$2,663
2	69	14,700	406,000	2,519
3 (medium)	60	14,700	379,000	2,353
4	68	15,100	424,000	2,260
5 (high)	104	15,300	478,000	2,293

Farms with the higher labor and management incomes per operator in general had more cows, better rates of production, sold more milk per worker, and had slightly lower total farm expenses per cow. Farms in the low quintile were also above average size (86 cows), but somewhat below average in efficiency factors, and had higher expenses (Table 3).

Operators of the low income farms (low quintile) apparently were not handicapped by size, but were not able to manage effectively all aspects of the operation. They lacked the ability to "put it all together".

The dairy management practices used by the farmers with varying managerial ability as reflected by labor and management income are shown in Table 4. Farms in the high income quintile in general were using the recommended dairy practices. These farms fed more concentrates per cow, obtained a higher percent of net energy from succulents, had fewer days dry, and a smaller percent of cows were leaving the herd.

Table 4. Labor and Management Income By Quintiles and Dairy Management Practices 362 New York Dairy Farms, 1981

Labor & Mgmt. Inc./Oper.	Lbs. Conc. Fed Per Cow	% Net Energy From Succulents	Days Dry	Age First Calving	% Leaving Herd
(Quintiles)					
1 (low)	6,200	40%	63	28	31%
2	5,700	35	62	27	27
3 (medium)	6,000	34	62	27	27
4	5,900	36	63	27	27
5 (high)	6,500	39	60	27	26

The high 20 percent (quintile) of the farms based on income are assumed to be following good practices which in turn are "paying". These might be used as the goal or targets for all managers.

Herd Size (Number of Cows)

Distribution by size of herd was similar for the 362 dairy practices farms and the 553 business management group with the exception of a smaller percentage of farms in the group with under 40 and with 150 and over cows.

Table 5. Distribution of Farms By Herd Size
All Business Summary Farms and Dairy Practices Farms
New York Dairy Farms, 1981

	Summary Group			
	Business Management		Dairy Practices	
Number of Cows	No. Farms	% Farms	No. Farms	% Farms
Under 40	82	15%	48	13%
40 to 54	130	24	87	24
55 to 69	110	20	79	22
70 to 84	74	13	47	13
85 to 99	38	7	25	7
100 to 149	67	12	47	13
150 and over	52	9	29	8

For the 362 dairy practices farms the net cash farm income, which is the difference between the cash receipts and cash expenses, increased as the size of herd increased. 1981 was a year with sizeable minus labor and management incomes per operator except for the 150 and over cow herd size. For the herds with 55 to 149 cows, the larger the herd size the larger the minus labor income per operator. This suggests that when farming pays, the larger the herd the higher the income, but when farming does not pay, the larger the size the larger the loss.

Table 6. Herd Size and Labor and Management Income
362 New York Dairy Farms, 1981

	Number	Net Cash Farm Income		Labor and Management Income	
Number of Cows	of Farms	Per Farm	Per Cow	Per Operator	Per Cow
Under 40	48	$14,170	$417	$-6,592	$-202
40 to 54	87	23,859	497	-5,083	-124
55 to 69	79	34,598	567	- 9	0
70 to 84	47	39,598	514	-4,117	- 67
85 to 99	25	47,353	526	-5,013	- 72
100 to 149	47	51,072	422	-9,470	-107
150 and over	29	98,486	483	7,168	57

The net cash farm income per farm increased as the number of cows increased but the net cash farm income per cow did not. The highest net cash farm income per cow was for the 55 to 69 cow group and the three groups with more than 55 and less than 100 cows had higher per cow net cash income than the larger or smaller herd size categories (Table 6).

Table 7. Herd Size and Related Business Factors
362 New York Dairy Farms, 1981

Number of Cows	Pounds of Milk Sold		Capital	Total Farm
	Per Cow	Per Worker	Per Cow	Expense Per Cow
Under 40	14,200	263,000	$6,254	$2,446
40 to 54	14,400	333,000	6,383	2,366
55 to 69	15,000	379,000	6,009	2,366
70 to 84	15,000	421,000	6,047	2,414
85 to 99	14,800	420,000	6,082	2,475
100 to 149	15,000	473,000	5,461	2,467
150 and over	15,000	573,000	4,923	2,341

Larger herds in general make more efficient use of resources. Labor and capital efficiency as measured by pounds of milk sold per worker and average capital per cow were better on the farms with larger herds. Milk sold per cow and total farm expenses per cow showed no definite relationship with size of herd (Table 7).

The dairy management feeding practices varied with the size of herd. The larger herds fed more pounds of concentrates per cow and obtained a higher percentage of the net energy from succulents. Average days dry tended to be less for the larger herds. Age at first calving and percent leaving the herd showed little differences by herd size (Table 8).

Table 8. Herd Size and Dairy Management Practices
362 New York Dairy Farms, 1981

Number of Cows	Lbs. Concentrates Fed Per Cow	% Net Energy From Succulents	Days Dry	Age First Calving	% Leaving Herd
Under 40	5,500	26%	67	28	27%
40 to 54	5,800	32	64	28	28
55 to 69	6,200	38	60	27	27
70 to 84	6,000	40	61	27	27
85 to 99	6,000	40	61	27	26
100 to 149	6,900	45	58	28	31
150 and over	6,600	46	60	26	30

Size of herd is a major business factor affecting labor and management incomes on dairy farms. In general larger herds pay better when well managed. Larger herds make it possible to use more efficiently overhead inputs such as labor and capital. Another advantage of size is that there are more productive units on which to make a profit in good years, but in years of loss there are more units on which to realize a loss.

This study suggests that size of herd is also related to dairy management practices. Feeding practices varied with size of herd and the breeding and culling practices were just as efficient in the larger herds as in the smaller ones. Average days dry, which is an indicator of good dairy management, was related to the size of the herd.

Milk Sold Per Cow

Business management studies show that milk sold per cow is one of the important variables affecting incomes. It is assumed that the physical measure of milk sold per cow is directly affected by most dairy management practices, so in this study milk sold per cow has been used along with income as a measure to relate to each practice studied.

Table 9. Distribution of Farms by Milk Sold Per Cow
All Business Summary Farms and Dairy Practices Farms
New York Dairy Farms, 1981

	Summary Group			
	Business Management		Dairy Practices	
Milk Sold Per Cow	No. Farms	% Farms	No. Farms	% Farms
Under 12,000	80	14%	27	7%
12,000 to 12,999	48	9	35	10
13,000 to 13,999	96	17	54	15
14,000 to 14,999	117	21	79	22
15,000 to 15,999	109	20	80	22
16,000 to 16,999	52	9	45	12
17,000 to 17,999	28	5	24	7
18,000 and over	23	4	18	5

Farms in the dairy practices group tended to be from the higher producing herds as indicated by the distribution shown in Table 9. Only seven percent of the dairy practices farms sold less than 12,000 pounds of milk per cow compared with 14 percent for the business management farms and 24 percent sold 16,000 or more pounds compared with 18 percent of the business management group. This is logical since DHI records are a management tool for improving production per cow. Only 34 percent of the business summary farms with less than 12,000 pounds sold per cow had DHI records and were included in the dairy practices summary whereas 84 percent of those selling 16,000 or more pounds were in the practices study.

Table 10. Milk Sold Per Cow and Labor and Management Income
362 New York Dairy Farms, 1981

	Net Cash Farm Income		Labor and Management Income	
Milk Sold Per Cow	Per Farm	Per Cow	Per Operator	Per Cow
Under 12,000	$17,090	$311	$- 5,518	$-112
12,000 to 12,999	23,276	302	-14,476	-207
13,000 to 13,999	28,357	368	- 4,906	- 80
14,000 to 14,999	34,472	460	- 5,344	- 90
15,000 to 15,999	49,836	554	703	10
16,000 to 16,999	49,685	606	285	5
17,000 to 17,999	44,664	677	328	6
18,000 and over	53,663	735	- 1,552	- 27

For the 362 farms in this study there was a strong association between milk sold per cow and net cash farm income. The relationship was less clear for labor and management income per operator and per cow. The farms selling 18,000 or more pounds per cow had lower labor and management incomes than for the 17,000 to 17,999 pound group suggesting a possible point of diminishing returns for the rate of milk production.

Table 11. Milk Sold Per Cow and Related Business Factors
362 New York Dairy Farms, 1981

Milk Sold Per Cow	Number of Cows	Lbs. Milk Sold/Worker	Capital Per Cow	Total Farm Expenses Per Cow
Under 12,000	55	302,000	$5,527	$1,930
12,000 to 12,999	77	360,000	5,310	2,149
13,000 to 13,999	77	404,000	5,579	2,287
14,000 to 14,999	75	423,000	5,649	2,372
15,000 to 15,999	90	454,000	5,677	2,419
16,000 to 16,999	82	426,000	6,166	2,635
17,000 to 17,999	66	445,000	6,122	2,700
18,000 and over	73	494,000	6,393	2,909

Farms selling between 15,000 and 17,000 pounds per cow were above average in size. Farms selling below 15,000 or above 17,000 were below average in size.

Pounds of milk sold per worker, which is an important business management factor, was associated with production per cow. Capital per cow and total farm expenses showed a relationship to milk sold per cow. Farms selling more milk per cow tended to have higher expenses per cow (Table 11).

Table 12. Milk Sold Per Cow and Dairy Management Practices
362 New York Dairy Farms, 1981

Milk Sold Per Cow	Lbs. Concen. Fed Per Cow	% Net Energy From Succulents	Days Dry	Age First Calving	% Leaving Herd
Under 12,000	4,500	32%	70	30	23%
12,000 to 12,999	5,200	32	69	28	30
13,000 to 13,999	5,600	38	61	28	27
14,000 to 14,999	6,000	36	63	28	27
15,000 to 15,999	6,400	39	60	27	29
16,000 to 16,999	6,500	40	60	27	28
17,000 to 17,999	7,100	33	59	27	28
18,000 and over	8,300	38	55	26	31

The dairy management practices all were related to the physical measure of pounds of milk sold per cow (Table 12). Pounds of concentrates fed per cow was strongly associated with milk sold per cow as would be expected. Farms selling more milk per cow had fewer days dry and calved earlier than the lower producing farms. In general, these suggest that the recommended dairy management practices do affect the rates of production.

Acres of Grain Corn Per Cow

Growing corn for grain has been increasing on New York dairy farms. In recent years there have been some management studies of this practice.* "Acres of grain corn per cow" is a measure of the extent to which corn is being grown.

The availability of land suitable for corn growing is a key consideration. First priority in the cropping program is on growing roughages which includes corn silage. Therefore, corn for grain is grown only when there is more land suitable for growing corn than what is needed for silage.

Table 13. Acres Grain Corn Per Cow and Land Use
362 New York Dairy Farms, 1981

Acres Grain Corn Per Cow	Total Crop Ac.	Crop Acres Per Cow	Acres Per Cow of			% Crop Ac. in all Corn
			Hay	Corn Sil.	Gr. Corn	
None	183	3.0	1.8	0.8	0	27%
.1 to .3	214	2.6	1.4	0.7	0.2	35
.4 to .6	270	3.1	1.5	0.6	0.5	42
.7 to .9	271	3.3	1.5	0.6	0.8	42
1.0 to 1.2	351	3.4	1.5	0.6	1.1	50
1.3 & over	383	4.5	1.8	0.6	1.5	47

The farms that had more acres of grain corn per cow were those with more total crop acres and more crop acres per cow (Table 13). The acres of hay and of corn silage per cow were about the same for all groups, so it was when additional crop acres were available that grain corn was produced. The percent of crop acres in corn ranged from 27 for the group with no grain corn to 50 for those with 1.0 to 1.2 acres of grain corn per cow.

Table 14. Acres Grain Corn Per Cow and Crop Yields
362 New York Dairy Farms, 1981

Acres Grain Corn Per Cow	Yield Tons Dry Matter Per Acre			Bu. Gr. Corn	Bu. Oats	Value R.E./ Till. Acre
	Hay	Corn Sil.	All Forages			
None	2.2	4.9	3.0	---	51	$1,260
.1 to .3	2.6	5.3	3.5	90.4	52	1,314
.4 to 6	2.8	5.0	3.4	92.6	38	1,292
.7 to .9	2.7	5.4	3.5	95.8	57	1,304
1.0 to 1.2	2.9	5.6	3.7	96.7	35	1,384
1.3 & over	2.7	5.4	3.4	86.4	66	1,245

Productivity of the land is another factor related to growing corn for grain on dairy farms. The farms with no grain corn per cow had lower forage yields per acre than those with grain corn (Table 14). The tons of dry matter per acre of hay ranged from 2.2 to 2.9 and tons of corn silage dry matter harvested from 4.9 to 5.6 for the groups in this study. "Value of real estate per tillable acre" is another indication of quality of land.

*A.E. Res.74-19, 76-3, 81-14, 82-15.

In general the value per acre of cropland was higher on the farms with grain corn than those with none. In brief, the farms growing corn for grain had both more and better cropland.

Table 15. Acres of Grain Corn Per Cow and Farm Incomes
362 New York Dairy Farms, 1981

Acres Grain Corn Per Cow	Number Farms	Net Cash Income Per Farm	Net Cash Income Per Oper.	Net Cash Income Per Cow	Labor & Management Income/Oper.	Labor, Mgmt. & Ownership Inc./Oper.
None	135	$28,438	$24,306	$459	$-3,547	$22,386
.1 to .3	50	38,028	29,479	464	-1,343	25,120
.4 to .6	63	50,685	42,953	576	57	32,424
.7 to .9	47	40,349	32,804	498	-2,681	24,145
1.0 to 1.2	29	47,495	34,923	470	-4,482	33,021
1.3 & over	38	41,663	27,231	484	-9,480	19,844

Of the 362 farms in the study, 135 or 37 percent harvested no corn for grain (Table 15). Sixty-seven or 29 percent of the 227 farms with grain corn had one acre or more per cow.

Five measures of income were computed for the farms when grouped by acres grain corn per cow. The income measures tended to increase as the acres of grain corn per cow increased up to the group with .4 to .6 acres per cow. This suggests that there may be an optimal amount of grain corn per cow to give the best income. This would involve the balance between size of herd and the land capabilities.

Table 16. Acres of Grain Corn Per Cow and Related Factors
362 New York Dairy farms, 1981

Acres Grain Corn Per Cow	Number Cows	Lbs. Milk Sold Per Cow	Lbs. Milk Sold Per Person	Lbs. Conc. Fed/Cow	Feed Pur. Per Cow	% Milk for Feed
None	62	14,600	373,800	5,800	$630	32%
.1 to .3	82	14,600	463,500	6,000	604	30
.4 to .6	88	15,500	443,200	6,000	537	25
.7 to .9	81	14,500	426,600	6,000	430	22
1.0 to 1.2	102	15,200	441,600	6,400	412	20
1.3 & over	86	15,100	379,800	7,200	378	18

Farms with more acres grain corn per cow tended to be larger as measured by number of cows. The farms with no grain corn averaged 62 cows while those with .4 or more acres per cow averaged from 81 to 102 cows per farm. Pounds of milk sold per cow and per person showed little relationship to the amount of grain corn per cow (Table 16). Feed bought per cow and the percent of milk receipts spent for purchased feed were strongly associated with acres grain corn per cow. The percent of the milk receipts used for purchased feed ranged from 32 for the group with no grain corn to 18 for those with 1.3 or more acres grain corn per cow.

Table 17. Acres Grain Corn Per Cow and Dairy Feeding Practices
362 New York Dairy Farms, 1981

Acres Grain Corn Per Cow	Feeding Index	Percent Net Energy From			
		Concentrates	Succulents	Hay	Pasture
None	117	44%	32%	16%	8%
.1 to .3	118	45	37	13	5
.4 to .6	118	43	41	10	6
.7 to .9	115	46	40	10	4
1.0 to 1.2	118	47	42	8	3
1.3 & over	126	49	39	9	3

Feeding practices appear to be related to the acres grain corn per cow. The farms with more grain corn per cow obtained a higher percentage of the net energy from concentrates (Table 17). The farms with more grain per cow also obtained a higher percent of net energy from succulents and a lower percentage from hay and pasture. Farms with no grain corn obtained 24 percent of net energy from hay and pasture compared with 12 to 16 percent for those with .4 or more of grain corn per cow. The feeding index showed no relationship to the acres grain corn per cow.

Table 18. Acres Grain Corn Per Cow and Dairy Management Practices
362 New York Dairy Farms, 1981

Acres Grain Corn Per Cow	% Days in Milk	Days Dry	First Calving		Percent Leaving Herd
			Age	Weight	
None	85%	65	28	1,100	28%
.1 to .3	86	61	27	1,110	28
.4 to .6	87	58	27	1,120	27
.7 to .9	86	60	27	1,120	27
1.0 to 1.2	86	62	28	1,120	28
1.3 & over	86	61	27	1,130	30

Dairy management measures of percent days in milk, average days dry, age and weight at first calving, appeared to be related to acres grain corn per cow while percent leaving the herd was not (Table 18). There is likely to be some interrelationships here to the extent that the better managers (those with the ability to put it all together) used both good dairy herd management practices and the crop management practice of growing more corn for grain.

The value of crops grown and fed are examined in the next section. These then are observed as they relate to the acres of grain corn grown per cow on the 362 farms in this study.

Value of Crops Produced and Fed

The value of the crops produced on these farms was computed by using the average farm prices for 1981 as determined by the New York Crop Reporting Service. The value of the 1981 crop production was then adjusted for the amount of crop sales and changes in the beginning and end of year feed and supply inventories to get the value of crops produced and fed. The calculations for the 362 farms are shown below.

Table 19. Calculation of Value of Crops Grown
362 New York Dairy Farms, 1981

Crop	Acres	Quantity	Price	Value	Value/Acre
Hay (all)	126	322 t.	$69.50	$22,379	$178
Corn silage	52	787 t.	23.00	18,235	351
Other forages	3	4 t.	69.50	278	93
Grain corn	41	3,807 bu.	2.60	9,898	241
Oats	6	303 bu.	1.90	576	96
Wheat	1	46 bu.	3.25	150	150
Total	229*			$51,867	$226

*Total tillable acres of 249 (page 4) include pasture and idle acres.

Hay crops of all kinds, including haylage, accounted for 55 percent of the acreage and 43 percent of the value of crops produced on these 362 farms in 1981. Corn silage accounted for 35 percent and grain corn for 19 percent of the total value of crops produced. Corn silage had the highest value per acre with $351 followed by grain corn with $241 per acre. The average for all crops was $226 per acre.

Table 20. Calculation of Value Feeds Fed and Related Factors
362 New York Dairy Farms, 1981

Item	Total Per Farm		Average Per Cow	
Value crops grown	$51,867		$665	
Decrease in feed inventories	0		0	
Total Grown Available		$51,867		$ 665
Value of crops sold	1,605		21	
Increase in feed inventories	1,021		13	
Amount Available Not Used		$ 2,626		$ 34
Value of crops grown & fed		$49,241		$ 631
Cost of purchased feed		42,241		542
Total Value & Cost of Feeds Fed		$91,482		$1,173
Percent of feed fed grown		54%		54%

The farms included in this study were those with dairy as the principle source of income. Farms with crop sales in excess of 10 percent of the milk receipts were included in a summary for dairy-cash crop farms. Consequently for the 362 farms most of the feeds grown were fed. Crops sold amounted to only 3.1 percent of the value of crops grown. For the 362 farms the value of crops grown and feed was greater than the cost of purchased feed fed. Total feed fed per cow was $1,173 with $631 grown and $542 purchased (Table 20).

Table 21. Total Value and Cost of Feeds Fed By Acres of Grain Corn Per Cow 362 New York Dairy Farms, 1981

Acres Grain Corn Per Cow	Value Crops Grown & Fed	Cost of Purchased Feed	Total Value & Cost of Feeds Fed	Percent of Feed Fed Grown
None	$32,107	$39,991	$ 72,098	45%
.1 to .3	44,719	51,071	95,790	47
.4 to .6	52,434	48,955	101,389	52
.7 to .9	58,596	36,273	94,869	62
1.0 to 1.2	74,455	44,022	118,477	63
1.3 or more	76,707	33,511	110,218	70
All Farms	$49,241	$42,241	$91,482	54%

The more acres of grain corn grown per cow the larger the percent of total feed costs were supplied by crops grown. This is what one would expect. The percent home grown feeds were of the total ranged from 45 to 70 percent with an average of 54 percent for all 362 farms (Table 21).

Table 22. Feed Costs Per Cow By Acres Grain Corn Per Cow 362 New York Dairy Farms, 1981

Acres Grain Corn Per Cow	Number of Cows	% Heifers are of Cows	Feed Cost Per Cow		Total Feed Costs	
			Home Grown	Total	Per Cwt. Milk	As % of Milk Rec.
None	62	71%	$518	$1,163	$7.97	58%
.1 to .3	82	74	546	1,169	8.01	59
.4 to .6	88	84	597	1,153	7.43	54
.7 to .9	81	77	723	1,171	8.09	59
1.0 to 1.2	102	75	730	1,162	7.66	56
1.3 or more	86	84	892	1,282	8.49	62
All Farms	78	77%	$631	$1,173	$7.94	58%

The farms with more acres of grain corn per cow had a higher percentage of the feed cost from home grown feed, but about the same total feed costs per cow (Table 22). This may be a reflection of the relatively modest value of home grown corn for 1981. The total feed cost per hundredweight of milk was highest for the farms with 1.3 or more acres of grain corn per cow. The percent that total feed cost was of the milk receipts was about the same for all groups except those with 1.3 or more acres of grain corn per cow. This suggests that it is important to have a reasonable balance between acres of corn grown for grain and number of cows.

Herd size is a major farm business factor, and so the feeds grown and total cost of feeds fed were examined with the farms sorted by this measure.

Table 23. Total Value and Cost of Feeds Fed By Herd Size
362 New York Dairy Farms, 1981

Herd Size (No. Cows)	Value Crops Grown & Fed	Cost of Purchased Feed	Total Value & Cost of Feed Fed	Percent of Feed Fed Grown
Under 40	$ 16,751	$ 21,372	$ 38,123	44%
40 - 54	28,317	27,434	55,751	51
55 - 69	38,444	31,760	70,208	55
70 - 84	51,801	39,858	91,659	57
85 - 99	60,402	47,483	107,885	56
100 - 149	85,402	64,164	149,566	57
150 and over	116,702	113,571	230,273	51

As expected, values of crops grown and fed and cost of feed purchased both increased with herd size. The percent of feed fed that was grown increased with the size of herd up to 85 cows then leveled off for herds up to 150 cows and over where it dropped. In general the larger herds tended to grow a higher proportion of their feed fed than did the smaller herds.

Table 24. Feed Costs Per Cow by Size of Herd
362 New York Dairy Farms, 1981

Herd Size (No. Cows)	Number of Cows	Heifers as % of Cows	Feed Cost Per Cow			Total Feed Costs	
			Home Grown	Purchased	Total	Per Cwt. Milk	As % of Milk Rec.
Under 40	34	79%	$493	$628	$1,121	$7.92	58%
40 - 54	48	77	590	572	1,161	8.04	60
55 - 69	61	74	641	521	1,162	7.66	56
70 - 84	77	82	673	518	1,191	7.91	58
85 - 99	90	77	670	528	1,198	8.10	58
100 - 149	121	76	706	530	1,236	8.25	60
150 and over	204	75	572	555	1,129	7.55	55

Value of feed grown and fed per cow increased with herd size to a maximum of $706 in herds of 100-149 cows. Value of feed grown and fed per cow dropped to $572 in the largest herd size group perhaps indicating that on the largest farms more cows are kept than can be supported on home grown feeds. Total feed costs per cow, per hundredweight of milk, and as a percent of milk receipts showed little relationship to herd size.

Labor and management income is one indicator of managerial ability. The tables below show what the better managers were doing in relation to home grown feeds.

Table 25. Total Value and Cost of Feeds Fed By Labor and Management Income Quintiles 362 New York Dairy Farms, 1981

Labor & Management Income Per Operator (Quintiles)	Value Crops Grown and Fed	Cost of Purchased Feed	Total Value and Cost of Feeds Fed	Percent of Feed Fed Grown
1 (low)	$68,490	$45,135	$113,625	60%
2	45,848	37,082	82,930	55
3 (medium)	35,542	34,089	69,631	51
4	39,303	38,531	77,661	51
5 (high)	59,996	56,227	116,223	52

Value of crops grown and fed and cost of purchased feed on a per farm basis showed no direct relationship to labor and management income. These cost measures are more closely related to size of farm, which also showed little direct relationship to labor and management income. However, the percent of feed fed grown showed a strong inverse relationship to labor and management income with a lower percentage being more profitable. This suggests that home grown feeds may have been more costly than purchased feeds in 1981.

Table 26. Feed Costs Per Cow by Labor and Management Income Quintiles 362 New York Dairy Farms, 1981

Labor & Management Income/Oper. (Quintiles)	Number of Cows	Heifers as % of Cows	Feed Cost Per Cow			Total Feed Costs	
			Home Grown	Purchased	Total	Per Cwt. Milk	As % of Milk Rec.
1 (low)	86	79	$797	$525	$1,322	$9.15	67%
2	69	72	665	537	1,202	8.17	60
3 (medium)	60	83	592	568	1,160	7.89	58
4	68	74	578	567	1,145	7.58	55
5 (high)	104	76	576	541	1,117	7.29	53

Although the feed purchased per cow increased slightly with labor and management income, the value of home grown feed per cow and total feed costs per cow showed a strong inverse relationship to profitability. Feed cost per hundredweight of milk sold and feed cost as percent of milk receipts both dropped as labor and management incomes rose. This emphasizes the importance of feed "cost control". In 1981 the better managers kept their total feed costs per cow and per hundredweight of milk down, and used slightly less of home grown feed per cow.

Analysis of Feeding Practices

Concentrates fed; percent net energy from concentrates, succulents, and hay; feeding index; average body weight of all cows; and average body weight at first calving, are examined in this section.

Concentrates Fed Per Cow

Levels of grain or concentrate feeding are a major concern of dairy-farmers. In general, the more concentrates fed the more milk produced and sold per cow (Table 27). Pounds of milk sold per pound of concentrate fed decreased from 4.0 for the group of low concentrate feeders to 1.7 for the high group.

Table 27. Pounds of Concentrates Fed Per Cow and Production
362 New York Dairy Farms, 1981

Pounds of Concentrates Fed Per Cow	Farms		Pounds Per Cow			Pounds Milk Sold/Pound of Conc.
	Number	Percent	Conc.	Milk Produced	Milk Sold	
4,000 or less	25	7%	3,400	13,800	13,700	4.0
4,001 to 5,000	59	16	4,600	14,200	13,400	2.9
5,001 to 6,000	102	28	5,500	15,700	14,500	2.6
6,001 to 7,000	95	26	6,500	16,600	15,100	2.3
7,001 to 8,000	49	14	7,500	17,200	15,800	2.1
8,001 and over	32	9	9,200	17,200	15,800	1.7

Farms with higher rates of concentrate feeding had more cows, greater farm expenses per cow, and larger net cash farm incomes (Table 28). However, the highest net cash farm income per cow was for the 7,001 to 8,000 pounds of concentrates group. In general, feeding more concentrates paid. With the negative labor and management incomes per operator for 1981 the relationship with this measure appears to be irregular.

Table 28. Pounds of Concentrates Fed Per Cow and Income
362 New York Dairy farms, 1981

Pounds of Concentrates Fed Per Cow	Number of Cows	Total Farm Exp./Cow	Net Cash Farm Income Per		Labor & Management Income/Oper.
			Farm	Cow	
4,000 or less	79	$2,277	$29,604	$375	$-10,172
4,001 to 5,000	59	2,207	27,238	462	- 4,579
5,001 to 6,000	78	2,329	37,311	478	- 320
6,001 to 7,000	74	2,418	37,648	509	- 3,258
7,001 to 8,000	91	2,587	51,428	565	- 2,124
8,001 and over	100	2,552	48,146	481	- 7,640

The ratio of milk prices to feed prices is a factor affecting levels of concentrate feeding[1]. From 1974 to 1978 the milk-feed price ratio increased from 1.21 to 1.54 and then declined some in 1979, 1980, and 1981. The pounds of concentrates fed per cow in the dairy practices studies increased from 4,800 to 6,200 pounds in 1979 then dropped to 5,900 in 1980 and 6,100 in 1981 (Table 29). It appears that dairyfarmers do respond to changes in the milk-feed price ratio.

Table 29. Milk-Feed Price Ratios and Concentrates Fed Per Cow New York Dairy Farms, 1974-1981

Year	Average Milk Price*	Average Cost 16% Ration*	Milk-Feed Price Ratio	Pounds Concentrates** Fed Per Cow
1974	$ 8.38	$6.91	1.21	4,800
1975	8.75	6.60	1.33	5,100
1976	9.83	6.95	1.41	5,400
1977	9.75	6.97	1.40	5,600
1978	10.50	6.83	1.54	6,000
1979	11.90	7.84	1.52	6,200
1980	13.00	8.98	1.45	5,900
1981	13.80	9.68	1.43	6,100

* Source: New York Agricultural Statistics 1981, New York Crop Reporting Service.
** Average reported by farms in dairy practices study.

As more concentrates were fed per cow the higher the percent net energy from concentrates. For the succulents (silages) there was little difference in the percent net energy supplied for the various levels of concentrate feeding except at the highest level. Farms feeding more pounds of concentrates per cow in general had fewer days dry, larger cows, and a higher percent of cows leaving the herd (Table 30). In brief, the operators who were feeding more concentrates per cow were using better dairy management practices.

Table 30. Pounds of Concentrtes Fed Per Cow and Dairy Management Practices 362 New York Dairy Farms, 1981

Pounds of Concentrates Fed Per Cow	Percent Net Energy From Conc.	Percent Net Energy From Succulents	Days Dry	Percent Leaving Herd	Body Weight All Cows	Somatic Cell Count
4,000 or less	32%	37%	68	27%	1,270	412,000
4,001 to 5,000	38	37	66	26	1,220	363,000
5,001 to 6,000	42	38	61	27	1,260	357,000
6,001 to 7,000	47	37	60	28	1,270	279,000
7,001 to 8,000	51	37	61	30	1,290	337,000
8,001 and over	58	34	60	30	1,290	630,000

[1]Young, M.L., A.E. Res. 80-8, 1980.

Percent Net Energy From Concentrates, Succulents, and Dry Hay

The dairy production records include detailed information on the kinds and amounts of feed fed which in turn provides the energy used by the cow for maintenance and production purposes. A number of measures related to the feeding practices are calculated including the percent of net energy from each of the four kinds of feed used, namely, concentrates, succulents, dry hay, and pasture. The succulents include corn silage, haylage, green chop, and any other of the silage types of feeds. Relationship between variations in the sources of net energy and the production per cow, net cash farm income, and the labor and management income per operator are reported below. It must be kept in mind that there are many other factors that are interrelated and also have an effect on the production and incomes.

Table 31. Percent Net Energy From Concentrates and Related Business Factors
362 New York Dairy Farms, 1981

Percent Net Energy from Concentrates	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Net Cash Farm Income Per Farm	Labor & Mgmt. Income Per Operator
Under 30	8%	80	14,600	$38,175	$-3,130
30 to 34	7	75	14,500	34,083	-9,034
35 to 39	11	62	14,100	30,657	-4,636
40 to 44	27	75	14,700	37,901	- 515
45 to 49	24	72	15,200	34,696	-3,245
50 to 54	13	92	15,400	49,458	-3,619
55 to 59	6	95	15,600	44,573	-4,905
60 and over	4	92	14,300	41,002	-5,196

Percent net energy from concentrates appears to be related to pounds of milk sold per cow, and farms with a higher percent net energy from concentrates tended to have higher net cash farm income (Table 31). Farms with higher percent net energy from concentrates in general were using better dairy management practices (Table 32).

Table 32. Percent Net Energy From Concentrates and Dairy Management Practices
362 New York Dairy Farms, 1981

Percent Net Energy from Concentrates	Pounds Conc. Fed/Cow	Percent Net Energy From Succulents	Days Dry	Percent Leaving Herd	Somatic Cell Count
Under 30	5,000	45%	63	26%	297,000
30 to 34	4,000	39	68	26	333,000
35 to 39	4,800	38	63	26	346,000
40 to 44	5,600	37	62	26	396,000
45 to 49	6,500	38	61	29	311,000
50 to 54	7,200	34	58	30	296,000
55 to 59	8,200	34	63	30	365,000
60 and over	9,000	29	61	29	936,000

Table 33. Percent Net Energy From Succulents and Related Business Factors 327* New York Dairy Farms, 1981

Percent Net Energy From Succulents	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Net Cash Farm Income Per Farm	Labor & Mgmt. Income Per Operator
0	2%	51	14,000	$23,120	$ 6,378
1 to 9	3	39	12,700	15,911	- 665
10 to 19	5	45	14,300	20,472	-6,514
20 to 29	15	52	14,900	25,127	-7,885
30 to 39	27	70	14,800	36,336	825
40 to 49	35	88	15,200	44,784	-3,999
50 and over	14	102	14,800	46,200	-4,247

*35 farms did not report percent net energy from succulents.

Greater use of silages has been recommended for a number of years. Hay crops put up as silage often means better quality roughage than if made as dry hay. Corn silage production has also been increasing. For the 362 farms in the 1981 study, succulents (silage) accounted for 37 percent of the net energy. Five percent of the farms reported less than 10 percent of the net energy from succulents while 14 percent reported over 50 percent (Table 33).

In general the farms that provided a higher percent of the net energy from succulents had more cows and higher rates of production per cow. Net cash farm incomes were higher for the farms using more succulents (Table 33).

Table 34. Percent Net Energy From Succulents and Dairy Management Practices 327* New York Dairy Farms, 1981

Percent Net Energy From Succulents	Pounds Concentrates Fed Per Cow	Percent Net Energy From Concentrates	Days Dry	Percent Leaving Herd	Somatic Cell Count
0	6,200	49%	69	23%	465,000
1 to 9	5,400	44	72	24	337,000
10 to 19	6,200	48	66	29	297,000
20 to 29	6,300	46	63	29	409,000
30 to 39	6,500	46	63	25	407,000
40 to 49	6,200	45	60	28	339,000
50 and over	5,600	41	60	31	358,000

*35 farms did not report percent net energy from succulents.

Farms with a higher percent of net energy from succulents fed about the same pounds of concentrates per cow and had about the same percent of net energy from concentrates. The higher net energy from succulent farms had fewer days dry which is an indication of good herd practices. The somatic cell count was variable (Table 34).

Table 35. Percent Net Energy From Hay and Related Business Factors 327* New York Dairy Farms, 1981

Percent Net Energy From Hay	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Net Cash Farm Income Per Farm	Labor & Mgmt. Income Per Operator
0	10%	117	14,500	$47,192	$-9,091
1 to 4	12	107	15,400	59,803	- 90
5 to 9	24	86	15,200	44,615	-1,728
10 to 14	21	64	15,000	33,539	-3,744
15 to 19	9	54	14,800	23,253	-2,898
20 to 24	12	55	14,200	25,909	-3,773
25 and over	12	48	13,500	20,873	-2,955

*35 farms did not report percent net energy from hay.

Ten percent of the 362 farms reported no net energy from hay. These were the larger farms with an average of 117 cows. On the other hand, 24 percent reported 20 percent or more net energy from hay and these were the smaller farms with an average of 51 cows. The farms depending more on hay had lower net cash farm incomes per farm (Table 35).

Dairy management practices followed seemed to correspond with the hay feeding practices. Farms depending more on hay fed less pounds of concentrates, had more days dry and a lower culling rate (Table 36). There did not appear to be any relationship with somatic cell count.

As the percent net energy from hay increased, that from succulents decreased. For all groups the combined hay and succulents accounted for from 47 to 51 percent of the total. The farms depending more on hay also used more pasture (Table 36).

Table 36. Percent Net Energy From Hay and Dairy Management Practices 327* New York Dairy Farms, 1981

Percent Net Energy From Hay	Pounds Concentrates Fed Per Cow	Percent Net Energy From			Days Dry	Percent Leaving Herd	Somatic Cell Count
		Hay	Succulents	Pasture			
0	7,100	0%	48%	1%	60	31%	329,000
1 to 4	6,800	3	44	4	59	31	395,000
5 to 9	6,600	7	41	5	60	28	430,000
10 to 14	5,900	12	39	6	62	27	356,000
15 to 19	5,800	17	32	8	60	26	271,000
20 to 24	5,600	22	29	7	67	26	321,000
25 and over	5,100	32	18	10	68	26	472,000

*35 farms did not report percent net energy from hay.

Feeding Index

Feeding index is a measure computed and reported to DHI cooperators. The feeding index is the ratio of the reported net energy fed per cow to the "calculated" maintenance and production requirements. This should reflect over or under feeding of the herd.

Table 37. Feeding Index and Related Business Factors
362 New York Dairy Farms, 1981

Feeding Index	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Net Cash Farm Income Per Farm	Labor & Mgmt. Income Per Operator
Less than 95	9%	80	14,700	$40,086	$-4,354
95 to 99	3	69	14,600	29,001	-9,382
100 to 104	4	84	14,800	38,713	-2,715
105 to 109	10	80	14,800	38,556	- 65
110 to 114	14	74	15,200	41,107	- 144
115 to 119	21	68	15,000	35,720	-2,554
120 to 124	17	76	14,900	35,714	-5,605
125 and over	22	88	14,700	40,260	-5,160

With 74 percent of the farms having feeding indices of 110 or more it suggests that some dairyfarmers were feeding considerably more than was needed for maintenance and production. This raises a question about the efficient use of feed on these farms. There was no apparent relationship between feeding index and size of herd, rates of production or income (Table 37).

Farms with high feeding indices were feeding more pounds of concentrates per cow. There was no apparent relationship of feeding index to the other dairy management practices (Table 38).

Table 38. Feeding Index and Dairy Management Practices
362 New York Dairy Farms, 1981

Feeding Index	Pounds Concentrates Fed Per Cow	Percent Net Energy From Succulents	Days Dry	Percent Leaving Herd	Somatic Cell Count
Less than 95	5,200	45%	63	26%	264,000
95 to 99	4,100	35	65	31	505,000
100 to 104	5,300	40	61	28	330,000
105 to 109	5,500	36	61	28	451,000
110 to 114	5,900	37	59	28	307,000
115 to 119	6,100	35	63	27	320,000
120 to 124	6,200	38	63	27	425,000
125 and over	7,100	37	62	29	397,000

Average Body Weight All Cows

Body weight of all cows reflects the size of the animals and probably is related to the feeding practices in raising heifers. Body weights are obtained from taping the animals. Average body weight of all cows for the 362 farms was 1,260 pounds. Sixty-one percent were in the 1,210 to 1,300 pound range (Table 39).

Table 39. Body Weight All Cows and Related Business Factors
362 New York Dairy Farms, 1981

Average Body Weight All Cows	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Net Cash Farm Income Per Farm	Labor & Mgmt. Income Per Operator
1,150 or less	4%	54	13,000	$21,943	$-4,757
1,160 to 1,200	10	58	14,000	23,192	-4,254
1,210 to 1,250	31	75	14,600	35,765	-5,587
1,260 to 1,300	30	84	15,200	44,898	316
1,310 to 1,350	16	79	15,000	42,203	-2,961
1,360 and over	8	101	15,000	41,664	-9,035

A strong, positive relationship appears to exist between average body weight and the related business factors. The bigger the cows the larger the herds, the higher the pounds of milk sold per cow and the higher the net cash farm income per farm. Although there was no readily apparent relationship of size of cows and labor and management income per operator, the groups with weights of 1,260 to 1,350 had the best incomes.

There also was a positive relationship between average body weight of all cows and the dairy management practices. The dairyfarmers with larger cows were also feeding more concentrates per cow, obtaining a higher percent of net energy from succulents and had fewer dry days (Table 40).

Table 40. Body Weight All Cows and Dairy Management Practices
362 New York Dairy Farms, 1981

Average Body Weight All Cows	Pounds Concentrates Fed Per Cow	Percent Net Energy From Succulents	Days Dry	Percent Leaving Herd	Somatic Cell Count
1,150 or less	5,200	32%	64	27%	297,000
1,160 to 1,200	5,800	31	65	30	356,000
1,210 to 1,250	5,800	36	62	28	390,000
1,260 to 1,300	6,500	38	61	27	305,000
1,310 to 1,350	6,200	38	62	27	544,000
1,360 and over	6,300	41	60	27	322,000

Body Weight at First Calving

Body weight at first calving is probably related to both feeding and breeding practices. The age at first calving will have some effect on weight. However, since feeding practices affect growth rates the body weight is reported in this section.

The average body weight at first calving for all 362 farms was 1,110 pounds. Thirty-two percent of the farms had average body weights at first calving of 1,150 pounds or more (Table 41).

Table 41. Body Weight at First Calving and Related Business Factors
362 New York Dairy Farms, 1981

Body Weight at First Calving	Percent of Farms	Number of Cows	Age at First Calving	Pounds Milk Sold Per Cow	Net Cash Farm Income Per Farm	Labor & Mgmt. Income Per Operator
1,020 or less	7%	52	28	12,900	$19,572	$-4,818
1,030 to 1,040	4	78	27	14,400	33,330	-1,372
1,050 to 1,060	9	68	27	15,200	38,905	-2,679
1,070 to 1,080	11	72	27	14,400	29,095	-1,858
1,090 to 1,100	15	97	27	14,800	45,148	-6,781
1,110 to 1,120	10	86	29	15,100	39,501	-4,121
1,130 to 1,140	13	86	27	15,200	50,776	2,381
1,150 to 1,160	11	62	28	15,500	39,269	-1,023
1,170 and over	21	78	27	15,000	35,594	-6,208

When grouped by body weight at first calving the relationships to various business and dairy management practices do not stand out distinctly. It appears that the heavier heifers were on farms with higher rates of production (Table 41). Likewise, the farms with heavier heifers at first calving also fed more concentrates per cow and obtained a higher percent of net energy from succulents (Table 42). This phenomena likely illustrates the interrelatedness of all management practices through the ability or skill of the manager.

Table 42. Body Weight at First Calving and Dairy Management Practices
362 New York Dairy Farms, 1981

Body Weight at First Calving	Pounds Concentrates Fed Per Cow	Percent Net Energy From Succulents	Days Dry	Percent Leaving Herd	Somatic Cell Count
1,020 or less	5,500	28%	66	28%	400,000
1,030 to 1,040	5,300	35	63	26	392,000
1,050 to 1,060	5,700	35	61	27	402,000
1,070 to 1,080	5,700	35	61	28	276,000
1,090 to 1,100	6,200	39	60	29	406,000
1,110 to 1,120	5,900	38	63	26	307,000
1,130 to 1,140	6,500	41	60	28	554,000
1,150 to 1,160	6,300	36	64	27	337,000
1,170 and over	6,400	37	63	28	310,000

Analysis of Breeding Practices

The dairy management practices included in this section are: age at first calving, projected minimum calving interval, breedings per conception, average number of days dry, and percent of days in milk.

Age at First Calving

The average age at first calving for the 362 farms in 1981 was 27 months. There was sizable range among the farms. Twelve percent of the farms had average age at first calving less than 25 months. These are in line with the recommendations of aiming to have heifers calve at two years of age. At the other end of the range, four percent reported average age at first calving of 33 months or more, which is approaching three years of age (Table 43).

Table 43. Age at First Calving and Related Business Factors
362 New York Dairy Farms, 1981

Age at First Calving	Percent of Farms	Number of Cows	Body Weight at First Calving	Pounds Milk Sold Per Cow	Net Cash Farm Income Per Farm	Labor & Mgmt. Income Per Operator
Under 25	12%	78	1,101	15,200	$43,571	$-2,780
25 to 26	30	86	1,109	15,300	42,046	-1,913
27 to 28	28	81	1,115	14,800	39,780	-2,787
29 to 30	19	67	1,124	14,500	31,211	-6,515
31 to 32	8	60	1,110	13,700	29,982	-5,847
33 and over	4	71	1,120	14,200	27,723	-2,130

The farms with the younger calving age for heifers tended to have the larger herd size and the higher production per cow. The group with the largest net cash income per farm averaged under 25 months at first calving.

Dairy management practices appeared to be related to the age at first calving (Table 44). Farms that had the heifers freshening at an early age also were feeding more concentrates per cow, had fewer days dry, higher percent leaving herd, and lower somatic cell counts.

Table 44. Age at First Calving and Dairy Management Practices
362 New York Dairy Farms, 1981

Age at First Calving	Pounds Concentrates Fed Per Cow	Percent Net Energy From Succulents	Days Dry	Percent Leaving Herd	Somatic Cell Count
Under 25	6,700	34%	60	29%	306,000
25 to 26	6,300	38	62	28	328,000
27 to 28	6,000	38	61	28	328,000
29 to 30	5,800	36	65	27	304,000
31 to 32	5,400	34	61	25	1,040,000
33 and over	5,500	36	64	24	778,000

Projected Minimum Calving Interval

The average minimum calving interval for the 362 farms in 1981 was 13.0 months. However, 17 percent of the farms reported average minimum calving intervals of less than 12.5 months. The goal is to have the cows calve at regular 12 months intervals but this is difficult to achieve.

Table 45. Projected Minimum Calving Interval and Related Business Factors 362 New York Dairy Farms, 1981

Projected Minimum Calving Interval (mo.)	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Net Cash Farm Income Per Farm	Labor & Mgmt. Income Per Operator
Less than 12.5	17%	62	14,800	$33,650	$- 1,307
12.5 to 12.9	36	78	15,200	42,043	653
13.0 to 13.4	27	81	14,700	35,497	- 6,979
13.5 to 13.9	12	91	14,800	43,502	- 5,168
14.0 or more	8	75	14,400	29,805	-11,746

The farms with the shortest calving interval had smaller herds (average 62 versus 75 to 91). In general, the longer the projected minimum calving interval, the lower the pounds of milk sold per cow (Table 45). This suggests that getting the cows bred back promptly does affect production.

Projected minimum calving interval appears to be related to the percent leaving the herd and the somatic cell count but did not show any relationship to the feeding practices (Table 46).

Table 46. Projected Minimum Calving Interval and Dairy Management Practices 362 New York Dairy Farms, 1981

Projected Minimum Calving Interval (mo.)	Pounds Concentrates Fed Per Cow	Percent Net Energy From Succulents	Days Dry	Percent Leaving Herd	Somatic Cell Count
Less than 12.5	5,900	34%	63	29%	440,000
12.5 to 12.9	6,100	37	61	28	373,000
13.0 to 13.4	6,200	36	63	28	340,000
13.5 to 13.9	6,100	40	61	27	353,000
14.0 or more	5,700	38	62	26	336,000

Breedings Per Conception

The relationship of breedings per conception to net cash farm income as shown in Table 47 is not what one might logically expect. Fewer breedings per conception did not give a higher income. Farms with more than two breedings per conception had the highest net cash incomes.

Table 47. Breedings Per Conception and Related business Factors 362 New York Dairy Farms, 1981

Breedings Per Conception	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Veterinary Expenses Per Cow	Net Cash Farm Income Per Farm	Labor & Mgmt. Income Per Operator
1.4 or less	21%	66	14,400	$32	$32,478	$-4,588
1.5 to 1.6	22	74	15,000	40	37,782	-1,328
1.7 to 1.8	22	78	14,700	44	39,924	-2,973
1.9 to 2.0	17	78	14,700	42	36,775	-3,054
2.1 to 2.2	8	97	15,600	52	45,560	-5,689
over 2.2	10	91	15,300	49	42,862	-5,048

Twenty-one percent of the farms reported an average of less than 1.5 breedings per conception in 1981, while 18 percent of the farms reported an average of over 2.0. The average of all 362 farms was 1.7 breedings per conception. The veterinary expenses per cow increased as the number of breedings increased with the highest of $52 for the group with 2.1 to 2.2 breedings per conception (Table 47).

The farms with more than two breedings per conception were larger and had higher rates of production. The two groups with high breedings per conception averaged 91 and 97 cows compared with 66 to 78 cows for the others. The group with fewest breedings had the smallest herds averaging 66 cows. The two groups with the most breedings per conception had the highest production with 15,300 and 15,600 pounds of milk sold per cow (Table 47). This suggests that larger herds and higher producing herds may have more problems in getting the cows bred.

Table 48. Breedings Per Conception and Dairy Management Practices 362 New York Dairy Farms, 1981

Breedings Per Conception	Pounds Concentrates Fed Per Cow	Percent Net Energy From Succulents	Days Dry	Percent Leaving Herd	Somatic Cell Count
1.4 or less	5,700	35%	62	30%	531,000
1.5 to 1.6	6,100	35	63	27	283,000
1.7 to 1.8	6,000	38	62	27	367,000
1.9 to 2.0	6,500	38	61	28	337,000
2.1 to 2.2	6,000	39	62	27	324,000
over 2.2	6,500	38	60	27	357,000

Breedings per conception showed no definite relationships to the dairy management practices (Table 48).

Average Number of Days Dry

Once it was thought that a longer resting period between lactations allowed the cow to build up energy reserves which would be returned later in the form of more milk per cow. Recently, however, it has been shown that with higher levels of concentrate feeding and proper veterinary care, milk per cow, net cash farm income, and labor and management income per operator increase with fewer days dry.

Table 49. Days Dry and Related Business Factors
362 New York Dairy Farms, 1981

Average Days Dry	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Net Cash Farm Income Per Farm	Labor & Mgmt. Income Per Operator
50 or less	8%	77	15,500	$42,021	$-4,019
51 to 55	16	83	15,500	46,961	-4,358
56 to 60	26	82	15,000	41,948	598
61 to 65	20	82	14,800	40,601	- 159
66 to 70	15	74	14,600	32,951	-7,236
over 70	16	62	13,900	22,991	-8,650

Eight percent of the farms reported an average of 50 or less days dry (Table 49). Fifty percent or one-half of the farms reported 60 or less, which is less than two months time out of production. It is of interest to observe that the farms with the lower number of days dry also fed more pounds of concentrates per cow, and provided a higher percent of net energy from succulents (Table 50).

Table 50. Days Dry and Dairy Management Practices
362 New York Dairy Farms, 1981

Average Days Dry	Pounds Concentrates Fed Per Cow	Percent Net Energy From Succulents	Age All Cows	Percent Leaving Herd	Somatic Cell Count
50 or less	6,400	39%	51	31%	311,000
51 to 55	6,400	40	51	27	495,000
56 to 60	6,100	39	51	27	390,000
61 to 65	6,200	39	51	27	265,000
66 to 70	5,800	33	51	29	371,000
over 70	5,500	30	54	27	383,000

The 1981 data in this study substantiates earlier research that has shown the fewer number of days dry the higher the production per cow. Farms in this study with an average of 56 to 60 days dry had the best labor and management incomes per operator (Table 49). It may be that the dry period can be "too short" as well as "too long".

Percent of Days in Milk

The percent of days in milk is an aggregate measure of calving interval, days dry, and days open. In general, the higher percent of days in milk, the more milk per cow and the more net cash farm income (Table 51).

Table 51. Percent Days in Milk and Related Business Factors
362 New York Dairy Farms, 1981

Percent Days in Milk	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Net Cash Farm Income Per Farm	Labor & Mgmt. Income Per Operator
81 or less	6%	54	13,400	$22,872	$-2,048
82 to 83	8	67	14,100	26,578	-4,990
84 to 85	20	80	14,400	35,694	-4,932
86 to 87	36	79	14,800	37,249	-2,297
88 to 89	22	80	15,600	47,722	-2,290
90 and over	7	88	15,800	44,786	-7,280

Thirty-six percent of the farms were in the 86 to 87 percent of days in milk category. The average percent of days in milk for the 362 farms in 1981 was 86. Farms with the higher percent of days in milk tended to be larger as measured by number of cows. As the percent of days in milk increased, the average days dry decreased as would be expected (Table 52).

Table 52. Percent Days in Milk and Dairy Management Practices
362 New York Dairy Farms, 1981

Percent Days in Milk	Pounds Concentrates Fed Per Cow	Percent Net Energy From Succulents	Days Dry	Percent Leaving Herd	Somatic Cell Count
81 or less	5,000	29%	84	21%	337,000
82 to 83	5,600	29	72	27	330,000
84 to 85	6,000	35	67	26	322,000
86 to 87	6,100	38	60	28	444,000
88 to 89	6,400	39	56	30	317,000
90 and over	6,600	41	49	32	332,000

The herd average of "percent days in milk" as included in the DHI reports to the dairy farmers appears to be an indicator of good breeding management practices which in turn affect the pounds of milk sold per cow and the net cash farm income.

Analysis of Culling Practices

Choosing which cows to keep, which to sell, and when, is an important but difficult management decision. To examine culling practices, two measures were used; percent of cows leaving the herd for purposes other than dairy (slaughter), and average age of all cows.

Percent Leaving the Herd

In 1981 for the 362 farms, the average percent leaving the herd was 28 which was up from the 26 percent in 1980 and equal to the 28 percent in 1979.

Table 53. Percent Leaving the Herd and Related Business Factors
362 New York Dairy Farms, 1981

Percent Leaving Herd	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Net Cash Farm Income Per Farm	Labor & Mgmt. Income Per Operator
Under 20	21%	72	14,400	$34,676	$- 472
20 to 24	17	65	14,800	31,407	- 2,512
25 to 29	23	81	15,100	43,510	- 269
30 to 34	17	86	15,000	44,027	- 3,964
35 and over	22	82	15,000	36,163	-10,030

The "best" culling rate is not obvious from the data in Tables 53 and 54. It is likely that there is a "too high" and a "too low" level for culling, with the optimum incomewise in the range of 25 to 35 percent. This would mean keeping the cows an average of less than four lactations. Dairy herd improvement does not recommend keeping a cow that does not perform well on her first lactation in the hopes the second will be better. Some animals are culled during or at the end of the first lactation. To counter balance these early culls, some cows are kept much longer than the average of four lactations. The averages used here give an overall indication of what is happening to the herd as a whole due to the culling practices. Each dairyfarmer must cull according to the conditions in the herd. Providing replacements is costly and is affected by meat and milk prices.

Table 54. Percent Leaving Herd and Dairy Management Practices
362 New York Dairy Farms, 1981

Percent Leaving Herd	Pounds Concentrates Fed Per Cow	Percent Net Energy From Succulents	Days Dry	Age All Cows	Somatic Cell Count
Under 20	5,700	35%	64	55	317,000
20 to 24	5,800	33	64	54	526,000
25 to 29	6,200	37	61	52	329,000
30 to 34	6,200	38	62	51	314,000
35 and over	6,400	39	60	48	442,000

Average Age of All Cows

It might logically be expected that the herds with a higher average age would have higher incomes since the costs of replacements either in raising heifers or by purchases would be less. However, this was not true for the 362 herds studied for 1981. Similar situations existed in the earlier years studied.

Table 55. Average Age All Cows and Related Business Factors
362 New York Dairy Farms, 1981

Average Age All Cows	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Net Cash Farm Income Per Farm	Labor & Mgmt. Income Per Operator
Under 45	10%	86	15,400	$42,232	$- 3,388
45 to 47	17	96	15,100	44,779	- 3,569
48 to 50	20	75	15,000	35,628	- 3,684
51 to 53	21	80	14,900	40,523	1,186
54 to 56	13	68	15,000	36,593	- 4,076
57 to 59	10	67	14,600	38,894	- 2,309
60 and over	10	59	13,300	22,833	-13,223

Sixty-eight percent of the farms had a herd average age of less than 54 months. However, the farms in the 51 to 53 months average age group had the best labor and management income per operator (Table 55). The pounds of milk sold per cow was the best for the herds with the lowest average age of all cows. The farms with an average age of cows in the herd of over 60 months had the lowest rate of production.

A possible explanation of younger herds producing more than older herds, could be an adherence to the DHI recommendation of culling cows whose production is not up to expectations in the first year. Also, each year the genetic potential of the new cows should be somewhat better due to the improved sires being used by artificial inseminators. The dairy management practices appeared to be better for the younger herds (Table 56).

Table 56. Average Age All Cows and Dairy Management Practices
362 New York Dairy Farms, 1981

Average Age All Cows	Pounds Concentrates Fed Per Cow	Percent Net Energy From Succulents	Days Dry	Percent Leaving Herd	Somatic Cell Count
Under 45	6,700	35%	60	36%	318,000
45 to 47	6,600	39	61	30	342,000
48 to 50	6,200	41	63	30	298,000
51 to 53	6,000	38	60	26	269,000
54 to 56	5,800	33	63	24	348,000
57 to 59	5,700	35	60	23	497,000
60 and over	5,200	31	67	21	748,000

Analysis of 130 Farms With Somatic Cell Count Records

Practices related to herd health are an important part of a herdsman's management. Mastitis has been a major problem in herd health. The challenge has been how to detect and control it. Early detection has been offered as a key factor in controlling mastitis in dairy herds.

The Somatic Cell Count program was developed by DHI as a way of helping dairyfarmers detect mastitis. New technology now makes it possible to determine cell counts in the individual milk samples processed in the DHI Laboratory. The Somatic Cell Count program was made available to New York dairyfarmers on an optional basis early in 1978. This added another tool for use in herd health management.

Table 57. Somatic Cell Count Cooperators by Size of Herd
362 New York Dairy Farms, 1981

Number of Cows	Number of Farms	Number of Somatic Cell Cooperators	Percent Using Somatic Cell
Under 40	48	20	42%
40 to 54	87	30	34
55 to 69	79	24	30
70 to 84	47	17	36
85 to 99	25	8	32
100 to 149	47	22	47
150 and over	29	9	31
All farms	362	130	36

Of the 362 farms included in the dairy management practices study 130, or 36 percent, had Somatic Cell Count information available. This information has been studied and is reported in this section. There seemed to be no relation to size of herd in the rate of acceptance of this tool as shown in Table 57. Herds with 100 to 149 cows had the highest percent of farms (47 percent) with Somatic Cell Count information.

Table 58. Somatic Cell Count and Labor and Management Incomes
130 New York Dairy Farms, 1981

Average Somatic Cell Count for Herd	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Net Cash Farm Income Per Farm	Labor & Mgmt. Income Per Oper.	Labor & Mgmt. Income Per Cow
Under 200,000	21%	75	15,700	$41,007	$- 686	$- 11
200,000 to 299,999	26	74	14,700	35,051	- 1,630	- 28
300,000 to 399,999	26	74	14,600	33,637	- 8,114	-138
400,000 to 499,999	13	78	14,400	31,804	- 3,984	- 63
500,000 and over	14	88	14,500	22,999	-14,997	-196

The average bulk tank somatic cell count for the herd was the factor available for use here. The average count for the 130 herds was 371,000. Twenty-one percent of the herds had average counts of under 200,000 while 14 percent were 500,000 or more (Table 58). Fifty-two percent were in the 200,000 to 400,000 range. Two farms reported exceptionally high counts which in some small groups makes the average seem unusually high.

There appeared to be some relationship between the somatic cell count and the size of the herd, the pounds of milk sold per cow, net cash farm income, and labor and management income per operator and per cow appeared to be related to the average somatic cell count for the herd (Table 58).

Table 59. Somatic Cell Count and Related Business Factors
130 New York Dairy Farms, 1981

Average Somatic Cell Count for Herd	Veterinary Expense Per Cow	Total Farm Expense Per Cow	Pounds Milk Sold Per Worker	Age of Oper.	Education of Oper.	Percent of Freestall Barns
Under 200,000	$54	$2,513	417,000	39	13	26%
200,000 to 299,999	39	2,372	396,000	39	13	21
300,000 to 399,999	38	2,361	393,000	39	13	24
400,000 to 499,999	39	2,377	398,000	34	12	41
500,000 and over	35	2,473	426,000	40	13	56

Several farm business factors were observed for the five groups based on somatic cell count with the results shown in Table 59. Farms with the lower somatic cell counts had larger veterinary expenses per cow. It might be assumed that the greater expense was of a preventative nature and resulted in less mastitis. The percent of farms with freestall barns was the highest for the high count group of farms. This suggests that type of barn may have some effect on mastitis problems.

The dairy management practices in general were not associated with the different levels of somatic cell counts. The farms with a lower count tended to have younger cows, and a higher proportion of pipeline milking systems (Table 60). The pounds of concentrates fed per cow, the percent net energy from succulents, and days dry did not appear to be related to the somatic cell counts.

Table 60. Somatic Cell Count and Dairy Management Practices
130 New York Dairy Farms, 1981

Average Somatic Cell Count for Herd	Pounds Concentrates Fed Per Cow	Percent Net Energy From Succulents	Days Dry	Age All Cows	Percent With Pipeline Milkers
Under 200,000	6,500	36%	61	50	63%
200,000 to 299,999	6,200	33	63	51	62
300,000 to 399,999	6,000	37	64	53	47
400,000 to 499,999	6,200	34	61	51	41
500,000 and over	6,300	35	64	54	28

Other Factors Studied

Management information of various kinds was available for each of the 362 farms. This made it possible to study possible relationships of various factors to the dairy management practices and the farm business in general. General observations in six areas are reported below. These may be helpful in trying to understand why and how certain dairy practices are used on New York farms.

Age and Education of Individual Farm Operators

The age and education of the farm operator is obtained in the farm business management records. This makes it possible to observe how different age operators manage. Since partnerships and corporations have two or more operators who often are in different age groups they have been excluded from the age and education sorts. Consequently, only the "Individual Operator" type of business is included in the age and education study section. Of the 362 farms, 286 were individual operators and 76 were partnerships or corporations. Of the 286 individual operators, 16 did not report the years of education so only 270 farms are included in the sorts by years of education. Seven farms did not report age and so only 279 farms are included in sorts by age.

Table 61. Age of Individual Operator and Related Characteristics 279 New York Dairy Farms, 1981

Age of Individual Operator	Percent of Farms	Average Age of Operator	Years of Education	Total Farm Assets	Farm Net Worth	Debt Per Cow
Under 30	9%	27	13	$303,000	$139,000	$3,106
30 to 34	13	32	14	391,000	196,000	2,960
35 to 39	22	37	13	445,819	250,231	2,643
40 to 44	22	41	13	476,337	303,264	2,191
45 to 49	16	46	12	441,473	275,610	2,272
50 to 54	12	51	12	576,795	410,784	1,766
55 and over	7	58	12	415,536	344,318	1,017

Nine percent of the operators in this study were under 30 years of age. Forty-four percent of the individual operators were under 40 years of age. The average age of all operators on the 362 farms was 39 years. For the partnerships and corporations the average age of the second operator was 32, and on the 15 farms with three operators the average age of the third operator was 32. This suggests that some young persons are getting started in dairy farming in New York State.

For the 279 individual operators the younger operators had more years of education. The average for those 30 to 34 was 14 years or the equivalent of a college associate degree whereas those 45 and over had an average of 12 years of education. Similar studies from other years also have indicated that the younger farmers have more years of formal education than the older farmers.

Total farm assets for the 362 farms in 1981 averaged $482,000 or about $6,175 per cow. The average debt per cow was $2,240. The average farm net worth was $302,000. The assets and net worth for the individual operators was somewhat less than that for all farms including partnerships and corporations.

Table 62. Age of Individual Operator and Related Business Factors
279 New York Dairy Farms, 1981

Age of Individual Operator	Number of Cows	Lbs. Milk Sold		Total Farm Exp./Cow	Net Cash Farm Income Per Farm	Labor & Mgmt. Income Per Operator
		Per Cow	Per Worker			
Under 30	51	13,800	351,000	$2,207	$18,752	$- 219
30 to 34	64	14,900	424,000	2,285	32,022	216
35 to 39	71	14,600	429,000	2,397	27,063	- 7,662
40 to 44	77	14,800	414,000	2,396	38,673	- 5,084
45 to 49	70	14,800	403,000	2,547	28,007	-12,180
50 to 54	91	14,800	426,000	2,443	46,013	- 3,210
55 and over	67	14,900	341,000	2,533	26,954	-14,682

Individual operators under 30 years of age had fewer cows and less total farm assets than the other age groups. This likely is due to their limited resources and being in the "starting-up" stage of the business. The operators under 30 had average net worths of $139,000 or a 45 percent equity (Table 61). Inflation with resulting increases in cattle, real estate, and machinery prices, has been a substantial factor in helping young persons to gain net worth once they get control of a business.

Total farm assets, net worth, and number of cows increased with age of the operators up to 55 (Tables 61 and 62). The farm assets and net worth were less for those over 55, but the average equity was higher with 82 percent. The debt per cow decreased from an average of $3,106 per cow for the group under 30 to $1,017 per cow or less than one-third for the group over 55. Debt per cow serves as an indicator of the financial pressure on the business because of indebtedness.

Labor and management income per operator was highest for the group from 30 to 34 followed by those under 30. The highest net cash farm income was for the 50 to 54 age group. The 30 to 34 and 55 and over groups had the highest pounds of milk sold per cow (Table 62). The two groups under 35 all had better labor incomes than those over 35 but their net cash farm incomes were lower which likely was due to higher interest payments on debts.

Table 63. Age of Individual Operator and Dairy Management Practices
279 New York Dairy Farms, 1981

Age of Individual Operator	Pounds Concentrates Fed Per Cow	Percent Net Energy From Succulents	Days Dry	Age First Calving	Percent Leaving Herd
Under 30	5,700	28%	64	28	29%
30 to 34	5,800	38	65	28	28
35 to 39	5,900	36	62	27	28
40 to 44	6,200	40	60	27	27
45 to 49	6,300	32	60	27	30
50 to 54	6,100	38	62	28	26
55 and over	5,500	35	61	28	27

The dairy management practices appear to be somewhat better on the farms with operators 40 to 54 years of age. This may reflect the time required to get practices organized and in place. It takes time to "put together" a good business.

Table 64. Education of Individual Operator and Related Business Factors 270 New York Dairy Farms, 1981

Years of Education	Percent of Farms	Age of Oper.	Number of Cows	Lbs. Milk Sold Per Cow	Lbs. Milk Sold Per Worker	Net Cash Farm Income Per Farm	Labor & Mgt. Income Per Operator
Under 12	8%	43	68	15,300	402,000	$28,633	$-7,210
12	48	41	65	14,600	407,000	31,478	-7,448
13 to 14	20	40	79	14,300	453,000	31,154	-4,931
15 to 16	20	39	79	15,100	434,000	36,129	-6,490
17 and over	4	37	47	14,800	334,000	20,502	-3,876

Forty-eight percent of the 270 individual operators reported 12 years of education. Only eight percent had less than 12 years (with an average of 10) while 24 percent had 15 years or more. The average age of those with less than 12 years of education was 43 compared with 41 for those with 12 years (Table 64).

Two groups might be compared here, the 48 percent with 12 years of education and the 40 percent with 13 to 16 years of education. These might be thought of as the high school graduates and those with some college education. The college education groups were larger with 79 cows compared with 65 for the high school group. The pounds of milk sold per cow was about the same but the college groups sold more milk per worker. The net cash farm incomes and the labor and management incomes per operator were better for the college group than the high school group.

Table 65. Education of Individual Operator and Dairy Management Practices 270 New York Dairy Farms, 1981

Years of Education	Pounds Concentrates Fed Per Cow	Percent Net Energy From Succulents	Days Dry	Age First Calving	Percent Leaving Herd
Under 12	6,100	33%	67	28	27%
12	5,700	36	61	28	28
13 to 14	6,000	36	62	27	28
15 to 16	6,600	37	61	28	29
17 and over	5,200	32	63	27	23

With the dairy management practices the college group fed more concentrates per cow than the high school group but there was little difference in the other practices (Table 65). For more details on age and education, see Appendix Tables 89 and 90.

Type of Barn and Milking System

The type of barn and the kind of milking system are two basic features of any dairy operation which tend to affect management. These 362 farms were grouped according to these two important features and the practices were observed.

Table 66. Type of Barn and Related Business Factors
362 New York Dairy Farms, 1981

Type of Barn	Percent of Farms	Number of Cows	Lbs. Milk Sold		Net Cash Farm Income	Labor & Mgmt. Income Per
			Per Cow	Per Worker	Per Farm	Operator
Freestall	32%	119	15,000	497,000	$57,820	$-1,261
Stanchion	63	58	14,900	371,000	28,978	-4,882
Other	5	55	14,900	352,000	28,086	101

One-third of the barns were freestall and two-thirds were the stanchion or stall type. The freestall barn farms had about twice as large herds as the stanchion barns as shown in Table 66. Pounds of milk sold per worker was higher in the freestall systems. The net cash farm income per farm and the labor and management income per operator were considerably better for the freestall operations.

The dairy management practices generally were better in the freestall operations. They fed more pounds of concentrates per cow, obtained a higher percent of the net energy from succulents, had fewer days dry, but a somewhat higher somatic cell count and higher percentage leaving the herd (Table 67).

Table 67. Type of Barn and Dairy Management Practices
362 New York Dairy Farms, 1981

Type of Barn	Pounds Concentrates Fed Per Cow	Percent Net Energy From Succulents	Days Dry	Somatic Cell Count	Percent Leaving Herd
Freestall	6,600	42%	60	474,000	29%
Stanchion	5,800	34	63	332,000	27
Other	6,000	37	64	252,000	25

On page 5 it was stated that labor and management income is an indication of the "managerial ability" of the operator. The analysis by type of barn seems to substantiate this concept. It is often said that it takes a "good manager" to operate successfully in a freestall barn. These 1981 data appear to support this. Labor and management incomes per operator (managerial ability) for the freestall operations were considerably higher than for the stanchion barn operations ($-1,261 versus $-4,882). The freestall operators used good business management procedures as shown by larger herds, higher production per cow, and better labor efficiency (Table 66) and recommended dairy practices as shown by feeding more concentrates per cow, obtaining more net energy from silages, having fewer days dry, and culling at a moderate rate (Table 67).

In the farm business records the operator designates the kind of milking system used. Definitions of systems may sometimes be a problem. A few freestall barns have reported "pipeline" milking systems which may be the use of a section of the old stanchion barn with a pipeline used instead of a parlor.

Table 68. Type of Milking System and Related Business Factors
362 New York Dairy Farms, 1981

Type of Milking System	Percent of Farms	Number of Cows	Lbs. Milk Sold Per Cow	Lbs. Milk Sold Per Worker	Net Cash Farm Income Per Farm	Labor & Mgmt. Income Per Operator
Bucket & Carry	2%	36	13,400	250,000	$12,420	$-4,114
Dumping Station	17	44	13,600	288,000	17,657	-4,676
Pipeline	48	63	15,000	391,000	34,154	-3,639
Herringbone Parlor	28	123	14,800	484,000	56,171	-2,773
Other Parlor	5	100	15,900	443,000	54,908	275

Pipeline milking systems accounted for nearly half the farms followed by 28 percent with herringbone parlor systems (Table 68). These systems tend to be associated with the type of barn as reported on the previous page. The pipelines tend to be used in the larger stanchion barns as shown by an average of 63 cows compared with 44 cows for the dumping station systems.

Herringbone parlor milking systems were used with the largest herds (average 123 cows) while the bucket and carry and dumping station, or transfer systems, were used by the smallest herds (average 36 and 44 cows) as shown in Table 68. Pounds of milk sold per cow was higher for the pipeline systems but milk sold per worker was considerably higher in the parlor systems. The herringbone parlor system had higher net cash farm incomes and labor and management income per operator than the dumping stations or pipeline systems.

Dairy management practices seemed to vary with the milking systems. Of the three primary systems, the herringbone parlors fed the most concentrates per cow, obtained the second highest proportion of net energy from succulents and had the second lowest days dry, but had the highest culling rate. The somatic cell count was highest for the herringbone parlor systems (Table 69).

Table 69. Type of Milking System and Dairy Management Practices
362 New York Dairy Farms, 1981

Type of Milking System	Pounds Concentrates Fed Per Cow	Percent Net Energy From Succulents	Days Dry	Somatic Cell Count	Percent Leaving Herd
Bucket & Carry	4,400	29%	77	270,000	17%
Dumping Station	5,400	27	66	428,000	28
Pipeline	6,000	37	61	296,000	27
Herringbone Parlor	6,700	42	60	494,000	30
Other Parlor	6,200	45	59	350,000	28

Milk Produced and Milk Sold Per Cow

DHI records report milk produced per cow based on the samples taken each month and then composited for the year. The farm business records report the pounds of milk sold per cow based on the total amount marketed for the year. These two measures differ by the amounts used by calf feeding, the farm family and the workers, milk loss from spillage, and milk unfit for use.

Table 70. Comparison of Milk Produced and Milk Sold Per Cow By Herd Size
362 New York Dairy Farms, 1981

Number of Cows	Pounds of Milk Per Cow		Difference	
	Produced	Sold	Pounds	Percent of Produced
Under 40	15,158	14,200	958	6.3%
40 to 54	15,575	14,400	1,175	7.5
55 to 69	16,299	15,000	1,299	8.0
70 to 84	16,157	15,000	1,157	7.2
85 to 99	15,964	14,800	1,164	7.3
100 to 149	16,120	15,000	1,120	6.9
150 and over	16,061	15,000	1,061	6.6

Differences between the milk produced and milk sold in 1981 were computed by herd size and by rates of production and the results are shown in Tables 70 and 71. Differences by herd size ranged from 958 to 1,299 pounds per cow while by rates of production the range was from 969 to 1,237. There was no apparent direct relationship between either size or rates of production and the differences. The average difference for all 362 farms was 6.9 percent of the milk produced as shown by the DHI records.

Table 71. Comparison of Milk Produced and Milk Sold Per Cow By Rates of Production
362 New York Dairy Farms, 1981

Milk Sold Per Cow	Pounds of Milk Per Cow		Difference	
	Produced	Sold	Pounds	Percent of Produced
Under 12,000	12,202	11,000	1,202	9.9%
12,000 to 12,999	13,737	12,500	1,237	9.0
13,000 to 13,999	14,660	13,500	1,160	7.9
14,000 to 14,999	15,623	14,600	1,023	6.5
15,000 to 15,999	16,653	15,600	1,053	6.3
16,000 to 16,999	17,469	16,500	969	5.5
17,000 to 17,999	18,371	17,400	971	5.3
18,000 and over	19,823	18,600	1,223	6.2

Table 72. Difference in Milk Produced and Sold Per Cow by Years
New York Dairy Farms, 1974-1981

Year	Pounds Milk Per Cow			Difference as Percent
	DHI	FBR	Difference	
1974	14,197	13,438	759	5.3%
1975	14,224	13,457	767	5.4
1976	14,515	13,694	821	5.7
1977	14,807	14,083	724	4.9
1978	15,227	14,401	826	5.4
1979	15,602	14,743	859	5.5
1980	15,783	14,800	983	6.2
1981	15,890	14,800	1,090	6.9

Pounds of milk per cow for both the DHI and the FBR increased each year from 1974 through 1981. The rate of increase tended to slow up in 1980 and 1981. The difference between the pounds produced per cow and the pounds sold per cow ranged from 724 in 1977 to 1,090 in 1981. There seemed to be a bimodel upward trend in the differences.

Table 73. Differences in Milk Produced and Sold Per Cow By
Registered versus Grade Herds
362 New York Dairy Farms, 1981

Kind of Herd	Number of Farms	Average Pounds Milk			Difference as Percent Produced
		Produced	Sold	Difference	
Registered	122	16,288	15,100	1,188	7.3%
Grade	240	15,688	14,700	988	6.3

The difference between pounds produced per cow and pounds sold was less for the grade than for the registered herds (Table 73).

The operators with the most managerial ability (high quintile) produced and sold the most milk per cow and had the largest herds, and also the largest difference between the pounds produced as shown by the DHI records and the pounds sold as shown by the farm business records (Table 74).

Table 74. Differences in Milk Produced and Sold Per Cow By
Labor and Management Income Quintiles
362 New York Dairy Farms, 1981

Managerial Ability (Income Quintile)	Number Cows	Average Pounds Milk			Difference as Percent Produced
		Produced	Sold	Difference	
1 (low)	86	15,476	14,400	1,076	7.0%
2	69	15,693	14,700	993	6.3
3 (medium)	60	15,810	14,700	1,110	7.0
4	68	15,904	15,100	804	5.1
5 (high)	104	16,558	15,300	1,258	7.6

Table 75. Differences in Milk Produced and Sold Per Cow By Type of Barn
362 New York Dairy Farms, 1981

Type of Barn	Number of Farms	Average Pounds Milk			Difference as Percent Produced
		Produced	Sold	Difference	
Freestall	115	15,852	15,000	852	5.4%
Stanchion	229	15,904	14,900	1,004	6.3
Other	18	15,950	14,900	1,050	6.6

The difference between the pounds produced and sold per cow was about 150 pounds less for the freestall barns than the stanchion barns. The percent that the difference was of the pounds produced was 5.4 percent for the freestall barns and 6.3 percent for the stanchion barns. This suggests that the freestall barns might be a factor affecting the amounts produced and the difference between amount produced and sold.

Table 76. Differences in Milk Produced and Sold Per Cow By Somatic Cell Count
130 New York Dairy Farms, 1981

Somatic Cell Count	Number of Farms	Average Pounds Milk			Difference as Percent Produced
		Produced	Sold	Difference	
Under 200,000	27	16,800	15,700	1,100	6.5%
200,000 to 299,999	34	16,151	14,700	1,451	9.0
300,000 to 399,999	34	15,639	14,600	1,039	6.6
400,000 to 499,999	17	15,131	14,400	731	4.8
500,000 and over	18	15,267	14,500	767	5.0

Farms with the highest somatic cell count showed the smallest difference between pounds produced and pounds sold per cow (Table 76). This is the opposite of what might logically be expected. One would expect farms with high rates of mastitis to have to discard more milk and therefore have a greater difference between the amounts produced and sold. The results shown here may be due in part to the methods used in reporting DHI production from cows with mastitis.

Income Over Feed Cost

DHI records report an economic measure called "Income Over Feed Cost". This is the difference between the value of the milk produced at current prices and the computed cost of the feed fed. This amount must cover all of the farm expenses or costs other than feed. This measure is used frequently in the dairy management record system. Here the measure of "Income Over Feed Costs" is examined in relation to various business factors and dairy practices.

Table 77. Income Over Feed Cost and Farm Business Income
356* New York Dairy Farms, 1981

Income Over Feed Cost	Percent of Farms	Price Received For Milk	Net Farm Cash Income	Labor & Mgmt. Income Per Oper.	Labor & Mgmt. Income Per Cow
Less than $1,100	13%	$13.63	$19,315	$-10,627	$-199
$1,100 to 1,199	9	13.66	26,899	-11,542	-213
1,200 to 1,299	14	13.58	33,618	- 2,758	- 33
1,300 to 1,399	18	13.69	37,557	- 3,770	- 59
1,400 to 1,499	15	13.61	40,886	1,929	35
1,500 to 1,599	11	13.56	40,391	720	12
1,600 to 1,699	9	13.80	59,649	- 1,689	- 23
1,700 and over	12	13.87	46,736	- 2,310	- 35

*Six farms did not report concentrate data.

A general relationship appears to exist between income over feed cost and the farm business measures of income but with numerous variations existing (Table 77). This is undoubtedly due to the great differences in the various farm expenses other than feed.

Table 78. Differences Between Income Over Feed Cost and Business Income Measures
356* New York Dairy Farms, 1981

Income Over Feed Cost	Average Income Over Feed Cost	Net Farm Cash Inc. Per Cow	Difference	Labor and Mgmt. Income Per Cow	Difference
Less than $1,100	$ 975	$317	$ 658	$-199	$1,174
$1,100 to 1,199	1,153	414	739	-213	1,366
1,200 to 1,299	1,243	405	838	- 33	1,276
1,300 to 1,399	1,352	475	877	- 59	1,411
1,400 to 1,499	1,446	553	893	35	1,411
1,500 to 1,599	1,538	546	992	12	1,526
1,600 to 1,699	1,647	635	1,012	- 23	1,670
1,700 and over	1,837	599	1,238	- 35	1,872

*Six Farms did not report concentrate data.

Differences between the income over feed costs per cow and the net farm cash income per cow and the labor and management income per cow were computed. The differences would cover all nonfeed costs and the return for the operator's labor and management. The differences were directly related to amount of income over feed cost (Table 78).

Table 79. Income Over Feed Cost and Related Business Factors
356* New York Dairy Farms, 1981

Income Over Feed Cost	Number of Cows	Milk Sales Per Cow	Feed & Crop Expenses Per Cow	Pounds of Milk Sold Per Cow	Pounds of Milk Sold Per Worker
Less than $1,100	61	$1,711	$605	12,600	329,000
$1,100 to 1,199	65	1,862	686	13,600	366,000
1,200 to 1,299	83	1,934	690	14,200	405,000
1,300 to 1,399	79	1,954	665	14,300	423,000
1,400 to 1,499	74	2,090	706	15,400	440,000
1,500 to 1,599	74	2,138	744	15,800	424,000
1,600 to 1,699	94	2,231	749	16,200	434,000
1,700 and over	78	2,326	739	16,800	448,000

*Six farms did not report concentrate data.

Income over feed cost did not appear to be related to the number of cows or size but was directly related to milk sales per cow, feed bought and crop expense per cow, and milk sold per cow (Table 79). These three items would directly affect the income and the feed costs components of the DHI measure "Income Over Feed Cost".

There was a direct relationship between pounds of milk sold per cow and per worker and the amount of income over feed cost. This again is a reflection of the method of computing "Income Over Feed Costs" which is based on the production per cow times price.

Table 80. Income Over Feed Cost and Dairy Management Practices
356* New York Dairy Farms, 1981

Income Over Feed Cost	Pounds Concentrates Fed Per Cow	Percent Net Energy From Hay	Percent Days in Milk	Age First Calving	Age All Cows
Less than $1,100	5,500	21%	84%	28	54
1,100 to 1,199	5,600	12	86	28	54
1,200 to 1,299	5,900	14	85	28	52
1,300 to 1,399	6,000	11	86	28	52
1,400 to 1,499	6,200	12	86	27	51
1,500 to 1,599	6,200	11	86	27	50
1,600 to 1,699	6,500	9	88	27	51
1,700 and over	6,800	9	87	27	50

*Six farms did not report concentrate data.

Income over feed cost appeared to be associated with the use of recommended dairy practices as shown in Table 80. The larger the income over feed cost the more pounds of concentrates fed per cow, the less percent of net energy from hay, the higher percent days in milk, the younger the heifers at first calving, and the younger the average age of the herd. These dairy practices all were related to the business income measures as discussed in preceeding sections.

It appears that income over feed cost is not necessarily an indication of a successful business operation but it does indicate the results of using good dairy management practices.

Combination of Factors

Individual factors have been examined up to this point. In this section, combinations of factors for the 362 farms are studied. First, combinations of four business factors are observed and then combinations of four dairy management practices.

For each factor, the farms were divided on the basis of whether they were above or below the average for the 362 farms. They were then grouped on the basis of the number of factors better than average. The combination of individual factors above average within the three middle groups varied.

Table 81. COMBINATION OF BUSINESS FACTORS* ABOVE AVERAGE AND INCOMES
362 New York Dairy Farms, 1981

Number of Business Factors Above Average	Percent of Farms	Net Cash Farm Income	Labor and Management Income per Operator	Labor, Mgmt. & Ownership Inc. per Operator
4 factors above average	8%	$78,765	$ 4,172	$43,078
3 factors above average	18	60,917	1,227	35,431
2 factors above average	28	37,024	-5,734	27,079
1 factor above average	28	25,836	-3,824	18,515
0 factors above average	18	16,961	-8,503	10,245

*Factors were: Size - average 78 cows; pounds milk sold per cow - average 14,800; pounds milk sold per worker - average 419,000; and cost control, percent purchased feed was of milk receipts - average 26 percent.

The relationship between the number of factors better than average and three measures of income are shown in Table 81. As the number of fators above average decreased the net cash farm income and the labor, management, and ownership income per operator decreased at a rapid rate. The relationship with labor and management income was reversed for the groups with one and two factors above average.

Management factors are all interrelated. This includes both the business factors and the dairy practice factors. The dairy practices of the five groups of farms sorted on business factors were observed and are reported in Table 82. The farms with better than average business factors also were using good dairy practices as shown by the four items observed. This is an indication of "managerial abilities" and how individuals who possess good managerial skills use them in both the production and business areas.

Table 82. COMBINATION OF BUSINESS FACTORS* ABOVE AVERAGE AND DAIRY PRACTICES
362 New York Dairy Farms, 1981

Number of Business Factors Above Average	Pounds Concentrates Fed per Cow	Percent Net Energy Succulents	Age First Calving	Days Dry
4 factors above average	7,200	43%	27 mo.	57
3 factors above average	6,600	42	27	60
2 factors above average	6,300	38	27	60
1 factor above average	5,800	35	28	63
0 factors above average	5,300	30	28	68

*See footnote for Table 81.

Dairy practices are interrelated the same as are business factors. The effects of individual dairy practices on incomes and production have already been observed in this study. The effects of combinations of the four dairy practices of pounds of concentrates fed per cow, percent net energy from succulents, age at first calving, and number of days dry, are shown in Table 83.

Table 83. COMBINATION OF DAIRY PRACTICES* ABOVE AVERAGE AND INCOMES
327** New York Dairy Farms, 1981

Number of Business Factors Above Average	Percent of Farms	Net Cash Farm Income	Labor and Management Income per Operator	Labor, Mgmt. & Ownership Inc. per Operator
4 factors above average	8%	$57,279	$ 1,239	$33,304
3 factors above average	19	44,743	-3,784	28,301
2 factors above average	32	34,455	-3,048	26,356
1 factor above average	29	25,610	-6,550	15,930
0 factors above average	12	21,191	-2,332	14,443

*Factors were: Pounds concentrates per cow - average 6,100; percent net energy from succulents - average 37 percent; age first calving - average 27 months; days dry - average 62.

**Net energy information by 35 of the 362 farms was not reported.

As the number of dairy practices above average decreased the net cash farm income and the labor, management, and ownership income per oprator also decreased. The relationship to labor and management income per operator was irregular. In general, it is important to use a combination of good dairy practices if one hopes to obtain a good income.

Dairy practices tend to first affect milk production which, in turn, has an effect on farm income. In Table 84 the effect of the combination of dairy practices on production are shown to be strong. The interrelatedness with farm business factors is shown by the fact that the farms with more dairy practices above average also were larger, had better labor efficiency, and better cost control.

Table 84. COMBINATION OF DAIRY PRACTICES* ABOVE AVERAGE AND BUSINESS FACTORS
327 New York Dairy Farms, 1981

Number of Business Factors Above Average	Pounds Milk Sold per Cow	Average Number of Cows	Pounds Milk Sold per Worker	Labor & Machinery Expense per Cwt. of Milk
4 factors above average	15,700	108	508,900	$5.01
3 factors above average	15,300	85	434,200	5.46
2 factors above average	14,600	72	394,900	5.57
1 factor above average	14,000	59	354,500	5.70
0 factors above average	12,600	52	291,400	5.91

*See footnote for Table 83.

This section on combination of factors points out the importance of a manager being able "to put it all together". In order to achieve high production one must use a combination of recommended dairy practices and to obtain a high farm income the operator must use a combination of good production and business management practices.

Summary and Conclusions

The purpose of this project was to study the relation of selected dairy management practices to farm business management factors. Data on selected dairy practices was merged with farm business summary data for 362 farms for the year 1981. Cross tabulation analyses were made for the various factors and the results included in this report. These analyses provide additional dimensions for business summaries and show how these dairy management practices paid on commercial dairy farms in 1981.

Pounds of milk sold per cow, net cash farm income per farm, and labor and management income per operator were used as indicators of the effects of the dairy management practices. The first measures the physical output, while the second and third measure financial returns. Effects of the dairy practices were more apparent on pounds of milk sold per cow than on income measures. This is logical since the first effect of a dairy practice is on milk production of the cow, which in turn affects income. Labor income is the bottom line measure of the combined effects of all components of the business. Cost control affects not only the dairy and crop practices but also the use of machinery, labor, and capital. A practice may increase production but reduce the income if added costs exceed added returns.

The cross tabulations for the various dairy management practices indicate that the practices do affect rates of production and incomes. The practices that showed the greatest relationship to income were: pounds of concentrate fed per cow, percent of net energy from succulents, acres of grain corn per cow, percent days in milk, and average age of all cows.

"Somatic cell count" is a new management tool provided by DHI. For 1981, 130 of the 362 farms, or 36 percent, used the somatic cell option. In general, farms with lower cell counts had higher production and better incomes.

The relationship of age and education of the individual operators was observed. Farmers in the 30 to 34 age bracket and those with 17 years or more of education had the highest labor and management incomes. In general, the farmers age 40 to 54 were using better practices and earned higher cash incomes.

There is a difference between the pounds of milk produced per cow as reported by DHI and the pounds of milk sold per cow as reported in farm business summaries. For the 362 farms this difference averaged 1,090 pounds per cow or 6.9 percent of the amount produced. If DHI rates of production are used for farm budgeting the figures need to be reduced by 6.9 percent to get the likely milk sold.

The measure "income over feed cost" was found to be related to the farm business measures of returns. However, the difference between this measure and net farm cash income at various levels ranged from less than $700 to over $1,200 indicating that it is not suited for use in cash flow budgeting.

In summary, the selected dairy management practices reported in the DHI records did have an effect on dairy farm incomes. Some practices have greater effects than others. In analyzing a dairy farm business, both the dairy practices and the business procedures should be examined. Data from this study can be used in analyzing farm businesses, in making comparisons, or for reference purposes.

Appendix Tables

Table 85. AVERAGE OF SELECTED FACTORS FOR ALL FARMS IN STUDY
New York Dairy Farms, 1977 through 1981

Factor	Average of All Farms				
	1977	1978	1979	1980	1981
Number of farms	363	370	337	383	362
% farms with DHI records	84%	88%	89%	89%	87%
% farms owner-sampler	16%	12%	11%	11%	13%
% farms freestall barns	35%	32%	32%	32%	32%
Worker equivalent	2.4	2.4	2.5	2.6	2.7
Number of cows	69	68	70	71	78
Number of heifers	51	49	51	55	60
Total crop acres	211	213	217	236	249
Total pounds milk sold	971,700	979,300	1,032,000	1,051,400	1,152,600
Total cash farm receipts	$105,102	$119,119	$140,899	$151,951	$175,700
Total end inventory	$283,000	$313,000	$385,000	$419,000	$460,000
Milk produced per cow	14,800	15,200	15,600	15,800	15,900
Milk sold per cow	14,100	14,400	14,700	14,800	14,800
Tons hay equivalent per acre	2.4	2.5	2.7	2.5	2.6
Tons corn silage per acre	14.3	14.1	13.8	14.6	15.0
Cows per worker	29	28	28	28	28
Milk sold per worker	402,000	405,000	413,000	408,000	419,000
Feed purchased per cow	$402	$422	$485	$529	$525
% feed is of milk receipts	29%	28%	28%	28%	26%
Feeding index	119	120	120	106	118
Rate roughage feeding	2.3	2.3	2.3	2.0	2.3
Lbs. concentrates fed per cow	5,600	6,000	6,200	5,900	6,100
% net energy-concentrates	48%	49%	50%	48%	45%
% net energy-succulents	32%	32%	32%	33%	37%
% net energy-hay	13%	12%	12%	13%	13%
% net energy-pasture	8%	7%	6%	6%	6%
Projected calving interval(mo.)	12.9	12.9	13.0	13.0	13.0
Days dry	62	61	60	61	62
% days in milk	86%	86%	86%	86%	86%
Breedings per conception	1.7	1.7	1.8	1.8	1.7
% leaving herd	29%	30%	28%	26%	28%
Age at first calving (mo.)	29	29	28	28	27
Age all cows (mo.)	54	54	53	53	52
Body weight at first calving	1,080	1,100	1,100	1,100	1,110
Body weight all cows	1,240	1,250	1,260	1,260	1,260
Income over value feed	$843	$972	$1,153	$1,271	$1,385
Average price rec. for milk	$9.75	$10.48	$11.87	$12.78	$13.66
Labor & management income per operator	$3,178	$20,980	$20,785	$885	$-3,374

Table 86. SELECTED BUSINESS FACTORS BY SIZE OF LABOR AND MANAGEMENT INCOME PER OPERATOR
362 New York Dairy Farms, 1981

Factor	Labor and Management Income Per Operator — QUINTILES				
	1	2	3	4	5
Number of farms	72	72	72	73	73
Labor & management income per operator	$-34,405	$-11,971	$-3,160	$5,199	$19,616
Labor, management & ownership income per operator	$4,172	$19,264	$22,931	$27,147	$46,860
Barn Type					
Percent with freestalls	37%	22%	25%	27%	47%
Size of Business					
Worker equivalent	3.2	2.5	2.3	2.4	3.3
Total crop acres	302	226	201	215	299
Number of cows	86	69	60	68	104
Total capital	$550,175	$456,950	$348,404	$387,746	$558,675
Rates of Production					
Pounds milk sold per cow	14,443	14,714	14,712	15,076	15,321
Tons hay crops per acre (H.E.)	2.6	2.6	2.3	2.4	2.8
Tons corn silage per acre	14.9	15.9	14.0	14.3	15.4
Labor Efficiency					
Pounds milk sold per worker	392,000	406,000	379,000	424,000	478,000
Cows per worker	27	28	26	28	31
Feeding Practices					
Feed bought per cow	$511	$520	$553	$549	$520
Pounds concentrate fed	6,200	5,700	6,000	5,900	6,500
Feeding index	122	116	117	117	119
Rate of roughage feeding	2.3	2.3	2.3	2.3	2.3
Percent NE from concentrates	45%	44%	45%	44%	46%
Percent NE from succulents	40%	35%	34%	36%	39%
Percent NE from dry hay	10%	13%	15%	13%	10%
Breeding Practices					
Percent days in milk	86%	86%	86%	86%	86%
Projected calving interval (mo.)	13.1	13.0	12.9	13.1	12.9
Average days dry	63	62	62	63	60
Breedings per conception	1.7	1.7	1.7	1.7	1.8
Average age at first calving (mo.)	28	27	27	27	27
Average age all cows (mo.)	52	53	52	52	50
Average weight first calving (lbs.)	1,120	1,110	1,110	1,100	1,120
Average weight all cows (lbs.)	1,280	1,260	1,250	1,250	1,270
Percent leaving herd	31%	27%	27%	27%	26%
Somatic cell count	512,000	317,000	310,000	375,000	290,000

Table 87. SELECTED BUSINESS FACTORS BY SIZE OF HERD
362 New York Dairy Farms, 1981

Factor	Number of Cows in Herd						
	Under 40	40-54	55-69	70-84	85-99	100-149	150 & over
Number of farms	48	87	79	47	25	47	29
Percent of farms	13%	24%	22%	13%	7%	13%	8%
Labor & management income per operator	$-6,592	$-5,083	$-9	$-4,117	$-5,013	$-9,470	$7,168
Barn Type							
Percent with freestalls	2%	8%	19%	34%	48%	79%	93%
Size of Business							
Worker equivalent	1.8	2.1	2.4	2.8	3.2	3.8	5.3
Total crop acres	121	172	209	263	283	377	534
Number of cows	34	48	61	77	90	121	204
Total capital	$225,149	$312,756	$378,575	$483,789	$559,577	$688,130	$1,023,884
Rates of Production							
Pounds milk sold per cow	14,200	14,400	15,000	15,000	14,800	15,000	15,000
Tons hay crops per acre (H.E.)	1.9	2.3	2.6	2.8	2.9	2.7	2.7
Tons corn silage per acre	13.5	13.9	14.1	14.0	16.5	15.8	15.7
Labor Efficiency							
Pounds milk sold per worker	263,000	333,000	379,000	421,000	420,000	473,000	573,000
Cows per worker	19	23	25	28	28	32	38
Feeding Practices							
Feed bought per cow	$607	$558	$506	$501	$514	$513	$536
Pounds concentrate fed	5,500	5,800	6,200	6,000	6,000	6,900	6,600
Feeding index	115	118	118	118	116	122	122
Rate of roughage feeding	2.3	2.3	2.3	2.4	2.4	2.2	2.2
Percent NE from concentrates	43%	44%	45%	44%	44%	49%	48%
Percent NE from succulents	26%	32%	38%	40%	40%	45%	46%
Percent NE from dry hay	21%	17%	11%	12%	11%	4%	4%
Breeding Practices							
Percent days in milk	85%	86%	86%	86%	87%	87%	86%
Projected calving interval (mo.)	12.7	12.9	12.9	13.0	13.5	13.3	13.1
Average days dry	67	64	60	61	61	58	60
Breedings per conception	1.6	1.7	1.7	1.6	1.8	1.9	1.8
Average age at first calving (mo.)	28	28	27	27	27	28	26
Average age all cows (mo.)	53	52	52	52	52	50	48
Average weight first calving (lbs.)	1,100	1,100	1,120	1,120	1,110	1,130	1,110
Average weight all cows (lbs.)	1,240	1,250	1,260	1,270	1,250	1,290	1,290
Percent leaving herd	27%	28%	27%	27%	26%	31%	30%
Somatic cell count	388,500	319,700	302,500	334,100	281,200	584,500	318,900

Table 88.

SELECTED BUSINESS FACTORS BY POUNDS MILK SOLD PER COW
362 New York State Dairy Farms, 1981

Factor	Pounds of Milk Sold Per Cow							
	Less Than 12,000	12,000 to 12,999	13,000 to 13,999	14,000 to 14,999	15,000 to 15,999	16,000 to 16,999	17,000 to 17,999	18,000 and Over
Number of farms	27	35	54	79	80	45	24	18
Percent of farms	7%	10%	15%	22%	22%	12%	7%	5%
Labor & management income per oper.	$-5,518	$-14,476	$-4,906	$-5,344	$703	$285	$328	$-1,552
Labor, management, & ownership income per operator	$12,381	$11,900	$21,923	$22,097	$32,250	$28,850	$32,998	$38,035
Barn Type								
Percent with freestalls	26%	31%	33%	28%	35%	38%	21%	39%
Size of Business								
Worker equivalent	2.0	2.7	2.6	2.6	3.1	3.2	2.6	2.7
Total crop acres	176	261	236	238	301	265	184	229
Number of cows	55	77	77	75	90	82	66	73
Total capital	$309,498	$419,529	$440,756	$445,303	$527,932	$524,112	$422,389	$479,506
Rates of Production								
Pounds milk sold per cow	11,000	12,500	13,500	14,600	15,600	16,500	17,400	18,600
Tons hay crops per acre (H.E.)	2.1	2.4	2.5	2.5	2.8	2.6	2.3	2.7
Tons corn silage per acre	12.9	13.6	15.8	15.1	15.1	14.7	15.5	17.3
Labor Efficiency								
Pounds milk sold per worker	302,000	360,000	404,000	423,000	454,000	426,000	445,000	494,000
Cows per worker	28	29	30	29	29	26	26	27
Feeding Practices								
Feed bought per cow	$446	$410	$523	$534	$512	$563	$667	$675
Pounds concentrate fed	4,500	5,200	5,600	6,000	6,400	6,500	7,100	8,300
Feeding index	115	118	120	118	118	118	118	121
Rate of roughage feeding	2.3	2.2	2.3	2.2	2.3	2.4	2.3	2.3
Percent NE from concentrates	39%	42%	43%	46%	46%	46%	48%	52%
Percent NE from succulents	32%	32%	38%	36%	39%	40%	33%	38%
Percent NE from dry hay	19%	17%	14%	12%	11%	10%	12%	7%
Breeding Practices								
Percent days in milk	84%	84%	86%	86%	87%	87%	87%	88%
Projected calving interval (mo.)	12.7	13.1	13.0	13.0	13.0	13.0	13.0	12.9
Average days dry	70	69	61	63	60	60	59	55
Breedings per conception	1.6	1.6	1.7	1.7	1.8	1.9	1.8	1.7
Average age at first calving (mo.)	30	28	28	28	27	27	27	26
Average age all cows (mo.)	60	52	52	51	50	50	51	48
Average weight first calving (lbs.)	1,050	1,110	1,110	1,110	1,120	1,110	1,150	1,150
Average weight all cows (lbs.)	1,190	1,260	1,250	1,260	1,270	1,260	1,300	1,290
Percent leaving herd	23%	30%	27%	27%	29%	28%	28%	31%
Somatic cell count	505,000	323,000	377,000	477,000	363,000	296,000	268,000	148,000

Table 89. SELECTED BUSINESS FACTORS BY AGE OF INDIVIDUAL OPERATORS*
279** New York Dairy Farms, 1981

Factor	Age of Individual Operators						
	Under 30	30-34	35-39	40-44	45-49	50-54	55 & over
Number of farms	24	36	60	61	45	33	20
% farms with DHI records	100%	89%	90%	92%	82%	85%	90%
% farms owner-sampler	0%	11%	10%	8%	18%	15%	10%
% farms freestall barns	0%	17%	23%	30%	36%	48%	30%
Worker equivalent	2.0	2.3	2.4	2.7	2.6	3.2	2.9
Number of cows	51	64	71	77	70	91	67
Number of heifers	34	51	55	62	57	68	50
Total crop acres	163	219	224	243	237	288	240
Total lbs. milk sold	702,000	953,000	1,037,000	1,137,000	1,039,000	1,351,000	996,000
Total cash farm rec.	$104,687	$141,613	$154,884	$174,735	$158,901	$208,550	$148,793
Total end inventory	$293,552	$373,208	$426,599	$456,243	$420,270	$552,721	$395,971
Milk produced per cow	14,877	16,071	15,740	16,002	16,111	15,665	15,424
Milk sold per cow	13,800	14,900	14,600	14,800	14,800	14,800	14,900
Tons hay equiv./acre	2.2	2.1	2.4	2.7	2.6	2.5	2.7
Tons corn silage/acre	12.8	12.6	14.7	14.4	15.0	15.3	14.1
Cows per worker	26	28	29	28	27	29	23
Milk sold per worker	351,000	424,000	429,000	414,000	403,000	426,000	341,000
Feeding index	117	117	118	119	116	119	115
Rate roughage feeding	2.2	2.4	2.3	2.3	2.2	2.3	2.3
Lbs. concentrated fed/cow	5,700	5,800	5,900	6,200	6,300	6,100	5,500
% net energy-concentrates	45%	43%	45%	45%	47%	45%	43%
% net energy-succulents	28%	38%	36%	40%	32%	38%	35%
% net energy-hay	20%	14%	13%	11%	14%	11%	15%
% net energy-pasture	7%	6%	6%	4%	8%	7%	8%
Projected calving interval (mo.)	12.7	12.8	12.9	13.1	12.8	13.4	13.4
Days dry	64	65	62	60	60	62	61
% days in milk	85%	85%	86%	86%	87%	86%	87%
Breedings per conception	1.6	1.6	1.8	1.7	1.8	1.8	1.7
% leaving herd	29%	28%	28%	27%	30%	26%	27%
Age of first calving (mo.)	28	28	27	27	27	28	28
Age all cows (mo.)	52	52	51	52	51	53	52
Body weight at first calv.	1,090	1,090	1,100	1,130	1,120	1,130	1,110
Body weight all cows	1,230	1,250	1,240	1,270	1,260	1,290	1,240
Income over value feed	$1,206	$1,403	$1,370	$1,402	$1,420	$1,388	$1,352
Feed purchased/cow	$567	$565	$541	$546	$517	$508	$526
% feed is of milk rec.	30%	28%	27%	27%	26%	25%	26
Ave. price received milk	$13.55	$13.56	$13.50	$13.79	$13.64	$13.84	$13.36
Labor & mgt. inc./oper.	$-219	$216	$-7,662	$-5,084	$-12,180	$-3,210	$-14,682
Net cash income	$18,752	$32,022	$27,063	$38,673	$28,007	$46,013	$26,954
Labor, mgt. & owner-ship income/operator	$15,559	$28,087	$21,714	$29,790	$16,941	$37,985	$19,602
Percent equity	47%	51%	58%	65%	65%	74%	84%

*Does not include partnerships or corporations.
**Age not reported by seven operators.

Table 90. SELECTED BUSINESS FACTORS BY EDUCATION OF INDIVIDUAL OPERATORS*
270** New York Dairy Farms, 1981

Factor	Years of Education Completed				
	Less than 12	12	13-14	15-16	17 & Over
Number of farms	22	130	54	54	10
% farms with DHI records	86%	86%	89%	94%	100%
% farms owner-sampler	14%	14%	11%	16%	0%
% farms freestall barns	27%	22%	39%	37%	0%
Worker equivalent	2.6	2.3	2.5	2.7	2.1
Number of cows	68	65	79	79	47
Number of heifers	52	51	60	65	37
Total crop acres	241	222	245	245	158
Total lbs. milk sold	1,038,000	948,000	1,132,000	1,195,000	695,000
Total cash farm receipts	$154,450	$144,092	$171,829	$179,473	$108,428
Total end inventory	$417,711	$403,135	$449,139	$459,092	$303,464
Milk produced per cow	16,079	15,480	15,481	16,482	16,224
Milk sold per cow	15,300	14,600	14,300	15,100	14,800
Tons hay equivalent per acre	2.5	2.5	2.5	2.6	2.4
Tons corn silage/acre	13.1	14.5	13.6	15.3	15.3
Cows per worker	26	28	32	29	23
Milk sold per worker	402,000	407,000	453,000	434,000	334,000
Feeding index	115	118	115	118	117
Rate roughage feeding	2.1	2.4	2.2	2.2	2.4
Lbs. concentrated fed/cow	6,100	5,700	6,000	6,600	5,200
% net energy-concentrates	47%	43%	46%	47%	42%
% net energy-succulents	33%	36%	36%	37%	32%
% net energy-hay	14%	14%	12%	11%	16%
% net energy-pasture	7%	6%	6%	4%	10%
Projected calving interval (mo.)	13.2	13.0	12.7	13.0	12.9
Days dry	67	61	62	61	63
% days in milk	86%	86%	86%	87%	86%
Breedings per conception	1.9	1.7	1.7	1.7	1.8
% leaving herd	27%	28%	28%	29%	23%
Age of first calving (mo.)	28	28	27	28	27
Age all cows (mo.)	51	53	51	51	52
Body weight at first calving	1,140	1,110	1,080	1,130	1,110
Body weight all cows	1,280	1,250	1,240	1,270	1,270
Income over value feed	$1,371	$1,346	$1,342	$1,446	$1,398
Feed purchased per cow	$514	$525	$538	$560	$563
% feed is of milk receipts	25%	26%	27%	27%	28%
Average price received milk	$13.48	$13.62	$13.67	$13.61	$13.59
Labor & mgt. income/operator	$-7,210	$-7,448	$-4,931	$-6,490	$-3,876
Net cash income	$28,633	$31,478	$31,154	$36,129	$20,502
Labor, mgt. & ownership income/operator	$20,877	$21,589	$27,672	$28,627	$12,484
Average age of operator	43	41	40	39	37

* Does not include partnerships or corporations.
** Years of education not reported by 16 operators.

Table 91. SELECTED BUSINESS FACTORS FOR REGISTERED AND GRADE HERDS
362 New York Dairy Farms, 1981

Factor	Registered	Grade
Number of farms	122	240
Percent farms with DHI records	98%	82%
Percent farms owner-sampler	2%	18%
Percent farms freestall barns	25%	35%
Worker equivalent	2.67	2.83
Number of cows	73	80
Number of heifers	60	59
Total crop acres	225	260
Total pounds milk sold	1,104,700	1,176,900
Total cash farm receipts	$172,836	$177,159
Total end inventory	$472,385	$454,399
Milk produced per cow	16,288	15,688
Milk sold per cow	15,100	14,700
Tons hay equivalent per acre	2.6	2.5
Tons corn silage per acre	15.7	14.6
Cows per worker	27	28
Milk sold per worker	413,745	415,866
Feed purchased per cow	$536	$523
Percent feed is of milk receipts	26%	26%
Feeding index	117	119
Rate roughage feeding	2.3	2.3
Pounds concentrates fed per cow	6,200	6,000
Percent net energy-concentrates	45%	45%
Percent net energy-succulents	37%	37%
Percent net energy-hay	12%	13%
Percent net energy-pasture	6%	6%
Projected calving interval (months)	13.0	13.0
Days dry	62	62
Percent days in milk	86%	86%
Breedings per conception	1.8	1.7
Percent leaving herd	26%	29%
Age at first calving (months)	27	27
Age all cows (months)	52	51
Body weight at first calving	1,130	1,110
Body weight all cows	1,280	1,250
Income over value feed	$1,439	$1,356
Average price received for milk	$13.77	$13.61
Net cash farm income	$39,120	$37,575
Labor & management income per operator	$-3,873	$-3,126
Labor, management, and ownership income per operator	$28,119	$23,844

Table 92. FARM BUSINESS SUMMARY FOR REGISTERED AND GRADE HERDS
362 New York Dairy Farms, 1981

Item	Registered		Grade	
Capital Investment	1/1/81	1/1/82	1/1/81	1/1/82
Livestock	$129,008	$131,835	$116,171	$118,888
Feed & supplies	29,002	31,139	32,872	33,327
Machinery & equipment	76,481	85,502	78,700	86,838
Land & buildings	206,003	223,909	204,355	215,346
TOTAL INVESTMENT	$440,494	$472,385	$432,098	$454,399
Receipts				
Milk sales	$152,109		$160,190	
Dairy cattle sold	13,355		10,209	
Livestock sales	3,410		2,545	
Other	3,962		4,215	
TOTAL CASH RECEIPTS	$172,836		$177,159	
Increase in livestock	4,223		5,789	
Increase in feed & supplies	2,137		455	
Appreciation	10,312		7,645	
TOTAL FARM RECEIPTS	$189,508		$191,048	
Expenses				
Labor	$ 12,528		$ 13,881	
Feed	40,567		43,093	
Machinery	16,360		16,714	
Livestock				
Replacement livestock	1,615		3,266	
Breeding fees	2,789		1,914	
Veterinary, medicine	3,457		3,169	
Milk marketing	4,597		4,479	
Other livestock expense	6,051		5,178	
Crops	12,036		13,675	
Real estate	12,281		11,391	
Telephone (farm share)	813		503	
Electricity (farm share)	3,072		3,093	
Interest paid	14,560		17,235	
Miscellaneous	2,990		1,993	
TOTAL CASH EXPENSES	$133,716		$139,584	
Expansion livestock	848		2,188	
Machinery depreciation	12,221		12,534	
Building depreciation	5,604		5,475	
Unpaid labor	1,689		1,700	
Interest on farm equity @ 9%	29,998		25,798	
TOTAL FARM EXPENSES	$184,076		$187,279	