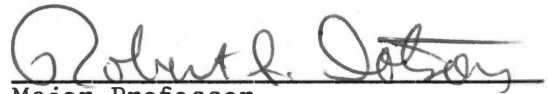


July 25, 1966

To the Graduate Council:

I am submitting herewith three related problems in lieu of thesis written by Houston Y. Beeler entitled: "Grade A Milk Producers in Williamson County, Tennessee: Problem A: Characteristics of Williamson County Grade A Milk Producers and Their Farms; Problem B: Management Practices of Williamson County Grade A Milk Producers; Problem C: Factors Influencing Dairy Management Practice Adoption by Williamson County Grade A Milk Producers." I recommend that they be accepted for nine quarter hours of credit in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural Extension.


Major Professor

We have read these problems
and recommend their acceptance:







Accepted for the Council:

Dean of the Graduate School

GRADE A MILK PRODUCERS IN WILLIAMSON COUNTY, TENNESSEE

PROBLEM A: CHARACTERISTICS OF WILLIAMSON COUNTY GRADE A MILK PRODUCERS
AND THEIR FARMS

PROBLEM B: MANAGEMENT PRACTICES OF WILLIAMSON COUNTY GRADE A MILK PRO-
DUCERS

PROBLEM C: FACTORS INFLUENCING DAIRY MANAGEMENT PRACTICE ADOPTION BY
WILLIAMSON COUNTY GRADE A MILK PRODUCERS

Three Related Special Problems in Lieu of Thesis

In Partial Fulfillment
of the Requirements for the Degree
Master of Science

by
Houston Y. Beeler

August 1966

Special
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Thesis
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PROBLEM A:
CHARACTERISTICS OF WILLIAMSON COUNTY GRADE A MILK PRODUCERS
AND THEIR FARMS

A Special Problem in Lieu of Thesis

In Partial Fulfillment
of the Requirements for the Degree
Master of Science

by
Houston Y. Beeler

August 1966

CHAPTER I

INTRODUCTION

I. THE SITUATION AND NEED FOR THE STUDY

Dairying is of major importance in Tennessee. The sale of dairy products was the third most important source of cash receipts from farm marketings in 1963 (17:22).^{*} The gross farm income from dairy products in 1963 was over 93 million dollars. This income was derived from 476,000 dairy cows on Tennessee farms. Average milk production per Tennessee cow that year was 4,710 pounds as compared to the national average milk production per cow of 7,545 pounds. Tennessee research indicates that milk production per cow of 6,000 pounds or more is necessary for a profitable dairy enterprise, and that cows producing below that amount should be culled and replaced.

Williamson County is located near the center of the area referred to as Middle Tennessee. It is bordered on the north by Metropolitan Nashville (Davidson County), the state Capital. About three-fourths of the county lies in the area known as the Central Basin; approximately one-fourth of the county area is on the Western Highland Rim. All of the county's dairy production is within the Central Basin area. The agriculture of the county consists of livestock, dairying, tobacco, and other crop production in descending order of their

^{*}Numbers in parentheses refer to numbered references in the Bibliography; those after the colon are page numbers.

relative economic importance (6:217). Dairying has continued to be an important part of the county's economy since the turn of this century. Of the leading counties in Tennessee, in value of dairy products sold by farmers in 1959, Williamson County ranked third (17:122).

Grade A milk production is the most important part of the county's dairy industry. In 1963, this county's 145 Grade A dairymen were delivering to the Nashville market more milk than was shipped by the county's 229 Grade A dairymen in 1953 (5:200). This decrease in the number of Grade A milk producers was the result of several forces other than milk prices. Some of these included: 1) efforts on the part of the Nashville Health Department to upgrade milking facilities; 2) increased pressure from urban expansion; 3) the change to all bulk tanks in the period 1958-59, and 4) the lack of enough competent dairy labor which forced many part-time and absentee owners out of the dairy business.

The problem arises as to what the situation will be during the next decade, if the present economic and technological conditions continue to change. Some statewide milk production problems that have been identified among dairymen include (4:16): 1) the lack of an adequate supply of quality feed (especially hay and silage); 2) too little use of artificial breeding; 3) failure to keep adequate records; 4) inadequate and/or inefficient housing and milking facilities; 5) the prevalence of mastitis in dairy herds throughout the state; and 6) improper

or inadequate use of insecticides in the control of flies and other insect pests with resultant high bacterial counts and/or contamination.

The basis for the identification of the foregoing problems was mainly that of observations made by county and state Extension staff members. Such problems point specifically to the need for further research to be done in selected counties to try to ascertain which production and management practices dairymen use or do not use.

Williamson County was one of several counties selected to participate in this study under the guidance of the Agricultural Extension Training and Studies and Dairy Departments of The University of Tennessee.

Because of the importance of factual information in Extension planning, this and other companion studies could serve as a basis for teaching dairy herd management to Grade A milk producers.

II. THE PURPOSE OF THE STUDY

This specific study was designed to try to answer the question: What are the characteristics of Williamson County Grade A dairymen (and their farms) whose herds produced in high, middle and low thirds in terms of average pounds of butterfat per cow in 1963?

III. REVIEW OF LITERATURE

At the time of the present study, only a limited number of studies had been made concerning the characteristics of Grade A dairy

producers in Tennessee. Reference has previously been made above to the companion studies in several other selected Tennessee counties. Most of the literature reviewed dealt with selected groups of dairy farmers who were enrolled in cooperating programs with their Land Grant College. In Virginia (8:16), a Dairy Farm Account Summary for 139 Grade A dairy farms in 1963, disclosed that the average dairyman milked 41 cows. The average production per cow was about 10,000 pounds of 3.5 percent butterfat milk. The percent of cow turnover in this study was 35 percent.

Givan's (10:8) 1964 study involved 3,097 Tennessee Grade A milk producers, and 152 of these were Williamson County dairymen. Givan found that the average producer was 47 years of age, farmed 250 acres of land, and milked a herd of 41 cows. The average production per cow was 7,157 pounds of milk annually.

Census information for 1959 (6:183) indicated that the average Williamson County farmer was 52.3 years of age, and that the average size of farm was 139.3 acres.

Cleland (7:38) reported that the median school years completed by Williamson County persons 25 years and over in 1960 was 8.6 years.

The records of the Nashville Milk Producers' Association, Incorporated (5:7) showed that, in 1963, there were 1,296 producers in the milkshed marketing an average of 749 pounds of milk per day, compared with 1,395 producers marketing an average of 493 pounds of milk per day in 1959.

O'Neal's (15:25) study indicated that the levels of milk production were related to the operator's management ability.

IV. METHODS

The Nashville Milk Producers' Association, Incorporated, furnished an alphabetical list of the 145 Williamson County Grade A milk producers selling milk in 1963. For the purposes of this study, 75 dairymen, about 52 percent of the total population, were randomly selected. The 75 dairymen were divided into three groups of 25 each according to their average per cow butterfat production for 1963. Table I shows the groups and the ranges of butterfat production within each group.

A survey (see Appendix) consisting of 45 main questions, some with many sub parts, was completed by a personal interview with each of the 75 dairymen previously selected. Other information obtained concerning each producer from the Nashville Milk Producers' Association, Incorporated, included pounds of milk marketed, butterfat test and bacterial count of milk; and was computed to herd averages for 1963. In addition, there were seven judgement questions for the interviewer to answer concerning his impressions of the respondent's level of practice adoption, managerial interest, attitude toward the survey, and how well the interviewer knew the respondent and his dairy situation.

Primary analyses were done in simple numbers and percents, and averages or medians were computed where appropriate. Main comparisons were made between high and low producers in an effort to find greatest differences.

TABLE I

NUMBERS OF WILLIAMSON COUNTY GRADE A DAIRYMEN IN THE BUTTERFAT
PRODUCTION GROUPS, ACCORDING TO RANGES IN BUTTERFAT
PRODUCTION PER COW BASED ON 1963 FIGURES

Average Per Cow Butterfat Production Group	Number of Producers Interviewed	Range of Butterfat Production Per Cow Within Groups (Pounds)
Low	25	110-249
Medium	25	250-289
High	25	290-440
Total	75	110-440

CHAPTER II

FINDINGS

I. DEGREE TO WHICH INTERVIEWER KNEW GRADE A MILK PRODUCERS

The interviewer was asked to rate how well he knew the respondents. Table II shows that 67 percent, or 50 of the dairymen, were known "very well" or "fairly well." Eighty-eight percent of the high producers were known very well or fairly well as compared with 52 percent of the medium producers and 60 percent of the low producers. The findings here point to the fact that the more progressive dairymen have contact with the County Extension office.

II. RESPONDENT'S ATTITUDE TOWARD SURVEY

Table III shows that the interviewer was well-received by 96 percent of the producers in each group. More high producers (88 percent) were "friendly" than was true for the low (76 percent). The three producers classed as "indifferent" were not known to the interviewer prior to this visit, one each being in the high, medium and low production groups.

III. EDUCATIONAL LEVELS

The average educational level of all the dairymen was 11.5 grades of school completed. Table IV shows that the educational level for

TABLE II

DEGREES TO WHICH INTERVIEWER KNEW ALL WILLIAMSON COUNTY DAIRYMEN
INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS
BY NUMBERS AND PERCENTS*

Degree to Which Interviewer Knew Respondent	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Very Well	22	30	13	52	5	20	4	16
Fairly Well	28	37	9	36	8	32	11	44
Not Very Well	19	25	1	4	9	36	9	36
Not at All	6	8	2	8	3	12	1	4
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

TABLE III

INTERVIEWER'S ESTIMATE OF THE ATTITUDES OF ALL WILLIAMSON COUNTY
DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS TOWARD
THE SURVEY BY NUMBERS AND PERCENTS*

Attitude Toward the Survey	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Friendly	61	81	22	88	20	80	19	76
Somewhat Friendly	11	15	2	8	4	16	5	20
Indifferent	3	4	1	4	1	4	1	4
Antagonistic	0	0	0	0	0	0	0	0
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

TABLE IV

EDUCATIONAL LEVELS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS BY NUMBERS AND PERCENTS,
AND AVERAGE EDUCATIONAL GRADE LEVEL*

Educational Grade Level	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
5-7	7	9	1	4	2	8	4	16
8	8	11	2	8	2	8	4	16
9-11	8	11	0	0	7	28	1	4
12	38	51	16	64	11	44	11	44
1-3 (college)	7	9	3	12	1	4	3	12
Bachelor's	4	5	2	8	1	4	1	4
Graduate Work or Advanced Degree	3	4	1	4	1	4	1	4
Total	75	100	25	100	25	100	25	100
Average Educa- tional Levels	11.5 grades		12.4 grades		11.2 grades		11.0 grades	

* Percents are rounded to nearest whole number.

the high group was 12.4 grades, the medium group was 11.2 grades, and the low group was 11.0 grades.

The most notable difference occurred in the fifth through eleventh grade categories that included a total of 23 dairymen. Only 3 of these were in the high group, 11 were in the medium and 9 were in the low group. Of the 52 dairymen in the twelfth grade through advanced college degree categories, 22 were in the high group, 14 in the medium and 16 in the low group.

There seemed to be a positive relation between educational level and high production.

IV. AGE GROUPS

It is seen in Table V that the average age of all 75 dairymen was about 48 years. It will be noted that the high producers averaged two years older (50 years) than the low (48 years).

With regard to this subject, eighteen producers in the age categories 55-64 years and 65 or more years posed a major problem not dealt with in this study, "How do I get out of, or retire from, the dairy business most advantageously in terms of personal net worth?"

V. GROSS FAMILY INCOME

The question on the interview schedule relating to total gross family income was optional on the part of the respondents and 42 (56 percent) of the dairymen gave no answer.

TABLE V

AGE GROUPS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED, HIGH,
MEDIUM AND LOW PRODUCERS BY NUMBERS AND PERCENTS,
AND AVERAGE AGES*

Age Category	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Under 25 years	1	1	0	0	1	4	0	0
25-34 years	8	11	3	12	2	8	3	12
35-44 years	22	29	4	16	8	32	10	40
45-54 years	25	33	10	40	9	36	6	24
55-64 years	11	15	7	28	3	12	1	4
65 or more years	8	11	1	4	2	8	5	20
Total	75	100	25	100	25	100	25	100
Average Age	48 years		50 years		47 years		48 years	

*Percents are rounded to nearest whole number.

An average gross family income of \$19,091 was reported by the 33 dairymen answering this question. Table VI shows that the average gross family income for the high producers averaged \$20,533, the medium \$21,250, and the low \$15,200. Positive relation is indicated between family income and production.

VI. SEX GROUPS

Only three of the dairy operations included in the survey were operated by women making the management decisions. Two of these were in the medium production group, and one was in the low group. An observation of the interviewer making this study was that the first contact at the farms was with the wife of the dairyman in approximately 80 percent of the cases. With three notable exceptions, in addition to the three female operators, such women stated that they could not answer questions concerning the management of their dairy operations.

VII. STAGE IN THE ADOPTION PROCESS

Table VII recognizes that all dairymen do not adopt recommended production practices at the same time. The interviewer was to render a judgment on each dairyman following the interview with respect to his apparent rate of adopting recommended dairy production practices.

The rating scale used gave 5 points to those judged to be among the first to adopt new dairy practices, 4 points to producers soon after the first, 3 points to those sooner than average, 2 points to those

TABLE VI

TOTAL 1963 GROSS FAMILY INCOMES OF ALL WILLIAMSON COUNTY DAIRYMEN
INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS BY NUMBERS
AND PERCENTS, AND AVERAGE INCOMES*

Total Gross Family Income Category in Dollars	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Not Answered	42	56	10	40	17	68	15	60
4000-5999	3	4	1	4	0	0	2	8
6000-7999	0	0	0	0	0	0	0	0
8000-9999	1	1	0	0	0	0	1	4
10,000-11,999	5	7	3	12	0	0	2	8
12,000-13,999	6	8	2	8	4	16	0	0
14,000-15,999	0	0	0	0	0	0	0	0
16,000-17,999	4	5	1	4	1	4	2	8
18,000-19,999	2	3	2	8	0	0	0	0
20,000-21,999	2	3	0	0	1	4	1	4
22,000-23,999	0	0	0	0	0	0	0	0
24,000-25,999	1	1	1	4	0	0	0	0
26,000-29,999	5	7	3	12	0	0	2	8
30,000-49,999	4	5	2	8	2	8	0	0
Total	75	100	25	100	25	100	25	100
Average for Those Reporting	\$19,091		\$20,533		\$21,250		\$15,200	

*Percents are rounded to nearest whole number.

TABLE VII

INTERVIEWER'S OPINION OF STAGES OF THE ADOPTION PROCESS REPRESENTED BY
ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW
PRODUCERS, IN TERMS OF NEW RECOMMENDED DAIRY MANAGEMENT
PRACTICES, BY NUMBERS AND PERCENTS*

Stage in Adoption of New Dairy Man- agement Practices	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Among the first few (5 points)	8	11	7	28	1	4	0	0
Soon after first few (4 points)	12	16	6	24	2	8	4	16
Sooner than aver- age (3 points)	21	28	6	24	7	28	8	32
A little later than most (2 points)	27	36	5	20	11	44	11	44
Among the last few (1 point)	7	9	1	4	4	16	2	8
Total	75	100	25	100	25	100	25	100
Average Stage	2.8 points		3.5 points		2.4 points		2.6 points	

*Percents are rounded to nearest whole number.

a little later than most, and 1 point for those among the last to adopt practices. All producers rated an average of 2.8 points. It will be noted that the high producers rated 3.5 points and the low producers rated 2.6 points. Of the eight dairymen rated among the first few seven were high producers, and one was in the medium category.

VIII. INTEREST IN DAIRY HERD MANAGEMENT IMPROVEMENT

The interviewer also expressed his opinion concerning each producer's interest in improving his dairy herd management. These ratings were given numerical numbers with those receiving a zero rating (0) for "not interested," 1 for "indifferent," 2 for "somewhat interested," and 3 for "very interested."

It will be noted in Table VIII that the average of all dairymen was 2.1 points or "somewhat interested." Ratings for three production groups averaged 2.5 points for the high producers, 2.0 points for the medium and 1.8 points for the low group.

The two high producers rated as "not interested," reported to the interviewer, that their only interest in dairying was "selling out immediately."

IX. MAJOR OCCUPATION

Table IX shows that 81 percent or 61 of the producers were full-time farmers. Another 12 to 16 percent were classified as part-time farmers, and only two producers were classified otherwise. No important differences were noted between production groups.

TABLE VIII

INTERVIEWER'S OPINION OF THE INTEREST OF ALL WILLIAMSON COUNTY
DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS, IN
IMPROVING THEIR LEVELS OF DAIRY HERD MANAGEMENT, BY
NUMBERS AND PERCENTS, AND AVERAGE INTEREST*

Degree of Interest in Improving Dairy Management Level	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Not Interested (0 points)	6	8	2	8	1	4	3	12
Indifferent (1 point)	9	12	0	0	5	20	4	16
Somewhat Interested (2 points)	33	44	7	28	13	52	13	52
Very Interested (3 points)	27	36	16	64	6	24	5	20
Total	75	100	25	100	25	100	25	100
Average Interest	2.1 points		2.5 points		2.0 points		1.8 points	

*Percents are rounded to nearest whole number.

TABLE IX

MAJOR OCCUPATIONS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS BY NUMBERS AND PERCENTS*

Major Occupations	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Full-time Farmer	61	81	20	80	21	84	20	80
Part-time Farmer	12	16	5	20	3	12	4	16
Professional Person	1	2	0	0	0	0	1	4
Retired Person	1	1	0	0	1	4	0	0
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

X. MAJOR FARM ENTERPRISES

Table X reveals that dairying was the major farm enterprise on 61 farms, with these distributed fairly equally in production classification ranges: 20 high, 21 medium, and 20 low producers. Eleven of the producers indicated that an unspecified combination of farm enterprises was of more economic importance than Grade A dairying on their farms.

XI. TOTAL FARM ACREAGE

As seen in Table XI, the average size dairy farm was 242 acres. The high producers had an average of 258 acres, medium 226 acres, and low producers averaged 243 acres. There may be some minor relationship between the size of a farm and the production rating.

XII. TOTAL CROPLAND ACREAGE

Table XII shows the total average cropland of all Grade A dairy farms was 149 acres. The high producers again had more acreage (162 acres of cropland) than the low producers (155 acres of cropland per farm).

XIII. COWS MILKED

Size of Herd

Table XIII indicates that the average size Grade A milking herd sampled consisted of 44 cows. Seventy-one percent of the herds were in

TABLE X

MAJOR FARM ENTERPRISES OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS BY NUMBERS AND PERCENTS*

Major Farm Enterprise	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Dairying	61	81	20	80	21	84	20	80
Beef	2	3	1	4	0	0	1	4
Grains	1	1	0	0	0	0	1	4
Other	11	15	4	16	4	16	3	12
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

TABLE XI

TOTAL FARM ACREAGE CATEGORIES OF ALL WILLIAMSON COUNTY DAIRYMEN
INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS BY NUMBERS AND
PERCENTS AND AVERAGE FARM ACRES*

Total Farm Acreage Interval	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
50-99	5	7	3	12	2	8	0	0
100-149	14	19	4	16	5	20	5	20
150-199	15	20	5	20	5	20	5	20
200-249	9	12	1	4	5	20	3	12
250-299	12	16	3	12	3	12	6	24
300-349	8	10	3	12	2	8	3	12
350-399	1	1	1	4	0	0	0	0
400-449	4	5	1	4	1	4	2	8
450-499	3	4	1	4	1	4	1	4
500-549	2	3	1	4	1	4	0	0
550-600	2	3	2	8	0	0	0	0
Total	75	100	25	100	25	100	25	100
Average Acres in Farm	242		258		226		243	

*Percents are rounded to nearest whole number.

TABLE XII

TOTAL CROPLAND ACREAGE CATEGORIES OF ALL WILLIAMSON COUNTY DAIRYMEN
INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS BY NUMBERS AND
AND PERCENTS, AND AVERAGE ACRES*

Total Cropland Acreage Interval	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
0-49	5	7	1	4	3	12	1	4
50-99	17	23	6	24	8	32	3	12
100-149	15	20	5	20	4	16	6	24
150-199	17	23	3	12	5	20	9	36
200-249	12	16	6	24	2	8	4	16
250-299	4	5	1	4	2	8	1	4
300-349	1	1	1	4	0	0	0	0
350-399	2	3	1	4	1	4	0	0
400-450	2	2	1	4	0	0	1	4
Total	75	100	25	100	25	100	25	100
Average Acres in Cropland	149		162		131		155	

*Percents are rounded to nearest whole number.

TABLE XIII

TOTAL NUMBERS OF COWS MILKED BY ALL WILLIAMSON COUNTY DAIRYMEN
INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS IN 1963 BY
NUMBERS AND PERCENTS, AND AVERAGE HERD SIZE*

Herd Size Interval in Numbers of Cows	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
12-29	13	17	4	16	3	12	6	24
30-49	34	45	11	44	13	52	10	40
50-69	19	26	6	24	5	20	8	32
70-100	9	12	4	16	4	16	1	4
Total	75	100	25	100	25	100	25	100
Actual Average Herd Size	44 cows		45 cows		46 cows		41 cows	

*Percents are rounded to nearest whole number.

the 30-69 cows herd size. There seems to be little relationship between herd size and production, though high producers averaged somewhat larger herds (45 cows) than low (41 cows).

Registered Cows

It will be noted in Table XIV that 64 percent of the high producers milked one or more registered cows, as compared to only 16 percent of the low producers. The high producers had an average of 8 registered cows per herd, while the low producers averaged only 3.

Also noted in Table XIV is the fact that 50 producers, or 67 percent of the dairymen, milked no registered cows. The ownership of registered cows may show a relationship to the producer who has an interest in improving his level of dairy herd management.

Breed of Cows

Tables XV and XVI show the breeds of registered and grade cows and their distribution throughout the three production ranges. It is of interest that there were 9 registered Holstein herds, 5 registered Jersey herds and 4 registered Guernsey herds. In the past, Williamson County had been considered a Jersey area.

Five herds reported no grade cows. At the same time, there were 53 producers who reported no registered cows in their herds (13 high producers, 19 medium and 21 low). Eighty percent of all producers with grade cows reported mixed milking herds consisting of combinations of Holsteins, Jerseys, Guernsey and Brown Swiss cows.

TABLE XIV

TOTAL NUMBERS OF REGISTERED COWS MILKED BY ALL WILLIAMSON COUNTY
DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS IN
1963 BY NUMBERS AND PERCENTS, AND AVERAGE NUMBERS*

Number of Registered Cows Milked	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
0	50	67	9	36	20	80	21	84
1-9	15	20	10	40	3	12	2	8
10-19	3	4	2	8	0	0	1	4
20-29	0	0	0	0	0	0	0	0
30-39	3	4	2	8	1	4	0	0
40-49	3	4	2	8	0	0	1	4
50-59	0	0	0	0	0	0	0	0
60-69	0	0	0	0	0	0	0	0
70-75	1	1	0	0	1	4	0	0
Total	75	100	25	100	25	100	25	100
Average Number	5 cows		8 cows		5 cows		3 cows	

* Percents are rounded to nearest whole number.

TABLE XV

BREEDS OF REGISTERED COWS MILKED IN 1963 BY ALL WILLIAMSON COUNTY
DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS
BY NUMBERS AND PERCENTS*

Breed of Registered Cows	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Ayrshire	1	1	1	4	0	0	0	0
Guernsey	4	5	3	12	1	4	0	0
Holstein	9	12	4	16	2	8	3	12
Jersey	5	7	2	8	2	8	1	4
Holstein and Jersey	2	3	2	8	0	0	0	0
Brown Swiss, Guernsey, Holstein, Jersey	1	2	0	0	1	4	0	0
None	53	70	13	52	19	76	21	84
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

TABLE XVI

BREEDS OF GRADE COWS MILKED IN 1963 BY ALL WILLIAMSON COUNTY DAIRYMEN
INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS BY NUMBERS AND PERCENTS*

Breed of Grade Cows	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Guernsey	1	1	0	0	1	4	0	0
Holstein	7	10	4	16	1	4	2	8
Jersey	2	3	1	4	1	4	0	0
Guernsey and Holstein	4	5	2	8	1	4	1	4
Holstein and Jersey	12	16	3	12	5	20	4	16
Brown Swiss, Guernsey, and Jersey	1	1	1	4	1	4	0	0
Brown Swiss, Holstein, and Jersey	5	7	2	8	2	8	1	4
Guernsey, Holstein, and Jersey	22	29	4	16	5	20	13	52
Brown Swiss, Guernsey, Holstein, and Jersey	16	21	7	28	6	24	3	12
None	5	7	2	8	2	8	1	4
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

XIV. HEIFERS KEPT

Replacement

This study reveals in Tables XVII and XVIII that approximately 88 percent of Grade A milk producers were raising some of their replacement heifers. The total average number of heifers over and under one year of age was 28 per farm. This number is probably low in relation to the number of cows milked, an average of 44 cows per farm. (Table XIII, page 23). The high producers raised more heifers (33) than did low producers (24).

Registered Heifers

It is revealed in Tables XIX and XX that only about 20 percent of the producers were keeping registered heifers over and under one year of age. One-half (50 percent) of those raising some purebred heifers were in the high production range. The interest in keeping registered heifers appears to be related to whether or not producers were milking registered cows as reported earlier in Table XIV, page 25.

Breed of Heifers

It is noted in Table XXI that 19 producers reported registered heifers kept. The 12 herds reporting a single breed kept included 6 of the Holstein breed, 4 of Guernsey, and 2 of Jersey breeds. The 7 herds that reported more than a single breed kept included combinations of Holsteins and Jerseys and other breeds. There was little difference to be noted between production groups when breeds were compared.

TABLE XVII

TOTAL NUMBERS OF HEIFERS ONE YEAR OR OLDER KEPT BY ALL WILLIAMSON
COUNTY DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS
IN 1963 BY NUMBERS AND PERCENTS, AND AVERAGE NUMBERS*

Number of Heifers Kept	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
0	9	12	4	16	4	16	1	4
1-10	14	19	5	20	3	12	6	24
11-20	40	53	7	28	15	60	18	72
21-30	10	13	7	28	3	12	0	0
31-40	2	3	2	8	0	0	0	0
41-50	0	0	0	0	0	0	0	0
Total	75	100	25	100	25	100	25	100
Average Number Kept	14 heifers		15 heifers		13 heifers		13 heifers	

*Percents are rounded to nearest whole number.

TABLE XVIII

TOTAL NUMBER OF HEIFERS UNDER ONE YEAR OF AGE KEPT BY ALL WILLIAMSON
COUNTY DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS IN
1963 BY NUMBERS AND PERCENTS, AND AVERAGE NUMBERS*

Number of Heifers Kept	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
0	8	11	2	8	3	12	3	12
1-10	25	33	7	28	7	28	11	44
11-20	31	42	8	32	14	56	9	36
21-30	9	12	6	24	1	4	2	8
31-40	1	1	1	4	0	0	0	0
41-43	1	1	1	4	0	0	0	0
Total	75	100	25	100	25	100	25	100
Average Number Kept	14 heifers		18 heifers		12 heifers		11 heifers	

*Percents are rounded to nearest whole number.

TABLE XIX

TOTAL NUMBERS OF REGISTERED HEIFERS ONE YEAR OR OLDER KEPT BY ALL
 WILLIAMSON COUNTY DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW
 PRODUCERS IN 1963 BY NUMBERS AND PERCENTS, AND
 AVERAGE NUMBERS*

Number of Heifers Kept	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
0	60	80	18	72	21	84	21	84
1-10	8	11	4	16	2	8	2	8
11-20	5	7	2	8	1	4	2	8
21-30	2	2	1	4	1	4	0	0
Total	75	100	25	100	25	100	25	100
Average Number Kept	2 heifers		3 heifers		2 heifers		2 heifers	

*Percents are rounded to nearest whole number.

TABLE XX

TOTAL NUMBERS OF REGISTERED HEIFERS UNDER ONE YEAR OF AGE KEPT BY ALL
 WILLIAMSON COUNTY DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW
 PRODUCERS IN 1963 BY NUMBERS AND PERCENTS, AND
 AVERAGE NUMBERS*

Number of Heifers Kept	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
0	60	80	17	68	21	84	22	88
1-10	9	12	5	20	2	8	2	8
11-20	5	7	3	12	2	8	0	0
21-30	1	1	0	0	0	0	1	4
Total	75	100	25	100	25	100	25	100
Average Number Kept	2 heifers		3 heifers		2 heifers		1 heifers	

*Percents are rounded to nearest whole number.

TABLE XXI

BREEDS OF REGISTERED HEIFERS KEPT IN 1963 BY ALL WILLIAMSON COUNTY
DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS BY
NUMBERS AND PERCENTS*

Breed of Registered Heifers	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
None kept	56	75	18	72	20	80	18	72
Guernsey	4	5	3	12	1	4	0	0
Holstein	6	8	2	8	1	4	3	12
Jersey	2	3	0	0	1	4	1	4
Holstein and Jersey	5	7	2	8	1	4	2	8
Guernsey, Holstein, and Jersey	1	1	0	0	0	0	1	4
Brown Swiss, Holstein, Jersey, and Guernsey	1	1	0	0	1	4	0	0
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

Table XXII shows a similar pattern with 13 Holstein herds, 5 Jersey, and 3 Guernsey herds. All other herds included two or more dairy breeds--the Holstein breed again pre-dominating. One producer had some Jersey and Angus crossbreeds; this reflected his effort at growing into a beef herd and out of Grade A milk production. No clear relation appears to exist between production and breed, though Holsteins were most popular.

XV. BULLS KEPT

Table XXIII shows that 42, or 56 percent, of dairymen kept no dairy bulls (excluding beef bulls kept and used on dairy cows and heifers). Thirty-three producers reported keeping an average of 1.5 bulls per herd. No differences were noted between high and low production averages.

In Table XXIV, it will be noted that 21 of the 33 dairymen keeping bulls kept registered bulls. They were equally divided among the three production groups. Table XXV reveals the 10 Grade A dairy producers used grade bulls.

Breeds of Bulls

The breeds of registered and grade dairy bulls kept by Grade A producers, mainly Holstein, is revealed in Tables XXVI and XXVII. Most of the producers who kept bulls indicated several reasons, namely: 1) "it is cheaper than artificial breeding"; 2) "you get a higher conception

TABLE XXII

BREEDS OF GRADE HEIFERS KEPT IN 1963 BY ALL WILLIAMSON COUNTY
DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS BY
NUMBERS AND PERCENTS*

Breed of Registered Heifers	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
None	15	20	3	12	7	28	5	20
Guernsey	3	4	1	4	1	4	1	4
Holstein	13	17	4	16	2	8	7	28
Jersey	5	7	1	4	2	8	2	8
Mixed	1	1	0	0	0	0	1	4
Guernsey and Holstein	6	8	3	12	2	8	1	4
Guernsey and Jersey	1	1	0	0	0	0	1	4
Holstein and Jersey	16	22	6	24	6	24	4	16
Brown Swiss, Guernsey, and Jersey	1	1	0	0	1	4	0	0
Brown Swiss, Guernsey, and Holstein	2	3	1	4	1	4	0	0
Brown Swiss, Holstein, and Jersey	2	3	0	0	1	4	0	0
Guernsey, Holstein, and Jersey	9	12	6	24	1	4	2	8
All Four Above	1	1	0	0	1	4	0	0
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

TABLE XXIII

TOTAL NUMBERS OF BULLS KEPT BY ALL WILLIAMSON COUNTY DAIRYMEN
INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS IN 1963 BY
NUMBERS AND PERCENTS, AND AVERAGE NUMBERS*

Number of Bulls Kept	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
0	42	56	15	60	12	48	15	60
1	21	28	6	24	9	36	6	24
2	9	12	3	12	3	12	3	12
3	2	3	1	4	0	0	1	4
4	1	1	0	0	1	4	0	0
Total	75	100	25	100	25	100	25	100
Average Number Kept by Those Reporting Bulls	1.5 bulls		1.5 bulls		1.5 bulls		1.5 bulls	

*Percents are rounded to nearest whole number.

TABLE XXIV

TOTAL NUMBERS OF REGISTERED BULLS KEPT BY ALL WILLIAMSON COUNTY
DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS IN 1963
BY NUMBERS AND PERCENTS, AND AVERAGE NUMBERS*

Number of Bulls Kept	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
0	54	72	18	72	18	72	18	7
1	13	18	6	24	4	16	3	12
2	7	9	1	4	2	8	4	16
3	0	0	0	0	0	0	0	0
4	1	1	0	0	1	4	0	0
Total	75	100	25	100	25	100	25	100
Average Number Kept by Those Reporting Registered Bulls	1.5 bulls		1.1 bulls		1.7 bulls		1.6 bulls	

*Percents are rounded to nearest whole number.

TABLE XXV

TOTAL NUMBERS OF GRADE BULLS KEPT BY ALL WILLIAMSON COUNTY DAIRYMEN
INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS IN 1963 BY NUMBERS
AND PERCENTS, AND AVERAGE NUMBERS

Number of Bulls Kept	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
0	65	86	22	88	21	84	22	88
1	6	8	1	4	3	12	2	8
2	2	3	1	4	1	4	0	0
3	2	3	1	4	0	0	1	4
4	0	0	0	0	0	0	0	0
Total	75	100	25	100	25	100	25	100
Average Number Kept by Those Keeping Grade Bulls	1.6 bulls		2.0 bulls		1.3 bulls		1.7 bulls	

*Percents are rounded to nearest whole number.

TABLE XXVI

BREEDS OF REGISTERED BULLS KEPT IN 1963 BY ALL WILLIAMSON COUNTY
DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS BY
NUMBERS AND PERCENTS*

Breed of Registered Bulls	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
None kept	63	85	22	88	21	84	20	80
Brown Swiss	1	1	0	0	1	4	0	0
Guernsey	2	3	0	0	1	4	1	4
Holstein	4	6	1	4	1	4	2	8
Jersey	4	5	1	4	1	4	2	8
Guernsey and Holstein	1	1	1	4	0	0	0	0
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

TABLE XXVII

BREEDS OF GRADE BULLS KEPT IN 1963 BY ALL WILLIAMSON COUNTY DAIRYMEN
INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS BY
NUMBERS AND PERCENTS*

Breed of Grade Bulls	All Dairymen Interviewed		High Producers		Medium Producers		High Producers	
	No.	%	No.	%	No.	%	No.	%
None	70	94	24	96	22	88	24	96
Brown Swiss	0	0	0	0	0	0	0	0
Guernsey	0	0	0	0	0	0	0	0
Holstein	4	5	1	4	2	8	1	4
Jersey	1	1	0	0	1	4	0	0
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

rate than with artificial breeding," 3) "and we keep a bull to breed our heifers."

XVI. RATINGS OF HERDS

Tables XXVIII and XXIX show the ratings of the dairy herds as adjudged by the producers and the interviewer respectively. It will be noted in Table XXVIII that 72 dairymen rated their herd on a scale from "poor" (0 points) to "excellent" (3 points) for an average rating of "fair" to "good" (1.8 points). A comparison of the average ratings of the three groups shows that the high producers averaged 2.3 points, compared to the low producers 1.4 points. Ten of the producers rated their herds as "excellent," and all ten were in the high category. The dairymen appeared to be generally aware of their proper herd ratings in relation to the herds of others in his community.

Table XXIX, using the same rating scale as Table XXVIII, shows that the interviewer's observation was reasonably reliable in scoring the 52 producers who were well enough known in the three production ranges. The average value of herds of known respondents was "low good" (1.6 points) with high producers scoring "good plus" (2.2 points), medium producers scored "fair plus" (1.3 points) and low producers scoring "fair minus" (0.9 points). All ten of the herds rated "excellent" were in the high production range.

TABLE XXVIII

RATINGS GIVEN TO THEIR DAIRY HERDS BY ALL WILLIAMSON COUNTY DAIRYMEN
INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS IN NUMBERS AND
PERCENTS, AND AVERAGE RATINGS*

Ratings Dairymen Gave Their Own Herds	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Not Answered	3	4	0	0	1	4	2	8
Poor (0 point)	2	3	0	0	1	4	1	4
Fair (1 point)	14	19	2	8	4	16	8	32
Good (2 points)	46	61	13	52	19	76	14	56
Excellent (3 points)	10	13	10	40	0	0	0	0
Total	75	100	25	100	25	100	25	100
Average Rating	1.8 points		2.3 points		1.7 points		1.4 points	

*Percents are rounded to nearest whole number.

TABLE XXIX

INTERVIEWER'S RATINGS GIVEN THE HERDS OF ALL WILLIAMSON COUNTY DAIRYMEN
INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS BY NUMBERS AND
PERCENTS, AND AVERAGE RATINGS*

Ratings Interviewers Gave Herds of Inter- viewees	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Not known well enough to rate	23	31	4	16	10	40	9	36
Poor (0 point)	7	9	1	4	1	4	5	20
Fair (1 point)	19	26	4	16	8	32	7	28
Good (2 points)	16	21	6	24	6	24	4	16
Excellent (3 points)	10	13	10	40	0	0	0	0
Total	75	100	25	100	25	100	25	100
Average Rating of Herds of Known Respondents	1.6 points		2.2 points		1.3 points		0.9 points	

*Percents are rounded to nearest whole number.

XVII. TYPE OF MILKING FACILITIES

The milking facilities used by the 74 dairymen answering shows that 55 dairymen, or 73 percent, used stanchion barns and 19 producers, or 25 percent, used elevated stall milking barns. A larger percent of the high producers (40) had elevated stalls than was true for the low (16 percent). (See Table XXX.)

XVIII. SIZE OF BULK TANK

All producers of Grade A milk in Williamson County had bulk tanks. As noted in Table XXXI, 63, or 85 percent of the producers were using tanks between 100 and 499 gallons in capacity. The range for high producers (100-1249 gallons) was greater than for the low (100-499 gallons), and nearly one-fourth of the high groups had tanks of 500 gallons or more--none of the low producers having tanks so large. Therefore, there seemed to be some positive relation between size of tank and production.

XIX. PIPELINE SYSTEMS AND WEIGHING DEVICES

It will be seen in Table XXXII that, of the 74 producers responding to this question, only 47 percent had installed a pipeline system. Fifty-two percent were still using bucket-type milkers, (one did not respond). It can be noted that 68 percent of the high producers were using the pipeline system, while only 28 percent of the low producers reported this type of milking system.

TABLE XXX

TYPES OF MILKING FACILITIES USED BY ALL WILLIAMSON COUNTY DAIRYMEN
INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS BY NUMBERS
AND PERCENTS

Type of Milking Facility	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Not Answered	1	2	0	0	1	4	0	0
Stanchion	55	73	15	60	19	76	21	84
Elevated Stall	19	25	10	40	5	20	4	16
Total	75	100	25	100	25	100	25	100

* Percents are rounded to nearest whole number.

TABLE XXXI

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS HAVING BULK TANKS
OF DIFFERENT SIZES*

Size of Bulk Tank (Gal.)	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Not Answered	3	4	1	4	1	4	1	4
100-249	16	22	7	28	5	20	4	16
250-499	47	63	11	44	16	64	20	80
500-749	7	9	4	16	3	12	0	0
750-999	1	1	1	4	0	0	0	0
1000-1249	1	1	1	4	0	0	0	0
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

TABLE XXXII

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS HAVING PIPELINE SYSTEMS AND WEIGHING DEVICES*

Had Pipeline Systems	All Dairymen Interviewed		High Producers		Medium Producers		High Producers	
	No.	%	No.	%	No.	%	No.	%
Not Answered	1	1	0	0	0	0	1	4
Yes	35	47	17	68	11	44	7	28
Had Weighing Device	17	23	10	40	4	16	3	12
Used Device	12	16	8	32	2	8	2	8
Didn't Use	5	7	2	8	2	8	1	4
Didn't Have Weighing Device	18	24	7	28	7	28	4	16
Used Tester's Device	1	1	1	4	0	0	0	0
Didn't Use Tester's Device	17	23	6	24	7	28	4	16
No	39	52	8	32	14	56	17	68
Used Tester's Device	8	11	3	12	2	8	3	12
Didn't Use Tester's Device	31	41	5	20	12	48	14	56
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

From the 17 producers reporting weighing devices in connection with these pipeline milkers, only 12 were using the weighing device, 8 of them in the high production group.

It is encouraging to note that 21 dairymen reported the use of their own or the tester's milk weighing device; therefore, it can be assumed that they may have been keeping some kind of records.

XX. STORAGE AVAILABLE FOR SILAGE

Kind

Table XXXIII shows that 68 percent of the producers had some type of silo, mainly upright (43 percent) or trench (16 percent). Little difference is to be seen when high and low producers are compared.

Capacity

The silage storage capacity is shown in Table XXXIV. The average capacity for those having silos was 314 tons, with high producers averaging 369 tons and low producers averaging only 294 tons. Adequate feed is essential for high production. The majority of the dairymen seemed not to look on silage as the best forage for dairy cattle, but instead saw silage production as a method of producing the most feed per acre of an acceptable roughage.

XXI. SOURCE OF WATER FOR COWS

The cows in all herds seemed to have access to an adequate water supply. Little difference is to be noted when high and low groups are compared. (See Table XXXV.)

TABLE XXXIII

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS HAVING DIFFERENT KINDS OF SILOS*

Type of Silo	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
None	24	32	7	28	10	40	7	28
Upright	32	43	12	48	8	32	12	48
Trench	12	16	5	20	3	12	4	16
Bunker	4	5	1	4	1	4	2	8
Upright and Trench	3	4	0	0	3	12	0	0
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

TABLE XXIV

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS HAVING DIFFERENT SILAGE
STORAGE CAPACITY*

Silage Storage Capacity in Tonnage Intervals	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
None	24	32	7	28	10	40	7	28
50-99	4	5	1	4	2	8	1	4
100-149	5	7	1	4	2	8	2	8
150-199	5	7	1	4	2	8	2	8
200-299	18	24	6	24	5	20	7	28
300-499	13	17	6	24	2	8	5	20
500-749	3	4	1	4	2	8	0	0
750 or more	3	4	2	8	0	0	1	4
Total	75	100	25	100	25	100	25	100
Average Capacity for Those Having Silos	314		369		270		294	
	tons		tons		tons		tons	

*Percents are rounded to nearest whole number.

TABLE XXXV

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS ACCORDING TO SOURCES
OF WATER FOR COWS*

Source of Water for Milk Cows	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Other water in barn	1	1	1	4	0	0	0	0
Water outside barn	26	36	11	44	8	32	7	28
Pond	4	5	1	4	0	0	3	12
Stream	6	8	1	4	3	12	2	8
Drinking cups and one or more other	4	5	1	4	3	12	0	0
Other water in barn and one or more other	13	17	5	20	3	12	5	20
Water outside and one or more other	13	18	3	12	4	16	6	24
Pond and stream	8	11	2	8	4	16	2	8
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

XXII. AMOUNT OF LOAFING BARN AREA

All of the producers reported having at least 30 square feet per cow of loafing barn area. Thirty-seven percent of the herds reported less than the recommended amount of 50 square feet per cow, with little difference in production levels. One low producer was using a new free stall barn. Many dairymen volunteered comments on this subject. They could be summarized as: "My cows prefer to bed down on sodded south hillsides and/or to use a wooded grove in preference to a muddy barn, except on extremely cold, wet nights." (See Table XXXVI.)

XXIII. MILKING

Person Doing Milking

Table XXXVII shows that in the case of 46 (61 percent) herds the owners did the milking, another 27 herds had tenant milking, and 2 herds had both the owner and the tenant milking. Seventy-two percent of the high production herd owners and 52 percent of the low were involved in milking. This suggests that milk production may be improved when the owner is at the barn to render management decisions.

Way Milker Was Paid

About one-half of the 29 tenants (39 percent of the total) milking on Grade A dairy farms were paid a percentage of the milk, and a like number received a salary. Again it should be noted that more high producing owners did their own milking than was true for the low. Also,

TABLE XXXVI

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS HAVING DIFFERENT AMOUNTS OF
LOAFING AREA PER COW*

Loafing Area Per Cow (Square Feet)	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Under 30	8	10	3	12	5	20	0	0
30-39	8	11	3	12	2	8	3	12
40-49	12	16	3	12	5	20	4	16
50-59	15	20	4	16	3	12	8	32
60-69	20	27	5	20	7	28	8	32
70 or more	11	15	7	28	3	12	1	4
Box (free) stalls	1	1	0	0	0	0	1	4
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

TABLE XXXVII

PERSONS DOING THE MILKING ON FARMS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS BY NUMBERS AND PERCENTS*

Person Doing Milking	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Owner	46	61	17	68	16	64	13	52
Tenant	27	36	7	28	8	32	12	48
Both	2	3	1	4	1	4	0	0
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

most high producers having milkers paid salaires, while most low producers paid a percentage of the milk,

XXIV. BUTTERFAT PRODUCTION

Table XXXVIII shows the herds categorized by the average butterfat production sold per cow in 1963. Tennessee Dairy Herd Improvement Association records have shown that cows averaging less than 250 pounds of butterfat are not profitable and should be culled (4). It is noted that the 25 herds in the low production range only averaged 193 pounds of butterfat per cow, and 27 other herds were in the marginal range of 250 to 299 pounds of butterfat. (The reader is referred to Table I, page 6, for the actual ranges for production found within each group.)

XXV. MILK PRODUCTION

The average milk production sold per cow in 1963 is shown in Table XXXIX. This reveals that the actual total average milk production for all producers interviewed was 6,600 pounds.

The high production range group had an average production of 8,720 pounds, the medium group averaged 6,320 pounds and the low production group averaged 4,760 pounds. Dairy Herd Improvement records indicate that milk production of less than 6,000 pounds per cow is not profitable (4).

This study shows that the low one-fourth of the herds in Williamson county could not have been returning much, if any, profit to

TABLE XXXVIII

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS BY AVERAGE BUTTERFAT PRODUCTION
CATEGORIES FOR 1963, AND TOTAL AVERAGES*

Average Butterfat Production Category, 1963 (Pounds Sold/Cow)	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
110-149	2	3	0	0	0	0	2	8
150-199	10	13	0	0	0	0	10	40
200-249	13	17	0	0	0	0	13	52
250-299	27	36	2	8	25	100	0	0
300-349	10	14	10	40	0	0	0	0
350-399	6	8	6	24	0	0	0	0
400-449	7	9	7	28	0	0	0	0
Total	75	100	25	100	25	100	25	100
Actual Average Production	272 lbs.		358 lbs.		265 lbs.		193 lbs.	

*Percents are rounded to nearest whole number.

TABLE XXXIX

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS BY AVERAGE MILK PRODUCTION
CATEGORIES FOR 1963, AND TOTAL AVERAGES*

Average Milk Production Category, 1963 (Pounds Sold/Cow)	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
2,000-2,999	1	1	0	0	0	0	1	4
3,000-3,999	3	4	0	0	0	0	3	12
4,000-4,999	6	8	0	0	0	0	6	24
5,000-5,999	12	16	0	0	5	20	7	28
6,000-6,999	17	23	1	4	9	36	7	28
7,000-7,999	16	22	6	24	9	36	1	4
8,000-8,999	10	13	8	32	2	8	0	0
9,000-9,999	4	5	4	16	0	0	0	0
10,000-10,999	1	1	1	4	0	0	0	0
11,000-11,999	2	3	2	8	0	0	0	0
12,000-12,999	1	1	1	4	0	0	0	0
13,000-13,999	2	3	2	8	0	0	0	0
Total	75	100	25	100	25	100	25	100
Total Actual Average Production	6,600 pounds		8,720 pounds		6,320 pounds		4,760 pounds	

*Percents are rounded to nearest whole number.

labor and management. This statement would take into consideration that there is a difference between pounds of milk sold and pounds of milk produced.

XXVI. BACTERIAL COUNT

The bacterial count shown in Table XL is the average of the approximately 12 counts made on milk from each herd in 1963.

It will be noted that good management appears to be directly related to clean milk as indicated by a comparison of median counts. While the median count for the high group was 26,000 bacteria per milliliter, it was 53,000 for the median group, and 96,000 for the low.

TABLE XL

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS BY AVERAGE BACTERIAL COUNT
CATEGORIES IN 1963*

Average Bacterial Count Category (Number/Ml.)	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
0-9,999	4	5	4	16	0	0	0	0
10,000-19,999	9	12	6	24	1	4	2	8
20,000-29,999	10	13	4	16	5	20	1	4
30,000-39,999	5	7	0	0	4	16	1	4
40,000-49,999	5	7	1	4	2	8	2	8
50,000-69,999	10	13	3	12	4	16	3	12
70,000-99,999	10	13	3	12	3	12	4	16
100,000-139,999	9	12	1	4	2	8	6	24
140,000-179,999	5	7	2	8	1	4	2	8
180,000-249,999	6	8	1	4	2	8	3	12
250,000-566,000	2	3	0	0	1	4	1	4
Total	75	100	25	100	25	100	25	100
Total Median Count**	59,000		26,000		53,000		96,000	

*Percents are rounded to nearest whole number.

**Median counts are rounded to the nearest thousand.

CHAPTER III

SUMMARY

This report is based on information obtained through a personal interview random sample survey of 75 of the 145 Grade A producers who marketed milk in 1963. This study was framed to characterize Grade A milk producers in Williamson County, Tennessee. The Nashville Milk Producers' Association, Incorporated, made their records concerning each producer's total milk marketed, butterfat tests, and bacterial counts available for the study. The producers were divided into three groups according to the average pounds of butterfat produced per cow in 1963, and the characteristics of the dairymen, herds and farms in these production groups were compared.

I. REVIEW OF FINDINGS

The following is a brief summary of the major findings of the study as related to the characteristics of Williamson County Grade A dairymen who produced in high, middle and low production thirds. One might conclude that the dairymen:

1. Produced a total average of 272 pounds of butterfat and 6,600 pounds of milk per cow; with the high group averaging 358 pounds of butterfat and 8,720 pounds of milk, compared to 193 pounds of butterfat and 4,760 pounds of milk for the low group

2. Averaged 48 years of age with the high production group being slightly older (50 years as compared to 48 for the low)

3. Had an average educational level of 11.5 grades with the high group having completed 12.4 grades, as compared to 11.0 for the low

4. Were generally known by the Assistant County Agent; 88 percent of the high producers being known fairly well or very well, as compared to 60 percent of the low producers

5. The survey was well received by 96 percent of the producers in each of the three production groups

6. Had an average gross family income of \$19,091 for the 44 percent reporting, with the high group averaging \$20,533, compared to \$15,200 for the low production group

7. Most of the dairymen (81 percent) were full-time farmers listing Grade A milk production as the major farm enterprise

8. Operated a farm averaging 242 acres and had an average of 149 acres of cropland; high producers having the largest farms with an average size of 258 total acres including 162 acres of cropland, and low producers having 243 total acres and 155 acres of cropland

9. Milked an average of 44 cows, with the high producers milking 45 cows, and the low producers averaging 41 cows

10. Had an average of five registered cows per herd, with the high producers having eight registered cows and the low producers three registered cows.

11. Raised most of their replacement heifers (88 percent of the dairymen reporting), with high producers averaging 33 total heifers per farm, as compared to 24 for the low group

12. Had an average silage storage capacity of 314 tons for the 68 percent of the dairymen with silos, the high producers averaging 369 tons, as compared to 294 tons for the low producers

13. Had a total median bacterial count of 59,000, with the median for the high group being 26,000 and that for the low group 96,000 bacteria per milliliter

14. Preferred to do their own milking, more high producers (68 percent) reporting that the owner was involved in the milking than the low (52 percent).

All producers had bulk tanks, 47 percent had pipeline milking systems and nearly three-fourths (73 percent) were milking in stanchion type barns.

The high producers showed a greater interest in improving their dairy production practices.

II. IMPLICATIONS

Some of the implications that can be drawn from the findings are:

1. Careful consideration of the characteristic differences between high and low producers can be of assistance in planning educational programs for Grade A producers individually and as a group; especially those in the low group

2. Practically all of the producers may be expected to be receptive to Extension personnel; however, the need for motivation is indicated regarding many of the producers in the low group

3. The wide ranges in educational levels (from the fifth grade through advanced college work) and age (from under 25 to past 65) indicate that different Extension approaches need to be tried.

4. Other data obtained from the survey should be further analyzed to determine which recommended dairy management practices were being used and why.

PROBLEM B:

MANAGEMENT PRACTICES OF WILLIAMSON COUNTY GRADE A MILK PRODUCERS

A Special Problem in Lieu of Thesis

In Partial Fulfillment
of the Requirements for the Degree
Master of Science

by
Houston Y. Beeler

August 1966

CHAPTER I

INTRODUCTION

I. THE SITUATION AND NEED FOR THE STUDY

Milk production ranks second in economic importance in Williamson County as a source of farm income. Grade A milk production in Williamson County is associated with the earliest history of dairying in Tennessee. Some necessary changes in production have been made gradually and with comparative ease. Others have involved complex economic and/or management changes that many producers have resisted.

Most of the Grade A producers in the county who sold milk in 1963 had considerable dairy production experience. Between 1953 and 1963, economic pressures and technological changes presented problems that decreased the number of Grade A dairymen by 37 percent (5). Many producers attempted to meet these challenges by marketing more milk through increased herd size, with little apparent emphasis on high production per cow.

No previous attempt has been made to learn what producers were and were not doing; therefore, it was felt that a close look at the present situation concerning management practices of Grade A dairymen should provide information needed to improve educational and other programs designed to help present and future dairymen do a more efficient job.

II. THE PURPOSE OF THE STUDY

The purpose of this study was to determine which recommended practices Williamson County Grade A milk producers were using and were not using in high, medium and low production groups in terms of pounds of butterfat per cow (1963 figures).

III. REVIEW OF LITERATURE

Information was limited with regard to management practices of Grade A dairymen in Tennessee. Inquiries sent to twelve southern dairy states revealed that there was a lack of information relating management practices and production levels.

In a recent Tennessee study conducted by Givan (10.2)*, it was found that, generally, Grade A producers were increasing the size of their operation. Almost one-half of the producers increased their herd size in 1962 over 1961. Also, it was noted that artificial insemination for all cows was being used on about one-third of the farms, most frequent use being in smaller herds.

A statewide Extension project plan (4:17) pointed out that the failure of Grade A producers to keep adequate records of feed fed and milk produced on a per cow basis was a deterrent to efficient dairy herd management. Only 17 percent of dairy cows in Tennessee were bred artificially in 1963.

*Numbers in parentheses refer to numbered references in the Bibliography; those after the colon are page numbers.

In a Michigan study (13:1397), it was found that artificial insemination (A. I.) sired cows were superior to non-A. I. cows within the same herds. Miller (14) found that herds on continuous Dairy Herd Improvement Association (D. H. I. A.) test (five or more years in 1962) and new herds (started on test in 1962) increased in milk production at about the same rate, while selected herds never on test made a slower increase. The increase was 12.6 percent for herds on continuous test, 12.3 percent for new herds on test, and 9 percent for non-tested herds over a two-year period (1962 to 1964).

A Virginia study (8:7) compiled from data on 139 Grade A dairy farms, maintaining mail-in accounts, showed there was an average difference of \$11,000 in labor income separating the 33 upper- and the 61 lower-income farms. Both groups had practically the same size of farm and their expenses were nearly the same. The differences in labor incomes were attributed to better management.

In 1964, O'Neal (15:25) found that the levels of milk production were positively related to the operator's management ability.

IV. METHODS

The Nashville Milk Producers' Association, Incorporated, provided a list of all the 145 Williamson County Grade A producers marketing milk, along with total milk production, butterfat test, and bacterial count figures for each month during the year 1963. A random selection of 75 of these Grade A dairy producers was made.

Each of producer was contacted personally, using a schedule (see Appendix) consisting of questions designed to reveal characteristics, production practices, and factors influencing practice adoption.

The present study had to do with those questions related to production practices. The 75 dairymen were divided as follows: 1) 25 high producers with average annual butterfat production (1963 figures) per cow ranging from 290 to 440 pounds; 2) 25 medium producers ranging from 250 to 289 pounds of butterfat per cow; and 3) 25 low producers ranging from 110 to 249 pounds.

Rating Explained

Twenty-three recommended dairy production practices were included in the interview schedule in an effort to determine the practice adoption levels of producers in the high, middle and low thirds.

The following rating scheme was used to classify management levels of individuals on each of 23 practices: 1) no points were given if the person interviewed had not heard of the specific practice; 2) one point was given if the person had only heard of the practice; 3) two points were given if the person was only interested in it; 4) three points were given if the person had not tried it but planned to do so; 5) four points were given if the person had tried the practice but was not using it at the time of the interview, and 6) five points were given if the person had tried the practice and was still using it.

The average practice diffusion ratings of the groups were compared in this study. For this report, the following practice diffusion

ratings were considered comparable to the diffusion stages indicated: "unaware" 0-.49; "aware" .50-1.49; "interested in it" 1.50-2.49; "planning to try" 2.50-3.49; "tried" 3.50-4.49, and "using" 4.50-5.00.

An average practice diffusion rating was determined for each producer by adding up his total score and dividing by 23 (the number of recommended practices). Group total average ratings also were completed for the purpose of comparing various groups. Other data reported are simply numbers, percents and averages. Main comparisons were between high and low producers.

In obtaining the information regarding the production practices, each respondent was given a card with the recommended practice typed on it, as it appeared on the interview schedule. This was done in order to further help the respondent understand the practice as the interviewer, discussed it with him. This interviewer explained only the basic fundamentals regarding the practice and conscientiously tried to let the respondent answer as to how he was really carrying out the recommended practice.

CHAPTER II

FINDINGS

I. MANAGEMENT LEVELS OF MILK PRODUCERS

Average Practice Diffusion Rating Intervals

Table XLI gives the average practice diffusion ratings for the 75 Williamson County dairymen divided into high, medium and low thirds according to the average butterfat production per cow.

It is noted that the average practice diffusion rating of all dairymen in this study was 3.75 (in the beginning of the "tried" stage). The high producers averaged 4.02, slightly above the middle of the "tried" stage; while the medium and low producers averaged 3.61, near the bottom of the "tried" stage.

The high producers had the highest average practice diffusion rating (4.02), when compared to the medium and low producers; both having 3.61 ratings. Twenty-eight percent of the high producers were in the "using" stage, while only four (4) percent of the low producers rated this high.

Also to be noted is the fact that 84 percent of the high producers were in the "tried" stage or above, as compared to 60 percent of the low producers. Another point of interest is that only 5 percent (4 dairymen) of all the producers were below the "planning to try" (2.50) stage in terms of the 23 recommended practices considered.

TABLE XLI

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS BY AVERAGE PRACTICE
DIFFUSION RATINGS, AND TOTAL AVERAGE RATINGS*

Average Practice Diffusion Rating Interval**	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
1.83-1.99	1	1	0	0	1	4	0	0
2.00-2.49	3	4	1	4	1	4	1	4
2.50-2.99	7	9	2	8	1	4	4	16
3.00-3.49	12	16	1	4	6	24	5	20
3.50-3.99	22	30	5	20	9	36	8	32
4.00-4.49	20	27	9	36	5	20	6	24
4.50-5.00	10	13	7	28	2	8	1	4
Total	75	100	25	100	25	100	25	100
Actual Total Average Rating	3.75		4.02		3.61		3.61	

*Percents are rounded to nearest whole number.

**In the rating scale used: 0 = unaware; 1 = aware of 23 recommended practices; 2 = interested in the practices; 3 = planning to try the practices; 4 = tried the practices but not using; and 5 = using the practices.

Relation to Production

The average individual dairy management practice diffusion ratings and total average ratings of all Williamson County dairymen interviewed, high, medium and low producers, are shown in Table XLII. Also, Table XLIII gives a breakdown of the percents of all Williamson County dairymen in each of the stages of the diffusion process for each of the management practices studied.

A wide variation in the average practice diffusion ratings is noted from practice to practice for all dairymen (See Table XLII). On the average, the ratings ranged from the "interested" stage (1.88) for Practice 18, "strip cup always used," to the "using" stage (4.99) for Practice 4, "12-14 month calving period provided."

All producers averaged in the "using" stage with regard to eight practices: 1) Practice 3, "60 day dry period provided cows" (4.89); 2) Practice 4, "12-14 month calving period" (4.99); 3) Practice 6, "75 percent herd replacements raised" (4.56); 4) Practice 13, "silage supplemented with enough hay" (4.83); 5) Practice 14, "high quality hay provided" (4.69); 6) Practice 16, "adequate improved pasture provided" (4.59); 7) Practice 20, "flies systematically controlled" (4.95); 8) Practice 23, "calves vaccinated for Brucellosis, etc." (4.81).

The high producers had a higher average rating than did the low producers in 18 of the 23 practices. Meaningful variations, averaging .84 to 1.84 points more for the high over the low producers, were noted in 6 of the 18 practices. These practices may give some

TABLE XLII

AVERAGE DAIRY MANAGEMENT PRACTICE DIFFUSION RATINGS AND TOTAL AVERAGE RATINGS FOR ALL WILLIAMSON COUNTY DAIRYMEN
INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS*

Dairy Management Practice	All Dairymen Average Rating	High Producers Average Rating	Medium Producers Average Rating	Low Producers Average Rating
1. Artificially inseminated $\frac{1}{2}$ or more of cows	3.56	4.16	3.52	3.00
2. All cows bred to same breed bull	4.11	4.72	3.36	4.24
3. 60 Day dry period provided cows	4.89	5.00	4.72	4.96
4. 12-14 Month calving period provided	4.99	5.00	5.00	4.96
5. 75 Percent cows fall freshened	4.12	4.32	4.16	3.88
6. 75 Percent herd replacements raised	4.56	4.84	4.12	4.72
7. Adequate milk records kept	2.03	3.00	1.20	1.88
8. Fed cows according to production	3.68	4.12	3.64	3.28
9. Adequate herd records kept (average):**	2.87	2.96	3.04	2.60
a) Calving records	4.55	4.60	5.00	4.04
b) Health records	0.33	0.48	0.20	0.32
c) Heat records	4.35	4.48	4.80	3.76
10. Calving permanently identified	2.29	2.60	1.92	2.36
11. Adequate supply of silage provided	3.52	3.60	3.12	3.84
12. High quality silage provided	3.31	3.52	3.00	3.40
13. Silage supplemented with enough hay	4.83	4.68	5.00	4.80
14. High quality hay provided	4.69	4.84	4.64	4.60
15. Hay and/or silage provided on pasture	3.09	3.88	3.36	2.04
16. Adequate improved pasture provided	4.59	4.28	4.60	4.88
17. Sufficient summer pasture provided	3.03	3.60	3.36	2.12
18. Strip cup always used	1.88	1.92	2.20	1.52
19. Separate feeding and loafing areas provided	2.61	3.20	2.52	2.12
20. Flies systematically controlled	4.95	5.00	4.84	5.00
21. Milking system 6-month checked	3.52	3.72	3.28	3.56
22. Professional advice obtained	4.43	4.60	4.08	4.60
23. Calves vaccinated for brucellosis, etc.	4.81	5.00	4.60	4.84
Actual Total Average Rating	3.75	4.02	3.61	3.61

*In the rating scale used: 0 = unaware; 1 = aware of the practice; 2 = interested in practice; 3 = planning to try the practice; 4 = tried the practice but not using; and 5 = using the practice.

**Interpreted to mean written records.

TABLE XLIII
PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED IN VARIOUS STAGES OF THE DIFFUSION PROCESS
ON EACH OF THE PRACTICES STUDIED*

Dairy Management Practice	Unaware of it Percent	Aware of it Percent	Interested in it Percent	Planning to Try Percent	Tried and Not Using Percent	Using it Percent	Total Percent
1. Artificially inseminated $\frac{1}{2}$ or more of cows	0	25	11	4	3	57	100
2. All cows bred to same breed bull	4	13	5	0	0	78	100
3. 60 Day dry period provided cows	0	1	2	0	1	96	100
4. 12-14 Month calving period provided	0	0	0	0	1	99	100
5. 75 Percent cows fall freshened	0	15	8	1	3	73	100
6. 75 Percent herd replacements raised	3	4	4	1	0	88	100
7. Adequate milk records kept	20	42	9	0	4	25	100
8. Fed cows according to production	4	23	7	0	1	65	100
9. Adequate herd records kept (average):**	8	1	4	75	7	5	100
a) Calving records	8	1	0	0	0	91	100
b) Health records	90	4	1	0	0	5	100
c) Heat records	9	3	3	0	0	85	100
10. Calves permanently identified	27	25	11	1	1	35	100
11. Adequate supply of silage provided	8	20	8	1	1	61	100
12. High quality silage provided	31	4	0	0	0	65	100
13. Silage supplemented with enough hay	1	3	0	0	0	96	100
14. High quality hay provided	3	3	1	1	0	92	100
15. Hay and/or silage provided on pasture	7	32	8	3	0	50	100
16. Adequate improved pasture provided	0	5	7	0	0	88	100
17. Sufficient summer pasture provided	11	29	5	4	3	48	100
18. Strip cup always used	16	46	13	1	8	16	100
19. Separate feeding and loafing areas provided	8	43	9	0	0	40	100
20. Flies systematically controlled	0	1	0	0	0	99	100
21. Milking system 6-month checked	11	19	6	0	0	64	100
22. Professional advice obtained	9	3	0	0	0	88	100
23. Calves vaccinated for brucellosis, etc.	3	1	0	0	0	96	100
Total Average	8	16	5	4	1	66	100

*Percents are rounded to nearest whole number.

**Interpreted to mean written records.

indications regarding the reasons for differences in production.

Breeding Practices

The first six practices listed in Tables XLII and XLIII are related to breeding. All producers averaged in the "tried" stage or beyond for these practices. When the high and low groups were compared, the only large difference was noted on Practices 1, "artificially inseminated one-half or more of cows", and 5, "75 percent of cows fall freshened". The high group averaged in the "tried" stage (4.16), while the low producers were in the "planning to try" stage (3.00) regarding artificial insemination. In relation to fall freshening, the high group averaged in the high "tried" stage (4.32) as compared to low producers who averaged in the low "tried" stage (3.88).

In Table XLIII it is noted that 36 percent of the producers were below the "plan to try" stage on Practice 1, with only 57 percent "using it." Also, regarding Practice 5, "75 percent of cows fall freshening," 23 percent were below the "planning to try" stage, with 73 percent in the "using it" stage. Many of the respondents indicated that their ideal percent of fall freshening cows would be about 66 percent for the months, September through November, with the remainder freshening throughout the year.

Keeping and Using Records

Practices 7 through 10 are related to records and their use. In Table XLII, page 73, it is noted that all producers were, on the average,

in the "interested" stage with regard to Practice 7, "adequate milk records kept," (2.03), and Practice 10, "calves permanently identified" (2.29). The average rating on Practice 9, "adequate herd records kept" was the "planning to try," stage (2.87), while the average on all producers on Practice 8, "fed cows according to production" was in the low "tried" stage (3.68).

When a comparison was made between the high and low producers, the greatest difference was noted in Practice 7, "adequate milk records kept," the high group being in the "planning to try" stage (3.00), and the low group in the "interested" stage (1.88), and in Practice 8, "fed cows according to production," the former being high in the "tried" stage (4.12) and the latter group high in the "planning to try" stage (3.28). It is interesting to note on Practice 9, "adequate herd records kept" that all producers were in "tried" stage or above, as related to "calving records" and "heat records," but in the other practice "health records" were only in the "unaware" stage for all groups. Table XLIII, page 74, shows that on sub-practice 9-b there were only 5 percent of the producers in the "using" stage, while 90 percent were in the "unaware" stage. Ninety-one percent of the producers were in the "using" stage on sub-practice 9-a, and 85 percent were in the same stage on sub-practice 9-c.

Data in Table XLIII, page 74, further show that on Practice 7, 71 percent of the producers were below the "planning to try" stage, with only 25 percent "using". With Practice 8, 65 percent were in the "using" stage, while only 34 percent were below the "planning to try" stage. It

also is noted that 63 percent were below "planning to try" on Practice 10, and only 35 percent were using" it.

The results of this survey help confirm the general assumption that farmers do not like to keep records, since all producers were generally low with regard to adopting practices related to keeping and using records.

It may be assumed that not enough producers were using these practices to properly demonstrate the benefits proven by research. This information indicates that these practices should have careful consideration in planning educational work to help all Grade A milk producers realize the potential benefits that they may receive from adopting these practices.

Feeding Practices

Practices 11 through 17 are related to providing the cows with adequate amounts of quality feed. Table XLII, page 73, shows that all the producers on the following three of these practices averaged in the "using" stage: Practice 13, "high quality hay provided" (4.69); Practice 14, "high quality hay provided" (4.69), and Practice 16, "adequate improved pasture provided" (4.59). It is noted that all producers averaged in the low "tried" stage on Practice 11, "adequate supply of silage" (3.52). All producers averaged in the "planning to try" stage on Practice 12, "high quality silage provided" (3.31); Practice 15, "hay and/or silage provided on pasture" (3.09); and Practice 17, "sufficient summer pasture provided" (3.03).

In comparing the high with the low producers, some interesting differences are noted in Table XLII, page 73, on Practice 16, "adequate improved pasture provided," The high producers were in the "tried" stage (4.28), while the low producers were in the "using" stage (4.88). This question caused many of the respondents to comment to the effect, that permanent pastures have been over-emphasized for high production of Grade A milk.

Answers on Practice 11, "adequate supply of silage provided," show both groups in the "tried" stage, with the high producers averaging 3.60 and the low producers 3.84. A look at Practice 12, "high quality silage provided," shows the high group in the "tried" stage (3.52), and the low in the "planning to try" stage (3.40).

On Practice 13, "silage supplemented with enough hay," the high producers (4.68) and the low producers (4.80) were both in the "using" stage.

Scrutiny of Practice 14, "high quality hay provided," shows again that the high group (4.84) and the low group (4.60) were both in the "using" stage.

Greater differences were to be noted on feeding Practices 15 and 17.

Practice 15, "hay and or silage provided on pasture," found the high producers in the "tried" stage (3.88) and the low in the "interested" stage (2.04); and Practice 17, "sufficient summer pasture provided," found the former in the "tried" stage (3.60) and the latter in the "interested" stage (2.12).

Consideration of Table XLIII, page 74, discloses that a high percent of all producers were in the "using" stage on three of the feeding practices. They were Practice 13, with 96 percent; Practice 14, with 92 percent, and Practice 16, with 88 percent included. Also noted in Table XLIII, page 74, was the high percent of all producers below the "planning to try" stage concerning the four remaining feeding practices.. For example, 32 percent were in this category on Practice 11, 35 percent on Practice 12, 47 percent on Practice 15, and 45 percent on Practice 17. These data tend to indicate that the failure to follow recommended forage feeding practices may be a factor contributing to the relatively low milk production per cow on Williamson County Grade A dairy farms.

Sanitation Practices

These Practices 18-20 in Table XLII, page 73, are generally classified as sanitary practices. It is noted that all producers were, on the average, in the "using" stage (4.95), with regard to Practice 20, "flies systematically controlled"; in the "planning to try" stage (2.61) on Practice 19, "separate feeding and loafing areas provided"; and only in the "interested" stage (1.88) on Practice 18, "strip cup always used." When the high and low groups were compared, the only large difference was noted on Practice 19, with the former in the "planning to try" stage (3.20), while the latter were in the "interested" stage (2.12).

Table XLIII, page 74, shows that 99 percent of all producers were in the "using" stage on Practice 20. It also is noted that 60 percent of all producers were below the "planning to try" stage on Practices 18

and 19. Only 16 percent were actually "using" Practice 18 and 40 percent were "using" Practice 19.

Other Practices

The last three practices in Table XLII, page 73, have been grouped as "other practices" for the purpose of this study. Practice 21, "milking system 6-month checked," had an average rating of "tried" (3.52) for all producers. A comparison of high and low groups shows only a slight difference between the ratings of the former (3.72) and latter (3.56)--both groups being in the "tried" stage.

It is noted in Table XLIII, page 74, that 64 percent were in the "using" stage on Practice 21, while the remaining 36 percent were below the "planning to try" stage.

On Practice 22, "professional advice obtained," all producers were in the "tried" stage (4.43). It will be noted that both the high and low groups were in the "using" stage (4.60).

It is noted in Table XLIII, page 74, that 88 percent of all producers were in the "using" stage on Practice 22.

All producers were in the "using" stage (4.81) regarding Practice 23, "calves vaccinated for brucellosis, etc." Table XLIII, page 74, shows that 98 percent of all producers were in the "using" stage concerning immunization against brucellosis and blackleg.

Relation to Herd Size

Table XLIV shows by herd size the total average rating for each of the 23 dairy management practices. In comparing the four herd size

TABLE XLIV

AVERAGE DAIRY MANAGEMENT PRACTICE DIFFUSION RATINGS OF WILLIAMSON COUNTY DAIRYMEN BY HERD SIZE CATEGORIES
FOR INDIVIDUAL DAIRY MANAGEMENT PRACTICES*

Dairy Management Practice	All Dairymen Average Rating (N = 75)	12-29 Cows Average Rating (N = 13)	30-49 Cows Average Rating (N = 34)	50-69 Cows Average Rating (N = 19)	70-100 Cows Average Rating (N = 9)
1. Artificially inseminated $\frac{1}{2}$ or more of cows	3.56	4.23	3.53	3.63	2.56
2. All cows bred to same breed bull	4.11	3.85	4.21	4.37	3.56
3. 60 Day dry period provided cows	4.89	5.00	5.00	4.79	4.56
4. 12-14 Month calving period provided	4.99	4.92	5.00	5.00	5.00
5. 75 Percent cows fall freshened	4.12	4.31	4.03	4.53	3.33
6. 75 Percent herd replacements raised	4.56	4.69	4.74	4.63	3.56
7. Adequate milk records kept	2.03	0.85	2.26	2.26	2.33
8. Fed cows according to production	3.68	3.00	4.03	3.32	4.11
9. Adequate herd records kept (average):*	2.87	3.00	2.88	2.74	2.89
a) Calving records	4.55	4.62	4.71	4.26	4.44
b) Health records	0.33	0.15	0.18	0.63	0.56
c) Heat records	4.35	4.31	4.62	3.84	4.44
10. Calves permanently identified	2.29	1.38	2.76	2.16	2.11
11. Adequate supply of silage provided	3.52	2.00	3.68	4.11	3.89
12. High quality silage provided	3.31	2.00	3.38	4.00	3.44
13. Silage supplemented with enough hay	4.83	4.31	5.00	4.79	5.00
14. High quality hay provided	4.69	4.08	4.82	5.00	4.44
15. Hay and/or silage provided on pasture	3.09	3.38	3.00	2.89	3.44
16. Adequate improved pasture provided	4.59	4.46	4.71	4.47	4.56
17. Sufficient summer pasture provided	3.03	1.46	3.11	3.53	3.89
18. Strip cup always used	1.88	1.38	2.03	1.89	2.00
19. Separate feeding and loafing areas provided	2.61	2.15	3.06	2.53	1.78
20. Flies systematically controlled	4.95	5.00	4.88	5.00	5.00
21. Milking system 6-month checked	3.52	2.69	4.06	2.89	4.00
22. Professional advice obtained	4.43	4.62	4.47	4.47	3.89
23. Calves vaccinated for brucellosis, etc.	4.81	5.00	5.00	4.79	3.89
Total Average Rating	3.68	3.44	3.81	3.71	3.56

*In the rating scale used: 0 = unaware; 1 = aware of the recommended practice; 2 = interested in the practice; 3 = planning to try the practice; 4 = tried the practice but not using; and 5 = using the practice.

**Interpreted to mean written records.

categories, it will be noted that the total average rating for all of the dairymen was in the "tried" stage (3.68), with only small variations noted for different size of herds. The highest average practice diffusion rating (3.81) was with herds of 30-49 cows in size; the second average rating (3.75) was with herds of 50-69 cows; the third average rating (3.56) was attained by 70-100 cow herds, and the lowest average rating (3.44) was made by small, 12-29, cow herds.

II. BREEDING OF HEIFERS

Method

Table XLV shows how heifers were bred on Williamson County Grade A dairy farms. Fifty-nine percent said they used a bull in natural service on all their heifers, one low producer indicated he used both natural and artificial breeding methods, and four other producers failed to answer this question. This study shows that thirty-five percent of all heifers are bred artificially with some advantage to high production. With 26 herds breeding artificially, 11 of the herds were in the high production group, 8 in the medium and 7 were low producers; as compared to the 44 herds using natural service with 13 high, 14 medium and 17 low producing herds. A slight positive relation between use of artificial insemination on heifers and production is intimated.

Type of Bull

Table XLVI reveals that 49 percent (37 producers) were using dairy bulls only to breed heifers, while 44 percent (33 producers) were

TABLE XLV

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS IN 1963 BY METHOD OF
BREEDING HEIFERS*

Method of Breeding Heifers	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Not Answered	4	5	1	4	3	12	0	0
Artificially	26	35	11	44	8	32	7	28
Naturally	44	59	13	52	14	56	17	68
Both	1	1	0	0	0	0	1	4
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

TABLE XLVI

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS IN 1963 BY TYPE OF BULL USED
ON HEIFERS*

Type of Bull Used	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Not Answered	3	4	1	4	2	8	0	0
Dairy	37	49	10	40	15	60	12	48
Beef	33	44	14	56	8	32	11	44
Both	2	3	0	0	0	0	2	8
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

using beef bulls to breed dairy heifers. There was little difference between the high, medium and low groups in the type of bull used.

III. BREEDING OF COWS

Type of Bull

Eighty-seven percent (67 producers) said their cows were bred to dairy bulls, while 8 percent (6 producers) used a beef bull only. Two producers reported using both dairy and beef bulls in breeding their cow herds; one was in the medium and one was in the low production group.

Ninety-six percent of the high producers were using dairy bulls as shown in Table XLVII, as compared to 84 percent of the low producer group.

IV. FEEDING OF COWS

Percent of Protein in Dairy Ration

Table XLVIII shows that 77 percent (58 producers) were feeding a 16 percent dairy concentrate ration, while the other seventeen producers' rations varied from 12 to 18 percent protein. There was little difference between the high and low production groups, excepting that there was a wider range in the percent of protein fed as it relates to the high producers. The interviewer did observe an interest on the parts of several dairymen in trying to learn what percent of protein they should have been feeding.

TABLE XLVII

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS IN 1963 BY TYPE OF
BULL USED ON COWS*

Type of Bull Used	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Dairy	67	89	24	96	22	88	21	84
Beef	6	8	1	4	2	8	3	12
Both	2	3	0	0	1	4	1	4
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

TABLE XLVIII

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS BY PERCENTS OF
PROTEIN USED IN DAIRY RATION*

Percent Protein in Dairy Ration	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
12	5	7	1	4	2	8	2	8
13	2	3	2	8	0	0	0	0
14	5	7	3	12	0	0	2	8
15	2	3	1	4	1	4	0	0
16	58	77	16	64	22	88	20	80
17	1	1	1	4	0	0	0	0
18	2	2	1	4	0	0	1	4
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

Method of Providing Concentrates

Table XLIX shows that 67 percent (50 producers) indicated that they bought their concentrates, as contrasted to 24 percent (18 producers) who mixed their own feed. Six of the producers reported some feed bought and some mixed, with two producers in each production range.

It will be noted that of the 50 producers buying feed, 20 were in the high producer group, 16 with medium group, with 14 in the low producer group; as compared to the 18 producers mixing their feed, with 3 high producers, 7 medium and 8 low producers.

Grinding Hay

Data in Table L show that 40 percent (30 producers) were grinding hay that was mixed with the concentrate feed and fed in the milk barn. It is noted that only 12 percent in the high production group were grinding hay, as compared to 56 percent in the low group. Grinding hay is generally assumed to be a practice associated with low production.

Type of Hay Fed

Seventy-five percent (56 producers) of the dairymen reported they fed only legume hay. Twenty-one percent (16 producers) indicated they fed a grass-legume mixture hay; the comment of several producers was that this hay was not as good as alfalfa, but was the best they could produce. Table LI shows that only 2 producers feeding legume-grass mixed hay were in the high production group, 7 medium and 7 in the low production group.

TABLE XLIX

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS BY METHOD OF
PROVIDING CONCENTRATES*

Method of Providing Concentrates	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Not Answered	1	1	0	0	0	0	1	4
Mix Own	18	24	3	12	7	28	8	32
Buy Them	50	67	20	80	16	64	14	56
Mix Some and Buy Some	6	8	2	8	2	8	2	8
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

TABLE L

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS BY WHETHER OR NOT THEY
GROUND THEIR HAY*

Grinding of Hay	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Did Grind Hay	30	40	3	12	13	52	14	56
Did Not Grind Hay	45	60	22	88	12	48	11	44
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

TABLE LI

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS BY TYPE OF HAY USUALLY FED IN 1963*

Type of Hay Fed	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Not Answered	2	3	1	4	0	0	1	4
Legume	56	75	22	88	18	72	16	64
Grass	1	1	0	0	0	0	1	4
Legume-Grass	16	21	2	8	7	28	7	28
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

Method of Supplying Salt and Minerals

Eighty percent of the producers supplied salt and minerals to their dairy cattle both by mixing them in the feed and by the free choice method. Sixteen percent supplied salt and minerals in the ration only. The method of supplying salt and minerals appeared to be of little significance.

Storage Capacity Available for Silage

Thirty-two percent (24 producers) did not have storage available for silage as shown in Table LII. The storage capacity of 68 percent (51 producers) of the dairymen who had silos varied from 50 to over 750 tons, with an average of 314 tons per farm. It will be noted that there seemed to be a relationship between high storage capacity and high production, since the high group averaged 369 tons, while the low production group averaged 294 tons of silage capacity per farm.

V. THE RELATION OF PRODUCTION AND MANAGEMENT LEVELS TO AGE

Table LIII reveals a slight tendency for younger producers to have higher average practice diffusion ratings than those in older age groups irrespective of production level. High producers, as usual, had higher average ratings (4.02) than did medium producers (3.61) and low producers (3.61).

TABLE LII

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS BY AMOUNTS OF SILAGE
STORAGE CAPACITY AVAILABLE*

Amount of Silage Storage Capacity Available in Tons	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
None	24	32	7	28	10	40	7	28
50-99	4	5	1	4	2	8	1	4
100-149	5	7	1	4	2	8	2	8
150-199	5	7	1	4	2	8	2	8
200-299	18	24	6	24	5	20	7	28
300-499	13	17	6	24	2	8	5	20
500-749	3	4	1	4	2	8	0	0
750 or more	3	4	2	8	0	0	1	4
Total	75	100	25	100	25	100	25	100
Average Capacity for Those Having Silos	314		369		270		294	
	tons		tons		tons		tons	

*Percents are rounded to nearest whole number.

TABLE LIII

NUMBERS AND AVERAGE DAIRY MANAGEMENT PRACTICE DIFFUSION RATINGS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS ACCORDING TO AGE GROUPS*

Age Group of Dairymen	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	Average Rating	No.	Average Rating	No.	Average Rating	No.	Average Rating
Under 25	1	3.83	0	---	1	3.83	0	---
25-34	8	3.98	3	3.90	2	3.70	3	4.26
35-44	22	3.76	4	4.29	8	3.64	10	3.64
45-54	25	3.76	10	4.10	9	3.52	6	3.54
55-64	11	3.98	7	3.96	3	3.99	1	4.13
65 or more	8	3.12	1	2.91	2	3.18	5	3.15
Actual total	75	3.75	25	4.02	25	3.61	25	3.61

*In the rating scale used: 0 = unaware; 1 = aware of the 23 recommended practices; 2 = interested in the practices; 3 = planning to try the practices; 4 = tried the practices but not using; and 5 = using the practices.

VI. THE RELATION OF PRODUCTION AND MANAGEMENT LEVELS TO EDUCATIONAL LEVELS

Table LIV shows a slight increase in average practice diffusion ratings as the educational levels of producers increase, with notable exceptions, that include only one producer in a category. It is noted that the high producers with 1-3 years of college (4.49) and B. S. (4.41) were, on the average, almost to the "using" stage (4.50-5.00). The interviewer observed that several of the producers in the three highest educational levels relied on others for many management decisions.

VII. THE RELATION OF PRODUCTION AND MANAGEMENT LEVELS TO SIZE OF FARM

It will be noted in Table LV that the average practice diffusion ratings increased as the average size of the farm increased. Also to be noted is the fact that the high producers continued to maintain the highest practice diffusion ratings in comparison to medium and low producers at all size of farm categories.

VIII. THE RELATION OF PRODUCTION AND MANAGEMENT LEVELS TO OCCUPATION

Eighty-one percent (61 producers) were classified as full-time farmers, while 16 percent (12 producers) were classified as part-time farmers, and 3 percent (2 producer each) reported their occupations as

TABLE LIV

NUMBERS AND AVERAGE DAIRY MANAGEMENT PRACTICE DIFFUSION RATINGS OF ALL WILLIAMSON COUNTY
DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS BY EDUCATIONAL LEVELS*

Educational Grade Level	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	Average Rating	No.	Average Rating	No.	Average Rating	No.	Average Rating
1-7	7	3.66	1	4.52	2	3.89	4	3.34
8	8	3.29	2	3.22	2	3.57	4	3.19
9-11	8	3.45	0	--	7	3.58	1	2.48
12	38	3.83	16	3.94	11	3.62	11	3.86
1-3 of college	7	4.04	3	4.49	1	3.74	3	3.69
B. S.	4	4.23	2	4.41	1	3.30	1	4.78
Advanced work and/or degree	3	3.67	1	4.13	1	3.48	1	3.39
Actual total	75	3.75	25	4.02	25	3.61	25	3.61

*In the rating scale used: 0 = unaware; 1 = aware of the 23 recommended practices; 2 = interested in the practices; 3 = planning to try the practices; 4 = tried the practices but not using; and 5 = using the practices.

TABLE LV

NUMBERS AND AVERAGE DAIRY MANAGEMENT PRACTICE DIFFUSION RATINGS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS BY SIZE OF FARM CATEGORIES*

Size of Farm Category	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	Average Rating	No.	Average Rating	No.	Average Rating	No.	Average Rating
50-99	5	3.38	3	3.54	2	3.15	0	--
100-199	29	3.70	9	3.93	10	3.55	10	3.64
200-399	30	3.73	8	4.12	10	3.67	12	3.53
400-600	11	4.08	5	4.31	3	3.94	3	3.84
Actual total	75	3.75	25	4.02	25	3.61	25	3.61

*In the rating scale used: 0 = unaware; 1 = aware of 23 recommended practices; 2 = interested in the practices; 3 = planning to try the practices; 4 = tried the practices but not using; and 5 = using the practices.

"professional" and "retired." Only slight differences were found between full-time and part-time farmers.

IX. THE RELATION OF PRODUCTION AND MANAGEMENT LEVELS
TO SOURCE OF INCOME

Dairying was the major source of income for 61 of the producers with an average practice diffusion rating of 3.75. The other 12 producers reporting "non-farm" (3.82), 9 producers, and "other-farm" (3.22), 3 producers, income as being greater than dairying had average practice diffusion ratings slightly higher than the dairying group. The high producers had higher practice diffusion ratings than the low producers in all three categories listed.

X. THE RELATION OF PRODUCTION AND MANAGEMENT LEVELS TO SEX

Only three of the dairy operations were operated by women making the management decisions. The practice diffusion rating of 3.75 was averaged by 72 male producers as compared to an average rating of 3.56 for the three women.

None of the women were in the high production group. The small number of women involved in the study would limit the meaning of this finding.

XI. THE RELATION OF PRODUCTION AND MANAGEMENT LEVELS
TO GROSS FAMILY INCOME

Table LVI shows that the average practice diffusion ratings tended to increase as the levels of total gross family income went

TABLE LVI

NUMBERS AND AVERAGE DAIRY MANAGEMENT PRACTICE DIFFUSION RATINGS OF ALL WILLIAMSON COUNTY
DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS BY TOTAL GROSS
FAMILY INCOME REPORTED*

Total Gross Family Income Category	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	Average Rating	No.	Average Rating	No.	Average Rating	No.	Average Rating
Not answered	42	3.55	10	3.83	17	3.51	15	3.40
\$2000-11,999	9	3.98	4	4.24	0	--	5	3.78
\$12,000-29,999	20	3.95	9	4.07	6	3.66	5	4.07
\$30,000-99,999	4	4.30	2	4.28	2	4.33	0	--
Total	75	3.75	25	4.02	25	3.61	25	3.61

*In the rating scale used: 0 = unaware; 1 = aware of 23 recommended practices; 2 = interested in the practices; 3 = planning to try the practices; 4 = tried the practices but not using; and 5 = using the practices.

up. Of the 37 producers answering this question average ratings went from 3.98 for 9 producers in the income bracket of \$2,000 to \$11,999 to a rating of 4.30 for 4 producers in the bracket of \$30,000 to \$99,999. The same trend is noted in all three production groups.

XII. THE RELATION OF PRODUCTION AND MANAGEMENT LEVELS TO DAIRY HERD RATING

Each respondent was asked to rate his herd as poor, fair, good or excellent. The results of this rating by 72 producers are shown in Table LVII. The average practice diffusion ratings tended generally to increase as producers increased their herd ratings in all production groups. This seems to indicate that those who rated their herds higher had higher management ratings also.

XIII. THE RELATION OF PRODUCTION AND MANAGEMENT LEVELS TO INTEREST IN IMPROVING DAIRY MANAGEMENT

The interviewer was asked to make a judgment rating of each producer's interest in improving his dairy management. Table LVIII shows the average practice diffusion ratings in relation to the average interest ratings given producers by the interviewer. The average practice diffusion ratings tended to increase as the producer's interest in improving his management level increased.

TABLE LVII

NUMBERS AND AVERAGE DAIRY MANAGEMENT PRACTICE DIFFUSION RATINGS OF ALL WILLIAMSON COUNTY
DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS BY RATINGS THEY GAVE THEIR
OWN DAIRY HERDS*

Ratings Dairymen Gave Their Own Herds in Value	All Dairymen Interviewed			High Producers			Medium Producers			Low Producers		
	No.	Average Rating	No.	Average Rating	No.	Average Rating	No.	Average Rating	No.	Average Rating	No.	Average Rating
Not Answered	3	3.88	0	--	1	3.65	2	4.00				
Poor	2	3.37	0	--	1	3.30	1	3.43				
Fair	14	3.32	2	2.57	4	3.55	8	3.40				
Good	46	3.70	13	3.91	19	3.64	14	3.69				
Excellent	10	4.45	10	4.45	0	--	0	--				
Total	75	3.75	25	4.02	25	3.61	25	3.61				

*In the rating scale used: 0 = unaware; 1 = aware of 23 recommended practices; 2 = interested in the practices; 3 = planning to try the practices; 4 = tried the practices but not using; 5 = using the practices.

TABLE LVIII

NUMBERS AND AVERAGE DAIRY MANAGEMENT PRACTICE DIFFUSION RATINGS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS BY INTEREST OF RESPONDENT IN IMPROVING HIS DAIRY MANAGEMENT*

Degree of Interest in Improving Dairy Management Level	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	Average Rating	No.	Average Rating	No.	Average Rating	No.	Average Rating
Not Interested	6	2.96	2	2.57	1	3.61	3	3.00
Indifferent	9	3.33	0	--	5	3.34	4	3.32
Somewhat Interested	33	3.59	7	3.63	13	3.49	13	3.68
Very Interested	27	4.25	16	4.37	6	4.11	5	4.03
Total	75	3.75	25	4.02	25	3.61	25	3.61

*In the rating scale used: 0 = unaware; 1 = aware of 23 recommended practices; 2 = interested in the practices; 3 = planning to try the practices; 4 = tried the practices but not using; 5 = using the practices.

CHAPTER III

SUMMARY

A total of 75 Williamson County Grade A dairymen were selected randomly from the 145 who produced milk throughout 1963, and were interviewed regarding their dairy production practices.

Using 1963 milk marketing data obtained from the Nashville Milk Producer's Association, Incorporated, and from confidential producer interviews, the producers were divided into three equal numbered production thirds (high, medium and low) according to average annual butterfat production per cow. Therefore, 25 producers were in each of the three production ranges.

Producers were interviewed and rated concerning their use of 23 Tennessee recommended production practices. These dairy production management practice diffusion ratings ranged from zero representing "unaware" in the diffusion process to five representing, "using." Average practice diffusion ratings were established for all producers and for the three production ranges. The average practice diffusion ratings were used in comparing the management levels of high, medium, low, and all producers in relation to: 1) production; 2) stage in the diffusion process; 3) herd size; 4) age, 5) educational level; 6) size of farm; 7) occupation; 8) source of income; 9) sex; 10) gross family income; 11) herd ratings, and 12) interest in improving their dairy herd management.

Additional information was obtained regarding and/or related to the 23 recommended dairy production practices. The data related mainly to dairy cattle breeding and feeding practices. The breeding information dealt specifically with the method of breeding service and type of bull used on dairy heifers and cows.

Additional feeding practice information collected included:

1) the percent of protein in the dairy ration; 2) methods of providing concentrates; 3) whether or not hay was ground; 4) type of hay fed; 5) methods of supplying salt and minerals, and 6) amounts of silage storage capacity available.

Literature comparing management practices at various production levels of Grade A milk production in Tennessee counties and in other areas was found to be limited. Most information dealt with a comparison of members versus non-members of record-keeping associations.

I. REVIEW OF FINDINGS

Following is a brief summary of the major findings of the study as related to production and management practices of Williamson County Grade A milk producers:

1. High producers tended to be operating at higher management levels than did either medium or low producers

2. High producers has a higher average practice diffusion rating than did low producers in 18 of the 23 practices; even though there was a wide variation in the average practice diffusion ratings from practice to practice for all dairymen

3. The high producers had ratings of .84 diffusion points or more above the low producers in the following six practices: a) artificially inseminated one-half of cows; b) kept adequate milk records; c) fed cows according to production; d) provided hay and/or silage on pasture; e) provided sufficient summer pasture; and f) provided separate feeding and loafing areas

4. High producers used artificial breeding services more on both cows and heifers than did the other groups and bred 98 percent of their cows to dairy bull, or compared to 84 percent of low producers

5. Eighty percent of the high producers bought concentrate feed, while 32 percent of the low were mixing their own

6. Only 12 percent of the high producers were grinding hay as compared to 56 percent of low producers who were following this non-recommended practice

7. Eighty-eight percent of high producers fed legume hay, compared to 64 percent of low producers

8. The high producers averaged 369 tons of silage storage capacity, compared to 294 tons for the low producer group

9. The younger producers tended to have higher practice diffusion ratings than did the older ones

10. Practice diffusion ratings tended generally to increase as the educational levels of dairymen increased

11. The practice diffusion ratings tended to increase as the average size of farm increased

12. The practice diffusion ratings tended to go up as the gross family income increased

13. A number of producers indicated they had tried and doubted the soundness of certain practices as recommended, namely: a) having 75 percent of cows freshen in fall; b) providing the recommended amount of improved pasture, and c) strip cup always used.

II. IMPLICATIONS

Assuming that the Grade A milk producers interviewed are representative of all Williamson County Grade A dairymen, the following implications may be drawn from the findings:

1. The data indicated a strong relationship between recommended practice adoption and the level of production

2. Williamson County Grade A dairymen were generally aware of recommended practices but additional Extension efforts are needed to encourage practice adoption

3. Adoption of practices relating to artificial breeding, feeding concentrates according to production, providing hay and/or silage on pasture, providing sufficient summer pasture, providing separate feeding and loafing areas, and a record keeping system seemingly had a greater influence on level of production than did most other practices

4. Further study and analysis needs to be made in this area to find out why producers do not adopt certain recommended practices.

PROBLEM C:
FACTORS INFLUENCING DAIRY MANAGEMENT PRACTICE ADOPTION BY
WILLIAMSON COUNTY GRADE A MILK PRODUCERS

A Special Problem in Lieu of Thesis

In Partial Fulfillment
of the Requirement for the Degree
Master of Science

by
Houston Y. Beeler

August 1966

CHAPTER I

INTRODUCTION

This study deals with the final analysis of data from the interview-type survey of 75 Grade A dairymen in Williamson County, Tennessee. The producers included were randomly selected from the population of 145 Williamson County dairymen marketing Grade A milk throughout 1963.

Dairying is one of the old important agricultural enterprises in the Middle Tennessee area, of which Williamson County is a part. In 1959, the sale of dairy products ranked second as a source of agricultural income, being exceeded only by the sale of cattle and calves (6:217)* of which dairy cattle are a part.

Grade A milk production for the Nashville market has developed as the most important part of the county's dairy industry. This has undergone several major changes in recent years; for example, Williamson County Grade A producers marketed more milk in 1963 than they did in any of the ten previous years. For example, records (5:200) show that in 1963 the average producer in the Nashville milkshed delivered 749 pounds of milk per day, compared to 493 pounds sold per day in 1959.

In the past, dairying has received major emphasis in the county Extension program through use of a wide variety of methods. Prior to

*Numbers in parentheses refer to numbered references in the Bibliography; those after the colon are page numbers.

this study, however, little information had been collected and analyzed that tried to identify those things motivating dairymen to use or not use recommended practices. This study, then, is an attempt to uncover some of the important factors influencing Grade A dairymen to adopt or not adopt recommended dairy management practices.

I. THE PURPOSE OF THE STUDY

Specificially, the purpose of this study was to try to determine what factors, other than those identified earlier, have influenced Grade A milk producers in Williamson County to adopt or not adopt recommended dairy production practices.

II. REVIEW OF LITERATURE

Studies (12:3) have shown there is a time lag between what is known and what is done by most farmers. Some new ideas and practices are accepted quickly and with little apparent effort, while others are accepted only after years of effort on the part of agencies and leaders working with rural people. All farmers do not adopt new ideas or practices at the same time. They tend to be at different stages in the adoption process at different times as it may relate to a given recommendation or to a number of practices.

The stages through which an individual goes from the time he first learns of an idea until he adopts it is referred to as the diffusion process. Most authorities (1:7) generally agree that the stages in the

adoption process include the following: 1) awareness (referred to in this study as "aware"), 2) interest (hereafter referred to as "interested"), 3) evaluation (referred to hereafter as "planning to try"), 4) trial (referred to as "tried"), and 5) adoption (called "using" in this study).

Some studies (19:3) reveal that, as one progresses through the diffusion process from "awareness" to "using", more individual teacher-learner contacts are required the closer the practice moves toward adoption. Mass media are generally employed by the Extension worker to disseminate information to influence large numbers of people from a state of unawareness to well within the "interested" stage. As farmers move from the "interested" to the "planning to try" stage, related group meeting types of contact seem to be most significant. As farmers seek information on "how to do it" and move to the "tried" and the beginning of the "using" stage, individual contacts with their confidants become important. Finally, the "using" stage is complete and the practice adopted when the farmer is satisfied with its use under existing conditions and will continue to use the practice when appropriate.

III. METHODS

An alphabetical list of Grade A milk producers in Williamson County was secured from the Nashville Producer's Association, Incorporated, along with data concerning total milk marketed, butterfat test and bacterial counts for 1963.

Seventy-five of Williamson County's 145 Grade A milk producers were selected randomly and were interviewed face-to-face using the schedule (see Appendix) consisting of questions designed to reveal characteristics, production practices and factors influencing practice adoption.

This study has to do with those questions related to the factors influencing practice adoption not already dealt with in a related problem. After the survey information was obtained, the producers were divided into thirds according to average butterfat production per cow in 1963, based on milk marketed. The high group (25 producers) had an average range of butterfat production per cow from 440 downward to 290 pounds; the medium group (25 producers) had production from 289 downward to 250 pounds, and the low group (25 producers) were in the range from 249 to 110 pounds. Main comparisons in this study will be between the high and low production groups. Analyses will be made based on simple numbers and percents, and averages will be shown where pertinent. Data, as usual, will be presented in tabular form.

CHAPTER II

FINDINGS

I. THINGS LIKED ABOUT GRADE A MILK PRODUCTION

Each Williamson County Grade A milk producer interviewed was asked to tell what he liked most about his dairy enterprise. Table LIX shows that 83 percent (62 producers) felt it provided a regular source of income and was a stable form of agriculture. There is little difference noted between the high and low production groups.

The next most frequently mentioned reason was, "I love dairy cattle"; this included 13 percent of all dairymen. Only three other producers made different replies. Their likes included, "It's what I know best," and "It's an enterprise utilizing family labor."

II. THINGS DISLIKED ABOUT GRADE A MILK PRODUCTION

Table LX shows the replies when each respondent was asked to tell what he disliked most about Grade A dairying. It will be noted that 51 percent (38 producers) reported that Grade A dairying is "too confining." Forty-four percent of the high producers felt this way, as compared to 60 percent of the medium producers and 48 percent of the low producers.

"Difficulties with labor" was mentioned as a dislike by 17 percent of the dairymen, 7 in the high group, 2 medium and 4 in the low

TABLE LIX

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS MENTIONING THINGS THEY LIKED MOST
ABOUT GRADE A DAIRY PRODUCTION

Thing Liked Most About Grade A Dairying	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
It provides a regular source of income and is a stable form of agriculture	62	83	20	80	20	80	22	88
It's what I know best	1	1	0	0	0	0	1	4
I love dairy cattle	10	13	3	12	5	20	2	8
Other	2	3	2	8	0	0	0	0
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

TABLE LX

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS MENTIONING THINGS THEY DISLIKED
MOST ABOUT GRADE A DAIRY PRODUCTION*

Thing Disliked Most About Grade A Dairying	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Not Answered or None	2	2	0	0	1	4	1	4
Too confining	38	51	11	44	15	60	12	48
I lack the technical knowledge and skill needed	2	2	1	4	0	0	1	4
The return on my time and money is in- adequate	5	7	1	4	2	8	2	8
My facilities aren't suited to it	2	3	0	0	1	4	1	4
It takes too large an investment	2	3	1	4	0	0	1	4
Difficulties with labor	13	17	7	28	2	8	4	16
Other	11	15	4	16	4	16	3	12
Total	75	100	25	100	25	100	25	100

*Percents are rounded to the nearest whole number.

production group. Seven percent (5 producers) gave the reason, "The net return on my time and money is inadequate," as their dislike, and this group was observed as engaged in other enterprises. Some other reasons given only once or twice were: "I lack the technical knowledge and skill needed"; "My facilities are not suited to it," and "It takes too large an investment." Two producers, one each in the medium and low production groups, stated they had no dislikes concerning dairying.

III. REASONS WHY GRADE A DAIRYMEN DO NOT ADOPT

RECOMMENDED PRACTICES

In order to determine the relative importance of some reasons why Grade A dairymen do not adopt recommended dairy production practices, each producer interviewed was asked to select the three most important reasons from a set of ten. This was done by giving the respondent a set of ten cards with a reason typed on each, from which he made his selection and ranked the three in order of importance.

Table LXI shows a combined summary of numbers and percents of all dairymen, high, medium and low producers, who ranked each selected reason as either first, second or third in importance. This study considers each of the three selected reasons by each producer as equal; therefore, the totals and percents will be three times those used heretofore. It will be noted that the data in this table reveal little difference between the high and low producer production ranges with regard to selection of reason.

TABLE LXI

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS RATING VARIOUS REASONS WHY GRADE A DAIRYMEN DO NOT ADOPT RECOMMENDED DAIRY MANAGEMENT PRACTICES (FIRST, SECOND, AND THIRD RANKINGS COMBINED)*

Reason Why Dairymen Do Not Adopt Recom- mended Practices**	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Not Answered***	6	8	4	20	1	4	1	4
1. Cost of practices outweighs possible benefits	72	96	25	100	23	92	24	96
2. Facilities not suited	61	81	20	80	19	76	22	88
3. More rewarding activities claim owner's time and money	17	23	7	28	4	16	6	24
4. Don't believe practices are sound	17	23	5	20	9	36	3	12
5. Have tried and found unsatisfactory	16	21	2	8	7	28	7	28
6. Physically unable to do supervision and management of job needed	13	17	5	20	2	8	6	24
7. Don't have the technical knowledge needed	11	15	3	12	5	20	3	12
8. Uncertainty of ownership in divided estate	6	8	1	4	3	12	2	8
9. Expect to sell dairy herd	3	4	2	8	0	0	1	4
10. Expect to move away from farm	3	4	1	4	2	8	0	0

* Percents are rounded to nearest whole number.

** Numbers and percents will not add up to the totals since each dairyman made three selections.

*** Six producers did not think one reason was more important than another and therefore declined to select and rank three reasons.

Reason 1, "Cost of practices outweighs possible benefits," was selected by 96 percent of all producers. All three production groups rated this reason first as their limitation on adopting recommended practices. Some of the practices most frequently mentioned by respondents regarding this reason were: 1) keeping adequate milk records; 2) feeding cows according to weighed production; 3) feeding high quality hay and/or silage on pasture; 4) sufficient summer pasture provided, and 5) separate forage feeding and loafing area provided.

The skepticism reflected here, concerning some research, suggested that Grade A milk production practices are probably the most limiting factor to increasing the managerial ability of Williamson County dairy-men.

Reason 2, "Facilities are not suited," was selected by 81 percent of all producers. This was selected by 80 percent of the high producers, compared to 88 percent of the low producers.

Some of the practices dairymen reported that they could not adopt due to the fact that there facilities were not suited included: 1) high quality hay provided; 2) sufficient summer pasture provided; 3) adequate supply of silage provided; 4) 75 percent of herd replacements raised, and 5) adequate improved pasture provided.

Reason 3, "More rewarding activities claim owner's time and money," was selected by 23 percent (17 producers) of all dairymen. This was selected by 28 percent of the high group compared to 24 percent of the low group.

Reason 4, "Don't believe practices are sound," was selected by 23 percent (17 producers) of all producers. Twenty percent of the high producers picked this reason as compared with 12 percent of the low producers. The two practices generally referred to here as being too narrowly defined were: 1) 75 percent cows fall freshening, and 2) adequate improved pasture provided.

Reason 5, "Have tried and found unsatisfactory," was selected by 21 percent (16 producers) of all dairymen. This reason was given by only 8 percent of the high producers, compared with 28 percent for both the medium and low production groups.

The other reasons and percents of dairymen selecting them were: 1) Reason 6, "Physically unable to do supervision and management of job needed," 17 percent; 2) Reason 7, "Don't have the technical knowledge needed," 15 percent; 3) Reason 8, "Uncertain of ownership in undivided estate," 8 percent; 4) Reason 9, "Expect to sell dairy herd," 4 percent, and 5) Reason 10, "Expect to move away from farm," 4 percent.

Each respondent was asked to give additional reasons why Grade A milk producers do not adopt recommended dairy production practices. Fifteen percent (11 producers) gave other reasons generally all relating to the shortage of labor, or inability of dairymen to accomplish all of the necessary farm production jobs in spring and summer. A comment made by one of the producers may emphasize their heavy work load, "I'd be a lot better off if I could do just one-half as much as I know how to

do," A comparison of the production groups shows 6 high, 3 medium and 2 low producers giving other reasons. This may suggest that these problems occur most often with the better dairymen.

IV. DAIRY MANAGEMENT ADVICE SOUGHT

It is generally recognized that farmers discuss management problems with many different individuals in the diffusion process of adopting recommended practices. Table LXII shows that 89 percent of all Williamson County dairymen sought advice from an average of 5.2 individuals. Eleven percent (8 dairymen) of the producers reported they sought no advice from any one. It is interesting to note that the eight were divided follows: 4 percent of the high producers, 20 percent of the medium and 8 percent of the low producers. The high producers tended to seek more advice concerning dairy management, having talked with 6.4 individuals compared with 5.6 for the low.

This study of all dairymen shows that "neighbor or friend" ranked highest (73 percent) as a source of advice on dairy management. When production groups are compared as to the highest source of advice, it is noted that 88 percent of high producers sought advice from "neighbor or friend" and "county agent," 56 percent of the medium producers talked with "neighbor or friend" and "DHIA supervisor or ABA technician," and 84 percent of the low producers consulted "milk plant fieldman."

Findings here are in keeping with that previously reported; (19:3) as the farmer seeks information on "how to do it" concerning a practice,

TABLE LXII

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED, HIGH, MEDIUM AND LOW PRODUCERS BY FREQUENCY WITH WHICH THEY REPORTED HAVING SOUGHT ADVICE CONCERNING DAIRY MANAGEMENT OF CERTAIN INDIVIDUALS*

Person from Whom Advice was Sought	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
None sought	8	11	1	4	5	20	2	8
1. Neighbor or friend	55	73	22	88	14	56	19	76
2. DHIA supervisor or ABA technician	54	72	21	84	14	56	19	76
3. County agent	53	71	22	88	13	52	18	72
4. Local veterinarian	52	69	20	80	12	48	20	80
5. Milk plant fieldman	48	64	17	68	10	40	21	84
6. Health department sanitarian	43	57	19	76	8	32	16	64
7. Feed dealer or salesman	39	52	13	42	10	40	16	64
8. Banker or PCA representative	21	28	9	36	4	16	8	32
9. Extension dairyman	16	21	11	44	3	12	2	8
10. Vo-Ag teacher	7	9	5	20	1	4	1	4
Average number individuals giving advice	5.2		6.4		3.6		5.6	

*Percents are rounded to nearest whole number.

he is more likely to seek advice from individuals that he has high confidence in and long acquaintance with.

Ranking second in importance to all dairymen as a source of advice with 72 percent was "DHIA supervisor or ABA technician." Eighty-four percent (21 producers) of the high group reported this source of advice, compared to 76 percent (19 producers) of the low producers.

A close third as an important source of advice to all dairymen was the "county agent" with 71 percent. Eighty-eight percent (22 producers) in the high group reported "county agent" as top source for advice, compared with 72 percent (18 producers) in the low production range.

With regard to only three of the sources of advice did the number and percent of low producers average as high or slightly above the high producers.

In the remaining sources of advice, the high producers talked to more different individuals than did the low producers.

The greatest difference between high and low producers will be noted with "Extension dairyman" and "Vo-Ag teacher" even though they had the least number of contacts. Of the 21 percent (16 producers) who sought advice from the "Extension dairyman," 44 percent were high producers, whereas, only 8 percent were low producers. Although persons seeking advice from a "Vo-Ag teacher" constituted only 9 percent of all dairymen, this source of information ranked very high, as 20 percent were in the high production range, compared to 4 percent in the low production group.

One unexplainable fact that is very evident in this study, and has been observed previously, is that in nine out of the ten sources of personal information studied the low producers reported considerably more advice sought than the medium producer group.

V. ADDITIONAL SOURCES OF DAIRY MANAGEMENT INFORMATION

It will be noted that 95 percent of all Williamson County Grade A dairymen indicated that they received certain useful dairy management information from sources listed in Table LXIII. Only 5 percent indicated that they did not receive information considered as useful from sources described as mass media and related group meetings. These media for disseminating useful information are generally employed concerning recommended practices from the "awareness" stage through the "planning to try" stage of the diffusion process.

All dairymen reported that they received information from an average of 4.3 different sources. The high group averaged 4.9, the medium 3.2 and the low 4.7 sources.

Farm magazines were the most frequently mentioned source reported by 87 percent of all producers. This same high rate of popularity of farm magazines was evidenced by 96 percent of the high group and 88 percent of the low group.

University bulletins and publications were reported by 73 percent of all producers. This source of information was reported by 72 percent of the high producers, compared with 88 percent of the low producer group.

TABLE LXIII

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,,
HIGH, MEDIUM AND LOW PRODUCERS BY FREQUENCY WITH WHICH THEY
REPORTED RECEIVING INFORMATION USEFUL IN THE MANAGEMENT OF
THEIR DAIRY HERDS FROM DIFFERENT SOURCES*

Source of Use- ful Information	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
None reported	4	5	0	0	3	12	1	4
Farm magazines	65	87	24	96	19	76	22	88
University bulletins and publications	55	73	18	72	15	60	22	88
Field days	27	36	12	48	4	16	11	44
Commercial feed company bulletins	27	36	12	48	5	20	10	40
Weekly newspapers	27	36	12	48	4	16	11	44
Daily newspapers	24	32	10	40	5	20	9	36
Radio	23	31	7	28	6	24	10	40
Television	9	12	2	8	3	12	4	16
Newsletters	7	9	3	12	2	8	2	8
Average number of sources of information	4.3		4.9		3.2		4.7	

*Percents are rounded to nearest whole number.

**Numbers and percents will not add up to the total of 75 dairy-
men interviewed nor to 100 percent, since dairymen received information
from more than one source.

Farm meetings as a source of useful information were reported by 61 percent (46 producers) of all producers. Seventy-two percent of high producers indicated this source of information, compared with 60 percent of the low producers.

Field days were reported by 48 percent (36 producers) of all dairymen as a useful source of management information. Here 64 percent of the high producers named this information source, whereas only 48 percent of low producers named field days.

Other sources from which all dairymen received useful management information, in the order reported are: 1) commercial feed company bulletins; 2) weekly newspaper; 3) daily newspaper; 4) radio; 5) television, and 6) newsletters.

It will be noted, concerning the ten information sources, that the high production group reported using seven of these sources more than did the low production group. These exceptions were: 1) University bulletins and publications; 2) radio, and 3) television.

Here again it will be noted that the low producer group reported a much greater number and percent of useful information obtained from sources under study than did the medium group.

VI. DEGREE TO WHICH INTERVIEWER WAS FAMILIAR WITH

DAIRY SITUATION

The interviewer was asked to rank each of the respondents at the end of the face-to-face interview as to the four degrees to which the

interviewer knew the producer's dairy situation. Table LXIV reveals that the interviewer was "very familiar" or "fairly familiar" with 63 percent (47 dairymen) of all the producers' dairy situations. Eighty percent of the high producers were in the "very familiar" or "fairly familiar" group, compared to 60 percent of the low producers. The other two degrees known ratings included 37 percent of all producers in "not very familiar" and "not familiar" categories. Only 20 percent of the high producers and 40 percent of the low production group were not known at least "fairly well."

High producers were generally better known than the medium or low producers.

VII. PRODUCERS' NEED FOR INCREASING ATTENTION TO MANAGEMENT OF HERD

Here the interviewer's opinion was recorded as to three degrees of attention that each respondent should give to the management of his dairy herd. It will be noted in Table LXV that it was the interviewer's opinion that 63 percent (47 producers) of all producers "should pay more attention" to the management of their dairy herd. There is little difference between the three production ranges, as they include 16 high, 16 medium and 15 low producers. Assuming that closer attention to herd management would result in higher production, it was the opinion of the interviewer that all the dairy operations which were at least "fairly familiar" (see Table LXIV) and possessed adequate facilities, needed more management attention.

TABLE LXIV

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS BY DEGREE TO WHICH INTERVIEWER
WAS FAMILIAR WITH THE DAIRY SITUATIONS OF THE RESPONDENTS*

Degree to Which Interviewer Knew Dairy Situation	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Very familiar	8	11	5	20	2	8	1	4
Fairly familiar	39	52	15	60	10	40	14	56
Not very familiar	16	21	3	12	7	28	6	24
Not familiar	12	16	2	8	6	24	4	16
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

TABLE LXV

NUMBERS AND PERCENTS OF ALL WILLIAMSON COUNTY DAIRYMEN INTERVIEWED,
HIGH, MEDIUM AND LOW PRODUCERS WHO SHOULD, IN THE INTERVIEWER'S
OPINION, PAY MORE ATTENTION TO THE MANAGEMENT
OF THEIR DAIRY HERD*

Attention Paid to Management of Dairy Herd	All Dairymen Interviewed		High Producers		Medium Producers		Low Producers	
	No.	%	No.	%	No.	%	No.	%
Should pay more attention	47	63	16	64	16	64	15	60
Should not pay more attention	1	1	0	0	1	4	0	0
Uncertain	27	36	9	36	8	32	10	40
Total	75	100	25	100	25	100	25	100

*Percents are rounded to nearest whole number.

The one producer recorded in the medium group as "should not pay more attention" to the management of his dairy herd, reported to the interviewer that he thoroughly detested milking and, in addition to that, he had been offered \$1,500 per acre for his farm.

As seen in the table, the interviewer was "uncertain" concerning 36 percent (27 producers) of the dairymen. The distribution by production ranges showing no trend, with 36 percent high, 32 percent medium and 40 percent in the low production group. This uncertainty was a result of lack of familiarity with these individual dairy farm operations.

CHAPTER III

SUMMARY

A total of 75 of Williamson County Grade A dairymen were randomly selected from the 145 producers marketing Grade A milk throughout 1963 for this study to determine some of the factors that influence the adoption of recommended dairy management practices.

Studies reviewed discussed the time lag between what is known and what is done by most farmers. They tend to be at different stages in a recognized five-step diffusion process at different times as it may relate to a given recommendation or a number of practices.

The adoption of recommended practices is generally related to the educational effort; first, through mass media, where large numbers of people may be made aware of a new idea; then through related group contacts which provide opportunities for practice appraisal; and, finally, as information is sought on "how to do it," individual contacts become important. Efforts have been made to identify educational media, group and individual contacts which the respondent had during 1963.

Each producer interviewed was asked what he liked and disliked most about Grade A milk production. Also, each respondent was asked to select and rank the three most important reasons, from a list of 10, why he felt Grade A dairymen often do not adopt recommended dairy production practices.

The interviewer recorded the degree to which he was familiar with each producer's dairy situation, and his opinion concerning the respondent's need for increasing attention to management of his herd.

The 75 Grade A milk producers were divided into high, medium and low groups (25 dairymen in each), according to butterfat production. The factors influencing the adoption of dairy management practices of these production groups were considered, based on data obtained from the personal interviews.

I. REVIEW OF FINDINGS

The following is a summary of the major findings concerning factors influencing management practice adoption of Grade A milk producers in Williamson County:

1. Eighty-three percent of all producers liked Grade A dairying because it provided a regular source of income and was a stable form of agriculture, 80 percent of the high producers and 88 percent of the low production group rating it first

2. "Too confining" was the greatest dislike reported by 51 percent of all dairymen; 44 percent of the high producers and 48 percent of the low production group selecting it

3. Ranking highest among all Grade A dairymen as reasons for not adopting recommended practices were "cost of practice outweighs possible benefits" (96 percent) and "facilities are not suited" (81 percent)

4. Eighty-nine percent of all Williamson County dairymen sought management advice from an average of 5.2 individuals. The high producers' two most frequent sources of advice reported (88 percent each) were "neighbor or friend" and "county agent"; whereas, the low producers' source reported most frequently (84 percent) was the "milk plant fieldman".

5. Nearly all Williamson County Grade A milk producers (95 percent) indicated that they received useful dairy management information from related group contacts and mass media, sources including, in order of usefulness reported, farm magazines, University bulletins and publications, farm meetings, field days, commercial feed company bulletins, weekly newspaper, daily newspaper, radio, television and newsletters

6. The interviewer was at least "fairly familiar" with nearly two-thirds (63 percent) of all Grade A producers, more high producers (80 percent) than low producers (60 percent) being represented

7. In the interviewer's opinion, about two-thirds (63 percent) of all dairymen should pay more attention to the management of their dairy herds.

II. IMPLICATIONS

Based on information revealed in this study, the Agricultural Extension Service educational program for Grade A milk producers in Williamson County should be strengthened. Some of the implications that may be drawn from the findings are:

1. Most dairymen in the Grade A milk enterprise like the regular income, although more than 50 percent dislike the confinement; therefore, it may be assumed that the majority of dairymen are interested in maximum returns

2. The two main reasons given by Grade A dairymen for not adopting recommended dairy production practices should be given careful consideration in planning an educational dairy program

3. Grade A dairymen do depend on many sources for useful management information; therefore, full utilization should be made of all sources to encourage practice adoption, along with every assurance that the information sources have the adequate recommended practice information

4. Information from this and the two related studies should be presented to all Grade A dairymen in an understandable form

5. Dairymen should be involved in planning that part of the County Extension program relating to them based on survey findings and other relevant data.

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APPENDIX

THE AGRICULTURAL EXTENSION SERVICE, UNIVERSITY OF TENNESSEE
Knoxville, Tennessee

TENNESSEE GRADE "A" DAIRYING SURVEY

INTRODUCTION: I am helping with a survey that is being made by the University of Tennessee. The purpose is to obtain information to use in planning programs helpful to Grade "A" dairymen. The answers you give will be added to those given by other dairymen who are being interviewed in this county and other parts of the state to get a complete picture of the dairy situation. Could I have a little of your time to go over these questions?

1. Total acres in farm _____ Cropland acres _____
2. Major occupation of the respondent
 - a. Full-time farmer _____
 - b. Part-time farmer _____
 - c. Business (specify) _____
 - d. Professional (specify) _____
 - e. Wage earner _____
 - f. Housewife or widow _____
 - g. Retired _____
 - h. Other (specify) _____
3. Is dairying your major source of income?
 - a. Yes _____
 - b. No _____
4. If your answer to question 3 above is NO, what is your major source of income? _____
5. Would you please complete this sentence? (Hand respondent card.)
"The thing I like most about Grade "A" dairy production is _____

TO THE INTERVIEWER: If the respondent mentions more than one thing, write down all of them, and ask him "which is most important?" Then underscore it.

6. Would you please complete this sentence? (Hand respondent card.)
"The thing I dislike most about Grade "A" dairy production is _____

TO THE INTERVIEWER: If the respondent mentions more than one thing, write down all of them, and ask him "Which is most important?" Then underscore it.

7. We have listed on these cards some reasons why Grade "A" dairy farmers do not adopt recommended dairy production practices. (Hand respondent set of cards.) Now, here is what we would like you to do:
- Please look through all of the cards; read each one; and pick out the three cards that show why you believe Grade "A" dairy farmers do not use better production practices. After you have selected the three cards, please hand me the rest.
 - Now, these three reasons are not of the same importance; so please go through them and decide which one is probably of most importance. Please give me the number on the back of the card. Also, please do this with the other two cards.

Rank	1	2	3
Card Number			

Are there any other reasons why you believe Grade "A" dairy farmers do not adopt recommended dairy production practices?

TO THE INTERVIEWER: The purpose of this next question is to find out if the respondent--

- (1) is aware of certain recommended practices
- (2) is interested in using them
- (3) has tried them
- (4) is still using them, or will use them when the need arises
- (5) and his reasons for never trying the practices, or for not using them after trying them.

INTERVIEWER hand each card to respondent separately after saying: "I have here a set of cards. On each card is a dairy production practice. Would you read each card and tell me whether or not you have tried that practice?" (Check Yes or No in the "Has Tried" column below.)

In his reply, the respondent may also answer the other four points. If not, interviewer will ask appropriate questions to obtain the answers. Check in appropriate columns below.

8. Recommended Dairy Production Practices	Read or		Inter-		Is Using		Has Tried	
	Heard of		ested In		or			
	Yes	No	Yes	No	Yes	No	Yes	No
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
(1) Using artificial insemination in the breeding of 50% or more of your cows (exclude heifers)								

i. Reasons for never trying practice OR not using after trying

(2) Breeding each bull to a bull of same breed								
--	--	--	--	--	--	--	--	--

i. Reasons for never trying practice OR not using after trying

(3) Having a basis for weighing feed and grain according to production with special attention to assure that high producers receive enough grain (i.e., 1-3 or 1-4)								
---	--	--	--	--	--	--	--	--

i. Reasons for never trying practice OR not using after trying

(4) Providing an adequate (6-8 tons annually per cow) supply of silage (when fed with hay)								
--	--	--	--	--	--	--	--	--

i. Reasons for never trying practice OR not using after trying

(5) Providing high quality silage (i.e., corn cut in dent stage, alfalfa in early bloom stage and grasses in boot stage)								
--	--	--	--	--	--	--	--	--

i. Reasons for never trying practice OR not using after trying

	Read or		Inter-		Is Using		Has Tried	
	Heard of		ested In		or			
	Yes	No	Yes	No	Will Use	Has Tried	Yes	No
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
(6) Providing enough roughage ($2\frac{1}{2}$ lb. of hay equivalent per cwt. of body weight daily) by supplementing silage with hay (1-2 tons annually per cow)								
i. Reasons <u>for never</u> trying practice OR not using after trying								
(7) Providing high quality hay (i.e., alfalfa cut at bud to 1/10 bloom stage, grasses and small grains in boot stage)								
i. Reasons <u>for never</u> trying practice OR not using after trying								
(8) Providing hay and/or silage when cows are on pasture								
i. Reasons <u>for never</u> trying practice OR not using after trying								
(9) Providing an adequate amount (1-2 acres per cow) of improved pasture (e.g., orchard grass and ladino)								
i. Reasons <u>for never</u> trying practice OR not using after trying								
(10) Providing sufficient summer pasture ($1/4$ to $1/2$ A. per cow)								
i. Reasons <u>for never</u> trying practice OR not using after trying								

	Read or Heard of		Inter- ested In		Is Using or Will Use		Has Tried	
	Yes	No	Yes	No	Yes	No	Yes	No
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
(11) Keeping adequate milk production records on a per cow basis (i.e., D.H.I.R., D.H.I.A., W.A.D.A.M.								
i. Reasons <u>for never</u> trying practice OR not using after trying								
(12) Raising at least 75% of all herd replacements								
i. Reasons <u>for never</u> trying practice OR not using after trying								
(13) Annually providing an average of sixty days per cow for dry period								
i. Reasons <u>for never</u> trying practice OR not using after trying								
(14) Maintaining a 12-14 month calving period for each cow in the herd								
i. Reasons <u>for never</u> trying practice OR not using after trying								
(15) Having at least 75% of cows in the herd freshen in the fall								
i. Reasons <u>for never</u> trying practice or not using after trying								
(16) Permanently identifying each calf as to sire and dam								
i. Reasons <u>for never</u> trying practice OR not using after trying								

	Read or		Inter-		Is Using		Has Tried	
	Heard of		ested In		or			
	Yes	No	Yes	No	Yes	No	Yes	No
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
(17) Vaccinating all calves (at 4-10 months of age) for brucellosis, blackleg, etc.								

i. Reasons for never trying practice OR not using after trying

(18) Keeping adequate herd records								
(a) Calving								
(b) Health								
(c) Heat								

i. Reasons for never trying practice OR not using after trying

(19) Using a strip cup on each cow before each milking								
--	--	--	--	--	--	--	--	--

i. Reasons for never trying practice OR not using after trying

(20) Having a routine check made (every 6 mo.) of milking system as to recommended vacuum level and pulsation rate (varies with manufacturer)								
---	--	--	--	--	--	--	--	--

i. Reasons for never trying practice OR not using after trying

(21) Providing separate feeding and loafing areas for the milking herd								
---	--	--	--	--	--	--	--	--

i. Reasons for never trying practice OR not using after trying

	Read or		Inter-		Is Using		Has Tried	
	Heard of		ested In		or			
	Yes	No	Yes	No	Yes	No	Yes	No
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
(22) Systematically using a recommended method of fly control around barns, loafing and milking areas								

i. Reasons for never trying practice OR not using after trying

ii. TO INTERVIEWER: If recommended method is used, explain the system mentioned: _____

(23) Getting the advice of professional dairy workers

--	--	--	--	--	--	--	--

i. Reasons for never trying practice OR not using after trying

9. During the past year, have you talked with anyone about the management of your dairy herd?

a. Yes _____

b. No _____

TO THE INTERVIEWER: If No, skip to question 11. If Yes, ask question 10 first.

10. With whom have you talked? (Check one or more of the following. If respondent gives names, write them at the side and check list later.)

a. County agent _____
 b. Extension dairyman _____
 c. Local veterinarian _____
 d. D.H.I.A. supervisor _____
 e. A.B.A. technician _____
 f. Vo-Ag teacher _____

g. Milk plant field man _____
 h. Feed dealer or salesman _____
 i. Banker or PCA representative _____
 j. Neighbor or friend (other dairyman) _____
 k. Health department sanitarian _____
 l. Other (specify) _____

11. From which of the following other sources did you receive information useful in the management of your dairy herd during the past year?

a. Univ. bulletins and publications _____	f. Radio _____
b. Commercial (feed company) bulletins _____	g. Television _____
c. Farm magazines _____	h. Farm meetings _____
d. Daily newspapers _____	i. Field days and tours _____
e. Weekly newspapers _____	j. Newsletters _____

12. What was the highest grade level that you completed? (Circle one)

0	12345678	9	10	11	12	1	2	3	4	Bachelor's	Master's	Doctor's
None	Grade Sch.			H. S.		Col.Underg.				Degree	Degree	Degree

13. Age of respondent?

a. Under 25 _____	d. 45-54 _____
b. 25-34 _____	e. 55-64 _____
c. 35-44 _____	f. 65 or more _____

14. What plans do you have for the future management of your dairy herd? (Including 23 practices listed earlier plus any others mentioned.)

15. (If respondent says he has no plans in question 14 above, ask why not.)

15. What land use system did you follow last year?

<u>Crop</u>	<u>Acres</u>	<u>Bottom or</u> <u>Upland</u>	<u>Yield</u>	<u>Disposition</u>	
				<u>Used</u>	<u>Sold</u>
Corn (grain)	_____	_____	_____	_____	_____
Corn (silage)	_____	_____	_____	_____	_____
Grass (silage)	_____	_____	_____	_____	_____
Kind _____	_____	_____	_____	_____	_____
Hay:					
Kind _____	_____	_____	_____	_____	_____
Kind _____	_____	_____	_____	_____	_____
Kind _____	_____	_____	_____	_____	_____
Pasture(improved)					
Kind _____	_____	_____	_____	_____	_____
Kind _____	_____	_____	_____	_____	_____
Kind _____	_____	_____	_____	_____	_____
Supplemental:					
Kind _____	_____	_____	_____	_____	_____
Kind _____	_____	_____	_____	_____	_____

17. How many dairy animals in each of the following classifications did you have last year?

	<u>Total</u>	<u>Registered</u>	<u>Grade</u>
a. Dairy cows milked	_____	_____	_____
b. Dairy heifers over 1 year of age	_____	_____	_____
c. Dairy heifers under 1 year of age	_____	_____	_____
d. Dairy bulls	_____	_____	_____

18. How many dairy animals in each of the classifications did you have in the following breeds? (Check with question 17 to see totals are the same.)

<u>Breed</u>	<u>Number of Cows</u>		<u>Number of Heifers</u>		<u>Number of Bulls</u>	
	<u>Regis.</u>	<u>Grade</u>	<u>Regis.</u>	<u>Grade</u>	<u>Regis.</u>	<u>Grade</u>
a. Brown Swiss	_____	_____	_____	_____	_____	_____
b. Guernsey	_____	_____	_____	_____	_____	_____
c. Holstein	_____	_____	_____	_____	_____	_____
d. Jersey	_____	_____	_____	_____	_____	_____
e. Other (please specify)	_____	_____	_____	_____	_____	_____

19. Do you now have more, the same or fewer dairy cows than you had last year?

a. More _____ i. How many more? _____ ii. Why? _____
 b. Same _____ i. Why? _____
 c. Fewer _____ i. How many fewer? _____ ii. Why? _____

20. How do you breed your heifers?

a. Artificially _____ b. Naturally _____

21. What type bull do you use on your heifers?

a. Dairy _____ b. Beef _____

22. What type of bull do you use on your cows?

a. Dairy _____ b. Beef _____

23. What percent protein do you use in your dairy ration?

a. 12% _____ b. 14% _____ c. 16% _____ d. 18% _____ e. Other(specify) _____

24. Do you mix your own concentrates?

a. Yes _____ b. Some _____ c. No _____

TO INTERVIEWER: If the answer to question 24 above was Yes, skip to question 26. If the answer was Some or No, ask question 25.

25. If you do not mix your own concentrates, how do you provide for them? _____

26. Do you grind your hay? a. Yes _____ b. No _____

TO INTERVIEWER: If the answer to question 26 above was Yes, ask question 27. If answer was No, skip to 28.

27. Please explain how hay is ground and fed. _____

28. What type of hay do you usually feed?

a. Legume _____ b. Grass _____ c. Legume-grass _____

29. How do you supply salt and minerals?

a. Mix in ration _____ b. Supply them free choice _____
c. Other (specify) _____

30. What source(s) of water do you have for your herd?

a. Drinking cups in barn _____ b. Other water in barn _____
c. Water outside barn _____ d. Pond _____ e. Stream _____

31. If you have a pond, what distance is it from the barn? _____ yds.

32. If you have a stream, what distance is it from the barn? _____ yds.

33. What type of milking set-up do you have?

a. Stanchion _____ b. Elevated stall c. Other (specify) _____

34. Do you have a bulk tank?

a. Yes _____ b. No _____

35. If you have a bulk tank, what is its capacity? _____ gallons

36. Do you have a pipeline system? a. Yes _____ b. No _____

37. If you do have a pipeline system, does it include a workable weighing device?

a. Yes _____ b. No _____

TO INTERVIEWER: If the answer to question 37 was Yes, ask question 38. If No, skip to question 39 below.

38. Do you use the weighing device?

a. Yes _____ b. No _____ If not, why not? _____

39. How much loafing barn area do you have for each cow? (in sq. ft.)

a. Under 30 _____ e. 60-69 _____
 b. 30-39 _____ f. 70 or above _____
 c. 40-49 _____ g. Box (free) stalls _____
 d. 50-59 _____

40. Do you have a silo? a. Yes _____ b. No _____

TO INTERVIEWER: If the answer to question 40 is Yes, ask question 41. If No, skip to question 42.

41. What type(s) of silo(s) do you have? What size? What type of cover to you use?

Type of Silo	Size	Type of Cover			
		Roof	Plastic	Other	None
Upright _____	_____	_____	_____	_____	_____
Trench _____	_____	_____	_____	_____	_____
Bunker _____	_____	_____	_____	_____	_____

42. Who does the milking?

a. Owner _____ b. Tenant _____ c. Other (please specify) _____

43. If person other than owner milks, how is he paid?

a. Percentage _____ b. Salary _____ c. Combination (specify) _____

44. (OPTIONAL) Approximately what was your total (gross) family income last year? (Hand card to respondent and ask him to select a category.)0

a. 0-1999 _____	i. 16,000-17,999 _____
b. 2,000-3,999 _____	j. 18,000-19,999 _____
c. 4,000-5,999 _____	k. 20,000-21,999 _____
d. 6,000-7,999 _____	l. 22,000-23,999 _____
e. 8,000-9,999 _____	m. 24,000-25,999 _____
f. 10,000-11,999 _____	n. 26,000-29,999 _____
g. 12,000-13,999 _____	o. 30,000-49,999 _____
h. 14,000-15,999 _____	p. 50,000-99,999 _____

45. How would you rate the present condition and value of your dairy herd?

a. Excellent _____

c. Fair _____

b. Good _____

d. Poor _____

Name of Respondent _____

Address _____ County _____ Number _____

Date _____ Tenure Status _____

QUESTIONS FOR THE INTERVIEWER TO ANSWER (Not in interview)

Name of Respondent _____

Address _____ County _____ Number _____

Date _____

46. Pounds of milk sold last year _____ Percent B. F. Test _____
Average bacterial count last year _____
47. All people do not adopt practices at the same time. About where would you place the respondent with respect to adopting new recommended dairy practices?
- a. Among the first few _____ c. Sooner than the average _____
b. Soon after the first few _____ d. A little later than most _____
e. Among the last few _____
48. Is the respondent
- a. Man _____ b. Woman _____
49. Interest of respondent in improving his dairy management (In interviewers judgement)
- a. Very interested _____ c. Indifferent _____
b. Somewhat interested _____ d. Not interested _____
50. Respondent's attitude toward survey (In interviewer's judgement)
- a. Friendly _____ c. Indifferent _____
b. Somewhat friendly _____ d. Antagonistic _____
51. Should the respondent pay more attention to management of his dairy herd in light of his situation?
- a. Yes _____ b. No _____ c. Uncertain _____
52. How well do you know the respondent?
- a. Very well _____ c. Not very well _____
b. Fairly well _____ d. Not at all _____
53. How familiar are you with the respondent's dairy situation?
- a. Very familiar _____ c. Not very familiar _____
b. Fairly familiar _____ d. Not familiar _____

54. If very or fairly familiar with their dairy situation, how would you rate the present condition and value of his dairy herd?

a. Excellent_____

b. Good-_____

c. Fair_____

d. Poor_____