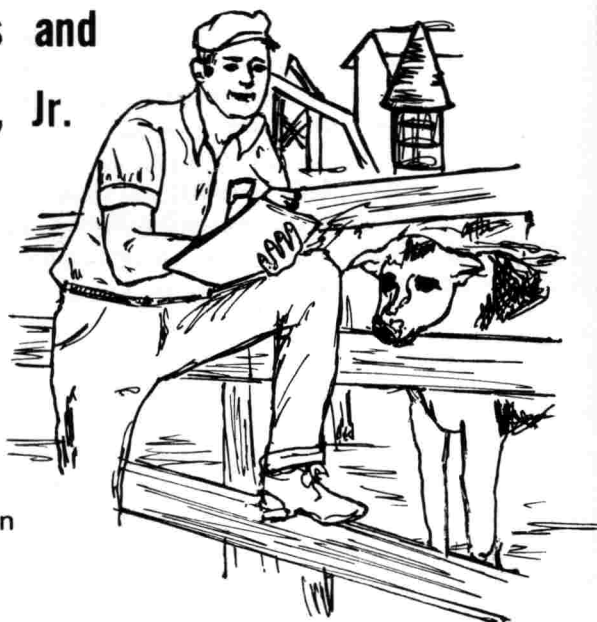


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Grade A Dairy Operators: Factors Related To Financial Growth

by **B.R. McManus** and
Ingram B. Howard, Jr.



The University of Tennessee
Agricultural Experiment Station
John A. Ewing, Dean
Knoxville

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SUMMARY

The objectives of this study were: 1) to relate financial goals and attitudes of farm operators toward credit to farm size and financial growth, and 2) to identify the relationship of selected factors to farm size and financial growth of Grade A dairy operators.

Data were obtained by personal interview of Grade A dairy farmers in West Tennessee. The data were collected by means of a structured questionnaire and a total of 178 usable questionnaires were obtained.

Findings indicate that a favorable attitude toward credit is desirable for increasing net worth. Those farmers who had a favorable attitude toward credit but expressed a concern for the effect that credit use would have on the total operation appeared to be most successful in increasing net worth.

The farmers normally expressed goals in physical accomplishment terms rather than monetary terms. The goals were expressed, however, most often in terms which would lead to financial accomplishment. Farmers expressed desires of reaching some level of satisfaction rather than seeking to maximize monetary returns.

A farm size model and a financial growth model were developed and estimated. For purposes of this study, farm size was measured in terms of net worth of the farm operator. Financial growth was measured in terms of change in net worth per year.

The farm size model included number of credit sources used, initial net worth, number of years engaged in Grade A dairying, average production per cow, and educational level as explanatory variables. Number of years engaged in Grade A dairying, initial net worth, and average production per cow were significantly related to net worth. Number of credit sources and education were positively related to net worth but were not significant. The five independent variables explained around 30 percent of the variation in net worth.

An increase in average production per cow of 1,000 pounds for the herd was associated with an increase in net worth of about \$10,000. Each additional year the farm operator was engaged in Grade A dairying was associated with an increase in his net worth of approximately \$5,000. An increase of \$1,000 in initial net worth was associated with an increase of almost \$1,500 in present net worth of the operator.

The financial growth model included change in farm debt per year, change in herd size per year, change in farm size per year, education, average production per cow, and goal index score. Variables which were significantly related to change in net worth per year were change in herd size per year, change in farm size per year, and education. Average production per cow and goal index score were positively related to change in net worth per year but were not significant. The six independent variables explained about 35 percent of the variation in change in net worth per year.

An increase in herd size of one milking cow per year was associated with an increase in net worth per year of \$658. An increase in net worth per year of nearly \$500 was associated with each additional year of formal education attained. Associated with each additional acre of land owned was an increase in net worth of \$220.

Grade A Dairy Operators: Factors Related To Financial Growth

by
B. R. McManus and Ingram B. Howard, Jr.*

The Grade A dairy industry in Tennessee and the United States has experienced tremendous changes in the last decade. During this time the number of dairy herds in Tennessee has decreased about 70 percent while herd size has more than doubled and production per cow has increased over 50 percent.¹ Dairy farms have become larger, and more laborsaving buildings and feeding equipment are now being used.

These changes have approximately quadrupled operating and investment capital for the individual Grade A producer. The problem of capital acquisition and accumulation must be faced by both beginning farmers and established producers. In order to maintain a viable milk production industry, additional knowledge is needed concerning acquisition and accumulation of capital by dairy farmers.

OBJECTIVES

The objectives of this study were: 1) to relate financial goals and attitudes of farm operators toward credit to farm size and capital accumulation, and 2) to identify the relationship of selected socioeconomic factors to farm size and capital accumulation of Grade A dairy operators.

*Associate Professor and former Research Assistant in Agricultural Economics, respectively, Department of Agricultural Economics and Rural Sociology.

¹Adapted from: **1969 Census of Agriculture: Tennessee**, U. S. Department of Agriculture; **Agricultural Trends in Tennessee**, Fourth Edition, 1964, Tennessee Crop Reporting Service; and **Tennessee Agricultural Statistics**, Bulletin T-7, 1970, Tennessee Crop Reporting Service.

SOURCE OF DATA

Data for this study were obtained by personal interview of Grade A dairy farmers in 16 counties in West Tennessee. The number of farmers interviewed and total number of Grade A producers in each county are shown in Figure 1. In September 1970, there were 250 Grade A producers in West Tennessee based on the records of the Associated Milk Producers, Inc., and the Agricultural Extension Service. Only producers who had herds of 15 or more cows were included in the survey. The data were collected by means of a structured questionnaire enumerated during September and October of 1970. A total of 178 usable questionnaires were obtained.

ANALYTICAL PROCEDURE

Selected socioeconomic variables were used to develop size and capital accumulation models in this study. Regression analysis was used to analyze the relationships of the selected socioeconomic variables associated with farm size and capital accumulation. In addition, a goal index was constructed by subjective scaling to be used in the capital accumulation model. The t-test was used in finding significant differences between means.

For purposes of this study, farm size was measured in terms of net worth of the farm operator. Capital accumulation was measured in terms of change in net worth per year.

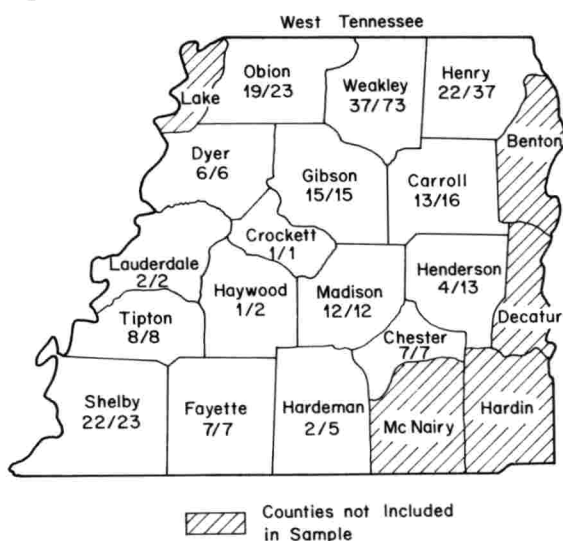


Figure 1. Number of schedules taken and number of Grade A producers by county, West Tennessee, 1970; for instance, Carroll County shows 13 schedules taken from 16 Grade A producers.

Source: Records from the Offices of the Associated Milk Producers, Inc., and the Agricultural Extension Service, 1970.

GOALS AND ATTITUDES

The level of financial success that a farmer achieves is often influenced by his attitudes and by the goals toward which he works. Data were obtained on the initial and future financial goals of each farm operator and on his attitudes toward the use of credit. Open-end and structured questions were used to secure information on goals and attitudes. Data obtained were used to study the relationships between goals and farm size and between attitudes and farm size.

Goals

Initial Financial Goals

Each farmer was asked an open-end question to get insights into his initial financial goals. The question was asked as follows: "When you started Grade A dairying, what financial goals or accomplishments did you want to achieve?" Twenty-five different goals were identified by farmers in response to the above question. The 10 goals listed most often are shown in Appendix B, Appendix Table 1. "Making a good or comfortable living" was the goal mentioned most frequently. "Increasing the level of milk production" and "increasing herd size" were second and third, respectively, in frequency mentioned. Other initial goals which farmers considered important were "having less debt or being out of debt" and "making the highest possible income from the farm."

Verbal Ranking of Specified Goals

After farmers had responded to the open-end question, they were handed a list containing 10 specified goals. The farmers were asked to check the three goals which were most important to them in present decisions they made about farming. They were then asked to rank these three items in order of importance to them.

The percentage of farmers ranking each of the 10 goals first are shown in Appendix B, Appendix Table 2. "Purchase additional land" was ranked first by more farmers than any other goal. "Increase size of herd" was second and "increase gross farm income and/or net farm income" was third in the frequency of first-place rankings.

Future Financial Goals

In order to determine the future financial goals of each farm operator, respondents were asked the following question: "What financial goals do you plan to achieve or accomplish in the next 10 to 15 years?" Several of the younger operators indicated that they were still in the process of accomplishing many of their initial goals. On the other hand, many older operators indicated that their initial goals had changed considerably since they first began dairying. There was a strong tendency for the younger operators to be growth oriented while the

older operators tended toward consolidation and preservation of assets.

The goal mentioned most frequently by the younger operators was "increasing herd production." "Building new milking and feeding facilities" was the second most often-mentioned goal among the younger operators. The third most important goal of the younger group was "operating a more profitable and efficient farm business."

"Reduce or get out of debt" was the goal mentioned most frequently by the older operators. "Build up security for later years" and "retirement" were second and third, respectively, in frequency mentioned by the older group.

Clarity of Initial Goal Verbalization

At the end of each interview the enumerator rated each farmer on the clarity of his initial goal verbalization. While clarity in goal formulation may be considered a continuum, each farmer was subjectively classified as having goals clearly verbalized, fairly clearly verbalized, or poorly verbalized.

Twenty-five percent of the farmers was rated as having clearly verbalized goals, 42 percent as having fairly clearly verbalized goals, and 33 percent as having poorly verbalized goals (Table 1). Farmers in the first category expressed a set of goals clearly and specifically. Farmers rated as having fairly clearly verbalized goals had some difficulty in verbalizing goals. Farmers in the last category stated only a vague or general farming goal and in some cases could verbalize no goals at all.

Table 1. Clarity of initial goal verbalization by Grade A dairy farmers, West Tennessee, 1970

Clarity of initial goal Verbalization	Number of farmers	Percent in each class
Clearly verbalized goals	44	25
Fairly clearly verbalized goals	75	42
Poorly verbalized goals	59	33
Total	178	100

Relationship Between Initial Goal Verbalization and Farm Size

Clarity of initial goal verbalization by farm operators was hypothesized to be positively related to present net worth. Farmers with clearly verbalized goals had the highest net worth while farmers with poorly verbalized goals had the lowest (Table 2). However, the differences in the average values were not significant at the .10 level.

Table 2. Average net worth of Grade A dairy farmers according to clarity of initial goal verbalization^a

Clarity of initial goal verbalization	Average net worth per farmer (Dollars)
Clearly verbalized goals	133,000
Fairly clearly verbalized goals	123,000
Poorly verbalized goals	107,000
All farmers	125,000

^aThe figures shown in the above table were based on 106 farmers. Seventy-two farmers were excluded from the analysis because of lack of data pertaining to capital investment and net worth.

Attitudes

Attitudes Toward the Use of Credit

In order to determine the attitudes of farmers toward credit, each farmer was asked a series of open-end questions concerning the use of farm credit in his operation. Some of the questions asked were: 1) What is your overall feeling toward farm credit? 2) Do you prefer to borrow from one or more than one source? and 3) How important do you think farm credit is as far as dairy farming is concerned?

Based on the responses of the farmers to the open-end questions, each farmer was subjectively classified by the enumerator into one of four groups on the basis of how strongly he favored using credit. As shown in Table 3, 53 percent of the farmers were classified as "strongly in favor" of using credit, 20 percent as "in favor" of using credit, 16 percent as "somewhat in favor" of using credit, and 11 percent as "not in favor" of using credit.

Most of the farmers who were classified as "strongly in favor" of credit were either young farmers who had used a considerable amount of credit to get started or established dairymen who had expanded their milking or feeding facilities. Nearly all of the above farmers indicated that credit was one of the most important sources of capital for dairy farmers.

Table 3. Attitudes of Grade A dairy farmers toward the use of credit

Attitude toward credit	Number of farmers	Percent
Strongly in favor of using credit	95	53
In favor of using credit	36	20
Somewhat in favor of using credit	28	16
Not in favor of using credit	19	11
Total	178	100

Farmers in the second category indicated that they would borrow under certain conditions. This group most often mentioned the following qualifications: 1) they were in favor of using credit, but the decision to borrow depended on the amount of debt they had and how profitable the "buy" was, and 2) the amount they would borrow depended upon the weather, crop, and price outlook.

Farmers in the third category were generally in favor of credit but were somewhat hesitant about going into debt. Many of these farmers used credit only for certain purposes. For example, some farmers would borrow for real estate or equipment purchases, but not for livestock purchases or operating expenses.

Farmers in the last category preferred not to borrow or use credit for farming purposes. The majority of farmers in the "not in favor" group operated smaller farms and few had expanded operations since starting in dairying. In most cases, farmers in this group used savings instead of credit to finance their operations.

Relationship Between Attitude Toward Credit and Farm Size

Farmers with a more favorable attitude toward credit were hypothesized to have higher net worth than farmers with a less favorable attitude toward credit. However, findings based on the data were somewhat different from the relationships hypothesized (Table 4). The group of farmers having the most positive attitude toward credit did not have the highest net worth. The average net worth of the group "strongly in favor" of using credit was higher than only one other group, the group "not in favor" of using credit. The group "in favor" of using

credit had, at the .10 level, a significantly higher net worth per farm than the group "not in favor" of using credit.

Table 4. Average net worth of Grade A dairy farmers according to attitude toward credit^a

Attitude toward credit	Average net worth per farmer (Dollars)
Strongly in favor of using credit	112,000
In favor of using credit	155,000
Somewhat in favor of using credit	122,000
Not in favor of using credit	107,000
All farmers	125,000

^aThe figures shown in the above table were based on 106 farmers. Seventy-two farmers were excluded from the analysis because of lack of data pertaining to capital investment and net worth.

Several factors may account for the above results. First, proper utilization of credit may have had more influence on the ability of the farm operator to acquire and accumulate capital in his operation than attitude toward using credit. Secondly, the "strongly in favor" group may have had an unusually high proportion of younger operators without time enough to accumulate a high capital investment or net worth. Finally, the technique used to classify the attitude of farmers toward credit may not have properly distinguished between different credit attitudes.

FARM SIZE AND FINANCIAL GROWTH MODELS

Two models were developed and estimated. These were designated as Models I and II. Model I was used to show the relationships between selected socio-economic variables and farm size. Model II was used to show the relationships between selected variables and capital accumulation. Equations were derived from the regression analysis and are shown with each respective model. The variables which were analyzed in the models are described below.

Variables in the Models

Dependent Variables

I. **Net worth** equaled present capital investment in the farm operation minus present farm debt. Net worth of the farm operator was measured in \$1,000 units.

II. **Change in net worth per year** equaled present net worth in farm assets minus initial net worth in farm assets divided by the number of years that the farm operator had been in Grade A dairying. Change in net worth was measured in \$1,000 units.

Independent Variables

Education was the actual number of years of formal education that the farm operator had attained.

Number of years Grade A dairying was the actual number of years that the farm operator had been engaged in Grade A dairy farming.

Average production per cow equaled the average yearly production of milk per cow in 1,000 pound units.

Initial net worth equaled initial capital investment minus initial farm debt. Initial net worth of the farm operator was measured in \$1,000 units.

Number of credit sources was the actual number of credit sources that the farm operator was using at the time of the survey.

Change in farm debt per year equaled present farm debt minus initial farm debt divided by the number of years engaged in Grade A dairying. Change in farm debt was measured in \$1,000 units.

Change in herd size per year equaled present herd size (the number of cows milked) minus initial herd size divided by the number of years engaged in Grade A dairying.

Change in farm size per year equaled present farm size (the number of acres owned) minus farm size at the time the farmer started dairying divided by the number of years engaged in Grade A dairying.

Goal index score¹ was a subjectively-scaled index score based on three goal categories: formulation of goals, ranking of specified goals, and clarity of initial goal verbalization. Minimum and maximum goal index scores which a farmer could receive ranged from 0 to 150, respectively.

Model Formulation

Five independent variables were hypothesized to be positively associated with net worth, the dependent variable in Model I. These variables were: educa-

¹The procedure used in constructing the goal index is in Appendix A and Appendix B, Appendix Tables 3 and 4.

tion, number of years engaged in Grade A dairying, average production per cow, initial net worth, and number of credit sources used.

Six independent variables were hypothesized to be positively associated with change in net worth per year, the dependent variable in Model II. These variables were: education, average production per cow, change in farm debt per year, change in herd size per year, change in farm size per year, and goal index score.

Results

Model I (Net Worth)

Model I was used to show the relationship between net worth and selected socioeconomic variables. The estimated regression equation for Model I was:²

$$Y_1 = -157.74 + 18.119X_1 + 1.405X_2 + 5.055X_3 + 10.133X_4 + 2.907X_5$$

(9.143) (0.321) (1.018) (3.636) (3.297)

$$R^2 = 0.301$$

$$Se = 77.732$$

where:

Y_1 = net worth

X_1 = number of credit sources

X_2 = initial net worth

X_3 = number of years engaged in Grade A dairying

X_4 = average production per cow

X_5 = education

The regression coefficients of all five variables had a positive sign. Number of years Grade A dairying, initial net worth, and average production per cow were significantly associated with net worth at the .05 level. Number of credit sources and education were not significant at the .05 level. The five independent variables in Model I explained about 30 percent of the variation in the dependent variable.

Based on Model I, increases in average production per cow were significantly associated with increases in net worth at the .05 level. An increase in average production per cow of 1,000 pounds was associated with an increase in net worth of about \$10,000.

Number of years engaged in Grade A dairying was an important variable associated with increased operator's net worth. Each additional year the farm operator was engaged in Grade A dairying was associated with an increase in his net worth of about \$5,000. Also, an increase of \$1,000 in initial net worth was associated with an increase of almost \$1,500 in present net worth of the operator.

²Standard errors of the regression coefficients are shown in parentheses below each coefficient. R^2 represents the total amount of variation in the dependent variable explained by the independent variables. Se equals the standard error of estimate of the estimating equation. The regression coefficients were tested for significance at the .05 level using a one-tailed test.

In Model I, number of credit sources failed to be significantly associated with net worth. Increasing the number of credit sources may be necessary to increase capital investment but does not guarantee an increase in net worth.

Model II (Growth in Net Worth)

Model II was used to show the relationship between change in net worth per year and selected socioeconomic variables. The equation derived from regression analysis was:

$$Y_2 = -3.764 + 0.499X_1 + 0.177X_2 + 0.220X_3 + 0.658X_4 + 0.013X_5 + 0.005X_6$$

(0.171) (0.228) (0.064) (0.158) (0.194)

(0.019)

$$R^2 = .354$$

$$Se = 4.718$$

where:

Y_2 = change in net worth per year

X_1 = education

X_2 = average production per cow

X_3 = change in farm size per year

X_4 = change in herd size per year

X_5 = change in farm debt per year

X_6 = goal index score

All independent variables in Model II had regression coefficients with a positive sign. Change in herd size, change in farm size, and level of education were significantly associated, at the .05 level, with change in net worth per year. Change in farm debt per year, average production per cow, and goal index score were not significantly associated with the dependent variable at the .05 level. The independent variables explained about 35 percent of the variation in change in net worth per year.

Based on Model II, a one unit increase in herd size per year was associated with an increase in net worth per year of \$658. An increase in net worth per year of nearly \$500 was associated with each additional year of formal education attained. Associated with each additional acre owned was an increase in net worth of \$220.

APPENDIX A

CONSTRUCTION OF GOAL INDEX

The goal index was based on three general goal categories covered by the questionnaire, Appendix B, Appendix Table 3. In the first goal category, each farmer was asked to state his initial financial goals when he began Grade A dairying. Later, each farmer stated his future financial goals. Each farmer was given points on the index scale if he had formulated initial and future financial goals. Future goals were given greater weight since they were considered the more reliable of the two responses.

In the second category, each farmer was given a list of 10 specified goals which appear in Appendix B, Appendix Table 2. Each respondent was then asked to check those goals which were most important to him in making farming decisions. The goals--"build net worth," "increase herd size," and "purchase additional land"--were given higher points since they reflect progressiveness and are a means of increasing net worth.

The enumerator, at the conclusion of each interview, made a subjective appraisal of the farmer's ability to verbalize his initial financial goals. The numerical values for each verbalization category were subjectively assigned. Values on each goal category may understate or overstate the comparative differences between the individuals.

The minimum and maximum number of possible points an individual could have received was 0 and 150, respectively. Goal index scores for the farmers ranged from a low of 26 to a high of 141. For the distribution of goal index scores and average index score, see Appendix B, Appendix Table 4.

APPENDIX B

Appendix Table 1. Ten financial goals listed most frequently by Grade A dairy farmers in response to open-end question

Financial goal	Percent of farmers listing each goal
Making a good or comfortable living	32
Increasing the level of milk production	30
Increase herd size	19
Having less debt or being out of debt	15
Making the highest possible income from the farm	10
Owning a farm and/or more land	9
Building net worth for later years	8
Providing children with college education	8
Obtaining more efficient buildings and/or equipment	6
Being a successful farmer	3

Appendix Table 2. Percentages of farmers ranking specified goals first on verbal rankings

Specified Goal	Percent of farmers ranking each goal first ^a
Purchase additional land	23
Increase size of herd	19
Increase gross farm income	10
Increase net farm income	10
Reduce debt	8
Own farm free of debt	7
Build net worth	6
Build or remodel dairy buildings	3
Become full owner of farm	2
Purchase farm equipment	1
Not responding	14

^aTotal percent exceeds 100 due to rounding

Appendix Table 3. Ratings for the Goal Index Score

Goal category	Points
I. Formulation of Financial Goals	
1. If farmer formulated initial goals	15
2. If farmer formulated future goals	20
Subtotal	35
II. Verbal Ranking of Specified Goals	
1. If build net worth was checked	30
2. If increase in herd size was checked	20
3. If purchase additional land was checked	15
4. All other goals checked (7 possible)	(each) 5
Subtotal	100
III. Clarity of Initial Goal Verbalization	
1. If goals were clearly verbalized	10
2. If goals were fairly clearly verbalized	5
3. If goals not clearly verbalized	0
Subtotal	15
Total	150

Appendix Table 4. Distribution of Goal Index scores for Grade A dairy farmers, West Tennessee, 1970

Goal Index Score	Number of farmers	Percent	Cumulative percent
21-30	1	0.9	0.9
31-40	1	0.9	1.8
41-50	8	7.5	9.3
51-60	8	7.5	16.8
61-70	11	10.4	27.2
71-80	6	5.7	32.9
81-90	12	11.3	44.2
91-100	23	21.7	65.9
101-110	10	9.5	75.4
111-120	11	10.4	85.8
121-130	7	6.6	92.4
131-140	6	5.7	98.1
141-150	2	1.9	100.0
Total ^a	106	100.0	

Average index score = 95.59

^aGoal index scores apply to only those farmers who had complete data pertaining to capital investment and net worth.

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