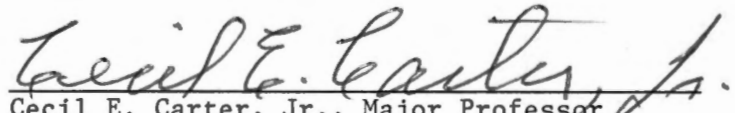
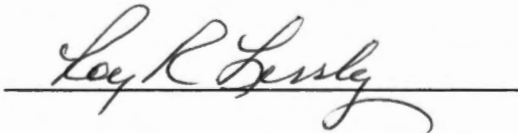


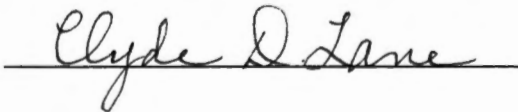
To the Graduate Council:

I am submitting herewith a thesis written by George M. Killgore entitled "Relationships Between Tennessee Cattle Producers Personal and Farm Operation Characteristics, Their Contacts With Extension Agents, Their Use of Management Practices and the Types of Cattle Handling Facilities Available and Year Constructed." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural Extension.


Cecil E. Carter, Jr., Major Professor

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RELATIONSHIPS BETWEEN TENNESSEE CATTLE PRODUCERS PERSONAL AND FARM
OPERATION CHARACTERISTICS, THEIR CONTACTS WITH EXTENSION
AGENTS, THEIR USE OF MANAGEMENT PRACTICES AND
THE TYPES OF CATTLE HANDLING FACILITIES
AVAILABLE AND YEAR CONSTRUCTED

A Thesis

Presented for the

Master of Science

Degree

The University of Tennessee, Knoxville

George M. Killgore

December 1988

AG-VET-MED.

THESIS

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DEDICATION

This thesis is dedicated to my father, Houston Travis Killgore, Sr., who passed away August 17, 1986 during the course of this study.
Thanks Dad.

ACKNOWLEDGMENTS

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ABSTRACT

The purpose of this study was to determine the personal and farm characteristics of Tennessee beef cattle producers, their management practices and their contacts with Extension as they relate to their cattle handling facilities available and the year they were constructed. Data were obtained through personal interviews with 1,813 beef cattle producers located in 85 counties in Tennessee. The 1985 Beef Cow-Calf Survey was used to collect data from producers who had a minimum of 25 cows of breeding age in their herd. Data were processed for computer analysis. Computations were made by the University of Tennessee computing center. The chi square statistical test was used to determine the strength or weakness of relationships between the dependent and independent variables. Chi square values which achieved the .05 probability level were accepted as significant.

Major findings included the following:

1. Over half of the producers surveyed were over 50 years of age, had beef cattle as their major source of income, were full-time farmers and had 41 or more breeding age cows.
2. Extension contacts made by producers ranged from a high of 74 percent receiving farm visits to a low of 57 percent attending beef meetings.
3. Of the management practices surveyed, a higher percentage of the beef producers were vaccinating for leptospirosis, blackleg, implanting calves, deworming cows, treating cattle for lice, and

marketing feeder calves at weekly auctions. A lower percentage were not pregnancy checking, vaccinating for brucellosis and IBR, BVD, and PI3 and breeding by artificial insemination.

4. A higher percent of the beef producers had all five types of cattle handling facilities and were constructed from 1976 to 1985.

5. The younger producers (under 50), those who had row crops as their major source of farm income, those who were full-time farmers and those who had larger herds (over 40 cows) and received one or more Extension contacts were more likely than others to have more types of cattle handling facilities available.

6. Producers who used all 11 management practices were more likely than others to have more types of cattle handling facilities available.

7. Producers who were younger (under 50), those with beef cattle as their major source of income, and those who were part-time farmers were more likely than others to have constructed their beef cattle facilities between 1976 and 1985. The year cattle handling facilities were constructed was not significantly related to farm operation characteristics. Producers who received one or more Extension contacts were more likely than others to have constructed facilities between 1976 and 1985.

8. Producers who pregnancy checked, vaccinated cows and/or heifers for leptospirosis, blackleg, and brucellosis, vaccinated cows for IBR, BVD and PI3, implanted calves and dewormed cows were more likely than others to have constructed cattle handling facilities between 1976 and 1985.

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CHAPTER I

THE PROBLEM AND ITS SETTING

I. INTRODUCTION

A very important part of Tennessee's agriculture is the production of beef cattle. As of January 1, 1987, all cattle and calves in Tennessee totaled 2,400,000 head, this is a decline of 4 percent from 1986 and a 5 percent decline from 1985. Tennessee ranks fourteenth nationwide in terms of beef cattle numbers (16).*

In 1986, Tennessee's calf crop totaled a little over 1 million calves (1,140,000). Average dollar value per head for all cattle and calves was estimated at \$335. The total gross income of sale of all cattle and calves was \$444,054,000 (16).

Tennessee has more than enough pasture acreage to offer great opportunities for beef cattle production. There are more acres in pasture than all other crops combined. Because of the 4,794,715 acres of pasture land, Tennessee is considered an ideal state for beef cattle production (16).

The Agricultural Extension Service has played a major role in the success of Tennessee agriculture, including beef cattle. Since the provision of the Smith Lever Act, the Extension Service has stressed the improvement of beef cattle management practices in order for the producer to achieve a greater return for his investment.

*Numbers in parenthesis refer to alphabetically numbered references in the Bibliography.

Tennessee beef cattle producers are primarily involved in a cow-calf operation. Calves are sold shortly after weaning or are back-grounded and then shipped to large feed lots in the west and midwest where they are fed to slaughter weights.

Increasing farm income from their cattle enterprise is the goal of every beef cattle producer. The Agriculture Extension Service is charged with the goal of improving the efficiency of beef production in Tennessee.

This study was concerned with the characteristics of Tennessee beef producers, their personal and farm operation characteristics, management practices and Extension contacts as they relate to beef cattle handling facilities available and the year of their construction.

II. NEED FOR THE STUDY

One of the main goals of the Agricultural Extension Service is to diffuse useful and practical information to the beef producers in the state of Tennessee. Extension agents work continuously to encourage the American people to apply the full amount of resources they have available to them. The aim of this study was an effort to look at selected aspects of the beef industry in Tennessee in order to provide a basis for improved Extension educational programs in beef production.

The 1985 Tennessee Cow-Calf Producer interview schedule was used to collect data for this study. It has been found that the types of beef cattle handling facilities are very important to the efficient operation of cow-calf operations. At present, no study has been conducted to determine the benefits of these facilities.

It was felt that a study was needed to determine the characteristics of Tennessee beef cattle producers, their personal and farm operation characteristics, management practices, and Extension contacts as they relate to beef cattle handling facilities available and the year of their construction.

III. PURPOSE OF THE STUDY

The main purpose of this study was to determine the personal and farm characteristics of Tennessee beef cattle producers, their management practices and their contacts with Extension as they relate to the beef cattle handling facilities available and the year they were constructed.

The specific objectives were:

1. To characterize Tennessee beef cattle producers, their farm operation and Extension contacts.
2. To determine the use of management practices by Tennessee beef producers.
3. To describe the types of beef cattle handling facilities being utilized by Tennessee beef cattle producers.
4. To determine relationships between Tennessee beef producers selected personal and farm operation characteristics and Extension contacts and types of cattle handling facilities available.
5. To determine relationships between Tennessee beef cattle producers types of beef cattle handling facilities available and their use of management practices.

6. To determine relationships between selected personal and farm operation characteristics and Extension contacts and the year Tennessee beef cattle producers constructed cattle handling facilities.

7. To determine relationships between the year cattle handling facilities were constructed by Tennessee beef producers and their use of management practices.

IV. LIMITATIONS OF THE STUDY

This study was limited to the analysis of the data available from the 1985 Tennessee Beef Cow-Calf Producer Survey. The data were obtained by Extension agents through personal interviews and the survey was limited to beef producers having herds of 25 or more breeding age cows. The number of interviews varied from county to county, depending on the number of beef producers in the county. Eighty-five of Tennessee's 95 counties were surveyed and 1,813 producers.

V. METHODS AND PROCEDURES

Population

The population of this study was 1,813 beef cow-calf producers in 85 selected Tennessee counties who had 25 or more breeding age cows in 1985.

Selection of Sample

To identify the producers to be included in the study Extension agents used an updated mailing list of beef cow-calf producers. The "nth" number technique was used to determine which producers to be surveyed. Alternate producers were selected to replace those who could not be interviewed.

Development of Survey

The 1985 Tennessee Beef Cow-Calf Survey was developed by the University of Tennessee Agricultural Extension Service specialist staff in the Animal Science department and the Extension Education department.

Conducting the Survey

The surveys were conducted by Extension agents in 85 counties in 1985 through personal interviews. The surveys were completed by the Extension agent on the farm of the producers or at the county Extension office.

Methods of Analysis

Following the completion of the surveys by the agents, the data were coded and processed for computer analysis. Computations were made by the University of Tennessee Computing Center.

The chi square test was used to determine the strength of the relationships between dependent and independent variables. The .05 probability level was the point at which a relationship was considered significant.

VI. DEFINITIONS OF TERMS

The following terms are defined to help give the reader a better understanding of the terms used in this study.

1. Cow-Calf Producer. A beef producer who sells feeder calves or yearlings from a herd of brood cows. Producing calves is the main goal of a cow-calf producer.

2. Extension Contact. Refers to the number of Extension beef meetings attended by a beef producer, the number of office visits made to the Extension office by a beef producer regarding beef cattle, the number of telephone calls made to the Extension office by a beef producer regarding beef cattle, and the total number of farm visits received by a beef producer regarding beef cattle by an Extension agent.

3. Farming Status. Refers to the cow-calf producer as a full-time, or part-time beef cattle producer.

4. Cattle Handling Facilities. Refers to the equipment available for working cattle which includes: Type one, headgate; Type 2, headgate and holding chute; Type three, headgate, holding chute and working chute; Type four, headgate, holding chute, working chute and crowding pen; and Type five, headgate, holding chute, working chute, crowding pens and holding pens.

5. Management Practice. A commonly accepted procedure that is research verified which, if carried out correctly and on a timely basis, can increase a desired outcome or return.

CHAPTER II

REVIEW OF RELATED STUDIES

There is a considerable amount of literature available on beef production. Due to the fact that most of the information on beef production focuses on technical subject matter, therefore, it is not directly related to this study.

However, in the past two decades there have been several studies related to characteristics of beef producers and their management techniques. From these studies selected findings will be reported in this review. In this chapter, studies cited are reported under the following headings: (1) Tennessee beef cattle producers, their personal and farm operation characteristics, (2) Tennessee beef cattle producers use of management techniques, and (3) Tennessee beef cattle producers use of Extension contacts.

I. TENNESSEE BEEF CATTLE PRODUCERS, THEIR PERSONAL AND FARM OPERATION CHARACTERISTICS

Considerable information is available relative to Tennessee beef cattle producers, their personal and farm operations characteristics. Both county and statewide studies are reviewed in this section.

Beeler (2) in a 1986 study involving 1,799 beef producers in a statewide survey found the number of full-time beef operators was 885 (51 percent) compared to 705 (40.6 percent) part-time beef operators and 146 (8.4 percent) retired beef operators. Fifty-three percent

had herd sizes in the 25 to 49 range and 42 percent used only 1 bull.

Lumpkin (10) in a 1985 study involving 1,047 beef producers discovered that 54 percent of the Tennessee beef producers surveyed were full-time farmers and 46 percent were part-time. Fifty two percent used 2 or more bulls and they weaned an average of 32 calves each.

Rutter (15) surveyed 1,047 beef producers in a statewide survey and discovered that 53 percent of the beef producers surveyed were full-time farmers, they had an average of 48.4 breeding cows in the herd, weaned an average of 43.7 calves and on the average used 2.1 bulls.

In a 1979 study Lovely (8) surveyed 52 beef producers in Campbell County to secure data concerning producer farming status and found that 58 percent were full-time farmers, they had an average of 20 cows, and on the average weaned 18 calves.

In a 1972 study Brewer (3) surveyed 40 beef producers in Marshall County and found that 58 percent were full-time farmers, on the average they weaned 32 calves, had an average of 35 cows in the herd, and on the average used 2 bulls per herd.

In 1971 Barnes (1) conducted a study of 38 beef producers in Claiborne County and reported that 60 percent were full-time farmers, they averaged 25 cows, weaned 21 calves, and they used only 1 bull.

Matthews (11) in a 1968 study of 75 Lawrence County beef producers reported that 27 percent of the producers were full-time farmers and they had an average of 18 cows.

Luck (9) in a 1968 study of Macon County beef producers reported that 65 percent of the producers were full-time farmers and they had an average of 20 cows.

Keyes (7) in a 1966 study of Campbell County beef producers reported that 67 percent of the beef producers were full-time farmers, they had an average of 29 cows, and weaned an average of 20 calves.

II. TENNESSEE BEEF CATTLE PRODUCERS USE OF MANAGEMENT PRACTICES

Rutter (15) found in a 1982 survey study the following information regarding the use of management practices by Tennessee beef producers: 10 percent pregnancy checked their cows; 13 percent used growth stimulating implants; and 85 percent dewormed cows once a year.

Mohamad (12) found that management practices which were weak (less than 60 percent) or needed improvement included: use of growth stimulants; pregnancy checking cows; and vaccinating for leptospirosis and other diseases.

Lumpkin (10) reported in a statewide study that only 11 percent pregnancy checked their cows, 13 percent used growth stimulants, and 85 percent dewormed their cows at least one time during the year.

Beeler (2) in a 1986 statewide survey reported 33 percent of the beef producers were implanting calves and pregnancy checking cows.

Headrick (5) found that 61 percent dewormed their cows, 15 percent pregnancy checked and 29 percent were using growth stimulants.

Ivy (6) in a 1987 study found that producers who had larger herds (over 40 cows), those who had cattle handling facilities, those who had row crop as their major source of farm income, those who were younger (under 50) and those who did have contacts with Extension agents during the previous 12 months were more likely than others to use artificial insemination.

III. TENNESSEE BEEF CATTLE PRODUCERS USE OF EXTENSION CONTACTS

Beeler's (2) study in 1986 revealed 166 of the 1,799 beef producers reported no Extension contacts. There were 1,633 (91 percent) of the beef producers who reported having one or more Extension contacts.

Mohamad's (12) 1979 study reported that beef producers averaged 19 total Extension contacts consisting of six telephone calls to Extension office, four Extension general meetings attended, four farm visits by the Extension agent, and one beef Extension meeting attended the previous year.

Rutter (15) in 1982 determined that there was a significant relationship between the total number of Extension contacts beef producers had and their use of 13 recommended practices. In each case, producers who used the practices had made significantly more total contacts with Extension agents during the previous 12 months.

Headrick (5) reported in a 1983 study that 52 percent of the beef producers surveyed reported attending one or more Extension

meetings during the last 12 months. The average number of meetings attended by all producers was seven. The average number of telephone calls to Extension office was four. Twenty percent of the producers received no visits from Extension agents during the previous 12 months and the average number of visits was five.

CHAPTER III

TENNESSEE BEEF CATTLE PRODUCERS PERSONAL AND FARM CHARACTERISTICS, USE OF MANAGEMENT PRACTICES AND NUMBER OF EXTENSION CONTACTS IN RELATIONSHIP WITH TYPES OF CATTLE HANDLING FACILITIES ON THEIR FARMS

The purposes of this chapter are to characterize beef cattle producers and to determine relationships between types of cattle handling facilities available, their use of management practices, selected personal and farm operation characteristics and Extension contacts.

The findings presented in this chapter are organized into three sections. Section I includes characteristics of beef cattle producers in Tennessee. Section II consists of information pertaining to relationships between Tennessee beef producers types of cattle handling facilities, selected personal and farm operation characteristics and Extension contacts. Section III consists of information pertaining to relationships between Tennessee beef producers types of cattle handling facilities and the use of management practices.

I. CHARACTERISTICS OF BEEF CATTLE PRODUCERS IN TENNESSEE

Table I presents findings regarding the characteristics of beef cattle producers in Tennessee. This section was organized into five subsections: (1) personal characteristics, (2) farm operation characteristics, (3) management practices, (4) Extension contacts, and (5) cattle handling facilities. The number and percent

Table I. Characteristics of Beef Cattle Producers in Tennessee

Selected Characteristics	Number of Producers	Percent of Producers
PERSONAL CHARACTERISTICS		
Age of Beef Producer		
Under 50	754	41.6
50-over	1,059	58.4
TOTAL	1,813	100.0
Mean = 51.4; Median = 52.0; Mode = 60.0; Valid Cases = 1,813		
Major Source of Farm Income		
Beef cattle	917	51.7
Row crop	858	48.3
No response	38	Missing
TOTAL	1,813	100.0
Valid Cases = 1,775		
Farming Status		
Full-time	1,030	57.9
Part-time	750	42.1
No response	33	Missing
TOTAL	1,813	100.0
Valid Cases = 1,780		
FARM OPERATIONS CHARACTERISTIC		
Number of Cows/Heifers Exposed to Bulls		
40-less	891	49.3
41-over	916	50.7
No response	6	Missing
TOTAL	1,813	100.0
Mean = 55.0; Median = 41.0; Mode = 25.0; Valid Cases = 1,807		
Number of Calves Lost at Birth		
1	338	18.7
2	391	21.6
3 to 5	500	27.6
6-over	192	10.6
Not any	390	21.5
No response	2	Missing
TOTAL	1,813	100.0
Mean = 2.75 Median = 2.00; Mode = 2.00; Valid Cases = 1,811		
Number of Calves Weaned		
10-29	625	35.0
30-59	744	41.6
60-over	412	23.1
Not any	6	0.3
No response	26	Missing
TOTAL	1,813	100.0
Mean = 48.7 Median = 37.0; Mode = 25.0; Valid Cases = 1,787		
Number of Bulls Used		
1	752	41.5
2	603	33.3
3	222	12.2
4-over	232	12.8
Not any	4	0.2
TOTAL	1,813	100.0
Mean = 2.06; Median = 2.00; Mode = 1.00; Valid Cases = 1,813		
Number of Feeder Calves Sold at Weaning		
25-less	667	46.9
26-49	498	35.0
50-over	256	18.1
None sold	392	Missing
TOTAL	1,813	100.0
Mean = 34.7; Median = 27.0; Mode = 20.0; Valid Cases = 1,781		
Average Weight of Calves Sold at Weaning		
400-under	124	8.7
401-450	350	24.6
451-499	293	20.7
500-over	654	46.0
Not any	392	Missing
TOTAL	1,813	100.0
Mean = 489.51; Median = 485.00; Mode = 500.00; Valid Cases = 1,421		

Table I (Continued)

Selected Characteristics	Number of Producers	Percent of Producers
Number of Calves Sold Last Spring		
1 to 24	417	65.1
25 to 49	140	21.8
50 to 400	84	13.1
Not any	1,167	Missing
No response	5	Missing
TOTAL	1,813	100.0
Mean = 27.53; Median = 17.00; Mode = 10.00; Valid Cases = 641		
Number of Calves Sold Last Summer or Fall		
1 to 24	202	64.1
25 to 49	66	21.0
50 to 400	47	14.9
Not any	1,494	Missing
No response	4	Missing
TOTAL	1,813	100.0
Mean = 27.68; Median = 18.00; Mode = 20.00; Valid Cases = 315		
Number of Finished Cattle Sold		
No	1,587	87.5
Yes	226	12.5
TOTAL	1,813	100.0
Mean = 956; Median = 1.00; Mode = .00; Valid Cases = 1,808		
MANAGEMENT PRACTICES		
Cows/Heifers Pregnancy Checked		
Not checked	1,414	78.1
Checked	397	21.9
No response	2	Missing
TOTAL	1,813	100.0
Valid Cases = 1,811		
Cows/Heifers Vaccinated for Leptospirosis		
No	788	43.6
Yes	1,018	56.4
No response	7	Missing
TOTAL	1,813	100.0
Valid Cases = 1,806		
Cows Vaccinated for Blackleg		
No	206	11.4
Yes	1,603	88.6
No response	4	Missing
TOTAL	1,813	100.0
Valid Cases = 1,809		
Replacement Heifers Vaccinated for Brucellosis		
No	1,127	65.9
Yes	582	34.1
No response	104	Missing
TOTAL	1,813	100.0
Valid Cases = 1,709		
Calves Implanted		
No	845	46.6
Yes	968	53.4
TOTAL	1,813	100.0
Mean = 1.40; Median = 1.00; Mode = 1.00; Valid Cases = 1,813		
Cows Dewormed		
Not dewormed	326	18.0
Dewormed	1,483	82.0
No response	4	Missing
TOTAL	1,813	100.0
Valid Cases = 1,809		
Cows Treated for Lice		
Untreated	584	32.4
Treated	1,221	67.6
No response	8	Missing
TOTAL	1,813	100.0
Valid Cases = 1,805		

Table 1 (Continued)

Selected Characteristics	Number of Producers	Percent of Producers
Cows/Heifers Bred by Artificial Insemination		
No	1,599	88.2
Yes	214	11.8
TOTAL	1,813	100.0
Mean = 28.3; Median = 10.0; Mode = 5.00; Valid Cases = 1,813		
Cows Vaccinated for IBR, BVD, and PI3		
No	1,089	60.2
Yes	721	39.8
No response	3	Missing
TOTAL	1,813	100.0
Valid Cases = 1,810		
Calves Vaccinated for IBR, BVD and PI3		
No	1,001	55.5
Yes	801	44.5
No response	11	Missing
TOTAL	1,813	100.0
Valid Cases = 1,802		
Method Used to Market Feeder Calves		
Weekly auction	836	48.2
Feeder calf sale	598	34.5
Trader	144	8.3
Direct-feeder	157	9.0
No response	78	Missing
TOTAL	1,813	100.0
Valid Cases = 1,735		
EXTENSION CONTACTS		
Number of Extension Beef Meetings Attended		
Not any	771	42.5
1	616	34.0
2	260	14.3
3-over	166	9.2
TOTAL	1,813	100.0
Mean = .956; Median = 1.00; Mode = .000; Valid Cases = 1,808		
Number of Visits to Extension Office		
Not any	659	36.3
1-2	709	39.2
3-over	445	24.5
TOTAL	1,813	100.0
Mean = 1.78; Median = 1.00; Mode = .000; Valid Cases = 1,811		
Number of Telephone Calls to Extension Office		
Not any	502	27.7
1-2	628	34.6
3-over	683	37.7
TOTAL	1,813	100.0
Mean = 2.59; Median = 2.00; Mode = .000; Valid Cases = 1,809		
Number Farm Visits Received by Extension Agent		
Not any	474	26.1
1-2	793	43.7
3-over	546	30.2
TOTAL	1,813	100.0
Mean = 2.14; Median = 1.00; Mode = .000; Valid Cases = 1,808		
CATTLE HANDLING FACILITIES		
Cattle Handling Facilities Available		
None	159	8.8
Headgate	172	9.5
Headgate-holding chute	410	22.6
Headgate-holding chute-working chute	301	16.6
Headgate-holding chute-working chute-crowding pen	241	13.3
Headgate-holding chute-working chute-crowding pen-holding pen	530	29.2
TOTAL	1,813	100.0
Valid Cases = 1,813		
Year Handling Facilities Constructed		
Before 1976	467	30.6
1976-1980	524	34.3
1981-1985	537	35.1
No response	285	Missing
TOTAL	1,813	100.0
Valid Cases = 1,528		

of producers are given for each variable. The mean is given where appropriate.

Producer Characteristics

Selected producer characteristics found in Table I include age, major source of farm income and farm status.

Age of producer. Forty-two percent of the producers were under 50 years of age, whereas 58 percent were over 50 years. The mean age of all beef producers was 51.

Major source of farm income. Fifty-two percent of the producers surveyed reported beef cattle as their major source of farm income, while 48 percent reported row crops as their major source of farm income.

Farming status. Fifty-eight percent of the producers were full-time farmers, whereas 42 percent were part-time farmers.

Farm Operations Characteristics

The variables included in this subsection are: (1) number of cows and heifers exposed to bulls, (2) number of calves lost at birth, (3) number of calves weaned, (4) number of bulls used, (5) number of feeder calves sold at weaning, (6) average weight of calves sold at weaning, (7) number of calves sold last spring, (8) number of calves sold last summer or fall, and (9) number of finished cattle sold.

Number of cows and heifers exposed to bulls. Slightly over 49 percent of the producers had 40 or less breeding age cows and heifers on their farm while 51 percent had 41 or more. The mean was 55.

Number of calves lost at birth. Nineteen percent of the producers reported losing only 1 calf at birth, 22 percent lost 2, 28 percent lost 3 to 5, 11 percent lost 6 and over, while over 21 percent did not lose any. The mean was 3.

Number of calves weaned. Thirty-five percent of the producers reported weaning 10 to 29 calves, 42 percent weaned 30 to 50, 23 percent weaned over 60 and 0.3 percent did not wean any. The mean number was 49.

Number of bulls used. Forty-two percent of the producers reported using 1 bull, 33 percent used 2, 12 percent used 3, 13 percent used over 4 bulls and 0.2 percent did not use any bulls. The mean number was 2.

Number of feeder calves sold at weaning. Forty-seven percent of the producers reported selling 25 or less calves at weaning, 35 percent sold 26 to 49, and 18 percent sold over 50. The median number of calves sold at weaning was 27.

Average weight of calves sold at weaning. Only 8.7 percent of the producers reported weaning weights of 400 pounds and under, as compared to 46 percent with weaning weights of 500 pounds and over. Twenty-five percent reported weaning weights of 401 to 450 pounds and 21 percent reported weaning weights of 451 to 499 pounds. The median weight of calves sold at weaning was 485.

Number of calves sold last spring. The majority (65 percent) of the producers who sold calves last spring reported selling 1 to 24 calves, 22 selling 25 to 49, and 13 percent selling 50 to 400. The mean number of calves sold last spring was 17.

Number of calves sold last summer or fall. Over one-half (64 percent) of the producers who sold calves last summer or fall reported selling 1 to 24 calves, 21 percent sold 25 to 49, and 15 percent sold 50 to 400. The mean number of calves sold last summer or fall was 18.

Number of finished cattle sold. Over 87 percent of the producers reported did not sell any finished cattle. Twelve percent reported selling finished cattle. The mean was 956.

Management Practices

The variables included in this subsection are: (1) cows and heifers pregnancy checked, (2) cows and heifers vaccinated for leptospirosis, (3) calves vaccinated for blackleg, (4) replacement heifers vaccinated for brucellosis, (5) calves implanted, (6) cows dewormed, (7) cattle treated for lice, (8) cows and heifers bred by artificial insemination, (9) cows vaccinated for IBR, BVD, and PI3, (10) calves vaccinated for IBR, BVD, and PI3, and (11) method used to market feeder calves.

Cows and heifers pregnancy checked. Over three-fourths (78.1 percent) of the producers reported not pregnancy checking, while almost 22 percent did pregnancy check.

Cows and heifers vaccinated for leptospirosis. Forty-four percent of the producers reported did not vaccinate their cows and heifers for leptospirosis, while 56 percent reported vaccinating for leptospirosis.

Calves vaccinated for blackleg. Slightly over 11 percent of the producers reported not vaccinating their calves for blackleg. Over 89 percent reported vaccinating for blackleg.

Replacement heifers vaccinated for brucellosis. Almost 66 percent of the producers reported not vaccinating their replacement heifers for brucellosis, while 34 percent reported vaccinating for brucellosis.

Calves implanted. Nearly 47 percent of the producers reported not implanting their calves. Over 53 percent reported implanting.

Cows dewormed. Only 18 percent of the producers reported did not deworm their cows, while 82 percent reported deworming.

Cattle treated for lice. Slightly over 32 percent of the producers reported not treating their cattle for lice; whereas, almost 68 percent did treat their cattle for lice.

Cows and heifers bred by artificial insemination. A majority (88.2 percent) of the producers reported not breeding cows and heifers by artificial insemination, while almost 12 percent did breed by artificial insemination. The mean was 28.

Cows vaccinated for IBR, BVD, and PI3. Over 60 percent of the producers reported not vaccinating cows for IBR, BVD, and PI3, while almost 40 percent reported vaccinating cows.

Calves vaccinated for IBR, BVD, and PI3. Nearly 56 percent of the producers reported did not vaccinate their calves for IBR, BVD, and PI3. Forty-four percent of the producers reported did vaccinate their calves.

Method used to market feeder calves. Almost half (48.2 percent) of the producers reported marketed their calves through weekly auction, 35 percent marketed through feeder calf sales, 8 percent marketed through a trader, and 9 percent marketed directly to a feeder.

Extension Contacts

The variables included in this subsection are: (1) number of Extension beef meetings attended, (2) number of visits to Extension office, (3) number of telephone calls to Extension office, and (4) number of farm visits received by Extension agents during the past year.

Number of Extension meetings attended. Seven hundred and seventy-one (42.5 percent) of the producers reported that they did not attend any meetings. Thirty-four percent attended 1, 14 percent attended 2, and 9 percent attended 3 and over. The mean number of meetings attended was 1.

Number of visits to Extension office. Six hundred and fifty-nine (36.3 percent) of the producers reported not visiting the Extension office. Seven hundred and nine (39 percent) reported 1 or 2 times, and 25 percent reported 3 or more visits. The mean number of visits was 2.

Number of telephone calls to Extension office. Five hundred and two (27.7 percent) of the producers reported no calls to Extension office, while 35 percent reported 1 to 2 calls and 38 percent had made 3 or more calls. The mean number of calls made during the last year was 3.

Number of farm visits received by Extension agents. Four hundred and seventy-four (26.1 percent) of the producers did not receive any farm visits by Extension agents during the past year. Seven hundred and ninety-three (43.7 percent) reported 1 to 2 visits and 546 (30.2 percent) had received 3 or more visits during the past year. The mean number of visits was 2.

Cattle Handling Facilities

The variables included in this subsection are: (1) cattle handling facilities available, and (2) year cattle handling facilities constructed.

Cattle handling facilities available. Only 9 percent of the producers reported not having any cattle handling facilities available, 10 percent had a headgate only, 23 percent had a headgate and holding chute, 17 percent had a headgate, holding chute and a working chute, 13 percent had a headgate, holding chute, working chute and a crowding pens, and 29 percent had a headgate, holding chute, working chute, crowding pens and holding pens.

Year cattle handling facilities constructed. Over 31 percent of producers responding reported constructing their cattle handling facilities before 1976, 34 percent from 1976 to 1980, and 35 percent from 1981 to 1985.

Table Summary

Fifty-eight percent of the beef producers were over 50 years of age, with 52 percent reporting beef cattle as their major source of income. Of the beef producers surveyed, 58 percent were full-time farmers.

Fifty-one percent of the beef producers had 41 or more breeding age cows exposed to bulls. Sixty-eight percent of the producers surveyed lost from 1 to 5 calves at birth. Seventy-seven percent weaned from 10 to 59 calves and 75 percent used from 1 to 2 bulls. Seventy-seven percent of the producers surveyed sold from 1 to 49 calves at birth, with an average weight of 490 pounds. Eighty-seven percent of producers sold from 1 to 49 calves last spring and 85 percent last summer or fall. The majority (88 percent) of the beef producers did not sell any finished cattle.

Nearly 58 percent of the producers surveyed attended 1 or more Extension beef meetings and nearly 64 percent made 1 or more Extension office visits. Over 72 percent of the producers made 1 or more telephone calls to the Extension office and almost 74 percent received 1 or more farm visits from the Extension agent.

Five of the 11 management practices studied were not used by the majority of the producers. These were: (1) cows and heifers pregnancy checked, (2) replacement heifers vaccinated for brucellosis, (3) cows and heifers bred by artificial insemination, (4) cows vaccinated for

IBR, BVD and PI3, and (5) calves vaccinated for IBR, BVD and PI3.

Forty-eight percent of the beef producers surveyed marketed their feeder calves at weekly auctions.

Ninety-one percent of the beef producers surveyed had some type of cattle handling facilities available and almost 70 percent built their facilities between 1976-1985.

II. RELATIONSHIPS BETWEEN TENNESSEE BEEF PRODUCERS SELECTED
PERSONAL AND FARM OPERATION CHARACTERISTICS,
EXTENSION CONTACTS AND THE TYPES OF
CATTLE HANDLING FACILITIES ON
THEIR FARMS

Table II presents findings regarding the relationships between beef producers selected personal and farm operation characteristics, Extension contacts and types of cattle handling facilities on their farms. The three subsections included: (1) personal characteristics, (2) farm operation characteristics, and (3) Extension contacts. The chi square test was used to determine strength of the relationships between the independent and dependent variables. The 0.05 probability level was used to determine significant relationships.

Personal Characteristics

Selected producer characteristics found in Table II include age, major source of farm income, and farm status.

Age of producer. Almost 34 percent of the beef cattle producers who were under 50 years of age had type five beef cattle handling

Table II (Continued)

Selected Characteristic	Types of Cattle Handling Facilities Available*									
	0		1		2		3		4	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
	Response		Response		Response		Response		Response	
Finished Cattle Sold										
No	150	9.5	158	10.0	382	24.1	262	16.5	208	13.1
Yes	9	4.0	14	6.2	28	12.4	39	17.3	33	14.6
Statistical Test $\chi^2 = 45.6$; $df = 5$; $p = 0.01$										
EXTENSION CONTACTS										
Number of Extension Beef Meetings Attended										
None	103	13.4	87	11.3	212	27.5	117	15.2	84	10.9
1	42	6.8	63	10.2	133	21.6	116	18.8	92	14.9
2	10	3.8	18	6.9	43	16.5	42	16.2	36	13.8
3-over	4	2.4	4	2.4	22	13.3	26	15.7	29	12.0
Statistical Test $\chi^2 = 131.4$; $df = 15$; $p = 0.01$										
Number of Visits to Extension Office										
None	89	13.5	83	12.6	163	24.7	96	14.6	81	12.3
1-2	50	7.1	64	9.0	158	22.3	132	18.6	90	12.7
3-over	20	4.5	25	5.6	89	20.0	73	16.4	70	15.7
Statistical Test $\chi^2 = 73.3$; $df = 10$; $p = 0.01$										
Number Telephone Calls to Extension Office										
None	66	13.1	60	12.0	130	25.9	76	15.1	52	10.4
1-2	60	9.6	71	11.3	153	24.4	102	16.2	83	13.2
3-over	33	4.8	41	6.0	127	18.6	123	18.0	106	15.5
Statistical Test $\chi^2 = 76.2$; $df = 10$; $p = 0.01$										
Number Farm Visits Received by Extension Agents										
None	73	15.4	69	14.6	133	28.1	67	14.1	52	11.0
1-2	65	8.2	79	10.0	176	22.2	148	18.7	114	14.4
3-over	21	3.8	24	4.4	101	18.5	86	15.8	75	13.7
Statistical Test $\chi^2 = 150.2$; $df = 10$; $p = 0.01$										

*0 = none, Type 1 = headgate, Type 2 = headgate and holding chute, Type 3 = headgate, holding chute and working chute, Type 4 = headgate, holding chute, working chute and crowding pens, Type 5 = headgate, holding chute, working chute, crowding pen and holding pen.

facilities, compared to 26 percent of those over 50. In contrast, a very low percentage (7.3 percent) of the beef cattle producers under 50 reported having no facilities available. Almost 10 percent of the over 50 beef cattle producers reported having no facilities available. The chi square (x^2) test indicated that the age of beef producers and the types of cattle handling facilities available were significantly (0.01) related. Beef producers under 50 were more likely to have type five cattle handling facilities than the beef producers over 50.

Major source of farm income. Twenty-eight percent of the beef producers who reported that their major source of farm income was beef cattle had type five cattle handling facilities as compared to 31 percent of the row crop producers who reported row crops as their major source of income. In contrast, 7 percent of the beef producers who reported beef cattle as their major source of income had no beef cattle handling facilities available as compared to 10 percent of the row crop producers. The chi square (x^2) test indicated that the major source of farm income and the types of cattle handling facilities available were significantly (0.03) related. Beef producers who reported row crops as their major source of farm income were more likely to have a type five cattle handling facilities available than beef producers who had beef cattle as their major source of farm income.

Farming status. Almost 33 percent of the producers who reported being a full-time beef producer had type five cattle handling

facilities available as compared to 26 percent of the part-time beef producers. In contrast, 9 percent of the full-time beef producers reported having no facilities while almost 9 percent of the part-time beef producers reported having no cattle handling facilities available. The chi square (x^2) test indicated that the farming status and the types of cattle handling facilities available were significantly (0.03) related. Beef producers who were full-time farmers were likely to have a type five cattle handling facilities available than part-time farmers.

Farm Operation Characteristics

This subsection presents findings regarding 10 farm operation characteristics of producers.

Number of cows and heifers exposed to bulls. Twenty percent of the beef producers who had 40 or less cows and heifers had type five cattle handling facilities available, while a larger percentage (38 percent) of the beef producers with 41 or more cows and heifers had type five cattle handling facilities available. However, a very low percentage (3.3 percent) of the beef producers with 41 or more cows and heifers reported having no facilities, while almost 15 percent of the beef producers with 40 or less cows and heifers reported having no facilities available. The chi square (x^2) test indicated that the number of cows and heifers exposed to bulls and the types of cattle handling facilities available were significantly (0.01) related. Beef producers with 41 or more cows and heifers were more likely to

have type five cattle handling facilities available than beef producers with 40 or less.

Year cattle handling facilities constructed. Almost 40 percent of the beef producers who constructed their cattle handling facilities from 1981-1985 had type five cattle handling facilities available, compared to 31 percent from 1976-1980 and 32 percent before 1976. In contrast, almost 9 percent of the beef producers who constructed their facilities before 1976 had only type 1 (headgate) facility available as compared to 5 percent from 1981-1985. The chi square (χ^2) test indicated that the year handling facilities were constructed and the types of cattle handling facilities available were significantly (0.04) related. Beef producers who constructed their handling facilities since 1981 were more likely to have type five cattle handling facilities than those producers who constructed their facilities prior to 1981.

Number of calves lost at birth. Over half (50.5 percent) of the beef producers who lost 6 or more calves at birth had type five cattle handling facilities available, compared to 23 percent of the producers who reported not losing any calves. In contrast, 16 percent of the beef producers who reported not losing any calves had no facilities, while only 3.1 percent reported losing 6 or more calves. The chi square (χ^2) test indicated that the number of calves lost at birth and the types of cattle handling facilities available were significantly (0.01) related. Beef producers who lost 6 or more calves

at birth were more likely to have type five cattle handling facilities than those producers who lost fewer calves.

Number of calves weaned. Almost 48 percent of the beef producers who weaned 60 or more calves had all five types of cattle handling facilities available, compared to 19 percent who weaned 10 to 29 calves. In contrast, only 2 percent of the producers who weaned 60 or more calves had no facilities available, while over 16 percent of those who reported weaning 10 to 29 calves had no facilities available. The chi square (x^2) test indicated that the number of calves weaned and the types of cattle handling facilities available were significantly (0.01) related. Beef producers who weaned 60 or more calves were more likely to have type five cattle handling facilities available than those producers who weaned fewer calves.

Number of bulls used. Almost 52 percent of the beef producers who used 4 or more bulls had type five cattle handling facilities available, compared to almost 19 percent of the producers who reported using only 1 bull. In contrast, 3 percent of the producers who reported using 4 or more bulls had no facilities, while almost 15 percent reported using only 1 bull. The chi square (x^2) test indicated that the number of bulls used and the types of cattle handling facilities available were significantly (0.01) related. Beef producers who used 4 or more bulls were more likely to have type five cattle handling facilities than those producers who used fewer bulls.

Number of feeder calves sold at weaning. Slightly over 42 percent of the beef producers who did not sell any calves at weaning had type five cattle handling facilities available, compared to 37 percent who reported selling 50 or more calves. Of the producers who reported selling 1 to 25 calves at weaning, 14 percent did not have any cattle handling facilities available as compared to almost 5 percent who sold 50 or more calves. The chi square (x^2) test indicated that the number of feeder calves sold at weaning and the types of cattle handling facilities available were significantly (0.01) related. Beef producers who did not sell any feeder calves at weaning were more likely than those who sold feeder calves to have type five cattle handling facilities available.

Average weight of calves sold at weaning. Thirty-five percent of the beef cattle producers who sold calves averaging over 500 pounds at weaning had type five cattle handling facilities available, compared to 15 percent under 400 pounds. In contrast, a very low percentage (6.0 percent) of the producers having weights of calves sold at weaning over 500 pounds had no facilities available, while 20 percent had weights under 400 pounds. The chi square (x^2) test indicated that the average weight of calves sold at weaning and the types of cattle handling facilities available were significantly (0.01) related. Beef producers who sold calves weighing 500 pounds or over at weaning were more likely to have all type five cattle handling facilities than those who sold calves at lighter weights. However, producers who did not sell any feeder calves were more likely to have type five cattle

handling facilities than those who did sell feeder calves regardless of the weight of calves sold.

Number of calves sold last spring. Over half (57.1 percent) of the beef producers who sold 50 to 400 calves last spring had type five cattle handling facilities available, compared to 27 percent who sold none, 28 percent who sold 1 to 24, and 37 percent of those who sold 25 to 49. In contrast, a very low percentage (1.2 percent) of the producers who sold 50 to 400 calves last spring had no facilities available as compared to 7 percent who sold 1 to 24, 2 percent who sold 25 to 49, and 11 percent who sold none. The chi square (x^2) test indicated that the number of calves sold last spring and the type of handling facilities available were significantly (0.01) related. Beef producers who sold 50 or more calves last spring were more likely to have type five cattle handling facilities than those who sold fewer calves last spring.

Number of calves sold last summer or fall. Two-thirds (64 percent) of the producers who sold calves last summer or fall had type five cattle handling facilities available, compared to 28 percent who sold none, 33 percent who sold 1 to 24, and 27 percent who sold 25 to 49. In contrast, a very low percentage (2 percent) of the producers who sold 50 to 400 calves last summer or fall had no facilities available as compared to 7 percent who sold 1 to 24, 3 percent who sold 25 to 49, and 9.4 percent who sold none. The chi square (x^2) test indicated that the number of calves sold last summer or fall and the types of

handling facilities available were significantly (0.01) related. Beef producers who sold calves last summer or fall were more likely to have type five cattle handling facilities than those who did not sell any calves.

Finished cattle sold. Almost 46 percent of the beef producers who sold finished cattle had type five cattle handling facilities available, compared to almost 27 percent of those who did not sell any finished cattle. In contrast, 10 percent of the producers who did not sell any finished cattle did not have any facilities available, while only 4 percent of the producers who sold finished cattle reported having no facilities. The chi square (χ^2) test indicated that whether or not the producers sold finished cattle and the types of cattle handling facilities available were significantly (0.01) related. Beef producers who sold finished cattle were more likely to have type five cattle handling facilities available than those who did not sell finished cattle.

Extension Contacts

The variables included in this subsection are: (1) number of Extension beef meetings attended, (2) number of visits to Extension office, (3) number of telephone calls to Extension office, and (4) number of farm visits received by Extension agents during the past 12 months.

Number of Extension beef meetings attended. Almost half (49 percent) of the beef producers who attended 3 or more Extension meetings

had type five cattle handling facilities available, compared to 43 percent of those who attended 2, 28 percent who attended 1, and 22 percent of those who did not attend any meetings. In contrast, a little over 2 percent of the producers who attended 3 or more Extension meetings did not have any cattle handling facilities, while almost 14 percent of the producers who did not attend any meetings had no facilities. The chi square (x^2) test indicated that producers who attended Extension beef meetings and the types of cattle handling facilities available were significantly (0.01) related. A larger percentage of the beef producers who attended Extension beef meetings were more likely to have type five cattle handling facilities than did those who did not attend any Extension beef meetings during the past year.

Number of visits to Extension office. Almost 38 percent of the beef producers who visited the Extension office 3 or more times had type five cattle handling facilities available as compared to 22 percent who never visited. In contrast, almost 5 percent of the producers who attended 3 or more Extension meetings had no facilities compared to 14 percent who had not visited the Extension office during the past year. The chi square (x^2) test indicated that the number of visits to the Extension office and the types of cattle handling facilities were significantly (0.01) related. Beef producers who visited the Extension more often were more likely to have type five cattle handling facilities available than those who had not visited the Extension office during the past year.

Number of telephone calls to Extension office. Forty-four percent of the beef producers who called the Extension office 3 or more times had type five cattle handling facilities available compared to 24 percent who never called. In contrast, almost 5 percent of the producers who called the Extension office 3 or more times had no facilities available as compared to 13 percent of the beef producers who never called. The chi square (x^2) test indicated that the number of telephone calls to the Extension office and the types of cattle handling facilities available were significantly (0.01) related. Beef producers who called the Extension office were more likely to have type five cattle handling facilities available than those who did not call the Extension office during the past year.

Number of farm visits received by Extension agents. Over 43 percent of the beef producers who received 3 or more farm visits from Extension agents had type five cattle handling facilities available, compared to 17 percent who did not receive any visits. In contrast, almost 4 percent of the producers who received 3 or more visits had no facilities compared to almost 16 percent who received no visits or had no facilities. The chi square (x^2) test indicated that the number of visits received by Extension agents and the types of cattle handling facilities were significantly (0.01) related. Beef producers who received 1 or more visits from Extension agents were more likely to have type five cattle handling facilities available than those who received no visits.

Table Summary

The age of producer, major source of farm income, and farming status were significantly related to the types of beef cattle handling facilities available. Producers who were under 50, row cropped and were full-time farmers had more type five cattle handling facilities available.

Beef producers who exposed 41 or more cows and heifers to bulls had type five cattle handling facilities available than those with fewer cows. Producers who built their cattle handling facilities between 1976-1985 tended to have type five facilities than those who built prior to 1976. Producers who lost more calves at birth, weaned a larger number of calves, and who used a larger number of bulls were more likely than other producers to have type five cattle handling facilities. Beef producers who did not sell any feeder calves had more type five cattle handling facilities available than those who sold feeder calves. Beef producers who weaned heavier feeder calves and who sold more calves last spring and last summer were more likely than other producers to have type five cattle handling facilities. Producers who sold finish cattle were more likely than those who did not to have type five cattle handling facilities.

Beef producers who attended 1 or more Extension beef meetings, made 1 or more office visits, made 1 or more telephone calls and received 1 or more farm visits from Extension agent were more likely than those who did not to have type five cattle handling facilities.

III. RELATIONSHIPS BETWEEN TENNESSEE BEEF PRODUCERS TYPES OF CATTLE HANDLING FACILITIES AVAILABLE AND THEIR USE OF MANAGEMENT PRACTICES

Table III presents findings regarding the relationships between beef producers types of cattle handling facilities and the use of management practices. The purpose of the analysis was to determine what influence, if any, that cattle handling facilities had on the use of management practices. The chi square (x^2) test was used to determine the relationships between dependent and independent variables. The 0.05 probability level was used to determine significant relationships.

Management Practices

This subsection presents findings regarding producers use of 11 management practices.

Cows and heifers pregnancy checked. Thirty-six percent of the beef producers who had all type five cattle handling facilities available pregnancy checked compared to 4 percent who had no facilities. When tested by the x^2 test, these differences were significant at the .05 level. Beef producers who had type five cattle handling facilities were more likely to pregnancy check than those with no handling facilities.

Cows and heifers vaccinated for leptospirosis. Over 71 percent of the beef producers who had type five cattle handling facilities available vaccinated for leptospirosis compared to over 21 percent

Table III (Continued)

Management Practices	Types of Cattle Handling Facilities Available*											
	0			1			2			3		
	Number	Percent	Response	Number	Percent	Response	Number	Percent	Response	Number	Percent	Response
Cattle Treated for Lice												
Untreated	110	69.6		89	51.7		144	35.4		77	25.6	
Treated	48	30.4		83	48.3		263	64.6		224	74.4	
Total	158	100.0		172	100.0		407	100.0		301	100.0	
Statistical Test $\chi^2 = 181.7$; $df = 5$; $p = 0.01$												
Cows/Heifers Bred by Artificial Insemination												
No	154	96.9		170	98.8		384	93.7		262	87.0	
Yes	5	3.1		2	1.2		26	6.3		39	13.0	
Total	159	100.0		172	100.0		412	100.0		301	100.0	
Statistical Test $\chi^2 = 80.9$; $df = 5$; $p = 0.01$												
Cows Vaccinated for IBR, BVD, and PI3												
No	136	86.1		133	77.3		278	67.8		172	57.1	
Yes	22	13.9		39	22.7		132	32.2		129	42.9	
Total	158	100.0		172	100.0		410	100.0		301	100.0	
Statistical Test $\chi^2 = 132.2$; $df = 5$; $p = 0.01$												
Calves Vaccinated for IBR, BVD, and PI3												
No	130	82.3		126	73.7		240	58.7		152	50.8	
Yes	28	17.7		45	26.3		169	41.3		147	49.2	
Total	158	100.0		171	100.0		409	100.0		299	100.0	
Statistical Test $\chi^2 = 101.3$; $df = 5$; $p = 0.01$												
Method Used to Market Feeder Calves												
Weekly auction	113	72.9		104	61.9		198	49.1		127	43.9	
Feeder calf sale	20	12.9		50	29.8		138	34.2		115	39.8	
Trader	17	11.0		8	4.8		49	12.2		17	5.9	
Direct-feeder	5	3.2		6	3.6		18	4.5		30	10.4	
Total	155	100.0		168	100.0		403	100.0		289	100.0	
Statistical Test $\chi^2 = 120.5$; $df = 15$; $p = 0.01$												

*0 = none, Type 1 = headgate, Type 2 = headgate and holding chute, Type 3 = headgate, holding chute and working chute, Type 4 = headgate, holding chute, working chute and crowding pens, Type 5 = headgate, holding chute, working chute, crowding pen and holding pen.

who had no facilities. When tested by the x^2 test, these differences were significant at the .05 level. Beef producers who had type five cattle handling facilities were more likely to vaccinate for leptospirosis than those with no facilities.

Calves vaccinated for blackleg. A very large majority (94.0 percent) of the beef producers who had type five cattle handling facilities available vaccinated for blackleg compared to 58 percent of those who had no facilities. When tested by the x^2 test, these differences were significant at the .05 level. Beef producers who had type five cattle handling facilities were more likely to vaccinate for blackleg than those with no facilities.

Replacement heifers vaccinated for brucellosis. Forty-two percent of the beef producers who had type five cattle handling facilities available vaccinated replacement heifers for brucellosis as compared to almost 16 percent who had no facilities. When tested by the x^2 test, these differences were significant at the .05 level. Beef producers who had type five cattle handling facilities were more likely to vaccinate replacement heifers for brucellosis than those with no facilities.

Calves implanted. Sixty-four percent of the beef producers who had type five cattle handling facilities available implanted calves compared to 23 percent who had no facilities. When tested by the x^2 test, these differences were significant at the .05 level. Beef producers who had type five cattle handling facilities were more likely to implant calves than those with no facilities.

Cows dewormed. A very large majority (92 percent) of the beef producers who had type five cattle handling facilities available dewormed cows compared to 56 percent who had no facilities. When tested by the x^2 test, these differences were significant at the .05 level. Beef producers who had type five cattle handling facilities were more likely to deworm cows than those with no facilities.

Cattle treated for lice. Over three-fourths (80 percent) of the beef producers who had type five cattle handling facilities available treated cattle for lice compared to 30 percent who had no facilities. When tested by the x^2 test, these differences were significant at the .05 level. Beef producers who had type five cattle handling facilities were more likely to treat cattle for lice than those with no facilities.

Cows and heifers bred by artificial insemination. Only 20 percent of the beef producers who had type five cattle handling facilities available bred cows and heifers by artificial insemination compared to 3 percent who had no facilities. When tested by the x^2 test, these differences were significant at the .05 level. Beef producers who had type five cattle handling facilities were more likely to breed cows and heifers by artificial insemination than those with no facilities.

Cows vaccinated for IBR, BVD, and PI3. Over half (56 percent) of the beef producers who had all five types of cattle handling facilities

available vaccinated cows for IBR, BVD, and PI3 compared to 14 percent who had no facilities. When tested by the x^2 test, these differences were significant at the .05 level. Beef producers who had type five cattle handling facilities were more likely to vaccinate cows for IBR, BVD and PI3 than those with no facilities.

Calves vaccinated for IBR, BVD, AND PI3. Fifty-five percent of the beef producers who had type five cattle handling facilities available vaccinated calves for IBR, BVD, and PI3 compared to 18 percent who had no facilities. When tested by the x^2 test, these differences were significant at the .05 level. Beef producers who had type five cattle handling facilities were more likely to vaccinate calves for IBR, BVD, and PI3 than those with no facilities.

Method used to market feeder calves. Thirty-seven percent of the beef producers who had type five cattle handling facilities available marketed feeder calves through feeder calf sales compared to 13 percent of those who had no facilities. When tested by the x^2 test, these differences were significant at the .05 level. Beef producers who had type five cattle handling facilities available were more likely to market feeder calves at feeder calf sales than those who had no facilities.

Table Summary

Beef producers who had type five cattle handling facilities available were more likely to be using each of the 11 practices studied than were producers who had no facilities. Producers with

type five cattle handling facilities were more likely than those with no facilities to check cows and heifers for pregnancy, to vaccinate cows and heifers for leptospirosis, to vaccinate calves for blackleg, to vaccinate heifers for brucellosis, to implant calves, to deworm cows, to treat cattle for lice, to breed cows and heifers by artificial insemination, to vaccinate cows and to vaccinate calves for IBR, BVD, and PI3, and to market calves at feeder calf sales.

CHAPTER IV

RELATIONSHIPS BETWEEN TENNESSEE BEEF PRODUCERS SELECTED PERSONAL AND FARM OPERATION CHARACTERISTICS, EXTENSION CONTACTS AND THE YEAR CATTLE HANDLING FACILITIES WERE CONSTRUCTED

Chapter IV presents findings regarding the relationships between selected personal and farm operation characteristics, Extension contacts and the year cattle handling facilities were constructed.

I. RELATIONSHIPS BETWEEN SELECTED PERSONAL AND FARM OPERATION CHARACTERISTICS, EXTENSION CONTACTS AND YEAR CATTLE HANDLING FACILITIES CONSTRUCTED

The findings of this section are presented in Table IV and were organized into three subsections: (1) personal characteristics, (2) farm operation characteristics, and (3) Extension contacts. The chi square (x^2) test was used to determine the strength of relationships between the independent variables. The 0.05 probability level was used to determine significant relationships.

Personal Characteristics

The selected producer characteristics found in Table IV include age, major source of farm income and farm status.

Age of producer. A little over 37 percent of the beef producers who were under 50 years of age constructed their cattle handling facilities between 1981 and 1985 compared to 33 percent of those 50 and over. In contrast, one-fourth (25 percent) of the beef producers under 50

constructed their beef cattle handling facilities before 1976 while 35 percent of the producers over 50 constructed facilities before 1976. The chi square (x^2) test indicated that the age of beef producers and the year cattle handling facilities were constructed were significantly (0.05) related. Beef producers under 50 were more likely than those 50 and over to have constructed cattle handling facilities after 1976.

Major source of farm income. Thirty-seven percent of the beef producers who reported beef cattle as their major source of farm income constructed their cattle handling facilities from 1981 to 1985, compared to about 33 percent of row crop producers. However, in contrast, about 27 percent of the beef producers who reported beef cattle as their major source of income constructed cattle handling facilities before 1976, while 34 percent of the row crop producers constructed facilities before 1976. The chi square (x^2) test indicated that the major source of farm income and the year cattle handling facilities were constructed were significantly (0.01) related. Beef producers who reported beef cattle as their major source of farm income were more likely than row crop producers to have constructed cattle handling facilities since 1976.

Farming status. About 33 percent of the beef producers who were full-time farmers constructed their cattle handling facilities between 1981 and 1985, compared to about 38 percent of the part-time farmers. In contrast, a higher percent (35 percent) of full-time farmers constructed cattle handling facilities before 1976, while only 24 percent of the part-time farmers constructed facilities before 1976.

The chi square (x^2) test indicated that farming status and the year cattle handling facilities were constructed were significantly (0.01) related. Beef producers who were part-time farmers were more likely than the full-time farmers to have constructed their cattle handling facilities after 1976.

Farm Operations Characteristic

This subsection presents findings regarding producers 9 farm operation characteristics and the year cattle handling facilities were constructed.

Number of cows and heifers exposed to bulls. Thirty-seven percent of the beef producers who had 40 or less cows and heifers exposed to bulls constructed cattle handling facilities from 1981 to 1985, compared to over 34 percent of those who had 41 or more cows. In contrast, only 28 percent of the producers who had 40 or less cows and heifers exposed to bulls constructed facilities before 1976, while almost 33 percent of the producers who had 41 or more constructed facilities before 1976. The chi square (x^2) test indicated that the number of cows and heifers exposed to bulls and the year cattle handling facilities were constructed were not significantly (0.17) related.

Number of calves lost at birth. Almost 39 percent of the beef producers who did not lose any calves at birth constructed cattle handling facilities form 1981 to 1985 compared to about 38 percent of those who lost 6 or more calves. In contrast, 32 percent of the producers who did not lose any calves at birth constructed facilities

before 1976, while a little over 28 percent of the producers who lost 6 or more calves at birth constructed facilities before 1976. When tested by the chi square (x^2) test, the differences were not significant at the .05 level. Therefore, the number of calves lost at birth was not significantly related to the year cattle handling facilities were constructed.

Number of calves weaned. About 38 percent of the beef producers who weaned 10 to 29 calves constructed cattle handling facilities from 1981 to 1985, compared to 34 percent of those who weaned 60 or more calves. In contrast, a little over 27 percent of the producers who weaned 10 to 29 calves constructed facilities before 1976 while 32 percent weaned 60 or more calves. When tested by the chi square (x^2) test, the differences were not significant at the .05 level. Therefore, the number of calves weaned was not significantly related to the year cattle handling facilities were constructed.

Number of bulls used. Just over 36 percent of the beef producers who used 1 bull constructed cattle handling facilities from 1981 to 1985, compared to 31 percent of those producers who used 4 or more bulls. In contrast, slightly over 30 percent of the beef producers who used only 1 bull constructed facilities before 1976 while about 32 percent of those who used over 4 bulls constructed facilities before 1976. When tested by the chi square (x^2) test, the differences were not significant at the .05 level. Therefore, the number of bulls used was not significantly related to the year cattle handling facilities were constructed.

Number of feeder calves sold at weaning. Almost 35 percent of the beef producers who reported not selling any feeder calves at weaning constructed cattle handling facilities from 1981 to 1985, compared to 34 percent of those producers who sold 50 or more calves at weaning. In contrast, 34 percent of the beef producers who did not sell any calves at weaning constructed facilities before 1976 compared to 27 percent of those who sold 50 or more calves at weaning. When tested by the chi square (x^2) test, the differences were not significant at the .05 level. Therefore, the number of calves sold at weaning was not significantly related to the year cattle handling facilities were constructed.

Average weight of calves sold. A little under 30 percent of the beef producers whose average weight of calves sold at weaning was 400 pounds and under constructed cattle handling facilities from 1981 to 1985, compared to 37 percent of those producers whose average weight of calves sold at weaning was 500 pounds and over. In contrast, 38 percent of the beef producers whose average weight of calves sold at weaning was 400 pounds and under constructed facilities before 1976, compared to slightly over 27 percent of those who sold calves 500 pounds and over at weaning. When tested by the chi square (x^2) test, the differences were not significant at the .05 level. Therefore, the average weight of calves sold at weaning was not significantly related to the year cattle handling facilities were constructed.

Number of calves sold last spring. A little over 35 percent of the beef producers who did not sell any calves last spring constructed cattle handling facilities from 1981 to 1985, compared to about 40 percent of those who sold 50 to 400 calves last spring. In contrast, 31 percent of the beef producers who did not sell any calves last spring constructed facilities before 1976, compared to 37 percent of those who sold 50 to 400 calves last spring. When tested by the chi square (χ^2) test, the differences were not significant at the .05 level. Therefore, the number of calves sold last spring was not significantly related to the year cattle handling facilities were constructed.

Number of calves sold last summer or fall. About 36 percent of the beef producers who did not sell any calves last summer or fall constructed cattle handling facilities from 1981 to 1985, compared to 27 percent of those who sold 50 to 400. In contrast, 30 percent of the beef producers who did not sell any calves last summer or fall constructed facilities before 1976, compared to 36 percent of those who sold 50 to 400. When tested by the chi square test (χ^2) the differences were not significant at the .05 level. Therefore, the number of calves sold last summer or fall was not related to the year cattle handling facilities were constructed.

Finished cattle sold. Thirty-five percent of the beef producers who did not sell any finished cattle constructed cattle handling facilities from 1981 to 1985, compared to 36 percent who did sell finished cattle. In contrast, 30 percent of the beef producers who

did not sell any finished cattle constructed facilities before 1976, compared to 34 percent of those who did sell finished cattle. When tested by the chi square (x^2) test, the differences were not significant at the .05 level. Therefore, the number of finished cattle sold was not significantly related to the year cattle handling facilities were constructed.

Extension Contacts

The independent variables included in this subsection are: (1) number of Extension beef meetings attended, (2) number of visits to Extension office, (3) number of telephone calls to Extension office, and (4) number of farm visits received by Extension agents during the past year.

Number of Extension beef meetings attended. About 32 percent of the beef producers who did not attend any Extension beef meetings constructed cattle handling facilities from 1981 to 1985, compared to 41 percent of those who attended 3 or more beef meetings. In contrast, almost 33 percent of the producers who did not attend any beef meetings constructed facilities before 1976, compared to 26 percent who attended 3 or more beef meetings. Although very close, the differences when tested by the chi square (x^2) test were not significant at the .05 level. Therefore, beef producers who attended Extension beef meetings did not differ significantly as to the year they constructed cattle handling facilities.

Number of visits to Extension office. About 29 percent of the beef producers who did not visit the Extension office constructed cattle handling facilities from 1981 to 1985, compared to 42 percent of those who visited 3 or more times. In contrast, 36 percent of the beef producers who did not visit the Extension office constructed facilities before 1976, compared to a little over 22 percent of those who visited 3 or more times. When tested by the chi square (x^2) test, the differences were significant at the .05 level. Beef producers who visited the Extension office 3 or more times during the past year were more likely than those who did not visit the Extension office to construct cattle handling facilities from 1981 to 1985.

Number of telephone calls to Extension office. Just over 27 percent of the beef producers who did not telephone the Extension office during the past year constructed cattle handling facilities from 1981 to 1985, compared to 41 percent of those who called 3 or more times. In contrast, 36 percent of the producers who did not call the Extension office constructed facilities before 1976 compared to 26 percent of those who called 3 or more times. The differences, when tested by the chi square (x^2) test, were significant at the .05 level. Beef producers who telephoned the Extension office 3 or more times during the year were more likely to have constructed cattle handling facilities from 1981 to 1985 than those who did not.

Number of farm visits received by Extension agent. About 27 percent of the beef producers who did not receive any visits from Extension

agents constructed cattle handling facilities from 1981 to 1985, compared to 43 percent of the beef producers who received 3 or more visits. In contrast, 38 percent of the beef producers who did not receive any visits from Extension agents constructed facilities before 1976, compared to 26 percent who received 3 or more visits. When tested by the chi square (χ^2) test, the differences were significant at the .05 level. Beef producers who received 3 or more visits during the year from Extension agents were more likely to have constructed cattle handling facilities from 1981 to 1985 than those who did not receive any visits.

Table Summary

The beef producers age, major source of farm income and farming status were significantly related to the year cattle handling facilities were constructed. Producers who were under 50, raised beef cattle as their major source of farm income and were part-time farmers were more likely to construct cattle handling facilities from 1976 to 1985.

The data also indicated that there was no significant difference between: (1) the number of cows and heifers exposed to bulls, (2) number of calves lost at birth, (3) number of calves weaned, (4) number of bulls used, (5) number of feeder calves sold at weaning, (6) average weight of calves sold at weaning, (7) number of calves sold last spring, (8) number of calves sold last summer or fall, and (9) finished cattle sold and the year cattle handling facilities were constructed.

Beef producers who made 1 or more visits to the Extension office during the past year, made 1 or more telephone calls to Extension office and received 1 or more farm visits by Extension agents were more likely than those who did not to have constructed cattle handling facilities from 1981 to 1985.

Beef producers who had more Extension contacts were more likely than those who did not to have constructed cattle handling facilities since 1981. Beef producers who attended 1 or more Extension beef cattle meetings during the past year did not differ significantly from those who did not as to the year cattle handling facilities were constructed.

CHAPTER V

RELATIONSHIPS BETWEEN THE YEAR CATTLE HANDLING FACILITIES WERE CONSTRUCTED BY TENNESSEE BEEF CATTLE PRODUCERS AND THEIR USE OF MANAGEMENT PRACTICES

Chapter V presents findings regarding the relationships between the year cattle handling facilities were constructed and the use of management practices by Tennessee beef cattle producers.

I. RELATIONSHIPS BETWEEN YEAR CATTLE HANDLING FACILITIES CONSTRUCTED AND USE OF MANAGEMENT PRACTICES BY TENNESSEE BEEF CATTLE PRODUCERS

The purpose of the analysis in Table V was to determine what influence, if any, that the year cattle handling facilities were constructed had on the use of management practices. The chi square (x^2) test was used to determine the strength of relationships between the independent and dependent variables. The 0.05 probability level was used to determine significant relationships.

Management Practices

This subsection presents findings regarding the year cattle handling facilities were constructed and the use of 11 management practices by Tennessee beef cattle producers.

Cows and heifers pregnancy checked. Thirty percent of the beef producers who constructed cattle handling facilities from 1981 to 1985

Table V. Relationships Between Year Cattle Handling Facilities Were Constructed by Tennessee Beef Producers and Their Use of Management Practices

Management Practices	Year Cattle Handling Facilities Constructed					
	Before 1976			1976-1980		
	Number Responses	Percent Responses		Number Responses	Percent Responses	
Cows/Heifers Pregnancy Checked						
Not checked	379	81.2		403	77.1	70.0
Checked	88	18.8		120	22.9	30.0
Total	467	100.0		523	100.0	100.0
	Statistical Test $\chi^2 = 17.5$; $df = 2$; $p = 0.02$					
Cows/Heifers Vaccinated for Leptospirosis						
No	228	49.0		190	36.4	32.7
Yes	237	51.0		332	63.6	67.3
Total	465	100.0		522	100.0	100.0
	Statistical Test $\chi^2 = 30.0$; $df = 2$; $p = 0.01$					
Cows Vaccinated for Blackleg						
No	48	10.3		35	6.7	5.8
Yes	418	89.7		489	93.3	94.2
Total	466	100.0		524	100.0	100.0
	Statistical Test $\chi^2 = 9.1$; $df = 2$; $p = 0.02$					
Replacement Heifers Vaccinated for Brucellosis						
No	308	69.1		311	62.8	59.7
Yes	138	30.9		184	37.2	40.3
Total	446	100.0		495	100.0	100.0
	Statistical Test $\chi^2 = 9.3$; $df = 2$; $p = 0.01$					
Calves Implanted						
No	219	46.9		206	39.3	40.4
Yes	248	53.1		318	60.7	59.6
Total	467	100.0		524	100.0	100.0
	Statistical Test $\chi^2 = 6.7$; $df = 2$; $p = 0.04$					
Cows Deformed						
Not deformed	99	21.2		76	14.5	9.0
Deformed	367	78.8		447	85.5	91.0
Total	466	100.0		523	100.0	100.0
	Statistical Test $\chi^2 = 30.2$; $df = 2$; $p = 0.01$					

Table V (Continued)

Management Practices	Year Cattle Handling Facilities Constructed					
	Before 1976		1976-1980		1981-1985	
	Number Responses	Percent Responses	Number Responses	Percent Responses	Number Responses	Percent Responses
Cattle Treated for Lice						
Untreated	136	29.2	142	27.2	141	26.4
Treated	329	70.8	381	72.8	394	73.6
Total	465	100.0	523	100.0	535	100.0
	Statistical Test $\chi^2 = 1.1$; $df = 2$; $p = 0.68$					
Cows/Heifers Bred by Artificial Insemination						
No	410	87.8	454	86.6	460	85.7
Yes	57	12.2	70	13.4	77	14.3
Total	467	100.0	524	100.0	537	100.0
	Statistical Test $\chi^2 = 1.0$; $df = 2$; $p = 0.61$					
Cows Vaccinated for IBR, BVD, and PI3						
No	297	63.6	296	56.5	277	51.8
Yes	170	36.4	228	43.5	258	48.2
Total	467	100.0	524	100.0	535	100.0
	Statistical Test $\chi^2 = 14.3$; $df = 2$; $p = 0.01$					
Cows Vaccinated for IBR, BVD, and PI3						
No	247	53.2	270	51.8	269	50.5
Yes	217	46.8	251	48.2	264	49.5
Total	464	100.0	521	100.0	533	100.0
	Statistical Test $\chi^2 = 0.86$; $df = 2$; $p = 0.70$					
Method Used to Market Feeder Calves						
Weekly Auction	194	44.1	224	44.2	235	46.2
Feeder Calf Sale	172	39.1	184	36.3	182	35.8
Trader	33	7.5	50	9.9	36	7.1
Direct-Feeder	41	9.3	49	9.7	56	11.0
Total	440	100.0	507	100.0	509	100.0
	Statistical Test $\chi^2 = 4.64$; $df = 6$; $p = 0.60$					

pregnancy checked compared to 19 percent of those who constructed facilities before 1976. When tested by the x^2 test, these differences were significant at the .05 level. Therefore, beef producers who constructed cattle handling facilities from 1981 to 1985 were more likely to pregnancy check than those who constructed facilities before 1976.

Cows and heifers vaccinated for leptospirosis. A little over 67 percent of the beef producers who constructed cattle handling facilities from 1981 to 1985 vaccinated for leptospirosis, compared to one-half (51 percent) who constructed facilities before 1976. When tested by the x^2 test, these differences were significant at the .05 level. Beef producers who constructed cattle handling facilities from 1981 to 1985 were more likely to vaccinate for leptospirosis than those producers who constructed facilities before 1976.

Calves vaccinated for blackleg. A very high percentage (94 percent) of the beef producers who constructed cattle handling facilities from 1981 to 1985 vaccinated calves for blackleg, compared to 90 percent who constructed facilities before 1976. When tested by the x^2 test, these differences were significant at the .05 level. Beef producers who constructed cattle handling facilities from 1981 to 1985 were more likely to have vaccinated for blackleg than those who constructed facilities before 1976.

Replacement heifers vaccinated for brucellosis. Only 40 percent of the beef producers who constructed cattle handling facilities from

1981 to 1985 vaccinated for brucellosis, compared to 31 percent who constructed facilities before 1976. When tested by the x^2 test, these differences were significant at the .05 level. Beef producers who constructed cattle handling facilities from 1981 to 1985 were more likely to vaccinate replacement heifers for brucellosis than those who constructed facilities before 1976.

Calves implanted. Almost 60 percent of the beef producers who constructed cattle handling facilities from 1981 to 1985 implanted calves, compared to 53 percent who constructed facilities before 1976. When tested by the x^2 test, these differences were significant at the .05 level. Beef producers who constructed cattle handling facilities from 1981 to 1985 were more likely to implant calves than those who constructed facilities before 1976.

Cows dewormed. A majority of the beef producers who constructed cattle handling facilities between 1981 to 1985 (91 percent) dewormed cows, compared to 79 percent who constructed facilities before 1976. When tested by the x^2 test, these differences were significant at the .05 level. Beef producers who constructed cattle handling facilities from 1981 to 1985 were more likely to deworm cows than those who constructed facilities before 1976.

Cattle treated for lice. Almost three-fourths (74 percent) of the beef producers who constructed cattle handling facilities from 1981 to 1985 treated cattle for lice, compared to 71 percent who constructed facilities before 1976. These differences were not significant at

the .05 level. Therefore, there was not a significant relationship between the year cattle handling facilities constructed and cattle treated for lice.

Cows and heifers bred by artificial insemination. Only 14 percent of the beef producers who constructed cattle handling facilities from 1981 to 1985, compared to 12 percent who constructed facilities before 1976, bred cows and heifers by artificial insemination. The differences were not significant at the .05 level. Therefore, there was not a significant relationship between the year cattle handling facilities constructed and cows and heifers bred by artificial insemination.

Cows vaccinated for IBR, BVD, and PI3. Almost half (48 percent) of the beef producers who constructed cattle handling facilities from 1981 to 1985, compared to 36 percent who constructed facilities before 1976, vaccinated cows for IBR, BVD, and PI3. These differences were significant. Beef producers who constructed cattle handling facilities from 1981 to 1985 were more likely to vaccinate cows for IBR, BVD, and PI3 than those who constructed facilities before 1976.

Calves vaccinated for IBR, BVD, and PI3. One half (50 percent) of the beef producers who constructed cattle handling facilities from 1981 to 1985, compared to 47 percent who constructed facilities before 1976, vaccinated calves for IBR, BVD, and PI3. These differences were not significant at the .05 level. Therefore, there was not a significant relationship between the year cattle handling facilities constructed and calves vaccinated for IBR, BVD, and PI3.

Method used to market feeder calves. Thirty-six percent of the beef producers who constructed cattle handling facilities from 1981 to 1985 compared to 39 percent who constructed facilities before 1976, marketed feeder calves through feeder calf sales. These differences were not significant at the .05 level. Therefore, there was not a significant relationship between the year cattle handling facilities were constructed and method used to market feeder calves.

Table Summary

The data indicated that the year cattle handling facilities were constructed was significantly related to cows and heifers pregnancy checked, cows and heifers vaccinated for leptospirosis, calves vaccinated for blackleg, replacement heifers vaccinated for brucellosis, calves implanted, cows dewormed, and cows vaccinated for IBR, BVD, and PI3. Beef producers who built cattle handling facilities more recently (1981 to 1985) were more likely to be using these practices than those who constructed facilities prior to 1981. The data also showed that the year cattle handling facilities were constructed was not significantly related to cattle treated for lice, cows and heifers bred by artificial insemination, calves vaccinated for IBR, BVD, and PI3, and method used to market feeder calves.

CHAPTER VI

SUMMARY OF MAJOR FINDINGS

I. PURPOSE AND SPECIFIC OBJECTIVES

Purpose

The purpose of this study was to determine the personal and farm characteristics of Tennessee beef cattle producers, their management practices and their contacts with Extension as they relate to the type of cattle handling facilities available and the year the facilities were constructed. This information may be useful to county Extension staffs and to state Extension specialists and administrators in planning and evaluating educational programs for beef producers in Tennessee.

Specific Objectives

The specific objectives of this study were:

1. To characterize Tennessee beef cattle producers, their farm operation characteristics and Extension contacts.
2. To determine the use of management practices by Tennessee beef producers.
3. To describe the types of beef cattle handling facilities being utilized by Tennessee beef cattle producers.
4. To determine relationships between Tennessee beef cattle producers selected personal and farm operation characteristics, their contacts with Extension and types of cattle handling facilities available on their farms.

5. To determine relationships between Tennessee beef cattle producers types of beef cattle handling facilities available and their use of management practices.

6. To determine relationships between Tennessee beef cattle producers selected personal and farm operation characteristics, Extension contacts and the year cattle handling facilities were constructed on their farm.

7. To determine relationships between the year cattle handling facilities were constructed by Tennessee beef cattle producers and their use of management practices.

II. METHOD OF INVESTIGATION

A total of 1,813 Tennessee beef cattle producers were randomly selected from 85 counties. Tennessee beef producers who had 25 or more breeding age cows in their herd were the study population. Data were collected through personal interviews by county Extension agents who returned the completed surveys to the Agricultural Extension Education office.

The 1985 Tennessee Beef Cow-Calf Producer interview schedule was used to collect data from the producers. Extension agents used the "nth" number technique to identify producers to be interviewed.

The data were coded and processed for computer analysis. The University of Tennessee Computing Center made the computations. The chi square (x^2) statistical test was used to determine the strength of the relationships between dependent and independent variables. Chi

square values which achieved the .05 probability level were accepted as indicating a significant relationship between the variables.

III. MAJOR FINDINGS

Major findings were presented and classified under headings related to the objectives of the study.

Characteristics of Tennessee Beef Cattle Producers, Their Farm Operation Characteristics, Management Practices and Extension Contacts

Producer characteristics were:

1. Fifty-eight percent of the producers were over 50 years of age.
2. Fifty-two percent of the producers major source of income was beef cattle.
3. Fifty-eight percent of the producers were full-time farmers.

Farm operation characteristics were:

1. Fifty-one percent of the producers had 41 or more cows and heifers exposed to bulls.
2. Twenty-eight percent lost 3 to 5 calves at birth.
3. Forty-two percent weaned 30 to 59 calves.
4. Forty-two percent used 1 bull.
5. Forty-seven percent sold less than 25 calves at weaning.
6. Forty-six percent sold calves with average weaning weights of 500 pounds and over.

7. Sixty-five percent sold 1 to 24 calves last spring.
8. Sixty-four percent sold 1 to 24 calves last summer or fall.
9. Eighty-eight percent did not sell any finished cattle.

Management practices were:

1. Seventy-eight percent of the beef producers did not pregnancy check.
2. Fifty-six percent vaccinated cows and heifers for leptospirosis.
3. Eighty-nine percent vaccinated calves for blackleg.
4. Sixty-six percent did not vaccinate heifers for brucellosis.
5. Fifty-three percent did implant calves.
6. Eighty-two percent did deworm cows.
7. Sixty-eight percent treated cattle for lice.
8. Eighty-eight percent did not breed cows and heifers by artificial insemination.
9. Sixty percent did not vaccinate cows for IBR, BVD, and PI3.
10. Fifty-six percent did not vaccinate calves for IBR, BVD, and PI3.
11. Forty-eight percent selected weekly auction to market their feeder calves.

Extension contacts were:

1. Fifty-seven percent of the producers attended 1 or more Extension beef meetings.
2. Sixty-five percent made 1 or more visits to the Extension office.
3. Seventy-two percent made 1 or more telephone calls to the Extension office.

4. Seventy-four percent received 1 or more farm visits from the Extension agent.

Types of Cattle Handling Facilities Being
Utilized by Tennessee Beef Producers

Cattle handling facilities were:

1. Twenty-nine percent of the beef producers had type five beef cattle handling facilities available.
2. Sixty-nine percent constructed beef cattle handling facilities between 1976 and 1985.

Relationships Between Selected Personal and Farm
Operation Characteristics of Tennessee Beef Cattle
Producers, Their Contacts With Extension and the
Types of Cattle Handling Facilities Available
on Their Farms

There was a significant relationship between the types of cattle handling facilities available and selected personal characteristics. These selected characteristics were age of producer, major source of farm income and farming status. Producers who were younger (under 50), those who had row crops as their major source of farm income, and those who were full-time farmers were more likely than others to have type five cattle handling facilities available.

There was a significant relationship between the types of cattle handling facilities available and the 10 farm operation characteristics. These farm operation characteristics included number of cows and heifers exposed to bulls, year cattle handling facilities

constructed, number of calves lost at birth, number of calves weaned, number of bulls used, number of feeder calves sold at weaning, average weight of calves sold at weaning, number of calves sold last spring, number of calves sold last summer or fall, and number of finished cattle sold. Producers who had larger herds (over 40 cows) constructed cattle handling facilities from 1981 to 1985, lost 6 or more calves at birth, weaned over 60 calves, used 4 or more bulls, did not sell any calves at weaning, therefore no weaning weight, sold 50 to 400 calves last spring, sold 50 to 400 calves last summer or fall, and did sell finished cattle were more likely than others to have all five types of cattle handling facilities available.

There was also a significant relationship between the types of cattle handling facilities available and Extension contacts. These Extension contacts included number of Extension beef meetings attended, number of visits to Extension office, number of telephone calls to Extension office, and number of farm visits received by Extension agents. Producers who attended 3 or more Extension beef meetings, visited the Extension office 3 or more times, made 3 or more telephone calls to the Extension office, and received 3 or more farm visits by the Extension agent were more likely than others who had fewer contacts to have all five types of cattle handling facilities available.

Relationships Between Tennessee Beef Producers

Types of Cattle Handling Facilities Available

and Their Use of Management Practices

There was a significant relationship between types of beef cattle handling facilities beef cattle producers had on their farms and their use of management practices. Those management practices include cows and heifers pregnancy checked, cows and/or heifers vaccinated for leptospirosis, blackleg and brucellosis, calves implanted, cows dewormed, cattle treated for lice, cows and heifers bred by artificial insemination, cows and heifers vaccinated for IBR, BVD, and PI3 and method used to market feeder calves. Producers who had type five handling facilities were more likely than other producers to be using the management practices.

Relationships Between Selected Personal and

Farm Operation Characteristics, Extension

Contacts and the Year Tennessee Beef Cattle

Producers Constructed Cattle Handling

Facilities on Their Farms

There was a significant relationship between the year cattle handling facilities were constructed and selected personal characteristics. These selected characteristics were age of producer, major source of farm income and farm status. Producers who were younger (under 50), those who had beef cattle as their major source of farm income, and those who were part-time farmers were more likely than others to have constructed beef cattle facilities between 1981 and 1985.

Farm operation characteristics were not significantly related to the year cattle handling facilities were constructed. Those characteristics were number of cows and heifers exposed to bulls, number of calves lost at birth, number of calves weaned, number of bulls used, number of calves sold at weaning, average weight of calves sold at weaning, number of calves sold last spring, summer or fall, and finished cattle sold.

There were significant relationships between Extension contacts and the year cattle handling facilities were constructed. These Extension contacts included number of visits to Extension office, number of telephone calls to Extension office, and the number of farm visits received by Extension agents.

Producers who visited the Extension office 3 or more times, made 3 or more telephone calls to the Extension office, and received 3 or more farm visits by the Extension agent were more likely than those who had fewer contacts to have constructed cattle handling facilities between 1981 and 1985. The number of beef meetings attended was not significantly related to the year cattle handling facilities were constructed.

Relationships Between the Year Cattle Handling
Facilities were Constructed by Tennessee Beef
Producers and the Use of Management Practices

There was a significant relationship between the year cattle handling facilities were constructed and use of 7 of the 11 management practices by beef producers. Those practices were cows and heifers

pregnancy checked, cows and/or heifers vaccinated for leptospirosis, blackleg and brucellosis, calves implanted, cows dewormed and cows vaccinated for IBR, BVD, and PI3. Producers who constructed cattle handling facilities from 1981 to 1985 were more likely than those who constructed facilities prior to 1976 to have pregnancy checked, vaccinated cows and/or heifers for leptospirosis, blackleg and brucellosis, vaccinated cows for IBR, BVD, and PI3, implanted calves, and dewormed cows.

There was not a significant relationship between the year cattle handling facilities were constructed and the use of 4 of the 11 management practices by beef producers. Those practices were cattle treated for lice, cows and heifers bred by artificial insemination, calves vaccinated for IBR, BVD, and PI3, and method used to market feeder calves.

IV. IMPLICATIONS AND RECOMMENDATIONS

Based upon the findings of this study, the following implications and recommendations are stated as follows:

1. Over 90 percent of the producers had some type of beef cattle handling facilities available ranging from almost 10 percent who had only a headgate available to 29 percent who had all five types of cattle handling facilities available. Of these, 26 percent were part-time producers and 20 percent owned small operations of 40 or less breeding age cows and heifers. The part-time producers were not as likely as the full-time producers to have type five cattle handling facilities.

Also, small producers were not as likely as large producers to have type five cattle handling facilities. This would indicate that part-time and small producers need help in learning the importance of having beef cattle handling facilities. This suggests that Extension should emphasize educating part-time and small operators as well as full-time and large producers about the need of having beef cattle handling facilities available.

A higher percentage of the producers that had 1 or more Extension contacts had an increasing amount of cattle handling facilities available than those with no contacts. It can be implied that Extension contacts are important if beef producers are to realize the benefits from having beef cattle handling facilities. It is further recommended that Extension continue to strive to do a better job of contacting beef producers and promote the need for having beef cattle handling facilities.

2. A larger percent of the producers who had type five cattle handling facilities available were more likely to be using 11 of the management practices studied than those who had fewer facilities. This suggests the need for additional Extension educational efforts to continue to work with producers who have no facilities.

3. Full-time producers were not as likely as the part-time producers to have constructed cattle handling facilities between the 10 year period of 1976 to 1985. This might indicate that full-time producers had more personal time and labor to spend with their beef cattle; therefore, the need to construct cattle handling facilities from 1976 to 1985 may not have been as great as for the part-time

producers. In any case, Extension must continue to work with all types of beef cattle producers to emphasize the importance of cattle handling facilities and increasing net profits.

A larger percent of producers who had 1 or more visits to Extension office, telephone calls and received 1 or more farm visits from the Extension agent were more likely to have constructed cattle handling facilities between 1976 and 1985 than those who had no contact during the past year with Extension agents. This would tend to imply that beef producers who contacted the Extension service in the 10 year time period benefited by constructing cattle handling facilities. Extension agents need to continue efforts to make themselves available and continue to increase the awareness of constructing cattle handling facilities to beef producers.

4. A significantly higher percent of the beef producers who constructed their cattle handling facilities between 1976 and 1985 were more likely to be using 11 of the management practices studied than those who constructed facilities before 1976. These findings would indicate that the Extension service should continue to stress the need for constructing cattle handling facilities among producers who do not have cattle handling facilities available at this time.

V. RECOMMENDATIONS FOR FURTHER STUDY

1. Similar studies should be made periodically to determine to what extent cattle handling facilities are being used by beef producers. By doing so, this would help Extension identify clientele and their needs.

2. Every effort needs to be made to continue to improve survey instruments and procedures and provide instructions to Extension agents gathering survey data.

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100 COTTON FIBRE
TRADE MARK BOND

APPENDIX

1985 TENNESSEE BEEF COW-CALF PRODUCER SURVEY
(Interview producers with herds of 25 or more breeding age cows)
(See Instructions on Last Page)



Card No. 1
(1)
Respondent No. 0 0
(2) (3)

County Name _____

Co. TEMIS No. (4) (5) (6)

PART I: GENERAL BEEF CATTLE SITUATION

For your most recently weaned calf crop give the:

- (7-9) _____ a. NUMBER OF COWS AND HEIFERS EXPOSED TO BULL(S)?
(10-11) _____ b. NUMBER OF CALVES LOST AT BIRTH OR DIED WITHIN TWO DAYS AFTER BIRTH?
(12-14) _____ c. NUMBER OF CALVES WEANED?
(15) _____ d. NUMBER OF BULLS USED?

PART II: MANAGEMENT SITUATION AND PRACTICES

Note: Use the most recently weaned calf crop in reference to questions in Part II.

A. Calving Management*

- (16-19) _____/_____/_____
Mo. Year 1. MONTH AND YEAR FIRST CALF BORN? (e.g. 0 1/8 4 = Jan. 1984; 9999 = don't know)
(20-23) _____/_____/_____
Mo. Year 2. MONTH AND YEAR LAST CALF BORN? (e.g. 0 9/8 4 = Sept. 1984; 9999 = don't know)
(24-26) _____ 3. NUMBER OF CALVES BORN WITHIN 45 DAYS AFTER BIRTH OF THE FIRST CALF? (9999 = don't know)

B. Breeding Management

- (27) _____ 1. FEMALES AND BULL(S) ARE OF THE SAME OR OF DIFFERENT BREEDS? (1 = same; 2 = different)
(28) _____ 2. FEMALES ARE CROSSBRED OR STRAIGHTBRED? (1 = crossbred; 2 = straightbred; 3 = both)
(29) _____ 3. WERE BULLS EVALUATED FOR BREEDING SOUNDNESS 30-45 DAYS BEFORE BREEDING SEASON BEGAN? (1 = no; 2 = yes; 9 = DNA)
(30) _____ 4. WERE PERFORMANCE TESTED BULLS USED? (1 = no; 2 = yes)
(31) _____ 5. WERE COWS AND HEIFERS PREGNANCY CHECKED? (1 = none; 2 = part; 3 = all)
(32) _____ 6. WERE OPEN FEMALES CULLED FROM HERD? (1 = none; 2 = part; 3 = all)
(33-34) _____ 7. AVERAGE AGE OF REPLACEMENT HEIFERS WHEN BRED? (in months)
(35-37) _____ 8. AVERAGE WEIGHT OF REPLACEMENT HEIFERS WHEN BRED?
(38) _____ 9. HERD ENROLLED IN TBCIP OR A SIMILAR BREED PERFORMANCE TESTING PROGRAM? (1 = no; 2 = yes)
(39-41) _____ 10. NUMBER OF COWS AND HEIFERS BRED BY ARTIFICIAL INSEMINATION? (0 0 0 = not any)

*Coding Instructions:

1. All entries are right justified.
2. A zero (0) = none or not any.
3. A nine (9) in each column = does not apply or don't know.

C. Feeding Management

- (42) _____ 1. KIND(S) OF HARVESTED FORAGES FED LAST WINTER? (1 = hay; 2 = silage; 3 = both hay and silage)
- (43) _____ 2. HERD GROUPED LAST WINTER BY AGE AND STAGE OF PRODUCTION AND FED SEPARATELY? (1 = no; 2 = yes)
- (44) _____ 3. DRY PREGNANT COWS FED LOWER QUALITY FORAGES EARLY IN WINTERING PERIOD? (1 = no; 2 = yes)
- (45) _____ 4. KINDS OF CROP RESIDUE FED LAST WINTER? (1 = none fed; 2 = corn; 3 = soybeans; 4 = both corn and soybeans; 5 = other)
- (46) _____ 5. FESCUE STOCKPILED FOR LATE FALL AND WINTER GRAZING? (1 = no; 2 = yes)
- (47) _____ 6. HAY AND/OR SILAGE "FORAGE TESTED" BEFORE WINTER FEEDING? (1 = no; 2 = yes)
- (48) _____ 7. KIND(S) OF SUPPLEMENTAL PROTEIN FED EACH DAY DURING WINTERING PERIOD? (1 = none fed; 2 = cottonseed or soybean meal; 3 = block or cubes; 4 = liquid)

D. Health Management (during past 12-months)

1. Vaccination

- (49) _____ a. COWS AND REPLACEMENT HEIFERS VACCINATED FOR LEPTOSPIROSIS? (1 = no; 2 = yes)
- (50) _____ b. COWS VACCINATED FOR IBR, BVD AND PI3? (1 = no; 2 = yes, part; 3 = yes, all)
- (51) _____ c. CALVES VACCINATED FOR IBR, BVD AND PI3? (1 = no; 2 = yes, part; 3 = yes, all)
- (52) _____ d. CALVES VACCINATED FOR BLACKLEG? (1 = no; 2 = yes, part; 3 = yes, all)
- (53) _____ e. REPLACEMENT HEIFERS VACCINATED FOR BRUCELLOSIS? (1 = no; 2 = yes, part; 3 = yes, all; 9 = no replacement heifers)
- (54) _____ f. NUMBER OF TIMES CALVES IMPLANTED? (0 = not any)

2. Deworming (during past 12-months)

- (55) _____ a. SEASON WHEN COWS AND BULLS DEWORMED? (1 = not dewormed; 2 = Fall only; 3 = Spring only; 4 = both Fall and Spring; 5 = other)
- (56) _____ b. CALVES DEWORMED? (Most recent calf crop) (1 = no; 2 = yes)

3. Fly Control

- (57) _____ a. PRIMARY METHOD USED TO CONTROL HORN AND FACE FLIES? (1 = none used; 2 = Backrubbers and/or oilers; 3 = Dustbags; 4 = Backrubbers with flaps; 5 = Oral larvacides; 6 = ear tags)
- (58-59) _____ b. MONTH BEGAN TREATMENT FOR HORN AND FACE FLIES? (e.g. 0 4 = April)

4. Grub and Lice Control (past 12-months)

- (60) _____ a. MONTH CATTLE TREATED FOR LICE? (1 = did not treat; 2 = by Nov. 1; 3 = by Nov. 1 and again in Feb.; 4 = did not treat until after Nov. 1 and lice build-up was present)
- (61) _____ b. CATTLE TREATED FOR GRUBS BEFORE NOV. 1? (1 = not treated; 2 = yes, treated before Nov. 1; 3 = yes, treated but not before Nov. 1)

Page 3

Card No. 2
 (1)
 Respondent No. 0 0
 (2) (3)

County No. (4) (5) (6)

PART III: FORAGE PRODUCTION

- (7-10) _____ 1. ACRES OF PERMANENT PASTURE LAND?
 (11-14) _____ 2. ACRES OF FESCUE PASTURE?
 (15-17) _____ 3. ACRES OF TEMPORARY WINTER AND/OR SUMMER PASTURE?
 (18-20) _____ 4. ESTIMATED PERCENT OF PERMANENT PASTURE LAND THAT HAD 30 PERCENT OR MORE LEGUME IN 1985?

PART IV: CATTLE HANDLING FACILITIES

- (21) _____ 1. CATTLE HANDLING FACILITIES AVAILABLE FOR WORKING CATTLE? (1 = headgate only; 2 = headgate and holding chute; 3 = headgate, holding chute and working chute; 4 = headgate, holding chute, working chute and crowding pen; 5 = headgate, holding chute, working chute, crowding pens and holding pens; 9 = none of the above)
 (22-23) _____ 2. WIDTH OF WORKING CHUTE? (inches) (99 = no working chute)
 (24-25) _____ 3. YEAR CATTLE HANDLING FACILITIES CONSTRUCTED? (e.g. 8 3 = 1983; 99 = do not have handling facilities)
 (26) _____ 4. DID YOU OBTAIN THE PLANS FOR CONSTRUCTING HANDLING FACILITIES FROM THE EXTENSION SERVICE ONLY, FROM THE EXTENSION SERVICE AND OTHER SOURCES OR FROM OTHER SOURCES ONLY? (1 = Extension service only; 2 = Extension service and other sources; 3 = other sources only; 9 = no plans were used or none constructed)

PART V: MARKETING

- (27-29) _____ 1. NUMBER OF FEEDER CALVES SOLD AT WEANING? (1985 calf crop; 0 0 0 = not any)
 (30-32) _____ 2. AVERAGE WEIGHT OF FEEDER CALVES SOLD AT WEANING? (1985 calf crop; 999 = none sold)
 (33-35) _____ 3. NUMBER OF CALVES SOLD LAST SPRING (1984 calf crop) AS BACKGROUNDED SHORT YEARLINGS? (0 0 0 = not any)
 (36-38) _____ 4. NUMBER OF CALVES SOLD SUMMER OR FALL (1985) AS BACKGROUNDED LONG YEARLINGS? (0 0 0 = not any)
 (39-40) _____ 5. NUMBER CALVES FROM 1984 CALF CROP FINISHED AND SOLD AS SLAUGHTER CATTLE? (0 0 0 = not any)
 (41) _____ 6. METHOD USED TO MARKET THE MAJORITY OF THE MOST RECENTLY SOLD FEEDER CALF CROP? (1 = weekly auction; 2 = organized feeder calf sale; 3 = local trader; 4 = direct to backgrounder or feeder)
 (42) _____ 7. REASON FOR SELECTING THE MARKETING METHOD USED? (i.e. question 6) (1 = better price; 2 = cattle are not graded; 3 = habit; 4 = lower cost; 5 = frequency of sales; 6 = other)

PART VI: EXTENSION CONTACTS

(Note: Agent and/or producer should estimate the number of contacts the producer had with Extension Agents over the past 12-months)

- (43) _____ 1. BEEF CATTLE MEETINGS ATTENDED?
 (44-45) _____ 2. OFFICE VISITS MADE? (regarding beef cattle)
 (46-47) _____ 3. TELEPHONE CALLS MADE? (regarding beef cattle)
 (48-49) _____ 4. FARM VISITS RECEIVED? (total number)
 (50-51) _____ 5. EXTENSION CIRCULAR OR NEWSLETTERS RECEIVED?

Page 4

PART VII: RESPONDENT AND FARM SITUATION

- (52) _____ 1. FARMING STATUS? (1 = full-time farm; 2 = part-time farm; 3 = retired)
- (53-54) _____ 2. ESTIMATED AGE OF FARM OPERATOR?
- (55) _____ 3. MAJOR SOURCE OF FARM INCOME? (1 = feeder calves; 2 = slaughter cattle; 3 = row crop sales; 4 = other)

PART VIII: APPLICATION OF INFORMATION

What practices have you adopted the past four (4) years that have helped you improve your beef operation? (Note: Agent briefly list practices below; e.g. crossbreeding, implanting)

GENERAL SURVEY INSTRUCTIONS

Date Due: December 1985.

Disposition: Mail completed survey forms to your Associate District Supervisor.

Population to be Surveyed: Beef Cow-Calf producers who have 25 or more breeding age cows.

Counties to be Surveyed: All counties.

Number of producers to be Surveyed:

- a. Counties having 15 to 50 producers survey 15
- b. Counties having 51 to 100 producers survey 20
- c. Counties having 101 to 300 producers survey 25
- d. Counties having over 300 producers survey 30.

Sampling Procedures:

- a. Use an up-to-date listing.
- b. Apply the Nth number technique to identify producers to be interviewed. Select a few alternates to replace those who for good reasons cannot be interviewed.

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COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS

The University of Tennessee Institute of Agriculture, U.S. Department of Agriculture, and county governments cooperating in furtherance of Acts of May 8 and June 30, 1914.

Agricultural Extension Service
M. Lloyd Downen, Dean

VITA

George M. Killgore was born April 9, 1952 to Mr. and Mrs. Houston T. Killgore of Crossville, Dekalb County, Alabama. He grew up in Hamilton County, Tennessee, where he attended John A. Patton Elementary School and was a graduate from Chattanooga Central High School in 1970. He entered Tennessee Technological University in 1970 and completed the requirements for a Bachelor of Science degree in Agriculture Natural Resource Management in 1975. While at Tennessee Tech., he was an active member of the Baptist Student Union.

He was employed as an assistant Extension agent in Fentress County, Tennessee in March 1976, responsible for youth agriculture programs. In 1983 he assumed the responsibilities of adult agriculture and was promoted to Extension leader.

He is married to the former Wanda Grace Parsley of Franklin, Tennessee and has one 18 month old daughter, Kayce.

He is a member of the Jamestown First Baptist Church, the Jamestown Rotary Club, the Tennessee Association of Agricultural Agents and Specialists, and Epsilon Sigma Phi. He was the 1985 District IV award winner for Catch-Four, 1987 state award winner for Catch-Four, 1986 TAA&S Outstanding Young Agent, 1986 recipient of the Jamestown Rotary Club Merit Award for Community Involvement, and the 1987 District IV and State Distinguished Service Award winner from TAA&S. He is also a member of the University of Tennessee Alumni Association Century Club.