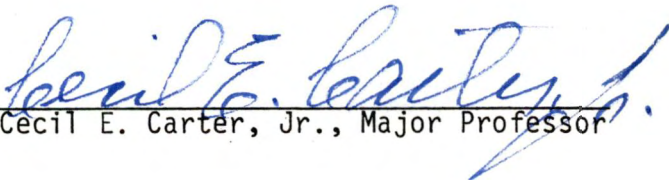
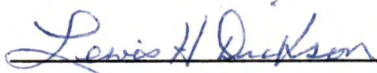
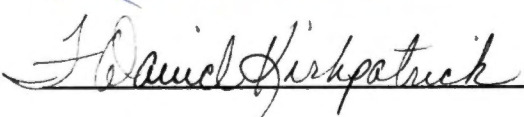


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RELATIONSHIPS BETWEEN TENNESSEE BEEF CATTLE PRODUCERS'
USE OF RECOMMENDED PRODUCTION PRACTICES AND
CHARACTERISTICS OF THE PRODUCERS, THEIR
FARM OPERATION AND CONTACTS WITH
COUNTY EXTENSION AGENTS

A Thesis
Presented for the
Master of Science
Degree
The University of Tennessee, Knoxville

Mark Lee Beeler

March 1986

AG-VET-MED.

Thesis

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ACKNOWLEDGMENTS

The author wishes to express his appreciation for the assistance given by his graduate committee: Dr. Cecil E. Carter, Jr., Dr. Lewis H. Dickson, and Dr. F. David Kirkpatrick for their constructive criticisms and helpful suggestions in reviewing this thesis.

Gratitude is expressed by the author to Dr. W. W. Armistead, Vice President for Agriculture, Institute of Agriculture, The University of Tennessee; Dr. M. Lloyd Downen, Dean, Agricultural Extension Service; Dr. Rural A. Peace, District Supervisor; Mr. A. C. Clark, District Supervisor, retired; and the Trousdale County Agricultural Extension Committee for encouragement and the granting of study leave.

ABSTRACT

The purpose of this study was to determine the relationships between selected beef producer characteristics and the recommended practices used and the average weaning weights of feeder calves sold. Data was collected through personal interviews with 1,799 beef producers in 84 counties using the 1981 Beef Cow-Calf Producer Survey. Producers interviewed had a minimum of 25 breeding age cows in their herd. The data were coded and punched on computer cards and computations made by The University of Tennessee Computing Center.

The analysis of variance F test and Chi Square were used to determine probability levels and the strength of the relationship between dependent and independent variables. F values and Chi Square values which achieved the .05 level of probability were accepted as significant.

Major findings included the following:

1. Fifty-one percent of the producers interviewed were full-time farmers and 47 percent had commercial crossbreds, 53 percent had a herd size in the 25 to 49 cow range, and 42 percent used only one bull.
2. Full-time farmers with purebred herds were using a higher percentage of the 22 selected recommended practices than other producers.
3. Producers using performance tested bulls were using more of the other recommended practices than those producers not using a performance tested bull.

4. Producers with the heaviest average weaning weights for feeder calves were retired farmers with commercial straightbred herds who had either 25 to 49 cows or 75 to 99 cows.

5. Producers following recommended production practices reported heavier weights for feeder calves sold at weaning than did those producers not using recommended practices.

Implications also were drawn and recommendations made for use of the findings and further study.

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CHAPTER I

THE PROBLEM AND ITS SETTING

I. INTRODUCTION

Beef cattle numbers in Tennessee have grown tremendously during the last three decades. Beef cattle numbers were 2,750,000 in 1984. Tennessee ranked tenth nationwide in terms of beef cattle numbers. (16)

Ample pastures offer great opportunities for beef production in Tennessee. There are more acres in pasture than all other crops combined. There are 5,000,000 acres of pasture land in Tennessee making it an ideal state for beef cattle production.

The Agricultural Extension Service has played an important role in the successful progress attained in Tennessee agriculture including beef cattle. Over the years the Extension Service has stressed the improvement of beef cattle management practices in order for the producer to achieve a greater return from his investment. With annual costs of approximately \$225 per cow, one can quickly discern the importance of offering the heaviest calves for sale at weaning with the lowest input costs. The Tennessee cow-calf business has the potential for being more efficient and therefore more profitable than it is. For example: the average weaning weight of calves sold is about 400 pounds. However, with improved management a 500 pound weaning weight is possible. Another way beef producers can be more efficient is to increase the percent calf crop from 70 percent to around 90 percent. Heavier weaning weights and higher calf crops percentage can mean a

greater return to beef producers. The goal of the Agricultural Extension Service is to improve the efficiency of beef production in Tennessee.

This study was concerned with the characteristics of beef producers and their farm operation, their use of performance tested bulls, and the weaning weights of the calves sold. It attempts to assess the quality of Tennessee beef cow-calf production system by using the weaning weights of calves sold as a criterion of the validity of the Tennessee Agricultural Extension Service's recommendations for beef production.

II. NEED FOR THE STUDY

Under provisions of the Smith-Lever Act, the Cooperative Extension Service exists to diffuse among the people of the United States useful and practical information on subjects relating to agriculture and home economics, and to encourage the application of the same. Extension agents work to encourage people to utilize more fully the resources that are available to them. This study was an effort to analyze selected aspects of the beef industry in Tennessee in order to provide a basis for improved Extension education programs in beef production.

Data were available from the 1981 Tennessee Cow-Calf Producer Survey. There was a need to analyze the data in order to determine to what extent the recommended beef production practices were being followed. There also was a need to examine the producer and farm

characteristics as they related to use of performance tested bulls. There also was a need to examine the relationship between producer and farm characteristics, and recommended production practices as they relate to the mean weaning weights of calves sold.

III. PURPOSE OF THE STUDY

The Agricultural Extension Service is charged with providing a research based information to beef producers in Tennessee. The objective of this study was to obtain information that would be useful in developing or restructuring programs for Tennessee beef producers.

The purpose of this study was to determine the relationships between selected characteristics of beef producers and their utilization of recommended practices and the mean weaning weights of calves sold.

Specifically, the objectives of this study were:

1. To characterize Tennessee beef producers and their farm operations.
2. To determine the relationships between certain characteristics of the beef producer and farm operation, the use of recommended beef practices and the use of performance tested bulls.
3. To determine the relationships between beef producer characteristics, recommended beef practices, and the mean weaning weights of calves sold.

IV. LIMITATIONS OF THE STUDY

This study was limited to the analysis of the data available from the 1981 Tennessee Beef Cow-Calf Producer Survey. The data were obtained by Extension agents through personal interviews and

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-four of the 95 counties in Tennessee were surveyed and 1,799 producers were included.

V. METHODS AND PROCEDURES

Population

The population of this study was beef cow-calf producers in 84 counties in Tennessee who had 25 or more breeding age cows (15 months of age or older) in their herd during the year previous to the survey.

Selection of Sample

Extension agents used their county list of beef producers to obtain the sample. The "nth" number technique was used to identify producers to be surveyed. Alternate producers were selected to replace those who for good reason could not be interviewed.

Development of Survey Instrument

The 1981 Tennessee Beef Cow-Calf Producer Survey was developed by The University of Tennessee, Agricultural Extension Service Specialist staff in the Animal Science department.

Conducting the Survey

The survey was conducted by Extension agents in the 84 counties through personal interview. The Extension agents scheduled interviews with producers and completed the survey on the farm or at the county Extension office.

Methods of Analysis

The data were coded and punched on computer cards. Computations were made by The University of Tennessee Computing Center. The analysis of variance F test and Chi Square test were used to determine the strength of the relationship between dependent and independent variables. The .05 probability level was the point at which a relationship was considered significant.

VI. DEFINITION OF TERMS

The following terms are defined to give the writer and reader a common understanding of the terms used in this study.

Cow-Calf Producer. A beef producer who maintains a herd of brood cows for the purpose of producing calves which are primarily marketed as feeder calves or as yearlings. Producing calves is the cow-calf producers main phase of beef production.

Recommended Practice. A research verified and commonly accepted procedure that, if performed correctly and on a scheduled basis, will increase the incidence of a desired outcome or return.

Performance Tested Bull. A bull that has undergone a 140 day feeding test to determine his rate of gain per day. Bulls are tested after weaning usually as yearlings. Rate of gain per day is a genetic trait that can be passed on to offspring.

Percent Calf Crop. Percent calf crop is the ratio of calves weaned to all females in the herd that are exposed to a bull during the breeding season.

CHAPTER II

REVIEW OF RELATED STUDIES

There is an extremely large amount of literature available on beef production. Most of the studies are focused on the technical subject matter of beef production and not directly related to this study. There have been several studies, however, in the past two decades related to the characteristics of beef producers and factors influencing adoption of recommended beef production practices. Selected findings from these studies will be reported in this review.

Studies cited in this chapter are reported under the following headings:

1. Characteristics of Tennessee beef producers and their farm operation.
2. Producers' use of recommended beef practices and factors influencing their adoption.
3. Producers' use of recommended beef production practices and average weaning weights of calves.

I. CHARACTERISTICS OF TENNESSEE BEEF

PRODUCERS AND THEIR FARM

OPERATION

Several survey type studies have been conducted on Tennessee beef producer characteristics and farm operation characteristics. The studies reviewed in this section are both county studies as well as statewide studies.

Mohamad (12) in a 1979 study involving 955 beef producers in a statewide survey found the following characteristics about Tennessee beef producers: they had an average of 47.6 breeding cows in the herd; used an average of 2.2 bulls; and they weaned an average 43.6 calves.

Headrick's (4) study involving 1,799 Tennessee beef producers revealed the following characteristics: 51 percent of the beef producers were full-time farmers; had an average herd size of 79 cows; and 42 percent of the producers used only one bull.

Lumpkin (10) in a 1985 study involving 1,047 beef producers discovered the following characteristics about Tennessee beef producers: 54 percent were full-time farmers; 52 percent used two or more bulls; and they weaned an average of 32 calves each.

In a 1982 study, Rutter (15) surveyed 1,047 beef producers in a statewide survey to secure data concerning beef producer characteristics. Rutter's study found the following characteristics about Tennessee beef producers: 53 percent 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 characteristics. Lovely reported the following characteristics by those surveyed: 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 (2) surveyed 40 beef producers in Marshall County. Brewer reported the following characteristics: 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 two bulls per herd.

In 1971 Barnes (1) conducted a study of 38 beef producers in Claiborne County. His findings included the following: 60 percent of the producers were full-time farmers; they had an average of 25 cows; weaned 21 calves and they used only one bull.

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

Luck (9) conducted a 1968 study of beef producer characteristics in Macon County. He found the following: 65 percent were full-time farmers and they had an average of 20 cows.

Keyes (6) in a 1966 study of Campbell County beef producers discovered the following characteristics: 67 percent were full-time farmers; they had an average of 29 cows; and weaned an average of 20 calves.

II. PRODUCER USE OF RECOMMENDED PRACTICES AND FACTORS INFLUENCING THEIR ADOPTION

Lumpkin (10) in a statewide Tennessee study found that six percent of the beef producers had their herds enrolled in TBCIP; 29 percent used performance tested bulls; 11 percent pregnancy checked

their cows; 13 percent used growth stimulants; and 85 percent dewormed their cows at least one time during the year.

Headrick (4) found that 17 percent of the producers checked bulls for breeding soundness; 31 percent used performance tested bulls; 61 percent dewormed their cows; 15 percent pregnancy checked their cows; 8 percent were enrolled in TBCIP; and 29 percent were using growth stimulants.

Mohamad's (12) study looked at differences between large and small sized beef herds. It was found that a higher percentage of the large producers were using more recommended practices than the small producers. Both groups were rated as weak (less than 60 percent using) in the following practices: use of performance tested bulls; herd enrolled in TBCIP; pregnancy checked cows; use of growth stimulants; and use of protein with low quality forages.

Rutter's (15) study in 1982 reported the following information regarding the use of recommended beef production practices by Tennessee producers: six percent were enrolled in TBCIP; 10 percent pregnancy checked their cows; 28 percent used performance tested bulls; 13 percent used growth stimulating implants; 85 percent dewormed cows once a year; and 55 percent fed protein supplement with low quality roughage.

III. FACTORS RELATED TO THE AVERAGE WEANING WEIGHT OF FEEDER CALVES

Lane (7) found that the last 30 to 45 days prior to calving was the most crucial in terms of calf development. Cows need a higher energy level in order to produce adequate milk and a healthy calf. He found that milk of cows and weaning weights of the calves were reduced by feeding a low level of TDN.

Powell (14) found, in a study of 28 growth stimulant implant trials, the average daily gain response for suckling calves was 8.8 percent, 15.1 percent for growing calves, and 10.8 percent for the finishing phase. It was shown that implants result in increased rate of gain and improved feed efficiency.

Collins (3) reported that producers can expect an increase of 8 to 10 percent in weaning weights by producing crossbred calves from straightbred cows and a 20 to 25 percent increase in weaning weights by using crossbred cows mated to a bull of a third breed.

Hill and Williams (5) reported that creep feeding resulted in an increased growth rate of .10 to .25 pounds per day. This response depends on the type of feed, the amount and length of the feeding period, pasture conditions, milk production of the dam, and the inherent growth potential of the calves.

Neel (13) reported that as calves grow older and increase in weight, their gain is increasingly affected by the quality and amount of available forage. Five years of research data indicated that calves grazing fescue-legume pastures gained 1.85 pounds per day as

compared to 1.69 pounds per day for calves grazing straight fescue pasture. The calves grazing the fescue-legume pasture were 40 pounds heavier at 240 days of age.

CHAPTER III

STUDY FINDINGS

The findings of this study were organized into three major sections according to the specific objectives of the study. Data pertaining to each objective are presented in separate tables.

In Section I major findings are reported regarding selected characteristics of the beef producers and their farming operation as background information for the reader.

In Section II major findings are reported regarding selected beef producer characteristics, use of selected recommended beef production practices, and the use of performance tested bulls.

In Section III major findings are reported regarding selected beef producer characteristics, use of selected recommended beef production practices and the mean weaning weights of calves sold.

I. CHARACTERISTICS OF BEEF PRODUCERS AND THEIR FARM OPERATIONS

Section I presents findings regarding selected characteristics of the beef producers and their farming operations. Table I presents 22 variables which tend to characterize the beef producer. Numbers and percents are reported for each variable.

Producer Characteristics

The characteristics of farming status and Extension contacts comprise the first portion of Table I.

TABLE I

CHARACTERISTICS OF BEEF CATTLE PRODUCERS
AND THEIR FARM OPERATION

Characteristics	Number of Producers	Percent of Producers
<u>Producer Characteristics:</u>		
Farm Status		
Full-time	885	51.0
Part-time	705	40.6
Retired	146	8.4
Total	1,736	100
Extension Contacts		
Not any	167	9.3
One-more	1,632	90.7
Total	1,799	100
<u>Farm Characteristics:</u>		
Herd Type		
Purebred	292	16.4
Commercial Straightbred	645	36.3
Commercial Crossbred	839	47.2
Total	1,776	100
Number of Females of Breeding Age in Herd		
Under 25 cows	120	6.7
25-49 cows	960	53.4
50-74 cows	353	19.6
75-99 cows	159	8.8
100 cows-over	207	11.5
Total	1,799	100
Number of Bulls Used		
One bull	755	42.0
Two bulls	603	33.5
Three bulls-over	441	24.5
Total	1,799	100

TABLE I (Continued)

Characteristics	Number of Producers	Percent of Producers
Number of Calves Sold-Weaning		
Under 25 calves	893	49.6
25-49 calves	579	32.2
50-74 calves	161	8.9
75-99 calves	45	2.5
100 calves-over	121	6.7
Total	1,799	100
Percent Cows/Heifers Weaning Calves		
Under 90	608	33.8
90-over	1,191	66.2
Total	1,799	100
<u>Breeding Management:</u>		
Cows Pregnancy Checked		
No	1,565	87.7
Yes	220	12.3
Total	1,785	100
Percent Calves Born Within 45 Days from First Calf		
Under 25%	161	9.3
25-49%	421	24.3
50-74%	686	39.7
75-98%	462	26.7
Total	1,730	100
Bulls Kept Separate From Cows During Off Breeding Season		
No	718	40.3
Yes	1,062	59.7
Total	1,780	100
Bulls Checked for Breeding Soundness		
No	1,479	83.4
Yes	294	16.6
Total	1,773	100
Used Performance Tested Bulls		
No	1,228	69.1
Yes	549	30.9
Total	1,777	100

TABLE I (Continued)

Characteristics	Number of Producers	Percent of Producers
<u>Feeding Management:</u>		
Major Forage Used to Winter Cows		
Hay	1,574	88.0
Silage	64	3.6
Combination	150	8.4
Total	1,788	100
Fed Cows by Weight and Stage of Production		
No	1,138	63.8
Yes	646	36.2
Total	1,784	100
Creep Feed Calves		
No	1,141	63.7
Yes	651	36.3
Total	1,792	100
Fed Protein Supplement Daily		
No	432	24.1
Yes	1,358	75.9
Total	1,790	100
Tested Forages		
No	1,683	94.0
Yes	107	6.0
Total	1,790	100
<u>General Herd Management:</u>		
Herd Enrolled in TBCIP or Other Program		
No	1,641	94.0
Yes	140	6.0
Total	1,781	100
Percent Permanent Pasture with 30% Legume		
Under 50	777	48.0
50-100	843	52.0
Total	1,620	100

TABLE I (Continued)

Characteristics	Number of Producers	Percent of Producers
Number of Times Feeder Calves Implanted		
None	1,257	71.0
Once	393	22.2
Twice	119	6.7
Three or more	2	0.1
Total	1,771	100
Season Brood Cows Dewormed		
Not dewormed	693	39.2
Fall	654	37.0
Fall and Spring	419	23.7
Total	1,766	100
Calves Dewormed While Nursing		
No	990	55.5
Yes	794	44.5
Total	1,784	100

*Totals vary because all producers did not answer all questions.

Farming status. 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.

Extension contacts. Of the 1,799 beef producers responding, only 167 (9.3 percent) reported no Extension contacts during the previous year while 1,632 (90.7 percent) reported one or more Extension contact during the previous year.

Farm Characteristics

The characteristics of the beef producers farms are summarized in the second part of Table I. The characteristics of herd type, number of females of breeding age in herd, number of bulls used, number of calves sold at weaning, and percent cows/heifers weaning calves are reported below giving numbers and percents for each variable.

Herd type. Two hundred and ninety-two producers (16.4 percent) reported their beef herds were purebred, 645 producers (36.3 percent) indicated their herd type as commercial straightbred, and 839 producers (47.2 percent) reported their herd type as commercial crossbred.

Number of females of breeding age in herd. In order to facilitate reporting, the producers were arranged into one of five groups according to the number of females of breeding age in the herd (females that were 15 months of age and older). The producers reported the following number of breeding age females in the herd: 120 (6.7 percent) had under 25 cows, 960 (53.4 percent) had 25 to 49

cows, 353 (19.6 percent) had 50 to 74 cows, 159 (8.8 percent) had 75 to 99 cows, and 207 (11.5 percent) had over 100 cows.

Number of bulls used. Producers were divided into three groups depending on the number of bulls reported used. Seven hundred and fifty-five (42 percent) producers reported using one bull; 603 (33.5 percent) producers reported using two bulls; 441 (24.5 percent) producers reported using three or more bulls.

Number of feeder calves sold at weaning. Producers were grouped into five categories in order to facilitate the reporting of the number of feeder calves sold at weaning. Producers reported the following number of weaned calves sold: 893 (49.6 percent) sold under 25 calves, 579 (32.2 percent) sold 25 to 49 calves, 161 (8.9 percent) sold 50 to 74 calves, 45 (2.5 percent) sold 75 to 99 calves, and 121 (6.7 percent) sold over 100 calves.

Recommended Practices

Beef producers' use of 15 recommended beef production practices are reported in the third part of Table I. The number and percent of producers using each of the recommended beef production practices are reported. The practices were classified by types of management categories including: breeding management, feeding management, and general herd management.

Breeding Management

The recommended practices that were classified as breeding management of the cow herd included: whether or not cows were

pregnancy checked, percent of calves born within 45 days from the first calf, whether or not bulls were kept separate from cows during the off breeding season, whether or not bulls were checked for breeding soundness, whether or not performance tested bulls were used.

Cows pregnancy checked. Most producers reported that they did not pregnancy check their cows. There were 1,565 (87.7 percent) producers who did not pregnancy check their cows.

Percent of calves born within 45 days from the first calf. As an aid to reporting, producers were divided into one of four groups as follows: 161 (9.3 percent) reported under 25 percent of calves were born within 45 days from the first calf, 421 (24.3 percent) reported 25 to 49 percent of calves were born within 45 days from the first calf, 686 (39.7 percent) reported 50 to 74 percent of calves were born within 45 days from the first calf, and 462 (26.7 percent) reported that 75 to 98 percent of their calves were born within 45 days from the first calf.

Bulls kept separate from cows during off breeding season. There were 718 (40.3 percent) of the producers who reported they did not keep the bulls separate from the cows during the off breeding season.

Checked bulls for breeding soundness. A vast majority of beef producers 1,479 (83.4 percent) reported that they did not have their bulls evaluated for breeding soundness.

Used performance tested bulls. The majority of beef producers 1,228 (69.1 percent) reported that they did not use performance tested bulls.

Feeding Management

The recommended production practices that were considered related to feeding management were major forages used to winter cows, if cows were fed by weight and stage of production, if calves were creep fed, if protein supplement was fed daily, if forages were tested.

Major forages used to winter cows. A large majority, 1,574 (88 percent), of producers reported feeding hay during the winter, 64 (3.6 percent) reported feeding silage, 150 (8.4 percent) reported feeding a combination of hay and silage.

Fed cows by weight and stage of production. The majority of beef producers, 1,138 (63.8 percent), did not feed cows based on special need.

Creep feed calves. A majority of beef producers, 1,141 (63.7 percent) did not creep feed calves.

Fed protein supplement daily. A large majority of beef producers, 1,358 (75.9 percent) did provide protein supplement daily.

Tested forages. An overwhelming majority of 1,683 (94 percent) of the 1,790 total respondents indicated that they did not have their forages tested.

General Herd Management

Several recommended management practices could be grouped no other way than general herd management and those practices include the following: if the herd was enrolled in TBCIP or similar program, percent permanent pasture with 30 percent legume, number of times the calves were implanted, season the brood cows were dewormed, if the calves were dewormed while nursing.

Herd enrolled in TBCIP or other program. Only 140 (6.0 percent) of the 1,781 producers surveyed reported they were enrolled in the Tennessee Beef Cattle Improvement Program (TBCIP) or other similar performance testing program.

Percent permanent pasture with 30 percent legumes. Seven hundred and seventy-seven producers (48 percent) reported that they had under 50 percent of their permanent pasture with 30 percent legumes. Slightly more, 843 (52 percent) reported that between 50 to 100 percent of their permanent pasture had 30 percent legumes.

Number of times feeder calves implanted. Of the 1,771 producers surveyed, 1,257 (71 percent) reported that they were not following the practice of using implants on calves. Three hundred and ninety-three (22.2 percent) implanted feeder calves once, 119 (6.7 percent) implanted feeder calves twice, 2 (0.1 percent) implanted their feeder calves 3 or more times.

Season brood cows dewormed. Of the 1,766 producers who were surveyed, 693 (39.2 percent) did not deworm the brood cows, 654 (37 percent) dewormed the brood cows once in the fall, 419 (23.7 percent) were dewormed twice in the fall and spring.

Calves dewormed while nursing. A total of 990 (55.5 percent) reported that they did not deworm the calves while nursing.

II. RELATIONSHIP BETWEEN BEEF PRODUCTION PRACTICES USED, AND THE USE OF PERFORMANCE TESTED BULLS

Section II presents findings regarding the relationships between producer characteristics, their use of 14 recommended production practices and their use of performance tested bulls. The number and percents are given in Table II for producers who did and did not use performance tested bulls. The Chi Square Test was used to determine the strength of the relationships between dependent and independent variables. The .05 probability level was accepted as significant.

Producer Characteristics

Farming status and Extension contacts are the producer characteristics summarized in part I of Table II.

Farming status. Of the 1,141 beef producers who reported that they were not using performance tested bulls, 560 (49.1 percent) were full-time operators, 471 (41.3 percent) were part-time operators, and 110 (9.6 percent) were retired operators. Of the 515 producers who reported using performance tested bulls, 289 (56.1 percent) were full-time operators, 195 (37.9 percent) were part-time operators, and 31 (6.0 percent) were retired operators.

The Chi Square (χ^2) test indicated that farming status and the use of performance tested bulls were significantly (0.007) related.

TABLE II

RELATIONSHIPS BETWEEN BEEF PRODUCER CHARACTERISTICS,
RECOMMENDED BEEF PRODUCTION PRACTICES USED,
AND THE USE OF PERFORMANCE TESTED BULLS

Characteristics	Use of Performance Tested Bulls						Row Total %	Number of Producers	χ^2	p
	No		Yes							
	Number of Producers	Column %	Row %	Number of Producers	Column %	Row %				
<u>Producer Characteristics:</u>										
Farm Status										
Full-time	560	49.1	66.0	289	56.1	34.0	100	849		
Part-time	471	41.3	70.7	195	37.9	29.3	100	666		
Retired	110	9.6	78.0	31	6.0	22.0	100	141		
Total	1,141	100.0		515	100.0			1,656	9.9	.007
Extension Contacts										
Not any	127	10.8	77.4	37	6.9	22.6	100	164		
One-more	1,049	89.2	67.9	497	93.1	32.1	100	1,546		
Total	1,176	100.0		534	100.0			1,710	5.9	.015
<u>Farm Characteristics:</u>										
Herd Type										
Purebred	108	9.3	38.7	171	32.6	61.3	100	279		

TABLE II (Continued)

Characteristics	Number of Producers	Use of Performance Tested Bulls				Number of Producers	Row Total %	χ^2	p
		No		Yes					
		Column %	Row %	Column %	Row %				
Commercial									
Straightbred	456	39.2	72.6	32.8	27.4	628	100		
Commercial									
Crossbred	600	51.5	76.7	34.6	23.3	782	100		
Total	1,164	100.0		100.0		1,689		145.0	.001
Number of Females of Breeding Age in Herd									
Under 25 cows	77	6.9	74.8	5.3	25.2	103	100		
25-49 cows	660	59.0	75.8	42.6	24.2	871	100		
50-74 cows	212	18.9	64.8	23.2	35.2	327	100		
75-99 cows	78	7.0	54.2	13.3	45.8	144	100		
100 cows-over	92	8.2	54.4	15.6	45.6	169	100		
Total	1,119	100.0		100.0		1,614		54.8	.001
Number of Bulls Used									
One bull	558	47.4	77.4	30.0	22.3	718	100		
Two bulls	391	33.3	68.5	33.7	31.5	571	100		
Three bulls-over	227	19.3	53.9	36.3	46.1	421	100		
Total	1,176	100.0		100.0		1,710		70.01	.001
Number of Calves Sold-Weaning									
Under 25 calves	591	50.2	70.0	47.4	30.0	844	100		
25-49 calves	400	34.0	72.1	29.0	27.9	555	100		

TABLE II (Continued)

Characteristics	Use of Performance Tested Bulls						Row Total %	Number of Producers	χ^2	p
	No			Yes						
	Number of Producers	Column %	Row %	Number of Producers	Column %	Row %				
50-74 calves	93	7.9	60.0	62	11.6	40.0	100	155		
75-99 calves	30	2.6	71.4	12	2.3	28.6	100	42		
100 calves-over	62	5.3	54.4	52	9.7	45.6	100	114		
Total	1,176	100.0		534	100.0			1,710	20.1	.001
Percent Cows/Heifers Weaning Calves										
Under 75%	387	32.9	73.3	141	26.4	26.7	100	528		
75-90%	789	67.1	66.8	393	73.6	33.2	100	1,182		
Total	1,176	100.0		534	100.0			1,710	6.9	.008
Breeding Management:										
Cows Pregnancy Checked										
No	1,090	93.2	72.7	409	76.7	27.3	100	1,499		
Yes	80	6.8	39.2	124	23.3	60.8	100	204		
Total	1,170	100.0		533	100.0			1,703	92.2	.001
Percent Calves Born Within 45 Days of First Calf										
Under 25%	128	11.2	83.1	26	5.0	16.9	100	154		
25-49%	298	26.0	71.6	118	22.9	28.4	100	416		
50-74%	453	39.6	67.7	216	41.9	32.3	100	669		
75-98%	266	23.2	63.2	155	30.2	36.8	100	421		
Total	1,145	100.0		515	100.0			1,660	22.9	.001

TABLE II (Continued)

Characteristics	Use of Performance Tested Bulls							Row Total %	χ^2	p
	No			Yes						
	Number of Producers	Column %	Row %	Number of Producers	Column %	Row %	Number of Producers			
Bulls Kept Separate From Cows										
No	575	49.2	83.7	112	21.1	16.8	687	100		
Yes	593	50.8	58.7	418	78.9	41.3	1,011	100		
Total	1,168	100.0		530	100.0		1,698		118.3	.001
Checked Bulls for Breeding Soundness										
No	1,053	89.9	73.8	374	71.8	26.2	1,427	100		
Yes	118	10.1	44.5	147	28.2	55.5	265	100		
Total	1,171	100.0		521	100.0		1,692		88.4	.001
Feeding Management:										
Major Forage Used to Winter Cows										
Hay	1,053	89.9	70.1	450	84.6	29.9	1,503	100		
Silage	36	3.1	60.0	24	4.5	40.0	60	100		
Combination	82	7.0	58.6	58	10.9	41.4	140	100		
Total	1,171	100.0		532	100.0		1,703		10.1	.006
Fed Cows by Weight and Stage of Production										
No	861	73.6	78.3	239	45.1	21.7	1,100	100		
Yes	309	26.4	51.5	291	54.9	48.5	600	100		
Total	1,170	100.0		530	100.0		1,700		123.4	.001

TABLE II (Continued)

Characteristics	Number of Producers	Use of Performance Tested Bulls				Number of Producers	Row Total %	χ^2	p
		No		Yes					
		Column %	Row %	Column %	Row %				
Creep Feed Calves									
No	815	69.3	73.6	293	55.2	26.4	1,108	100	
Yes	361	30.7	60.3	238	44.8	39.7	599	100	
Total	1,176	100.0		531	100.0		1,707		31.4 .001
Fed Protein Supplement Daily									
No	313	26.7	76.0	99	18.6	24.0	412	100	
Yes	861	73.3	66.5	433	81.4	33.5	1,294	100	
Total	1,174	100.0		532	100.0		1,706		39.1 .001
Tested Forages									
No	1,132	96.4	70.6	472	88.9	29.4	1,604	100	
Yes	42	3.6	41.6	59	11.1	58.5	101	100	
Total	1,174	100.0		531	100.0		1,705		39.1 .001
General Herd Management:									
Herd Enrolled in TBCIP or Other Program									
No	1,130	96.8	72.5	429	80.9	27.5	1,559	100	
Yes	37	3.2	26.8	101	19.1	73.2	138	100	
Total	1,167	100.0		530	100.0		1,697		121.0 .001

TABLE II (Continued)

Characteristics	Number of Producers	Use of Performance Tested Bulls				Number of Producers	Row Total %	χ^2	p
		No		Yes					
		Column %	Row %	Column %	Row %				
Percent Permanent Pasture with 30% Legume									
Under 50%	517	49.7	70.9	42.8	29.1	729	100		
50-100%	523	50.3	64.9	57.2	35.1	806	100		
Total	1,040	100.0		100.0		1,535		6.1	.001
Number of Times Feeder Calves Implanted									
None	889	76.4	74.2	59.2	25.8	1,198	100		
Once	221	19.0	59.2	29.1	40.8	373	100		
Twice	54	4.6	47.8	11.3	52.2	113	100		
Three or more	0	0	0	0.4	100.0	2	100		
Total	1,164	100.0		100.0		1,686		60.0	.001
Season Brood Cows Dewormed									
Not dewormed	535	46.1	79.7	26.0	20.3	671	100		
Fall	408	35.1	64.7	42.6	35.3	631	100		
Fall and Spring	218	18.8	56.9	31.4	43.1	383	100		
Total	1,161	100.0		100.0		1,685		67.7	.001
Calves Dewormed While Nursing									
No	728	62.0	77.1	41.1	22.9	944	100		
Yes	446	38.0	59.0	58.9	41.0	756	100		
Total	1,174	100.0		100.0		1,700		63.7	.001

Greater percentages of the full-time farmers (34.0 percent) were using performance tested bulls compared to 29.3 percent of the part-time farmers and 22.0 percent of the retired farmers.

Extension contacts. Of the 1,176 beef producers who reported not using performance tested bulls, 127 (10.8 percent) had no Extension contact and 1,049 (89.2 percent) had one or more Extension contact during the past 12 months. Of the 534 producers who indicated that they were using performance tested bulls 37 (6.9 percent) had no Extension contact and 497 (93.1 percent) had one or more Extension contacts.

The Chi Square (χ^2) test indicated that there was a significant (0.015) relationship between Extension contacts and the use of performance tested bulls. Higher percentages of those producers with one or more Extension contacts (32.1 percent) were using performance tested bulls compared to 22.6 percent of the producers who had no Extension contact.

Farm Characteristics

The characteristics of the beef producers' farm are summarized in the second part of Table II in order to establish the relationship between these independent variables and the use/non-use of performance tested bulls.

Herd type. One hundred and eight (9.3 percent) of the purebred producers, 456 (39.2 percent) of the commercial straightbred producers, and 600 (51.5 percent) of the commercial crossbred producers were not using performance tested bulls. Of the 525 producers who

were using performance tested bulls, 171 (32.6 percent) were purebred producers, 172 (32.8 percent) were commercial straightbred producers, and 182 (34.6 percent) were commercial crossbred producers.

The Chi Square (χ^2) indicated that herd type and the use of performance tested bulls were significantly (0.001) related. A greater percentage of the purebred producers (61.3 percent) were using performance tested bulls compared to 27.4 percent of the commercial straightbred producers and 23.3 percent of the commercial crossbred producers.

Number of females of breeding age in herd. In order to facilitate the reporting, the producers were classified into five categories according to the number of females of breeding age in the herd (females that were 15 months of age and older). For each group the number and percent is reported indicating use/non-use of performance tested bulls. There were 1,119 producers who reported not using performance tested bulls, and of that total, 77 (6.9 percent) had under 25 cows, 660 (59.0 percent) had 25 to 49 cows, 212 (18.9 percent) had 50 to 74 cows, 78 (7.0 percent) had 75 to 99 cows, and 92 (8.2 percent) had 100 cows or more. Of the 495 producers who reported that they did use performance tested bulls, 26 (5.3 percent) had under 25 cows, 211 (42.6 percent) had 25 to 49 cows, 115 (23.2 percent) had 50 to 74 cows, 66 (13.3 percent) had 75 to 99 cows, and 77 (15.6 percent) had 100 cows or more.

The Chi Square (χ^2) test indicated that the size of the beef herd and the use of performance tested bulls were significantly

related (0.001). A greater percentage of those producers with herds from 75 to 99 cows (45.8 percent) were using performance tested bulls compared to 45.6 percent of producers with over 100 cows, producers with 50 to 74 cows (35.2 percent), producers with less than 25 cows (25.2 percent), and producers with 25 to 49 cows (24.2 percent) were using performance tested bulls. Producers with larger herds were more likely to be using performance tested bulls than were producers with smaller herds.

Number of bulls used. There were 1,176 producers who reported non-use of performance tested bulls and of that total 558 (47.4 percent) were using one bull, 391 (33.3 percent) were using two bulls, and 227 (19.3 percent) were using three or more bulls. Of the 534 producers who reported using performance tested bulls, 160 (30.0 percent) were using one bull, 180 (33.7 percent) were using two bulls, and 194 (36.3 percent) were using three or more bulls.

The Chi Square (χ^2) test indicated a significant relationship (0.001) between the number of bulls used and the use of performance tested bulls. A high percentage of those producers using three or more bulls (46.1 percent) were using performance tested bulls compared to 31.5 percent of the producers using two bulls and 22.3 percent of the producers using only one bull. Producers with larger numbers of herd bulls were more likely to be using performance tested bulls.

Number of calves sold at weaning. There were 1,176 producers who reported that they were not using performance tested bulls. Of

that total, 591 (50.2 percent) sold under 25 calves, 400 (34.0 percent) sold 25 to 49 calves, 93 (7.9 percent) sold 50 to 74 calves, 30 (2.6 percent) sold 75 to 99 calves, 62 (5.3 percent) sold 100 calves or more. There were 534 producers who reported that they were using performance tested bulls. Of that number 253 (47.4 percent) sold less than 25 calves, 155 (29.0 percent) sold 25 to 49 calves, 62 (11.6 percent) sold 50 to 74 calves, 12 (2.3 percent) sold 75 to 99 calves, and 52 (9.7 percent) sold 100 calves or more.

The Chi Square (χ^2) test indicated that the number of calves sold at weaning and the use of performance tested bulls were significantly related (0.001). Of those producers who sold over 100 calves, 45.6 percent used performance tested bulls, compared to 40.0 percent of the producers selling 50 to 74 calves, 30.0 percent of the producers selling less than 25 calves, 28.6 percent of the producers who sold 75 to 99 calves, and 27.9 percent of the producers who sold 25 to 49 calves. Producers who sold more calves were more likely to be using performance tested bulls.

Percent cows and heifers weaning calves. There were 1,176 producers who reported that they did not use performance tested bulls. Of that total 387 (32.9 percent) had cows that on the average were weaning under 75 percent of their calves, 789 (67.1 percent) had cows that were on the average weaning 75 to 90 percent of their calves. There were 534 producers who reported that they were using performance tested bulls. Of that total 141 (26.4 percent) had cows that on the average weaned under 75 percent of their calves and 393 (73.6 percent) had cows that weaned 75 to 90 percent of the calves.

The Chi Square (χ^2) test indicated that the percent of cows and heifers weaning calves was significantly related to the use of performance tested bulls. A greater percentage of producers who used performance tested bulls than those who did not had a higher percent of cows and heifers weaning calves. Producers who used performance tested bulls had a higher percentage of their cows and heifers weaning calves than those who did not use performance tested bulls.

Recommended Practices

Relationships between 14 selected recommended beef production practices and the non-use/use of performance tested bulls are reported in the third part of Table II. The practices were classified according to the type of management involved and include the following: breeding management, feeding management, and general herd management.

Breeding Management

There were four categories of recommended beef production practices that comprise breeding management. These practices include: whether or not cows were pregnancy checked, the percentage of calves born within 45 days of the first calf, whether or not bulls were kept separate from cows during the off breeding season, and whether or not bulls were checked for breeding soundness.

Cows pregnancy checked. There were 1,170 producers who indicated that they did not use performance tested bulls and of that number 1,090 (93.2 percent) reported they did not have their cows

pregnancy checked and 80 (6.8 percent) reported that they did pregnancy check their cows. There were 533 producers who reported that they did use performance tested bulls and of that number 409 (76.7 percent) did not pregnancy check their cows and 124 (23.3 percent) did have their cows pregnancy checked.

The Chi Square (χ^2) test indicated there was a significant (0.001) relationship between whether cows were pregnancy checked and the use of performance tested bulls. Of those producers who reported using a performance tested bull, a greater percentage of producers who did have their cows pregnancy tested were using performance tested bulls than those who did not. Producers who had their cows pregnancy checked were more likely to use performance tested bulls.

Percent calves born within 45 days of first calf. There were 1,145 producers who reported that they did not use performance tested bulls and of that number 128 (11.2 percent) had under 25 percent of the calves born within 45 days of the first calf, 298 (26.0 percent) had 25 to 49 percent of the calves born within 45 days of the first calf, 453 (39.6 percent) had 50 to 74 percent of the calves born within 45 days of the first calf, 266 (23.2 percent) had 75 to 98 percent of the calves born within 45 days of the first calf. There were 515 producers who reported that they used performance tested bulls and of that number 26 (5.0 percent) had under 25 percent of the calves born within 45 days of the first calf, 118 (22.9 percent) had 25 to 49 percent of the calves born within 45 days of the first calf, 216 (41.9 percent) had 50 to 74 percent of the calves born within 45

days of the first calf, and 155 (30.2 percent) had 75 to 98 percent of their calves born within 45 days of the first calf.

The Chi Square (χ^2) test indicated a significant (0.001) relationship between the percent of calves born within 45 days of the first calf and the use of performance tested bulls. A greater percentage of producers who used performance tested bulls had over 50 percent of their calves born within 45 days of the first calf than those who did not use performance tested bulls. Producers who used performance tested bulls were more likely a greater percentage of their calves born within a 45 day interval.

Bulls kept separate from cows. There were 1,168 producers who reported that they did not use performance tested bulls and of that number 575 (49.2 percent) did not keep bulls separate from the cows, 593 (50.8 percent) did keep bulls separate from the cows. There were 530 producers who indicated that they did use performance tested bulls and of that number 112 (21.1 percent) did not keep bulls separate from cows, 418 (78.9 percent) did keep bulls separate from their cows.

The Chi Square (χ^2) test indicated a significant relationship (0.001) between whether or not bulls were kept separate from the cows and the use of performance tested bulls. A greater percentage of those producers who used performance tested bulls kept the bulls separate from the cows during the non-breeding times than those who did not use performance tested bulls. Producers who used performance tested bulls were more likely to keep bulls separate from cows during the off-breeding season.

Checked bulls for breeding soundness. Of the 1,171 producers who indicated that they did not use a performance tested bull, 1,053 (89.9 percent) producers did not have their bulls evaluated for breeding soundness, 118 producers (10.1 percent) did have their bulls evaluated for breeding soundness. There were 521 producers who indicated they did use a performance tested bull, and of that number 374 (71.8 percent) reported that they did not have their bulls evaluated for breeding soundness, 147 (28.2 percent) producers reported that they did have their bulls checked for breeding soundness.

The Chi Square (X^2) test indicated a significant relationship (0.001) between whether bulls were evaluated for breeding soundness and the use of performance tested bulls. A higher percentage of producers who used performance tested bulls checked their bulls for breeding soundness compared to those producers who did not use performance tested bulls.

Feeding Management

The heading of feeding management is composed of five categories all of which are recommended beef production practices. These practices include: the major forage used as a winter feed, whether cows were fed based on their weight and stage of production, whether calf creep feeds were used, whether the cows were fed a protein supplement daily, and whether producers had their forages tested.

Major forages used to winter cows. There were 1,171 producers responding to the survey who indicated they did not use performance tested bulls. Of that total, 1,053 (89.9 percent) used only hay as

a winter feed, 36 (3.1 percent) used only silage as a winter forage, and 82 (7.0 percent) reported using a combination of hay and silage as the major winter forage. There were 532 producers who did use a performance tested bull and of that number 450 (84.6 percent) fed hay as the main winter forage, 24 (4.5 percent) used silage as their main winter forage, and 58 (10.9 percent) reported using a combination of hay and silage as the main forage for winter feeding.

The Chi Square (χ^2) test indicated a significant relationship (0.006) between the type of winter forage used and the use of performance tested bulls. A larger percentage of producers who used hay as the primary winter forage did not use performance tested bulls than those who did use performance tested bulls. A larger percentage of producers who used silage or a combination of hay and silage used performance tested bulls.

Fed cows by weight and stage of production. There were 1,170 producers who indicated that they did not use a performance tested bull and of that total, 861 (73.6 percent) did not feed their cows based on weight and stage of production, and 309 (26.4 percent) indicated they did group their cows in order to feed them based on weight and stage of production. There were 530 producers who reported using a performance tested bull, and of that total 239 (45.1 percent) did not feed their cows based on weight and stage of production, and 291 (54.9 percent) reported they did feed their cows based on weight and stage of production.

The Chi Square (χ^2) test indicated that the relationship between feeding cows based on weight and stage of production and the use of performance tested bulls was significant (0.001). A greater percentage of producers who did use performance tested bulls fed according to their cow's weight and stage of production compared to those who did not use performance tested bulls.

Creep feed calves. There were 1,176 producers who reported that they did not use a performance tested bull and of that number 815 (69.3 percent) did not creep feed their calves, and 361 (30.7 percent) did creep feed their calves. There were 531 producers who did use a performance tested bull and of that figure 293 (55.2 percent) did not creep feed their calves while 238 (44.8 percent) did creep feed the calves.

The Chi Square (χ^2) test indicated that the relationship between creep feeding calves and the use of performance tested bulls was significant (0.001). A larger percentage of producers who did use performance tested bulls did creep feed their calves than those who did not use performance tested bulls. Producers who used performance tested bulls were more likely to creep feed their calves.

Fed protein supplement daily. There were 1,174 producers who indicated that they did not use a performance tested bull and of that total 313 (26.7 percent) fed no protein supplement daily, while 861 (73.3 percent) did feed protein supplement daily. There were 532 producers who reported using a performance tested bull and of that number 99 (18.6 percent) did not feed protein supplement daily and 433 (81.4 percent) did feed their cows protein supplement daily.

The Chi Square (χ^2) test indicated that there was a significant relationship (0.001) between feeding protein supplement daily and the use of performance tested bulls. A greater percentage of producers who used performance tested bulls fed protein supplement daily. Producers who used performance tested bulls were more likely to feed protein supplement daily.

Tested forages. There were 1,174 beef producers who indicated that they did not use a performance tested bull, and of that number 1,132 (96.4 percent) indicated that they did not have their forages tested. There were 42 (3.6 percent) who indicated that they did have their forages tested. Of the 531 producers who did use a performance tested bull, 472 (88.9 percent) did not have their forages tested. There were 59 producers (11.1 percent) who indicated that they did have their forages tested.

The Chi Square (χ^2) test indicated that the relationship between testing forages and the use of a performance tested bull was significant (0.001). A greater percentage of producers who did use performance tested bulls did have their forages tested. Producers who used performance tested bulls were more likely to have their forages tested.

General Herd Management

General herd management is composed of five categories which include: whether the herd was enrolled in TBCIP, the percent of pastures with 30 percent legume, the number of times that feeder

calves were implanted, the season during which the brood cows were dewormed, and whether the calves were dewormed while nursing the cows.

Herd enrolled in TBCIP or other program. There were 1,167 producers who did not use a performance tested bull and of that number 1,130 (96.8 percent) did not have their herd enrolled in TBCIP or other similar program, and 37 (3.2 percent) did have their herd enrolled in TBCIP or similar program. Of the 530 producers who were using a performance tested bull, 429 (80.9 percent) were not enrolled in TBCIP or similar program, and 101 (19.1 percent) did have their herds enrolled in TBCIP or similar program.

The Chi Square (χ^2) test indicated that the relationship between whether the herd was enrolled in TBCIP or similar program and the use of a performance tested bull was significant (0.001). A greater percentage of those producers who used performance tested bulls had their herds enrolled in TBCIP or other similar program. Producers who used performance tested bulls were more likely to enroll their herds in TBCIP or other similar program.

Percent permanent pasture with 30 percent legumes. There were 1,040 producers who reported that they did not use performance tested bulls. Of that figure, 517 (49.7 percent) had less than 50 percent of their permanent pasture with 30 percent legumes, and 523 (50.3 percent) had 50 to 100 percent of their permanent pastures with 30 percent legumes. There were 495 producers who did use a performance tested bull and 50 percent of their permanent pastures with 30

percent legumes, while 283 (57.2 percent) producers had 50 to 100 percent of their pastures with 30 percent legumes.

The Chi Square (χ^2) test indicated a significant relationship (0.014) between the percent of permanent pastures with 30 percent legumes and the use of performance tested bulls. A greater percentage of those producers who did use performance tested bulls had over half of their pasture containing 30 percent legumes. Producers who used performance tested bulls were more likely to have 30 percent legumes in a higher percentage of their permanent pasture than those who did not use performance tested bulls.

Number of times feeder calves implanted. Of the 1,164 producers who did not use a performance tested bull, 889 (76.4 percent) did not implant their calves at all, 221 (19.0 percent) implanted their calves once, 54 (4.6 percent) implanted their calves twice and none implanted three times or more. There were 522 producers who did use a performance tested bull and of that group, 309 (59.2 percent) did not implant their calves, 152 (29.1 percent) implanted their calves only once, 59 (11.3 percent) implanted their calves twice and 2 (0.4 percent) implanted their calves three or more times.

The Chi Square (χ^2) test indicated that the number of times feeder calves were implanted and the use of performance tested bulls were very significantly (0.001) related. A greater percentage of those producers who did use performance tested bulls (40.8 percent) implanted their feeder calves one or more times as compared to the producers who did not use performance tested bulls only 23.6 percent of them implanted feeder calves one or more times.

Season brood cows dewormed. There were 1,161 producers who did not use performance tested bulls and of that total, 408 (35.1 percent) dewormed in the fall, and 218 (18.8 percent) dewormed in the fall and spring. There were 524 producers who reported using performance tested bulls and of that group, 136 (26.0 percent) did not deworm their cows, 223 (42.6 percent) dewormed the cows in the fall and 165 (31.4 percent) dewormed the cows in the fall and spring.

The Chi Square (X^2) test indicated a significant (0.001) relationship between the use of performance tested bulls and deworming brood cows. A greater percentage of producers who use performance tested bulls (74 percent) dewormed their brood cows either once or twice per year while only 53.9 percent of the producers not using performance tested bulls dewormed their cows either once or twice per year.

Calves dewormed while nursing. There were 1,174 producers who reported they did not use a performance tested bull and of that group, 728 (62 percent) did not deworm their calves while they were nursing and 446 (38 percent) did deworm their calves while the calves were nursing. There were 526 producers who indicated they did use performance tested bulls and of that total, 216 (41.1 percent) did not deworm their calves while they were nursing and 310 (58.9 percent) did deworm the calves while they were nursing.

The Chi Square (X^2) test indicated a significant (0.001) relationship between the use of performance tested bulls and whether calves were dewormed while they were nursing. A greater percentage

of producers who used performance tested bulls (58.9 percent) dewormed their calves while the calves were nursing compared to 38.0 percent of the producers who did not use a performance tested bull dewormed their calves while the calves were still nursing.

III. RELATIONSHIP BETWEEN BEEF PRODUCER CHARACTERISTICS, RECOMMENDED BEEF PRODUCTION PRACTICES, AND THE MEAN WEANING WEIGHTS OF CALVES SOLD

Section III presents findings regarding the relationships between producer characteristics, the producer's use of 15 recommended production practices, and the mean weaning weights of the calves sold. The number of producers in each category are reported along with the average weaning weights in Table III for each producer characteristic and each recommended production practice. The data were statistically analyzed by the one-way analysis of variance F test to determine the strength of relationships between dependent and independent variables. The .05 level of probability was considered significant.

Farming status. Eight hundred and seventy-one of the 1,711 beef producers were full-time farmers. The average weaning weights of calves produced by these farmers was 395 pounds. There were 687 part-time farmers who produced calves that achieved an average weaning weight of 406 pounds, and there were 153 retired farmers who produced calves that had an average weaning weight of 435 pounds.

TABLE III

RELATIONSHIPS BETWEEN BEEF PRODUCER CHARACTERISTICS,
RECOMMENDED BEEF PRODUCTION PRACTICES AND
THE MEAN WEANING WEIGHTS OF CALVES SOLD

Characteristics	Number of Producers	Average Weaning Weight		
		Mean Weight (Pounds)	F	p
<u>Producer Characteristics:</u>				
Farm Status				
Full-time	871	395		
Part-time	687	406		
Retired	153	435		
Total	1,711	403	3.6	.030
Extension Contacts				
Not any	166	371		
One-more	1,633	403		
Total	1,799	400	4.7	.030
<u>Farm Characteristics:</u>				
Herd Type				
Purebred	286	366		
Commercial Straightbred	634	410		
Commercial Crossbred	786	408		
Total	1,706	402	6.4	.001
Number of Females of Breeding Age in Herd				
Under 25 cows	116	322		
25-49 cows	941	413		
50-74 cows	347	401		
75-99 cows	158	413		
100 cows-over	237	375		
Total	1,799	400	8.4	.001
Number of Bulls Used				
One bull	724	401		
Two bulls	577	405		
Three bulls-over	498	391		
Total	1,799	400	0.9	.420

TABLE III (Continued)

Characteristics	Number of Producers	Average Weaning Weight		F	p
		Mean Weight (Pounds)			
Number of Feeder Calves Sold-Weaning					
Under 25 calves	857	344			
25-49 calves	558	463			
50-74 calves	156	456			
75-99 calves	42	476			
100 calves-over	186	402			
Total	1,799	400	49.9		.001
Percent Cows/Heifers Weaning Calves					
Under 75%	533	393			
75-90%	1,266	403			
Total	1,799	400	1.2		.277
<u>Breeding Management:</u>					
Cows Pregnancy Checked					
No	1,507	407			
Yes	208	386			
Total	1,715	404	2.6		.105
Percent Calves Born Within 45 Days of First Calf					
Under 25%	158	374			
25-49%	420	392			
50-74%	675	406			
75-98%	421	423			
Total	1,674	403	3.8		.010
Bulls Kept Separate From Cows					
No	690	390			
Yes	1,019	415			
Total	1,709	405	8.8		.003
Checked Bulls for Breeding Soundness					
No	1,448	403			
Yes	281	396			
Total	1,729	402	0.4		.054

TABLE III (Continued)

Characteristics	Number of Producers	Average Weaning Weight		F	p
		Mean Weight (Pounds)			
Used Performance Tested Bulls					
No	1,176	402			
Yes	534	407			
Total	1,710	404	0.3		.600
<u>Feeding Management:</u>					
Major Forage Used to Winter Cows					
Hay	1,519	410			
Silage	69	370			
Combination	150	341			
Total	1,738	402	11.7		.001
Fed Cows by Weight and Stage of Production					
No	1,109	408			
Yes	604	392			
Total	1,713	402	3.2		.073
Creep Feed Calves					
No	1,113	402			
Yes	607	405			
Total	1,720	403	0.11		.740
Fed Protein Supplement Daily					
No	414	399			
Yes	1,305	404			
Total	1,719	403	0.23		.630
Tested Forages					
No	1,617	404			
Yes	101	380			
Total	1,718	784	7.04		.001
<u>General Herd Management:</u>					
Herd Enrolled in TBCIP or Other Program					
No	1,571	407			
Yes	138	377			
Total	1,709	404	3.61		.058

TABLE III (Continued)

Characteristics	Number of Producers	Average Weaning Weight		F	p
		Mean Weight (Pounds)			
Percent Permanent Pasture with 30% Legume					
Under 50	798	400			
50-100	814	404			
Total	1,612	402	0.16	.689	
Number of Times Feeder Calves Implanted					
None	1,204	402			
Once	377	419			
Twice	116	366			
Three or more	2	255			
Total	1,699	403	3.38	.018	
Season Brood Cows Dewormed					
Not dewormed	676	410			
Fall	633	406			
Fall and Spring	388	389			
Total	1,697	404	1.89	.152	
Calves Dewormed While Nursing					
No	949	398			
Yes	763	411			
Total	1,712	404	2.17	.141	

The variance F test indicated a significant relationship between farming status and the average weaning weight of calves. The retired beef producer sold calves at a higher average weaning weight.

Extension contacts. One hundred and sixty-six of the 1,799 beef producers reported no Extension contact and the average weaning weight of calves produced by that group was 371 pounds. There were 1,633 beef producers who reported having one or more Extension contacts and the average weaning weights of calves produced by this group was 403 pounds. When tested by the F test there was a significant relationship between total Extension contacts over the last 12 months and the average weaning weight of calves. Those producers with one or more Extension contacts sold calves with a higher average weaning weight.

Herd type. There were 286 beef producers with a purebred herd and their average weaning weight of calves they produced was 366 pounds. There were 634 producers with a commercial straightbred herd and they produced calves with an average weaning weight of 410 pounds. Seven hundred and eighty-six producers with commercial crossbred herds produced calves that had an average weaning weight of 408 pounds. When tested by the F test there was a significant relationship between herd type and the average weaning weight. Producers with commercial straightbred herds sold calves with higher average weaning weights.

Number of females of breeding age in herd. Of the 1,799 beef producers who responded to this question, 116 had fewer than 25 cows

with an average weaning weight of 322 pounds. There were 941 producers with 25 to 49 cows who produced calves with an average weaning weight of 413 pounds, 347 producers with 50 to 74 cows and the average weaning weight of their calves was 401 pounds, 158 producers with 75 to 99 cows produced calves with an average weaning weight of 413 pounds, and 237 producers with over 100 cows produced calves with an average weaning weight of 375 pounds. When tested by the F test there was a positive and significant relationship between the number of females of breeding age in the herd and the average weaning weight of calves. Producers with less than 25 cows in herd tended to wean lighter calves than other producers.

Number of bulls used. Of the 1,799 beef producers who responded to this question, 724 of them used one bull and their calves had a 401 pound average weaning weight, 577 producers used two bulls and their calves had a 405 pound average weaning weight, and 498 who reported using three or more bulls produced calves with a 391 pound average weaning weight. When analyzed by the F test, there was not a significant relationship between the number of bulls used and the average weaning weight of calves.

Number of feeder calves sold at weaning. Of the 1,799 beef producers who responded, there were 857 producers who sold fewer than 25 calves which had an average weaning weight of 344 pounds. There were 558 producers who sold 25 to 49 calves with an average weaning weight of 463 pounds. There were 156 producers who sold 50 to 74 calves with an average weaning weight of 456 pounds. There were 42

producers who sold 75 to 99 calves with an average weaning weight of 476 pounds. The 186 producers who sold over 100 calves had an average weaning weight of 402 pounds. When tested by the variance F test, there was a positive and significant relationship between the number of calves sold and the average weaning weights. Producers selling 75 to 99 calves tended to have the highest average weaning weights.

Percent of cows or heifers weaning calves. Five hundred and thirty-three of the 1,799 producers had less than 75 percent of their cows or heifers weaning calves and those calves had an average weaning weight of 393 pounds. The 1,266 producers who had 75 to 90 percent of their cows or heifers weaning calves sold calves with an average weight of 403 pounds. The analysis variance F test showed there was not a significant relationship between the percentage of cows or heifers weaning calves and the average weaning weight of calves.

Cows pregnancy checked. Of the 1,715 beef producers who responded to this question, 1,507 producers reported they did not pregnancy check their cows and they sold calves with an average weaning weight of 407 pounds, and 208 producers did have their cows pregnancy checked and those calves had an average weaning weight of 386 pounds. The analysis of variance F test indicated there was not a significant relationship between whether cows were pregnancy checked on average weaning weights. However, this could be explained by the fact that

of those who did pregnancy check, 61 percent used performance tested bulls and they probably had a better measure of weaning weights than those who did not pregnancy check.

Percent of calves born within 45 days of first calf. The 421 producers who had 75 to 98 percent of their calves born within 45 days of the first calf had an average calf weaning weight of 423 pounds, while 675 producers who had 50 to 74 percent of their calves born within 45 days of the first calf reported average weaning weight of calves to be 406 pounds. There were 420 producers who had 25 to 49 percent of their calves born within 45 days of the first calf reported average calf weaning weight was 392 pounds. The 158 producers who had less than 25 percent of their calves born within 45 days of the first calf reported an average calf weaning weight of 374 pounds. When tested by the F test, there was a significant relationship between the percent of calves born within 45 days of the first calf and the average weaning weights. Producers with the largest percent of calves born within the shortest period of time tended to wean the heavier calves.

Bulls kept separate from cows during off breeding season. There were 1,709 producers who responded to this question and 690 producers indicated that they did not keep bulls separate from cows during the off breeding season had calves with an average weaning weight of 390 pounds. There were 1,019 producers who did keep bulls separate from cows during the off breeding season and their average calf weaning weight was 415 pounds. The F test indicated a significant

relationship between keeping bulls and cows separate during the off breeding season and the average weaning weight of calves. Producers who used a definite breeding season tended to wean heavier calves.

Checked bulls for breeding soundness. Of the 1,729 beef producers who responded, 1,448 producers did not have the bulls evaluated for breeding soundness, and they reported an average calf weaning weight of 403 pounds. There were 281 producers who did have their bulls evaluated for breeding soundness and their average calf weaning weight was 396 pounds. When tested by the variance F test, it was found there was not a significant relationship between bulls evaluated for breeding soundness and average weaning weights. However, this could be explained by the fact that 56 percent of those who had their bulls checked for breeding soundness used performance tested bulls and they probably had a better measure of weaning weights than those who did not check the bulls for breeding soundness.

Used performance tested bulls. There were 1,176 beef producers who did not use a performance tested bull, of the 1,710 total interviewed, these producers reported an average calf weaning weight of 402 pounds. There were 534 producers who did use performance tested bulls and those producers recorded an average calf weaning weight of 407 pounds. The variance F test indicated there was not a significant relationship between the use of performance tested bulls and average weaning weights.

Major forages used to winter cows. One thousand, five hundred and nineteen beef producers utilized only hay as the major winter

forage and the average weaning weight of the calves was 410 pounds. Sixty-nine producers used silage as the major winter forage with the average weaning weight of calves at 370 pounds. There were 150 producers who utilized a combination of both hay and silage as the major winter forages and the average calf weaning weight was 341 pounds. When analyzed by the F test, there was a significant relationship between the type of winter forage used to feed cows and the average weaning weight of calves. Producers who fed hay had calves with higher weaning weights than those who fed silage.

Fed cows by weight and stage of production. Of the 1,713 producers who responded, there were 1,109 who did not feed their cows according to weight and stage of production and they reported an average calf weaning weight of 408 pounds. There were 604 producers who indicated they were feeding their cows by weight and stage of production and the average weaning weight of their calves was 392 pounds. When tested by the F test, there was not a significant relationship between feeding cows by weight and stage of production and average weaning weight.

Creep feed calves. There were 1,113 of the 1,720 producers who did not creep feed their calves and they reported an average calf weaning weight of 402 pounds. There were 607 producers who did creep feed their calves and they reported a 405 pound average weaning weight for those calves. The F test showed there was not a significant relationship between creep feeding calves and the average weaning weight.

Fed protein supplement daily. Of the 1,719 producers who responded to the question, 414 did not feed a protein supplement daily and they recorded an average calf weaning weight of 399 pounds. There were 1,305 producers who did feed a protein supplement daily and the average weaning weight of their calves was 404 pounds. The variance F test showed there was not a significant relationship.

Tested forages. There were 1,718 beef producers who responded to this question and 1,617 of them said they did not test their forages and they recorded a 404 pound average calf weaning weight. There were 101 producers who did have their forages tested and the average weaning weight of their calves was 380 pounds. When analyzed by the F test, there was significant relationship between testing forages and the average weaning weight of calves. This may indicate that the quality of forage that was available was adequate to meet the nutritional needs of the calves since producers who did not test their forage had a higher average calf weaning weight.

General Herd Management

The heading of general herd management was subdivided into five categories including: whether the herd was enrolled in TBCIP, the percent permanent pasture with 30 percent legume, number of times feeder calves were implanted, season the brood cows were dewormed, and whether the calves were dewormed while nursing. These recommended practices were studied to determine their relationship to the average weaning weights of calves.

Herd enrolled in TBCIP or other program. There were 1,709 beef producers who responded to this question and of that number 1,571 producers reported their herd was not enrolled in any kind of performance testing program and their calves had an average weaning weight of 407 pounds. There were 138 producers who were enrolled in TBCIP or similar program and their average calf weaning weight was 377 pounds. The F test indicated there was not a significant relationship between enrollment in TBCIP or similar program and average weaning weights of calves.

Percent permanent pasture with 30 percent legumes. Of the 1,612 beef producers who responded, 798 of them indicated they had less than 50 percent of their permanent pasture with 30 percent legumes in it and their average calf weaning weight was 400 pounds. There were 814 producers who reported between 50 to 100 percent of their permanent pastures with 30 percent legumes in it and the average weaning weight of their calves was 404 pounds. The F test showed there was not a significant relationship between the percent of permanent pasture with 30 percent legumes and the average weaning weight of the calves.

Number of times feeder calves implanted. There were 1,699 beef producers who responded and of that total, 1,204 indicated they did not implant their calves with a growth stimulant and they recorded a 402 pound average calf weaning weight. There were 377 producers who implanted their calves once and the average weaning weight of their calves was 419 pounds. There were 116 producers who implanted their

calves twice and the average weaning weight of their calves was 366 pounds. There were two producers who implanted three or more times and they reported an average calf weaning weight of 255 pounds. The F test showed there was a significant relationship between implanting with a growth stimulant and the average weaning weight of calves. Producers who implanted once had calves with the heaviest average weaning weight.

Season brood cows dewormed. There were 1,697 beef producers who responded and of that total, 676 indicated they did not deworm their cows and the average weaning weight of their calves was 410 pounds. There were 633 producers who dewormed their cows in the fall and the average weaning weight of their calves was 406 pounds. There were 388 producers who dewormed their cows in the fall and spring and the average weaning weight of their calves was 389 pounds. The F test showed there was not a significant relationship between the season the brood cows were dewormed and the average weaning weight of calves.

Calves dewormed while nursing. There were 1,712 beef producers who responded and of that total, 949 did not deworm their calves while they were still nursing and they reported the average weaning weight of their calves was 398 pounds. There were 763 producers who did deworm their calves while they were still nursing and the average weaning weight of their calves was 411 pounds. The F test indicated that there was not a significant relationship between whether the calves were dewormed while nursing and the average weaning weight of the calves.

IV. RELATIONSHIPS BETWEEN THE PERCENT OF 22 SELECTED RECOMMENDED PRACTICES USED AND SELECTED PRODUCER AND FARM CHARACTERISTICS

Section IV presents data summarizing the relationships between 22 selected recommended practices used and selected farm and producer characteristics of Tennessee cow-calf producers. The purpose of this analysis was to determine relationships between selected characteristics of the beef producers and their use of 22 beef production practices and these relationships are shown in Table IV. The 22 selected practices are: females and bulls of different breeds, crossbred females, breeding soundness check for bulls, use performance tested bulls, cows grouped and fed according to stage of production, dry cows fed poor quality forage, fed cows crop residue, used stockpiled forages, tested forages, creep feeding of calves, fed cows protein supplement daily, used an identification program, provided salt and mineral, dewormed calves while nursing, used fly control, vaccinated cows for leptospirosis, used a grub and lice control, pregnancy checked cows, enrolled herd in TBCIP, vaccinated heifers for brucellosis, and kept bulls and cows separate during the off breeding season.

The variables were grouped under two major sub-headings: farm characteristics and producer characteristics.

TABLE IV

RELATIONSHIPS BETWEEN THE PERCENT OF 22 SELECTED
RECOMMENDED PRACTICES USED AND SELECTED
PRODUCER AND FARM CHARACTERISTICS

Characteristics	Percent Selected Practices Used			
	Number of Producers	Mean*	F Value	p
<u>Producer Characteristics:</u>				
Farming Status				
Full-time	886	45		
Part-time	704	42		
Retired	147	36		
Total	1,737	43	21.33	.000
Extension Contacts				
Not any	167	35		
One-over	1,629	43		
Total	1,796	43	37.83	.000
<u>Farm Characteristics:</u>				
Herd Type				
Purebred	292	53		
Commercial Straightbred	646	38		
Commercial Crossbred	838	43		
Total	1,776	43	102.58	.000

*Means are rounded to nearest whole number.

Producer Characteristics

The farming status of beef producers and the number of contacts these producers made with Extension agents over a 12 month period were included in this subsection.

Farming status. There were 886 producers (51 percent) who were full-time farmers, and they used 45 percent of the 22 selected practices, 704 producers (41 percent) were part-time farmers, and they used 42 percent of the 22 practices, and 147 producers (8 percent) were retired farmers, and they used 36 percent of the 22 practices. The F test showed that the differences were significant at the .05 level. Full-time producers used a higher percentage of the 22 practices than either part-time farmers or retired farmers.

Extension contacts. There were 167 producers (9 percent) who reported having no Extension contact during the previous 12 months who used 35 percent of the 22 selected practices while 1,629 producers (91 percent) indicated having one or more Extension contact during the previous 12 months, and they used 43 percent of the 22 practices. When tested by the F test, these differences were significant at the .05 level. Producers with one or more Extension contact used a significantly higher percentage of the 22 selected practices than those who had no Extension contact.

Farm Characteristics

Herd type. The 292 producers (17 percent) who had purebred herds used 53 percent of the 22 selected practices while the 646 producers (36 percent) who had commercial straightbred herds used 38

percent of the 22 selected practices, and the 838 producers (47 percent) who had commercial crossbred herds used 43 percent of the 22 practices. When tested by the F test, the differences were significant at the .05 level. Producers with purebred herds used a higher percentage of the 22 selected practices than producers with commercial straightbred or commercial crossbred herds.

CHAPTER IV

SUMMARY OF MAJOR FINDINGS

I. PURPOSES AND SPECIFIC OBJECTIVES

Purposes

The purposes of this study were to determine the characteristics of beef producers and their farm operation. Another was to determine the recommended beef production practices used and any relationships between producers with selected characteristics and their use of recommended practices. Finally, to determine the relationships between average weaning weights and the use of selected recommended practices.

Specific Objectives

The specific objectives of this study were:

1. To characterize beef producers and their beef production operation.
2. To determine the relationship between use of performance tested bulls and recommended practices used.
3. To determine the relationship between the average weaning weights of the calves sold and the use of recommended practices.
4. To determine the relationship between the percentage of 22 selected recommended practices and selected producer and farm characteristics.

II. METHOD OF INVESTIGATION

A total of 1,799 beef producers were randomly selected in 84 Tennessee counties. The population studied included Tennessee beef producers who had 25 or more breeding age cows in their herd. The survey population in each county varied according to the number of beef producers in that county. The following guidelines were given:

1. Counties having 15 to 50 producers survey 15.
2. Counties having 51 to 100 producers survey 20.
3. Counties having 101 to 300 producers survey 25.
4. Counties having over 300 producers survey 30.

The 1981 Tennessee Beef Cow-Calf Producers' Survey was used to collect the data from the producers. Extension agents used the "nth" number technique to identify producers on their county beef cattle mailing lists who were later interviewed.

The data were coded and punched on computer cards. Computation was made by The University of Tennessee Computing Center. Chi Square and analysis of variance F test were the statistics used to determine the strength of the relationship between dependent and independent variables. F values and Chi Square values which achieved the .05 level of probability were accepted as indicating a significant relationship. The mean, numerical values, and percentages were computed and given for the variables where appropriate.

III. MAJOR FINDINGS

Characteristics of Beef Cattle Producers and their Farm Operation

Producer Characteristics:

1. Fifty-one percent of the producers were full-time farmers.
2. Ninety-one percent had one or more Extension contact.

Farm Characteristics:

1. Forty-seven percent of the producers had commercial cross-bred herds.
2. Fifty-three percent had herd sizes in the 25 to 49 range.
3. Forty-two percent used only one bull.
4. Fifty percent sold less than 25 calves at weaning.
5. Sixty-six percent had over 90 percent of the cows and heifers weaning calves.

Breeding Management:

1. Twelve percent pregnancy checked their cows.
2. Forty percent had between 50 and 74 percent of the calves born within 45 days of the first calf.
3. Sixty percent kept bulls separate from cows during the off breeding season.
4. Seventeen percent had bulls checked for breeding soundness.
5. Thirty-one percent used performance tested bulls.

Feeding Management:

1. Eighty-eight percent used hay as the major forage to winter cows.

2. Thirty-six percent fed cows by weight and stage of production.
3. Thirty-six percent creep fed their calves.
4. Seventy-six percent fed protein supplement daily to cows.
5. Six percent had their forages tested.

General Herd Management:

1. Six percent had their herds enrolled in TBCIP or other similar program.
2. Fifty-two percent reported having 50 to 100 percent of their permanent pasture containing 30 percent legumes.
3. Twenty-nine percent did implant their feeder calves at least once.
4. Sixty-one percent did deworm their cows at least once per year.
5. Forty-five percent dewormed their calves while they were nursing.

Relationship Between Beef Production Practices Used, and the Use of Performance Tested Bulls

There was a significant relationship between each producer and farm characteristics and their use of performance tested bulls. Each of the production practices studied was significantly related to the use of performance tested bulls.

1. A greater percentage of full-time farmers used performance tested bulls.
2. Producers with one or more Extension contact were more likely to use performance tested bulls than those making no contacts with Extension.

3. A higher percentage of purebred producers used performance tested bulls.

4. Producers with 75 to 99 cows were more likely to use performance tested bulls than those with fewer cows.

5. Producers with three or more bulls were more likely to use performance tested bulls than those with fewer bulls.

6. Producers who sold over 100 feeder calves used a higher percentage of performance tested bulls.

7. A higher percentage of producers who used performance tested bulls had 75 to 90 percent of cows and heifers weaning calves.

8. Over 60 percent of the producers who pregnancy checked their cows used a performance tested bull compared to only 27 percent who did not pregnancy check.

9. A higher percentage of producers who used performance tested bulls had 75 to 98 percent of their calves born within 45 days of the first calf.

10. A higher percentage of producers who used performance tested bulls kept bulls separate from cows during the off breeding season.

11. A higher percentage of the producers who used performance tested bulls had their bulls checked for breeding soundness.

12. Producers using performance tested bulls were more likely to feed hay as the major winter feed.

13. A greater percentage of producers who used performance tested bulls fed their cows according to weight and stage of production.

14. A larger percentage of producers who used performance tested bulls creep fed their calves.

15. A greater percentage of producers who used performance tested bulls fed protein supplement daily.

16. A larger percentage of producers who used performance tested bulls had their forages tested.

17. A larger percentage of producers who used performance tested bulls had their herds enrolled in TBCIP.

18. A larger percentage of the producers who used performance tested bulls had over half of their permanent pasture contain 30 percent legumes.

19. Only about 40 percent of the producers who implanted calves only once were using performance tested bulls.

20. Seventy-four percent of producers who dewormed the cows at least once used performance tested bulls.

21. A larger percentage of producers using performance tested bulls did deworm the calves while nursing.

Relationship Between Selected Variables and the Mean Weight of Feeder Calves Sold at Weaning

Variables were categorized under the following headings: producer characteristics, farm characteristics, breeding management, feeding management, and general herd management.

1. The mean weaning weight of calves sold was not significantly related to 12 of the 21 variables studied. Those variables were:

a. Number of bulls used.

- b. Percent cows and heifers weaning calves.
- c. Pregnancy checked cows.
- d. Bulls checked for breeding soundness.
- e. Used performance tested bulls.
- f. Cows fed by weight and stage of production.
- g. Creep feed calves.
- h. Fed protein supplement daily.
- i. Herd enrolled in TBCIP or similar program.
- j. Percent permanent pasture with 30 percent legumes.
- k. Season brood cows dewormed.
- l. Calves dewormed while nursing.

2. Ten of the variables were significantly related to the mean weaning weight of calves sold. Those variables were:

- a. Farming status.
- b. Extension contacts.
- c. Herd type.
- d. Number of females of breeding age in herd.
- e. Number of calves sold at weaning.
- f. Percent of calves born within 45 days of first calf.
- g. Bulls kept separate from cows during off breeding season.
- h. Major forages used to winter cows.
- i. Tested forages.
- j. Number of times feeder calves implanted.

3. Producers with the heaviest weaning weights tended to be retired farmers, with one or more Extension contact, with commercial straightbred herds, with either 25 to 49 cows or 75 to 99 cows, who sold 75 to 99 feeder calves at weaning, who had 75 to 98 percent of their calves born within 45 days of the first calf, who kept bulls separate from cows during off breeding season, who fed primarily hay as the winter forage to cows, who did not have the forages tested, and who implanted their calves only once.

Percentage of 22 Selected Recommended Practices Used and Producer and Farm Characteristics

1. The percentage of the 22 selected recommended practices were significantly related to the three variables studied. Those variables were:

- a. Herd type.
- b. Farming status.
- c. Extension contacts.

2. Producers who used a larger percentage of the 22 selected recommended practices had purebred herds, were full-time farmers and had one or more Extension contact during the previous 12 month period.

IV. IMPLICATIONS AND RECOMMENDATIONS

The results of the findings in this study indicate that Tennessee beef producers are not using a very high percentage of the

recommended production practices. Based on these findings, the implications and recommendations below are drawn.

1. A majority of producers were full-time farmers with commercial crossbred herds. Their herd size was in the 25 to 49 cow range. Most used only one bull which was kept separate from the cows during the off breeding season. While producers did realize the benefits of some practices such as crossbreeding, they failed to realize the value of such practices as limited calving season, checking bulls for breeding soundness, using performance tested bulls, testing forages, implanting calves, pregnancy checking cows, enrolling herd in an improvement program and creep feeding. One third or less of the producers were using these practices. This suggests the need for more educational efforts to convince producers the value of using recommended practices.

2. A majority of the producers who were using performance tested bulls also followed more of the other recommended practices. The fact remains that only one-third of the producers were using performance tested bulls. It seems that if producers do begin by adopting one practice they tend to also follow more of the others as well.

3. Producers with the heavier weaning weights of feeder calves tended to be those who followed more of the recommended practices. Extension agents should use this type of information when trying to convince other producers regarding the benefits of following these research verified production practices.

4. Finally, the producers who were using a higher percentage of the 22 selected recommended practices were full-time farmers with purebred herds and one or more Extension contact. Extension agents should strive to make more contacts with other types of producers in order to encourage them to utilize more of the recommended practices.

Beef producers seeking advice and information frequently utilize the Agricultural Extension Service. It is hoped that the findings of this study will help Extension agents see areas where beef producers need help and strive to meet those needs.

V. RECOMMENDATIONS FOR FURTHER STUDY

1. A similar study should be conducted periodically to determine if Tennessee beef producers are using more recommended practices than this study indicates, and to help the Extension Service adjust its teaching methods and educational emphasis.

2. A study of this type if used properly should be beneficial to specialists, district personnel and county agents to help improve Extension's educational programs for beef producers.

3. A continual effort should be made to improve surveys used to collect data. These changes need to be made so that the same information can be obtained each time since this is the only way to determine progress being made.

4. A study to accurately assess the value of performance tested bulls on actual herds using the average weaning weights of the calves as a measure would be beneficial. The study could be set up to

observe the differences between high, medium, and low testing bulls from the performance tested bull sales after integrating them in beef herds in Tennessee.

BIBLIOGRAPHY

BIBLIOGRAPHY

1. Barnes, James Hughes. "Some Significant Beef Production Practices of Two Selected Beef Producer Groups in Claiborne County, Tennessee." Unpublished Master's thesis, The University of Tennessee, Knoxville, 1971.
2. Brewer, Lester Ray. "Characteristics of Marshall County Beef Producers and Their Farms, Management Practices of Marshall County Beef Producers, Factors Influencing Beef Management Practice Adoption by Marshall County Beef Producers." Unpublished special problems in lieu of thesis, The University of Tennessee, Knoxville, 1972.
3. Collins, James C. 1979. "Crossbreeding of Beef Cattle." Tennessee Beef Cow-Calf Handbook SR1007.
4. Headrick, Alfred Dean. "Influence of Selected Variables Upon Percent of Calves Born Within 45 Days of First Calf Born, Average Weight of Calves Sold at Weaning and the Number of Contacts Tennessee Beef Cow-Calf Producers had with County Extension Agents." Unpublished Master's thesis, The University of Tennessee, Knoxville, 1983.
5. Hill, James R., Jr. and John N. Williams. "Creep Feeding Nursing Beef Calves." Tennessee Beef Cow-Calf Handbook SR3005.
6. Keyes, Gordon Kenneth. "Production and Management Practices of Selected Beef Cattle Producers in Campbell County, Tennessee." Unpublished Master's thesis, The University of Tennessee, Knoxville, 1966.
7. Lane, Clyde D. 1980. "Nutrition of the Beef Cow and its Effect of Reproduction." Tennessee Beef Cow-Calf Handbook TN2052.
8. Lovely, Ralph A. "Production and Management Practices of Beef Cattle Producers in Campbell County, Tennessee." Unpublished Master's thesis, The University of Tennessee, Knoxville, 1975.
9. Luck, George Fletcher. "Production and Management Practices of Selected Beef Cattle Producers in Macon County, Tennessee." Unpublished Master's thesis, The University of Tennessee, Knoxville, 1971.
10. Lumpkin, Jimmy J. "Relationships Between Certain Tennessee Cow-Calf Producer and Farm Characteristics and Their Use of Recommended Practices." Unpublished Master's thesis, The University of Tennessee, Knoxville, 1985.

11. Matthews, James Thomas. "Characteristics of Lawrence County Beef Producers and Their Farms, Management Practices of Lawrence County Beef Producers, Factors Influencing Beef Management Practice Adoption by Lawrence County Beef Producers." Unpublished special problems in lieu of thesis, The University of Tennessee, Knoxville, 1968.
12. Mohamad, Warka O. "Some Characteristics and Management Practices of Selected Tennessee Cow-Calf Producers in 1976-1977." Unpublished Master's thesis, The University of Tennessee, Knoxville, 1979.
13. Neel, James B. 1982. "Maintain Legumes in Grass Pastures to Maximize Reproductive Efficiency of the Commercial Cow-Calf Herd." Tennessee Beef Cow-Calf Handbook TN1054.
14. Powell, Fred C. "Growth Stimulant Implants." Tennessee Beef Cow-Calf Handbook TN3050.
15. Rutter, Floyd David. "Relationships Between Characteristics of Beef Producers, Their Production Operations and Their Use of Management Practices and the Number of Contacts They had with Extension." Unpublished Master's thesis, The University of Tennessee, Knoxville, 1982.
16. Tennessee Agricultural Statistics, Annual Bulletin, Tennessee Crop Reporting Service, Bulletin T-21, 1984.

APPENDIX



THE AGRICULTURAL EXTENSION SERVICE
UNIVERSITY OF TENNESSEE
KNOXVILLE, TENNESSEE



1981 TENNESSEE BEEF COW-CALF
PRODUCER SURVEY

(Interview producers with herds of 25 or more breeding age cows)
(See Instructions on Last Page)

1 Card Number (leave blank)
(1)

(2) (3) (4) County Number (TEMIS code number)

(5) (6) Respondent Number (leave blank)

A. General Information about
Respondent and His Farm Situation

(7) Type of beef cattle herd (1 = Purebred; 2 = Commercial
Straightbred; 3 = Commercial Crossbred)

(8) Farming status (1 = Full-time; 2 = Part-time; 3 = Retired)

B. Size of Beef Cattle Operation

(9) (10) (11) Number of females of breeding age presently in the herd.
(Number of females that are 15 months of age and older).

(12) (13) (14) Number of cows and heifers exposed to the bull(s) to produce
the most recently weaned calf crop.

(15) (16) Number of calves that were lost at birth or died within 2 days
following birth from females that produced the most recently
weaned calf crop. (Record number of calves lost from females
in Question 10).

(17) (18) (19) Number of calves weaned in the most recently weaned calf
crop. (Record the number of calves weaned from cows and
heifers in Question 10).

(20) (21) Number of herd bull (s) used to produce the most recently
weaned calf crop (Record the number of bull(s) used to
breed the females in Question 10).

*Coding Instruction:

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

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C. Calving Management

- (22) (23) In what month was the first calf of the most recently weaned calf crop born? (01 = Jan., 02 = Feb., etc.)
- (24) (25) In what month was the last calf of the most recently weaned calf crop born? (01 = Jan., 02 = Feb., etc.)
- (26) (27) Approximate percent of the most recently weaned calf crop born within 45 days after the birth of the first calf?
- (28) How many times per day were cows checked during the calving season?

D. Breeding Management

- (29) Females and bull(s) used to produce most recently weaned calf crop were of different breeds. (1 = No; 2 = Yes; 9 = DNA*)
- (30) Were females used to produce most recently weaned calf crop crossbred? (1 = No; 2 = Yes; 9 = DNA).
- (31) Gave bull(s) a breeding soundness evaluation 30 to 45 days before the beginning of the breeding season (1 = No; 2 = Yes; 9 = DNA).
- (32) Used performance tested bull(s). (1 = No; 2 = Yes; 9 = DNA).
- (33) (34) Age of replacement heifers when bred. (Record age in months).
- (35) (36) (37) Weight of replacement heifers when bred.

E. Feeding Management

- (38) Major harvested forages used to winter beef cows (1 = Hay; 2 = Silage; 3 = Combination of the two; 9 = DNA).
- (39) Was herd grouped and fed according to age and stage of production during the winter? (1 = No; 2 = Yes; 9 = DNA).
- (40) Were either poorer quality forages or crop residues fed to dry, pregnant cows early in the wintering period? (1 = No; 2 = Yes; 9 = DNA).
- (41) Major crop residue fed to beef cows to reduce winter feed cost (1 = None; 2 = Corn; 3 = Soybean; 4 = Both Corn and Soybean; 5 = Other).
- (42) Was fescue stockpiled for use as late fall and early winter-grazing? (1 = No; 2 = Yes).

*DNA = Does not apply

- (43) Were either hay or silage "forage tested" before winter feeding? (1 = No; 2 = Yes).
- (44) Were calves creep fed? (1 = No; 2 = Yes).
- (45) Supplemental protein provided daily during the wintering period. (1 = No; 2 = Cottonseed or Soybean Meal; 3 = Block or Cubes; 4 = Liquid).

F. General Herd Management Practices

- (46) What type of method was used to provide permanent identification of cattle? (1 = None; 2 = Ear Tag; 3 = Neck Chain; 4 = Hot Brand; 5 = Freeze Brand).
- (47) Age when most horned calves are dehorned. (1 = Within 48 hours after birth; 2 = Before two months of age; 3 = After two months of age; 9 = DNA).
- (48) Age when most male calves are castrated. (1 = Within 48 hours after birth; 2 = Before two months of age; 3 = After two months of age; 9 = DNA).
- (49) How many times were feeder calves implanted between birth and marketing (1 = None; 2 = Once; 3 = Twice; 4 = 3 or more times)
- (50) Method most commonly used to supply salt and/or minerals to the herd. (1 = None provided free choice; 2 = Block; 3 = Loose).
- (51) Method used to provide magnesium oxide to herd (1 = none provided; 2 = Block; 3 = Loose; 4 = Mixed in grain or with silage)
- (52) Brood cows were dewormed (1 = Not dewormed; 2 = Fall; 3 = Both Fall and Spring).
- (53) Were calves in most recently weaned calf crop dewormed while nursing their dams? (1 = No; 2 = Yes).
- (54) Major method used to control horn and face flies (1 = None used; 2 = Backrubbers and/or oilers; 3 = Dustbags; 4 = Backrubbers with flips; 5 = Oral larvacides; 6 = Ear Tags).
- (55) Began treatment for horn and face flies by the first of April. (1 = No; 2 = Yes; 3 = A later date; 4 = Did not treat).
- (56) Vaccinated brood cows and replacement heifers for leptospirosis (1 = No; 2 = Yes).

- (57) Treated cattle for grub control before November 1.
(1 = No; 2 = Yes).
- (58) Treated cattle for lice. (1 = Did not treat; 2 = Only treated by November 1; 3 = Treated by November 1 and again in February; 4 = Did not treat until lice "build up" was evident).
- (59) Pregnancy checked all cows exposed to the bull(s) during the breeding season. (1 = No; 2 = Yes).
- (60) Herd enrolled in the TBCIP or a similar breed performance testing program. (1 = No; 2 = Yes).
- (61) Vaccinated calves twice for blackleg, malignant edema and black's disease (1 = No; 2 = Yes).
- (62) Vaccinated replacement heifers for brucellosis. (1 = No; 2 = Yes).
- (63) Kept bull(s) separated from cows during the off-breeding season (1 = No; 2 = Yes).

Card Number TWO

(1)

County Number (TEMIS code number)

(2) (3) (4)

Respondent Number (leave blank)

(5) (6)

G. Beef Cattle Marketing

(This section is in reference to the most recently marketed calf crop)

Number of feeder calves sold at weaning.

(7) (8) (9)

Average weight of feeder calves sold at weaning.

(10) (11) (12)

Number of calves sold in the Spring as backgrounded, short yearlings.

(13) (14) (15)

Number of calves sold in the Summer or Fall as backgrounded long yearlings.

(16) (17) (18)

Number of finished cattle sold during the most recent 12-months.

(19) (20) (21)

Number of replacement heifers retained from the most recently weaned calf crop.

(22) (23) (24)

(25) 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 back-grounder or feeder).

H. Forage Production and Use

(26) (27) (28) (29) Acres of improved permanent pasture land.

(30) (31) (32) Acres of temporary winter and/or summer pasture.

(33) (34) Estimated percent of permanent pasture land that had 30 percent or more legume in 1981.

I. Estimated Number of Contacts with County Extension Agents During the Past 12 Months

(35) (36) Number of Extension beef cattle meetings attended

(37) (38) Number of telephone calls to the Extension Office to seek information on beef cattle.

(39) (40) Number of visits made to the County Extension Office to seek information on beef cattle.

(41) (42) Total number of farm visits received from County Extension Agents

General Survey Instructions

Date Due: November 1, 1981

Disposition: Mail completed survey forms to your Associate District Supervisor, Agricultural Programs, for forwarding to Agricultural Extension Education.

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

Counties to be Surveyed: All counties having at least 15 beef cow-calf producers who have 25 or more breeding age cows.

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

VITA

Mark Lee Beeler was born January 9, 1954, to Mr. and Mrs. Houston Y. Beeler of Brentwood, Williamson County, Tennessee. He attended Lipscomb Elementary School and graduated from Battle Ground Academy in 1972.

After graduation, he attended the University of Tennessee, Knoxville, majoring in Animal Science. He received a Bachelor of Science degree in Agriculture in August, 1976.

After working for Cargill Inc.-Nutrena Feed Division as a warehouse manager for about one year, he was employed as Assistant Extension Agent in Hickman County in June, 1977. In 1981, he was promoted to Extension Leader in Trousdale County.

He is a member of Gamma Sigma Delta, a national honorary Extension fraternity; Epsilon Sigma Phi, a national honorary Extension fraternity; the Tennessee Association of Agricultural Agents and Specialist; the National Association of County Agricultural Agents; Tennessee Association of Extension 4-H Workers; the National Association of Extension 4-H Agents; and The University of Tennessee National Alumni Association.