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James Scott Chadwell

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To the Graduate Council:

I am submitting herewith a thesis written by James Scott Chadwell entitled "Selected characteristics of Tennessee feeder pig producers and their use of recommended swine management practices in relation to the number of contacts producers had with county extension agents." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural Extension.

Cecil E. Carter Jr., Major Professor

We have read this thesis and recommend its acceptance:

Roy Lessly, Frank Masincupp

Accepted for the Council:

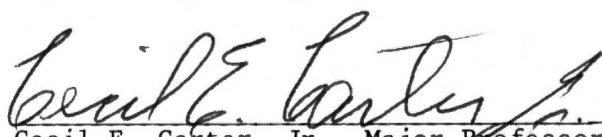
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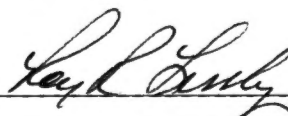
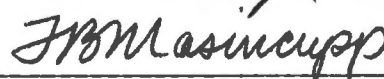
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To the Graduate Council:

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Cecil E. Carter, Jr., Major Professor

We have read this thesis
and recommend its acceptance:

Accepted for the Council:


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SELECTED CHARACTERISTICS OF TENNESSEE FEEDER PIG PRODUCERS AND
THEIR USE OF RECOMMENDED SWINE MANAGEMENT PRACTICES IN
RELATION TO THE NUMBER OF CONTACTS PRODUCERS
HAD WITH COUNTY EXTENSION AGENTS

A Thesis

Presented for the

Master of Science

Degree

The University of Tennessee, Knoxville

James Scott Chadwell

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ABSTRACT

The purpose of this study was to characterize Tennessee swine producers, and determine the relationship between the number of contacts producers had with the Agricultural Extension Service and their use of recommended swine management practices. One thousand and eighty-three swine producers were randomly selected and personal interviews were conducted by county Extension agents. Survey and interview schedules were developed by the University of Tennessee Extension Swine Specialists and the Agricultural Extension Education Department. These surveys were administered by county Extension agents during the fall of 1984. Information recorded included the producer's personal characteristics, the size of the operation, the number and type of contacts producers had with Extension during a 12-month time period and their use of recommended swine management practices.

The data were coded and punched on computer cards, and computations were made by the University of Tennessee Computing Center. The Chi-Square test and the one-way analysis of variance F test were used to determine the significance and strength of the relationship between the dependent and independent variables. The .05 level of probability was chosen for determining significance.

Major findings included the following:

1. Almost 80 percent of the producers were over the age of 36 and had obtained a high school education or less.
2. The majority of the swine producers surveyed operated on a small scale with about 74 percent averaging less than 20 sows,

and approximately 80 percent farrowed less than 50 litters per year.

3. Extension contacts made by producers ranged from a high of 77 percent using telephone calls to the Extension office to a low of only 45 percent attending Extension swine meetings.

4. About 4 percent of the recommended swine management practices were used by 85 percent of the producers.

5. Over 50 percent of the producers used more than 66 percent of the swine management practices.

6. Younger producers (under 36 years of age), producers with a college degree, and those who were full-time farmers made significantly more Extension contacts than the other producers.

7. There was a significant difference between the use of 10 of the following recommended swine management practices and the total number of contacts producers made with Extension: (1) number of times/year sows were vaccinated for leptospirosis, (2) number of times/year sows were vaccinated for rhinitis, (3) number of times/year boars were vaccinated for parvovirus, (4) used medication in water to treat disease, (5) used sulfa in the water, (6) used antibiotic in water, (7) used medication in sows gestation, lactation ration, (8) frequency with which iron shots were given to pigs, (9) clipped needle teeth, (10) pounds of feed fed sows.

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CHAPTER I

THE PROBLEM AND ITS SETTING

I. INTRODUCTION

Technology has made dramatic changes in the swine industry in Tennessee over the past several years. In many areas of Tennessee smaller hog farms have either folded or consolidated into large scale operations. Fewer and larger operations, which utilize new technology, seems to be the trend for the future.

Three common swine enterprises found statewide are: farrow-to-feeder pig, feeder pig-to-finish and farrow-to-finish operations. Tradition has been an important factor in determining location of these enterprises along with physical and economic resource characteristics specific to many areas of the state. Farm situations, for instance, characteristic of many areas of central and eastern Tennessee have a limited amount of acreage for corn production. The price of corn, the principle feed source for hogs, is generally higher in these areas. Therefore, the farrow-to-feeder pig production operation which has a lower corn requirement than the other two, has been the predominant enterprise. In contrast, the opposite is true in the western part of the state where the feeder pig-to-finish and farrow-to-finish is the most prevalent operation (14).*

*Numbers in parentheses refer to alphabetically listed sources in the Bibliography.

One of the first organized graded feeder pig sales was held in Cookeville, Putnam County, Tennessee in 1958, the first sale being held in Sevierville, Tennessee. The sale was organized in order to provide a fair market for producers' pigs since there was no such sale at that time (12).

In 1958, 521 graded sales were held across the state with 525,282 feeder pigs being sold at a value of \$19,600,515 down 10 percent from the year before. Gross income from all hogs and pigs sold across the state last year (1986) totaled \$167,388,000, up 6 percent from the previous year (13).

In Tennessee the Agricultural Extension Service has played an important role in the progress made by the swine industry. This was evidenced by the hundreds of swine facilities across the state built according to the University of Tennessee Extension recommendations (3).

This study was concerned with characterizing swine producers by their personal characteristics, characteristics of the swine operation, number and types of contacts with Extension, their use of recommended production practices and the interrelationship among these variables.

II. NEED FOR THE STUDY

The purpose of the University of Tennessee Agricultural Extension Service is to provide educational information to farmers and homemakers.

Answers to the following questions were sought during this study. Were swine producers making use of the information being distributed

by Extension agents and did these contacts lead to the adoption and use of the recommended swine production practices?

This study was necessary to assist county Extension agents in evaluating their county programs and in determining priorities and direction for future educational programs.

III. PURPOSE OF THE STUDY

The purposes of this study were to characterize feeder pig producers by their personal characteristics, characteristics of the swine operation, number and types of contacts with Extension, their use of recommended swine management practices and to determine the interrelationships among these variables.

The specific objectives were:

1. To characterize feeder pig producers and their operations, as to personal characteristics of the producer and the swine operation, number and types of contacts with Extension and producers' use of recommended swine management practices.
2. To determine the relationship between the personal characteristics of the feeder pig producer and size of their operation and the number and types of contacts with Extension over a 12 month period.
3. To determine the relationship between the number and type of contacts feeder pig producers had with Extension over a 12 month period and their use of Extension recommended swine management practices.

IV. LIMITATIONS

This study was limited to data from the 1983 swine survey conducted by the University of Tennessee Agricultural Extension Service. Extension agents from 76 counties obtained the data through personal interviews with 1,083 swine producers. The number of producers interviewed varied from county to county, depending on the number of swine producers located in each county.

V. METHOD OF INVESTIGATION

Data for this study were obtained from both feeder pig and market hog producers throughout Tennessee. However, only the data from the feeder pig producers in Tennessee will be researched in this study. Data were collected through personal interviews by county Extension agents who returned the completed surveys to the Agricultural Extension Education office.

The Extension agents received the following instructions regarding which swine producers were to be interviewed:

1. Interview feeder pig and market hog producers having at least five sows.
2. Interview 15 swine producers for the first 50 producers and 5 additional interviews for each additional 50 producers in the county to a maximum of 25 interviews with swine producers.

The "nth" number technique was used to identify producers to be interviewed. Alternates were randomly selected to replace producers who were unable to be interviewed.

The University of Tennessee Agricultural Extension Specialist staff in the Swine and Extension Education Departments developed the survey to be administered.

Agents in each of the participating counties conducted the survey through personal interviews. The completed surveys were then returned to the Agricultural Extension Education office for analysis.

The data were coded and processed for computer analysis. The University of Tennessee Computing Center facilities were used to analyze the data. The Chi-Square test was used to determine strengths of the relationship between dependent and independent variables. χ^2 values which achieved the .05 probability level were chosen as being statistically significant.

VI. DEFINITION OF TERMS

1. Feeder Pig Producers--Individuals deriving all or part of their farm income from the sale of feeder pigs.
2. Feeder Pig--A young gilt or barrow between the weights of 30-90 lbs. which is sold at a graded feeder pig sale.
3. Extension Contacts--The number of Extension meetings attended, number of visits to the Extension office, number of telephone calls to the Extension office, or farm visits received by the swine producer over a 12-month period.
4. Recommended Management Practice--A research verified and/or commonly accepted procedure or task which, where performed correctly and on a regular basis, will increase or help insure a desired outcome or return.

5. Personal Characteristics of the Producer and Size of Operations--

The age of the producer, the producer's education, the employment of the producer (full-time or part-time) and the average number of sows on hand in 1983.

CHAPTER II

REVIEW OF LITERATURE

This chapter presents findings from several studies concerning the influence of the characteristics of producers, size of their operation and their contacts with Extension on the use of recommended production practices by producers.

Section I presents the relationship between personal characteristics of producers, size of operation and Extension contacts over a 12-month period.

Section II presents the relationship between Extension contacts during a 12-month period and the use of recommended production practices.

I. RELATIONSHIP BETWEEN PERSONAL CHARACTERISTICS OF PRODUCERS, SIZE OF OPERATION AND EXTENSION CONTACTS PER YEAR

A tendency for full-time producers to visit the county Extension office more than part-time producers were indicated in a study by Arnett in Wilson County, Tennessee in 1973 (1). The relationship, however, was not significant. This study did show that the number of office visits made by Wilson County producers were significantly related to their participation in Extension meetings. Arnett also found in his study that the educational level of Wilson County producers was significantly related to the number of visits made to the county Extension office.

Jamison Jenkins' 1975 study of soybean producers in Tennessee revealed that full-time producers attended significantly more Extension meetings than part-time producers (4).

Perry's study of Tennessee swine producers in 1980 showed a significant relationship between the employment of producers (full-time vs part-time) and total Extension contacts (9).

A 1978 study of Grade "A" dairy producers in Tennessee by Pat Freeman, showed that the size of the operation had a positive significant relationship with the total number of Extension contacts (2).

McLemore's statewide study of Tennessee swine producers found that the number of sows farrowing twice per year and the number of pigs raised to weaning were significantly related to the total number of Extension contacts (7).

Michael Gordon's research in 1977 showed that the size of operation of feeder pig producers in Haywood County, Tennessee was significantly related to the number of contacts with Extension, with producers having larger operations having more contacts with Extension (3). Also, producers who planned to increase the size of their operation made significantly more contacts with Extension than those who had no intentions of increasing their operation.

In his 1978 study, Solomon Yabaya found that corn producers in Tennessee who had more contacts with Extension had significantly more acreage and yield for both silage and grain than those that had fewer contacts (14).

II. RELATIONSHIP BETWEEN EXTENSION CONTACTS PER YEAR AND PRODUCERS USE OF RECOMMENDED MANAGEMENT PRACTICES

In a North Central Regional Extension publication, research by Rogers indicated that early adopters of practices have more contact with county Extension agents than do producers in any other adopter categories (10). The early adopters are ranked especially high in the number of personal Extension contacts that they have through meetings, office calls and farm visits as well as total Extension contacts.

Arnett found in a Wilson County, Tennessee study that the number of telephone calls and office visits made to the county Extension office was significantly related to the major farm enterprise (1). More contacts were made by tobacco and dairy producers with Extension than were made by swine, poultry and sheep producers. Arnett's study also revealed that the producers with higher gross income and higher tobacco yields, made significantly more contacts with Extension.

Wilson and Gallup found that approximately 14.6 percent of the adoption by farmers was due to the meetings they attended (13). Thirteen percent of the practice changes were a result of farm visits by agents and 6 percent of the practice changes were due to office calls.

A significant positive relationship was reported by Jenkins between Tennessee soybean producers' contacts with Extension and their use of the recommended practices of liming and fertilizing by soil test recommendations (4). However, use of the majority of soybean

practices and corn production practices reported by Jenkins and Yabaya's study (a) did not show a significant relationship to Extension contacts. This was contributed to the fact that most producers were already using the recommended practices.

In a 1980 study, Perry found that the total number of recommended production practices used by Tennessee swine producers was significantly related to the number of contacts with Extension through meetings, office visits, telephone calls, farm visits received from agents and total Extension contacts (9).

Osikorobia found in his 1979 study that the increase in the number of recommended production practices used by Tennessee swine producers was significantly related to the total number of Extension contacts made the previous year (8).

McLemore's Tennessee study revealed that the total number of contacts with Extension was significantly related to the feeder pig producers' use of 23 of the 25 recommended practices studied (7). Producers using more of the recommended practices had made the most Extension contacts. The only recommended production practices that were not found to be significantly related to the number of contacts with the Extension office were: (1) preventing pig anemia, and (2) keeping the farrowing house clean and dry.

CHAPTER III

CHARACTERIZATION OF TENNESSEE FEEDER PIG PRODUCERS AND THEIR OPERATION

This chapter on characterization of Tennessee feeder pig producers and their operation is divided into two sections dealing with the first two tables of this study. Selected variables were discussed under subheadings within each section.

Section I presents data regarding the personal characteristics of feeder pig producers, the characteristics of their swine operation and the number and types of contacts the producers had with the Agricultural Extension Service in a 12-month period.

Section II presents data regarding the swine management practices recommended by the Extension Service. These are divided into two major subheadings in reference to production practices and feeding practices.

I. CHARACTERISTICS OF FEEDER PIG PRODUCERS, SWINE OPERATION, AND NUMBER AND TYPE OF EXTENSION CONTACTS

The purpose of this section is to present findings regarding the characteristics of feeder pig producers, their swine operation and the number and type of Extension contacts through the use of the 14 variables reported in Table I. The total number and the percent of producers is given for each variable.

TABLE I. Characteristics of Tennessee Feeder Pig Producers, Their Farm Operation and Number and Types of Extension Contacts

Personal Characteristics of Producer	Number of Producers	Valid Percent of Producers
Farmer Age		
35-under	225	21.2
36-50	422	39.8
51-over	412	38.9
No response	24	0.0
TOTAL	1083	100.0
M = 24* V.C. = 1059**		
Farmer Education		
High School or less	841	80.3
College	206	19.7
No response	36	0.0
TOTAL	1083	100.0
M = 36 V.C. = 1047		
Farmer Employment		
Full-time farm	447	42.5
Part-time farm	605	57.5
Other	31	0.0
TOTAL	1083	100.0
M = 31 V.C. = 1052		
Average Number Sows in 1983		
10-less	455	42.2
11-20	339	31.4
21-over	285	26.4
No response	4	0.0
TOTAL	1083	100.0
M = 4 V.C. = 1079		
Number Litters Farrowed		
15-less	319	29.5
16-29	348	32.2
30-50	198	18.3
50-over	217	20.1
No response	1	0.0
TOTAL	1083	100.0
M = 1 V.C. = 1082		
Number Pigs Raised to Weaning		
125-less	364	33.6
126-250	342	31.6
251-over	377	34.8
TOTAL	1083	100.0
M = 0 V.C. = 1083		
Number Pigs Sold as Feeders		
Under 100	330	30.5
100-199	373	34.4
200-over	380	35.1
TOTAL	1083	100.0
M = 0 V.C. = 1083		
Average Weight of Feeder Pigs Sold		
45-under	659	62.6
46-over	393	37.4
No response	31	0.0
TOTAL	1083	100.0
M = 0 V.C. = 1052		
Average Number Pigs Weaned Per Litter Farrowed		
7.00-under	322	30.5
7.01-8.00	372	35.2
8.01-over	361	34.2
No response	28	0.0
TOTAL	1083	100.0
M = 28 V.C. = 1055		

*Missing.

**Valid cases.

Characteristics of Producers

The first three variables in Table I deal with the personal characteristics of the feeder pig producer with regard to their age, education, and employment. The results of these variables indicate the socioeconomic status of the producer.

Farmer age. Just over 21 percent, the smallest group of the 1,083 producers surveyed, were 35 years old or younger. The largest group, 39.8 percent, or 422 producers, were between the ages of 36 and 50. The age bracket of 51 years of age and older comprised the second largest group of 38.9 percent or a total of 412 producers.

Farmer education. Eight hundred and forty-one, or 80.3 percent of the feeder pig producers surveyed, had obtained a high school education or less. The remaining 206 producers, or 19.7 percent, had achieved a college degree.

Farmer employment. Full-time farmers totaled 447 or 42.5 percent of the 1,052 producers responding with the majority, 57.5 percent, or 605, being employed as part-time.

Characteristics of Swine Operation

The second division of Section I presents findings regarding six quantitative variables which attempt to characterize the swine producers' farm operation as to the number of swine owned, raised, and sold. Numbers and percents of producers are used to help describe the operation.

Average number of sows in 1983. Most of the 1,079 feeder pig producers who responded to this question were small producers: 455, or 42.2 percent, owning 10 sows or less. Just over 31 percent reported owning 11 to 20 sows and 285 (26.4 percent) were large operators owning 21 or more sows during 1983.

Number of litters farrowed. Almost 30 percent of the producers responding farrowed less than 16 litters. Just over 32 percent farrowed between 16 and 29 litters and 18.3 percent farrowed between 30 and 50 litters. Those producers farrowing over 50 litters per year totaled 217 or 20.1 percent.

Number of pigs raised to weaning. These producers who raised 125 pigs or less to weaning made up 33.6 percent to the total. Producers raising 126 to 250 pigs to weaning age accounted for 31.6 percent while 34.8 percent of the total was comprised of producers raising over 250 pigs per year to weaning age.

Number of pigs sold as feeders. The smallest percent of producers, only about 30 percent, sold less than 100 pigs as feeders. Three hundred and seventy-three, or just over 34 percent of the producers surveyed, sold between 100 and 199 pigs as feeders, while 35 percent (380) producers sold 200 or more pigs as feeders during the 12-month period.

Average weight of feeder pigs sold. Of the 1,052 producers who responded, a majority (62.6 percent) sold pigs that averaged weighing

45 pounds or less. Only 34 percent, 343 producers, sold pigs as feeders weighing more than 45 pounds.

Average number of pigs weaned per litter farrowed. Nearly 31 percent of the swine producers reported weaning 7 pigs per litter or less. More than 35 percent averaged weaning between 7.01 pigs and 9.00 pigs per litter while weaning 8.01 or more pigs per litter was reported by 34.2 percent of the producers.

Number and Types of Extension Contacts

The third division of Section I involves five quantitative variables which attempt to characterize the swine producers by the number of contacts made with the Agricultural Extension Service through Extension meetings, office visits, telephone calls, farm visits and visits received from veterinarians. The total number and percent of producers responding are given for each variable.

Swine meetings attended. Five hundred and seventy-five (55.5 percent) of the swine producers responding to the survey did not attend any Extension meetings. The remaining 44.5 percent attended between 1 and 8 Extension swine meetings.

Office visits made. Only about 27 percent (29) of the producers had not made any visits to the county Extension office. Six hundred and twenty-seven producers, or nearly 57 percent, had made between 1 and 3 visits while only about 16 percent made Extension office visits totaling 4 or more.

Telephone calls made. About 23 percent of the swine producers surveyed made no telephone calls to the Extension office. Nearly 60 percent, or 627 producers, made 5 or less telephone calls and 19.5 percent made 6 or more telephone calls to the Extension office.

Number of farm visits received from Extension agents. Almost 30 percent of the swine producers surveyed did not receive any farm visits from the Extension agent. Fifty-four percent (585) producers received between 1 and 3 farm visits while about 17 percent received 4 or more farm visits from the Extension agent.

II. SWINE PRODUCERS' USE OF RECOMMENDED MANAGEMENT PRACTICES

The purpose of Section II is to present findings regarding the characteristics of swine producers and their use of 21 production practices reported in Table II. This section is divided into two subsections, one on health practices, the other on feeding practices. The total number and percent of producers responding to each question is used to help summarize Tennessee feeder pig producers use of 21 pig management practices.

Health Practices

The first 16 variables in Table II deal with the producers use of health practices recommended by the Agricultural Extension Service.

Number of times/year sows were vaccinated for leptospirosis.

Almost 35 percent of the swine producers surveyed did not vaccinate

TABLE II. Number and Percent of Swine Producers Using Recommended Management Practices

Management Practices	Number of Producers	Valid Percent of Producers
HEALTH PRACTICES		
Number Times/Year Vaccinated Leptospirosis		
None	378	34.0
Once	204	18.8
Twice	475	43.9
Three-over	26	2.4
TOTAL	1083	100.0
M = 0* V.C. = 1083**		
Number Times/Year Sows Vaccinated Rhinitis		
None	718	66.3
Once	114	10.5
Twice-Over	251	23.2
TOTAL	1083	100.0
M = 0 V.C. = 1083		
Number Times/Year Sows Vaccinated Parvovirus		
None	858	79.3
Once	104	9.6
Twice	120	11.1
TOTAL	1082	100.0
M = 1 V.C. = 1082		
Number Times/Year Boars Vaccinated Parvovirus		
None	833	76.9
Once	133	12.3
Twice-over	117	10.8
TOTAL	1083	100.0
M = 0 V.C. = 1083		
Number Times/Year Sows Wormed		
None	67	6.2
Once	166	15.3
Twice	620	57.2
Three-over	230	21.2
TOTAL	1083	100.0
M = 0 V.C. = 1083		
Number Times/Year Sows Treated for Lice		
None	54	5.0
Once	146	13.5
Twice	395	36.5
Three-over	488	45.1
TOTAL	1083	100.0
M = 0 V.C. = 1083		
Use Medication in Water to Treat Disease		
No	764	80.3
Yes	188	19.7
DNA***	131	0.0
TOTAL	1083	100.0
M = 131 V.C. = 952		

TABLE II (Continued)

Management Practices	Number of Producers	Valid Percent of Producers
Use Sulfa in Water		
No	600	79.3
Yes	157	20.7
DNA	326	0.0
TOTAL	1083	100.0
M = 326 V.C. = 757		
Use Antibiotic in Water		
No	449	58.5
Yes	318	41.5
DNA	316	0.0
TOTAL	1083	100.0
M = 316 V.C. = 767		
Medication Used in Sows Gestation-Lactation Ration		
None	386	36.1
Antibiotic	378	35.3
Sulfa	45	4.2
Both	261	24.4
DNA	13	0.0
TOTAL	1083	100.0
M = 13 V.C. = 1070		
Medication Used in Pigs Weaning Ration		
None	243	22.9
Antibiotic	486	45.8
Sulfa	42	4.0
Both	291	27.4
DNA	21	0.0
TOTAL	1083	100.0
M = 21 V.C. = 1062		
How Frequent Iron Shots Given to Pigs		
Never	249	25.6
Sometimes	277	28.5
Always	445	45.8
DNA	112	0.0
TOTAL	1083	100.0
M = 112 V.C. = 971		
Age Pigs Receive Iron Shots		
3 days after birth	627	87.2
Later	92	12.8
DNA	364	0.0
TOTAL	1083	100.0
M = 364 V.C. = 719		
Clip Needle Teeth		
Never	155	14.5
Sometimes	359	33.5
Always	558	52.1
No Response	11	0.0
TOTAL	1083	100.0
M = 11 V.C. = 1072		

TABLE II (Continued)

Management Practices	Number of Producers	Valid Percent of Producers
Age Pigs When Teeth Clipped		
First 3 days	796	87.8
Later	111	12.2
DNA	176	0.0
TOTAL	1083	100.0
M = 176 V.C. = 907		
Farrowing Quarters Disinfected		
No	424	44.9
Yes	520	55.1
DNA	139	0.0
TOTAL	1083	100.0
M = 139 V.C. = 944		
FEEDING PRACTICES		
Source of Feed		
Commercially mixed feed	635	59.3
Mixed feed on farm	436	40.7
DNA	12	0.0
TOTAL	1083	100.0
M = 12 V.C. = 1071		
Increase Feed to Pregnant Sows		
No	193	18.0
Yes	877	82.0
DNA	13	0.0
TOTAL	1083	100.0
M = 13 V.C. = 1070		
Pounds Feed Fed Pregnant Sows		
5-under	485	45.5
6-9	470	41.1
10-over	111	10.4
DNA	17	0.0
TOTAL	1083	100.0
M = 17 V.C. = 1066		
Pounds Feed Fed Nursing Sows		
10-less	556	52.0
11-over	514	48.0
DNA	13	0.0
TOTAL	1083	100.0
M = 13 V.C. = 1070		
How Did Creep Feed Pigs		
Creep feed only	783	73.0
Ate with sow	146	13.6
Creep plus corn	144	13.4
DNA	10	0.0
TOTAL	1083	100.0
M = 10 V.C. = 1073		

* = Missing.

** = Valid cases.

*** = Does not apply.

their sows for leptospirosis. About 19 percent vaccinated sows 1 time per year while nearly 44 percent (475) of the producers vaccinated sows 2 times. Only about 2.0 percent vaccinated sows 3 or more times per year.

Number of times/year sows were vaccinated for rhinitis. Seven hundred and eighteen, or 66.3 percent, of the feeder pig producers did not vaccinate their sows for rhinitis during the 12-month time period. Just over 10 percent vaccinated their sows 1 time and about 23 percent vaccinated their sows 2 or more times.

Number of times/year sows were vaccinated for parvovirus. Over 79 percent (858) of the producers responding did not vaccinate their sows for parvovirus. About 10 percent vaccinated 1 time per year while 11 percent vaccinated 2 times per year.

Number of times/year boars were vaccinated for parvovirus. Nearly 77 percent of the 1,083 producers surveyed did not follow the recommended practice of vaccinating their boars for parvovirus. About 12 percent of the feeder pig producers vaccinated 1 time per year and almost 11 percent vaccinated their boars 2 or more times during the 12-month period.

Number of times/year sows were wormed. Producers who did not worm their sows tallied only about 6.0 percent. Over 15 percent wormed their sows 1 time per year while 620 (57.2 percent) of the producers wormed their sows 2 times. About 21 percent averaged worming their sows 3 times or more during the year.

Number of times/year sows were treated for lice. Five percent of the swine producers surveyed did not treat their sows for lice. Only 13.5 percent treated sows for lice 1 time per year with nearly 37 percent treating 2 times per year for lice. Almost 45 percent (488) of the producers treated their sows 3 or more times per year for lice.

Use medication in water to treat disease. Of the 972 producers responding to this question, over 80 percent used no medication in the water for disease treatment. Nearly 20 percent did use medication in the water to treat disease.

Use sulfa in the water. About 79 percent of the 757 producers responding did not use sulfa in their water while almost 21 percent did follow the practice of using sulfa in the sows water.

Use antibiotic in the water. Four hundred and forty-nine, or 58.5 percent, of those producers responding did not use antibiotic in the water while 41.5 percent did follow this practice.

Medication used in sows gestation or lactation ration. About 36 percent of the 1,070 producers responding used no medication in the sows gestation or lactation ration. Over 35 percent used antibiotic, 4.2 percent used sulfa, and about 24 percent used both sulfa and antibiotic in the sows ration.

Medication used in the pigs weaning ration. Nearly 30 percent of the swine producers surveyed used no medication in the pigs weaning

ration. Almost 46 percent (486) of the producers use antibiotic, 4.0 percent used sulfa, while over 27 percent used both sulfa and antibiotic in their pigs weaning ration.

How frequent were iron shots given to pigs. Producers who never gave iron shots to their pigs numbered 249, or 25.6 percent. Over 28 percent sometimes gave their pigs iron shots and nearly 46 percent always gave their pigs iron shots.

Age pigs received iron shots. Over 87 percent or 627 producers who responded to this survey question gave their pigs iron shots within 3 days after their birth. Ninety-two producers (12.8 percent) gave their pigs iron shots sometime later.

Clip needle teeth. Just over 14 percent of the swine producers never clipped their pigs' needle teeth, over 33 percent clipped needle teeth sometimes, and more than 52 percent always clip the needle teeth.

Age of pigs when needle teeth clipped. Almost 88 percent of the swine producers who clipped their pigs needle teeth did so within the first 3 days after birth. About 12 percent clipped the needle teeth later.

Farrowing quarters disinfected. Nearly 45 percent of the 944 producers who responded to the survey question did not disinfect the sow's farrowing quarters while just over 55 percent did follow the recommended practice.

Feeding Practices

The remaining five variables in Table II deal with the swine feeding management practices recommended by the Extension Service and their use by the feeder pig producers.

Source of feed. Nearly 60 percent of the 1,071 feeder pig producers responding to this question fed a commercially mixed feed while about 41 percent fed their herd feed that was mixed on the farm.

Increase feed to pregnant sows. Only 18 percent of the producers did not increase the amount of feed fed to pregnant sows. Eighty-two percent or 877 producers did follow the recommended practice of increasing the amount of feed fed to their pregnant sows.

Pounds of feed fed to pregnant sows. Almost 46 percent of the producers fed less than 6 pounds of feed to their pregnant sows. About 41 percent fed between 6 and 9 pounds and just over 10 percent fed 10 pounds or more of feed to their pregnant sows.

Pounds of feed fed nursing sows. Five hundred and fifty-six or 52 percent of the surveyed swine producers fed 10 pounds or less of feed to nursing sows. The other 48 percent fed 11 pounds or more to their nursing sows.

How did creep feed pigs. Seventy-eight percent (783) of the 1,073 producers responding only creep fed their pigs. Nearly 14 percent let their pigs eat with the sow and only about 13 percent creep fed plus fed corn to their pigs.

III. CHAPTER SUMMARY

Almost 79 percent of the producers were over the age of 36 with just over 21 percent or 225 of the 1,059 feeder pig producers responding being young farmers less than 36 years of age. Over 80 percent had only a high school education or less and nearly 58 percent of the producers farmed on a part-time basis.

Nearly 74 percent of the farmers surveyed were small producers averaging less than 20 sows. Almost 80 percent of the producers farrowed less than 50 litters per year. About 65 percent raised 250 pigs or less to weaning and the same percent weaned 8 pigs or less per litter. Sixty-five percent of the producers sold less than 200 feeder pigs per year with almost the same percentage (64 percent) selling pigs that averaged weighing 45 pounds or less.

Nearly 45 percent of the producers surveyed attended between 1 and 8 Extension swine meetings. Over 73 percent made 1 or more Extension office visits and over 77 percent of the producers made 1 or more telephone calls to the Extension office. At least 70 percent of the swine producers received at least 1 farm visit from the Extension agent.

One-third or 7 of the 21 management practices recommended by the Extension service were not used by about 50 percent of the producers. These were vaccinating sows for atrophic rhinitis, vaccinating sows and boars for parvovirus, the use of medication in the water to treat disease, the use of either sulfa or an antibiotic in the water and the amount of feed fed nursing sows. Eleven of the management practices

were used by nearly 65 percent of the producers with over 85 percent using the following 5 practices: (1) wormed sows once or more per year, (2) treated sows for lice twice or more times per year, (3) gave iron shots to pigs within 3 days after birth, (4) clipped needle teeth, and (5) clipped needle teeth within 3 days after birth.

CHAPTER IV

RELATIONSHIPS BETWEEN THE PERSONAL CHARACTERISTICS OF TENNESSEE FEEDER PIG PRODUCERS, THEIR SIZE OF FARM OPERATION AND THE NUMBER AND TYPES OF CONTACTS WITH EXTENSION

This chapter presents findings regarding relationships between the personal characteristics of the swine producers, their size of operation and the number and types of contacts they had with Extension agents. The producers' personal characteristics studied were: farmers' age, farmers' education, farmers' employment and number of sows owned in 1983. These variables were studied to determine relationships with the number of contacts producers had with Extension. Data were collected on four contact variables which include: number of Extension swine meetings attended, number of visits to the Extension office, number of telephone calls to the Extension office and number of farm visits received from Extension agents. The Chi-Square test was used to determine strengths of relationships between dependent and independent variables. Data are summarized in four tables. Each table constitutes a section.

I. FARMERS' AGE AND NUMBER AND TYPE OF EXTENSION CONTACTS

This section presents findings regarding the relationships between swine producers' age and the number and type of contacts made with Extension. The total number and percent of producers is given for each variable as well as the Chi-Square value and probability level.

Farmers' Age and Swine Meetings Attended

Table III indicates that of the producers who were 35 years of age or less, over 49 percent did attend Extension swine meetings compared to just over 41 percent of those 51 years of age and over. Although the data did show a slight tendency for the younger producer to attend more Extension swine meetings, the differences were not significant as tested by the Chi-Square test. Therefore, there was not a significant relationship between the farmers' age and number of Extension swine meetings attended.

Farmers' Age and Office Visits Made

Almost 80 percent of the producers in all three age groups made 1 or more visits to the county Extension office during the past 12-months. In each of the age levels, 1 to 3 visits to the Extension office was most prevalent with nearly 60 percent of the producers involved. These observed differences in Extension office visits made were significant as tested by the Chi-Square test. Therefore, there was a significant relationship between the number of office visits made and the age of the swine producer. Producers in the 35 and under category did have a slight advantage in the number of Extension office visits.

Farmers' Age and Telephone Calls Made

Nearly 85 percent of the swine producers 35 years of age and under made more than 1 telephone call to the county Extension office. Of the producers between 36 and 50 years of age, 76.5 percent made

TABLE III. Relationships Between Producers' Age and Extension Contacts

Characteristics of Producers	Farmer Age					
	35-Under		36-50		51-Over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
Swine Meetings Attended						
None	109	50.9	215	52.8	277	58.7
1-over	105	49.1	192	47.2	160	41.3
TOTAL	214	100.0	407	100.0	387	100.0
	Statistic $\chi^2 = 1.2$; $p = 0.120$					
Office Visits Made						
None	49	22.2	124	29.5	96	23.4
1-3	130	58.8	248	58.9	232	56.4
4-over	42	19.0	49	11.6	83	20.2
TOTAL	221	100.0	421	100.0	411	100.0
	Statistic $\chi^2 = 14.8$; $p = 0.005$					
Telephone Calls Made						
None	34	25.4	99	23.5	92	22.4
1-5	134	60.6	253	60.1	233	56.8
6-over	53	24.0	69	16.4	85	20.7
TOTAL	221	100.0	421	100.0	410	100.0
	Statistic $\chi^2 = 10.0$; $p = 0.041$					
Farm Visits Received						
None	50	22.6	136	32.3	108	26.3
1-3	114	51.6	227	53.9	234	56.9
4-over	157	25.8	58	13.8	69	16.8
TOTAL	221	100.0	421	100.0	411	100.0
	Statistic $\chi^2 = 18.5$; $p = 0.001$					

more than 1 telephone call to the Extension office and 77.5 percent of the 51 years of age and older producers made more than 1 telephone call to the Extension office. These observed differences in telephone calls made to the Extension office were significant as tested by the Chi-Square test. Therefore, there was a significant relationship between the number of telephone calls made and the age of the swine producer. Younger feeder pig producers made more telephone calls than older producers.

Farmers' Age and Farm Visits Received

Of the swine producers 35 years of age and under, 77.4 percent received more than 1 farm visit by the Extension agent. Only 67.7 percent of the swine producers in the 36 to 50 years of age group received 1 or more farm visits and 73.7 percent of the producers 51 years of age and over received 1 or more farm visits from the Extension agent. These observed differences in farm visits received from the Extension agent were significant as tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits made by the Extension agent and the age of the swine producer. Fewer swine producers in the 36 to 50 years of age group received farm visits from the Extension agent than in either of the other two age groups.

II. FARMERS' EDUCATION AND NUMBER AND TYPES OF EXTENSION CONTACTS

This section presents findings regarding the relationship between the swine producers' education and the number and types of contacts

made with Extension. The total number and percent of producers is given for each variable as well as the Chi-Square value and the probability level.

Farmers' Education and Swine Meetings Attended

Table IV indicates that of the feeder pig producers having a high school degree or less of formal education, only 42.6 percent attended 1 or more Extension swine meetings compared to 55.4 percent of those who attended college. These observed differences in swine meetings attended and the producers' education proved significant as tested by the Chi-Square test. Therefore, there was a significant relationship between the producers' education and the number of Extension swine meetings attended. Producers with college education were more likely than those with high school or less to attend Extension swine meetings.

Farmers' Education and Office Visits Made

Nearly 84 percent of the swine producers having a college education made 1 or more visits to the county Extension office during a 12-month period compared to only about 72 percent of the producers with a high school degree or less. These observed differences in the swine producers' education and visits made to the Extension office proved significant as tested by the Chi-Square test. Therefore, there was a significant relationship between the swine producers' education and the number of visits made to the Extension office. One to 3 visits were made most frequent by nearly 60 percent of both categories of

TABLE IV Relationships Between Producers' Education and Extension Contacts

Characteristics of Producers	Farmer Education					
	High School-Less		College			
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents		
Swine Meetings Attended						
None	463	57.4	87	44.6		
1-over	343	42.6	108	55.4		
TOTAL	806	100.0	195	100.0		
	Statistic $\chi^2 = 9.9$; $p = 0.002$					
Office Visits Made						
None	235	28.1	34	16.6		
1-3	483	57.8	121	59.0		
4-over	118	14.1	50	24.4		
TOTAL	836	100.0	205	100.0		
	Statistic $\chi^2 = 19.3$; $p = 0.001$					
Telephone Calls Made						
None	203	24.3	21	10.2		
1-5	497	59.4	119	58.0		
6-over	136	16.3	65	31.7		
TOTAL	836	100.0	205	100.0		
	Statistic $\chi^2 = 35.4$; $p = 0.00$					
Farm Visits Received						
None	250	29.9	41	20.0		
1-3	467	55.9	107	52.2		
4-over	119	14.2	57	27.8		
TOTAL	836	100.0	205	100.0		
	Statistic $\chi^2 = 24.1$; $p = 0.001$					

swine producers. However, feeder pig producers who attended college were more likely to visit the Extension office than those who did not.

Farmers' Education and Telephone Calls Made

Nearly 90 percent of the producers having a college education made 1 or more calls to the county Extension office during a 12-month period. Whereas, just over 75 percent of the swine producers having a high school education or less made 1 or more calls to the Extension office during the same period of time. These observed differences in the swine producers' education and number of telephone calls made to the Extension office were significant. Therefore, there was a significant relationship between the producers' education and the number of telephone calls made to the county Extension office. Producers with a college education were more likely than those with high school or less to make telephone calls to the Extension office.

Farmers' Education and Farm Visits Received

Eighty percent of the swine producers having a college education received 1 or more farm visits from the county Extension office during a 12-month time period. Only 70.1 percent of the producers having a high school education or less received 1 or more farm visits from the Extension office during the same time period. These observed differences in the farmers' education and the number of farm visits received from the Extension office proved significant as tested by the Chi-Square test. Therefore, there was a significant relationship between the farmers' education and the number of farm visits received

by the Extension office. Again producers having a college education were more likely than those with high school or less to visit the Extension office.

III. FARMERS' EMPLOYMENT AND NUMBER AND TYPE OF EXTENSION CONTACTS

This section presents findings regarding the relationship between swine producers' employment and the number and type of contacts made with Extension. The total number and percent of producers is given for each variable as well as the Chi-Square value and the probability level.

Farmers' Employment and Swine Meetings Attended

Table V indicates that over 51 percent of the full-time farmers attended 1 or more Extension swine meetings. Of the part-time farmers, only about 41 percent attended Extension swine meetings during the 12-month time period. These observed differences in swine meetings attended and the producers' employment proved significant as tested by the Chi-Square test. Therefore, there was a significant relationship between the producers' employment and the number of Extension swine meetings attended during the 12-month time. Feeder pig producers who were full-time farmers were more likely to attend Extension swine meetings than were part-time farmers.

Farmers' Employment and Office Visits Made

Nearly 76 percent of the full-time producers made 1 or more visits to the Extension office during the year compared to over 73 percent

TABLE V. Relationships Between Producers' Employment and Extension Contacts

Characteristics of Producers	Farmer Employment			
	Full-Time Farmer		Part-Time Farmer	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
Swine Meetings Attended				
None	203	48.8	348	58.9
1-over	213	51.2	243	41.1
TOTAL	416	100.0	591	100.0
	Statistic $\chi^2 = 9.6$; $p = 0.002$			
Office Visits Made				
None	107	24.3	161	26.6
1-3	257	58.3	353	58.3
4-over	77	17.5	91	15.0
TOTAL	441	100.0	605	100.0
	Statistic $\chi^2 = 1.5$; $p = 0.477$			
Telephone Calls Made				
None	74	16.8	149	24.7
1-5	267	60.5	354	58.6
6-over	100	22.7	101	16.7
TOTAL	441	100.0	604	100.0
	Statistic $\chi^2 = 12.3$; $p = 0.002$			
Farm Visits Received				
None	80	18.1	212	35.0
1-3	267	60.5	309	57.1
4-over	94	21.3	84	13.9
TOTAL	441	100.0	605	100.0
	Statistic $\chi^2 = 38.5$			

of the part-time producers. These observed differences in office visits made and the employment of the producer did not prove significant as tested by the Chi-Square test. Therefore, there was not a significant relationship between the producers' employment and the number of Extension office visits made over a 12-month period of time. Feeder pig producers who were part-time farmers were just as likely to visit the Extension office as were the full-time farmers.

Farmers' Employment and Telephone Calls Made

Over 83 percent of the full-time producers made 1 or more telephone calls to the Extension office during a time period of 12-months compared to just over 75 percent of the part-time producers. These observed differences in farmers' employment and telephone calls made proved significant as tested by the Chi-Square test. Therefore, there was a significant relationship between the farmers' employment and the number of telephone calls made to the Extension office during a year's time. A majority of both the full-time and part-time producers (nearly 60 percent) made between 1 to 5 telephone calls to the Extension office. However, feeder pig producers who were full-time farmers were more likely than the part-time farmers to telephone the Extension office.

Farmers' Employment and Farm Visits Received

Nearly 82 percent of the full-time producers received 1 or more farm visits from the Extension office during a 12-month period compared to only 65 percent of the part-time producers. These observed differences between the farmers' employment and the number of farm

visits received proved significant as tested by the Chi-Square test. Therefore, there was a significant relationship between the farmers' employment and the number of farm visits received from the Extension during the year. Feeder pig producers who farmed full-time were more likely than those who farmed part-time to receive farm visits from the Extension agent.

IV. AVERAGE NUMBER OF SOWS IN 1983 AND NUMBER AND TYPE OF EXTENSION CONTACTS

Table VI presents findings regarding the relationship between swine producers' average number of sows on hand in 1983 and the number and type of contacts made with Extension. The total number and percent of producers is given for each variable as well as the Chi-Square value and the probability level.

Average Number of Sows in 1983 and Swine Meeting Attended

Table VI indicates that nearly 68 percent of the producers having 100 or more sows attended 1 or more Extension swine meetings during the year compared to only about 38 percent of those producers having under 20 sows. These observed differences in swine meetings attended and average number of sows producers had in 1983 were significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the average number of sows on hand in 1983 and the number of Extension swine meetings attended in a 12-month period. The largest number of sows producers had in 1983, the more swine meetings they attended although the larger number of producers (942 of 1027) had less than 50 sows.

TABLE VI. Relationships Between Average Number of Sows in 1983 and Extension Contacts

Average Number of Sows in 1983	Number of Sows											
	Under 20			20-49			50-99			100-Over		
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
Swine Meetings Attended												
None	441	62.3	97	41.5	19	39.6	12	32.4				
1-over	267	37.7	137	58.5	29	60.4	25	67.6				
TOTAL	708	100.0	234	100.0	48	100.0	37	100.0				
	Statistic $\chi^2 = 44.8$; $p = 0.001$											
Office Visits Made												
None	204	28.2	63	25.1	12	21.1	8	19.5				
1-3	411	56.8	145	57.8	32	56.1	23	56.1				
4-over	109	15.1	43	17.1	13	22.8	10	24.4				
TOTAL	724	100.0	251	100.0	57	100.0	41	100.0				
	Statistic $\chi^2 = 6.3$; $p = 0.394$											
Telephone Calls Made												
None	186	25.7	43	17.1	9	15.8	3	7.3				
1-5	419	58.0	153	61.1	29	50.9	21	51.2				
6-over	118	16.3	55	21.9	19	33.3	17	41.5				
TOTAL	723	100.0	251	100.0	57	100.0	41	100.0				
	Statistic $\chi^2 = 33.3$; $p = 0.001$											
Farm Visits Received												
None	238	32.9	56	22.3	10	17.5	5	12.2				
1-3	383	52.9	156	58.2	31	54.4	20	48.2				
4-over	103	14.2	49	19.5	16	28.1	16	39.0				
TOTAL	724	100.0	251	100.0	57	100.0	41	100.0				
	Statistic $\chi^2 = 35.3$; $p = 0.001$											

Average Number of Sows in 1983 and Office Visits Made

About 80 percent of the producers who had more than 50 sows on hand in 1983 made 1 or more visits to the Extension office during a 12-month time period compared to just over 70 percent of the producers who had less than 50 sows. These observed differences in the number of Extension office visits made and the number of sows on hand in 1983 were not significant when tested by the Chi-Square test. Therefore, there was not a significant relationship between the average number of sows on hand in 1983 and the number of visits made to the Extension office in a year. Feeder pig producers with fewer sows were just as likely to visit the Extension office as those having a larger number of sows.

Average Number of Sows in 1983 and Telephone Calls Made

Nearly 93 percent of those producers who average more than 100 sows on hand in 1983 made 1 or more telephone calls to the Extension office during a 12-month time period compared to 74 percent of the producers who averaged 20 sows or less. These observed differences proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the average number of sows in 1983 and the number of telephone calls made to the Extension office in a 12-month period. More producers, over 50 percent no matter how many sows were on hand, preferred to make between 1 and 5 telephone calls to the Extension office. However, larger producers made more telephone calls to the Extension office than did the smaller producers.

Average Number of Sows in 1983 and Farm Visits Received

Nearly 88 percent of the swine producers who averaged 100 or more sows in 1983 received 1 or more farm visits from the Extension office during a 12-month period compared to just over 67 percent of the producers who averaged less than 20 sows in 1983. These observed differences proved significant as tested by the Chi-Square test. Therefore, there was a significant relationship between the average number of sows in 1983 and the number of farm visits received from the Extension office during the same time period. Almost 50 percent of all the swine producers, regardless of the number of sows they averaged in 1983 received between 1 and 3 visits from the Extension office during the 12-month time period. However, feeder pig producers with 100 or more sows were more likely to receive a farm visit from the Extension agent than those who had fewer sows.

V. CHAPTER SUMMARY

Younger producers did differ significantly from older producers in terms of the number of contacts they had with Extension through office visits, telephone calls, and farm visits. Swine producers who were 35 years of age or under attended more Extension swine meetings, made more office visits and telephone calls to the Extension office and received more farm visits from Extension agents.

Swine producers having a college education made significantly more contacts with Extension than did producers having a high school education or less. A significantly higher percent of the college

degree producers made contact with Extension through Extension swine meetings attended, office visits and telephone calls made to the Extension office, and received more visits from Extension agents.

Full-time and part-time producers did differ significantly in the number of contacts they had with Extension through meetings, telephone calls and farm visits received from agents. The swine producers who were full-time farmers attended significantly more Extension swine meetings, made more visits and telephone calls to the Extension office and received more farm visits from Extension agents.

Feeder pig producers who averaged 50 or more sows attended significantly more Extension swine meetings, made more visits and telephone calls to the Extension office and received more farm visits from the Extension agent than those who averaged less than 50 sows.

CHAPTER V

RELATIONSHIPS BETWEEN THE NUMBER AND TYPE OF EXTENSION CONTACTS TENNESSEE FEEDER PIG PRODUCERS HAD OVER A 12-MONTH PERIOD AND THEIR USE OF EXTENSION RECOMMENDED SWINE MANAGEMENT PRACTICES

This chapter presents findings regarding relationships between the number and types of contacts feeder pig producers had with Extension over a 12-month time period and their use of the swine management practices recommended by the Tennessee Extension Service. Data are summarized in four tables with each table constituting a section.

Section I presents findings regarding relationships between the number of Extension swine meetings attended over a 12-month time period and the use of recommended swine management practices.

Section II presents findings regarding relationships between the number of visits swine producers made to the county Extension office over a 12-month time period and the use of recommended swine production practices.

Section III presents findings regarding relationships between the number of telephone calls made to the Extension office by swine producers during a 12-month time period and the use of recommended management practices.

Section IV presents findings regarding relationships between the number of farm visits received by the swine producers from the Extension

office during a 12-month time period and the use of recommended swine management practices.

I. RELATIONSHIPS BETWEEN THE NUMBER OF SWINE MEETINGS ATTENDED
AND THE USE OF RECOMMENDED SWINE
MANAGEMENT PRACTICES

This section presents data regarding the relationship between Extension swine meetings attended and the use of recommended swine management practices. Findings summarized in Table VII organizes the recommended management practices into two subsections: (1) health practices and (2) feeding practices. The number of swine meetings attended by swine producers was divided into two groups: those who attended none and those who attended 1 or more. The Chi-Square test was used to determine strengths of relationships between dependent and independent variables.

Health Practices

This subsection presents findings regarding relationships between the health practices used and the number of Extension swine meetings attended. These findings are summarized in Table VII.

Vaccinate sows for leptospirosis and swine meetings attended.

Only 58 percent of the swine producers who did not attend any Extension meetings vaccinated their sows for leptospirosis at least once during the 12-month time period compared to nearly 73 percent of the producers who attended 1 or more swine meetings. Twice per year was the preferred

TABLE VII. Relationships Between Swine Meetings Attended and the Use of Recommended Swine Management Practices

Management Practices	Swine Meetings Attended			
	None		1-Over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
HEALTH PRACTICES				
Number Times/Year Sows Vaccinated Leptospirosis				
None	241	42.1	126	27.5
Once	116	20.3	85	18.5
Twice	200	35.0	241	52.5
3-over	15	2.6	7	1.5
TOTAL	572	100.0	459	100.0
Statistic $\chi^2 = 35.6$; $p = 0.001$				
Number Times/Year Sows Vaccinated Rhinitis				
None	424	74.1	269	58.6
Once	45	7.9	66	14.4
Twice-over	103	18.0	124	27.0
TOTAL	572	100.0	459	100.0
Statistic $\chi^2 = 28.5$; $p = 0.001$				
Number Times/Year Sows Vaccinated Parvovirus				
None	472	82.5	350	76.4
Once	47	8.2	53	11.6
Twice	53	9.3	55	12.0
TOTAL	572	100.0	458	100.0
Statistic $\chi^2 = 6.0$; $p = 0.051$				
Number Times/Year Boars Vaccinated Parvovirus				
None	461	80.6	336	73.2
Once	58	10.1	70	15.3
Twice-over	53	9.3	53	11.5
TOTAL	572	100.0	459	100.0
Statistic $\chi^2 = 8.4$; $p = 0.015$				
Number Times/Year Sows Wormed				
None	38	6.6	28	6.1
Once	102	17.8	59	12.9
Twice	324	56.6	262	57.1
3-over	108	18.9	110	24.0
TOTAL	572	100.0	459	100.0
Statistic $\chi^2 = 7.3$; $p = 0.064$				

TABLE VII (Continued)

Management Practices	Swine Meetings Attended			
	None		1-Over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
Number Times/Year Sows Treated Lice				
None	29	5.1	23	5.0
Once	97	17.0	48	10.5
Twice	207	36.2	168	36.6
3-over	239	41.8	220	47.9
TOTAL	572	100.0	459	100.0
Used Medication in Water Treat Disease				
No	433	86.4	305	75.1
Yes	68	13.6	101	24.9
TOTAL	501	100.0	406	100.0
Use Sulfa in Water				
No	330	86.8	248	73.8
Yes	50	13.2	88	26.2
TOTAL	380	100.0	336	100.0
Use Antibiotic in Water				
No	258	67.0	171	50.7
Yes	127	33.0	166	49.3
TOTAL	385	100.0	337	100.0
Medication Used Sows Gestation/Lactation Period				
None	250	44.5	121	26.5
Antibiotic	181	32.2	178	38.9
Sulfa	28	5.0	17	3.7
Both	103	18.3	141	30.9
TOTAL	562	100.0	457	100.0
Medication Used Pigs Weaning Ration				
None	169	30.2	65	14.3
Antibiotic	234	41.9	229	50.4
Sulfa	24	4.3	16	3.5
Both	132	23.6	144	31.7
TOTAL	559	100.0	454	100.0

Statistic $\chi^2 = 9.8$; $p = 0.020$

Statistic $\chi^2 = 18.2$; $p = 0.001$

Statistic $\chi^2 = 18.6$; $p = 0.001$

Statistic $\chi^2 = 19.1$; $p = 0.001$

Statistic $\chi^2 = 43.1$; $p = 0.001$

Statistic $\chi^2 = 37.9$; $p = 0.001$

TABLE VII (Continued)

Management Practices	Swine Meetings Attended			
	None		1-Over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
How Frequent Iron Shots to Pigs				
Never	157	31.6	88	20.6
Sometimes	159	32.0	113	26.5
Always	181	36.4	226	52.9
TOTAL	497	100.0	427	100.0
				Statistic $\chi^2 = 27.0$; $p = 0.001$
Age Pigs Received Iron Shots				
3 days after birth	274	80.6	315	93.5
Later	66	19.4	22	6.5
TOTAL	340	100.0	337	100.0
				Statistic $\chi^2 = 23.7$; $p = 0.001$
Clip Needle Teeth				
Never	107	19.0	44	9.6
Sometimes	210	37.3	137	29.9
Always	246	43.7	277	60.5
TOTAL	563	100.0	458	100.0
				Statistic $\chi^2 = 33.0$; $p = 0.001$
Age Pigs When Teeth Clipped				
First 3 days	387	84.5	368	91.3
Later	71	15.5	35	8.7
TOTAL	458	100.0	403	100.0
				Statistic $\chi^2 = 8.6$; $p = 0.003$
Farrowing Quarters Disinfected				
No	242	50.6	168	40.2
Yes	236	49.4	250	59.8
TOTAL	478	100.0	418	100.0
				Statistic $\chi^2 = 9.4$; $p = 0.002$

TABLE VII (Continued)

Management Practices	Swine Meetings Attended			
	None		1-Over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
FEEDING PRACTICES				
Source of Feed				
Commercially Mixed Feed	350	62.1	270	59.2
Mixed Feed on Farm	214	37.9	186	40.8
TOTAL	564	100.0	456	100.0
	Statistic $\chi^2 = 0.7$; $p = 0.389$			
Increase Feed to Pregnant Sows				
No	133	23.5	51	11.3
Yes	433	76.5	402	88.7
TOTAL	566	100.0	453	100.0
	Statistic $\chi^2 = 24.7$; $p = 0.001$			
Pounds Feed Fed Pregnant Sows				
5-under	243	43.3	225	49.5
6-9	245	43.7	197	43.3
10-over	73	13.0	33	7.3
TOTAL	561	100.0	455	100.0
	Statistic $\chi^2 = 10.0$; $p = 0.007$			
Pounds Feed Fed Nursing Sows				
10-less	307	54.5	230	50.4
11-over	256	45.5	226	49.6
TOTAL	563	100.0	456	100.0
	Statistic $\chi^2 = 1.5$; $p = 0.216$			
How Did Creep Feed Pigs				
Creep feed only	395	69.8	357	78.3
Ate with sow	92	16.3	41	9.0
Creep plus corn	79	14.0	58	12.7
TOTAL	566	100.0	456	100.0
	Statistic $\chi^2 = 13.0$; $p = 0.002$			

number of times to vaccinate sows for leptospirosis. Of the producers who did not attend any swine meetings, 35 percent vaccinated twice per year; whereas, 52.5 percent of the producers who attended 1 or more Extension swine meetings vaccinated twice per year. These observed differences in the number of swine meetings attended and the use of the recommended practice of vaccinating sows for leptospirosis were found to be significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension swine meetings attended and the use of the recommended practice of vaccinating sows for leptospirosis. Feeder pig producers who attended Extension swine meetings were more likely to vaccinate sows for leptospirosis than those who did not attend any meetings.

Vaccinate sows for rhinitis and swine meetings attended. Twenty-six percent of the swine producers who did not attend any swine meetings during the 12-month period vaccinated their sows for rhinitis at least once during the same time period compared to over 41 percent of the producers who did attend 1 or more Extension swine meetings. A higher percentage of the producers who did vaccinate their sows for rhinitis, 18 percent of those who did not attend any swine meetings and 27 percent of those who did attend 1 or more swine meetings, vaccinated twice or more per years. These observed differences in the number of swine meetings attended and the use of the recommended practice of vaccinating sows for rhinitis was found to be significant as tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension swine meetings attended and the use of the

recommended practice of vaccinating sows for rhinitis each year. Feeder pig producers who attended 1 or more Extension swine meetings in the past year were more likely to have vaccinated sows for rhinitis than were those who had not attended any meetings.

Vaccinate sows for parvovirus and swine meetings attended. Just over 17 percent of the producers who did not attend any swine meetings during the 12-month period vaccinated their sows at least once for parvovirus compared to about 23 percent of those producers who did attend 1 or more Extension swine meetings. These observed differences in the number of swine meetings attended and the number of times producers vaccinated their sows for parvovirus did not prove to be significant when tested by the Chi-Square test. Therefore, there was not a significant relationship between the number of swine meetings attended by producers and the use of the recommended practice of vaccinating sows for parvovirus.

Vaccinate boars for parvovirus and swine meetings attended. Nearly 20 percent of those feeder pig producers, who did not attend any Extension swine meetings during the 12-month time period, vaccinated their boars at least once for parvovirus compared to 26.7 percent of the producers who attended 1 or more swine meetings. As shown in Table VII the majority of both groups of producers, those who did or did not attend any Extension swine meetings, did not use the recommended practice of vaccinating their boars yearly. These observed differences in the number of swine meetings attended and the

number of times producers vaccinated their boars for parvovirus proved to be significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of swine meetings attended by producers and the use of the recommended practice of vaccinating boars for parvovirus during the year.

Wormed sows and swine meetings attended. Just over 93 percent of the feeder pig producers, who did not attend any Extension swine meetings during the 12-month period, wormed their sows at least once during the year compared to nearly 94 percent of the swine producers who attended 1 or more swine meetings. Table VII shows that a larger percent (57.1 and 56.6, respectively) of both producers who did attend 1 or more swine meetings and those who did not attend any swine meetings, wormed their sows twice per year. These observed differences in the number of swine meetings attended and the number of times per year swine producers wormed their sows did not prove to be significant when tested by the Chi-Square test. Therefore, there was not a significant relationship between the number of Extension swine meetings attended by producers and the use of the recommended practice of worming sows yearly.

Treat for lice and swine meetings attended. Almost 95 percent of the swine producers who did not attend any swine meetings during the 12-month time period treated their sows for lice at least once during that year compared to the same percent (95 percent) of those swine producers who attended 1 or more swine meetings. However, almost

48 percent of the feeder pig producers who attended Extension swine meetings treated sows for lice compared to about 42 percent of those who did not attend any swine meetings. These observed differences between the number of Extension swine meetings attended and the treatment of sows for lice proved to be significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension swine meetings attended and the use of the recommended practice of treating their sows for lice in a 12-month time period.

Medication in water and swine meetings attended. Only 13.6 percent of those feeder pig producers who did not attend any swine meetings during a 12-month time period used medication in the sows drinking water during the same time period compared to nearly 25 percent of the producers who did attend 1 or more Extension swine meetings. These observed differences in the number of swine meetings attended and the use of medication in the sows drinking water did prove significant when tested by the Chi-Square test. Therefore, there was a significant relationships between the number of Extension swine meetings producers attended during a 12-month period and the use of the recommended practice of using medication in the sows drinking water. Feeder pig producers who attended Extension swine meetings were more likely than those who did not to use medication in water to treat disease.

Use sulfa in water and swine meetings attended. Only 13.2 percent of those producers who did not attend any swine meetings during the 12-month period used sulfa in the water supply compared to over 26 percent of those producers who attended 1 or more Extension swine meetings. These observed differences in the number of swine meetings attended and the use of sulfa in the water proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension swine meetings attended by producers and the recommended use of sulfa in the water supply for prevention of disease. Feeder pig producers who attended Extension swine meetings were more likely than those who did not to use sulfa in water to treat disease.

Used antibiotic in water and swine meetings attended. Thirty-three percent of those producers who did not attend any swine meetings during the 12-month period used antibiotics in the water supply compared to nearly 50 percent of those producers who attended 1 or more Extension swine meetings. These observed differences in the number of swine meetings attended and the use of an antibiotic in the water supply proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension swine meetings attended by producers and the recommended use of antibiotic in the water supply for prevention of disease. Feeder pig producers who attend Extension swine meetings were more likely than those who did not to use antibiotic in swine drinking water.

Used medication in sows gestation/lactation ration and swine meetings attended. Over 55 percent of those producers who did not attend any Extension swine meetings used some type of medication (sulfur or antibiotic) in the sows gestation/lactation ration compared to nearly 74 percent of those producers who attended 1 or more swine meetings. Those producers using only sulfa in the sows gestation/lactation ration represented the smallest percentage of both groups, 5.0 percent of those who did not attend any swine meetings and only 3.7 percent of those producers who attended 1 or more swine meetings. These observed differences in the number of Extension swine meetings attended and the use of medication in the sows gestation/lactation ration proved significant when tested by the Chi-Square test. Therefore, there was a significant relationships between the number of Extension swine meetings attended and using the recommended medication in the sows gestation/lactation ration. Feeder pig producers who attended Extension swine meetings were more likely than those who did not use medication during sows gestation/lactation period.

Used medication in pigs weaning ration and swine meetings attended. Nearly 70 percent of those feeder pig producers who did not attend any Extension swine meetings during the 12-month period did use medication (antibiotic or sulfa) in the pigs weaning ration compared to almost 86 percent of those producers who attended 1 or more Extension swine meetings. A larger percentage, 41.9 percent of those producers who attended no swine meetings and 50.4 percent of those who attended 1 or more swine meetings, used an antibiotic instead of sulfa in the

pigs weaning ration. These observed differences in the number of swine meetings attended and the use of medication in the pigs weaning ration proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension swine meetings attended by producers during a 12-month period and the use of medication in the pigs weaning ration. Feeder pig producers who attended Extension swine meetings were more likely than those who did not to use medication in pigs weaning ration.

Frequency of iron shots to pigs and swine meetings attended.

Nearly 32 percent of these feeder pig producers who did not attend any Extension swine meetings during the 12-month time period never gave iron shots to the pigs during that time compared to just over 20 percent of these producers who attended 1 or more swine meetings. Nearly 53 percent of the producers who attended 1 or more swine meetings always gave iron shots to their pigs as compared to only 36.4 percent of those producers who did not attend any meetings. These observed differences in the number of swine meetings attended and the frequency of iron shots given to pigs proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension swine meetings attended during a 12-month time period and the frequency of iron shots given to pigs during that time. Feeder pig producers who attended Extension meetings gave pigs iron shots more frequently than those who attended no meetings.

Age pigs received iron shots and swine meetings attended. Nearly 81 percent of those producers who did not attend any Extension swine meetings gave iron shots to their pigs within 3 days after birth compared to almost 94 percent of those producers who attended 1 or more swine meetings. These observed differences in the number of swine meetings attended and the age pigs received their iron shots proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension swine meetings attended during the 12-month time period and the age of the pigs when they received their iron shots. Feeder pig producers who attended Extension swine meetings were more likely than those who did not follow the practice of giving pigs iron shots within 3 days after birth.

Clipped needle teeth and swine meetings attended. Nineteen percent of those producers who did not attend any Extension swine meetings during the 12-month period never clipped the pigs needle teeth during that time compared to only 9.6 percent of those producers who attended 1 or more swine meetings. A higher percentage of both groups of producers (43.7 percent of those who did not attend any swine meetings and 60.5 percent of those who attended 1 or more swine meetings) always clipped needle teeth during the year. These observed differences in the number of swine meetings attended and the recommended practice of clipping needle teeth proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension swine meetings attended during the 12-month

period by swine producers and the use of the recommended practice of clipping pigs needle teeth.

Pigs age when teeth clipped and swine meetings attended. Over 84 percent of those producers who did not attend any Extension swine meetings during the 12-month period clipped the pigs needle teeth during the first 3 days after birth compared to more than 91 percent of those swine producers who attended 1 or more Extension swine meetings. These observed differences in the number of swine meetings attended and the age of the pigs when producers clipped the needle teeth proved to be significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of swine meetings attended and use of the recommended practice of clipping pigs needle teeth within 3 days after birth.

Disinfected farrowing quarters and swine meetings attended. Only about 49 percent of those producers who did not attend any Extension swine meetings during the 12-month period disinfected the farrowing quarters between farrowing compared to nearly 60 percent of those producers who attended 1 or more Extension swine meetings. These observed differences in the number of swine meetings attended and the disinfecting of the farrowing quarters proved to be significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension swine meetings attended by producers during the 12-month period and whether or not farrowing quarters were disinfected following each farrowing period. Producers

who attended Extension meetings were more likely than those not attending to follow the practice of disinfecting farrowing quarters after each farrowing season.

Feeding Practices

This subsection presents findings regarding the relationship between feeding practices used and the number of Extension swine meetings attended.

Source of feed and swine meetings attended. Almost 62 percent of those producers who did not attend any Extension swine meetings during the year used a commercially mixed feed in their swine operation compared to just over 59 percent of the producers who attended 1 or more swine meetings. There was a slight tendency for producers to use more commercially mixed feed than feed mixed on the farm. These observed differences in the swine meetings attended and source of feed did not prove significant when tested by the Chi-Square test. Therefore, there was not a significant relationship between the number of Extension swine meetings attended and the source of feed used in the swine operation.

Increase feed to pregnant sows and swine meetings attended. Over 76 percent of the producers who did not attend any Extension swine meetings during the 12-month time increased the amount of feed fed to pregnant sows compared to nearly 89 percent of the producers who attended 1 or more swine meetings. These observed differences in the number of swine meetings attended and the amount of feed increased

to pregnant sows proved significant when tested to the Chi-Square test. Therefore, there was a significant relationship between the number of Extension swine meetings attended during the 12-month period and the use of the recommended practice of increasing the amount of feed fed to pregnant sows.

Pounds of feed fed pregnant sows and swine meetings attended.

Eighty-seven percent of the producers who did not attend any Extension swine meetings during the 12-month time period fed 9 pounds or less of feed to pregnant sows compared to nearly 93 percent of those producers who attended 1 or more swine meetings. Only 7.3 percent of the producers who attended 1 or more swine meetings fed more than 10 pounds of feed to pregnant sows as compared to 13 percent of the producers who did not attend any swine meetings. These observed differences in number of swine meetings attended and the pounds of feed fed to pregnant sows proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension swine meetings attended during a 12-month period and the pounds of feed fed to pregnant sows.

Pounds of feed fed nursing sows and swine meetings attended. Over 5.4 percent of the producers who did not attend any Extension swine meeting during a 12-month period fed 10 pounds or less feed to nursing sows compared to just over 50 percent of those swine producers who did attend 1 or more swine meetings. These observed differences in number of swine meetings attended and pounds of feed fed to nursing

sows proved not to be significant when tested by the Chi-Square test. Therefore, there was not a significant relationship between the number of Extension swine meetings attended during the year and the pounds of feed fed nursing sows.

How creep fed pigs and swine meetings attended. Nearly 70 percent of the producers who did not attend any Extension swine meetings during the 12-month period fed creep feed only to their pigs compared to over 78 percent of those producers who attended 1 or more swine meetings. Only 9.0 percent of the producers who attended 1 or more swine meetings used the practice of letting pigs eat with the sows compared to over 16 percent of the producers who did not attend any swine meetings. These observed differences in number of swine meetings attended and method in which pigs were creep fed proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension swine meetings attended during the 12-month period and the method the producers used to creep feed their pigs.

II. RELATIONSHIPS BETWEEN THE NUMBER OF OFFICE VISITS MADE AND THE USE OF RECOMMENDED SWINE MANAGEMENT PRACTICES

This section presents findings regarding relationships between Extension office visits made and the use of recommended management practices. Findings presented in Table VIII organized the recommended management practices into two subsections: (1) health practices and (2) feeding practices. The number of office visits made by swine

TABLE VIII. Relationships Between Office Visits Made and the Use of Recommended Swine Management Practices

Management Practices	Office Visits Made							
	None		1-3		4-Over			
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
HEALTH PRACTICES								
Number Times/Year Sows Vaccinated Leptospirosis								
None	131	45.3	188	30.7	59	33.5		
Once	47	16.3	121	19.8	36	20.5		
Twice	106	36.7	286	46.7	78	44.3		
3-over	5	1.7	17	2.8	3	1.7		
TOTAL	289	100.0	612	100.0	176	100.0		
								Statistic $\chi^2 = 19.5$; $p = 0.004$
Number Times/Year Sows Vaccinated Rhinitis								
None	227	78.5	397	64.9	90	51.1		
Once	15	5.2	79	12.9	20	11.4		
Twice-over	47	16.3	136	22.2	66	37.5		
TOTAL	289	100.0	612	100.0	176	100.0		
								Statistic $\chi^2 = 45.8$; $p = 0.001$
Number Times/Year Sows Vaccinated Parvovirus								
None	254	87.9	468	76.6	131	74.4		
Once	12	4.2	67	11.0	25	14.2		
Twice	23	8.0	76	12.4	20	11.4		
TOTAL	289	100.0	611	100.0	176	100.0		
								Statistic $\chi^2 = 21.3$; $p = 0.001$
Number Times/Year Boars Vaccinated Parvovirus								
None	251	86.9	459	75.0	118	67.0		
Once	16	5.5	81	13.2	36	20.5		
Twice-over	22	7.6	72	11.8	22	12.5		
TOTAL	289	100.0	612	100.0	176	100.0		
								Statistic $\chi^2 = 30.6$; $p = 0.001$
Number Times/Year Sows Wormed								
None	32	11.1	29	4.7	6	3.4		
Once	46	15.9	97	15.8	22	12.5		
Twice	160	55.4	352	57.5	105	59.7		
3-over	51	17.6	134	21.9	43	24.4		
TOTAL	289	100.0	612	100.0	176	100.0		
								Statistic $\chi^2 = 19.5$; $p = 0.003$

TABLE VIII (Continued)

Management Practices	Office Visits Made							
	None		1-3		4-Over			
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
Number Times/Year Sows Treated Lice								
None	19	6.6	28	4.6	7	4.0		
Once	49	17.0	76	12.4	21	11.9		
Twice	105	36.3	231	37.7	56	31.8		
3-over	116	40.1	277	45.3	92	52.3		
TOTAL	289	100.0	612	100.0	176	100.0		
	Statistic $\chi^2 = 10.3$; $p = 0.112$							
Use Medication in Water Treat Disease								
No	226	90.4	433	79.7	103	66.0		
Yes	24	9.6	110	20.3	53	34.0		
TOTAL	250	100.0	543	100.0	156	100.0		
	Statistic $\chi^2 = 36.3$; $p = 0.001$							
Use Sulfa in Water								
No	170	91.9	321	76.4	108	73.0		
Yes	15	8.1	99	23.6	40	27.0		
TOTAL	185	100.0	420	100.0	148	100.0		
	Statistic $\chi^2 = 23.8$; $p = 0.001$							
Use Antibiotic in Water								
No	129	68.6	246	57.9	74	49.7		
Yes	59	31.4	179	42.1	75	50.3		
TOTAL	188	100.0	425	100.0	149	100.0		
	Statistic $\chi^2 = 12.8$; $p = 0.002$							
Medication Used Sows Gestation/Lactation Ration								
None	112	39.4	215	35.5	57	32.4		
Antibiotic	98	34.5	205	33.9	73	41.5		
Sulfa	20	7.0	16	2.6	9	5.1		
Both	54	19.0	169	27.9	37	21.0		
TOTAL	284	100.0	605	100.0	176	100.0		
	Statistic $\chi^2 = 20.4$; $p = 0.002$							
Medication Used Pig's Weaning Ration								
None	70	25.1	140	23.1	33	19.1		
Antibiotic	129	46.2	262	43.3	91	52.6		
Sulfa	13	4.7	20	3.3	9	5.2		
Both	67	24.0	183	30.2	40	23.1		
TOTAL	279	100.0	605	100.0	173	100.0		
	Statistic $\chi^2 = 10.1$; $p = 0.123$							

TABLE VIII (Continued)

Management Practices	Office Visits Made					
	None		1-3		4-Over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
FEEDING PRACTICES						
Source of Feed						
Commercially mixed feed	150	53.0	387	63.7	97	55.7
Mixed feed on farm	133	47.0	221	36.3	77	44.3
TOTAL	283	100.0	608	100.0	174	100.0
	Statistic $\chi^2 = 10.3$; $p = 0.006$					
Increase Feed to Pregnant Sows						
No	70	24.6	106	17.4	17	9.9
Yes	215	75.4	503	82.6	154	90.1
TOTAL	285	100.0	609	100.0	171	100.0
	Statistic $\chi^2 = 15.9$; $p = 0.001$					
Pounds Feed Fed Pregnant Sows						
5-under	138	48.9	270	44.4	74	43.5
6-9	113	40.1	278	45.7	78	45.9
10-over	31	11.0	60	9.9	18	10.6
TOTAL	282	100.0	608	100.0	170	100.0
	Statistic $\chi^2 = 2.8$; $p = 0.600$					
Pounds Feed Fed Nursing Sows						
10-less	157	55.3	303	49.9	92	53.2
11-over	127	44.7	304	50.1	81	46.8
TOTAL	284	100.0	607	100.0	173	100.0
	Statistic $\chi^2 = 2.4$; $p = 0.306$					
How Did Creep Feed Pigs						
Creep feed only	197	69.1	446	73.2	136	78.2
Ate with sow	56	19.6	74	12.2	16	9.2
Creep plus corn	32	11.2	89	14.6	22	12.6
TOTAL	285	100.0	609	100.0	174	100.0
	Statistic $\chi^2 = 14.0$; $p = 0.007$					

producers was classified into three groups: (1) those who made no visits, (2) those who made 1 to 3 visits, and (3) those who made 4 or more visits. The Chi-Square test was used to determine strengths of relationships between the dependent and independent variables.

Health Practices

This subsection presents findings (Table VIII) regarding the relationship between health practices used and Extension office visits made.

Vaccinate sows for leptospirosis and office visits made. Over 45 percent of the producers who made no Extension office visits during the 12-month period did not vaccinate their sows for leptospirosis during that time compared to less than 31 percent of the producers who made between 1 and 3 Extension office visits. The larger percent of all groups of producers who did vaccinate their sows during the year preferred to do so twice. These observed differences in office visits made and number of times producers vaccinated for leptospirosis proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension office visits made during the year and the number of times per year swine producers vaccinated their sows.

Vaccinate sows for rhinitis and office visits made. Over 78 percent of the producers who did not make any Extension office visits during the 12-month period did not vaccinate their sows during that

time for rhinitis compared to nearly 51 percent of the producers who made between 4 or more office visits. The percentage of producers who did vaccinate for rhinitis increased as they made more office visits (16.3 percent for producers with no office visits to 37.5 percent for producers who made 4 or more). These observed differences in the number of office visits made and number of times per year sows were vaccinated for rhinitis proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension office visits made per year and the number of times per year swine producers vaccinated their sows for rhinitis.

Vaccinate sows for parvovirus and office visits made. Almost 88 percent of the producers who did not make any Extension office visits during the 12-month period did not vaccinate their sows for parvovirus compared to about 74 percent of the producers who made 4 or more office visits during the year. These observed differences in the number of office visits made and the number of times per year sows were vaccinated for parvovirus proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension office visits made and the number of times per year swine producers vaccinated their sows for parvovirus.

Vaccinate boars for parvovirus and office visits made. Almost 87 percent of the producers who did not make any Extension office visits during the year did not vaccinate their boars for parvovirus

during the year compared to only 67 percent of these producers who made 4 or more Extension office visits during the year. These observed differences in the number of office visits made and number of times per year boars were vaccinated for parvovirus proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension office visits made and the number of times per year swine producers vaccinated boars for parvovirus. The more visits swine producers made to the Extension office, the higher the percentage increased for producers who vaccinated their boars one or more times during the year.

Sows wormed and office visits made. Nearly 89 percent of the swine producers who did not make any office visits wormed their sows at least once per year compared to nearly 97 percent of the producers who made 4 or more Extension office visits during the year. The largest percentage, over 55 percent, of all three groups of producers (no visits, 1 to 3, and 4 or more) fell into the category of vaccinating sows twice per year. These observed differences in the number of office visits made during the year and the number of times per year sows were wormed proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension office visits made per year and the number of times per year swine producers wormed their sows. Feeder pig producers who visited the Extension office were more likely than those who did not to worm their sows and to worm more times during the year.

Treated sows for lice and office visits made. Nearly 7.0 percent of the producers who did not make any office visits during the 12-month period did not treat their sows for lice during that time compared to only 4.0 percent of the producers who made 4 or more office visits. The greatest difference was in producers who treated their sows for lice 3 times per year or more. About 40 percent of the producers who did not make any office visits treated their sows for lice 3 or more times per year as compared to 52.3 percent of the producers who made 3 or more Extension office visits during the year. These observed differences in the number of office visits made and the number of times per year sows were treated for lice did not prove significant when tested by the Chi-Square test. Therefore, there was not a significant difference in the number of Extension office visits made by swine producers and the number of times per year they treated their sows for lice.

Medication in water and office visits made. Over 90 percent of the producers who did not make any office visits during the 12-month period did not put medication in the water supply during that time compared to just 66 percent of the producers who made 4 or more office visits during the year. These observed differences in number of office visits made and the use of medication in the water supply proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension office visits made during the year by swine producers and the use of the recommended practice of using medication in the water supply to

prevent disease. Feeder pig producers who made visits to the Extension office during the year were more likely than those who did not to use medication in water to treat disease.

Use sulfa in water and office visits made. Almost 92 percent of the swine producers who did not make any office visits during a 12-month period did not use sulfa in the water supply compared to only 73 percent of those producers who made 4 or more Extension office visits during the year. These observed differences in the number of office visits made and the use of sulfa in the water supply proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship in the number of Extension office visits made by swine producers and the use of sulfa in the water supply. Feeder pig producers who visited the Extension office during the year were more likely than those who did not to use sulfa in swine drinking water.

Antibiotic in water and office visits made. Nearly 69 percent of the swine producers who did not make any Extension office visits during the 12-month period did not use an antibiotic in the herd's water supply compared to only about 50 percent of those producers who made 4 or more office visits during the year. These observed differences in the number of office visits made and the use of antibiotics in the water supply proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension office visits made by swine producers and the use of antibiotics in the water supply.

Medication in sows gestation/lactation ration and office visits

made. Nearly 40 percent of the producers who did not make any Extension office visits during the 12-month period did not use any medication in the sows gestation/lactation ration compared to about 32 percent of the producers who made 4 or more visits. More producers who used medication in the sows gestation/lactation ration used antibiotics more than sulfa or a combination of antibiotic and sulfa. These observed differences in the number of office visits made and the use of medication in the sows gestation/lactation ration proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension office visits made by swine producers during a 12-month period and the use of medication in the sows gestation/lactation ration.

Medication in pigs weaning ration and office visits made. Just over 25 percent of the producers who did not make any office visits during the 12-month period did not use any medication in the pig's weaning ration compared to about 19 percent of those producers who made 4 or more Extension office visits during the year. A larger percentage of the producers who did use medication in the pig's weaning ration used antibiotics more than either sulfa or a combination of antibiotics and sulfa. These observed differences in the number of office visits made and the use of medication in the pig's weaning ration did not prove significant when tested by the Chi-Square test. Therefore, there was not a significant relationship between the number

of Extension office visits made during the year and the use of medication in the pig's weaning ration.

Frequency of iron shots to pigs and office visits made. Over 37 percent of the swine producers who did not make any Extension office visits during the 12-month period never gave iron shots to their pigs during that time compared to just over 16 percent of the producers who made 4 or more Extension office visits. The majority of all the producers, regardless of the number of office visits made, always gave iron shots to their pigs. These observed differences in the number of office visits made and the frequency of iron shots given to pigs proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension office visits made by swine producers during the year and the frequency with which iron shots were given to the pigs.

Age pigs received iron shots and office visits made. Nearly 86 percent of those producers who did not make any Extension office visits during the 12-month period gave iron shots to pigs within 3 days of birth compared to about 93 percent of those producers who made 4 or more office visits. These observed differences in office visits made and the age of pigs when given iron shots did not prove significant when tested by the Chi-Square test. Therefore, there was not a significant relationship between the number of Extension office visits made by swine producers and the use of the recommended practice of giving pigs iron shots within 3 days of birth.

Clipped needle teeth and office visits made. Almost 22 percent of the swine producers who did not make any office visits during the 12-month period never clipped the needle teeth on the baby pigs compared to about 11 percent of those producers who made 4 or more office visits. The largest percentage difference in the three categories of producers occurs between producers who always clip their pigs needle teeth. Just over 42 percent of those producers who did not make any office visits always clipped their pigs needle teeth as compared to nearly 59 percent of the producers who made 4 or more office visits. These observed differences in the number of office visits made and the practice of clipping the pigs needle teeth proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension office visits made by swine producers and use of the recommended practice of always clipping pigs needle teeth. Feeder pig producers who made 1 or more visits to the Extension office were more likely than those who did not to clip needle teeth.

Pigs age when teeth clipped and office visits made. Just over 89 percent of the swine producers who did not make any Extension office visits during the 12-month period clipped their pigs needle teeth during the first 3 days of birth compared to nearly 92 percent of the producers who made 4 or more office visits. These observed differences in the number of office visits made and the age of the pigs when producers clipped their needle teeth did not prove significant when

tested by the Chi-Square test. Therefore, there was not a significant relationship between the number of Extension office visits made by swine producers and the use of the recommended practice of clipping the pigs needle teeth within 3 days after birth.

Farrowing quarters disinfected and office visits made. Nearly 48 percent of the swine producers who did not make any office visits during the 12-month period did not disinfect the farrowing quarters during that time compared to nearly 38 percent of the producers who made 4 or more office visits. These observed differences in the number of office visits made and whether or not producers disinfected farrowing quarters did not prove significant when tested by the Chi-Square test. Therefore, there was not a significant relationship between the number of Extension office visits made by swine producers and the use of the recommended practice of disinfecting the farrowing quarters.

Feeding Practices

This subsection presents findings regarding the relationship between the feeding practices used and the number of Extension office visits made.

Source of feed and office visits made. Fifty-three percent of the producers who did not make any office visits during the 12-month period used commercially mixed feed instead of feed mixed on the farm compared to about 56 percent of the producers who made 4 or more office visits. These observed differences in office visits made and source

of feed proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension office visits made by producers and the source of feed fed to the swine herd.

Increased feed to pregnant sows and office visits made. Almost 25 percent of the producers who did not make any office visits, did not increase the amount of feed fed to pregnant sows compared to about 10 percent of the producers who made 4 or more office visits. These observed differences in the number of office visits made and amount of feed fed pregnant sows proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension office visits made during the year and the use of the recommended practice of increasing the amount of feed fed to pregnant sows. Feeder pig producers who visited the Extension office were more likely than those who did not to increase amount of feed fed to pregnant sows.

Pounds feed fed pregnant sows and office visits made. Only 11 percent of the producers who did not make any office visits during the 12-month period fed 10 pounds of feed or more to pregnant sows compared to just over 10 percent of those producers who made 4 or more Extension office visits. There was little percentage difference in the percentage of producers who fed 5 pounds or less to pregnant sows and those feeding 6 to 9 pounds. These observed differences in the number of visits made and the pounds of feed fed to pregnant sows

proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension office visits made by producers and the pounds of feed fed to pregnant sows.

Pounds of feed fed nursing sows and office visits made. About 55 percent of the swine producers who did not make any office visits during the 12-month period fed 10 pounds or less feed to their nursing sows during that time compared to just over 53 percent of those producers who made 4 or more office visits. These observed differences in the number of office visits made and the pounds of feed fed to nursing sows did not prove significant when tested by the Chi-Square test. Therefore, there was not a significant relationship between the number of Extension office visits made by swine producers and the pounds of feed fed to nursing sows.

How creep fed pigs and office visits made. About 69 percent of the producers who did not make any Extension office visits during the 12-month period fed only creep feed to their pigs compared to just over 78 percent of the producers who made 4 or more office visits during the year. A smaller percentage of the producers who had made at least 1 office visit let their pigs feed with the sows. These observed differences in the number of office visits made and the method producers used to feed their pigs proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of Extension office visits made by producers during the year and the method in which they fed their pigs.

III. RELATIONSHIPS BETWEEN THE NUMBER OF TELEPHONE CALLS
MADE AND THE USE OF RECOMMENDED SWINE
MANAGEMENT PRACTICES

This section presents data regarding relationships between Extension telephone calls made during a 12-month period and the use of recommended management practices. In Table IX the recommended management practices are classified into two subsections: (1) health practices, and (2) feeding practices. The number of telephone calls made by swine producers was divided into three groups: (1) those who made no telephone calls, (2) those who made between 1 and 5 telephone calls, and (3) those who made 6 or more telephone calls. The Chi-Square test was used to determine strengths of relationships between the dependent and independent variables.

Health Practices

This subsection presents findings regarding the relationship between the health practices used and the number of Extension telephone calls made.

Vaccinate sows for leptospirosis and telephone calls made. Findings reported in Table IX indicates that over 51 percent of the swine producers who did not make any telephone calls to the Extension office during the 12-month time period did not vaccinate their sows for leptospirosis during that year compared to about 28 percent of those producers who made 6 or more telephone calls. Most of the producers who vaccinated their sows for leptospirosis did so twice per year with

TABLE IX. Relationships Between Telephone Calls Made and the Use of Recommended Swine Management Practices

Management Practices	Telephone Calls Made					
	None		1-5		6-Over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
HEALTH PRACTICES						
Number Times/Year Sows Vaccinated Leptospirosis						
None	125	51.2	193	31.0	59	28.2
Once	38	15.6	127	20.4	39	18.7
Twice	79	32.4	286	45.9	105	50.2
3-over	2	.8	17	2.7	6	2.9
TOTAL	244	100.0	623	100.0	209	100.0
Statistic $\chi^2 = 39.1$; $p = 0.001$						
Number Times/Year Sows Vaccinated Rhinitis						
None	201	82.4	399	64.0	113	54.1
Once	15	6.1	78	12.5	21	10.0
Twice-over	28	11.5	146	23.4	75	35.9
TOTAL	244	100.0	623	100.0	209	100.0
Statistic $\chi^2 = 33.4$; $p = 0.001$						
Number Times/Year Sows Vaccinated Parvovirus						
None	221	90.6	486	78.1	145	69.4
Once	8	3.3	68	10.9	28	13.4
Twice	15	6.1	68	10.9	36	17.2
TOTAL	244	100.0	622	100.0	209	100.0
Statistic $\chi^2 = 33.4$; $p = 0.001$						
Number Times/Year Boars Vaccinated Parvovirus						
None	216	88.5	478	76.7	133	63.6
Once	16	6.6	74	11.9	43	20.6
Twice-over	12	4.9	71	11.4	33	15.8
TOTAL	244	100.0	623	100.0	209	100.0
Number Times/Year Sows Wormed						
None	29	11.9	33	5.3	4	1.9
Once	45	18.4	100	16.1	20	9.6
Twice	126	51.6	362	58.1	129	61.7
3-over	44	18.0	128	20.5	56	26.8
TOTAL	244	100.0	623	100.0	209	100.0
Statistic $\chi^2 = 32.7$; $p = 0.001$						

TABLE IX (Continued)

Management Practices	Telephone Calls Made					
	None		1-5		6-Over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
Number Times/Year Sows Treated Lice						
None	17	7.0	27	4.3	10	4.8
Once	37	15.2	87	14.0	22	10.5
Twice	86	35.2	227	36.4	78	37.3
3-over	104	42.6	282	45.3	99	47.4
TOTAL	244	100.0	623	100.0	209	100.0
		Statistic $x^2 = 5.1$; $p = 0.529$				
Use Medication in Water Treat Disease						
No	199	91.7	431	79.2	131	70.1
Yes	18	8.3	113	20.8	56	29.9
TOTAL	217	100.0	544	100.0	187	100.0
		Statistic $x^2 = 30.6$; $p = 0.001$				
Use Sulfa in Water						
No	132	88.0	342	77.6	124	77.0
Yes	18	12.0	99	22.4	37	23.0
TOTAL	150	100.0	441	100.0	161	100.0
		Statistic $x^2 = 8.3$; $p = 0.016$				
Use Antibiotic in Water						
No	117	77.5	243	54.5	88	53.7
Yes	34	22.5	203	45.5	76	46.3
TOTAL	151	100.0	446	100.0	164	100.0
		Statistic $x^2 = 27.0$; $p = 0.001$				
Medication Used Sows Gestation/Lactation Ration						
None	113	47.1	210	34.0	60	29.0
Antibiotic	64	26.7	226	36.6	86	41.5
Sulfa	8	3.3	27	4.4	10	4.8
Both	55	22.9	154	25.0	51	24.6
TOTAL	240	100.0	617	100.0	207	100.0
		Statistic $x^2 = 20.3$; $p = 0.002$				
Medication Used Pigs Weaning Ration						
None	67	28.3	140	22.8	35	17.2
Antibiotic	93	39.2	286	46.5	103	50.5
Sulfa	6	2.5	24	3.9	12	5.9
Both	71	30.0	165	26.8	54	26.5
TOTAL	237	100.0	615	100.0	204	100.0
		Statistic $x^2 = 13.0$; $p = 0.043$				

TABLE IX (Continued)

Management Practices	Telephone Calls Made					
	None		1-5		6-Over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
How Frequent Iron Shots to Pigs						
Never	94	44.8	123	21.9	31	16.1
Sometimes	59	28.1	176	31.3	42	21.8
Always	97	27.1	263	46.8	120	62.2
TOTAL	210	100.0	562	100.0	193	100.0
Statistic $\chi^2 = 71.9$; $p = 0.001$						
Age Pigs Received Iron Shots						
3 days after birth	98	83.8	372	85.7	152	93.3
Later	19	16.2	62	14.3	11	6.7
TOTAL	117	100.0	434	100.0	163	100.0
Statistic $\chi^2 = 7.4$; $p = 0.025$						
Clip Needle Teeth						
Never	51	21.2	82	13.2	21	10.2
Sometimes	99	41.1	204	33.0	54	26.2
Always	91	37.8	333	53.8	131	63.6
TOTAL	241	100.0	619	100.0	206	100.0
Statistic $\chi^2 = 33.3$; $p = 0.001$						
Age Pigs When Teeth Clipped						
First 3 days	152	81.3	462	87.5	177	94.7
Later	35	18.7	66	12.5	10	5.3
TOTAL	187	100.0	528	100.0	187	100.0
Statistic $\chi^2 = 15.5$; $p = 0.001$						
Farrowing Quarters Disinfected						
No	127	62.0	227	41.9	68	35.6
Yes	78	38.0	315	58.1	123	64.4
TOTAL	205	100.0	542	100.0	191	100.0
Statistic $\chi^2 = 32.7$; $p = 0.001$						

TABLE IX (Continued)

Management Practices	Telephone Calls Made					
	None		1-5		6-Over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
FEEDING PRACTICES						
Source of Feed						
Commercially mixed feed	144	60.8	398	64.2	91	44.0
Mixed feed on farm	93	39.2	222	35.8	116	56.0
TOTAL	237	100.0	620	100.0	207	100.0
Statistic $\chi^2 = 26.6$; $p = 0.001$						
Increase Feed to Pregnant Sows						
No	66	27.4	101	16.3	25	12.3
Yes	175	72.6	518	83.7	179	87.7
TOTAL	241	100.0	619	100.0	204	100.0
Statistic $\chi^2 = 20.1$; $p = 0.001$						
Pounds Feed Fed Pregnant Sows						
5-under	125	52.3	271	43.9	86	42.4
6-9	94	39.3	283	45.9	91	44.8
10-over	20	8.4	63	10.2	26	12.8
TOTAL	239	100.0	617	100.0	203	100.0
Statistic $\chi^2 = 7.0$; $p = 0.136$						
Pounds Feed Fed Nursing Sows						
10-less	135	56.5	321	51.9	96	46.8
11-over	104	43.5	298	48.1	109	53.2
TOTAL	239	100.0	619	100.0	205	100.0
Statistic $\chi^2 = 4.1$; $p = 0.127$						
How Did Creep Feed Pigs						
Creep feed only	161	67.1	461	74.4	157	75.8
Ate with sow	38	15.8	86	13.9	21	10.1
Creep plus corn	41	17.1	73	11.8	29	14.0
TOTAL	240	100.0	620	100.0	207	100.0
Statistic $\chi^2 = 8.0$; $p = 0.092$						

producers who made more Extension telephone calls representing the largest percents. These observed differences in the number of telephone calls made and the number of times per year producers vaccinated their sows for leptospirosis proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of telephone calls made to the Extension office during the year and the number of times per year swine producers vaccinated their sows for leptospirosis. Feeder pig producers who made 1 or more telephone calls to the Extension office were more likely than those who did not to vaccinate sows for leptospirosis.

Vaccinated sows for rhinitis and telephone calls made. Over 82 percent of the swine producers who did not make any telephone calls to the Extension office during the 12-month period did not vaccinate their sows for rhinitis compared to just over 54 percent of those producers who made 6 or more telephone calls to the Extension office. The majority of the producers who did vaccinate their sows for rhinitis did so twice per year or more. These observed differences in the number of telephone calls made and the number of times per year producers vaccinated their sows for rhinitis proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of telephone calls producers made to the Extension office during the year and the number of times per year producers vaccinated their sows for rhinitis.

Vaccinated sows for parvovirus and telephone calls made. Nearly 91 percent of the producers who did not make any telephone calls to the Extension office during the year did not vaccinate their sows for parvovirus compared to just over 69 percent of the producers who made 6 or more telephone calls to the Extension office. These observed differences in the number of telephone calls made and the number of times per year producers vaccinate their sows for parvovirus proved significant when tested by the Chi-Square test. Therefore, there will be a significant relationship between the number of telephone calls made to the Extension office during the year and the number of times per year swine producers vaccinated their sows for parvovirus.

Vaccinated boars for parvovirus and telephone calls made. Nearly 89 percent of the producers who did not make any telephone calls to the Extension office during the 12-month period did not vaccinate their boars for parvovirus compared to just over 63 percent of those producers who made 4 or more telephone calls. Of the producers who did vaccinate their boars for parvovirus, the majority preferred to vaccinate once per year. These observed differences in the number of telephone calls made and the number of times per year producers vaccinated their boars for parvovirus proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of telephone calls made to the Extension office and the number of times per year producers vaccinated their boars for parvovirus.

Sows wormed and telephone calls made. Nearly 12 percent of the swine producers who did not make any telephone calls to the Extension office during the 12-month period did not worm their sow at all during that time compared to not quite 2.0 percent of those producers who made 6 or more telephone calls to the Extension office. Regardless of the number of telephone calls made to the Extension office feeder pig producers tended to worm sows twice each year. These observed differences in the number of telephone calls made and the number of times per year producers wormed their sows proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of telephone calls swine producers made to the Extension office and the number of times per year swine producers wormed their sows.

Treated sows for lice and telephone calls made. Seven percent of the swine producers who did not make any telephone calls to the Extension office during the 12-month period failed to treat their sows for lice during that time compared to about 5.0 percent of those producers who made 6 or more telephone calls. The majority of all the swine producers treated their sows 2 to 3 times per year for lice with the highest percentage treating their sows 3 times. These observed differences in the number of telephone calls made and the number of times per year producers treated their sows for lice did not prove significant when tested by the Chi-Square test. Therefore, there was not a significant relationship between the number of telephone calls made to the Extension office by swine producers during

the year and the number of times per year producers treated their sows for lice.

Used medication in water and telephone calls made. Nearly 92 percent of the swine producers who did not make any telephone calls to the Extension office during the 12-month period did not use medication in the herd's water supply to prevent disease compared to only about 70 percent of those producers who made 6 or more telephone calls to the Extension office. These observed differences in the number of telephone calls made and the use of medication in the water supply to treat disease proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of telephone calls made to the Extension office by swine producers during the year and the use of the recommended practice of using medication in the water supply to treat disease. Feeder pig producers who made telephone calls to the Extension office were more likely than those who did not to add medication to drinking water.

Used sulfa in water and telephone calls made. Eighty-eight percent of the swine producers who did not make any telephone calls to the Extension office during the 12-month period did not use sulfa in the water supply to treat disease compared to 77 percent of the swine producers who made 6 or more telephone calls. These observed differences in the number of telephone calls made and the use of sulfa in the water supply to treat disease proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship

between the number of telephone calls made to the Extension office during the year and the use of sulfa in the water supply to treat disease. Feeder pig producers who made telephone calls to the Extension office were more likely than those who did not to use sulfa in the drinking water.

Used antibiotic in water and telephone calls made. Nearly 78 percent of the swine producers who did not make any telephone calls to the Extension office during the 12-month period did not use an antibiotic in the water supply to treat disease compared to about 54 percent of the producers who made 6 or more telephone calls. These observed differences in the number of telephone calls made and the use of an antibiotic in the water supply proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of telephone calls made to the Extension office by swine producers during the year and the use of an antibiotic in the water supply to treat disease. Feeder pig producers who made telephone calls to the Extension office were more likely than those who did not to use antibiotic in drinking water.

Medication used in sows gestation/lactation ration and telephone calls made. Just over 47 percent of the swine producers who did not make any telephone calls to the Extension office during the 12-month period failed to use any medication in the sows gestation/lactation ration compared to just 29 percent of the producers who made 6 or more telephone calls. The majority of the swine producers who did

use some type of medication in the sows gestation/lactation ration used an antibiotic. These observed differences in the number of telephone calls made to the Extension office by swine producers and the use of the recommended practice of using medication in the sows gestation/lactation ration were significant. Therefore, there was a significant relationship between the number of telephone calls made to the Extension office and use of medication in sows gestation/lactation ration. Producers who made telephone calls to the Extension office were more likely than those who did not to use medication in the sows gestation/lactation ration.

Medication used in pigs weaning ration and telephone calls made.

Over 28 percent of the swine producers who did not make any telephone calls to the Extension office during the 12-month period did not use any medication in the pigs weaning ration compared to just over 17 percent of those producers who made 6 or more telephone calls. Of those producers who did use medication in the pigs weaning ration, the larger percentage preferred to use an antibiotic regardless of the number of telephone calls made. However, these observed differences in the number of telephone calls made and the use of medication in the pigs weaning ration proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of telephone calls made to the Extension office by swine producers during the year and the use of the recommended practice of using medication in the pigs weaning ration.

Iron shots to pigs and telephone calls made. Almost 45 percent of the swine producers who did not make any telephone calls to the Extension office during the 12-month period never gave iron shots to their pigs during that time compared to only about 16 percent of the producers who made 6 or more telephone calls. These observed differences in telephone calls made and the frequency with which producers gave iron shots to their pigs proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of telephone calls made to the Extension office during the year by the producers and the age of pigs when they received iron shots from producers.

Clipped needle teeth and telephone calls made. Over 21 percent of the producers who did not make any telephone calls to the Extension office during the 12-month period never clipped their pigs needle teeth compared to just over 10 percent of these producers who made 6 or more telephone calls. These differences were significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of telephone calls made to the Extension office and use of the practice of clipping pigs needle teeth.

Age of pigs when teeth clipped and telephone calls made. About 81 percent of the swine producers who did not make any telephone calls to the Extension office during the 12-month period failed to clip their pigs needle teeth within the first 3 days after birth compared to nearly 95 percent of those producers who made 6 or more Extension

office telephone calls. These observed differences in the number of telephone calls made and the age of the pigs when producers clipped their needle teeth proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of telephone calls made to the Extension office by swine producers during the year and the age of pigs when producers clipped their needle teeth.

Farrowing quarters disinfected and telephone calls made. Sixty-two percent of the swine producers who did not make any telephone calls to the Extension office during the 12-month period did not disinfect the farrowing quarters compared to about 35 percent of the producers who made 6 or more telephone calls. These observed differences in the number of telephone calls made and the practice of disinfecting the sows farrowing quarters proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of telephone calls made by producers to the Extension office during the year and the use of the recommended practice of disinfecting the sows farrowing quarters.

Feeding Practices

This subsection presents findings regarding the relationship between the feeding practices used and the number of Extension telephone calls made.

Source of feed and telephone calls made. Almost 61 percent of the producers who did not make any telephone calls to the Extension

office during the 12-month period used a commercially mixed feed in their operation. Over 65 percent of those producers who made between 1 and 5 telephone calls to the Extension office during the year used a commercially mixed feed instead of a feed mixed on the farm. However, only 44 percent of the swine producers who made 6 or more telephone calls to the Extension office used a commercially mixed feed instead of a feed mixed on the farm. These observed differences in the number of telephone calls made and the source of feed used on the farm proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of telephone calls made to the Extension office by producers and the source of feed used in the farm operation.

Increase feed to pregnant sows and telephone calls made. Over 27 percent of the swine producers who did not make any telephone calls to the Extension office during the 12-month period did not increase the amount of feed fed to pregnant sows compared to just over 12 percent of the producers who made 6 or more Extension office telephone calls. These observed differences in the number of telephone calls made and the amount of feed fed pregnant sows proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of telephone calls made to the Extension office during the year by swine producers and the amount of feed fed to pregnant sows.

Pounds of feed fed pregnant sows and telephone calls made. Over 52 percent of the swine producers who made no telephone calls to the Extension office during the 12-month period fed 5 pounds or less feed to their pregnant sows compared to about 42 percent of those producers who made 6 or more Extension office telephone calls. The majority of the remaining producers fed between 6 and 9 pounds of feed to their pregnant sows with very little difference between the number of Extension telephone calls made. Less than 13 percent was the highest percentage of the producers who fed 10 pounds or more to their pregnant sows. These observed differences in the number of telephone calls made and the pounds of feed fed to pregnant sows did not prove significant when tested by the Chi-Square test. Therefore, there was not a significant relationship between the number of telephone calls made to the Extension office during the year by swine producers and the pounds of feed fed to pregnant sows.

Pounds of feed fed nursing sows and telephone calls made. Nearly 75 percent of the swine producers who did not make any telephone calls to the Extension office during the 12-month period fed 10 pounds or less feed to their nursing sows compared to over 46 percent of those producers who made 6 or more telephone calls. Of the producers who fed 11 pounds or more feed to nursing sows, the highest percentage were those who made 6 or more Extension office telephone calls. These observed differences in the number of telephone calls made and the pounds of feed fed nursing sows did not prove significant when tested by the Chi-Square test. Therefore, there was not a

significant relationship between the number of telephone calls made by swine producers to the Extension office during the year and the pounds of feed fed to nursing sows.

How creep fed pigs and telephone calls made. About 67 percent of the producers who did not make any telephone calls to the Extension office during the 12-month period fed creep feed only to their pigs compared to almost 76 percent of the swine producers who made 6 or more telephone calls. Of the producers who made more Extension telephone calls, a lesser percentage let the pigs eat with the sows, but there was little difference in the percentage who fed creep feed plus corn. These observed differences in the number of telephone calls made and the manner in which pigs were creep fed did not prove significant when tested by the Chi-Square test. Therefore, there was not a significant relationship between the number of telephone calls swine producers made to the Extension office during the year and the manner in which pigs were creep fed.

IV. RELATIONSHIPS BETWEEN THE NUMBER OF FARM VISITS RECEIVED AND THE USE OF RECOMMENDED SWINE MANAGEMENT PRACTICES

This section presents data regarding the relationships between farm visits received from the Extension office during a 12-month period and the use of recommended management practices. Findings reported in Table X divides the recommended management practices into two subsections: (1) health practices, and (2) feeding practices.

TABLE X. Relationships Between Farm Visits Received and the Use of Recommended Swine Management Practices

Management Practices	Farm Visits Received					
	None		1-3		4-Over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
HEALTH PRACTICES						
Number Times/Year Sows Vaccinated Leptospirosis						
None	134	42.9	187	32.2	57	31.0
Once	52	16.7	120	20.7	32	17.4
Twice	121	38.8	257	44.2	92	50.0
3-over	5	1.6	17	2.9	3	1.6
TOTAL	312	100.0	581	100.0	184	100.0
Statistic $\chi^2 = 15.2$; $p = 0.019$						
Number Times/Year Sows Vaccinated Rhinitis						
None	236	75.6	382	65.7	96	52.2
Once	29	9.3	62	10.7	23	12.5
Twice-over	47	15.1	137	23.6	65	35.3
TOTAL	312	100.0	581	100.0	353	100.0
Statistic $\chi^2 = 31.5$; $p = 0.001$						
Number Times/Year Sows Vaccinated Parvovirus						
None	260	83.6	468	80.6	125	67.9
Once	21	6.8	55	9.5	28	15.2
Twice	30	9.6	58	10.0	31	16.8
TOTAL	311	100.0	581	100.0	184	100.0
Statistic $\chi^2 = 19.2$; $p = 0.001$						
Number Times/Year Boars Vaccinated Parvovirus						
None	253	81.1	459	79.0	116	63.0
Once	29	9.3	64	11.0	40	21.7
Twice-over	30	9.6	58	10.0	28	15.2
TOTAL	312	100.0	581	100.0	184	100.0
Statistic $\chi^2 = 26.1$; $p = 0.001$						
Number Times/Year Sows Wormed						
None	32	10.3	31	5.3	4	2.2
Once	50	16.0	93	16.0	22	12.0
Twice	168	53.8	345	59.4	104	56.5
3-over	62	19.9	112	19.3	54	29.3
TOTAL	312	100.0	581	100.0	184	100.0
Statistic $\chi^2 = 23.5$; $p = 0.001$						

TABLE X (Continued)

Management Practices	Farm Visits Received							
	None		1-3		4-Over		Percent Respondents	Percent Respondents
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents		
Number Times/Year Sows Treated Lice								
None	21	6.7	22	3.8	11	6.0		
Once	40	12.8	89	15.3	17	9.2		
Twice	107	34.3	223	38.4	62	33.7		
3-over	144	46.2	247	42.5	94	51.1		
TOTAL	312	100.0	581	100.0	184	100.0		
	Statistic $\chi^2 = 11.7$; $p = 0.069$							
Use Medicine in Water Treat Disease								
No	249	89.9	405	80.4	108	64.3		
Yes	28	10.1	99	19.6	60	35.7		
TOTAL	277	100.0	504	100.0	168	100.0		
	Statistic $\chi^2 = 43.3$; $p = 0.001$							
Use Sulfa in Water								
No	181	86.2	318	79.7	100	69.4		
Yes	29	13.8	81	20.3	44	30.6		
TOTAL	210	100.0	399	100.0	144	100.0		
	Statistic $\chi^2 = 14.7$; $p = 0.001$							
Use Antibiotic in Water								
No	143	68.1	242	59.9	64	43.2		
Yes	67	31.9	162	40.1	84	56.8		
TOTAL	210	100.0	404	100.0	148	100.0		
	Statistic $\chi^2 = 22.5$; $p = 0.001$							
Medication Used Sows Gestation/Lactation Ration								
None	132	42.9	198	34.5	54	29.5		
Antibiotic	91	29.5	200	34.8	85	46.4		
Sulfa	14	4.5	25	4.4	6	3.3		
Both	71	23.1	151	26.3	38	20.8		
TOTAL	308	100.0	574	100.0	183	100.0		
	Statistic $\chi^2 = 18.4$; $p = 0.005$							
Medication Used Pigs Weaning Ration								
None	82	26.8	137	23.9	24	13.5		
Antibiotic	126	41.2	256	44.7	100	56.2		
Sulfa	12	3.9	22	3.8	8	4.5		
Both	86	28.1	158	27.6	46	25.8		
TOTAL	306	100.0	573	100.0	178	100.0		
	Statistic $\chi^2 = 15.3$; $p = 0.018$							

TABLE X (Continued)

Management Practices	Farm Visits Received					
	None		1-3		4-Over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
How Frequent Iron Shots to Pigs						
Never	94	34.9	128	24.2	27	16.0
Sometimes	74	27.5	164	31.1	39	23.1
Always	101	37.5	236	44.7	103	60.9
TOTAL	269	100.0	528	100.0	169	100.0
	Statistic $\chi^2 = 31.2$; $p = 0.001$					
Age Pigs Receive Iron Shots						
3 days after birth	145	81.0	352	89.1	125	89.3
Later	34	19.0	43	10.9	15	10.7
TOTAL	179	100.0	395	100.0	140	100.0
	Statistic $\chi^2 = 7.9$; $p = 0.019$					
Clip Needle Teeth						
Never	49	15.9	90	15.6	16	8.8
Sometimes	116	37.7	186	32.2	55	30.2
Always	143	46.4	301	52.2	111	61.0
TOTAL	308	100.0	577	100.0	182	100.0
	Statistic $\chi^2 = 12.1$; $p = 0.017$					
Age Pigs When Teeth Clipped						
First 3 days	224	86.5	415	86.8	152	92.1
Later	35	13.5	63	13.2	13	7.9
TOTAL	259	100.0	478	100.0	165	100.0
	Statistic $\chi^2 = 3.7$; $p = 0.158$					
Farrowing Quarters Disinfected						
No	134	50.4	233	45.7	56	34.4
Yes	132	49.6	277	54.3	107	65.6
TOTAL	266	100.0	510	100.0	163	100.0
	Statistic $\chi^2 = 10.7$; $p = 0.005$					

TABLE X (Continued)

Management Practices	Farm Visits Received					
	None		1-3		4-Over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
FEEDING PRACTICES						
Source of Feed						
Commercially mixed feed	199	65.2	350	60.6	85	46.7
Mixed feed on farm	106	34.8	228	39.4	97	53.3
TOTAL	305	100.0	578	100.0	182	100.0
	Statistic $\chi^2 = 16.8$; $p = 0.001$					
Increase Feed to Pregnant Sows						
No	75	24.5	88	15.3	30	16.5
Yes	231	75.5	489	84.7	152	83.5
TOTAL	306	100.0	577	100.0	182	100.0
	Statistic $\chi^2 = 11.9$; $p = 0.003$					
Pounds Fed Fed Pregnant Sows						
5-under	142	46.7	268	46.4	72	40.4
6-9	136	44.7	248	42.9	85	47.8
10-over	26	8.6	62	10.7	21	11.8
TOTAL	304	100.0	578	100.0	178	100.0
	Statistic $\chi^2 = 3.3$; $p = 0.504$					
Pounds Fed Fed Nursing Sows						
10-less	172	56.2	286	49.6	94	51.9
11-over	134	43.8	291	50.4	87	48.1
TOTAL	306	100.0	577	100.0	181	100.0
	Statistic $\chi^2 = 3.5$; $p = 0.171$					
How Did Creep Feed Pigs						
Creep feed only	214	69.3	429	74.4	136	74.7
Ate with sow	57	18.4	66	11.4	23	12.6
Creep plus corn	38	12.3	82	14.2	23	12.6
TOTAL	309	100.0	577	100.0	182	100.0
	Statistic $\chi^2 = 8.9$; $p = 0.069$					

The number of farm visits received by swine producers from the Extension office was divided into three groups: (1) those producers who received no farm visits, (2) those producers who received between 1 and 3 farm visits, and (3) those producers who received 4 or more farm visits. The Chi-Square test was used to determine strengths of relationships between the dependent and independent variables.

Health Practices

This subsection presents the findings regarding the relationship between the health practices used and the number of Extension farm visits received.

Vaccinate sows for leptospirosis and farm visits received. Nearly 43 percent of the swine producers who did not receive any farm visits from the Extension office during the 12-month period did not vaccinate their sows for leptospirosis compared to only 31 percent of those producers who received 4 or more Extension farm visits. The majority of the swine producers who did vaccinate for leptospirosis preferred to do so twice per year, with the largest percentage being the group of producers who had received 4 or more farm visits. These observed differences in the number of farm visits received and the number of times per year sows were vaccinated for leptospirosis proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits swine producers received from the Extension office and the number of times per year producers vaccinated sows for leptospirosis.

Vaccinate sows for rhinitis and farm visits received. Almost 76 percent of the producers who did not receive any farm visits from the Extension office during the 12-month period did not vaccinate their sows for rhinitis compared to only about 52 percent of those producers who received 4 or more Extension farm visits. The majority of the producers who did vaccinate for rhinitis did so twice or more per year with the highest percentage being those who received 4 or more farm visits. These observed differences in the number of Extension farm visits received and the number of times per year sows were vaccinated for rhinitis proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits received by the swine producer from the Extension office during the year and the number of times per year producers vaccinated their sows for rhinitis.

Vaccinate sows for parvovirus and farm visits received. Almost 84 percent of the swine producers who did not receive any farm visits from the Extension office during the year failed to vaccinate their sows for parvovirus compared to only about 68 percent of the producers who received 4 or more farm visits. There was little percentage difference between those producers who vaccinated their sows either once or twice per year for parvovirus regardless of the number of Extension farm visits received. These observed differences in the number of Extension farm visits received and the number of times per year sows were vaccinated for parvovirus proved significant when

tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits received by producers from the Extension office during the year and the number of times per year swine producers vaccinated their sows for parvovirus.

Vaccinate boars for parvovirus and farm visits received. About 81 percent of the swine producers who did not receive any farm visits during the 12-month period from the Extension office did not vaccinate their boars for parvovirus compared to 63 percent of those producers who received 4 or more Extension farm visits. The highest percentage of those producers who did vaccinate did so once per year and they had received 4 or more farm visits. These observed differences in the number of farm visits received and number of times per year boars were vaccinated for parvovirus proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits received by swine producers from the Extension office during the year and the number of times per year boars were vaccinated for parvovirus.

Sows wormed and farm visits received. Just over 10 percent of the swine producers who did not receive any farm visits from the Extension office during the 12-month period did not worm their sows during the year compared to only about 2.0 percent of those producers who received 4 or more farm visits. Over half of all the producers wormed their sows twice per year with little difference in percentage between those who received no farm visits and those who received

4 or more. However, these observed differences in farm visits received and number of times per year producers wormed sows proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits producers received from Extension and the number of times per year producers wormed their sows.

Sows treated for lice and farm visits received. Nearly 7.0 percent of the swine producers who did not receive any farm visits from the Extension office during the 12-month period never treated their sows for lice during that time compared to 6 percent of these producers who received 4 or more farm visits. These observed differences in the number of farm visits made and the number of times producers treated sows for lice per year proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits received by swine producers from the Extension office during the year and the number of times per year producers treated their sows for lice.

Used medication in water and farm visits received. Nearly 90 percent of the swine producers who did not receive any farm visits from the Extension office during the 12-month period did not use any medication in the water supply to treat disease compared to only about 64 percent of those producers who received 4 or more farm visits. These observed differences in the number of farm visits received and whether or not the producers used medication in the water supply

proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits the swine producer received from the Extension office during the year and using the practice of adding medication in the water supply to treat disease.

Sulfa in water and farm visits received. Over 86 percent of the swine producers who did not receive any farm visits during the 12-month period from the Extension office did not use sulfa in the water supply compared to only about 64 percent of the producers who received 4 or more farm visits. These observed differences in the number of farm visits received and the use of sulfa in the water supply proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits received by the swine producer from the Extension office during the year and the use of sulfa in the water supply.

Antibiotic in water and farm visits received. Over 68 percent of the swine producers who did not receive any farm visits during the 12-month period from the Extension office did not use any antibiotics in the water supply to prevent disease compared to only about 43 percent of the swine producers who received 4 or more farm visits. These observed differences in the number of farm visits received and the use of antibiotics in the water supply proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits swine producers received from

the Extension office during the year and the use of antibiotics in the water supply to prevent disease.

Medication used in sows gestation/lactation ration and farm visits received. Almost 43 percent of the swine producers who did not receive any farm visits during the year from the Extension office did not use any type of medication in the sows gestation/lactation ration compared to not quite 30 percent of the producers who received 4 or more Extension farm visits. The majority of all the remaining producers used either an antibiotic or both an antibiotic and sulfa in the sows gestation/lactation ration. A very small percentage used only sulfa in the sows gestation/lactation ration. Again, a higher percentage of the producers who received the most Extension farm visits used an antibiotic in the sows gestation/lactation ration. These observed differences in the number of farm visits received and the use of medication in the sows gestation/lactation ration proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits received by the swine producer from the Extension office during the year and the use of medication in the sows gestation/lactation ration.

Medication used in pigs weaning ration and farm visits received. Almost 27 percent of the swine producers who did not receive any farm visits from the Extension office during the year failed to use any type of medication in the pigs weaning ration compared to just above 13 percent of the swine producers who received 4 or more farm visits.

The majority of all the remaining producers used either an antibiotic or both an antibiotic plus sulfa in the pigs weaning ration. Only a very small percentage of the producers used only sulfa in the pigs weaning ration. Producers who used an antibiotic in the pigs weaning ration tended to be the ones who received the most farm visits. These observed differences in the number of farm visits recieved and the use of medication in the pigs weaning ration proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits swine producers received from the Extension office during the year and the use of medication in the pigs weaning ration.

Frequency of iron shots to pigs and farm visits received. Nearly 35 percent of the swine producers who did not receive any farm visits from the Extension office during the year never gave iron shots to their pigs compared to only 16 percent of the producers who received 4 or more Extension farm visits. The majority of all three groups of swine producers always gave iron shots to their pigs and the highest percentage was achieved by those producers who received 4 or more Extension farm visits. These observed differences in the number of farm visits received and the frequency of iron shots to baby pigs proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits swine producers received from the Extension office during the year and the frequency with which those producers gave iron shots to their pigs.

Age pigs received iron shots and farm visits received. Eighty-one percent of the swine producers who did not receive any farm visits from the Extension office during the year gave their pigs iron shots within 3 days after birth compared to over 89 percent of the swine producers who received 4 or more Extension farm visits. These observed differences in the number of farm visits received and the age of pigs when they received iron shots proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits received during the year from the Extension office by the swine producers and the age of the pigs when they received their iron shots.

Clipped needle teeth and farm visits received. Almost 16 percent of the swine producers who did not receive any farm visits during the year from the Extension office never clipped their pigs needle teeth compared to only about 9.0 of the swine producers who received 4 or more Extension farm visits. Nearly half or more of all the producers always clipped the needle teeth of their pigs. These observed differences in the number of farm visits received and whether or not producers clipped the needle teeth of their pigs proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits received by swine producers from the Extension office during the year and the use of the recommended practice of clipping their pigs needle teeth.

Age pigs when needle teeth clipped and farm visits received. Over 86 percent of the swine producers who did not receive any farm visits from the Extension office during the 12-month period clipped their pigs needle teeth within the first 3 days of birth compared to over 92 percent of those producers who received 4 or more farm visits. These observed differences in the number of farm visits received and the practice of clipping their pigs needle teeth within the first 3 days of birth did not prove significant when tested by the Chi-Square test. Therefore, there was not a significant relationship between the number of farm visits received by producers from the Extension office during the year and the use of the recommended practice of clipping the pigs needle teeth within the first 3 days after birth.

Farrowing quarters disinfected and farm visits received. Over 50 percent of the swine producers who did not receive any farm visits from the Extension office during the 12-month period did not disinfect the sows farrowing quarters compared to about 34 percent of the swine producers who received 4 or more Extension farm visits. These observed differences in the number of farm visits received and whether or not producers disinfected the farrowing quarters proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits received by the swine producer from the Extension office during the year and the use of the recommended practice of disinfecting the sows farrowing quarters.

Feeding Practices

This subsection presents findings regarding the relationship between the feeding practices used and the number of Extension farm visits received.

Source of feed and farm visits received. Over 65 percent of the swine producers who did not receive any farm visits from the Extension office during the 12-month period used a commercially mixed feed instead of a feed mixed on the farm compared to about 47 percent of those producers who received 4 or more Extension farm visits. These observed differences in the number of farm visits received and the source of feed used proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits received by the swine producer from the Extension office during the year and the source of feed used in the swine operation.

Increase feed fed pregnant sows and farm visits received. Nearly 76 percent of the swine producers who did not receive any farm visits from the Extension office during the 12-month period did increase the feed fed to pregnant sows compared to about 84 percent of the swine producers who received 4 or more Extension farm visits. These observed differences in the number of farm visits received and whether or not the producer increased the amount of feed fed to pregnant sows proved significant when tested by the Chi-Square test. Therefore, there was a significant relationship between the number of farm visits received by swine producers during the year from the Extension office and the

use of the recommended practice of increasing the amount of feed fed pregnant sows.

Pounds feed fed pregnant sows and farm visits received. Almost 47 percent of the swine producers who did not receive any farm visits from the Extension office during the 12-month period fed 5 pounds of feed or less to their pregnant sows compared to about 40 percent of those producers who received 4 or more Extension farm visits. The majority of the remaining producers preferred to feed between 6 and 9 pounds of feed to their pregnant sows with only a small percentage of the producers feeding 10 pounds or more. These observed differences in the number of farm visits received and the amount of feed producers fed pregnant sows did not prove significant when tested by the Chi-Square test. Therefore, there was not a significant relationship between the number of farm visits received by the swine producer during the year from the Extension office and the amount of feed producers fed to their pregnant sows.

Pounds feed fed nursing sows and farm visits received. Over 56 percent of the swine producers who did not receive any farm visits from the Extension office during the 12-month period fed 10 pounds of feed or less to their nursing sows compared to nearly 52 percent of the producers who received 4 or more Extension farm visits. These observed differences in the number of farm visits received and the amount of feed fed to nursing sows did not prove significant when tested by the Chi-Square test. Therefore, there was not a significant

relationship between the number of farm visits received during the year by swine producers from the Extension office and the amount of feed producers fed to their nursing sows.

How creep fed pigs and farm visits received. Over 69 percent of the swine producers who did not receive any farm visits from the Extension office during the 12-month period fed creep feed only to their pigs compared to almost 75 percent of the swine producers who received 4 or more Extension farm visits. There was little percentage difference between those producers who let their pigs eat with the sows and those who fed creep feed plus corn to their pigs. These observed differences in the number of farm visits received and the manner in which producers creep fed pigs did not prove significant when tested by the Chi-Square test. Therefore, there was not a significant relationship between the number of farm visits received by the swine producer from the Extension office during the year and the manner in which producers creep fed their feeder pigs.

V. CHAPTER SUMMARY

There was a significant relationship between the use of 10 of the recommended production practices and the number of total Extension contacts through swine meetings, office visits, telephone calls to the office and farm visits from the agent. These practices were vaccination of sows for leptospirosis, vaccination of sows for rhinitis, vaccination of boars for parvovirus, use of medication in the water to treat disease, use of sulfa in the water to treat

disease, use of an antibiotic in the water to treat disease, medication used in sows gestation/lactation ration, frequency iron shots were given to pigs, were needle teeth clipped, and increased feed fed to pregnant sows. The swine producers, who used each of these 10 practices, attended significantly more Extension meetings, made more visits and telephone calls to the Extension office and received more farm visits from the Extension agent than those producers who did not use these practices.

The swine producers who did attend 1 or more Extension swine meetings did differ significantly from those producers who did not attend any swine meetings during the year in 17 of the 21 recommended management practices. The four practices where there was no significant differences were the number of times per year sows were vaccinated for parvovirus, the number of times per year sows were wormed, the source of feed and the pounds of feed fed to nursing sows.

There was a significant difference between the swine producers who made 1 or more visits to the Extension office during the year and those producers who did not make any office visits in 16 of the recommended management practices. The six recommended practices which did not show any significant difference were the number of times per year sows were treated for lice, the use of medication in the pigs weaning ration, the age of the pigs when they received their iron shots, the age of the pigs when their needle teeth were clipped, disinfection of farrowing quarters and the pounds of feed fed to pregnant sows.

The number of swine producers who made 1 or more telephone calls to the Extension office did differ significantly from those producers who did not make any telephone calls to the Extension office during the year in 17 of the 21 recommended management practices. Those practices which did not show a significant difference were the number of times per year sows were treated for lice, the pounds of feed fed pregnant sows, the pounds of feed fed to nursing sows and how producers creep feed their pigs.

There was a significant difference between the swine producers who received 1 or more farm visits from the Extension agent and those producers who did not receive any farm visits during the year in 16 of the 21 recommended management practices. Those practices which did not show a significant difference were the number of times per year sows were treated for lice, the age of the pigs when the needle teeth were clipped, the pounds of feed fed pregnant sows, the pounds of feed fed nursing sows and how producers creep fed their pigs.

The total number of contacts producers had with Extension through meetings, office visits, telephone calls and farm visits received from the Extension agent was significantly related to the number of recommended swine management practices used. Producers who attended more Extension swine meetings, made more office visits and telephone calls and received more farm visits from the Extension agent used significantly more of the recommended swine management practices than producers with fewer total Extension contacts.

CHAPTER VI

SUMMARY OF MAJOR FINDINGS

This chapter presents a summary of the major findings of this study. The chapter was divided into five sections relating to the purposes and objectives, methods of investigation, major findings, implications and recommendations, and recommendations for further study.

I. PURPOSE AND SPECIFIC OBJECTIVES

Purposes

The purpose of this study were to characterize feeder pig producers as to their personal characteristics, characteristics of their swine operation, number and types of contacts made with Extension, their use of recommended swine management practices and to determine the interrelationships among the variables.

Specific Objectives

1. To characterize feeder pig producers and their operations, as to personal characteristics of the producer and the swine operation, number and types of contacts with Extension and producers use of recommended swine management practices.
2. To determine the relationship between the personal characteristics of the feeder pig producer and size of their operation and the number and types of contacts with Extension over a 12-month period.

3. To determine the relationships between the number and type of contacts feeder pig producers had with Extension over a 12-month period and their use of Extension recommended swine management practices.

II. METHOD OF INVESTIGATION

The data for this study were taken from a population including both feeder pig and market hog producers throughout Tennessee. However, only the data from the feeder pig producers in Tennessee was included in this study. Data were collected through personal interviews by county Extension agents who returned the completed surveys to the Agricultural Extension Education office.

The Extension agents received the following instructions regarding which swine producers were to be interviewed.

1. Interview feeder pig and market hog producers having at least five sows.
2. Interview 15 randomly selected swine producers for the first 50 producers and 5 for each additional 50 producers in the county to a maximum of 25 producers.

The "nth" number technique was to be used to identify producers to be interviewed. Alternatives were randomly selected to replace producers who were unable to be interviewed.

The University of Tennessee Agricultural Extension Specialist staff in the Swine and Extension Education Departments developed the survey to be administered.

Agents in each of the participating counties conducted the survey through personal interviews. The completed surveys were then returned to the Agricultural Extension Education office for analysis.

Method of Analysis

The data were coded and punched on computer cards. The University of Tennessee Computing Center facilities were used to analyze the data. The Chi-Square test was used to determine strengths of the relationship between dependent and independent variables. Chi-Square values which achieved the .05 probability level was chosen as being statistically significant.

III. MAJOR FINDINGS

Major findings were classified and presented under headings related to the objectives of the study. Table XI summarizes findings regarding relationships between each type of Extension contact and use of recommended swine management practices.

Characteristics of the Feeder Pig Producers and the Size of Their Operation

Almost 79 percent of the producers were over the age of 36 with just over 21 percent or 225 of the 1059 surveyed being young farmers less than 36 years of age. Over 80 percent had only a high school education or less and nearly 58 percent of the producers farmed on a part-time basis.

Nearly 74 percent of the farmers surveyed were small producers averaging less than 20 sows. Almost 80 percent of the producers

TABLE XI. Summary of Relationships Between Extension Contacts and the Use of Recommended Management Practices

Management Practices	Types of Extension Contacts			
	Swine Meetings Attended	Office Visits Made	Telephone Calls Made	Farm Visits Made by Agents
Vaccinate sows for leptospirosis	0.001	0.004	0.001	0.019
Vaccinate sows for rhinitis	0.001	0.001	0.001	0.001
Vaccinate sows for parvovirus	0.051	0.001	0.001	0.001
Vaccinate boars for parvovirus	0.015	0.001	0.001	0.001
Wormed sows	0.064	0.003	0.001	0.001
Treat sows for lice	0.020	0.112	0.529	0.069
Medication in water	0.001	0.001	0.001	0.001
Sulfa in water	0.001	0.001	0.016	0.001
Antibiotic in water	0.001	0.002	0.001	0.001
Medication in sows gestation, lactation ration	0.001	0.002	0.002	0.005
Medication in pigs weaning ration	0.001	0.123	0.043	0.018
Iron shots to pigs	0.001	0.001	0.001	0.001
Age received iron shots	0.001	0.070	0.025	0.019
Clip needle teeth	0.001	0.001	0.001	0.017
Age teeth clipped	0.003	0.109	0.001	0.158
Disinfect farrowing quarters	0.002	0.097	0.001	0.005
Source of feed	0.389	0.006	0.001	0.001
Pounds of feed fed sows	0.001	0.001	0.001	0.003
Pounds of feed fed pregnant sows	0.007	0.600	0.136	0.504
Pounds feed fed nursing sows	0.216	0.306	0.127	0.171
How creep fed pigs	0.002	0.007	0.092	0.069

farrowed less than 50 litters per year. About 65 percent raised 250 pigs or less to weaning and the same percent weaned 8 pigs or less per litter. Sixty-five percent of the producers sold less than 200 feeder pigs per year with almost the same percentage (64 percent) selling pigs that averaged weighing 45 pounds or less.

Extension Contacts Made by Producers

Nearly 45 percent of the producers surveyed attended between 1 and 8 Extension swine meetings during the past 12 months. Over 73 percent made 1 or more Extension office visits and over 77 percent of the producers made 1 or more telephone calls to the Extension office. At least 70 percent of the swine producers received at least 1 farm visit from the Extension agent.

Use of Recommended Swine Management Practices

One-third or 7 of the 21 management practices recommended by the Extension service were not used by about 50 percent of the producers. These were vaccinating sows for atropic rhinitis, vaccinating sows and boars for parvovirus, the use of medication in the water to treat disease, the use of either sulfa or an antibiotic in the water and the amount of feed fed to nursing sows. Eleven of the recommended management practices were used by nearly 65 percent of the producers with over 85 percent using the following five practices: (1) wormed sows once or more per year, (2) treated sows for lice 1 or more times per year, (3) gave iron shots to pigs within 3 days after birth, (4) clipped the pigs needle teeth, and (5) clipped needle teeth within 3 days after birth.

Relationships Between Producers Personal Characteristics,
the Size of Their Operation and the Number and Type of
Extension Contacts

Younger producers did differ significantly from older producers in terms of the number of contacts they had with Extension through office visits, telephone calls and farm visits. Swine producers who were 35 years of age or under attended more Extension swine meetings, made more office visits and telephone calls to the Extension office and received more farm visits from Extension agents than producers who were over 35.

Swine producers having a college education made significantly more contacts with Extension than did producers having a high school education or less. A significantly higher percent of the college degree producers made contacts with Extension through Extension swine meetings attended, office visits and telephone calls made to the Extension office, and received more visits from Extension agents.

Full-time and part-time producers did differ significantly in the number of contacts they had with Extension through meetings, telephone calls and farm visits received from agents. The swine producers who were full-time farmers attended significantly more Extension swine meetings, made more visits and telephone calls to the Extension office and received more farm visits from Extension agents.

Producers who averaged having more sows in 1983 did differ significantly in the number of Extension contacts than the producers who averaged less than 20 sows in 1983. Swine producers who averaged

50 or more sows attended significantly more Extension swine meetings, made more telephone calls to the Extension office and received more farm visits from the Extension agent than those having fewer sows.

Relationships Between Extension Contacts and the Use
of Recommended Management Practices

There was a significant relationship between the use of 10 of the recommended management practices and the number of total Extension contacts through swine meetings, office visits, telephone calls to the office and farm visits from the agent. These practices were vaccination of sows for leptospirosis, vaccination of sows for rhinitis, vaccination of boars for parvovirus, use of medication in the water to treat disease, use of sulfa in the water to treat disease, use of an antibiotic in the water to treat disease, medication used in sows gestation/lactation ration, frequency with which iron shots were given to pigs, whether or not needle teeth were clipped, and increase of feed fed to pregnant sows. The swine producers who used each of these 10 practices attended significantly more Extension meetings, made more visits and telephone calls to the Extension office and received more farm visits from the Extension agent than those producers who did not use these practices.

The swine producers who did attend 1 or more Extension swine meetings did differ significantly from those producers who did not attend any swine meetings during the year in 17 of the 21 recommended management practices. The four practices where no significant difference

were shown were the number of times per year sows were vaccinated for parvovirus, the number of times per year sows were wormed, the source of feed fed and the pounds of feed fed to nursing sows.

There was a significant difference between the swine producers who made 1 or more visits to the Extension office during the year and those producers who did not make any office visits in 14 of the recommended management practices. The 7 practices which did not show any significant difference were the number of times per year sows were treated for lice, the use of medication in the pigs weaning ration, the age of the pigs when they received their iron shots, the age of the pigs when their needle teeth were clipped, the disinfection of farrowing quarters, the pounds of feed fed to pregnant sows, and the pounds of feed fed nursing sows.

The number of swine producers who made 1 or more telephone calls to the Extension office did differ significantly from those producers who did not make any telephone calls to the Extension office during the year in 17 of the 21 recommended management practices. Those practices which did not show a significant difference were the number of times per year sows were treated for lice, the pounds of feed fed pregnant sows, the pounds of feed fed to nursing sows, and how producers creep fed their pigs.

There was a significant difference between the swine producers who received 1 or more farm visits from the Extension agent and those producers who did not receive any farm visits during the year in 16 of the 21 recommended management practices. Those practices which

did not show a significant difference were the number of times per year sows were treated for lice, the age of the pigs when needle teeth were clipped, the pounds of feed fed pregnant sows, the pounds of feed fed nursing sows and how producers creep fed their pigs.

The total number of contacts producers had with Extension through meetings, office visits, telephone calls and farm visits received was significantly related to the number of recommended swine management practices used. Producers who attended more Extension swine meetings, made more office visits and telephone calls and received more farm visits from the Extension agent used significantly more of the recommended swine management practices than producers with fewer total Extension contacts.

IV. IMPLICATIONS AND RECOMMENDATIONS

Based upon the findings of this study, the implications and recommendations are drawn.

1. About 50 percent of the swine producers surveyed used less than 33 percent or 7 of the 21 recommended swine management practices. There was a significant positive relationship between the use of 10 of the 21 practices and total Extension contacts. Therefore, efforts should be made to contact those people who are not using the recommended practices.

2. Nearly 55 percent of the producers surveyed did not attend any Extension swine meetings in comparison to only 25 to 30 percent of the producers who did not use the other methods of contact. Due

to the highly significant relationship between Extension contacts and use of the recommended practices, attempts should be made to increase awareness and attendance at these meetings.

3. The majority (74 percent) of the swine producers owned small operations averaging less than 20 sows. Eighty percent of the producers farrowed less than 50 litters per year. However, the smaller percent (26) of the producers were large scale operators who made more total contacts with Extension. Efforts should be increased toward contacting the small scale producers and encouraging their use of the recommended swine management practices.

V. RECOMMENDATIONS FOR FURTHER STUDY

Similar studies should routinely be conducted in all work areas to determine points needing emphasis in Extension educational programs for planning, implementation and reporting purposes.

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APPENDIX

UNIVERSITY OF TENNESSEE
AGRICULTURAL EXTENSION SERVICE

1983 SWINE SURVEY County
(1) (2) (3)

Feeder Pig and Slaughter Hog Production

Part I: Pig Production

Note: Part I is to be completed for both
the feeder pig producers and the farrow-to-
finish producers.

A. General Production and Marketing Information

1. During the past 12-months:

a. Average number of sows maintained on farm during
past 12-months? (sows)
(4) (5) (6)

b. Number of litters farrowed during past
12-months? (litters)
(7) (8) (9)

c. Number of pigs raised to weaning?
 (pounds)
(10) (11) (12) (13)

d. Number of pigs sold as feeders?
 (feeder pigs)
(14) (15) (16) (17)

e. Number hogs sold for slaughter?
 (slaughter hogs)
(18) (19) (20) (21)

2. Average weight of feeder pigs sold?
 (pounds)
(22) (23)

B. Health Practices (during past 12-months)

1. Vaccination

a. Number times sows were vaccinated for:

1. Leptospirosis? (times/year)
(24)

2. Athrophic Rhinitis? (times/year)
(25)

3. Parvovirus? (times/year)
(26)

- b. Number times boars vaccinated for parvovirus?
 _____ (times/year)
 (27)
2. Number times sows were wormed? _____ (times/year)
 (28)
3. Number times sows were treated for lice and mange?
 _____ (times/year)
 (29)
4. Medication used in drinking water as an emergency
 treatment of swine diseases?
 _____ (1 = no; 2 = yes; 9 = DNA)
 (30)
- a. Did you use sulfa?
 _____ (1 = no; 2 = yes; 9 = DNA)
 (31)
- b. Did you use antibiotic?
 _____ (1 = no; 2 = yes; 9 = DNA)
 (32)
5. Medication used in sow and pig rations
- a. Sows' gestation/lactation ration?
 _____ (1 = none; 2 = antibiotic; 3 = sulfa; 4 =
 (33) both)
- b. Pigs' weaning ration?
 _____ (1 = none; 2 = antibiotic; 3 = sulfa; 4 =
 (34) both)
6. Giving iron shots to baby pigs farrowed in
 confinement
- a. Extent done?
 _____ (1 = never; 2 = sometimes; 3 = always; 9 =
 (35) DNA)
- b. Age of pigs?
 _____ (1 = during first 3 days after birth; 2 =
 (36) later; 9 = DNA)
7. Clipping needle teeth:
- a. Extent done?
 _____ (1 = never; 2 = sometimes; 3 = always)
 (37)
- b. Age of pigs?
 _____ (1 = during first 3 days; 2 = later; 9 =
 (38) DNA)

8. Sanitation:
 Scrub farrowing quarters with water and a disinfectant between farrowing?
 _____ (1 = no; 2 = yes; 9 = DNA)
 (39)

c. Feeding (during past 12-months)

1. Did you buy the majority of your feed as a complete feed or did you mix feed on your farm?
 _____ (1 = bought commercial mixed feed; 2 = mixed
 (40) feed on the farm)
2. Pregnant sows
- a. Did you increase the amount feed fed pregnant sows 2 to 3 weeks before farrowing?
 _____ (1 = no; 2 = yes)
 (41)
- b. How many pounds of feed were fed per sow per day? _____ (pounds/day)
 (42) (43)
3. Nursing sows: How many pounds of feed were fed per sow per day? _____ (pounds/day)
 (44) (45)
4. Pigs: How did you creep feed?
 _____ (1 = used complete creep feed only; 2 = pigs
 (46) ate with sow; 3 = used complete creep feed plus shelled corn; 9 = DNA)

D. Pig Production Problem

During the past 12-months, what has been your most serious problem in raising pigs? _____
 (47)

(1 = pig scours; 2 = small litters; 3 = uneven weight of pigs at birth; 4 = sows fail to milk; 5 = downer sows; 6 = sows fail to breed; 7 = weak legs; 8 = other)

Part II: General Information About the Farmer

1. Approximate age? _____ (years)
 (48) (49)
2. Approximate education?
 _____ (1 = 8 grades or less; 2 = between 9-12 grades;
 (50) 3 = some college; 4 = college graduate)
 NOTE: Agent estimate
3. Employment?
 _____ (1 = full-time farmer; 2 = part-time job off
 (51) farm; 4 = retired; 5 = other)

VITA

James Scott Chadwell was born August 11, 1951, to Mr. and Mrs. James J. Chadwell of Kingsport, Sullivan County, Tennessee. He began his formal education at Jackson Elementary then attended Ross N. Robinson Junior High and then graduated from Dobyns-Bennett High School in Kingsport in 1969.

He attended Tennessee Technological University in 1969 and completed the requirements for a Bachelor of Science Degree in Animal Science in 1973. Besides his studies, he was a member of the Tennessee Tech Aggies, the Block and Bridle Club and participated in intramural sports.

He was employed as an Assistant Extension Agent in Putnam County, Tennessee in August, 1974.

He is married to the former Melanie Leigh May of Waverly, Tennessee and has three children, Britnie, Lee Scott and Jamie.

He is an honorary member of Tennessee Tech Farmhouse Fraternity and attends the First United Methodist Church of Cookeville.