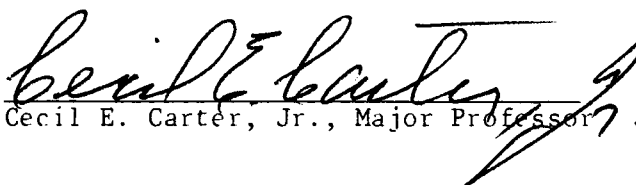
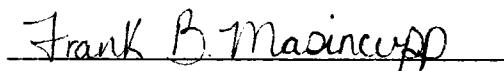


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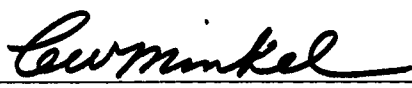

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RELATIONSHIPS BETWEEN TENNESSEE FEEDER PIG PRODUCERS PERSONAL
AND FARM OPERATION CHARACTERISTICS AND USE OF
RECOMMENDED SWINE PRODUCTION PRACTICES

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

Jerry Thomas Patterson

August 1988

DEDICATION

This thesis is dedicated to my father, Clyde Patterson. His willingness to work long hours and his love for his seven children instilled in me the desire to always strive for higher goals.

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ABSTRACT

The purpose of this study was to determine relationships between characteristics of Tennessee feeder pig producers, their farming operation, their use of recommended swine production practices and the number and types of contacts producers had with Extension agents. A total of 1,083 Tennessee feeder pig producers were surveyed to obtain data for this study. The "nth" number method of sampling was used to select producers in each county to be interviewed. Personal interviews were conducted by county Extension agents. Information was obtained about general characteristics of the producers, their farming operation, their use of recommended practices, and the number of contacts producers had with Extension agents.

The data were analyzed using the University of Tennessee Computing Center facilities. The chi square test was used to determine relationships between the dependent and independent variables. The .05 level of probability was accepted as significant.

Major findings of the study include the following:

1. Full-time farmers farrowed more sows, raised more pigs to weaning, and were more likely to prepare their own feed at their farm than the part-time farmers.
2. Full-time producers were more likely than part-time farmers to practice disease control measures including vaccinations, use feed additives and medication in the hog's water. Full-time producers also attended more Extension swine meetings and received more farm visits from their Extension agent than did the part-time farmers.

3. Producers 35 years and under were more likely than older producers to have larger operations, farrow more litters and wean more pigs. They also tended to vaccinate their sows more frequently for leptospirosis, rhinitis, and parvovirus. Younger producers were more likely than older producers to use antibiotics in water, give iron shots, clip needle teeth, and disinfect farrowing quarters. Younger producers made more office visits, telephone calls to the Extension office, and received more farm visits from Extension agents than did the older producers.

4. Producers with a college education tended to have larger operations, were more likely to be using recommended health and feeding practices than were those producers with a high school education or less. Producers with a college education attended more Extension meetings, received more farm visits and made more visits and telephone calls to the Extension office.

5. Swine producers that had more than 20 sows in their herd were more likely to mix feed on the farm, increase feed to pregnant sows, increase feed to lactating sows, and use creep feed only for their pigs than were producers with smaller herd size.

6. The average number of pigs weaned per litter was significantly related to the use of recommended production practices. Producers that weaned eight or more pigs per litter tended to use more of the recommended production practices than those that weaned seven or less. Producers who vaccinated their sows for parvovirus, leptospirosis, and rhinitis, and those who used medication in the sows gestation and lactating feeding

rations or in the water, wormed their sows, disinfected the farrowing quarters and clipped needle teeth tended to wean more pigs per litter than those producers not using these practices. Producers who mixed their own feed, increased feed to pregnant and lactating sows tended to wean more pigs per litter.

Implications and recommendations also were included in the study.

TABLE OF CONTENTS

CHAPTER	PAGE
I. THE PROBLEM AND ITS SETTING.	1
Introduction.	1
Need for the Study.	1
Purpose of the Study.	2
Limitations of the Study.	3
Method of Investigation	3
Definition of Terms	4
II. REVIEW OF RELATED STUDIES.	6
Characteristics of Producers and Their Use of Recommended Practices.	6
Characteristics of Operations and Their Relationship with Recommended Practices.	8
Characteristics of Producers and Their Operations as they Related to Extension Contacts	8
III. CHARACTERISTICS OF SWINE PRODUCERS, THEIR SWINE OPERATION, AND THE NUMBER AND TYPES OF CONTACTS PRODUCERS HAD WITH EXTENSION	11
Producer Characteristics.	11
Size of Operation	16
Health Practices.	17
Feeding Practices	21
Number and Kinds of Extension Contacts.	23
IV. RELATIONSHIPS BETWEEN SWINE PRODUCERS EMPLOYMENT, AGE, EDUCATION, USE OF SWINE PRODUCTION PRACTICES AND EXTENSION CONTACTS	25
Relationships Between Swine Producers Employment and Size of Operation, Use of Swine Production Practices and the Number and Types of Extension Contacts	25
Relationships Between Swine Producers Age and Size of Operation, Use of Swine Production Practices and the Number and Types of Extension Contacts	42
Relationships Between Swine Producers' Education and Size of Operation, Use of Swine Production Practices, and the Number and Types of Contacts with Extension	59

CHAPTER	PAGE
V. RELATIONSHIP BETWEEN NUMBER OF SOWS OWNED AND PRODUCERS USE OF RECOMMENDED SWINE PRODUCTION PRACTICES.	76
Relationships Between Number of Sows Owned and Use of Health Practices.	76
Relationships Between Average Number of Sows Owned and Feeding Practices.	85
VI. RELATIONSHIPS BETWEEN THE AVERAGE NUMBER OF PIGS WEANED PER LITTER AND PRODUCERS USE OF RECOMMENDED SWINE PRODUCTION PRACTICES	89
Relationships Between the Average Number of Pigs Weaned Per Litter and Use of Health Practices.	89
Relationships Between the Average Number of Pigs Weaned Per Litter and Use of Feeding Practices.	99
VII. SUMMARY OF MAJOR FINDINGS.	102
Purpose and Specific Objectives	102
Method of Investigation	103
Major Findings.	104
Implication and Recommendations	109
Recommendations for Further Study	110
BIBLIOGRAPHY	111
APPENDIX	114
VITA	117

LIST OF TABLES

TABLE		PAGE
I.	Characteristics of Swine Producers, Their Swine Operations, and the Number and Types of Contacts Producers Had With Extension.	12
II.	Relationships Between Swine Producers' Employment and Size of Operation, Use of Swine Production Practices and the Number and Types of Extension Contacts.	26
III.	Relationships Between Swine Producers Age and Size of Operation, Use of Swine Production Practices and the Number and Types of Extension Contacts.	43
IV.	Relationships Between Swine Producers' Education, Use of Recommended Production Practices and the Number and Types of Extension Contacts.	60
V.	Relationships Between Average Number of Sows and Producers Use of Recommended Swine Production Practices	77
VI.	Relationships Between Average Number of Pigs Weaned Per Litter and Producers Use of Recommended Swine Production Practices.	90

CHAPTER I

THE PROBLEM AND ITS SETTING

I. INTRODUCTION

The swine industry is a very important part of the agricultural system in the State of Tennessee. In 1982 the total of all hogs and pigs in Tennessee had a farm value of \$59,850,000 (13)*. This ranks swine production second to only total cows and calves with a farm value of \$862,500,000. According to the Tennessee Statistical Abstract there were 950,000 total head of hogs and pigs on farms in the state on January 1, 1985 (12). The total farm related income of 71.9 percent of all Tennessee famers was under \$10,000 in 1982 (13).

The Extension service has been involved in assisting producers to become more aware of efficient production methods and to adopt recommended practices. This study was concerned with the extent to which swine producers in Tennessee use some 27 recommended practices and how they relate to the number of Extension contacts. The personal characteristics of the producers and the size of the operation was also looked at in relation to the use of these practices.

II. NEED FOR THE STUDY

The Cooperative Extension Service diffuses useful and practical information to the swine producers in the State of Tennessee. Extension

*Numbers in parentheses refer to reference in alphabetically listed Bibliography; those after the colon represent page numbers.

agents work to educate the producers regarding recommended practices and encourage the use of the same.

In order for Extension to effectively serve the swine industry, it must stay in touch with the local producer and adjust programs to suit their needs. This study was needed to assist Extension agents in evaluating their programs and in determining priorities and direction for further educational programs.

III. PURPOSE OF THE STUDY

The major purpose of this study was to obtain information useful to Extension agents and swine specialists in planning and evaluating educational programs for swine producers in Tennessee.

Specifically, the objectives of this study were:

1. To describe Tennessee swine producers as to their personal and farm characteristics, their use of swine production practices and the number and types of contacts producers had with Extension agents.
2. To determine relationships between the employment status of the producers and their size of operation, use of recommended production practices and contacts made with Extension agents.
3. To determine relationships between the age of the producer and their size of operation, use of recommended production practices and contacts made with Extension agents.
4. To determine relationships between the education of the producer and their size of operation, use of recommended production practices and the number and types of Extension contacts.

5. To determine relationships between the average number of sows owned, and the producers use of recommended production practices.

6. To determine relationships between the average number of pigs weaned per litter and the producers use of recommended production practices.

IV. LIMITATIONS OF THE STUDY

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 were 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 University of Tennessee Agricultural Extension Specialist Staff in the Swine and Extension Education Department developed the interview form to be administered by county Extension agents.

The Extension agents were to follow this procedure in selecting swine producers 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.

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 completed surveys were sent to the Agriculture Extension Education office and the data 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. Chi square values which achieved the .05 probability level were chosen as being statistically significant.

VI. DEFINITION OF TERMS

1. Extension Contact. The number of Extension meetings attended, number of telephone calls, number of office visits made to the county Extension office, or the number of farm visits received by the swine producer during the past 12 months.

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

3. Swine Producers. Individuals making all or part of their farming income from the production of swine for sale. They constitute the target audience considered in this study.

CHAPTER II

REVIEW OF RELATED STUDIES

There is a large amount of literature available on swine production. However, most studies were focused on the technical subject matter of swine production and Extension contacts and not directly related to this study. Available studies are reported under the following headings: (1) relationship between personal characteristics of the farming operation and Extension contacts, (2) relationship between farm characteristics of the farm operation and Extension contacts, and (3) relationship between Extension contacts and the use of recommended practices. Selected findings from these studies will be reported in this review.

Studies cited in this chapter are reported under the following headings: (1) characteristics of swine producers and their use of recommended practices, (2) characteristics of swine operations and the relationships with recommended practices, and (3) characteristics of the producer and their operation as they relate to Extension contacts.

I. CHARACTERISTICS OF PRODUCERS AND THEIR USE OF RECOMMENDED PRACTICES

Gordon (7) found in his study of Haywood County Feeder Pig Producers in 1977 that the farmers employment was not significantly related to Extension contacts or to the use of recommended practices.

Beeler (2) in his 1986 study of beef producers found that full-time producers used a higher percentage of the practices than either part-time or retired farmers.

In Perry's (11) 1980 swine study, the number of meetings attended, office visits, and telephone calls, and Extension contacts were significantly related to the farmers employment. Full-time farmers had more contacts and used a higher percentage of recommended practices.

In a 1985 study, Carmichael (5) reported that the age and education of the Dairy producers was significantly related to the total number of production practices used. The younger producers were reported to have had a higher percentage increase in pounds of milk producers than older farmers. Educational level of the producer was related to the number of practices used.

Freeman (6) reported that the educational level of the farm operator was significantly related to the number of Extension contacts made over a 12 month period. The more educated farmers had made significantly more office visits than those less educated. Wilson and Gallop (14) in their nationwide study in 1955 found that the age of farmers was not significantly related to their use of recommended production practices. They also found that farmers with some college training showed a somewhat higher use of recommended practices (6 percent difference) than those with just a high school education.

Blair (3) reported in a 1977 swine study that the age and education level of the producers were significantly related to the use of recommended production practices and Extension contacts.

II. CHARACTERISTICS OF OPERATIONS AND THEIR RELATIONSHIP WITH RECOMMENDED PRACTICES

In the 1979 swine study, McLemore (9) found that producers using the least amount of recommended practices weaned fewer pigs. He also found that about 60 percent of the producers bred from 1 to 10 females twice within a 12 month period.

In Carmichael's (5) dairy farmers study, those producers who operated larger acreages used more of the recommended practices.

In Perry's (11) study, those producers weaning the fewest pigs used the least recommended practices.

III. CHARACTERISTICS OF PRODUCERS AND THEIR OPERATIONS AS THEY RELATED TO EXTENSION CONTACTS

Perry (11) in a 1980 survey found that 14 of 18 recommended production practices studied were used by at least 50 percent of the producers. Nine of the 18 recommended practices was significantly related to each type of Extension contact and to the total number of contacts producers had with Extension agents over a 12 month period. The type of swine operation was significantly related to the number of contacts with Extension.

Bradley (4) in a cotton study of 69 farmers found there was a significant relationship between cotton producers receiving the kind of help they wanted and the number of contacts they had with Extension. Cotton yields were significantly related to the number of Extension meetings attended during the year.

Jenkins (8) in a study of 50 soybean producers selected randomly in Fayette County, indicated that neither a soybean producers' major occupation nor his major source of income had significant influence upon the number of Extension contacts he made. Soybean producers with larger acreages made significantly greater number of Extension contacts than smaller producers.

Arnett (1) in his 1973 study of 203 Wilson county farmers who either made a telephone call or visit to the Extension office during a three year period, found that a farmer's age, race or whether he was a full-time or part-time farmer did not influence the number of visits made to the Extension office. However, education of the farmer was significantly related. A significant association was found between the number of office visits and type of farming enterprise, size of farm, gross farm income, yield of tobacco, or serving actively in other farm related associations such as being a director of Farm Bureau. Farmers having dairy, beef, or tobacco as their major farm enterprise made more visits than did those with either swine, sheep or poultry. Farmers with larger farms, more gross farm income and higher tobacco yields made more office visits.

Gordon (7) reported that feeder pig producers who were full-time farmers, part-time farmers, or retired farmers did not differ significantly as to the number of Extension meetings attended, swine meetings attended, visits to the Extension office, telephone calls to the Extension office, or number of visits received from Extension agents.

In Carmichael's (5) 1985 study, those producers who attended more meetings, made more visits to the Extension office and made more

telephone calls reported higher averages in pounds of butterfat and average pounds of milk produced.

Osidoirobis's (10) 1982 study of swine producers reported that Extension contacts and the use of recommended practices was significantly related. The more total Extension contacts producers reported having had the previous year, the higher the average number of recommended swine production practices they were using.

CHAPTER III

CHARACTERISTICS OF SWINE PRODUCERS, THEIR SWINE OPERATION, AND THE NUMBER AND TYPES OF CONTACTS PRODUCERS HAD WITH EXTENSION

Data in Table I reports the number and percentage of swine producers by variables which tend to characterize producers, their swine operations, their use of recommended swine production practices, and the number of contacts producers had with Extension agents. The variables are classified into five sections. The sections are: (1) producer characteristics, (2) size of operation, (3) health practices, (4) feeding practices, and (5) Extension contacts.

I. PRODUCER CHARACTERISTICS

Variables included in this section are age, education and employment of the swine producers.

Age of Producers

Just over 21 percent, or 225 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 38.9 percent, or 412 producers, of the total. The mean age of producers was 47 years.

Farmers Education

Eight hundred and forty-one, or 80.3 percent, of producers surveyed had a high school education or less. The other 206 producers, or 19.7 percent, had received a college degree.

TABLE I. Characteristics of Swine Producers, Their Swine Operations, and the Number and Types of Contacts Producers Had With Extension

Producer Characteristics, Production Practices, Size of Operation, Extension Contacts	Number of Producers	Percent of Producers
PRODUCER CHARACTERISTICS		
Age of Producer		
35-under	225	21.2
36-50	422	39.8
51-over	412	38.9
No response	24	0.0
Total	1,083	100.0
Mean = 47		
Education of Producer		
High school-less	841	80.3
College	206	19.7
No response	36	0.0
Total	1,083	100.0
Farmer Employment		
Full-time	447	42.5
Part-time	605	57.5
No response	31	0.0
Total	1,083	100.0
SIZE OF OPERATION		
Average Number Sows		
10-less	455	42.2
11-20	339	31.4
21-over	285	26.4
No response	4	0.0
Total	1,083	100.0
Mean = 22		
Number Litters Farrowed		
15-less	319	29.5
16-29	348	32.2
30-50	198	18.3
Over 50	217	20.1
No response	1	0.0
Total	1,083	100.0
Mean = 42.5		
Number Pigs Raised to Weaning		
125-less	364	33.6
126-250	342	31.6
251-over	377	34.8
Total	1,083	100.0
Mean = 314		
Number of Pigs Sold as Feeders		
Under 100	330	30.5
100-199	373	34.4
200-over	380	35.1
Total	1,083	100.0
Mean = 223		
Average Weight of Feeder Pigs Sold		
45-under	659	62.6
46-over	393	37.4
No response	31	0.0
Total	1,083	100.0
Mean = 45		
Average Number Pigs Weaned/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	1,083	100.0

TABLE I (Continued)

Producer Characteristics, Production Practices, Size of Operation, Extension Contacts	Number of Producers	Percent of Producers
HEALTH PRACTICES		
Number Times Sows Vaccinated for Leptospirosis		
None	378	34.9
Once	204	18.8
Twice	475	43.9
Three-over	26	2.4
Total	1,083	100.0
Mean = 1.14		
Number Times Sows Vaccinated for Rhinitis		
None	718	66.3
Once	114	10.5
Twice-over	251	23.2
Total	1,083	100.0
Mean = .58		
Number Times Sows Vaccinated for Parvovirus		
None	858	79.3
Once	104	9.6
Twice	120	11.1
Total	1,082	100.0
Mean = .31		
Number Times Boars Vaccinated for Parvovirus		
None	833	76.9
Once	133	12.3
Twice-over	117	10.8
Total	1,083	100.0
Mean = .33		
Number Times Sows Wormed		
None	67	6.2
Once	166	15.3
Twice	620	57.2
Three-over	230	21.2
Total	1,083	100.0
Mean = 2.1		
Number Times Sows Treated for Lice		
None	54	5.0
Once	146	13.5
Twice	395	36.5
Three-over	488	45.1
Total	1,083	100.0
Mean = 3		
Medication Used in Water for Disease		
No	764	80.3
Yes	188	19.7
No response	131	0.0
Total	1,083	100.0
Use Sulfa in Water		
No	600	79.3
Yes	157	20.7
No response	326	0.0
Total	1,083	100.0
Use Antibiotic in Water		
No	449	58.5
Yes	318	41.5
No response	316	0.0
Total	1,083	100.0

TABLE I (Continued)

Producer Characteristics, Production Practices, Size of Operation, Extension Contacts	Number of Producers	Percent of Producers
Medication Used Sows Gestation and Lactation Ration		
None	386	36.1
Antibiotic	378	35.3
Sulfa	45	4.2
Both	261	24.4
No response	13	0.0
Total	1,083	100.0
Medication Used Pigs Weaning Ration		
None	243	22.9
Antibiotic	486	45.8
Sulfa	42	4.0
Both	291	27.4
No response	21	0.0
Total	1,083	100.0
How Frequently Iron Shot to Pigs		
Never	249	25.6
Sometimes	277	28.5
Always	445	45.8
No response	112	0.0
Total	1,083	100.0
Age Pigs Receive Iron Shots		
3 days after birth	627	87.2
Later	92	12.8
No response	364	0.0
Total	1,083	100.0
Clip Needle Teeth		
Never	155	14.5
Sometimes	359	33.5
Always	558	52.1
No response	11	0.0
Total	1,083	100.0
Age Pigs When Teeth Clipped		
First 3 days	796	87.8
Later	111	12.2
No response	176	0.0
Total	1,083	100.0
Farrowing Quarters Disinfected		
No	424	44.9
Yes	520	55.1
No response	139	0.0
Total	1,083	100.0
FEEDING PRACTICES		
Source of Feed		
Commercial mixed feed	635	59.3
Mixed feed on farm	436	40.7
No response	12	0.0
Total	1,083	100.0
Increased Feed to Pregnant Sows		
No	193	18.0
Yes	877	82.0
No response	13	0.0
Total	1,083	100.0
Pounds Feed Fed to Pregnant Sows		
5-under	485	45.5
6-9	470	41.1
10-over	111	10.4
No response	17	0.0
Total	1,083	100.0

Mean = 6.2

TABLE I (Continued)

Producer Characteristics, Production Practices, Size of Operation, Extension Contacts	Number of Producers	Percent of Producers
Pounds Feed Fed Nursing Sows		
10-less	556	52.0
11-over	514	48.0
No response	13	0.0
Total	1,083	100.0
Mean = 10.4		
How Did Creep Feed Pigs		
Creep feed only	783	73.0
Ate with sow	146	13.6
Creep plus corn	144	13.4
No response	10	0.0
Total	1,083	100.0
NUMBER AND KINDS OF EXTENSION CONTACTS		
Swine Meetings Attended		
None	575	55.5
1-8	461	44.5
No response	47	0.0
Total	1,083	100.0
Mean = .65		
Office Visits Made		
None	290	26.8
1-3	616	56.9
4-over	177	16.3
Total	1,083	100.0
Mean = 1.7		
Farm Visits Received		
None	312	28.8
1-3	585	54.0
4-over	186	17.2
Total	1,083	100.0
Mean = 2.1		
Telephone Calls Made		
None	244	22.6
5-under	627	57.9
6-over	211	19.5
No response	1	0.0
Total	1,083	100.0
Mean = 3.4		

Farmers Employment

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

II. SIZE OF OPERATION

Variables presented in this section are average number of sows, number of litters farrowed, number of pigs raised to weaning, number of pigs sold as feeders, average weight of feeder pigs sold, and average number of pigs weaned per litter farrowed.

Average Number of Sows

Forty-two percent, or 455 producers, had 10 sows or less. About 31 percent, 339 producers, owned 11 to 20 sows. The small number of producers, 285 or 26.4 percent, owned 21 sows or more. The mean number of sows was 22.

Number of Litters Farrowed

About 30 percent, or 319 producers, farrowed 15 litters or less. The largest number, 348 or 32.2 percent, of producers farrowed 16-29 litters. In the 30 to 50 litters per year group were 198 producers or 18.3 percent. Just over 20 percent or 217 of the producers farrowed over 50 litters per year. The average number of litters farrowed was 42.5.

Number of Pigs Raised to Weaning

Those producers who raised 125 pigs or less to weaning made up 33.6 percent of the total. Producers raising 126 to 250 pigs accounted

for 31.6 percent while 34.8 percent of the total were producers raising over 250 pigs per year. The average number of pigs raised to weaning was 314 of all the 1,083 producers.

Number of Pigs Sold as Feeders

About 30 percent, or 330 producers, sold under 100 pigs as feeders. Those selling from 100-199 pigs comprised 34.4 percent, or 373, of the total. The highest number of producers, 380 or 35.1 percent, sold over 200 pigs as feeders. The average number of pigs sold was 223.

Average Weight of Feeder Pigs Sold

The largest percentage, 62.6 percent or 659 producers, sold their pigs at 45 pounds or under. The average weight of all pigs sold was 45 pounds which is within the recommended weight of 45 to 50 pounds. The smaller number of producers, 393 or 37.4 percent, sold their pigs at 46 pounds or over.

Average Number Pigs Weaned/Litter Farrowed

The smallest group of respondents, 322 or 30.5 percent, reported weaning 7 pigs or less per litter. Thirty-five percent, or 372 producers, weaned from 7-8 pigs per litter. Those weaning 8 pigs or more were 361 or 34.2 percent.

III. HEALTH PRACTICES

Findings are reported in this section regarding the following variables: (1) number of times sows vaccinated for leptospirosis, (2) number of times sows vaccinated for rhinitis, (3) number of times sows vaccinated for parvovirus, (4) number times boars vaccinated for

parvovirus, (5) number times sows wormed, (6) number times sows treated for lice, (7) medication used in water for disease, (8) used sulfa in water, (9) used antibiotic in water, (10) medication used in sows gestation and lactation ration, (11) medication used in pigs weaning ration, (12) frequency of iron shots to pigs, (13) age pigs receive iron shots, (14) clip needle teeth, (15) age pigs when teeth clipped, and (16) farrowing quarters disinfected.

Number Times Sows Vaccinated for Leptospirosis

Of the 1,083 producers 34.9 percent, or 378, did not vaccinate their sows for leptospirosis. Only 204, or 18.8 percent, vaccinated one time. The largest total of 475, or 43.9 percent, vaccinated two times. The smallest group of 26, or 2.4 percent, vaccinated three times or more. The average number of vaccinations for leptospirosis was 1.14 times.

Number Times Sows Vaccinated for Rhinitis

Just over 66 percent of the producers, or 718, did not vaccinate their sows for rhinitis. About 10.5 percent of the producers, or 114, vaccinated only once. Vaccinations of two times or more was practiced by 251 or 23.2 percent of the total. The producers on the average give .58 shots to sows for rhinitis.

Number Times Sows Vaccinated for Parvovirus

Almost all of the producers, 858 or 79.3 percent, did not give their sows shots for parvovirus. Those vaccinating only once comprised 9.6 percent, or 104 producers, of the total. The average number of

vaccinations was .31 with only 120 producers or 11.1 percent of producers repeating the practice two times per year.

Number Times Boars Vaccinated for Parvovirus

The highest number of producers, 833 or 76.9 percent, did not vaccinate their boars for parvovirus. Only 133 producers, 12.3 percent, vaccinated one time. The smallest number, 7 or 10.8 percent, gave vaccinations two times or more. The average number of vaccinations given was .33 times per year.

Number of Times Sows Wormed

Of the total 1,083 producers only 67 or 6.2 percent never wormed their sows. Those worming once was 15.3 percent or 166 of the total. Those that wormed twice were 620 or 57.2 percent. The producers worming three times or more totaled 230 or 21.2 percent. The average number of times the producers wormed their sows was 2.1.

Number Times Sows Treated for Lice

Five percent, or 54 producers, did not treat their sows for lice. Those treating only once was 13.5 percent or 146. Treating sows twice per year were 395 or 36.5 percent of the producers. The highest number, 488 or 45.1 percent, treated their sows three or more times. The average number of treatments was three.

Medication Used in Water for Disease

The highest number of producers, 764 or 80.3 percent, did not use this method of disease treatment. Only 188, or 19.7 percent, used medication in the water.

Used Sulfa in Water

The largest percentage, 79.3 percent or 600 producers, did not use sulfa in the water source. Only 157, or 20.7 percent, did use sulfa in the water.

Used Antibiotic in Water

Of the total respondents, 449 or 58.5 percent, did not use antibiotics in the water. Only 318, or 41.5 percent, used antibiotics in the water supply.

Medication Used in Sows Gestation and Lactation Ration

The number of producers that did not use medication rations was 386 or 36.1 percent. Those that used antibiotic was 378 or 35.3 percent. The producers that used only sulfa was 45 or 4.2 percent. Producers that used both sulfa and antibiotic numbered 261 or 24.4 percent.

Medication Used in Pigs Weaning Ration

The producers that did not use medicated rations were 22.9 percent or 243 producers. Those that used antibiotics in their rations totaled 486 or 45.8 percent. Sulfa was used by only 42 or 4 percent. Medicated rations with both sulfa and antibiotic were used by 291 producers or 27.4 percent.

How Frequently Iron Shots to Pigs

Iron shots were not given to pigs by 249 or 25.6 percent of producers. Those producers that sometimes gave iron shots totaled 277 or 28.5 percent. Iron shots were always given to pigs by 445 or 45.8 percent of the producers.

Age Pigs Receiving Iron Shots

Those producers which gave iron shots within three days after birth totaled 627 or 87.2 percent. Only 92 or 12.8 percent of those producers giving iron shots did so after three days of age of pigs.

Clip Needle Teeth

The number of producers which never clipped needle teeth was 155 or 14.5 percent. Producers which sometimes, but not always, clipped needle teeth totaled 359 or 33.5 percent. The producers that always clipped needle teeth totaled 558 or 52.1 percent of the total.

Age Pigs When Teeth Clipped

The producers which clipped the needle teeth the first three days of age were 796 or 87.8 percent. Only 111, or 12.2 percent, of those using this practice clipped after three days of age.

Farrowing Quarters Disinfected

The farrowing quarters were not disinfected by 422, 44.9 percent, of the producers. Those that responded yes totaled 520, 55.1 percent, of the producers.

IV. FEEDING PRACTICES

Variables presented in this section are: (1) source of feed, (2) increased feed to pregnant sows, (3) pounds feed fed to pregnant sows, (4) pounds feed fed to nursing sows, and (5) how did creep feed pigs.

Source of Feed

The highest percentage, 59.3 percent or 635, of producers use a commercial mixed feed source. Only 40.7 percent, 436 producers, mixed the feed on the farm.

Increased Feed to Pregnant Sows

Only 18 percent, 193 producers, did not increase the feed given to pregnant sows. The majority of producers, 877 or 82 percent, did increase feed level to pregnant sows.

Pounds Feed Fed Pregnant Sows

The number of producers feeding five pounds and less were 485 or 45.5 percent of the total. Feeding from 6 to 9 pounds were 470 producers or 41.1 percent. Those feeding 10 pounds or more totaled 111 or 10.4 percent. The average number of pounds of feed fed to pregnant sows was 6.2 pounds.

Pounds Feed Fed Nursing Sows

The producers feeding 10 pounds or less totaled 556 or 52 percent. Those increasing feed to nursing sows to 11 pounds or more totaled 514 or 48 percent. The average pounds of feed fed to nursing sows was 10.4 pounds.

How Did Creep Feed Pigs

The number of producers that used a creep feed only was 783 or 73 percent. The producers that allowed the pigs to eat with the sows totaled 146 or 13.6 percent. Only 13.4 percent, or 144, producers used a creep feed plus corn.

V. NUMBER AND KINDS OF EXTENSION CONTACTS

Variables included in this section are: (1) swine meetings attended, (2) office visits made, (3) farm visits received, and (4) telephone calls made to Extension

Swine Meetings Attended

Five hundred seventy-five, or 55.5 percent, of the producers did not attend any swine meetings. The producers that attended from 1 to 8 meetings totaled 461 or 44.5 percent. The average number of swine meetings attended by producers was .65.

Office Visits Made

The number of producers that made no office visits to Extension was 290 or 26.8 percent. The highest total of producers, 616 or 56.9 percent, made from 1 to 3 visits to the Extension office. Only 177, or 16.3 percent, made 4 or more visits. The average was 1.7 visits made to the Extension office.

Farm Visits Received

The number of producers receiving no farm visits was 312 or 28.8 percent. Those producers receiving from 1 to 3 visits was 585 or 54 percent. Only 196, or 17.2 percent, of the producers received 4 or more visits from Extension. The average number of farm visits received by the producers was 2.1.

Telephone Calls Made

The number of producers that did not make telephone calls to the Extension office totaled 244 or 22.6 percent. Those that made from 1 to 5 calls numbered 627 or 57.9 percent. Only 211, or 19.5 percent, of producers made 6 or more phone calls to the Extension office. An average number of 3.4 calls were made by producers to the Extension office.

CHAPTER IV

RELATIONSHIPS BETWEEN SWINE PRODUCERS EMPLOYMENT, AGE, EDUCATION, USE OF SWINE PRODUCTION PRACTICES AND EXTENSION CONTACTS

The purpose of this chapter was to present findings concerning relationships between swine producers personal characteristics, their use of swine production practices and the number of contacts made with Extension agents. Findings were organized into three sections: (1) relationships between swine producers employment and size of operation, use of swine production practices and number of Extension contacts, (2) relationships between swine producers age and size of operation, use of swine production practices, and the number of Extension contacts, and (3) relationships between swine producers education, use of swine production practices and the number of Extension contacts.

I. RELATIONSHIPS BETWEEN SWINE PRODUCERS EMPLOYMENT AND SIZE OF OPERATION, USE OF SWINE PRODUCTION PRACTICES AND THE NUMBER AND TYPES OF EXTENSION CONTACTS

Data in Table II presents findings regarding relationships between swine producers employment status, use of swine production practices and contacts made with Extension agents. Findings presented in this section are divided into four subsections: (1) size of operation which deals with size and type of operation, (2) health practices which deals with practices of sows and baby pigs, (3) feeding practices which deals

TABLE II. Relationships Between Swine Producers' Employment and Size of Operation, Use of Swine Production Practices and the Number and Types of Extension Contacts

Size of Operation, Health Practices, Feeding Practices and Extension Contacts	Producers' Employment			
	Full-Time Farmer		Part-Time Farmer	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
SIZE OF OPERATION				
Average Number Sows				
10-less	142	31.8	300	49.7
11-20	123	27.6	206	34.1
21-over	181	40.6	98	16.2
Total	446	100.0	604	100.0
Statistics $\chi^2 = 80.15$; $p = .00$				
Number Litters Farrowed				
15-less	93	20.9	215	35.5
16-29	124	27.8	216	35.7
30-50	86	19.3	104	17.2
50-over	143	32.1	70	11.6
Total	446	100.0	605	100.0
Statistics $\chi^2 = 77.66$; $p = .00$				
Number Pigs Raised to Weaning				
125-less	116	26.0	236	39.0
126-250	117	26.2	214	35.4
251-over	214	47.9	155	25.6
Total	447	100.0	605	100.0
Statistics $\chi^2 = 56.3$; $p = .00$				
Number Pigs Sold as Feeders				
100-less	115	25.7	202	33.4
100-199	138	30.9	230	38.0
200-over	194	43.4	173	28.6
Total	447	100.0	605	100.0
Statistics $\chi^2 = 24.9$; $p = .000$				
Average Weight Feeder Pigs Sold				
45-under	271	62.6	373	63.0
46-over	162	37.4	219	37.0
Total	433	100.0	592	100.0
Statistics $\chi^2 = .005$; $p = .94$				

TABLE II (Continued)

Size of Operation, Health Practices, Feeding Practices and Extension Contacts	Producers' Employment			
	Full-Time Farmer		Part-Time Farmer	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
HEALTH PRACTICES				
Times Year Sows Vaccinated Leptospirosis				
None	132	29.5	231	38.2
Once	68	15.2	136	22.5
Twice	234	52.3	225	37.2
Three times-over	13	2.9	13	2.1
Total	447	100.0	605	100.0
Statistics $\chi^2 = 26.7$; $p = .00$				
Times Year Sows Vaccinated Rhinitis				
None	268	60.0	424	70.1
Once	46	10.3	68	11.2
Two times-over	133	29.8	113	18.7
Total	447	100.0	605	100.0
Statistics $\chi^2 = 17.7$; $p = .0001$				
Times Year Sows Vaccinated Parvovirus				
None	338	75.6	492	81.5
Once	41	9.2	61	10.1
Twice	68	15.2	51	8.4
Total	447	100.0	604	100.0
Statistics $\chi^2 = 11.73$; $p = .0028$				
Times Year Boars Vaccinated Parvovirus				
None	334	74.7	473	78.2
Once	47	10.5	82	13.6
Two-over	66	14.8	50	8.3
Total	447	100.0	605	100.0
Statistics $\chi^2 = 12.189$; $p = .0023$				
Times Year Sows Wormed				
None	32	7.2	35	5.8
Once	52	11.6	105	17.4
Two	267	59.7	335	55.4
Three-over	96	21.5	130	21.5
Total	447	100.0	605	100.0
Statistics $\chi^2 = 7.2$; $p = .06$				

TABLE II (Continued)

Size of Operation, Health Practices, Feeding Practices and Extension Contacts	Producers' Employment			
	Full-Time Farmer		Part-Time Farmer	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
Times Year Sows Treated Lice				
None	20	4.5	31	5.1
Once	45	10.1	94	15.5
Twice	175	39.1	205	33.9
Three-over	207	46.3	275	45.5
Total	447	100.0	605	100.0
Statistics	$\chi^2 = 8.05; p = .04$			
Used Medicated Water Treat Disease				
No	315	76.8	429	82.3
Yes	95	23.2	92	17.7
Total	410	100.0	521	100.0
Statistics	$\chi^2 = 4.0; p = .04$			
Use Sulfa in Water				
No	245	77.5	346	80.3
Yes	71	22.5	85	19.7
Total	316	100.0	431	100.0
Statistics	$\chi^2 = .674; p = .41$			
Used Antibiotic in Water				
No	175	54.7	264	60.6
Yes	145	45.3	172	39.4
Total	320	100.0	436	100.0
Statistics	$\chi^2 = 2.37; p = .12$			
Medication Used Sows Gestation/Lactation Ration				
None	140	31.5	234	39.3
Antibiotic	165	37.2	200	33.6
Sulfa	22	5.0	22	3.7
Both	117	26.4	140	23.5
Total	444	100.0	596	100.0
Statistics	$\chi^2 = 6.97; p = .07$			

TABLE II (Continued)

Size of Operation, Health Practices, Feeding Practices and Extension Contacts	Producers' Employment			
	Full-Time Farmer		Part-Time Farmer	
	Number of Respondents	Percent of Respondents	Number of Respondents	Percent of Respondents
Medication Used Pigs Weaning Ration				
None	77	17.5	161	27.1
Antibiotic	210	47.7	261	43.9
Sulfa	18	4.1	22	3.7
Both	135	30.7	150	25.3
Total	440	100.0	594	100.0
Statistics	$\chi^2 = 13.7; p = .003$			
Frequency Iron Shots to Pigs				
Never	109	26.6	131	24.3
Sometimes	107	26.1	166	30.7
Always	194	47.3	243	45.0
Total	410	100.0	540	100.0
Statistics	$\chi^2 = 2.5; p = .28$			
Age Pigs Receive Iron Shots				
3 days-less	272	91.3	344	84.1
4 days-over	26	8.7	65	15.9
Total	298	100.0	409	100.0
Statistics	$\chi^2 = 7.27; p = .007$			
Clip Needle Teeth				
Never	63	14.2	83	13.9
Sometimes	147	33.1	202	33.8
Always	234	52.7	313	52.3
Total	444	100.0	598	100.0
Statistics	$\chi^2 = .058; p = .97$			
Age Pigs When Teeth Clipped				
3 days-less	336	89.4	440	86.3
4 days-over	40	10.6	70	13.7
Total	376	100.0	510	100.0
Statistics	$\chi^2 = 1.62; p = .20$			

TABLE II (Continued)

Size of Operation, Health Practices, Feeding Practices and Extension Contacts	Producers' Employment			
	Full-Time Farmer		Part-Time Farmer	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
Farrowing Quarters Disinfected				
No	162	41.0	252	47.5
Yes	233	59.0	279	52.5
Total	395	100.0	531	100.0
Statistics	$\chi^2 = 3.54; p = .0596$			
FEEDING PRACTICES				
Source of Feed				
Commercially mixed	205	46.4	422	70.3
On farm-mixed	237	53.6	178	29.7
Total	442	100.0	600	100.0
Statistics	$\chi^2 = 59.9; p = .00$			
Increase Feed to Pregnant Sows				
No	72	16.3	110	18.3
Yes	369	83.7	490	81.7
Total	441	100.0	600	100.0
Statistics	$\chi^2 = .577; p = .44$			
Pounds Fed Pregnant Sows				
5-under	223	50.3	256	43.0
6-9	183	41.3	274	46.0
10-over	37	8.4	66	11.1
Total	443	100.0	596	100.0
Statistics	$\chi^2 = 6.16; p = .045$			
Pounds Fed Nursing Sows				
10-less	217	49.0	331	55.3
11-over	226	51.0	268	44.7
Total	443	100.0	599	100.0
Statistics	$\chi^2 = 3.77; p = .0521$			

TABLE II (Continued)

Size of Operation, Health Practices, Feeding Practices and Extension Contacts	Producers' Employment			
	Full-Time Farmer		Part-Time Farmer	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
How Creep Feed Pigs				
Creep-only	322	72.7	440	73.3
Ate with sow	64	14.4	74	12.3
Creep plus corn	57	12.9	86	14.3
Total	443	100.0	600	100.0
Statistics	$\chi^2 = 1.27$; $p = .52$			
EXTENSION CONTACTS				
Swine Meetings Attended				
None	206	48.9	348	58.9
1-8	215	51.1	243	41.1
Total	421	100.0	591	100.0
Statistics	$\chi^2 = 9.43$; $p = .0021$			
Office Visits Made				
None	108	24.2	161	26.6
1-3	261	58.4	353	58.3
4-over	78	17.4	91	15.0
Total	447	100.0	605	100.0
Statistics	$\chi^2 = 1.53$; $p = .46$			
Telephone Calls Made				
None	74	16.6	149	24.7
5-less	271	60.6	354	58.6
6-over	102	22.8	101	16.7
Total	447	100.0	604	100.0
Statistics	$\chi^2 = 13.09$; $p = .0014$			
Farm Visits Received				
None	80	17.9	212	35.0
1-3	271	60.6	309	51.1
4-over	96	21.5	84	13.9
Total	447	100.0	605	100.0
Statistics	$\chi^2 = 40.13$; $p = .00$			
Farm Visits Received From Veterinarian				
None	218	48.8	399	66.0
1-3	172	38.5	181	29.9
4-over	57	12.8	25	4.1
Total	447	100.0	605	100.0
Statistics	$\chi^2 = 43.05$; $p = .000$			

with feeding practices of sows and pigs, and (4) Extension and veterinarian contacts between the producers and the Extension agent or local veterinarian.

Size of Operation and Employment Status

Variables included in this sub-section are: (1) average number of sows, (2) number of litters farrowed; (3) number of pigs raised to weaning, (4) number of pigs sold as feeders, and (5) average weight of feeder pigs sold.

Average number of sows. Forty percent of the full-time farmers had 21 or more sows compared to 16.6 percent of the part-time farmers. When tested by the x^2 test, these differences were significant at the .05 level. Therefore, employment was significantly related to the number of sows owned. Full-time farmers had significantly larger number of sows than did the part-time farmers.

Number of litters farrowed. A little above 32 percent of the full-time farmers farrowed 50 or more litters compared to 11.6 percent of the 605 part-time farmers. When tested by the x^2 test, these differences were significant at the .05 level. Full-time farmers farrowed significantly more litters than did the part-time farmers.

Number of pigs raised to weaning. Forty-eight percent of the full-time farmers raised 251 or more pigs to weaning compared to 25 percent of the part-time farmers. When tested by the x^2 test, these differences were significant at the .05 level. Full-time farmers

tended to raise a larger number of pigs to weaning than part-time farmers.

Number of pigs sold as feeders. About 43 percent of full-time farmers sold 200 or more pigs as feeders as compared to 28 percent of the part-time farmers. When tested by the x^2 test, the differences were significant at the .05 level. Full-time farmers sold a significantly higher number of feeder pigs than did part-time farmers.

Average weight of feeder pigs sold. Sixty-two percent of full-time farmers compared to 63 percent of the part-time farmers sold their pigs at 45 pounds and under. When tested by the x^2 test these differences were not significant at the .05 level. Therefore, the weight of the feeder pigs sold was not significantly related to the employment of the producer.

Health Practices and Employment Status

Variables included in this sub-section are: (1) times per year sows vaccinated for leptospirosis, (2) times per year sows vaccinated for rhinitis, (3) times per year sows vaccinated for parvovirus, (4) times per year boars vaccinated for parvovirus, (5) times per year sows wormed, (6) times per year sows treated for lice, (7) use of medicated water for disease treatment, (8) use of sulfa in water, (9) use of antibiotic in water, (10) use of medication in sows gestation and lactation ration, (11) use of medicated weaning ration for pigs, (12) frequency of iron shots for pigs, (13) age pigs received iron shots, (14) clipping of pigs needle teeth, (15) age of pigs when needle teeth were clipped, and (16) farrowing quarters disinfected.

Times per year sows vaccinated for leptospirosis. Fifty-two percent of the full-time farmers vaccinated their sows two times per year compared to 37 percent of the part-time farmers. When tested by the x^2 test, these differences were significant at the .05 level. A significantly higher percentage of the full-time farmers vaccinated their sows two times per year than did part-time farmers.

Times per year sows vaccinated for rhinitis. Twenty-nine percent of full-time farmers vaccinated their sows two times per year for rhinitis compared to 18 percent of the part-time farmers. When tested by the x^2 test, these differences were significant at the .05 level. Full-time farmers were more likely than part-time farmers to have vaccinated for rhinitis.

Times per year sows vaccinated for parvovirus. Fifteen percent of full-time farmers vaccinated their sows for parvovirus at least twice compared to 8 percent of the part-time farmers. When tested by the x^2 test these differences were significant at the .05 level. Full-time farmers were more likely than part-time farmers to have vaccinated sows for parvovirus.

Times per year boars vaccinated for parvovirus. Fourteen percent of the full-time farmers vaccinated boars for parvovirus two or more times per year compared to 8 percent of the part-time farmers. When tested by the x^2 test, these differences were significant. A significantly higher percentage of the full-time farmers vaccinated boars for parvovirus than did part-time farmers.

Times per year sows wormed. Fifty-nine percent of full-time farmers wormed their sows twice compared to 55 percent of the part-time farmers. When tested by the x^2 test these differences were not significant. The number of times sows were wormed was not significantly related to the farmers employment.

Times per year sows treated for lice. Eighty-five percent of full-time farmers treated their sows for lice two or more times per year compared to 78 percent of the part-time farmers. When tested by the x^2 test, the differences were significant. A significantly higher percent of full-time farmers compared to the part-time farmers treated their sows for lice two or more times per year.

Used medication in water. Twenty-three percent of full-time farmers used medication in the water for disease treatment, while only 17 percent of part-time farmers used this method. When tested by the x^2 test, the differences were significant. Full-time farmers were more likely than part-time farmers to use medication in the drinking water.

Used sulfa in water. Twenty-two percent of full-time farmers used sulfa in water compared to 19 percent of the part-time farmers. When tested by the x^2 test, the difference was not significant at the .05 level. There was not a significant relationship between use of sulfa in water and the employment status of farmers.

Used antibiotic in water. Forty-five percent of the full-time farmers compared to 39 percent of the part-time farmers used antibiotics

in drinking water. When these differences were tested by the x^2 test it was not significant. The use of antibiotics in water was not significantly related to farmers employment status.

Medication used in sows gestation and lactation ration. Sixty-eight percent of full-time farmers and 60 percent of part-time farmers used medication in gestation and lactation rations of sows. When tested by the x^2 test these differences were not significant. The use of medication in sow gestation and lactation rations was not significantly related to employment of the farmer.

Medication used in pigs weaning rations. Eighty-three percent of full-time farmers and about 73 percent of the part-time farmers used medication in their weaning rations for pigs. When tested by the x^2 test these differences were significant at the .05 level. The use of medications in pigs weaning rations was significantly related to the farmers employment status. Full-time farmers were more likely than part-time farmers to be using medication in the pigs weaning ration.

Frequency of iron shots to pigs. Seventy-three percent of the full-time farmers compared to 75 percent of the part-time farmers gave iron shots to their baby pigs. When tested by the x^2 test these differences were not significant. The frequency that iron shots were given to pigs was not significantly related to farmers employment status.

Age of pigs receiving iron shots. Ninety-one percent of full-time farmers gave iron shots to pigs within three days or less of age

compared to 84 percent of the part-time farmers. When tested by the x^2 test, these differences were significant at the .05 level. The age at which iron shots were given to pigs was significantly related to the employment status of farmers. A higher percentage of full-time farmers gave iron shots within three days of age than did part-time farmers.

Clip needle teeth. Fifty-two percent of full-time farmers compared to 52 percent of the part-time farmers always clipped the needle teeth of their pigs. When tested by the x^2 test these differences were not significantly related. Employment status was not significantly related to whether or not needle teeth were clipped.

Age of pigs when needle teeth clipped. Eighty-nine percent of full-time farmers compared to 86 percent of part-time farmers clipped needle teeth of pigs within three days or less of age. When tested by the x^2 test these differences were not significant. There was not a significant relationship between the age of pigs when the needle teeth are clipped and farmers employment status.

Farrowing quarters disinfected. Fifty-nine percent of full-time farmers disinfected farrowing quarters compared to 52 percent of the part-time farmers. When tested by the x^2 test, these differences were significant at the .05 level. Disinfecting the farrowing quarters was significantly related to the farmers employment status. Full-time farmers were more likely than part-time farmers to disinfect their farrowing house.

Feeding Practices and Employment Status

Variables included in this sub-section are: (1) source of feed, (2) increasing feed to pregnant sows, (3) pounds of feed given to pregnant sows, (4) pounds of feed given to nursing sows, and (5) how pigs were creep fed.

Source of feed. Fifty-three percent of full-time farmers mixed the feed on the farm compared to 29 percent of the part-time farmers. When tested by the x^2 test, these differences were significant at the .05 level. A significantly higher percentage of full-time farmers mixed the feed on the farm than did part-time farmers.

Increase feed to pregnant sows. Eighty-three percent of the full-time farmers compared to 81 percent of the part-time farmers increased the feed given to pregnant sows. When tested by the x^2 test, these differences were not significant. Increasing the feed to pregnant sows was not significantly related to farmers employment status.

Pounds fed to pregnant sows. Fifty percent of the full-time farmers fed the pregnant sows 5 pounds of feed or less compared to 43 percent of the part-time farmers. When tested by the x^2 test, these differences were significant at the .05 level. Pounds of feed fed to pregnant sows was significantly related to the farmers employment status. Full-time farmers were more likely than part-time farmers to be feeding 5 pounds of feed to pregnant sows.

Pounds fed to nursing sows. Fifty-one percent of the full-time farmers fed nursing sows 11 pounds or more of feed, while 44 percent

of part-time farmers increased feed. When tested by the x^2 test the differences were significant. Pounds of feed fed to nursing sows was significantly related to farmers employment status. A higher percentage of full-time farmers than part-time farmers increased feed fed to nursing sows.

How pigs were creep fed. Seventy-three percent of full-time farmers used creep feed only, compared to 73 percent of the part-time farmers. When tested by the x^2 test these differences were not significant. The type of creep feeding was not significantly related to employment status.

Extension Contacts and Farmers Employment

Variables included in this sub-section are: (1) swine meetings, (2) office visits, (3) telephone calls made to Extension, (4) farm visits received from agents, and (5) farm visits received from veterinarian.

Swine meetings attended. Fifty-one percent of full-time farmers attended from 1 to 8 Extension swine meetings compared to 41 percent of the part-time farmers. When tested by the x^2 test these differences were significant at the .05 level. The number of Extension swine meetings attended was significantly related to the farmers employment status. A higher percentage of full-time farmers attended Extension swine meetings than did the part-time farmers.

Office visits. Eighty-three percent of full-time farmers made 3 or less visits to the Extension office compared to 85 percent of the

part-time farmers. When tested by the x^2 test the differences were not significant at the .05 level. The number of office visits made to Extension office was not significantly related to the farmers employment status.

Telephone calls. Eighty-three percent of the full-time farmers made telephone calls to the Extension office compared to 74 percent of the part-time farmers. When tested by the x^2 test, these differences were significant at the .05 level. The number of telephone calls made to Extension was significantly related to the farmers employment status. Full-time farmers made more telephone calls to the Extension office than did part-time farmers.

Farm visits received. Sixty percent of the full-time farmers received from 1 to 3 farm visits from Extension agents compared to 51 percent of the part-time farmers. When tested by the x^2 test, these differences were significant. The number of farm visits received by Extension was significantly related to farmers employment status. Full-time farmers received more farm visits from Extension agents than did part-time farmers.

Farm visits received from veterinarian. Thirteen percent of the full-time farmers received 4 or more farm visits from the veterinarian compared to 4 percent of the part-time farmers. When tested by the x^2 test, these differences were significant at the .05 level. The number of farm visits received from the veterinarian was

significantly related to the farmers employment status. A higher percentage of full-time farmers than of the part-time farmers received farm visits from the veterinarian.

Table Summary

The data were analyzed to determine relationships between farm size of operation, use of herd health practices, use of feeding practices, number of Extension contacts made, number of veterinarian contacts, and farmer employment status.

The data showed that employment was significantly related to the size of the operation.

Full-time farmers tended to have larger sow herds, farrowed more litters, raised more pigs to weaning and sold more pigs as feeders than part-time farmers. Average weight of feeder pigs was not significantly related to employment.

Employment status was significantly related to 9 of the 16 health practices and were not significantly related to 7 others. Farmers employment status was significantly related to: (1) times per year sows were vaccinated for leptospirosis, (2) times per year sows were vaccinated for rhinitis, (3) times per year sows were vaccinated for parvovirus, (4) times per year boars vaccinated for parvovirus, (5) times sows treated for lice, (6) used medication in water, (7) medication used in pigs weaning ration, (8) age pigs received iron shots, and (9) farrowing quarters disinfected. Full-time farmers tended to have a higher use of these recommended practices.

Farmers employment was not significantly related to the following practices: (1) times per year sows wormed, (2) use of sulfa in water,

(3) use of antibiotic in water, (4) medication used in sows ration, (5) frequency of iron shots to pigs, (6) clip needle teeth, and (7) age of pigs when needle teeth were clipped.

Full-time farmers tended to use a higher percentage of recommended feeding practices than did part-time farmers. However, the practices of increasing feed to pregnant sows and the method of creep feeding pigs were not significantly related to farmers employment status.

A significantly higher percentage of full-time farmers than part-time farmers had contact with Extension through swine meetings, telephone calls, and farm visits received. There was not a significant relationship between employment status and the number of visits made to the Extension office. Full-time farmers also received more farm visits from the veterinarian than did part-time farmers.

II. RELATIONSHIPS BETWEEN SWINE PRODUCERS AGE AND SIZE OF OPERATION, USE OF SWINE PRODUCTION PRACTICES AND THE NUMBER AND TYPES OF EXTENSION CONTACTS

Table III presents findings regarding relationships between swine producers age, use of swine production practices and contacts made with Extension agents. Findings presented in this section were divided into four subsections: (1) size of operation, (2) use of health practices, (3) use of feeding practices, and (4) the number of contacts between producers and Extension agents.

TABLE III. Relationships Between Swine Producers Age and Size of Operation, Use of Swine Production Practices and the Number and Types of Extension Contacts

Size of Operation, Health Practices, Feeding Practices Extension Contacts	Producers' Age					
	35-under		36-50		51-over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
SIZE OF OPERATION						
Average Number Sows						
10-less	83	36.9	150	35.6	212	51.6
11-20	67	29.8	140	33.3	123	29.9
21-over	75	33.3	131	31.1	76	18.5
Total	225	100.0	421	100.0	411	100.0
Statistics	$\chi^2 = 32.51; p = .00$					
Number Litters						
15-less	55	24.6	108	25.6	150	36.4
16-29	67	29.9	122	28.9	146	35.4
30-50	44	19.6	89	21.1	62	15.0
50-over	58	25.9	103	24.4	54	13.1
Total	224	100.0	422	100.0	412	100.0
Statistics	$\chi^2 = 35.55; p = .00$					
No Pigs Weaned						
125-less	69	30.7	117	27.7	171	41.5
126-250	63	28.0	133	31.5	134	32.5
251-over	93	41.3	172	40.8	107	26.0
Total	225	100.0	422	100.0	412	100.0
Statistics	$\chi^2 = 29.62; p = .00$					
Number Feeder Pigs Sold						
100-less	57	25.3	109	25.8	157	38.1
100-199	81	36.0	142	33.6	141	34.2
200-over	87	38.7	171	40.5	114	27.7
Total	225	100.0	422	100.0	412	100.0
Statistics	$\chi^2 = 23.86; p = .0001$					
Average Weight Pigs Sold						
45-under	141	64.1	262	63.6	243	61.1
46-over	79	35.9	150	36.4	155	38.9
Total	220	100.0	412	100.0	398	100.0
Statistics	$\chi^2 = .78; p = .67$					

TABLE III (Continued)

Size of Operation, Health Practices, Feeding Practices Extension Contacts	Producers' Age					
	35-under		36-50		51-over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
HEALTH PRACTICES						
Times Year Sows Vaccinated Leptospirosis						
None	53	23.6	142	33.6	174	42.2
Once	43	19.1	80	19.0	79	19.2
Twice	122	54.2	189	44.8	152	36.9
Three-over	7	3.1	11	2.6	7	1.7
Total	225	100.0	422	100.0	412	100.0
Statistics	$\chi^2 = 26.44; p = .0002$					
Times Year Sows Vaccinated Rhinitis						
None	121	53.8	279	66.1	298	72.3
Once	29	12.9	41	9.7	43	10.4
Two-over	75	33.3	102	24.2	71	17.2
Total	225	100.0	422	100.0	412	100.0
Statistics	$\chi^2 = 25.30; p = .000$					
Times Year Sows Vaccinated Parvovirus						
None	170	75.6	324	77.0	344	83.5
Once	26	11.6	40	9.5	36	8.7
Twice	29	12.9	57	13.5	32	7.8
Total	225	100.0	421	100.0	412	100.0
Statistics	$\chi^2 = 9.8; p = .04$					
Times Year Boars Vaccinated Parvovirus						
None	172	76.4	313	74.2	329	79.9
Once	30	13.3	52	12.3	48	11.7
Two-over	23	10.2	57	13.5	35	8.5
Total	225	100.0	422	100.0	412	100.0
Statistics	$\chi^2 = 6.14; p = .18$					
Times Year Sows Wormed						
None	7	3.1	27	6.4	33	8.0
Once	26	11.6	61	14.5	73	17.7
Twice	142	63.1	239	56.6	224	54.4
Three-over	50	22.2	95	22.5	82	19.9
Total	225	100.0	422	100.0	412	100.0
Statistics	$\chi^2 = 12.1; p = .05$					

TABLE III (Continued)

Size of Operation, Health Practices, Feeding Practices Extension Contacts	Producers' Age					
	35-under		36-50		51-over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
Times Year Sows Treated Lice						
None	7	3.1	21	5.0	24	5.8
Once	25	11.1	63	14.9	53	12.9
Twice	89	39.6	153	36.3	145	35.2
Three-over	104	46.2	185	43.8	190	46.1
Total	225	100.0	422	100.0	412	100.0
Statistics	$\chi^2 = 4.97; p = .54$					
Medicated Water for Disease						
No	156	76.5	294	79.9	300	82.2
Yes	48	23.5	74	20.1	65	17.8
Total	204	100.0	368	100.0	365	100.0
Statistics	$\chi^2 = 2.69; p = .26$					
Used Sulfa in Water						
No	114	75.0	236	77.1	241	83.4
Yes	38	25.0	70	22.9	48	16.6
Total	152	100.0	306	100.0	289	100.0
Statistics	$\chi^2 = 5.49; p = .064$					
Use Antibiotic in Water						
No	75	48.4	180	58.3	186	63.5
Yes	80	51.6	129	41.7	107	36.5
Total	155	100.0	309	100.0	293	100.0
Statistics	$\chi^2 = 9.49; p = .0087$					
Medication Used in Gestation/Lactation Ration						
None	75	33.6	142	34.1	157	38.6
Antibiotic	90	40.4	147	35.3	134	32.9
Sulfa	10	4.5	15	3.6	19	4.7
Both	48	21.5	112	26.9	97	23.8
Total	223	100.0	416	100.0	407	100.0
Statistics	$\chi^2 = 6.21; p = .39$					

TABLE III (Continued)

Size of Operation, Health Practices, Feeding Practices Extension Contacts	Producers' Age					
	35-under			36-50		
	Number of Respondents	Percent Respondents	Percent Respondents	Number of Respondents	Percent Respondents	51-over Number of Respondents
Medication Used Pigs Weaning Ration						
None	40	18.1		89	24.7	107
Antibiotic	114	51.6		183	44.5	179
Sulfa	7	3.2		17	4.1	17
Both	60	27.1		122	29.7	103
Total	221	100.0		411	100.0	406
Statistics	$\chi^2 = 8.486; p = .20$					
How Frequent Iron Shots to Pigs						
Never	37	17.9		85	21.5	123
Sometimes	50	24.2		117	29.6	107
Always	120	58.0		193	48.9	125
Total	207	100.0		395	100.0	355
Statistics	$\chi^2 = 36.8; p = .000$					
Age Pigs Iron Shots						
3 days-less	146	85.9		272	88.6	200
4 days-over	24	14.1		35	11.4	31
Total	170	100.0		307	100.0	231
Statistics	$\chi^2 = .88; p = .64$					
Clip Needle Teeth						
Never	26	11.7		55	13.1	68
Sometimes	68	30.6		117	27.9	166
Always	128	57.7		247	58.9	175
Total	222	100.0		419	100.0	409
Statistics	$\chi^2 = 25.41; p = .00$					
Age Pig Teeth Clipped						
3 days-less	175	91.1		330	91.7	275
4 days-over	17	8.9		30	8.3	63
Total	192	100.0		360	100.0	338
Statistics	$\chi^2 = 19.86; p = .00$					
Farrowing Quarters Disinfected						
No	81	39.3		160	41.1	178
Yes	125	60.7		229	58.9	159
Total	206	100.0		389	100.0	337
Statistics	$\chi^2 = 13.36; p = .0013$					

TABLE III (Continued)

Size of Operation, Health Practices, Feeding Practices Extension Contacts	Producers' Age					
	35-under			36-50		
	Number of Respondents	Percent Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents
FEEDING PRACTICES						
Source of Feed						
Commercially mixed	123	55.4		249	59.6	254
On farm mix	99	44.6		169	40.4	155
Total	222	100.0		418	100.0	409
Statistics	$\chi^2 = 2.68; p = .26$					
Increase Feed to Pregnant Sows						
No	35	15.8		73	17.4	77
Yes	187	84.2		346	82.6	330
Total	222	100.0		419	100.0	407
Statistics	$\chi^2 = 1.007; p = .60$					
Pounds Fed to Pregnant Sows						
5-under	108	48.2		195	46.7	176
6-9	98	43.8		184	44.0	179
10-over	18	8.0		39	9.3	47
Total	224	100.0		418	100.0	402
Statistics	$\chi^2 = 2.9; p = .56$					
Pounds Fed to Nursing Sows						
10-less	107	47.8		222	53.0	217
11-over	117	52.2		197	47.0	188
Total	224	100.0		419	100.0	405
Statistics	$\chi^2 = 2.17; p = .33$					
How Creep Feed Pigs						
Creep only	187	83.9		296	70.6	282
Ate with sow	15	6.7		62	14.8	65
Creep plus corn	21	9.4		61	14.6	61
Total	223	100.0		419	100.0	408
Statistics	$\chi^2 = 18.3; p = .001$					

TABLE III (Continued)

Size of Operation, Health Practices, Feeding Practices Extension Contacts	Producers' Age					
	35-under		36-50		51-over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
EXTENSION CONTACTS						
Swine Meetings Attended						
None	110	50.7	216	52.9	228	58.8
1 to 8	107	49.3	192	47.1	160	41.2
Total	217	100.0	408	100.0	388	100.0
Statistics	$\chi^2 = 4.5$; $p = .105$					
Office Visits Made						
None	50	22.2	124	29.4	96	23.3
1-3	132	58.7	249	59.0	233	56.6
5-over	43	19.1	49	11.6	83	20.1
Total	225	100.0	422	100.0	412	100.0
Statistics	$\chi^2 = 14.81$; $p = .0051$					
Telephone Calls Made						
None	34	15.1	99	23.5	92	22.4
5-less	137	60.9	253	60.0	234	56.9
6-over	54	24.0	70	16.6	85	20.7
Total	225	100.0	422	100.0	411	100.0
Statistics	$\chi^2 = 10.07$; $p = .039$					
Farm Visits Received						
None	50	22.2	136	32.2	108	26.2
1-3	116	51.6	228	54.0	235	57.0
4-over	59	26.2	58	13.7	69	16.7
Total	225	100.0	422	100.0	412	100.0
Statistics	$\chi^2 = 19.99$; $p = .0005$					
Farm Visits From Veterinarian						
None	118	52.4	251	59.5	249	60.4
1-3	85	37.8	135	32.0	133	32.3
4-over	22	9.8	36	8.5	30	7.3
Total	225	100.0	422	100.0	412	100.0
Statistics	$\chi^2 = 4.57$; $p = .33$					

Size of Operation and Age

Variables included in this sub-section are: (1) average number of sows, (2) number of litters farrowed, (3) number of pigs weaned, (4) number of feeder pigs sold, and (5) average weight of feeder pigs sold.

Average number of sows. Fifty-two percent of the producers that were 51 years old or older had 10 sows or less compared to 37 percent of those 35 years or younger. When tested by the x^2 test, the differences were significant at the .05 level. The older producers tended to have fewer sows in their herds.

Number of litters weaned. Seventy-two percent of the producers 51 years or older produced fewer than 30 litters per year compared to 55 percent of those producers 35 years old and under. Of the 36-50 year old producers, 54 percent produced less than 30 litters per year. When tested by the x^2 test, the differences were significant at the .05 level. Some producers 51 years of age and older produced fewer litters per year than those under 51 years of age.

Number of pigs weaned. Forty-two percent of the producers 51 years of age and over weaned 125 or less pigs compared to 31 percent of those 35 and under. When tested by the x^2 test, the differences were significant at the .05 level. Older producers tended to wean fewer pigs per year than did younger producers.

Number of feeder pigs sold. Thirty-nine percent of the producers 35 years and under and 41 percent of those 36-50 years old, compared

to 28 percent of the producers 51 years and over sold 200 or more pigs. When tested by the x^2 test, these differences were significant. The producers 51 years and older tended to sell fewer feeder pigs each year than did the younger producers.

Average weight of pigs sold. Sixty-four percent of the producers 35 years and under and those 36 to 50 years of age sold their pigs at 45 pounds or less, compared to 61 percent of those 51 and over. When tested by the x^2 test, the differences were not significant at the .05 level. The age of the producer was not significantly related to the weight at which the pigs were sold.

Health Practices and Age

Variables included in this sub-section are: (1) times per year sows vaccinated for leptospirosis, (2) times per year sows vaccinated for rhinitis, (3) times per year sows vaccinated for parvovirus, (4) times per year boars vaccinated for parvovirus, (5) times per year sows wormed, (6) times per year sows treated for lice, (7) medication used in water for disease treatment, (8) used sulfa in water, (9) used antibiotic in water, (10) medication used in gestation and lactation ration, (11) medication used in pigs weaning ration, (12) frequency of iron shots to pigs, (13) age pigs given iron shots, (14) clip needle teeth, (15) age of pigs when needle teeth clipped, and (16) farrowing quarters disinfected.

Times per year sows vaccinated for leptospirosis. Fifty-four percent of the producers that were 35 years or under vaccinated their

sows two times per year, while only 45 percent of those age 36 to 50 and only 37 percent of those 51 and over did the same. When tested by the x^2 test, the differences were significant at the .05 level. Younger producers were more likely than those over 35 years of age to vaccinate their sows two times per year.

Times sows vaccinated for rhinitis. Thirty-three percent of the producers 35 and under vaccinated their sows two or more times per year for rhinitis, while only 24 percent of the 36 to 50 and 17 percent of those over 51 did the same. When tested by the x^2 test, the differences were significant at the .05 level. The younger producers were more likely to vaccinate their sows for rhinitis two times per year than were those producers over 35 years of age.

Times sows vaccinated for parvovirus. Twenty-five percent of the producers ages 35 and under vaccinated their sows for parvovirus one or more times per year, compared to 23 percent of those ages 36 to 50 and 16 percent of those 51 years and over did the same. When tested by the x^2 test, the differences were significant at the .05 level. Younger producers were more likely than those over 35 years of age to vaccinate their sows for parvovirus.

Times per year boars vaccinated for parvovirus. Approximately 75 percent of each of the three age groups of producers did not vaccinate their boars for parvovirus. When tested by the x^2 test, the differences were not significant at the .05 level. Most producers did not vaccinate their boars for parvovirus regardless of the producers age.

Times per year sows wormed. Eighty-five percent of the producers 35 years and under wormed their sows two or more times per year, while only 74 percent of the older producers (51 years and older) did the same. Seventy-nine percent of the producers between 36 and 50 years old wormed their sows two times or more. When tested by the x^2 test, the differences were significant at the .05 level. Younger producers tended to worm their sows more often than those over 35 years of age.

Times per year sows treated for lice. Approximately 95 percent of producers of each age group treated their sows for lice one or more times per year. When tested by the x^2 test, the relationship was not significant at the .05 level. Most producers tended to treat their sows for lice regardless of their age.

Used medication in water for disease. Approximately 80 percent of producers in each age group did not use medication in the water for disease control. When tested by the x^2 test, the differences were not significant at the .05 level. Most swine producers, regardless of their age, did not use medication in the water supply.

Used sulfa in water. Seventy-five percent of producers 35 years and under, 77 percent of producers 36 to 50 years old, and 83 percent of producers 51 years and older did not use sulfa in the water supply. When tested by the x^2 test, the differences were not significant at the .05 level. Most swine producers, regardless of their age, did not use sulfa in the drinking water.

Used antibiotic in water. Almost 52 percent of the producers under 36 years of age compared to about 37 percent of those over 50 years of age used antibiotics in the drinking water. When tested by the x^2 test, these differences were significant at the .05 level. Younger producers were more likely than those over 50 to use antibiotics in water.

Medication used in gestation and lactation ration. Approximately 65 percent of producers regardless of their age used some type of medication in the sows gestation and lactation rations. When tested by the x^2 test, there was no significant difference at the .05 level. Therefore, the use of medication in the sows ration did not differ significantly as to the age of the producers.

Medication used in pigs weaning ration. Almost 52 percent of producers 35 years and under used antibiotic in the weaning ration, while approximately 44 percent of the producers in the other age groups used the same practice. When tested by the x^2 test, these differences were not significant at the .05 level. Most farmers regardless of age tended to use medication in the feeding ration of pigs.

Frequency of iron shots given to pigs. Fifty-eight percent of the producers 35 years and under always gave their pigs iron shots, while only 49 percent of producers 36 to 50 years old and 35 percent of those 51 and over did the same. When tested by the x^2 test, the differences were significant at the .05 level. Younger producers were more likely to give iron shots to pigs than were older producers.

Age of pigs when iron shots given. Regardless of the age of producers, over 85 percent of all producers gave iron shots to their pigs at three days or less of age. When tested by the x^2 test, these differences were not significant at the .05 level. Regardless of their ages, producers tended to give iron shots at three days or less of pigs age.

Clip needle teeth. Approximately 58 percent of the producers 50 years and younger always clipped the needle teeth of pigs, compared to 43 percent of producers 51 years and older. When tested by the x^2 test, the differences were significant. Younger producers were more likely than those over 50 to clip needle teeth.

Age of pigs when teeth clipped. About 91 percent of all the producers 50 years of age and under clipped their pigs needle teeth within three days or less of age, while only 81 percent of those producers 51 years and older did the same. When tested by the x^2 test, the differences were significant at the .05 level. Most producers under 50 years of age clipped the needle teeth of pigs within the recommended time. The producers age was significantly related to the age at which the pigs needle teeth was clipped. Older producers were less likely than those under 51 years of age to clip teeth during the first three days after birth.

Farrowing quarters disinfected. Sixty-one percent of the producers 35 years and under, 59 percent of those 36 to 50 years

disinfected the farrowing quarters, while only 47 percent of the producers 51 years and over used this practice. When tested by the x^2 test, the differences were significant at the .05 level. Younger producers were more likely than those over 50 to disinfect farrowing quarters.

Feeding Practices and Age

Variables included in this subsection are: (1) source of feed, (2) increase feed to pregnant sows, (3) pounds fed to pregnant sows, (4) pounds fed to nursing sows, and (5) how pigs were creep fed.

Source of feed. Sixty-two percent of the producers 51 years and over used a commercial mix for their feed source, while 55 percent of the younger producers (35-less) and 60 percent of the middle age (36 to 50) producers did the same. When tested by the x^2 test, the differences were not significant at the .05 level. A higher percentage of producers tended to use a commercial mix feed regardless of age.

Increase feed to pregnant sows. Eighty-four percent of those producers 35 and under, 83 percent of producers 36 to 50 years, and 81 percent of those over 51 years increased the pounds feed fed to pregnant sows. When tested by the x^2 test, the differences were not significant at the .05 level. Most producers tended to increase the feed to pregnant sows regardless of their ages.

Pounds fed to pregnant sows. Forty-eight percent of the younger producers (35 years or less), 47 percent of the producers 36 to 50 years,

and 44 percent of those producers 51 years and older fed their pregnant sows 5 pounds of feed or less. When tested by the x^2 test, the differences were not significant at the .05 level. Most producers tended to feed their pregnant sows less than 10 pounds per day regardless of the producers age.

Pounds feed fed to nursing sows. About 54 percent of the producers 51 years and over and 53 percent of those 36 to 50 years of age fed their nursing sows 10 pounds of feed or less per day, while 48 percent of the 35 years or less age group did the same. When tested by the x^2 test, the differences were not significant at the .05 level. The pounds of feed fed to nursing sows did not differ as to ages of the producers.

How pigs creep fed. Eighty-four percent of the producers 35 and under used creep feed only, while 71 percent of those 36 to 50 years old and 69 percent of the older producers (51 years and over) used this method of feeding. When tested by the x^2 test, the relationship was significant at the .05 level. The younger age producers were more likely than those over 50 to use creep feed only.

Extension Contacts and Age

Variables included in this sub-section are: (1) Extension swine meetings attended, (2) visits made to the Extension office, (3) telephone calls made to the Extension office, (4) farm visits received from Extension agents, and (5) farm visits received from veterinarians.

Swine meetings. About 59 percent of producers 51 years and older, 53 percent of producers 36 to 50 years and 51 percent of those 35 years and younger did not attend any Extension swine meetings during the past year. These differences were not significant at the .05 level. About half of the producers did not attend a swine meeting regardless of their ages.

Office visits made. Approximately 77 percent of the producers 51 years old and over and of those 35 years and under made one or more visits per year to the Extension office, compared to 70 percent of the producers ages 36 to 50. When tested by the chi-square test, these differences were significant at the .05 level. The younger producers and the older producers tended to have more Extension contacts through office visits than those in the 36 to 50 age groups.

Telephone calls made. About 60 percent of the producers age 35 years or less and 60 percent of the producers age 36 to 50 had five or less telephone calls to the Extension office compared to 56 percent of the producers 51 years of age and over. When tested by the chi-square test these differences were significant at the .05 level. Swine producers 35 years of age and younger tended to make more telephone calls to the Extension office than those over 35 years old.

Farm visits received from Extension. Approximately 26 percent of the producers ages 35 years or less received four or more visits from Extension agents, while 16 percent of producers 51 years and older and only 13 percent of the producers 36 to 50 received as many visits.

When tested by the chi-square test, the differences were significant at the .05 level. The younger producers tended to receive more farm visits from the Extension agent than the producers over 35 years of age.

Farm visits received from the veterinarian. About 60 percent of the producers age 51 and older did not receive any visits from the veterinarian, 59 percent of the producers age 36 to 50, and 52 percent of the producers 35 years and under did not receive any visits from the veterinarian. When tested by the chi-square test, the differences were not significant at the .05 level. The number of farm visits producers received from veterinarians did not differ as to ages of the swine producers.

Table Summary

The data were analyzed to determine the relationships between farmers age and size of operation, recommended health and feeding practices, and Extension contacts.

The data indicated that producers 35 years and younger tended to have larger operations, farrow more litters and wean more pigs. They also tended to vaccinate their sows more frequently for leptospirosis, rhinitis, and parvovirus. Younger producers also used antibiotics in water, gave iron shots more frequently, clipped needle teeth, and disinfected farrowing quarters more often than the older producers.

The producers age was not significantly related to feeding practices (source of feed, increase feed to pregnant sows, pounds fed

to pregnant sows, pounds fed to lactating sows), with the exception of how the pigs were creep fed.

The age was significantly related to the number and types of Extension contacts. Younger producers tended to make more office visits and telephone calls to the Extension office. The younger producers also tended to receive more farm visits from Extension agents than did the older producers.

III. RELATIONSHIPS BETWEEN SWINE PRODUCERS' EDUCATION AND SIZE OF OPERATION, USE OF SWINE PRODUCTION PRACTICES, AND THE NUMBER AND TYPES OF CONTACTS WITH EXTENSION

Table IV presents findings regarding relationships between swine producers' education and their use of swine production practices and the number of contacts producers made with Extension agents. Findings presented in this section were organized into four sub-sections: (1) size of operation, (2) health practices, (3) feeding practices, and (4) number of contacts producers had with Extension agents and local veterinarians.

Size of Operation and Education

Variables included in this sub-section are: (1) average number of sows, (2) number of litters farrowed, (3) number of pigs raised to weaning, (4) number of pigs sold as feeders, and (5) average weight of feeder pigs sold.

Average number of sows. Almost 41 percent of those farmers with a college education, compared to 23.1 percent of producers who had a

TABLE IV; Relationships Between Swine Producers' Education, Use of Recommended Production Practices and the Number and Types of Extension Contacts

Size of Operation, Health Practices, Feeding Practices and Extension Contacts	Producers' Education			
	High-School-less		College	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
SIZE OF OPERATION				
Average Number Sows				
10-less	377	44.9	61	29.6
11-20	268	31.9	61	29.6
21-over	194	23.1	84	40.6
Total	839	100.0	206	100.0
Statistics	$\chi^2 = 28.92; p = .000$			
Number Litters Farrowed				
15-less	259	30.8	44	21.5
16-29	280	33.3	57	27.8
30-50	159	18.9	35	17.1
50-over	143	17.0	69	33.7
Total	840	100.0	205	100.0
Statistics	$\chi^2 = 29.35; p = .00$			
Number Pigs Raised to Weaning				
125-less	301	35.8	47	22.8
126-250	272	32.3	58	28.2
251-over	268	31.9	101	49.0
Total	841	100.0	206	100.0
Statistics	$\chi^2 = 23.13; p = .00$			
Number Pigs Sold as Feeders				
100-less	272	32.3	44	21.4
100-199	299	35.6	65	31.6
200-over	270	32.1	97	47.1
Total	841	100.0	206	100.0
Statistics	$\chi^2 = 17.97; p = .001$			
Average Weight Feeder Pigs Sold				
45-under	524	64.1	118	58.7
46-over	294	35.9	83	41.3
Total	818	100.0	201	100.0
Statistics	$\chi^2 = 1.75; p = .18$			

TABLE IV (Continued)

Size of Operation, Health Practices, Feeding Practices and Extension Contacts	Producers' Education			
	High-School-less		College	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
HEALTH PRACTICES				
Times Year Sows Vaccinated Leptospirosis				
None	317	37.7	46	22.3
Once	163	19.4	38	18.4
Twice	345	41.0	112	54.4
Three-over	16	1.9	10	4.9
Total	841	100.0	206	100.0
Statistics	$\chi^2 = 23.89; p = .00$			
Times Year Sows Vaccinated Rhinitis				
None	581	69.1	109	52.9
Once	86	10.2	26	12.6
Two-over	174	20.7	71	34.5
Total	841	100.0	206	100.0
Statistics	$\chi^2 = 20.87; p = .00$			
Times Year Sows Vaccinated Parvovirus				
None	684	81.4	144	69.9
Once	72	8.6	28	13.6
Twice	84	10.0	34	16.5
Total	840	100.0	206	100.0
Statistics	$\chi^2 = 13.34; p = .0013$			
Times Year Boars Vaccinated Parvovirus				
None	663	78.8	142	68.9
Once	95	11.3	32	15.5
Two-over	83	9.9	32	15.5
Total	841	100.0	206	100.0
Statistics	$\chi^2 = 9.39; p = .0091$			
Times Year Sows Wormed				
None	61	7.3	5	2.4
Once	139	16.5	19	9.2
Twice	481	57.2	120	58.2
Three-over	160	19.0	62	30.1
Total	841	100.0	206	100.0
Statistics	$\chi^2 = 21.56; p = .0001$			

TABLE IV (Continued)

Size of Operation, Health Practices, Feeding Practices and Extension Contacts	Producers' Education			
	High-School-less		College	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
Times Year Sows Treated Lice				
None	43	5.1	8	3.9
Once	124	14.7	15	7.3
Two	303	36.0	77	37.4
Three-over	371	44.1	106	51.5
Total	841	100.0	206	100.0
Statistics	$x^2 = 9.49; p = .023$			
Used Medication in Water Treat Disease				
No	616	83.1	124	67.4
Yes	125	16.9	60	32.6
Total	741	100.0	184	100.0
Statistics	$x^2 = 21.84; p = .00$			
Use Sulfa in Water				
No	477	82.1	112	68.7
Yes	104	17.9	51	31.3
Total	581	100.0	163	100.0
Statistics	$x^2 = 13.03; p = .0003$			
Use Antibiotic in Water				
No	363	61.5	76	46.3
Yes	227	38.5	88	53.7
Total	590	100.0	164	100.0
Statistics	$x^2 = 11.5; p = .0007$			
Medication Used Sows Gestation/Lactation Ration				
None	316	38.1	55	27.0
Antibiotic	282	34.0	81	39.7
Sulfa	29	3.5	15	7.4
Both	203	24.5	53	26.0
Total	830	100.0	204	100.0
Statistics	$x^2 = 13.05; p = .0045$			

TABLE IV (Continued)

Size of Operation, Health Practices, Feeding Practices and Extension Contacts	Producers' Education			
	High-School-less		College	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
Medication Used Pigs Weaning Ration				
None	199	24.2	34	16.7
Antibiotic	375	45.5	95	46.8
Sulfa	29	3.5	11	5.4
Both	221	26.8	63	31.0
Total	824	100.0	203	100.0
Statistics	$\chi^2 = 6.54; p = .08$			
Frequency Iron Shots				
Never	206	27.3	34	17.4
Sometimes	237	31.4	36	18.5
Always	311	41.2	125	64.1
Total	754	100.0	195	100.0
Statistics	$\chi^2 = 32.66; p = .00$			
Age Pigs Receive Iron Shots				
3 days	463	85.3	151	93.8
Later	80	14.7	10	6.2
Total	543	100.0	161	100.0
Statistics	$\chi^2 = 7.34; p = .006$			
Clip Needle Teeth				
Never	129	15.4	18	8.9
Sometimes	306	36.6	42	20.8
Always	401	48.0	142	70.3
Total	836	100.0	202	100.0
Statistics	$\chi^2 = 32.52; p = .00$			
Age Pigs Teeth Clipped				
First 3 days	597	85.7	175	95.1
Later	100	14.3	9	4.9
Total	697	100.0	184	100.0
Statistics	$\chi^2 = 11.14; p = .0008$			
Farrowing Quarters Disinfected				
No	352	48.2	61	32.3
Yes	379	51.8	128	67.7
Total	731	100.0	189	100.0
Statistics	$\chi^2 = 14.66; p = .0001$			

TABLE IV (Continued)

Size of Operation, Health Practices, Feeding Practices and Extension Contacts	Producers' Education			
	High-School-less		College	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
FEEDING PRACTICES				
Source of Feed				
Commercially mixed	522	62.7	101	49.5
On farm mixed	311	37.3	103	50.5
Total	833	100.0	204	100.0
Statistics	$\chi^2 = 11.28; p = .0008$			
Increase Feed to Pregnant Sows				
No	160	19.2	19	9.3
Yes	672	80.8	185	90.7
Total	832	100.0	204	100.0
Statistics	$\chi^2 = 10.58; p = .0011$			
Pounds Fed Pregnant Sows				
5-under	392	47.3	87	42.2
6-9	360	43.5	94	45.6
10-over	76	9.2	25	12.1
Total	828	100.0	206	100.0
Statistics	$\chi^2 = 2.5; p = .27$			
Pounds Fed Nursing Sows				
10-less	460	55.4	83	40.3
11-over	371	44.6	123	59.7
Total	831	100.0	206	100.0
Statistics	$\chi^2 = 14.41; p = .0001$			
How Creep Feed Pigs				
Creep only	595	71.5	163	79.1
Ate with sow	118	14.2	20	9.7
Creep plus corn	119	14.3	23	11.2
Total	832	100.0	206	100.0
Statistics	$\chi^2 = 4.98; p = .082$			

TABLE IV (Continued)

Size of Operation, Health Practices, Feeding Practices and Extension Contacts	Producers' Education			
	High-School-less		College	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
EXTENSION CONTACTS				
Swine Meetings Attended				
None	466	57.5	87	44.6
1 to 8	345	42.5	108	55.4
Total	811	100.0	195	100.0
Statistics	$\chi^2 = 9.96; p = .0016$			
Office Visits Made				
None	236	28.1	34	16.5
1-3	487	57.9	121	58.7
4-over	118	14.0	51	24.8
Total	841	100.0	206	100.0
Statistics	$\chi^2 = 20.83; p = .00$			
Telephone Calls Made				
None	203	24.1	21	10.2
5-less	501	59.6	119	57.8
6-over	137	16.3	66	32.0
Total	841	100.0	206	100.0
Statistics	$\chi^2 = 36.29; p = .00$			
Farm Visits Received				
None	250	29.7	41	19.9
1-3	470	55.9	108	52.4
4-over	121	14.4	57	27.7
Total	841	100.0	206	100.0
Statistics	$\chi^2 = 23.27; p = .00$			
Farm Visits Received from Veterinarian				
None	523	62.2	91	44.2
1-3	256	30.4	94	45.6
4-over	62	7.4	21	10.2
Total	841	100.0	206	100.0
Statistics	$\chi^2 = 22.24; p = .000$			

high school education or less, had 21 or more sows in their herd. These differences were significant at the .05 level. Farmers with a college education tended to have larger operations.

Number of litters farrowed. Almost 34 percent of those farmers with a college education, compared to 17 percent of farmers with a high school education or less, farrowed five or more litters per year. These differences were significant. Farmers with a college education tended to farrow more litters of pigs than producers who did not attend college.

Number of pigs raised to weaning. Forty-nine percent of those farmers with a college education, compared to 31.9 percent who had a high school education or less, weaned over 250 pigs per year. These differences were significant at the .05 level. Farmers with a college education tended to wean more pigs than those not attending college.

Number of pigs sold as feeders. Just over 47 percent of those farmers with a college education, compared to 32.1 percent of producers with a high school education or less, sold 200 or more feeder pigs per year. These differences were significant. Farmers with a college education tended to sell more pigs as feeders than did those not attending college.

Average weight of feeder pigs sold. About 42 percent of those farmers with a college education, compared to 35.9 percent of farmers with a high school education or less, sold feeder pigs with an average weight of over 45 pounds. These differences were not significant at

the .05 level. Therefore, there was not a significant relationship between the farmers education and the average weight of feeder pigs sold.

Health Practices and Education

Variables included in this sub-section are: (1) times per year sows vaccinated for leptospirosis, (2) times per year sows vaccinated for rhinitis, (3) times per year sows vaccinated for parvovirus, (4) times per year boars vaccinated for parvovirus, (5) times per year sows wormed, (6) times per year sows treated for lice, (7) use of medicated water for disease treatment, (8) use of sulfa in water, (9) use of antibiotic in water, (10) use of medication in sows gestation and lactation ration, (11) use of medicated weaning ration for pigs, (12) frequency of iron shots for pigs, (15) age of pigs when needle teeth were clipped, and (16) farrowing quarters disinfected.

Times per year sows vaccinated for leptospirosis. Over 54 percent of those farmers with a college education, compared to 41 percent of farmers with a high school education or less, vaccinated sows for leptospirosis twice per year. These differences were significant. Producers with a college education were more likely than those with a high school or less education to vaccinate sows two times per year.

Times per year sows vaccinated for rhinitis. About 31 percent of farmers with a high school education or less vaccinated their sows for rhinitis, while over 47 percent of farmers with a college education did the same. These differences were significant at the .05 level.

Farmers with a college education were more likely than those with a high school or less education to vaccinate sows for rhinitis two or more times per year.

Times per year sows vaccinated for parvovirus. Approximately 30 percent of the farmers with a college education, compared to only 19 percent of farmers with a high school education or less, vaccinated sows for parvovirus. These differences were significant. Producers with a college education tended to vaccinate their sows more often than did producers who had a high school or less education.

Times per year boars vaccinated for parvovirus. Thirty-one percent of the farmers with a college education, compared to 21 percent of those with a high school education or less, vaccinated boars for parvovirus. These differences were significant at the .05 level. Farmers with a college education were more likely to vaccinate their boars than were the farmers not attending college.

Times sows wormed. Approximately 30 percent of the producers with a college education, compared to 19 percent of those with a high school education or less, wormed their sows two or more times per year. These differences were significant at the .05 level. Farmers with a college degree were more likely than those not attending college to worm their sows three or more times per year.

Times per year sows treated for lice. About 52 percent of farmers with a college education, compared to 44 percent of those with a high

school education or less, treated sows three or more times per year. These differences were significant. Producers with a college degree were more likely than those without a college degree to treat sows for lice three or more times per year.

Use medication in water for disease. Thirty-three percent of the farmers with a college education used medication in the water compared to 17 percent of the farmers with a high school education or less. These differences were significant. Producers with a college education were more likely to use medication in the water for disease than were producers with a high school or less education.

Use sulfa in water. Thirty-one percent of the farmers with a college degree used sulfa in the water compared to 18 percent of farmers with a high school education or less. These differences were significant. The farmers education was significantly related to using sulfa in the water. Producers completing college were more likely than those who did not to use sulfa in swine drinking water.

Use of antibiotics in water. Fifty-four percent of the farmers with a college education used antibiotic in the water compared to only 39 percent of those with a high school education or less. These differences were significant. The producers education level was significantly related to using antibiotics in the water. Producers with a college education were more likely than those with high school or less to use antibiotics in drinking water.

Medication used in sows gestation and lactation ration. Seventy-three percent of the producers with a college education used medication in the sows rations compared to only 62 percent of those with a high school education or less. These differences were significant. Education level was significantly related to the use of medication in the sows gestation and lactation rations. Producers with a college education were more likely than those with high school or less to use medication in the sows gestation and lactation ration.

Medication used in pigs weaning ration. Eighty-three percent of farmers with a college education compared to 76 percent of those with a high school education or less used medication in the pigs weaning ration. When tested by the x^2 test, these differences were not significant at the .05 level. Producers with a high school education were just as likely as those with a college education to use medication in pigs weaning rations.

Frequency of iron shots. About 83 percent of producers with a college education gave their pigs iron shots compared to 73 percent of those with a high school education or less. These differences were significant at the .05 level. Producers with a college education were more likely than those not attending college to always give pigs iron shots.

Age pigs received iron shots. Approximately 94 percent of producers with a college education compared to 85 percent of those with a high school education or less gave the iron shot at three days of age or

less. When tested by the chi-square test the differences were significant at the .05 level. Producers with a college education were more likely than those with a high school education to give iron shots at three days of age or less.

Clip needle teeth. About 70 percent of the farmers always clipped pigs needle teeth compared to only 48 percent of those with a high school education or less. When tested by the x^2 test, these differences were significant at the .05 level. Therefore, the producers education was significantly related to the practice of clipping needle teeth. Producers who graduated from college were more likely than those who did not to always clip the needle teeth of pigs.

Age of pigs when teeth clipped. About 95 percent of the farmers with college educations clipped teeth within the first three days of age compared to 86 percent of farmers with high school educations or less. When tested by the chi-square test, these differences were significant at the .05 level. Therefore, the farmers education was significantly related to the age of the pig when the teeth were clipped. Farmers with a college education were more likely than those with high school or less to clip teeth within the first three days of age.

Farrowing quarters disinfected. Approximately 68 percent of farmers with a college education disinfected the farrowing quarters compared to 52 percent of farmers with a high school education or less. When tested by the chi-square test, these differences were significant at the .05 level. Therefore, the farmers education was significantly

related to the practice of disinfecting farrowing quarters. Farmers with a college education were more likely than those with high school or less to disinfect farrowing quarters.

Feeding Practices and Education

Variables included in this sub-section are: (1) source of feed, (2) increasing feed to pregnant sows, (3) pounds fed to pregnant sows, (4) pounds fed to nursing sows, and (5) how the pigs were creep fed.

Source of feed. Fifty percent of farmers with a college education mixed feed on the farm compared to 37 percent of farmers with a high school education or less. When tested by the chi-square test, these differences were significant at the .05 level. Therefore, farmers education was significantly related to the source of swine feed. Farmers with a college education were more likely than those with a high school education or less to mix feed on their farm.

Increase feed to pregnant sows. About 91 percent of farmers with a college education compared to 81 percent of farmers with a high school education or less increased the feed to pregnant sows. When tested by the x^2 test the difference was significant at the .05 level. Therefore, the farmers education was significantly related to increasing feed to pregnant sows. Farmers with a college education were more likely than those with high school or less to increase the amount of feed fed to pregnant sows.

Pounds fed pregnant sows. Approximately 42 percent of farmers with a college education compared to 47 percent of farmers with a high

school education or less fed their pregnant sows five pounds or less of feed. When tested by the chi-square test, the differences were not significant at the .05 level. Farmers with a high school education did not differ from those with high school or less as to the pounds of feed they fed to pregnant sows.

Pounds fed to nursing sows. Approximately 60 percent of farmers with a college education compared to 45 percent of farmers with a high school education or less fed nursing sows 11 or more pounds of feed. When tested by the chi-square test, these differences were significant at the .05 level. Therefore, the farmers education and the pounds fed to nursing sows was significantly related. Farmers with a college education were more likely than those with high school or less to be feeding nursing sows over 10 pounds of feed.

How to creep feed pigs. Seventy-nine percent of farmers with a college education compared to 72 percent of those with a high school education or less used a creep feed only. When tested by the chi-square test, these differences were not significant. Farmers with a college education did not differ significantly from those with high school or less as to how pigs were creep fed.

Extension Contacts and Education

Variables included in this sub-section are: (1) number of Extension swine meetings attended, (2) number of visits made to the Extension office, (3) number of telephone calls made to the Extension office, (4) number of farm visits received from Extension agents, and (5) number of farm visits received from veterinarians.

Swine meetings attended. About 55 percent of farmers with a college education attended one or more Extension swine meetings during the past 12 months compared to 43 percent of those with a high school education or less. When tested by the chi-square test the differences were significant at the .05 level. Therefore, the farmers education and the swine meetings attended were significantly related. Farmers with a college education were more likely than those with high school or less to have attended an Extension swine meeting during the past year.

Office visits. Approximately 83 percent of producers with a college education compared to 72 percent of those with a high school education or less made one or more visits to the Extension office during the past year. When tested by the chi-square test, these differences were significant at the .05 level. Therefore, the farmers education was significantly related to the number of office visits made. Farmers with a college education made more visits to the Extension office than did those with a high school education.

Telephone calls. Thirty-two percent of producers with a college education compared to 16 percent of farmers with a high school education or less made six or more telephone calls to the Extension office. When tested by the chi-square test, these differences were significant. Farmers with a college education tended to make more telephone calls to the Extension office than did farmers with high school or less.

Farm visits received. About 28 percent of farmers with a college education compared to 14 percent of farmers with a high school education or less received four or more farm visits from Extension. When tested by the chi-square test, the differences were significant at the .05 level. Farmers with a college education received more farm visits from Extension agents than did farmers with high school or less education.

Farm visits received from veterinarians. Forty-five percent of farmers with a college education compared to 30 percent of farmers with a high school education or less received one to three visits from their local veterinarian. When tested by the chi-square test, the differences were significant at the .05 level. Therefore, the number of farm visits received from veterinarians was significantly related to the farmers education. Farmers with a college education received more visits from veterinarians.

Table Summary

The data indicated that the education of the producers was significantly related to the size of operation, the health and feeding practices used and the number of type of Extension contacts. The data indicated that producers with a college education tended to have larger operations, use more of the recommended health and feeding practices than did those with a high school education or less. Those with a college education also tended to attend more Extension meetings, receive more farm visits, make more telephone calls, and made more visits to the Extension office. They also tended to receive more farm visits from Extension agents and their local veterinarian.

CHAPTER V

RELATIONSHIP BETWEEN NUMBER OF SOWS OWNED AND PRODUCERS USE OF RECOMMENDED SWINE PRODUCTION PRACTICES

The purpose of this chapter was to present findings concerning relationships between the number of sows owned and the producers use of recommended production practices. Findings were organized into two sections: (1) relationships between average number of sows and health practices used by producers, and (2) relationships between the average number of sows and use of feeding practices by swine producers.

I. RELATIONSHIPS BETWEEN NUMBER OF SOWS OWNED AND USE OF HEALTH PRACTICES

Variables included in this section as presented in Table V are: (1) times per year sows vaccinated for leptospirosis, (2) times per year sows vaccinated for rhinitis, (3) times per year sows vaccinated for parvovirus, (4) times per year boars vaccinated for parvovirus, (5) times per year sows wormed, (6) times per year sows treated for lice, (7) medication used in water, (8) used sulfa in water, (9) used antibiotics in water, (10) medications used in sows gestation and lactation ration, (11) medication used in pigs weaning ration, (12) frequency of iron shots given, (13) age of pigs when iron shots given, (14) clipped needle teeth, (15) age of pigs when teeth clipped, and (16) farrowing quarters disinfected.

TABLE V. Relationships Between Average Number of Sows and Producers Use of Recommended Swine Production Practices

Production Practices	Average Number of Sows					
	10-less		11-20		21-over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
HEALTH PRACTICES						
Times Year Sows Vaccinated for Leptospirosis						
None	243	53.4	96	28.3	37	13.3
Once	83	18.2	82	24.2	38	13.6
Twice	122	26.8	154	45.4	193	69.2
Three-over	7	1.5	7	2.1	11	3.9
Total	455	100.0	339	100.0	279	100.0
Statistics	$\chi^2 = 170.94; p = .00$					
Times Year Sows Vaccinated for Rhinitis						
None	367	80.7	216	63.7	127	45.5
Once	36	7.9	48	14.2	30	10.8
Two-over	52	11.4	75	22.1	122	43.7
Total	455	100.0	339	100.0	279	100.0
Statistics	$\chi^2 = 117.86; p = .00$					
Times Year Sows Vaccinated for Parvovirus						
None	404	88.8	258	76.1	187	67.3
Once	24	5.3	46	13.6	34	12.2
Twice	27	5.9	35	10.3	57	20.5
Total	455	100.0	339	100.0	278	100.0
Statistics	$\chi^2 = 60.21; p = .00$					
Times Year Boars Vaccinated for Parvovirus						
None	392	86.2	245	72.3	187	67.0
Once	39	8.6	58	17.1	36	12.9
Two-over	24	5.3	36	10.6	56	20.1
Total	455	100.0	339	100.0	279	100.0
Statistics	$\chi^2 = 56.1; p = .00$					
Times year Sows Wormed						
None	49	10.8	13	3.8	4	1.4
Once	93	20.4	46	13.6	24	8.6
Twice	225	49.5	208	61.4	183	65.6
Three-over	88	19.3	72	21.2	68	24.4
Total	455	100.0	339	100.0	279	100.0
Statistics	$\chi^2 = 56.89; p = .00$					

TABLE V (Continued)

Production Practices	Average Number of Sows					
	10-less		11-20		21-over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
Times Year Sows Treated Lice						
None	37	8.1	11	3.2	6	2.2
Once	80	17.6	45	13.3	20	7.2
Twice	149	32.7	116	34.2	124	44.4
Three-over	189	41.5	167	49.3	129	46.2
Total	455	100.0	339	100.0	279	100.0
Statistics	$x^2 = 39.09; p = .00$					
Used Medication in Water for Disease						
No	337	87.3	250	82.0	174	67.7
Yes	49	12.7	55	18.0	83	32.3
Total	386	100.0	305	100.0	257	100.0
Statistics	$x^2 = 38.24; p = .00$					
Use Sulfa in Water						
No	252	86.0	195	81.3	152	69.4
Yes	41	14.0	45	18.8	67	30.6
Total	293	100.0	240	100.0	219	100.0
Statistics	$x^2 = 21.86; p = .00$					
Use Antibiotics in Water						
No	206	68.4	148	61.7	95	43.0
Yes	95	31.6	92	38.3	126	57.0
Total	301	100.0	240	100.0	221	100.0
Statistics	$x^2 = 35.19; p = .00$					
Used Medication in Sow Gestation Ration						
None	206	46.1	111	32.9	64	23.1
Antibiotic	130	29.1	131	38.9	115	41.5
Sulfa	17	3.8	13	3.9	15	5.4
Both	94	21.0	82	24.3	83	30.0
Total	447	100.0	337	100.0	277	100.0
Statistics	$x^2 = 42.2; p = .00$					

TABLE V (Continued)

Production Practices	Average Number of Sows					
	10-less		11-20		21-over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
Medicated Pig Weaning Ration						
None	128	28.8	74	22.2	39	14.1
Antibiotic	184	41.4	166	49.8	131	47.5
Sulfa	14	3.2	11	3.3	17	6.2
Both	118	26.6	82	24.6	89	32.2
Total	444	100.0	333	100.0	276	100.0
Statistics	x ² = 27.2; p = .0001					
Frequency of Iron Shots						
Never	145	38.5	74	23.7	29	10.5
Sometimes	111	29.4	109	34.9	56	20.4
Always	121	32.1	129	41.3	190	69.1
Total	377	100.0	312	100.0	275	100.0
Statistics	x ² = 109.42; p = .00					
Age of Pigs for Iron Shots						
Birth-3 days	184	79.3	210	87.1	227	94.6
Later	48	20.7	31	12.9	13	5.4
Total	232	100.0	241	100.0	240	100.0
Statistics	x ² = 24.48; p = .00					
Clip Needle Teeth						
Never	98	21.7	39	11.7	17	6.1
Sometimes	173	38.4	107	32.0	74	26.6
Always	180	39.9	188	56.3	187	67.3
Total	451	100.0	334	100.0	278	100.0
Statistics	x ² = 65.15; p = .000					
Age of Pigs Clip Teeth						
3 days-under	293	82.8	256	88.0	239	94.1
Later	61	17.7	35	12.0	15	5.9
Total	354	100.0	291	100.0	254	100.0
Statistics	x ² = 17.569; p = .0002					
Farrowing Quarters Disinfected						
No	232	62.9	133	44.6	56	20.7
Yes	137	37.1	165	55.4	214	79.3
Total	369	100.0	298	100.0	270	100.0
Statistics	x ² = 111.87; p = .000					

TABLE V (Continued)

Production Practices	Average Number of Sows					
	10-less		11-20		21-over	
	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents	Number of Respondents	Percent Respondents
FEEDING PRACTICES						
Source of Feed						
Commercial feed	320	71.1	220	65.5	92	33.5
On farm mix	130	28.9	116	34.5	183	66.5
Total	450	100.0	336	100.0	275	100.0
Statistics	$\chi^2 = 107.62; p = .00$					
Increase Feed to Pregnant Sows						
No	111	24.7	54	16.1	26	9.4
Yes	339	75.3	281	83.9	251	90.6
Total	450	100.0	335	100.0	277	100.0
Statistics	$\chi^2 = 28.29; p = .00$					
Pounds Fed to Pregnant Sows						
5-under	191	43.2	160	47.3	129	46.7
6-9	202	45.7	147	43.5	118	42.8
10-over	49	11.1	31	9.2	29	10.5
Total	442	100.0	338	100.0	276	100.0
Statistics	$\chi^2 = 1.9; p = .74$					
Pounds Fed to Nursing Sows						
10-less	257	57.9	180	53.1	113	40.8
11-over	187	42.1	159	46.9	164	59.2
Total	444	100.0	339	100.0	277	100.0
Statistics	$\chi^2 = 20.24; p = .00$					
How Creep Feed Pigs						
Creep only	294	65.3	253	75.1	228	82.3
Ate with Sow	91	20.2	32	9.5	23	8.3
Creep plus corn	65	14.4	52	15.4	26	9.4
Total	450	100.0	337	100.0	277	100.0
Statistics	$\chi^2 = 36.01; p = .00$					

Times Per Year Sows Vaccinated for Leptospirosis

About 69 percent of those farmers with 21 or more sows compared to 27 percent of those with 10 or less sows vaccinated two times per year for leptospirosis. When tested by the chi-square test, these differences were significant at the .05 level. Farmers with over 20 sows were more likely than those with fewer sows to vaccinate for leptospirosis two or more times per year.

Times Per Year Sows Vaccinated for Rhinitis

Approximately 44 percent of producers with 21 or more sows compared to about 11 percent of producers with 10 sows or less vaccinated their sows for rhinitis two or more times per year. When tested by the x^2 test, these differences were significant at the .05 level. Producers with over 20 sows were more likely than those with fewer sows to vaccinate for rhinitis.

Times Per Year Sows Vaccinated for Parvovirus

Approximately 21 percent of producers with 21 or more sows compared to about 6 percent of those with 10 or less sows vaccinated their sows for parvovirus two times per year. When tested by the chi-square test, these differences were significant at the .05 level. Producers with over 20 sows were more likely than those with fewer sows to vaccinate their sows for parvovirus.

Times Per Year Boars Vaccinated for Parvovirus

About 20 percent of producers with 21 or more sows compared to about 5 percent of those with 10 or less vaccinated boars for parvovirus.

When tested by the chi-square test, these differences were significant at the .05 level. Producers with over 20 sows were more likely than those with fewer sows to vaccinate their boars for parvovirus two or more times per year.

Times Per Year Sows Wormed

About 66 percent of producers with 21 or more sows compared to less than 50 percent of those with 10 or less sows wormed the sows two times per year. When tested by the chi-square test, these differences were significant at the .05 level. Producers with over 20 sows were more likely than those with fewer sows to worm sows two or more times per year.

Times Per Year Sows Treated for Lice

Approximately 45 percent of producers with 21 or more sows compared to 33 percent of producers with 10 sows or less treated the sows for lice two times per year. When tested by the chi-square test, these differences were significant at the .05 level. The average number of sows owned was significantly related to the times per year the sows were treated for lice. Producers with over 20 sows were more likely than those with fewer sows to treat sows for lice two times per year.

Medication Used in Water for Disease

Approximately 33 percent of producers with 21 or more sows compared to only 13 percent of those with 10 or less used medication in the water supply. These differences were significant. The larger producers were more likely than those with 20 sows or less to use a medicated water supply.

Used Sulfa in Water

Approximately 31 percent of the larger producers (21 sows or more) compared to 14 percent of the smaller producers (10 or less) used sulfa in the water supply. The number of sows owned was significantly related to the use of sulfa in the water. Larger producers were more likely to use sulfa in water than were the smaller producers.

Antibiotics in Water

Fifty-seven percent of producers with 21 or more sows compared to 32 percent of those with 10 or less used antibiotics in the water. The number of sows owned was significantly related to the use of antibiotics in water. Larger producers were more likely to use antibiotics in the water than the smaller producers.

Used Medication in Sow Gestation and

Lactation Ration

Approximately 77 percent of the producers with 21 or more sows compared to less than 54 percent of producers with 10 or less sows used medication in their sows rations. The number of sows owned was significantly related to the practice of using medication in the sows feed. Larger producers were more likely than those with 20 or less sows to use medication in the sows gestation and lactation ration.

Medication in Pigs Weaning Ration

About 86 percent of producers with 21 or more sows compared to only 71 percent of the producers with 10 sows or less used medication in the pigs weaning ration. According to the x^2 test these differences were significant. The larger producers were more likely than smaller producers to use medication in pigs weaning ration.

Frequency of Iron Shots

Slightly more than 69 percent of producers with 21 or more sows compared to only 32 percent of those with 10 sows or less always gave iron shots to the pigs. These differences were significant at the .05 level. The larger producers tended to give iron shots more than did smaller producers.

Age of Pigs When Iron Shots Given

About 95 percent of producers with 21 or more sows compared to slightly more than 79 percent with 10 or less sows gave iron shots within the first three days of age. The number of sows owned was significantly related to the age of pigs when iron shots were given. The larger producers tended to give iron shots at an earlier age than did the smaller producers.

Clipped Needle Teeth

Slightly over 67 percent of producers with 21 sows or more compared to slightly less than 40 percent of producers with 10 or less always

clipped the pigs needle teeth. The average number of sows owned was significantly related to the practice of clipping needle teeth of pigs. Larger producers tended to clip the pigs needle teeth more often than did smaller producers.

Age of Pigs When Needle Teeth Clipped

Approximately 94 percent of the larger producers (21 sows or more) compared to about 83 percent of small producers (10 sows or less) clipped the pigs needle teeth at three days of age or less. These differences were significant. Larger farmers tended to clip the needle teeth within the first three days compared to smaller farmers.

Farrowing Quarters Disinfected

Approximately 79 percent of the larger farmers (21 or over sows) compared to slightly over 37 percent of smaller farmers (10 or less sows) did disinfect the sows farrowing quarters. The differences were significant at the .05 level. The larger farmers tended to disinfect the farrowing quarters more often than did the smaller farmers.

II. RELATIONSHIPS BETWEEN AVERAGE NUMBER OF SOWS OWNED AND FEEDING PRACTICES

Variables included in this section are: (1) source of feed, (2) increase feed to pregnant sows, (3) pounds fed to pregnant sows, (4) pounds fed to nursing sows, and (5) how the pigs were creep fed.

Source of Feed

About 66 percent of producers with 21 or more sows compared to only 30 percent of those with 10 or less mixed their own feed on the farm. The average number of sows owned was significantly related to the practice of on-farm feed mixtures. Larger producers tended to mix their own feed more than did the smaller producers.

Increase Feed to Pregnant Sows

Nearly 91 percent of producers with 21 sows or more compared to 75 percent of those with 10 or less sows increased the feed to pregnant sows. The relationship between the average number of sows owned and increasing feed to pregnant sows was significant. Larger producers tended to always increase the feed level to pregnant sows.

Pounds Fed to Pregnant Sows

Forty-seven percent of the larger producers compared to 43 percent of the smaller producers fed 5 pounds or less feed to the pregnant sows. These differences were not significant at the .05 level. The average number of sows owned was not significantly related to the pounds of feed fed to sows. All producers tended to feed their sows about the same.

Pounds Fed to Nursing Sows

Approximately 59 percent of the producers with 21 or more sows compared to about 42 percent of those with 10 sows or less fed 11

pounds or more feed to their nursing sows. These differences were significant. The number of sows owned was significantly related to use of the practice of increasing feed to nursing sows. Larger producers were more likely to increase feed level to nursing sows than were the smaller producers.

How Pigs Were Creep Fed

Approximately 82 percent of the producers with 21 or more sows compared to slightly more than 65 percent of those with 10 sows or less used a creep feed only. These differences were significant. Larger producers were more likely to use a creep feed only than were the smaller producers.

Chapter Summary

The data were analyzed to determine relationships between the average number of sows, use of herd health practices, and use of feeding practices.

The data showed that the average number of sows owned was significantly related to use of herd health practices. Farmers with 21 or more sows in their herd tended to use 11 of the 16 recommended health practices. Larger producers tended to vaccinate more often for parvovirus, rhinitis, and leptospirosis. They also used medication in the water and feed rations, gave iron shots, clipped needle teeth, and disinfected farrowing quarters more frequently than did the smaller producers.

The average number of sows was significantly related to all feeding practices with the exception of one practice. Producers with larger sow herds tended to: (1) mix feed on farm, (2) increase feed to pregnant sows, (3) increase feed to lactating sows, and (4) use creep feed only for their pigs.

CHAPTER VI

RELATIONSHIPS BETWEEN THE AVERAGE NUMBER OF PIGS WEANED PER LITTER AND PRODUCERS USE OF RECOMMENDED SWINE PRODUCTION PRACTICES

The purpose of this chapter was to present findings concerning relationships between the average number of pigs weaned per litter and the producers use of recommended swine production practices. The findings were organized into two sections: (1) relationships between average number of pigs weaned per litter and use of health practices, and (2) relationships between average number of pigs weaned per litter and use of feeding practices.

I. RELATIONSHIPS BETWEEN THE AVERAGE NUMBER OF PIGS WEANED PER LITTER AND USE OF HEALTH PRACTICES

Variables included in this section as found in Table VI are: (1) number of times per year sows vaccinated for leptospirosis, (2) number of times per year sows vaccinated for rhinitis, (3) number of times per year sows vaccinated for parvovirus, (4) number of times per year boars vaccinated for parvovirus, (5) times per year sows wormed, (6) times per year sows treated for lice, (7) used medication in water for disease, (8) used sulfa in water, (9) used antibiotic in water, (10) medication used in sows gestation ration, (11) medication used in pigs weaning ration, (12) frequency iron shots given to pigs, (13) age of pigs receiving iron shots, (14) clip needle teeth, (15) age of pigs when teeth clipped, and (16) farrowing quarters disinfected.

TABLE VI (Continued)

Production Practices	Average Number of Pigs Weaned Per Litter											
	7.00-under				7.01-8.00				8.01-over			
	Number of Respondents		Percent Respondents		Number of Respondents		Percent Respondents		Number of Respondents		Percent Respondents	
Number Times Year Sows Treated for Lice												
None	20		38.5		21		40.4		11		21.2	
Once	49		33.8		48		33.1		48		33.1	
Twice	118		30.4		140		36.1		130		33.5	
Three-over	138		29.2		163		34.5		172		36.4	
Statistics	x ² = 5.92; p = .43											
Used Medication in Water for Disease												
No	241		31.9		257		34.0		258		34.1	
Yes	40		22.5		65		36.5		73		41.0	
Statistics	x ² = 6.42; p = .04											
Used Sulfa in Water												
No	193		32.6		198		33.4		201		34.0	
Yes	34		22.7		56		37.3		60		40.0	
Statistics	x ² = 5.63; p = .0598											
Used Antibiotic in Water												
No	160		36.2		150		33.9		132		29.9	
Yes	68		22.1		109		35.5		130		42.3	
Statistics	x ² = 19.94; p = .00											
Medication Used in Sows Gestation Ration												
None	131		34.6		130		34.3		118		31.1	
Antibiotic	88		24.1		137		37.5		140		38.4	
Sulfa	22		48.9		10		22.2		13		28.9	
Both	79		30.7		90		35.0		88		34.2	
Statistics	x ² = 17.94; p = .0064											
Medication Used in Pigs Weaning Ration												
None	90		37.7		70		29.3		79		33.1	
Antibiotic	124		26.3		184		39.1		163		34.6	
Sulfa	16		38.1		8		19.0		18		42.9	
Both	88		30.8		102		35.7		96		33.6	
Statistics	x ² = 16.05; p = .01											
Totals												

Number of Times Per Year Sows Vaccinated for Leptospirosis

About 54 percent of producers that vaccinated for leptospirosis three or more times, compared to only 24 percent of those that did not vaccinate, weaned eight pigs or more per litter. The number of times sows were vaccinated for leptospirosis was significantly related to the number of pigs weaned. Producers who vaccinated for leptospirosis tended to wean more pigs per litter than those that did not vaccinate their sows.

Times Per Year Sows Vaccinated for Rhinitis

Approximately 39 percent of producers that vaccinated the sows for rhinitis two or more times, compared to 32 percent of those that did not vaccinate, weaned eight or more pigs per litter. These differences were significant at the .05 level. Producers that vaccinated the sow for rhinitis tended to wean more pigs per litter than those that did not vaccinate.

Times Per Year Sows Vaccinated for Parvovirus

Forty-three percent of those producers that vaccinated the sows for parvovirus two times per year, compared to 31 percent of those that did not vaccinate, weaned eight or more pigs per litter. The number of times the sows were vaccinated for parvovirus was significantly related to the number of pigs weaned. Producers who vaccinated their sows tended to wean more pigs per litter than those that did not vaccinate.

Times Per Year Boars Vaccinated for Parvovirus

Forty-nine percent of producers that vaccinated their boars at least once per year, compared to 31 percent of those that did not vaccinate the boars, weaned eight or more pigs per litter. The number of times the boars were vaccinated for parvovirus was significantly related to the number of pigs weaned. Producers who vaccinated their boars for parvovirus tended to wean more pigs than those that did not vaccinate.

Times Per Year Sows Wormed

Approximately 41 percent of the producers that wormed their sows three or more times, compared to only 22 percent of those that did not worm their sows, weaned eight or more pigs per litter. These differences were significant at the .05 level. Producers who wormed their sows regularly tended to wean more pigs per litter than those who did not.

Times Per Year Sows Treated for Lice

About 36 percent of the producers who treated their sows for lice three times or more, compared to 21 percent of those that did not treat for lice, weaned eight or more pigs per litter. These differences were not significant at the .05 level. The number of times the sows were treated for lice was not significantly related to the number of pigs weaned per litter.

Medication Used in Water for Disease

Forty-one percent of producers who used medication in the water supply, compared to only 34 percent of those that did not, weaned eight or more pigs per litter. The use of medication in the water supply for disease control was significantly related to the number of pigs weaned per litter. Farmers who used medicated water tended to wean more pigs per litter than those who did not use medicated water.

Used Sulfa in Water

Forty percent of the producers that used sulfa in the water, compared to 34 percent of producers that did not use sulfa in water, weaned eight or more pigs per litter. These differences were not significant at the .05 level. The use of sulfa in the water supply was not significantly related to the number of pigs weaned per litter. Most producers did not use sulfa in the water supply.

Used Antibiotic in Water

About 42 percent of the producers that used antibiotics in water, compared to only 30 percent of those that did not, weaned eight or more pigs per litter. The use of antibiotics in the water was significantly related to the number of pigs weaned per litter. Producers who used antibiotics in the water tended to wean more pigs per litter than those who did not.

Medication Used in Sows Gestation Ration

About 67 percent of the producers who used either an antibiotic or sulfa in the sows gestation ration, compared to only 31 percent of those that did not use any medication, weaned eight or more pigs per litter. The use of medication in the sows gestation ration was significantly related to the number of pigs weaned per litter. Producers who used medication in sows ration tended to wean more pigs per litter than those that did not.

Medication Used in Pigs Weaning Ration

About 77 percent of the producers that used either antibiotic or sulfa in the pigs weaning ration, compared to only 33 percent of those that did not use any medication, weaned eight or more pigs per litter. The use of medication in the pigs weaning ration was significantly related to the number of pigs weaned per litter. Producers that used medicated weaning rations tended to wean more pigs per litter.

Frequency Iron Shots Given to Pigs

About 42 percent of producers always gave iron shots to pigs, compared to only 24 percent of producers that never gave shots, weaned eight or more pigs per litter. These differences were significant at the .05 level. Producers which gave iron shots to their pigs tended to wean more pigs per litter than those who never gave iron shots.

Age of Pigs Receiving Iron Shots

Approximately 40 percent of the producers who gave their pigs iron shots within the first three days of age, compared to 28 percent of those who waited to after three days, weaned eight or more pigs per litter. The age of the pigs when iron shots were given was significantly related to the number of pigs weaned per litter. Producers who gave iron shots within the first three days of age tended to wean more pigs per litter.

Clip Needle Teeth

Approximately 70 percent of the producers that clipped needle teeth, compared to 24 percent of those that never clipped needle teeth, weaned eight or more pigs per litter. The practice of clipping pigs needle teeth was significantly related to the number of pigs weaned per litter. Producers that clipped needle teeth tended to wean more pigs per litter.

Age Pigs When Teeth Clipped

About 37 percent of the producers who clipped the needle teeth within the first three days, compared to 27 percent of those that clipped the teeth later, weaned eight or more pigs per litter. These differences were not significant at the .05 level. The age of the pigs when the needle teeth were clipped was not significantly related to the number of pigs weaned per litter.

Farrowing Quarters Disinfected

Nearly 42 percent of the producers that disinfected the farrowing quarters, compared to only 27 percent of those that did not disinfect,

weaned eight or more pigs per litter. The use of the practice of disinfecting the farrowing quarters was significantly related to the number of pigs weaned per litter. Producers that disinfected farrowing quarters weaned more pigs per litter than those who did not.

II. RELATIONSHIPS BETWEEN THE AVERAGE NUMBER OF PIGS WEANED PER LITTER AND USE OF FEEDING PRACTICES

Variables included in this section were: (1) source of feed, (2) increased feed to pregnant sows, (3) pounds fed to pregnant sows, (4) pounds fed to nursing sows, and (5) method by which pigs were creep fed.

Source of Feed

About 38 percent of the producers that mixed the feed on the farm, compared to 31 percent that used commercial feed, weaned eight or more pigs per litter. The number of pigs weaned per litter was significantly related to the source of the feed. Producers that mixed feed on the farm weaned a higher number of pigs than those that used commercial feed.

Increased Feed to Pregnant Sows

Approximately 37 percent of the producers that increased feeding levels to pregnant sows, compared to only 25 percent of those that did not, weaned eight or more pigs per litter. These differences were significant at the .05 level. The producers that increased feed to pregnant sows tended to wean more pigs per litter.

Pounds Fed to Pregnant Sows

About 36 percent of producers that fed 10 pounds or more to pregnant sows, compared to 32 percent that fed 5 pounds or less, weaned 8 or more pigs per litter. The differences were not significant. The pounds of feed fed to pregnant sows was not related to the average number of pigs weaned per litter.

Pounds Fed to Nursing Sows

Nearly 39 percent of the producers that fed their nursing sows 11 pounds or more, compared to only 30 percent of those that fed 10 pounds or less, weaned 8 or more pigs per litter. The number of pounds fed to nursing sows was significantly related to the number of pigs weaned per litter. Producers who increased the feed to nursing sows to 11 pounds or more tended to wean more pigs per litter.

Method Pigs Creep Fed

About 31 percent of the producers that used creep feed plus corn, compared to 36 percent of those that used creep feed only, weaned eight or more pigs per litter. These differences were not significant at the .05 level. The methods used to creep feed pigs was not significantly related to the average number of pigs weaned per litter.

Chapter Summary

The data in this chapter were analyzed to determine relationships between the average number of pigs weaned per litter, use of health practices, and the use of feeding practices.

The data showed that the average number of pigs weaned per litter was significantly related to the use of 13 of the 16 herd health practices. Producers tended to wean more pigs when they vaccinated their sows for parvovirus, leptospirosis, and rhinitis, used medication in the rations of water, wormed their sows, disinfected farrowing quarters, clipped needle teeth, gave pigs iron shots, gave iron shots within three days of birth, vaccinated the boars for parvovirus, used antibiotics in water, and used medication in pigs weaning ration.

Three of the 5 feeding practices were significantly related to the number of pigs weaned per litter. Producers who weaned more pigs per litter tended to mix their own feed, increase feed to pregnant sows, and increase feed to nursing sows.

CHAPTER VII

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

The major purpose of this study was to obtain information useful to Extension agents and swine specialists in planning and evaluating educational programs for swine producers in Tennessee.

Specifically, the objectives of this study were:

1. To describe Tennessee swine producers as to personal and farm characteristics, their use of swine production practices, and the number and types of contacts producers had with Extension agents.
2. To determine relationships between the employment status of the producers and their size of operation, use of recommended production practices, and contacts made with Extension agents.
3. To determine relationships between the age of the producer and their size of operation, use of recommended production practices, and contacts made with Extension agents.
4. To determine relationships between the education of the producer and their size of operation, use of recommended production practices, and the number and types of Extension contacts.

5. To determine relationships between the average number of sows owned and the producers use of recommended production practices.

6. To determine relationships between the average number of pigs weaned per litter and the producers use of recommended production practices.

Limitations of the Study

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.

II. 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 University of Tennessee Agricultural Extension Specialist staff in the Swine and Extension Education Department developed the interview form to be administered by county Extension agents.

The Extension agents were to use the following procedure in selecting swine producers 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.

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 completed surveys were sent to the Agriculture Extension Education office and the data 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.

III. MAJOR FINDINGS

The major findings of this study were organized and are presented below by the study's major objectives.

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 only just over 21 percent, or 225 of the 1,083 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 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. Sixty-four percent of the producers sold pigs that averaged 45 pounds or less.

Use of Recommended Swine Management Practices

Seven of the 21 management practices recommended by the Extension service were used by less than 50 percent of the producers. These were vaccinating sows for rhinitis, vaccinating boars and sows 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 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 one or more times per year, (3) gave iron shots to pigs within three days after birth, (4) clipped the pigs needle teeth, and (5) clipped needle teeth within three days after birth.

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 one or more Extension office visit and over 77 percent of the producers made one or more telephone calls to the Extension office.

At least 70 percent of the swine producers received at least one farm visit from the Extension agent during the past 12 months.

Relationships Between Swine Producers Employment, Age,
Education, Use of Swine Production Practices and
Extension Contacts

Producers employment. Full-time farmers tended to have larger sow herds, farrowed more litters, raised more pigs to weaning and sold more pigs as feeders than part-time farmers.

Employment status was significantly related to 9 of the 16 health practices and was not significantly related to the 7 others. Farmers' employment status was significantly related to the number of times per year sows were vaccinated for leptospirosis, times per year sows vaccinated for rhinitis, times per year sows vaccinated for parvovirus, times per year boars vaccinated for parvovirus, times sows treated for lice, used medication in water, medication used in pigs weaning ration, age pigs received iron shots, and farrowing quarters disinfected.

Full-time farmers tended to use a higher percent of recommended feeding practices than did part-time farmers. The feeding practices of increasing feed to pregnant sows and the method of creep feeding pigs were not significantly related to the producers employment status.

A higher percentage of full-time farmers than part-time farmers had contact with Extension through swine meetings, telephone calls, and farms visits received. There was not a significant relationship between employment status and the number of visits made to the Extension

office. Full-time farmers also received more farm visits from the local veterinarian than did part-time farmers.

Producers age. Producers 35 years and younger tended to have larger operations, farrow more litters and wean more pigs. They also tended to vaccinate their sows more frequently for leptospirosis, rhinitis, and parvovirus. Younger producers also used antibiotics in water, gave iron shots more frequently, clipped needle teeth, and disinfected farrowing quarters more often than the older producers.

The producers age was not significantly related to use of feeding practices (source of feed, increase feed to pregnant sows, pounds fed to pregnant sows, pounds fed to lactating sows), with the exception of how the pigs were creep fed.

The producers age was significantly related to the number and types of Extension contacts. Younger producers tended to make more office visits and telephone calls to the Extension office. The younger producers also tended to receive more farm visits from Extension agents than did the older producers.

Producers education. The data indicated that the education of the producers was significantly related to the size of operation, the health and feeding practices used and the number and type of Extension contacts. The data indicated that producers with a college education tended to have larger operations, use more of the recommended health and feeding practices than did those producers with a high school education or less. Producers with a college education attended more

Extension meetings, received more farm visits, and made more visits and telephone calls to the Extension office. They also received more farm visits from their local veterinarian and the Extension agent.

Relationship Between the Average Number of Sows and the Producers Use of Recommended Production Practices

The data indicated that the number of sows owned was significantly related to the use of recommended herd health practices. Farmers with 21 or more sows in their herd tended to use more of the recommended health practices. Larger producers tended to vaccinate more often for parvovirus, rhinitis, and leptospirosis. These producers also used medication in the water and feeding rations, gave iron shots, clipped needle teeth, and disinfected farrowing quarters more frequently than did the smaller producers.

The number of sows owned was significantly related to use of each of the feeding practices with one exception. Producers with larger sow herds were more likely to: (1) mix feed on farm, (2) increase feed to pregnant sows, (3) increase feed to lactating sows, and (4) use creep feed only for their pigs than were producers with smaller herd size.

Relationships Between Average Number of Pigs Weaned Per Litter and Producers Use of Recommended Production Practices

The data indicated that the average number of pigs weaned per litter was significantly related to use of the herd health practices, with the exception of three practices. Producers who vaccinated their sows for parvovirus, leptospirosis, and rhinitis, used medication in

the sows gestation and lactating feeding rations or the water, wormed their sows, disinfected the farrowing quarters and clipped needle teeth tended to wean more pigs per litter than those who did not use these practices.

Most feeding practices were significantly related to the number of pigs weaned per litter with two exceptions. Producers who mixed their own feed, increased the feed to pregnant sows, and increased feed to nursing sows tended to wean more pigs per litter than those not using these practices.

IV. IMPLICATION 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 7 of the 21 recommended swine management practices. There was a significant relationship between most of the production practices and Extension contacts. The author feels efforts should be made to contact these people who are not using the recommended practices.

2. The data indicated that full-time producers had larger swine operations, mixed feed on the farm and used more of the recommended feeding and health practices than did part-time producers. Full-time farmers also had more total contacts with Extension agents. Extension agents should identify their producers according to employment status and plan special programs that would be beneficial to the part-time producer.

3. The data indicated that producers' age and education was related to the number and types of Extension contacts. The younger farmer with a college education attended more Extension meetings and made more telephone calls and visits to the Extension office. The Extension agent should identify their clients according to age and education. The author feels programs should be implemented to encourage the producers with a high school or less education and the producers with 20 sows or less to use more of the recommended production practices.

4. The data indicated that those producers that maintained 20 or more sows and weaned eight or more pigs per litter use more of the recommended practices and had more contacts with Extension agents. The Extension agent must use special programs to encourage the smaller producers to use the recommended production practices.

V. RECOMMENDATIONS FOR FURTHER STUDY

Similar studies should be conducted in subsequent years in Tennessee to determine points needing emphasis regarding the effect that Extension contacts and teaching methods have upon the use of recommended practices in the field of agriculture.

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APPENDIX

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? (4) (5) (6) (sows)
- b. Number of litters farrowed during past 12-months? (7) (8) (9) (litters)
- c. Number of pigs raised to weaning? (10) (11) (12) (13) (pigs weaned)
- d. Number of pigs sold as feeders? (14) (15) (16) (17) (feeder pigs)
- e. Number hogs sold for slaughter? (18) (19) (20) (21) (slaughter hogs)
2. Average weight of feeder pigs sold? (22) (23) (pounds)

B. Health Practices (during past 12-months)

1. Vaccination

- a. Number times sows were vaccinated for: 1. Leptospirosis? (24) (times/year).
2. Atrophic Rhinitis? (25) (times/year). 3. Parvovirus? (26) (times/year)
- b. Number times boars vaccinated for Parvovirus? (27) (times/year)

2. Number times sows were wormed? (28) (times/year)3. Number times sows were treated for lice and mange? (29) (times/year)4. Medication used in drinking water as an emergency treatment of swine diseases? (30) (1 = no; 2 = yes; 9 = DNA)a. Did you use sulfa? (31) (1 = no; 2 = yes; 9 = DNA)b. Did you use antibiotic? (32) (1 = no; 2 = yes; 9 = DNA)

5. Medication used in sow and pig rations

a. Sows' gestation/lactation ration? (33) (1 = none; 2 = antibiotic; 3 = sulfa; 4 = both)b. Pigs' weaning ration? (34) (1 = none; 2 = antibiotic; 3 = sulfa; 4 = both)

6. Giving iron shots to baby pigs farrowed in confinement

a. Extent done? (35) (1 = never; 2 = sometimes; 3 = always; 9 = DNA)b. Age of pigs? (36) (1 = during first 3 days after birth; 2 = later; 9 = DNA)7. Clipping needle teeth: a. Extent done? (37) (1 = never; 2 = sometimes; 3 = always).b. Age of pigs? (38) (1 = during first 3 days; 2 = later; 9 = DNA)8. Sanitation: Scrub farrowing quarters with water and a disinfectant between farrowing? (39) (1 = no; 2 = yes; 9 = DNA)

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? (40) (1 = bought commercial mixed feed; 2 = mixed feed on the farm)

2. Pregnant sows

a. Did you increase the amount feed fed pregnant sows 2 to 3 weeks before farrowing? (41) (1 = no; 2 = yes)b. How many pounds of feed were fed per sow per day? (42) (43) (pounds/day)3. Nursing sows: How many pounds of feed were fed per sow per day? (44) (45) (pounds/day)4. Pigs: How did you creep feed? (46) (1 = used complete creep feed only; 2 = pigs ate with sow; 3 = used complete creep feed plus shelled corn; 9 = DNA)

*Coding Instructions

- All entries are right justified.
- Fill each blank column.
- A zero (0) in each column = none.
- A nine (9) in each column = DNA (does not apply) or don't know.

TAEE 4161

Revised 6/83

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? (48) (49) (years)

2. Approximate education? (50) (1 = 8 grades or less; 2 = between 9-12 grades; 3 = some college; 4 = college graduate) NOTE: Agent estimate

3. Employment? (51) (1 = full-time farmer; 2 = part-time job off farm; 3 = full-time job off farm; 4 = retired; 5 = other)

4. Extension contacts

(NOTE: Agent and/or farmer should estimate the number of contacts the producers had with Extension over the past 12-months)

a. Swine meetings? (52) b. Office visits? (53) c. Telephone calls? (54) (55) d.

Farm visits? (56) (57)

5. Estimated number of farm visits producer received during the past 12-months from a veterinarian? (58) (59) (farm visits) NOTE: Agent and/or farmer estimate

Part III: Slaughter Hog Production - from Weaning to Market

NOTE: Part III is to be completed for the farrow-to-finish producers only (e.g. this excludes producers who finish purchased pigs only and those who produce feeder pigs only)

A. General

1. Place where slaughter hogs are fed? (60) (1 = in a building; 2 = on the ground; 3 = both)

2. Percent of hogs fed in building? (61) (62) (63) (percent)

3. If some hogs are fed in building, type of flooring used? (64) (1 = slats; 2 = flush alley; 3 = solid concrete-no flush; 4 = DNA)

4. Marketing method? (65) (1 = packer; 2 = hog buying station; 3 = stock yard; 4 = other)

5. Have you ever forward priced market hogs using the futures market? (66) (1 = no; 2 = yes)

6. Have you ever forward priced market hogs using a contract with a buying station or packer? (67) (1 = no; 2 = yes)

B. Production Practices

1. Worm pigs during finishing period? (68) (1 = no; 2 = yes)

2. Treat pigs for lice after weaning? (69) (1 = no; 2 = yes)

3. Percent protein fed pigs from weaning to 125 pounds? (70) (71) (percent/protein)

4. Medication used in growing/finishing ration? (72) (1 = none; 2 = antibiotic; 3 = sulfa; 4 = both)

5. Withdraw sulfa from feed before selling hogs for slaughter? (73) (1 = do not feed sulfa; 2 = no, do not withdraw; 3 = yes, sulfa is withdrawn)

If yes, how many days before selling? (74) (1 = 1-7 days; 2 = 8-14 days; 3 = at least 15 days before selling; 4 = DNA)

6. Withdraw antibiotic from feed before selling hogs for slaughter? (75) (1 = do not feed antibiotic; 2 = no, do not withdraw; 3 = yes, antibiotic is withdrawn)

If yes, how many days before selling? (76) (1 = 1-7 days; 2 = 8-14 days; 3 = at least 15 days before selling; 4 = DNA)

C. General Instructions

1. Date due: December, 1983.
2. Disposition: Associate Supervisor.
3. Survey population: Feeder pig and market hog producers having at least five (5) sows.
4. Counties to be surveyed: All counties.
5. Sample size:
 - a. Counties with less than 50 producers interview 15.
 - b. Counties with 50 to 100 producers interview 20.
 - c. Counties with over 100 producers interview 25.
6. Sampling Procedure: Nth number.

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VITA

Jerry Thomas Patterson was born September 16, 1949 to Mr. and Mrs. Clyde E. Patterson of Lexington, Henderson County, Tennessee. He began his formal education at Laster Elementary, a one teacher school. Beginning in the fourth grade he attended South Haven Elementary, then attended Lexington High School and graduated in 1967.

He attended the University of Tennessee at Martin in 1967 and received a Bachelor of Science Degree in General Agriculture in 1971. Besides his studies he was a member of the Agriculture Club, the first UTM Rodeo Team and participated in intramural sports.

He was employed as an Assistant Extension Agent in Madison County, Tennessee in May 1972. He then assumed the duties of Assistant Extension Agent in Chester County, Tennessee in November 1978.

He is married to the former Janice Claire Yates of Lexington, Tennessee and has three children, Jerri Lynn, Jaclyn, and Jared.

He is a member of the Lexington Church of Christ. He is also a member of the Tennessee Association of Extension 4-H Workers and the Tennessee Association of Agricultural Agents and Specialists. He was selected the outstanding Young Agent in 1977 and received the 4-H Workers Distinguished Service Award in 1986 and was initiated into Phi Kappa Phi in 1987.