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A STUDY OF SWINE FATTENING ENTERPRISE AND THE
RELATIONSHIP TO SELECTED APPROVED PRACTICES
USED IN A GROUP OF VOCATIONAL AGRICULTURE
PROJECTS IN TEXAS



WADE
1961

A STUDY OF SWINE FATTENING ENTERPRISE AND THE RELATIONSHIP
TO SELECTED APPROVED PRACTICES USED IN A GROUP OF
VOCATIONAL AGRICULTURE PROJECTS IN TEXAS

By

Frank Jerry Wade

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science
in the
Graduate Division
of

PRAIRIE VIEW AGRICULTURAL AND MECHANICAL COLLEGE
Prairie View, Texas

August, 1961

ACKNOWLEDGEMENTS

The writer wishes to express his appreciation for the guidance and assistance given by Dr. E. M. Norris, Teacher Trainer. His helpful criticisms and advice were of great value in the preparation of this study. Appreciation is also expressed to Mr. S. E. Palmer, Mr. Paul Rutledge, and Mr. G. Jones, Area Supervisors, and the seventy teachers of Vocational Agriculture, who so freely gave information that helped make this study possible.

Special appreciation is also given to Mr. J. R. Powell, State N. F. A. Advisor, Mr. Curtis L. Wade, and to the wife of the writer, Mrs. Murline A. Wade, for their constant encouragement and helpful criticisms of the study.

BIOGRAPHICAL SKETCH OF THE WRITER

Frank J. Wade, son of J. Y. and Mittie Wade, was born December 31, 1922, in Douglass, Nacogdoches County, Texas. He attended E. J. Campbell High School, where he was enrolled in the Vocational Agriculture Department. The writer was a member of the E. J. Campbell Chapter of New Farmers of America and served as its Vice-President. He was graduated from high school in 1942. In January, 1943, he began work as a student at Prairie View Agricultural and Mechanical College, majoring in Agricultural Education. After four years of study at the college, he was graduated May 18, 1947.

After graduation, he was employed as a teacher of veterans at Daingerfield, Texas, for one year. The writer was married to former Murline A. Drummer, of Hughes Springs, Texas, On June 15, 1948. Since 1949, the writer has been employed as a teacher of vocational agriculture at Thornton High School, Queen City, Texas.

The writer is a member of The Texas Forestry Association, Inc., Teachers State Association of Texas, Prairie View Alumni Association, Texas Association of Teachers of Vocational Agriculture, American Vocational Association and National Vocational Agriculture Teachers Association.

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CHAPTER I

INTRODUCTION

Having students of vocational agriculture develop a list of approved practices and set production goals for their production enterprises have been recognized by teachers of vocational agriculture as successful teaching devices. This creates in the student a desire to do better work, use more approved practices, discover new practices, keep accurate records, and develops in him the need to analyze his farming enterprises in terms of his achievements. Also, it enables the student and teacher to evaluate production enterprises in terms of goals attained or not attained. The recent development in the various farming enterprises has aided greatly the teaching of vocational agriculture through attaining production goals by use of approved practices.

Many successful methods involving these devices are now being used by teachers of vocational agriculture. All these methods have as the main purpose getting each student of vocational agriculture to use those approved practices in his production enterprises that will give him the best possible efficiency. Regardless of the method used by the teacher, his main objective is to have the student with a swine fattening enterprise use those approved practices which will result in a daily gain of 1.5 pounds or more.

It is recognized by the writer that approved practices, efficient standards, and goals for specific enterprises vary from county to county as well as from farm to farm. For some enterprises these differences are great; for others they are small. Many reasons for these differences can be found. A list of these would include; soil fertility, climate, elevation of land, breeding stock available, importance of the enterprise, et cetera.

Swine fattening was selected for this study because of the interest shown for this enterprise by students in the writer's local community, district, area, and state.

Purpose of the Study

The purpose of this study was to collect data from swine fattening enterprises in the State of Texas, and to analyze the standards of efficiency achieved by students of vocational agriculture in the swine fattening enterprise and determine the relationship of these to some selected approved practices set up by state colleges. It is hoped that this analysis will be a valuable aid to the teachers of vocational agriculture in Texas, in teaching swine fattening, and that it will enable students to achieve production goals through the use of approved practices, and thereby help students produce pork more efficiently.

Approved practices have always played an important

role in agriculture. They are practices used by farmers and students of vocational agriculture. These practices form a basis for teaching as well as assistance to students who develop a sound farming program. As the teacher and student select the practices that are to be used in an enterprise from the approved practices list, only those practices are selected which aid students in achieving success.

The degree of student achievement in the swine fattening enterprise may be determined by the number of approved practices satisfactorily carried out.

Some supplementary objectives of the study were:

1. To determine the condition of pigs secured for the practice.

2. To determine how many of the 20 practices for the swine fattening enterprise were used by the students of the 70 teachers included in this study.

3. To compare the production efficiency and financial outcomes of those using each practice with those that did not use the practices.

4. To determine the extent to which management practices were carried out.

5. To compare the management practices with profit.

6. To determine which practices seem more difficult to adopt.

7. To determine the value of records in the swine fattening enterprise.

Scope of the Study

This study is principally concerned with the swine fattening enterprise and the relationship to selected approved practices used in a number of vocational projects in Texas.

This was determined by mailing questionnaires with questions to 180 teachers of vocational agriculture departments in the State of Texas, to secure information from records of students who had two or more head of swine. Only 76 analysis sheets and approved practices list were analyzed for this study.

This study was conducted in Area I, Area II and Area III of Texas, as shown on map, Figure 1, page 5.

The records of 70 students of vocational agriculture in the East Central area of Texas were obtained. These represented the swine fattening enterprises of two or more animals in scope from vocational agriculture departments studied. This study covers only the Negro vocational agriculture departments in this geographical area.

In making this study, the writer has attempted to point out the relationship of swine fattening enterprise to approved practices used. Then, ways were suggested in which these practices, if used frequently, could lead to better quality animals and greater income.

J. W. Edgar - Commissioner
 M. A. Browning - Assistant Commissioner
 George H. Hurt - Director
 J. A. Marshall - Assistant Director
 E. C. Weekley - Consultant

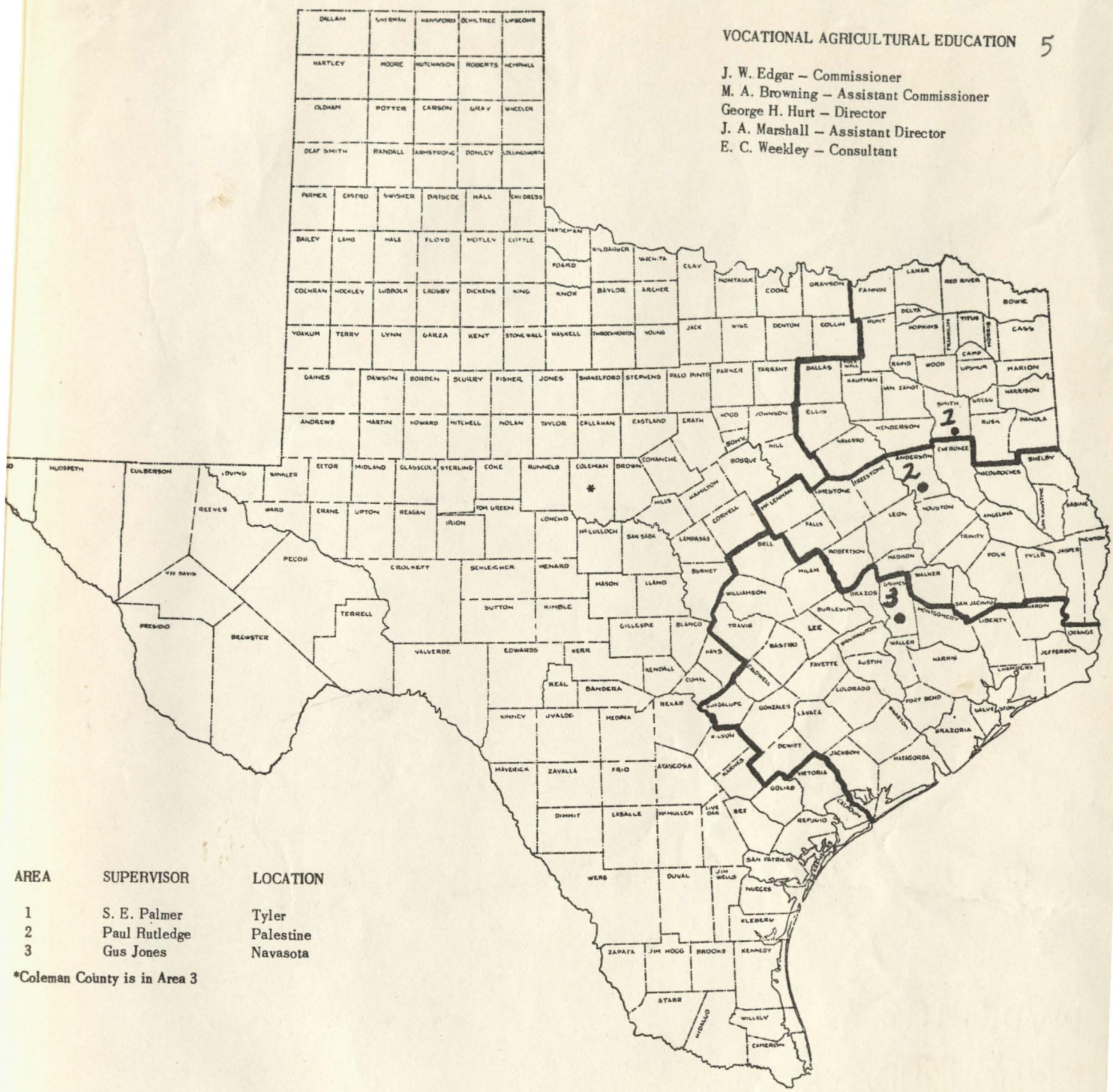


FIGURE 1

Map of Texas with the Location of Area I, Area II and Area III. The three areas of swine feeding are indicated on the map.

Definition of Terms

Approved practices. The term refers to those farm practices which have been tested by experiment stations, and/or farmers, and are accepted as being of superior merit.¹

Production goals. Goals which students set at the beginning of an enterprise for the most important efficiency factors.²

Efficiency factor. Efficiency factors are those elements in the conduct of an enterprise which are known to limit the rates or economy of production and the returns from the enterprise.³

History

The contribution of the humble pig to American agriculture is expressed by his undisputed title as the "mortgage lifter." No other animal has been of such importance to the New Farmers of America. In no other class of animals have so many truly American breeds been created. These facts

¹Norman K. Hoover, and Henry S. Burner, Production Goals for Livestock Enterprise (Pennsylvania Experiment Station, Bulletin No. 527).

²Ibid.

³Ibid.

probably result (1) from the suitability of native maize or Indian corn as a swine feed, (2) from the ease with which pork could be cured and stored prior to the days of refrigeration, and (3) from the need for fats and high energy foods for laborers engaged in the heavy development work of a frontier country.

The past has been good, but to pause in a changing world is to retrogress. The potential pork-export situation is not encouraging. Lard is a "drug on the market," and greater efficiency of production in the jet age is essential in all industries, including the livestock business. In order for the swine industry to progress under these circumstances, it would appear that the soundest approach might consist of (1) breeding a type of hog that is less "lardy" in conformation, (2) feeding so as to produce less fat, (3) selecting breeding animals on a production-tested basis for greater efficiency of production, and (4) purchasing hogs on a quality basis.

"Texas is the seventh ranking state out of the ten hog producing states. During the years of 19⁴⁴-48, the average number of hogs produced in Texas was 2,13⁴,000. In 1949, there were 1,701,000 hogs produced."⁴

⁴Livestock Market News, Statistics and Related Data, Department of Agriculture, (July, 1949), p. 2.

Suitability of the farm is a very important aspect to the swine fattening enterprise.

Usually a combination of several factors suggests the livestock enterprise should be adapted to a particular farm and farmer. Some of the things that characterize a successful major swine enterprise are:

1. Swine knowledge, interest, and skill of the operator.
2. A plentiful supply of home-grown grains or other high energy feeds and pastures suitable to swine feeding.
3. Available labor skilled in caring for swine, especially at farrowing time.
4. A satisfactory market outlet.
5. Well-drained soil.
6. Adequate and convenient, but not elaborate equipment.
7. Good records.

The average person is aware, at least in part, of the basic utility function of swine in contributing food. Few recognize, however, that because of their added functions, swine are an integral part of a sound, mature, and permanent agriculture.

The important position that the hog occupies in American agriculture is due to certain factors and economic conditions favorable to swine production. These may be

enumerated as follows:

1. Swine excel all other farm animals, except broilers, in the economy with which they convert concentrated farm feed into meat and meat products. Historical support of this assertion is found in the fact that, despite the predominantly cereal grain diet of the people, China has the largest swine population of any country in the world. Of course, it is recognized that Chinese swine are used primarily as scavengers and for the fertility value of the manure produced.

2. Swine are prolific, commonly farrowing from six to twelve pigs, and they will produce two litters per year.

3. Swine excel in dressing percentage, yielding 65 to 80 per cent of their live weight when dressed "packer style"--with head, leaf fat, kidneys, and ham facings removed. On the other hand, cattle dress only 50 to 60 per cent, and sheep and lambs, 45 to 55 per cent. Moreover, because of the small proportion of bone, the percentage of edible meat in the carcass of the hogs is greater.

4. Pork is most nutritious. Because of the higher content of fat and the slightly lower content of water, the energy value of pork is usually higher than that of beef or lamb.

5. Hogs are efficient converters of wastes and by-products into pork. This includes grain wasted by fattening

cattle, garbage, garden waste, and such dairy by-products as skim milk.

6. Since hogs are well adapted to the practice of self-feeding, labor is kept to a minimum.

7. Swine require a small investment for buildings and equipment.

8. The pig is adapted to both diversified and intensified agriculture.

9. The initial investment in getting into the business is small, and the returns come quickly. A gilt may be bred at eight months of age, and the pigs can be marketed six months after farrowing.

10. Hogs are unexcelled as a source of farm meats. This is due to their ease of dressing and the superior curing and keeping qualities of pork.

11. Hogs have a ready market in all areas.

The list of approved practices used in carrying out a swine fattening enterprise has never been static. New developments through research in feeding, breeding and management are constantly changing, and adding to, the list of approved practices. Changes in practices continually affect the standards of efficiency in production. This is evident in the feed-grain ratio. While 425 pounds of feed were required per 100 pounds of gain in 1930 to grow and finish a hog from eight weeks to market, many hog raisers are now

doing the same job on 340 pounds of feed, and some on as little as 325 pounds of feed per 100 pounds of gain. So, the efficiency standards of the 1930's cannot be held up as goals for today. With better practices of feeding and management, along with better hogs through feeding, the efficiency standards are constantly being moved towards higher levels.

Another reason for the changing of approved practices, efficiency standards, goals, and even the efficiency factor, is the change in consumer demands.

Classification set up by various interests. In 1931, various interests, composed of farmers, meat processors, and representatives of the United States Department of Agriculture, met and set classes and grades of market hogs.

Market classes of hogs.--"Market class is based upon the sex of the hog. They are barrows, gilts, sows, boars, stags, and pigs. For slaughter hogs, barrows and gilts are classed together.

Market grade indicates quality, finish, and conformation. "Grade" should not be confused with inspection. The purple ribbon-like stamp with the grade name and letters USDA in shield, denotes grade and quality. The other inspection stamp has nothing to do with grade, but usually refers to sanitation."⁵

The new grades for market hogs are based largely on quantity and quality of lean meat, weight, the degree of finish,

⁵C. C. Scarborough, Southern Hog Growing (Danville: Illinois: The Interstate, 1958), pp. 163-164.

percentage of fat and other factors. It should be known that these grades apply to hogs on foot as well as after they are slaughtered. The five grades for market hogs are as follows:

"U. S. No. 1. Hogs in this grade must produce the highest quality cuts of pork. The carcass has at least 50 per cent of weight in primal cuts, (hams, loin, picnics, and Boston Butts). There is a high ratio of lean to fat. The carcass of a 200-pound hog in this class will measure approximately 30 inches, and will have from 1.4 to 1.7 inches of backfat."

"U. S. No. 2. Hogs in this grade will produce a high quality pork, but there will be a little more fat than in the U. S. No. 1. The carcass will yield from 45 to 48 per cent of its weight in the primal cuts. The carcass length will be about the same as the U. S. No. 1, but the backfat is 1.7 to 2.0 inches."

"U. S. No. 3. Hogs in this grade have a high quality pork but are overfat. The carcass will yield less than 45 per cent of its weight in the primal cuts. The carcass length will be less than 30 inches and backfat on a 200-pound hog will be 2.0 inches or more."

"Medium. Hogs in this grade are underfinished. The cuts of pork are soft and flabby. These hogs may have a high percentage of lean to fat, but there is little or no marbling. The backfat is not excessive, due to poor finish, 1.1 to 1.4 inches on a 200-pound hog."

"Cull. Hogs in this grade are decidedly unfinished. The ratio of lean to fat will likely be high, but the pork will be soft and watery, with no marbling. The backfat may average less than 1.0 inches."⁶

We know that the swine fattening enterprise with its practices, standards, and goals of tomorrow will be different from those of today. It would not be surprising, and certainly from reviewing the above information, that it seems

⁶Ibid., p. 164.

justifiable to have depth of backfat or per cent of lean as an additional factor for the swine fattening enterprise.

Procedure

The procedure followed in collecting the data used in this study can be outlined as follows:

1. Texas was the selected state used for gathering all approved practices and analysis sheets for this study.
2. A list of approved practices was developed from approved practices lists from state colleges, commercial feed companies, magazines, bulletins and textbooks on swine fattening. Since a complete list of approved practices was not available, care was taken to select practices that represented all phases of the swine fattening management practices, such as feeding, diseases and facilities. This list of approved practices was then mimeographed. Copies of approved practice lists and analysis sheets were given to teachers at the Teachers' State In-Service Training Meeting, July 11-14, 1960. These were agriculture teachers of students, each of whom had a swine fattening enterprise of two or more animals. These sheets were mailed in as they were completed.
3. After the data were in the hands of the writer, all 70 analysis sheets and the accompanying check lists of approved practices were examined for errors in mathematics and incomplete record keeping. Six were discarded. Copies of the data sheets

are given in Appendices A, B, and C.

4. The information was then compiled from the analysis sheets and check lists of approved practices and a chart was made to show the following information concerning the feeding enterprise: breeds of animals, number of shoats, date started, age in days, average weight at 56 days, inventory of over-all investment, total pounds live pork produced and total pounds of feed.

5. The information was tabulated according to the findings.

Feeding Growing-Fattening Pigs

In the practical swine enterprise, "growing-fattening" generally refers to that period from weaning (about eight weeks of age) to market weight of about 225 pounds. Because hogs are fattened at an early age, the process really consist of both growing and fattening. There are two methods of finishing hogs for market; (1) full feeding all the time until the animals attain a market weight, and (2) limited feeding early in the period before marketing. Pasture may be utilized to advantage with both methods. Greater use of forage crops will accompany a system of limited rations. Neither system, full feeding or limited feeding, can be recommended as being best for any and all conditions. The plan to follow should be determined by: (1) market conditions, (2) price of feeds, (3) feeds available on the farm, (4) kind and extent of pastures

available, and (5) available labor. Self-feeders are well adapted to a system of full feeding, but hand feeding is necessary in any plan for limiting the ration. In case the animal is confined to the dry lot, growing-fattening pigs should be full fed, and the ration should contain 5 to 15 per cent of a ground dry forage, preferably high quality alfalfa.

"When on full feed, fattening pigs will consume approximately 5 pounds of feed daily per 100 pounds live weight of 225 pounds, up to 100 pounds in weight."⁷

⁷M. E. Ensminger, Swine Husbandry (Danville, Ill.: The Interstate Printers and Publishers, 1952), p. 133.

CHAPTER II

PRESENTATION AND ANALYSIS OF DATA

Successful management of the swine fattening enterprise may be determined by the approved practices used in connection with the enterprise. Perhaps there are many approved practices that are recognized as desirable practices but are not listed in this study.

Tables I through V show the conditions existing from seventy questionnaires of the twenty approved practices selected for this study.

Quality of Pigs Selected

The data in Table I show that out of seventy agriculture teachers reporting, 81.4 per cent secured high grade pigs "frequently" that were in good health as indicated by vigor, alertness, and smoothness. There were 14.3 per cent who secured such pigs "occasionally." Only 4.3 per cent secured such pigs "rarely." There were no teachers who reported "never" securing pigs of the above mentioned quality.

In answer to question two, 57.1 per cent of the teachers who reported "frequently," secured pigs of good size for their age, (35-40 pounds at fifty six days old). There were 37.2 per cent of teachers who followed this practice "occasionally." There were 4.3 per cent of the teachers who "rarely" used practice number two. Only 1.4 per cent "never" achieved the above mentioned goal.

TABLE I

THE CONDITION OF PIGS SECURED FOR THE PRACTICE

Practice	Number Reporting	Per Cent of Occurrence				Practice Report
		I do frequently	I do occasionally	I rarely do	I never do	
1. Do you secure high grade pigs that are in good health as indicated by vigor, alertness, and smoothness?	70	81.4	14.3	4.3	0.0	100
2. Do you secure pigs of good size for their age (35-40 pounds at 56 days of age?)	70	57.1	32.2	4.3	1.4	100
3. Have you chosen pigs from good type parentage?	70	80.0	15.7	4.3	0.0	100

The data in answer to question three, show that 80.0 per cent of the teachers reported "frequent" selection of pigs from good type parentage; 15.7 per cent selected pigs from good type parentage "occasionally;" and 4.3 per cent selected pigs by this plan "rarely." None of the teachers reported that they never selected pigs from good type parentage.

It has been assumed that, no hog can be said to excel others in all points of swine production and for all conditions, but pigs must have good form, quality and condition in order to bring a reasonable amount of profit.

Providing Healthful Surroundings

The data in Table II show the extent to which sanitation practices were carried out by the seventy teachers reporting. Practice four showed that 28.6 per cent "frequently" provided pens that were kept dry, and free from drafts. There were 52.9 per cent who "occasionally" followed this practice, and 1.4 per cent who "never" carried out this practice.

Controlling Parasites

In answer to question number five, 77.1 per cent "frequently" controlled mange by using recommended insecticides. The findings showed 18.6 per cent who reported "occasionally" following this plan. The study revealed that 4.3 per cent of the teachers followed this practice "rarely." None of the teachers reported "never" following this plan.

The writer believes that practice four was the

hardest to adopt because of weather conditions, failure to build pens large enough, and the lack of sufficient grass established on the place where the animals were kept. Many of the students might have used home remedies.

In answer to question number six, 87.1 per cent of the teachers "frequently" controlled lice. The data show that 10.0 per cent of the teachers who reported "occasionally," followed this practice. There were 2.9 per cent of the teachers who reported following the plan "rarely." None reported "never" controlling lice.

In practice seven, 82.8 per cent of the teachers who reported, treated pigs for worms "frequently." There were 14.3 per cent of the teachers who reported that they "occasionally" followed this practice. The writer found that 2.9 per cent of the teachers who reported, followed the plan "rarely," and none of the teachers reported "never" following this practice. It is believed that the practice was followed very closely because of the need to reduce the daily feed cost.

There are many methods of controlling lice on hogs that have been found to be easily and economically applied. Some years ago, the use of dipping vats and concrete wallows for treating large numbers of hogs was a common practice in the South. Now, spraying with some of the newer chemicals is more economical, more sanitary and more effective.

TABLE II

THE EXTENT TO WHICH SANITATION PRACTICES WERE CARRIED OUT

Practice	Number Reporting	Per cent of Occurrence				Practice Report
		I do frequently	I do occasionally	I rarely do	I never do	
4. Do you provide a pen that can be kept sanitary, dry and free from drafts?	70	28.6	52.9	17.1	1.4	100
5. Do you control mange by using recommended insecticides?	70	77.1	18.6	4.3	0.0	100
6. Do you control lice?	70	87.1	10.0	2.9	0.0	100
7. Do you treat pigs for worms as needed?	70	82.8	14.3	2.9	0.0	100

Successful swine production necessitates the application of health-conserving, disease-prevention, and parasite-control measures to the breeding, feeding, and management of the herd. By nature, the pig possesses clean habits, if only he is given an opportunity. In too many cases, however, the pig is placed in close confinement, crowded conditions, old hog lots, and filthy quarters. Such conditions favor the attack by the common diseases and parasites of swine.

The following program of swine health, disease prevention, and parasite control is recommended:

1. Satisfactory housing is essential and must be provided, for hogs are more sensitive to extremes of heat and cold than any other class of farm animals. The main requirements for satisfactory housing are that the quarters be kept dry, easily cleaned, sanitary, well ventilated and that they provide protection from heat, cold, and winds.

2. Avoid muddy lots and wallows; do not allow manure, corncobs, and other litter to accumulate in the lots, and keep the fence rows clean and free from weeds.

3. Divide the hogs into rather small groups, based upon size, age, and sex. Young hogs do not thrive when forced to pile up in sleeping quarters and when crowded away from the feed trough.

4. Provide plenty of clean fresh water in a suitable trough or drinking fountain.

5. Control lice and other insects.
6. Treat pigs for parasites such as trichinae.
7. Use the recommended insecticides for mange.

It is much healthier and easier to follow these rules to prevent parasites and diseases than to treat sick animals. The key to prevention is sanitation.

"Sanitation is a double-barreled problem. First, there is the problem of providing facilities and surroundings which can be made sanitary. Then there is the problem of actually keeping swine and their surroundings in sanitary condition."¹ Therefore, good sanitation is dependent on the proper solution of these problems.

Feeding Practices

The data in Table III show practices related to feeding. Since feed is about 80 per cent of the total cost of growing hogs, the grower who makes money on his hogs must study his feeding problems. He needs to understand why a balanced ration is needed as well as what is needed to balance the ration.

It has been found in the study that feeding is one of the major management problems in growing hogs.

In the study, the writer found that 31.4 per cent of these reporting used 16 to 18 per cent protein growing ration fed protein supplement "free-access" in the self-feeder.

¹Coffey, S. J., and Jackson, Lyman E. Livestock Management (Chicago: J. B. Lippincott Company, 1944), p. 47.

TABLE III
PRACTICES RELATED TO FEEDING

Practice	Number Reporting	Per cent of Occurrence				Practice Report
		I do frequently	I do occasionally	I rarely do	I never do	
8. Do you feed a 16-18 percent protein growing ration or feed protein supplement "free-access" in the self-feeder?	70	31.4	45.7	22.9	0.0	100
9. Do you feed all the corn pigs will eat in addition to the growing ration during the last 6-8 weeks?	70	21.4	31.4	34.3	12.9	100
10. Do you provide adequate pasture of good quality or suncured alfalfa hay?	70	24.3	38.6	28.6	8.5	100
11. Do you use an anti-biotic in the feed ration?	70	35.7	32.8	22.9	8.6	100
12. Do you provide adequate minerals for the fattening of pigs?	70	58.6	30.0	10.0	1.4	100

There were 45.7 per cent who used this practice "occasionally;" 22.9 per cent used this practice "rarely;" and none reported "never" using this practice.

The importance of protein supplements for growing pigs cannot be over emphasized. Experiments show that the daily gain of hogs has been made to more than double by the addition of protein supplements to the ration. They have also shown that the feed cost is decreased when protein supplement is fed. This results in higher net returns from hogs.

In answer to question nine, 21.4 per cent "frequently" feed all the corn pigs would eat in addition to the growing ration during the last six to eight weeks. There were 31.4 per cent who used the practice "occasionally;" 34.3 per cent used this practice "rarely," and 12.9 per cent "never" carried out this practice. This was probably true because some feeds cost much more than others, and some require more labor in growing and harvesting than others.

The data in answer to question ten, revealed that 24.3 per cent of those reporting provided adequate pasture of good quality or sun-cured alfalfa hay "frequently;" 38.6 per cent used this practice "occasionally;" 28.6 per cent used this practice "rarely;" and 8.5 per cent reported "never" using this practice.

Perhaps, the greater percentage of teachers followed

the plan "occasionally" because the type of soil might not have produced alfalfa hay, or because of the high cost of the hay, or the weather conditions and cost involved in fencing of larger areas. The 8.5 per cent of teachers who "never" followed this plan, perhaps never followed it because they never experienced the use of good pasture or quality sun-cured alfalfa hay or any other hay.

All teachers reported that they used anti-biotics in the feed ration except 8.6 per cent who "never" carried out this practice. Here the writer believes that much of the feeds were grown on the home farm where anti-biotics are fairly new in the swine fattening enterprise.

The addition of anti-biotics in most instances, improves the ration. These chemicals stimulate the rate of gain and reduce the feed requirements per pound of gain. As yet, the exact function is not definitely known, but anti-biotics seem to contribute to the health of animals by preventing harmful organisms from developing in the digestive tract.

Some of the more commonly known anti-biotics are aureomycin, terramycin, penicillin and baciteracin. Of these, aureomycin and terramycin seem to stimulate the rate of gains under a greater variety of conditions. New and effective anti-biotics are being explored. Some may prove to be effective in hog rations. Present information indicates

that ten grams of anti-biotics per ton of feed are about the right amount to use. Thorough mixing is important.

In answer to question number twelve, 58.6 per cent of the teachers reported that they provided adequate minerals for the fattening of pigs. There were 30.0 per cent of the teachers who followed this plan "occasionally," 10 per cent who reported carrying out the plan "rarely," and 1.4 per cent "never" followed this plan.

It is possible for the writer to believe that the owner of animals might not have been aware of the deficiency of minerals in the soil and regular feeds, therefore, many did not buy additional minerals for fattening of pigs. It is a well-known fact that pigs need certain minerals, such as calcium and phosphorus for bone building and other purposes.

Perhaps, many teachers reported "never" in practices nine through twelve because the grower was trying to keep the feed cost as low as possible. Feed costs with good gains must be kept as low as possible. The combination of good rates of gains at the lowest possible cost means the most profit.

To succeed in swine fattening enterprise production, the farmer must use good feeding practices. Perhaps, the use of some practices will depend on the equipment and capital to provide for these practices. When a hog is raised on high

proteins, minerals, anti-biotics, growing ration, and good pasture with alfalfa hay, the leaner carcasses are sold for more money.

The cost of swine production will vary widely from year to year in various sections, depending chiefly upon the price of feed.

Because of the many advantages and the importance of economic feeding practices, the largest net returns were made only as the students carried out the five practices related to feeding as often as possible.

In answer to question thirteen, 87.1 per cent of the teachers who reported "frequently," provided shade during summer months; 8.6 per cent used this practice "occasionally;" 2.9 per cent reported "rarely;" and 1.4 per cent "never" used practice thirteen.

The data in Table IV show practices related to self feeding. In answer to question fourteen, 37.1 per cent of the teachers who reported "frequently," provided self-waterers, and 25.7 per cent reported "occasionally" using this practice. Twenty per cent reported "rarely" following this plan. There were 17.2 per cent of teachers who reported "never" using self-waterers. Approximately one-half of the teachers who reported "never" used this practice as compared with those who did.

The writer believes that many teachers never adopted

this practice because they probably did not realize the importance of having plenty of fresh water for animals at all times. "A growing-fattening pig requires about five pounds of water for each pound of gain produced."²

The data in answer to question fifteen, revealed that 38.6 per cent of those reporting "frequently" provided self-feeders. The same number reported "occasionally;" 15.7 per cent reported "rarely;" and there were 7.1 per cent who reported "never" carrying out this practice.

Approximately the same percentage of those reporting placed self-feeders on platforms and have self-waterers within ten feet of the self-feeder. Numerous experiments have been conducted to determine whether it is best to practice self-feeding or hand-feeding of swine.

Records show that there is very little difference in the daily gain of pigs when self-fed and when fed by hand, provided they are hand-fed at least three times per day. Records of results also show that the cost of feed per 100 pounds gain is less when self-feeding is practiced. There is also a saving in labor when pigs are self-fed.³

²Ibid., p. 14.

³R. D. Lewis, "Swine Investigations in Texas," Texas Agricultural Extension Service, Bulletin 866 (July, 1957), pp. 3-18.

TABLE IV
PRACTICES RELATED TO SELF FEEDING

Practice	Number Reporting	Per cent of Occurrence				Practice Report
		I do frequently	I do occasionally	I rarely do	I never do	
14. Do you use a self-waterer?	70	37.1	25.7	20.0	17.2	100
15. Do you use a self-feeder?	70	38.6	38.6	15.7	7.1	100
16. Do you have the self-feeder on a platform?	70	38.6	38.6	15.7	7.2	100
17. Do you have the self-waterer with 10 feet of the self-feeder?	70	32.9	34.3	18.5	14.3	100

Providing Shade and Water

It is believed that the use of shade was a very important and common practice since 87.1 per cent provided shade frequently during the summer months.

"By supplying a concrete hog wallow, or better still, by having a fogging or sprinkler for his hog feeding layout, one can increase the gain my at least ten per cent when the average temperature is 85°F."⁴

It is necessary for the animals to have a self-waterer within ten feet of the self-feeder which should be placed on a platform. If these practices are carried out the cost of feed per 100 pounds of gain will be less and the self-feeder should save the owner much labor.

Keeping Records

The data in Table V show practices related to record keeping. In answer to question eighteen, 55.7 per cent of the teachers reported "frequently." There were 35.5 per cent of the teachers who reported "frequently" keeping satisfactory feed and weight records so that gain per day and feed per pound can be determined. The author found 40.0 per cent "occasionally" carried out this practice; 18.6 per cent reported "rarely" following this plan; and 5.9 per cent of the teachers reported "never" following this plan.

Perhaps, the teachers are busy with other phases of

⁴Ibid., p. 12.

farming that they forget the value of complete and accurate records. They also forget that they get just as much pay for keeping records as they do for many other jobs.

In answer to question twenty, 47.1 per cent of the teachers who reported "frequently," evaluated the effectiveness of the enterprise by setting goals. The analysis revealed that 35.7 per cent of the teachers who reported "occasionally," followed this plan. Only 10.0 per cent followed this practice "rarely," and 7.2 per cent "never" carried out this practice.

There is a definite relationship between the weight at which hogs are marketed and the returns from the enterprise. The weight of hogs, when marketed, affects both the price per pound and the total value per hog.

"Some markets combine some of these. For example, 180-240 is used as "tops" in some areas. The seller would do well to know the best market weights and time of marketing."⁵

The weight of a hog together with its grade, determines the carcass and percentage of lean meat cuts. The weight groups are narrow compared with those of other animals. Weight groups differ on markets, but are generally as follows: 120-140 pounds; 140-160 pounds; 160-180 pounds; 180-200 pounds; 200-220 pounds; 220-240 pounds; 240-270 pounds; 270-300 pounds; 300-330 pounds; 330-360 pounds; 360-400 pounds; 400 pounds up.

⁵Ibid., p. 157.

TABLE V

PRACTICES RELATED TO RECORD KEEPING:

Practice	Number Reporting	Per cent of occurrence				Practice Report
		I do frequently	I do occasionally	I rarely do	I never do	
18. Do you market pigs at 190-225 pounds at about six months of age?	70	55.7	31.4	10.0	2.9	100
19. Do you keep satisfactory feed and weight records so that gain per day and feed per pound can be determined?	70	35.7	40.0	18.6	5.7	100
20. Do you evaluate the effectiveness of the enterprise by setting goals?	70	47.1	35.7	10.0	7.2	100

Good records enable the owner to see how far he has gone in the direction he started in the swine fattening enterprise. The teacher may also evaluate the effectiveness of the student in terms of accurate records kept by the student.

Practices eight through eleven seem to be the most difficult to adopt. It is believed that the causes are lack of finance, students use of home grown feeds, and many students failure to use anti-biotics in the feeding ration.

CHAPTER III

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

A study has been made of the swine fattening enterprise and the relationship to selected approved practices used in a group of vocational projects in Texas.

A. The following practices rated over 80 per cent on the basis of "I do frequently:"

1. Do you secure high grade pigs that are in good health as indicated by vigor, alertness, and smoothness?

6. Do you control lice?

7. Do you treat pigs for worms as needed?

13. Do you provide shade during summer months?

B. The following practices rated under 80 per cent on the basis of "I do frequently:"

4. Do you provide a pen that can be kept sanitary, dry, and free from drafts?

8. Do you feed a 16-18 per cent protein growing ration or feed protein supplement "free-access" in the self-feeder?

9. Do you during the last 6-8 weeks, feed all the corn pigs will eat in addition to the growing ration?

11. Do you use an anti-biotic in the feed ration?

14. Do you use a self-waterer?

15. Do you use a self-feeder?

16. Do you have a self-feeder on a platform?

17. Do you have the self-waterer within 10 feet of the self-feeder?

19. Do you keep satisfactory feed and weight records so that gain per day and feed per pound can be determined.

20. Do you evaluate the effectiveness of the enterprise by setting goals?

C. These practices rated above 30 per cent on the basis of "I do occasionally:"

2. Do you secure pigs of good size for their age (35-40 pounds at 56 days of age?)

4. Do you provide a pen that can be kept sanitary, dry and free from drafts?

8. Do you feed a 16-18 per cent protein growing ration or feed protein supplement "free-access" in the self-feeder?

9. Do you, during the last 6-8 weeks, feed all the corn pigs will eat in addition to the growing ration?

10. Do you provide adequate pasture of good quality or sun-cured alfalfa hay?

11. Do you provide adequate minerals for the fattening of pigs.

15. Do you use a self-feeder?

16. Do you have the self-feeder on a platform?

17. Do you have the self-waterer within 10 feet of the self-feeder?

18. Do you market pigs at 190-225 pounds at about six months of age?

19. Do you keep satisfactory feed and weight records so that gain per day and feed pounds can be determined?

20. Do you evaluate the effectiveness of the enterprise by setting goals?

D. The following practices rated below 30 per cent on the basis of "I do occasionally":

1. Do you secure high grade pigs that are in good health as indicated by vigor, alertness, and smoothness?

3. Do you choose pigs from good type parentage?

5. Do you control mange by using recommended insecticides?

6. Do you control lice?

7. Do you treat pigs for worms as needed?

12. Do you provide adequate minerals for the fattening of pigs?

13. Do you provide shade during summer months?

14. Do you use a self-feeder?

E. The following practices rated over 20 per cent on the basis of "I do rarely":

8. Do you feed a 16-18 per cent protein growing ration or feed protein supplement "free-access" in the self-feeder?

9. Do you, during the last 6-8 weeks, feed all the corn pigs will eat in addition to the growing ration?

10. Do you provide adequate pasture of good quality or sun-cured alfalfa hay?

11. Do you use an anti-biotic in the feed ration?

F. These practices rated under 20 per cent on the basis of "I rarely do:"

1. Do you secure high grade pigs that are in good health as indicated by vigor, alertness, and smoothness?

2. Do you secure pigs of good size for their age (35-40 pounds at 56 days of age?)

3. Do you choose pigs from good type parentage?

4. Do you provide a pen that can be kept sanitary, dry and free from drafts?

5. Do you control mange by using recommended insecticides?

6. Do you control lice?

7. Do you treat pigs for worms as needed?

12. Do you provide adequate minerals for the fattening of pigs?

13. Do you provide shade during summer months?

14. Do you use a self-waterer?

15. Do you use a self-feeder?

16. Do you have the self-feeder on a platform?

17. Do you have the self-waterer within 10 feet of the self-feeder?

18. Do you market pigs at 190-225 pounds at about six months of age?

19. Do you keep satisfactory feed and weight records so that gain per day and feed per pound can be determined?

20. Do you evaluate the effectiveness of the enterprise by setting goals?

G. The following practices rated over 7 per cent on the basis of "I never do:"

9. Do you, during the last 6-8 weeks, feed all the corn pigs will eat in addition to the growing ration?

10. Do you provide adequate pasture of good quality or sun-cured alfalfa hay?

11. Do you use an anti-biotic in the feed ration?

14. Do you use a self-waterer?

15. Do you use the self-feeder?

16. Do you have a self-feeder on a platform?

17. Do you have a self-waterer within 10 feet of the self-feeder?

20. Do you evaluate the effectiveness of the enterprise by setting goals?

H. The following practices rated under 7 per cent on the basis of "I never do:"

1. Do you secure high grade pigs that are in good health as indicated by vigor, alertness, and smoothness?

2. Do you secure pigs of good size for their age (35-40 pounds at 56 days of age?)

3. Do you secure pigs of good type parentage?

4. Do you provide a pen that can be kept sanitary, dry, and free from drafts?
5. Do you control mange by using recommended insecticides?
6. Do you control lice?
7. Do you treat pigs for worms as needed?
8. Do you feed a 16-18 per cent protein growing ration or feed protein supplement "free-access" in the self-feeder?
12. Do you provide adequate minerals for the fattening of pigs?
13. Do you provide shade during summer months?
18. Do you market pigs at 190-225 pounds at about six months of age?
19. Do you keep satisfactory feed and weight records so that gain per day and feed per pound can be determined?

Conclusions

With the data revealed in the study, the following conclusions have been reached:

1. There was no significant relationship between the frequency of approved practices and income.
2. The following practices ran above 80 per cent under "frequency": Practice one, six, seven, eight, and thirteen.
3. Practices four, eight, nine, eleven, fourteen, fifteen, sixteen, seventeen, nineteen and twenty ran below 80 per cent under the "I do frequently column."

4. Practices two, four, eight, nine, ten, eleven, fifteen, sixteen, seventeen, eighteen, nineteen and twenty were above 30 per cent under "occasionally." Practices one, three, five, six, seven, twelve, thirteen and fourteen were below 30 per cent under "occasionally."

5. Under "I do rarely," four practices were above 20 per cent, and all others were below.

6. Under the column "I never do," eight practices ran above 7 per cent, and all other practices were below.

In writing a conclusion for this study, the writer feels that a random sampling would have been much better for a study of this nature. It would also have aided considerably in arriving at conclusions if each lot of hogs could have been visited, as well as each student who helped supply data for this study. This also would have made the data more meaningful. Some of the data collected for this study were not used because of apparent misunderstanding and inaccurate record keeping. Therefore, what is given constitutes the joint opinion of the writer and the student. There is also a question in the writer's mind at this point as to whether or not the student involved too many criteria. The writer, recognizing these shortcomings, retains the feeling that a study of this nature is exceedingly important, worthwhile, and of value to the vocational agriculture teachers.

Recommendations

In light of the findings of this study, the writer makes the following recommendations.

1. That farmers pay more attention to the approved practices.
2. That farmers make use of approved practices received from vocational agriculture departments and other agriculture workers.
3. That students do a better job of selecting animals and feeds.
4. That superior breeding stock be used in the swine program.
5. That farmers keep better records in order to readily determine their profits or losses.
6. That the students make a closer study of local and terminal markets.
7. That the teachers emphasize the importance of accurate and complete records on the swine fattening enterprise.
8. The writer further recommends that a similar study be made every one-half decade in order to determine the progress that is being made in the swine fattening enterprise.

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APPENDIX

APPENDIX A. Copy of letter given to all cooperating teachers of vocational agriculture and area supervisors.

P. O. Box 156
Queen City, Texas
July 13, 1960

TO ALL AGRICULTURE TEACHERS IN TEXAS

Gentlemen:

Approved practices have always been recognized by leaders in vocational agriculture as essential in teaching adults to carry successful farming programs. In recent years, new emphasis has been placed upon the use of these practices as they relate to the production enterprise in terms of the enterprise efficiency. It is the feeling of leaders in vocational agriculture that the recently developed "Production Enterprise Analysis" is an essential as approved practices in the teaching of vocational agriculture.

The above statement indicates that there are definite relationships between the approved practices used and the level of efficiency attained for production enterprises. I am undertaking a study of these relationships as they apply to the swine fattening enterprise. It is the purpose of this study to define these relationships and bring about a better understanding of approved practices as they relate to certain efficiency factors.

To gather the necessary data for a study of this kind the approved practices used and the analysis of individual swine fattening enterprises are needed. Therefore, I am asking for the cooperation of all agriculture teachers in the state.

I am kindly asking that you please complete the enclosed questionnaire by placing a check (___/) in the space provided, if it applies to the boy's practice, and mail directly to:

Frank J. Wade
Thorton High School
P. O. Box 156
Queen City, Texas

Please do this immediately. Your kind cooperation in this study will be greatly appreciated.

Sincerely yours,

Frank J. Wade

APPENDIX B

MANAGEMENT PRACTICES FOR SWINE FATTENING ENTERPRISE

NAME _____ ADDRESS _____
P. O. Box No. _____ City _____
SCHOOL _____ DATE _____

Please complete the following questionnaire by placing a check (___/) in the space provided, if it applies to the boy's practice:

Q U E S T I O N N A I R E

Practice	I do fre- quently	I do oc- casion- ally	I rarely do	I never do
1. Do you secure high grade pigs that are in good health as indicated by vigor, alertness, and smoothness?				
2. Do you secure pigs of good size for their age (35-40 pounds at 56 days of age . .				
3. Do you choose pigs from good type parentage?				
4. Do you provide a pen that can be kept sanitary, dry and free from drafts?				
5. Do you control mange by using recommended insecticides? . .				

APPENDIX B (continued)

Practice	I do fre- quently	I do oc- casion- ally	I rarely do	I never do
6. Do you control lice?				
7. Do you treat pigs for worms as needed?				
8. Do you feed a 16-18 per cent protein growing ration or feed protein supplement "free-access" in the self-feeder?				
9. Do you during the last 6-8 weeks, feed all the corn pigs will eat in addition to the growing ration?				
10. Do you provide adequate pasture of good quality or sun-cured alfalfa hay?				
11. Do you use an anti-biotic in the feed ration?				
12. Do you provide adequate minerals for the fattening of pigs? . . .				
13. Do you provide shade during summer months?				
14. Do you use a self-waterer? . . .				
15. Do you use a self-feeder?				

APPENDIX B (continued)

Practice	I do fre- quently	I do oc- casion- ally	I rarely do	I never do
16. Do you have the self-feeder on a platform?				
17. Do you have the self-waterer within 10 feet of the self- feeder?				
18. Do you market pigs at 190- 225 pounds at about six months of age?				
19. Do you keep satisfactory feed and weight records so that gain per day and feed per pound can be determined?				
20. Do you evaluate the effective- ness of the enterprise by setting goals?				
21. OTHER PRACTICES _____ _____				

APPENDIX C

ANALYSIS OF SWINE (SHOAT FEEDING) ENTERPRISE

Breed _____ No. Shoats _____ Date Started _____

Age in days _____ Average weight at 56 days _____

Inventory over all investment _____

Total pounds live pork produced _____ Profit _____

Total pounds of feed _____

Important practices and conditions which improved the production and income:

Ways in which the efficiency of this enterprise might have been improved:

TABLE VI
A SUMMARY OF THE QUESTIONNAIRE

Practice	Number Reporting	Per cent of Occurrence				Practice Report
		I do frequently	I do occasionally	I rarely do	I never do	
1. Do you secure high grade pigs that are in good health as indicated by vigor, alertness, and smoothness?	70	81.4	14.3	4.3	0.0	100
2. Do you secure pigs of good size for their age (35-40 pounds at 56 days of age?)	70	57.1	37.2	4.3	1.4	100
3. Do you choose pigs from good type parentage?	70	80.0	15.7	4.3	0.0	100
4. Do you provide a pen that can be kept sanitary, dry and free from drafts?	70	28.6	52.9	17.1	1.4	100
5. Do you control mange by using recommended insecticides?	70	77.1	18.6	4.3	0.0	100
6. Do you control lice?	70	87.1	10.0	2.9	0.0	100
7. Do you treat pigs for worms as needed?	70	82.8	14.3	2.9	0.0	100

TABLE VI (continued)

Practice	Number Reporting	Per cent of Occurrence				Practice Report
		I do frequently	I do occasionally	I rarely do	I never do	
8. Do you feed a 16-18 per cent protein growing ration or feed protein supplement "free-access" in the self-feeder?	70	31.4	45.7	22.9	0.0	100
9. Do you during the last 6-8 weeks, feed all the corn pigs will eat in addition to the growing ration?	70	21.4	31.4	34.3	12.9	100
10. Do you provide adequate pasture of good quality or sun-cured alfalfa hay?	70	24.3	38.6	28.6	8.5	100
11. Do you use an anti-biotic in the feed ration?	70	35.7	32.8	22.9	8.6	100
12. Do you provide adequate minerals for the fattening of pigs?	70	58.6	30.0	10.0	1.4	100
13. Do you provide shade during summer months?	70	87.1	8.6	2.9	1.4	100
14. Do you use a self-waterer?	70	37.1	25.7	20.0	17.2	100
15. Do you use a self-feeder?	70	38.6	38.6	15.7	7.1	100
16. Do you have the self-feeder on a platform?	70	38.6	38.6	15.7	7.2	100

TABLE VI (continued)

Practice	Number Reporting	Per cent of Occurrence				Practice Report
		I do frequently	I do occasionally	I rarely do	I never do	
17. Do you have the self-waterer within 10 feet of the self-feeder?	70	32.9	34.3	18.5	14.3	100
18. Do you market pigs at 190-225 pounds at about six months of age?	70	55.7	31.4	10.0	2.9	100
19. Do you keep satisfactory feed and weight records so that gain per day and feed per pound can be determined?	70	35.7	40.0	18.6	5.7	100
20. Do you evaluate the effectiveness of the enterprise by setting goals?	70	47.1	35.7	10.0	7.2	100