February 17, 1969

To the Graduate Council:

I am submitting herewith a thesis written by James Richard McFall entitled "Effects of Selected Variables on Prices Received for Feeder Pigs in the Weakley County Feeder Pig Sales." I recommend that it be accepted for nine quarter hours of credit in partial fulfillment of the requirements for the degree of Master of Science, with a major in Animal Husbandry.

Haley M. Jamison
Major Professor

We have read this thesis and recommend its acceptance:

Robert R. Shrode

Robert L. Dotson

Accepted for the Council:

Hilton A. Smith
Vice Chancellor for Graduate Studies and Research

EFFECTS OF SELECTED VARIABLES ON PRICES RECEIVED FOR FEEDER PIGS IN THE WEAKLEY COUNTY FEEDER PIG SALES

A Thesis

Presented to

the Graduate Council of

The University of Tennessee

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

---

by

James Richard McFall

March 1969

ACKNOWLEDGEMENTS

The author wishes to express his sincere appreciation to the following persons who have contributed to this thesis:

Dr. Haley M. Jamison, Major Professor and thesis advisor, for his counseling, and untiring efforts with the statistical analysis and interpretation of the data, and reviewing the manuscript.

Dr. Charles S. Hobbs, Department Head, for his counsel and encouragement during the course of graduate study.

Drs. Robert R. Shrode and Robert S. Dotson, for serving on the graduate committee with Dr. Jamison, and their counsel, cooperation and review of the manuscript.

Dr. Webster Pendergrass, Vice-Chancellor, Institute of Agriculture, University of Tennessee; Dr. Vernon W. Darter, Dean, Agricultural Extension Service, University of Tennessee; O. Clinton Shelby, Assistant to the Dean; and Supervisors, H. T. Short and Gene W. Turner for granting inservice training leave to do graduate study.

The entire Animal Husbandry Department, secretaries and fellow students whose many courtesies have made this graduate study a more pleasant and worthwhile experience.

His wife, Freda; and children, Martha Elizabeth and James Richard, Jr., for their encouragement, understanding and assistance, making possible this course of graduate study.

Polly Hutcherson, his Extension Secretary, for her patience and help assembling and typing.

860289

The computations associated with the statistical analysis for this research were done with the aid of equipment of the University of Tennessee Computing Center. This Computing Center was established with the aid of a National Science Foundation Grant (No. NSF-G 135-1).

ABSTRACT

Records of 655 pens of pigs sold in 18 sales held every other month (January, March, May, July, September and November) from 1965 through 1967 were studied to determine the effects of grade, weight, pen size, month, and year on the average price of feeder pigs sold in the Weakley County, Feeder Pig Sales at Dresden, Tennessee. The data were analyzed by least-squares methods.

Differences in price among grades of feeder pigs were statistically significant. Pigs grading No. 1 averaged $0.66 more per hundredweight than those grading No. 2 and $2.46 more than pigs which graded No. 3. Pigs grading No. 2 averaged $1.81 more than pigs grading No. 3.

There was a significant difference ($P < .01$) in the price paid for pigs in larger lots as compared to pigs in smaller lots. Pigs in pens of 1-15 and 16-30 sold for significantly ($P < .01$) less than pigs in pens of 31 or more. Least-squares analysis showed that prices of pigs in pens of 1-15 and 16-30 were similar, and the difference was not significant.

Pigs weighing 31-40 pounds averaged higher in price per hundredweight than any of the other weight classes. In general, the heavier the weight class, the lower the price received per hundredweight. Pigs in pens averaging 31-40 pounds sold for $39.73 per hundredweight as compared with $27.34 for pigs weighing 66 pounds or more with a difference of $12.39 ($P < .01$). Differences among all other weight classes also were highly significant.

Differences in prices among months were highly significant, with highest average prices being paid in September and lowest in November. The difference in price of pigs between these months was $8.60. Year differences, as expected, accounted for a large portion of the price variation and were highly significant ($P < .01$).

The results of this study indicate the importance of having a sufficient volume of pigs so that pigs can be penned and sold in large lots of the desired weight and grade.

LIST OF TABLES

TABLE		PAGE
I.	Format Used for IBM Cards	13
II.	Least-Squares Estimates of the Effects Studied.	17
III.	Analysis of Variance of Price Received.	18

LIST OF FIGURES

FIGURE PAGE

1. Example of the Pen Sheet Used in the Weakley County Feeder Pig Sales. 11

CHAPTER I

INTRODUCTION

The Weakley County Feeder Pig Sales in Dresden, Tennessee, have established themselves as an important part of the livestock enterprise in Weakley County in West Tennessee. Farm income from feeder pigs sold in Weakley County feeder pig sales rose from $7,772.00 in 1964, to $142,221.81 in 1967. During the intervening three-year period, the number of pigs sold increased from 622 pigs in 1964 to 8,535 pigs in 1967. The number of sales increased from two sales in 1964 to six sales in 1967. With the establishment of a regular market outlet for their pigs, swine producers were able to develop feeder pig producing enterprises on their farms with confidence that they would have a competitive market for their product. Until the organization of such feeder pig sales, feeder pig producers were at the mercy of the pig buyer who traveled from farm to farm or purchased pigs at the regular livestock auction markets.

Prior to this study, no organized statistical analysis has been made of the effects of various factors on the price of feeder pigs sold in the sales. The objective of this study was to evaluate the effects of the following variables on the price of feeder pigs sold in the Weakley County sales from January, 1965, through December, 1967:

1. Grade.
2. Pen size (number of pigs per pen).
3. Pen weight (average).

4. Month of sale.

5. Year.

It is hoped that conclusions drawn from this study will be helpful to breeders and feeders in planning their respective swine production programs and that this study will contribute information which will be useful in improving existing sales and establishing new feeder pig sales in Tennessee.

CHAPTER II

REVIEW OF LITERATURE

Information dealing with the effects of various factors on the prices of feeder pigs in organized sales was found to be limited. Much of the information available had been accumulated from general surveys of the problem. Critical analyses of data which had been reported were few.

Rudd (1953) found, in feeder pig sales at five central Kentucky auctions over a 23-year period (1926-48), that lightweight feeder pigs, (lightweight being under 80 pounds) reached a peak in price in May, although June and July were almost as high. After the peak in May, a slight decline during June and July was followed by a further decrease in prices to the season's low for lightweights in December.

Barnhart et al. (1957) reported that feeder pig prices and marketing, like the prices and marketing of slaughter weight hogs, varied considerably from year to year, both in level and in change from season to season. Receipts of feeder pigs at central Kentucky auctions averaged highest in October and lowest in June. The seasonal movement of prices was roughly in reversal of the pattern of marketing, with the highest price for feeders being paid in July and the seasonal low in prices occurring in December. The seasonal relationships were an average for a number of years and indicated only the general trend of seasonal movements. Individual years differed markedly from the averages. Differences in seasonal movements were related also to the

weights within the feeder classification. The level of feeder pig prices was closely related to the price for slaughter weight hogs.

These workers stated that the price that hog feeders are willing to pay for feeder pigs is determined largely by the price they expect to receive for slaughter hogs and also by the price of corn. When the price of hogs relative to the price of corn (the corn-hog ratio) is favorable for feeding, feeder pigs will usually sell at a premium above slaughter weights. On the other hand. if the corn-hog price ratio is unfavorable, feeders will be discounted in price relative to slaughter weight hogs.

Haas and Stevens (1962) estimated the effects which pooling pigs had on price. The increase in value ranged from 25 cents to $7.50 per pig and $1.00 to $5.00 per hundredweight for all agencies reporting in a six-state area. The estimated increase varied considerably between agencies and states and ranged from $1.00 to $7.50 per pig in Missouri, $1.00 to $7.00 per pig in Tennessee, $2.00 to $5.00 per pig in Virginia, $1.00 to $2.00 per hundredweight in Kentucky, and 50 cents to $5.00 per hundred-weight in Ohio. These estimates were based on pigs weighing about 50 pounds. These workers indicated that pen size was an important factor affecting prices of pooled feeder pigs and one over which market agencies do not have absolute control, at least in terms of minimum size.

They noted that if producers are to realize full value for feeder pigs, they must have an effective marketing system that provides for (1) efficient movement and handling and (2) a price mechanism which will reflect the true value of the pigs. They concluded that pooling feeder pigs helps increase the efficiency of the marketing system.

Powell and Houston (1962) reported that in recent years as high as one-third of Tennessee's pig crop has been sold as feeder pigs.

They stated that there is a seasonal influence on the price paid for pigs. Smaller pigs generally sell better in the spring or summer when cold weather is not a problem. Heavier pigs (50-90 pounds) usually sell better in the fall or winter when there is a good demand for pigs to glean corn fields. They stated also that feeder pig buyers are becoming more quality conscious. More emphasis is being placed on meat-type pigs, and the buyer is interested in uniformity of type as well as size.

A few states have held feeder pig sales in the last few years. Pig sales in Tennessee have grown considerably in number in the past five years. Missouri is one of the leading states in feeder pig sales. Sewell (1962) stated that in marketing cooperatives where pigs are delivered to the feeders, a 40- to 50-pound pig is usually preferred. In Missouri feeder pig sales, pigs weighing up to 100 pounds or more have sold well and have been profitable to the feeder pig grower. Pigs weighing over 70 pounds have been in demand in the fall to glean corn fields. Garbage feeders and suppliers of serum plants want hogs weighing 80 pounds and above. The outlook for slaughter hog prices at the time when the feeder pigs are ready for market is a big factor in setting the price for different weights of feeder pigs sold at auction. Perennially, there has been a good demand for 60- to 70-pound pigs in Missouri sales.

O'Neal (1964) stated, in a report on feeder pig sales held in Sevier County, Tennessee, that the main purpose of pig sales is to

realize a satisfactory price through combining a large volume of pigs to attract several buyers. He stated also that feeder pig sales have been successful in East Tennessee during the past five years because the method of marketing appeals to both the seller and the buyer. The seller can market all of his pigs at one time where there is a sufficient volume of pigs to attract numerous buyers, and, in addition, he can sell his pigs in a uniform group according to weight and grade. The buyer can purchase a large volume of pigs in a very short period of time and can buy the weight, quality, and grade that meet his requirements. O'Neal further stated that if feeder pig sales are to continue to be successful, a steady volume of high quality, meat-type pigs that exceed 45 pounds in weight must be maintained. Most feeder pig buyers are interested in uniform groups of pigs that are of high quality and range in weight from 45 to 65 pounds.

Waddell (1965) found in a study of the feeder pig sales held in Cookeville, Tennessee, that grade had a significant effect ($P < .01$) on the price paid for feeder pigs. Pigs that graded No. 1 averaged $0.77 more per hundredweight than those that graded No. 2 and $2.65 more than pigs that graded No. 3. Number 2 grade pigs averaged $1.88 more than pigs that graded No. 3.

The differences in price per hundred-weight associated with differences in pen size (number of pigs per pen), indicate a definite price advantage for selling feeder pigs in larger lots. Pigs selling in lots of 1 to 15 averaged less in price than those sold in any other pen size. Pigs selling in lots of 16 to 30 head averaged higher than those of any other grouping and sold for $0.75 more per hundredweight than those in pens of 1 to 15 head ($P < .01$).

The weight of pigs in pens averaging 31 to 40 pounds sold for the highest price, while pigs in pens averaging 66 pounds or more, sold for the lowest price per hundredweight. There was a price difference of $6.60 per hundredweight between the two weight groups, which was highly significant ($P < .01$). It also was found that prices decreased in a linear fashion from the 31- to 40-pound weight class to the class including weights of 66 pounds and more. Results from this sale indicate that a 31- to 40-pound pig is the first preference of the feeder pig buyer and that a 41- to 50-pound pig is the second preference.

CHAPTER III

EXPERIMENTAL PROCEDURE

Source of Data

Records were available from the Weakley County Feeder Pig Sales in Dresden, Tennessee, as far back as the first sale which was held in 1964. However, the data from sales held during the years 1965 through 1967 were selected for analysis in this study. During this period, six sales were held each year (January, March, May, July, September, and November). A total of 655 pens of pigs of varying size weight, and grade were usable in the study to determine the effects of different variables including number of pigs per pen (pen size), average weight of pigs in a pen (pen weight), feeder grade, month and year of sale on the price of feeder pigs received in the Weakley County sales.

Consignment Procedure

When the pig producer decides to sell pigs through the Weakley County Feeder Pig Sale, he must give the number of pigs, along with his name and address, to the County Agricultural Extension Office at least four weeks before the sale. Pigs to be sold have to be vaccinated 21 days prior to the sale.

Inspection of Pigs

Each consignment of pigs is inspected on the farm at the time of vaccination at least 21 days before the sale and again by the sales committee of the Weakley County Livestock Association as they are unloaded at the sale. As the pigs are inspected and vaccinated on the

farm, the inspector and veterinarian check for any indication of disease in the entire herd, or any condition or abnormality in the pigs consigned to the sale that would prevent them from being accepted at the sale. At the second inspection, the sales committee and state grader check for indications of disease and other conditions or abnormalities that may have been overlooked on the farm or may have developed since the farm inspection. As each consignment of pigs is unloaded, the consignor must present a vaccination slip to show that his pigs have been inspected and vaccinated on the farm. No pigs are accepted unless they have been properly farm inspected and vaccinated at least 21 days prior to the sale.

Grades and Grading of Pigs

The points considered in the grading and sorting of pigs into the various feeder pig grades at the Weakley County Feeder Pig Sale are as follows:

1. Grade No. 1. Lengthy, well-muscled, firm pigs that are high in quality and in a very thrifty condition. A large percentage of these pigs should feed out as U.S. No. 1 market hogs.

2. Grade No. 2. Thrifty, well-developed pigs that do not carry quite the muscling, firmness, and quality of No. 1 pigs. A large percentage of these pigs should feed out as U.S. No. 2 market hogs.

3. Grade No. 3. Pigs that are short and lacking in natural firmness and quality. This grade is usually the least uniform grade in the sale. A large percentage of these pigs should feed out as U.S. No. 3 market hogs.

Weighing of Pigs

As the pigs are unloaded, they are graded and sorted by the grader into uniform groups according to size. Each group is then weighed. A Consignor Invoice is prepared and a copy given to the consignor. This invoice lists the number of pigs, grade, total weight, and the pen number of each group.

Penning of Pigs

As each group of pigs comes off the scales, it is penned according to grade and the average weight of the group. As it is penned, the information from the consignor's invoice is entered on the pen sheet. This sheet has a complete listing of information regarding the pigs in that particular pen (Figure 1).

Selling of Pigs

The sale order is determined to a large extent by what is the most convenient way of moving the pigs between the pen and the sale ring. However, the first few pens sold are some of the higher grading, more uniform pigs. This tends to set a price pattern for the sale and is generally believed to improve the overall price of the sale as to compared to what might result if the sale were started with lower grading, less uniform pigs. The pen sheets are arranged according to the sale order and taken to the sale ring as a pen is sold. The price is recorded on the pen sheet, and the sheet is returned to the sale office for necessary calculation and payment to consignors. Pigs are sold by the pound rather than by the head.

WEAKLEY COUNTY FEEDER PIG SALE
DRESDEN, TENNESSEE

PEN NO. _____ GRADE _____ WEIGHT RANGE _____

Total No. Head	Total Wt. of Pen	Average Weight of Pen	Price/Wt.	Buyer Address

Consignor	No. Pigs	Weight	Total Amount Received

Figure 1. Example of the pen sheet used in the Weakley County, Feeder Pig Sales.

Analysis of Data

Since weights were not obtained on individual pigs and because pigs were penned in groups of varying size (number), depending upon grade and average weight, it was not feasible to include these factors in the analysis as continuous variables. Thus, the pen was used as the experimental unit in the analysis of the data.

For the purpose of this study, the following discrete pen weight (average) classification was used: 31 to 40 pounds, 41 to 50 pounds, 51 to 65 pounds and 66 or more pounds. A pen averaging less than 31 pounds was included in the 31 to 40 pound class.

The number of pigs sold in a particular pen was determined by the grade and weight classification. The sale pens varied in size from one to as many as 73 head. In order to evaluate the effect of number of pigs per pen on price, pen size was classified as follows: 1 to 15 head, 16 to 30 head, and 31 or more head. The pigs were classified according to the month they were sold in order to study any effect that this variable might have had upon the prices received.

The data were coded as needed and punched on IBM cards according to the foremat presented in Table I.

Because of disproportionate subclass frequencies, least-squares methods as described by Harvey (1960) were used in the analysis to obtain estimates of the effects of year, month of sale, grade, pen size and pen weight (average) on the price received per hundredweight for feeder pigs.

TABLE I

FORMAT USED FOR IBM CARDS

Data	Code	IBM Card Column Numbers
Pen no.	Use actual no.	1-2
No. pigs/pen	Use actual no.	3-4
Total wt./pen	Use actual weight	5-8
Av. wt./pig/pen	Use actual average	9-11
Grade of pigs (pen)		12-13
No. 1	01	
No. 2	02	
No. 3	03	
Pen size (no. of pigs/pen)		14-15
1-15 pigs	1	
16-30 pigs	2	
31+ pigs	3	
Pen weight (av. wt. of pigs/pen)		16-17
31-40 lb.	1	
14-50 lb.	2	
51-65 lb.	3	
66+ lb.	4	
Price/cwt./pen	Use actual price	18-21
Month of sale		22-23
January	1	
March	3	
May	5	
July	7	
September	9	
November	11	
Year of sale		24-25
1965	65	
1966	66	
1967	67	

The assumed model considered appropriate for the analysis was:

$Y_{ijklmn} = \mu + y_i + m_j + gk + p_l + w_m + e_{ijklmn}$ where:

Y = population mean price when equal numbers exist in all subclasses

Y_{ijklmn} = price per hundredweight for the n^{th} lot of pigs sold in the i^{th} year, the j^{th} month, the k^{th} grade, the l^{th} pen size and the m^{th} weight group.

i = 1, 2, 3 as follows:

1. 1965
2. 1966
3. 1967

j = 1, 2, 6 as follows:

1. January
2. March
3. May
4. July
5. September
6. November

k = 1, 2, 3 as follows:

1. Grade No. 1
2. Grade No. 2
3. Grade No. 3

l = 1, 2, 3 as follows:

1. 1-15 pigs per pen
2. 16-30 pigs per pen
3. 31+ pigs per pen

m = 1, 2, 3, 4 as follows:

1. 31-40 pounds
2. 41-50 pounds
3. 51-65 pounds
4. 66+ pounds

n = 1, 2, ..., n_{ijklmi}; n_{ijklm} = number of lots in the $ijklm^{th}$ group of lots

e_{ijklmn} = random error

The least-squares estimates of means were calculated to see if they were significantly different at the 1-percent level of probability according to the procedure outlined by Duncan (1955) and modified by Kramer (1967).

CHAPTER IV

RESULTS AND DISCUSSION

The least-squares estimates of the environmental effects on the price per hundredweight of feeder pigs are shown in Table II. The analysis of variance is presented in Table III.

Grade Effects

Grade of pig had a highly significant effect ($P < .01$) on the price received per hundredweight of feeder pigs. Number 1 pigs sold for an average of $2.46 per hundredweight more than pigs grading No. 3 and $0.66 per hundredweight more than the pigs grading No. 2. Number 3 pigs sold for $1.81 less per hundredweight than those grading No. 2.

As expected, No. 1 pigs were higher in price ($34.58 per hundredweight) than No. 2 pigs ($33.92 per hundredweight), and pigs that graded No. 2 brought more per hundredweight than those that graded No. 3 ($32.1 per hundredweight). The difference in price between the No. 1 and No. 2 grades was not nearly so marked as the price differential between the No. 2 and No. 3 grades.

Pen Size

The estimates of differences in price per hundredweight due to variation in pen size (number of pigs in the pen) indicate a definite price advantage for selling feeder pigs in larger lots. Pigs penned in lots of 1 to 15 and 16 to 30 averaged less in price than the other

TABLE II

LEAST-SQUARES ESTIMATES[1] OF THE EFFECTS STUDIED

Variable	No. of pens	Average Price Received Per Hundredweight
Grade		
No. 1	91	1.040[a]
No. 2	320	0.384[a]
No. 3	244	-1.424[b]
Pen size (no. of pigs per pen)		
1-15 pigs	156	-1.552[a]
16-30 pigs	229	- .079[a]
31-73 pigs	270	1.631[b]
Pen weight (average)		
31-40 pounds	103	6.193[a]
41-50 pounds	100	1.309[b]
51-65 pounds	131	-1.303[c]
66-137 pounds	321	-6.199[d]
Month of sale		
January	87	-2.052[a,b]
March	74	2.840[c]
May	129	0.123[b]
July	124	- .370[a]
September	106	4.027[c]
November	135	-4.567[d]
Year		
1965	140	- .698[a]
1966	248	3.325[b]
1967	267	-2.627[c]

[1]Estimates are deviations from the overall adjusted mean when equal numbers exist per subclass. The overall arithmetic mean of average price per hundredweight was $33.54.

[a,b,c,d]Least squares estimates within a column and within subclass followed by the same letter do not differ significantly from one another. All others differ significantly ($P < .01$).

TABLE III

ANALYSIS OF VARIANCE OF PRICE RECEIVED

Source	Degrees of Freedom	Mean Squares
Grade	2	267.744**
Pen size (no. of pigs per pen)	2	385.123**
Pen weight (average)	3	3961.085**
Month of sale	5	1056.545**
Year of sale	2	2286.484**
Error	640	38.147

**P < .01.

pen-size classification based on the number of animals in the pen. Pigs selling in lots of 31 and more averaged higher in price than those of any other pen-size classification and sold for $3.18 more per hundredweight than those in pens of 1 to 15 head ($P < .01$). These data indicate the desirability of pooling feeder pigs so that they can be sold in uniform lots of 31 or more head per pen.

Other workers, including Haas and Stevens (1962), O'Neal (1964) and Waddell (1965), also have reported advantages for selling pigs in larger lots.

Pen Weight

Pigs in pens averaging 31 to 40 pounds in weight sold for the highest price ($39.73 per hundredweight), while pigs in pens averaging 66 pounds or more sold for the lowest price ($27.34). The difference in price per hundredweight of $12.39 between those two weight groups was highly significant. These data indicate that prices decreased in a linear manner from the 31- to the 40-pound weight class to the 66-pound or more class.

These results indicate that a 31-40 pound pig is the first preference of the feeder pig buyer and a 41-50 pound pig is the second preference.

Month of Sale

These data indicate that month of sale had a highly significant effect ($P < .01$) on price received per hundredweight of feeder pigs. The price received for pigs in September, on the average, was highest ($37.07 per hundredweight) while the lowest prices were received in

November ($28.97 per hundredweight).

These findings are not in agreement with those reported by Waddell (1965), who reported that prices of pigs sold in April were significantly higher ($P < .01$) than pigs sold in any other month.

Year

As expected, there were highly significant differences among years in prices received from feeder pigs per hundredweight. Least-squares estimates of prices were $32.84, $36.87 and $30.91 for 1965, 1966, and 1967, respectively. These differences are largely due to adjustments to supply and demand as influenced by market price, including both current price and price expected when the feeder pigs are finished for market.

CHAPTER V

SUMMARY AND CONCLUSIONS

Records of 655 pens of pigs sold in 18 sales held every other month (January, March, May, July, September and November) from 1965 through 1967 were studied to determine the effects of grade, weight, pen size, month, and year on the average price of feeder pigs sold in the Weakley County, Feeder Pig Sales at Dresden, Tennessee. The data were analyzed by least-squares methods.

Differences in price among grades of feeder pigs were statistically significant. Pigs grading No. 1 averaged $0.66 more per hundredweight than those grading No. 2 and $2.46 more than pigs which graded No. 3. Pigs grading No. 2 averaged $1.81 more than pigs grading No. 3.

There was a significant difference ($P < .01$) in the price paid for pigs in larger lots as compared to pigs in smaller lots. Pigs in pens of 1-15 and 16-30 sold for significantly ($P < .01$) less than pigs in pens of 31 or more. Least-squares analysis showed that prices of pigs in pens of 1-15 and 16-30 were similar, and the difference was not significant.

Pigs weighing 31-40 pounds averaged higher in price per hundredweight than any of the other weight classes. In general, the heavier the weight class, the lower the price received per hundredweight. Pigs in pens averaging 31-40 pounds sold for $39.73 per hundredweight as compared with $27.34 for pigs weighing 66 pounds or more with a difference

of $12.39 ($P < .01$). Differences among all other weight classes also were highly significant.

Differences in prices among months were highly significant, with highest average prices being paid in September and lowest in November. The differences in price of pigs between these months was $8.60. Year differences, as expected, accounted for a large portion of the price variation and were highly significant ($P < .01$).

The results of this study indicate the importance of having a sufficient volume of pigs so that pigs can be penned and sold in large lots of the desired weight and grade.

LITERATURE CITED

LITERATURE CITED

Barnhart, C. E. 1957. The Feeder Pig Enterprise in Kentucky. Ky. Agr. Ext. Circ. 549.

Duncan, D. B. 1955. Multiple Range and Multiple F-Tests. Biometrics 11:1.

Haas, J. T. and I. M. Stevens. 1962. Feeder Pig Pooling-Improve Marketing Through Grading and Commingling. U.S.D.A. Marketing Res. Report 566:1-59.

Harvey, W. R. 1960. Least Squares Analysis of Data with Unequal Subclass Numbers. U.S.D.A. Agr. Res. Service Bul. ARS-20-8.

Kramer, C. Y. 1957. Extension of Multiple Range to Group Correlated Adjusted Means. Biometrics 13:13-18.

O'Neal, James G. 1964. A Study of the Development, Organization and Operation of Demonstration Feeder Pig Sales in Sevier County, Tennessee, from 1961 through 1963. Special Problem in Lieu of Thesis, University of Tennessee Agriculture Library.

Powell, Fred and Joe W. Houston. 1962. Tennessee Feeder Pigs. Tenn. Agr. Ext. Service Bul. 453.

Rudd, Robert. 1953. At What Weights Should I Market My Feeder Pigs? Ky. Agr. Exp. Sta. Bul. 515.

Sewell, Homer B. 1962. Marketing Feeder Pigs. Mo. Agr. Exp. Service Mimeo., 1962.

Waddell, Robert D. 1965. Effects of Various Factors on Prices of Pigs in the Cookeville, Tennessee, Feeder Pig Sales. Master's thesis. University of Tennessee, Knoxville, Tennessee.

VITA

James Richard McFall was born on August 24, 1925 in Hardin County, Savannah, Tennessee. He was educated in the elementary and secondary schools of Hardin County, and was graduated from Central High School, Savannah in May 1943.

In November of 1943 he entered the United States Navy and served in the South Pacific until May, 1946.

Having been reared on a livestock and cattle farm, he enrolled in the study of agriculture at the University of Tennessee Junior College at Martin, Tennessee, for the summer quarter of 1946.

In January, 1948, he was employed by the Hardin County Board of Education as an instructor for its Veterans on the Farm Training Program and worked in this program until June, 1951.

In the fall of 1951 he enrolled at the University of Tennessee at Knoxville in agriculture and in the study of Animal Husbandry. He received his B.S. degree in June, 1953.

In June, 1953, he joined the staff of the Agricultural Extension Service, University of Tennessee, as Assistant County Agent. He served Weakley County in this capacity until May, 1968, at which time he was promoted to County Agent of the same county and is currently serving in the same capacity.

He is enrolled in the University of Tennessee Graduate School studying toward a Master's degree in Animal Husbandry which he expects to receive in the graduation exercise in March, 1969.

He was married in 1950 to the former Miss Freda Kate Stricklin, also of Savannah. They are the parents of two children; Martha Elizabeth, born in 1954, and James Richard, Jr., born in 1957.