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I am submitting herewith a thesis written by Jack C. McDaniel entitled "Effects of Selected Variables on the Prices Received for Feeder Pigs in the Carthage Feeder Pig Sales." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Animal Science.

Haley M. Jamison, Major Professor

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

A Thesis

Presented for the

Master of Science

Degree

The University of Tennessee

Jack C. McDaniel

March 1975

ACKNOWLEDGEMENTS

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

Dr. Haley M. Jamison, Major Professor and thesis advisor, for his invaluable assistance, patience, and counseling during the entire course of graduate study and for his untiring efforts with the statistical analysis, interpretation of data, and for reviewing the manuscript.

Dr. Robert S. Dotson and Dr. William R. Backus for serving on the graduate committee with Dr. Jamison, and for their counsel, cooperation and for reviewing the manuscript.

Dr. Webster Pendergrass, Vice President, Institute of Agriculture, The University of Tennessee; Dr. William D. Bishop, Dean, Agricultural Extension Service, The University of Tennessee; Supervisors, A. C. Clark and Dr. Rural A. Peace, for making this study possible by granting educational leave.

To the entire Animal Science Department, secretaries, and fellow students, A. Hayden Brown, Jr., Lacy Upchurch, Earl Law and Julius Johnson, whose associations have made this graduate study a more pleasant and rewarding experience.

To the Extension Staff and County Agricultural Committee in Smith County for their cooperation during this period of graduate study.

To his wife, Anna, for her encouragement, understanding, patience and assistance in making this study possible.

The author acknowledges the use of The University of Tennessee Computing Center, Knoxville, Tennessee, in obtaining the results shown in this thesis.

ABSTRACT

Records from 4,362 pens (250,625 pigs) sold in the Carthage feeder pig sales from 1969 through 1973 were studied to evaluate the effects of grade, average weight per pen, pen size, month and year of sale on the average price received per hundredweight and per head for feeder pigs.

The data in Analyses I and II were for the period February, 1969 through September, 1970, in which average weight per pen was 53.05 pounds, average number of pigs per pen was 37.38, with average prices per hundredweight and per head of $40.69 and $20.80, respectively.

The data in Analyses III and IV were for the period October, 1970 through October, 1973, in which average weight per pen was 52.95 pounds, average number of pigs per pen was 51.90, with an average price per hundredweight and per head of $44.64 and $21.21, respectively.

This study revealed that year of sale had a significant effect on the price received per hundredweight and per head for feeder pigs. As would be expected, the sources of variation of year of sale are fixed and environmental effects did exist.

Grade of pig had a highly significant effect on both of the dependent variables, prices received per hundredweight and the price received per head in all analyses. In Analysis I, grade 1 pigs sold for $10.39 per hundredweight and $5.24 per head more than pigs grading 4, and $4.24 per hundredweight and $2.49 per head more than pigs grading 3. Grade 2 pigs sold for $2.03 less per hundredweight and

$1.23 less per head than pigs grading 1; whereas in Analysis II, the differences among grades both from the standpoint of price received per hundredweight and price received per head were in the same degree of magnitude. Pigs grading 1 compared to those grading 4 returned to the producers $10.67 more per hundredweight and $5.43 more per head.

In Analysis III, grades 1 and 2 pigs were combined and sold for $6.85 more per hundredweight and $3.60 more per head than did those grading 4.

In Analysis IV, pigs grading 1 and 2 were combined and sold for $6.96 more per hundredweight and $3.71 more per head than those pigs grading 4.

Month of sale had a highly significant effect on price received per hundredweight and per head. In Analyses I and II, pigs sold in December brought significantly more per hundredweight and per head than did pigs sold in any other month of the year. In Analyses III and IV, pigs sold in April brought more per hundredweight and more per head than any other month of the year.

Pigs sold for less in April in Analysis I and pigs sold for less in January in Analyses II, III, and IV, than any other month of the year.

Pen size did not have a significant effect on prices received for feeder pigs in any analyses. In Analysis I, pigs in pen sizes of 261 - 270 sold for more per hundredweight and per head than did pigs in any other category; whereas in Analysis III, pigs in pens of 351 - 360 sold for more per hundredweight than did pigs in any other pen size.

Differences in average weight per pen were highly significant sources of variation in prices received in all analyses. When the

price received per hundredweight was regressed on average weight per pen in Analyses I, II, III and IV with all other sources of variation held constant, these data indicate in all analyses that as average weight per pen increases, the price per hundredweight decreases.

When average price received per hundredweight and average price received per head was regressed on average number of pigs per pen, a significant difference did not exist.

When the average price received per head was regressed on average weight per pen, these data indicate that, as average weight per pen increased, so did average price per head received. These data indicate that, although lightweight pigs sell for more per hundredweight than heavy pigs, the price per head increases about $0.14. Thus, according to these data selling lightweight pigs is undesirable provided the cost of gain is less than $0.14 per pound.

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CHAPTER I

INTRODUCTION

Before the Carthage feeder pig sales, farmers in Smith and neighboring Middle Tennessee counties were at the clemancy of the pig buyer who traveled from farm to farm or at the regular livestock auction market.

The Smith County area is well adapted for feeder pig production; however, most producers do not produce enough pigs to attract individual buyers. Hence, there was a need for an organized sale where producers are able to market larger pens of pigs which are uniform in size and quality.

Smith County Agricultural Agent, Edward Ward Copeland, and the livestock associations of Smith, Macon and Trousdale Counties initiated and organized the Carthage Feeder Pig Sales. The first sale was held August 20th, 1964 at the Smith County Commission Company with 374 head of pigs sold that averaged 61 pounds and sold for $20.28 per hundredweight.

Farm income from feeder pigs sold in the Carthage Feeder Pig Sales has increased from $14,982.11 in 1964 to $1,791,043.68 in 1973 while the number of head sold increased from 1,316 in 1964 to 56,620 in 1973.

Due to the need created by the ever expanding feeder pig production in the area, the number of sales per month increased. From 1964

through 1966, sales were held monthly; bimonthly from 1969 through 1968; and weekly since 1969.

Since the beginning of these sales, no organized statistical analysis has been made of the effects of various factors on the price producers received for their pigs sold in the Carthage feeder pig sales. The objective of this study was to evaluate the effects of: grade, weight, pen size, month and year on the price received per hundredweight and per head in the Carthage feeder pig sales from 1969 through 1973.

It is hoped that the findings from this study will prove beneficial to farmers in Tennessee in planning their feeder pig production and marketing program, and that the conclusions drawn will be helpful to the feeder pig producers and sale managers in the continued effort to improve the feeder pig sales throughout Tennessee.

CHAPTER II

REVIEW OF LITERATURE

There have been few published reports dealing with the effects of grade and average pen weight on the price received for feeder pigs in organized sales. Much of the information available is found in general survey and not many critical analyses of data have been made.

The grade (USDA 1970) of a feeder pig is determined by evaluating its logical slaughter potential and its thriftiness. The logical slaughter potential of a thrifty feeder pig is its expected slaughter grade at a market weight of 220 pounds after a normal feeding period.

Barnhart et al. (1957) reported that the price producers receive for feeder pigs follows closely the price received for slaughter hogs. Buyers are willing to pay for feeder pigs according to what they expect to receive for those pigs as slaughter hogs and the price of hogs relative to the price of corn or the number of bushels of corn required to equal in value one hundred pounds of live hog. Feeder pigs will usually sell for a premium above slaughter price if the corn-hog ratio is favorable or will be discounted should the ratio be unfavorable.

A study of feeder pig sales held in Sevierville, Tennessee, by O'Neal (1964) indicated that if feeder pig sales are to remain successful, a steady volume of high quality meat type pigs that exceed 45 pounds must be maintained. This study revealed the buyer's willingness to buy high quality uniform pens of pigs weighing 45 - 65 pounds.

The number of organized feeder pig sales in Tennessee has grown until Tennessee is among the leading states in the feeder pig business. Sewell (1962) reported that, in the Missouri marketing cooperatives where feeder pigs were delivered to feeders, the first preference was for pigs weighing 40 - 50 pounds. The Missouri feeder pig sales were accepting pigs up to 100 pounds.

Powell and Houston (1962) revealed that in recent years, as high as one-third of Tennessee's pig crop has been sold as feeder pigs. These were pigs purchased for feeding to slaughter weight by Tennessee swine feeders and order buyers or out-of-town state feeders. As far as profits are concerned, according to Powell and Houston, the best weight to sell was 40-50 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.

Pigs in pens averaging 31 - 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 $16.00 per hundredweight between the two weight groups, which was highly significant ($P < .01$). It was found also that prices decreased in a linear fashion from the 31 - 40 pounds weight class to the class including weights of 66 pounds and more. Results from this study indicated 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.

Hicks (1972) reported that Tennessee producers made considerable progress in terms of producing a higher percentage of grade 1 and 2 feeder pigs, while grade 3 was steady and grade 4 and other percentages declined. He stated that the spread in price per hundredweight received for grade 1 and 2 and grade 4 feeder pigs was much greater in all weight ranges than it had been in the past, thus indicating that feeder pig buyers are becoming more quality conscious. As in the past, the price per hundredweight received showed a definite advantage for carrying feeder pigs to 45 pounds, and a disadvantage for carrying pigs to 55 pounds.

McFall (1969) found in a study of the Weakley County, Tennessee, pig sales that grade had a highly significant effect on price received for feeder pigs. The grade 1 pigs sold for an average of $0.66 per hundredweight more than grade 2 pigs and $2.46 more than grade 3 pigs. The grade 2 pigs sold for an average of $1.81 per hundredweight more than the grade 3 pigs. Grade 1 pigs sold for more ($34.58 per hundredweight) than grade 2 pigs ($33.92 per hundredweight), and grade 2 sold for more per hundredweight than grade 3 pigs ($32.10 per hundredweight). The difference in price between grade 1 and grade 2 was not nearly so marked as the price differential between grade 2 and grade 3 pigs. Thirty-one to 41 pound pigs 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. This data indicated that prices decreased in a linear manner from the 31- to the 40-pound weight class to the 66-pound or more class. His results indicated that a 31-40 pound feeder pig is the first preference of the feeder pig buyer and a 41-50 pound pig is the second preference.

Donaldson (1970) reported in a study of the Cookeville, Tennessee, feeder pig sales that grade of feeder pigs has a significant effect on the price received per hundredweight as well as price per head. His study indicated that from 1964 through 1965, with average weight per pen as a continuous independent variable, grade 1 pigs sold for $2.43 more per hundredweight and $1.41 per head than grade 3 pigs and $0.59 more per hundredweight and $0.52 more per head than grade 2 pigs. Grade 2 pigs sold for $1.83 more per hundredweight and $0.89 more per head than grade 3 pigs. When grade 1 and 2 were combined (July 1, 1965-December, 1967) with same continuous independent variables, grade 1 and 2 combined sold for $2.80 more per hundredweight and $1.78 more per head than grade 4 pigs. Grade 3 pigs sold for $1.75 more per hundredweight and $1.05 more per head than grade 4 pigs. Donaldson's study indicated that as average weight per pen increased, the price per hundredweight decreased. This reflects the buyers' willingness to pay more per hundredweight for light weight pigs than for heavier pigs. One can conclude from these data that selling light weight pigs is highly undesirable provided cost gain is less than $0.16 per pound.

Finch (1972) tabulated grades, weights and prices for 16,860 pigs at a Texas cooperative feeder pig sale and found that grade 1 pigs

averaged 56 pounds and sold for $32.02 per hundredweight, grade 2 averaged 52 pounds and sold for $28.40 per hundredweight, and grade 3 averaged 48 pounds and sold for $20.91 per hundredweight. Grade 1 pigs sold for $3.62 more per hundredweight than grade 2 and grade 3 sold for $7.49 less than grade 2 pigs.

Sharp (1974) stated that grade of pig had a highly significant effect on price per hundredweight and per head received for feeder pigs in the Sevierville, Tennessee, feeder pig sales. From May, 1961 through March, 1970, where average weight per pen was a continuous independent variable, grade 1 pigs sold for $1.26 more per hundredweight and $0.93 per head more than grade 2 pigs; $2.99 per hundredweight and $1.47 per head more than grade 3 pigs and $5.29 per hundredweight and $2.73 per head more than grade 4 pigs. Grades 1 and 2 were combined after April, 1970 and also proved that grade had significant effect on prices received for feeder pigs. Grades 1 and 2 combined sold for $1.72 more per hundredweight and $0.85 more per head than grade 3; $5.71 more per hundredweight and $2.33 more per head than grade 4 and $9.73 more per hundredweight and $4.16 more per head than grade 5. Sharp (1974) also found that average weight per pen had a significant effect on feeder pig prices. As average weight per pen increased, the price per hundredweight decreased. When price per head was regressed on average pen weight, or average pen weight increased, so did average price per head. For every pound increase in average weight, price per head increased $0.18. He concluded that selling light weight pigs is undesirable, provided the cost gain is less than $0.18 per pound.

The leaner, grade 1 and 2 and grade 3 feeder pigs were more efficient feed converters than the fatter grade 4 pigs according to Tracy (1972). This was concluded in a study of performance of feeder pigs of various grades at the Lawrence County, Tennessee, feeder pig sales. Grade 1 and 2 feeder pigs combined produced carcasses that were leaner ($P < .05$), more muscular ($P < .01$) and graded higher than grade 3 and 4. Also the feed costs were slightly higher per unit of gain for the grade 4 feeder pig than grades 1, 2 and 3.

Waddell (1965) found that difference in price per hundredweight associated with difference 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 - 15 averaged less in price than those sold in any other pen size. Pigs selling in lots of 16 - 30 head averaged higher than those of any other grouping and sold for $0.75 more per hundredweight than those in pens of 1 - 15 ($P < .01$).

There is a significant difference ($P < .01$) according to McFall (1969) in the price paid for pigs in larger lots as compated to smaller lots. Pigs in pens of 1 - 15 and 16 - 30 sold significantly ($P < .01$) less than pigs in pens of 31 or more.

Donaldson (1970) reported that prices received from pigs in September (Analyses I and II) were the highest; whereas in Analyses III and IV, prices were highest in February and March. January prices were lowest in Analyses I and II, while November prices were lowest in Analyses III and IV.

CHAPTER III

EXPERIMENTAL PROCEDURE

I. SOURCE OF DATA

Records were available from the Carthage Feeder Pig Sales from the beginning of the sales in 1964. However, the data from February 1969 through September 1973 were analyzed in this study. During this period, sales were held each week.

A total of 4,362 pens of pigs (250,625) of varying weight and grades were used to determine the effect of average pen weight and grade on prices received in the sales.

II. RULES AND REGULATIONS OF THE CARTHAGE FEEDER PIG SALES

The following rules and regulations are applicable to all sales that are held:

1. All consignors must be member of Smith County Livestock Association.

2. All pigs must be healthy and raised on farm of consignor.

3. Pigs will be accepted at weights from 30-90 pounds. Forty to 60 pounds are recommended.

4. All breeds of hogs and crossbreeds will be accepted.

5. All male pigs must be castrated and clear by sale time.

6. The Sales Committee will inspect all pigs upon arrival at

sale. Only pigs complying with the rules and regulations will be accepted.

7. Pigs will be sorted, weighed, penned and sold in uniform groups.

8. Pigs will not be accepted from anyone that buys or deals in feeder pigs.

9. Each producer must obtain a marketing card.

10. The marketing card cannot be loaned to other producers.

III. CONSIGNMENT PROCEDURE

When a feeder pig producer decides to market pigs through the Carthage feeder pig sales, he must obtain a marketing card from his county Agricultural Extension office. This certifies that he is a bona fide pig producer in his county. The marketing card is good for one year and is renewable each year. He must present this card to the sales committee representative each time he markets pigs.

IV. INSPECTION

The only inspection made of the feeder pigs is by the sales committee at the auction. The sales committee checks for indications of disease and other abnormalities. The producer must present a valid marketing card at the time the inspection is made.

V. PIG IDENTIFICATION

All pigs at the Carthage sale are identified by numbered ear tags

at the unloading dock. The ear tag numbers are recorded on a receiving ticket with the producer's name and address. A record is kept of the ear tag numbers and producer by the Agricultural Extension office and the State Department of Agriculture.

VI. GRADES AND GRADING

The pigs at the Carthage sale are sorted by weight and graded by an official of the Tennessee Department of Agriculture. Pigs are graded according to the following criteria:

1. Grade 1: Lengthly, well-muscled, large frame with width between legs, trim, in a very thrifty condition. These pigs should feed out as U.S. No. 1 market hogs.

2. Grade 2: Moderate in length and frame, having moderately thick muscling evident in the hams and shoulders. These should feed out as U.S. No. 2 market hogs.

3. Grade 3: Slightly short in length with small frame with legs set fairly close; slightly thin muscling throughout as evident in these and flat hams and shoulders. These pigs should feed out as U.S. No. 3.

4. Grade 4: Short in length with thin muscling throughout and small frame. The hams are thin and rather flat, particularly in the lower parts toward the shanks with legs being very close together due to thin muscling. These pigs should feed out as U.S. No. 4.

5. Grade 5: For the purpose of this study, a grade 5 pig is one marketed with grades 1 and 2 mixed.

VII. WEIGHING OF PIGS

After the pigs are graded and sorted into uniform groups according to size, each group is weighed. A weight ticket is filled out and a copy given to the consignor. The weight ticket lists the number of pigs, grade, total weight and the pen number of each group.

VIII. PENNING OF PIGS

As each group of pigs is weighed, they are penned according to grade and the average weight of the group. The carbon copy of the weight ticket is sent to the commission company office. The information is then recorded on the pen sheet which has a complete listing of the information concerning each consignor's pigs in that pen.

IX. SELLING OF PIGS

The sale order is determined by the manager of the commission company. The first few pens sold are some of the higher grading uniform pigs. This, it is believed, tends to set the price pattern for the sale which is generally assumed to enhance the overall price received in the remaining pens. The remaining pens are sold in order by grade and weight from highest grade and lowest weight to lowest grade and highest weight. The pen sheets are arranged according to the sale order. Pigs are sold to highest bidder. The price per hundredweight is recorded on pen sheet along with buyer's name and returned to commission company office for calculations for payment by the buyer and payment to consignor.

X. CLASSIFICATION OF DATA AND METHOD OF ANALYSIS

Since weights were not obtained on individual pigs 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 analyses. Thus, the pen was used as the experimental unit in the analyses of the data.

Pen summary sheets, which included grade, pen size, average weight, month, year, selling price per hundredweight and selling price per head were available for all of the pigs used in this study. The data were taken directly from these sheets, coded and punched into IBM cards according to the format as presented in Table XXI, Appendix.

From February, 1969 through September, 1970, inclusive, the pigs were graded into four grades and sold in four grades; whereas, from October, 1970 through October, 1973, the pigs were sorted into five grades; thus grades 1 and 2 were combined on occasion and sold as one grade. Thus, it was necessary that the data from the two periods be analyzed separately.

For the purpose of this study, the following ten discrete pen weight (average) classifications were used: 25 - 30 pounds, 31 - 35 pounds, 36 - 40 pounds, 41 - 45 pounds, 46 - 50 pounds, etc., in 10-pound increments up to and including 100 pounds.

The number of pigs sold in a particular pen (pen size) was determined by the grade and weight classification. The sale pens varied from 1 to as many as 360 head. In order to obtain a more realistic estimate of pen-size effects, the data were divided into 31

discrete classes with respect to pen size. The discrete classes represented pen size in increments of 10 animals. The pigs were classified according to the month during which they were sold in order to study any effects that this variable might have had upon the price received.

Because of disproportionate subclass frequencies, least-squares methods, as described by Harvey (1960), were used in the analyses to obtain estimates of the effects of grade, year, month, pen size and the continuous variable of average weight per pen on the price received per hundredweight and price received per head for feeder pigs. In Analyses II and IV, pen size was deleted as a discrete variable and the average number of pigs per pen was used as a continuous variable.

It was believed that two analyses, one with number of head per pen as a discrete variable and pen weight (average) as a continuous variable and another analysis with number of head per pen as well as pen weight as continuous variables, would be helpful in gaining insight into the way in which pen size and pen weight affect price.

The assumed models considered appropriate for the analyses were:

$$Y_{ijklm} = a + y_i + g_j + m_k + p_l + b_1 (W_{ijkl_m} - \bar{W}) + e_{ijklm}$$

$$Y_{ijklm} = a + y_i + g_j + m_k + b_1 (W_{ijkl_m} - \bar{W}) + b_2 (P_{ijk} - \bar{P}) + e_{ijkl_m}$$

Y_{ijklm} = the average price per hundredweight and the average price per head received for pigs sold in the i^{th} year, the j^{th} grade, the k^{th} month, and l^{th} pen size.

y_i = effect of the i^{th} year.

i = 1, 2, 3, 4, 5 as follows:

1. 1969
2. 1970
3. 1971
4. 1972
5. 1973

g_j = effect of the j^{th} grade.

j = 1, 2, 3, 4, 5 as follows:

1. Grade 1
2. Grade 2
3. Grade 3
4. Grade 4
5. Grade 1 and 2 (in second model)

m_k = effect of k^{th} month.

k = 1, 2, . . . , 12 as follows:

1. January
2. February
3. March
4. April
5. May
6. June
7. July
8. August
9. September
10. October
11. November
12. December

p_l = effect of l^{th} pen size.

l = 1, 2, . . . , 31 as follows:

1. 1-10 pigs per pen
2. 11-20 pigs per pen
3. 21-30 pigs per pen
4. 31-40 pigs per pen
5. 41-50 pigs per pen
6. 51-60 pigs per pen
7. 61-70 pigs per pen
8. 71-80 pigs per pen
9. 81-90 pigs per pen
10. 91-100 pigs per pen
11. 101-110 pigs per pen
12. 111-120 pigs per pen
13. 121-130 pigs per pen
14. 131-140 pigs per pen
15. 141-150 pigs per pen
16. 151-160 pigs per pen
17. 161-170 pigs per pen
18. 171-180 pigs per pen
19. 181-190 pigs per pen
20. 191-200 pigs per pen
21. 201-210 pigs per pen
22. 211-220 pigs per pen
23. 221-230 pigs per pen

24. 231-240 pigs per pen

25. 241-250 pigs per pen

26. 261-270 pigs per pen

27. 271-280 pigs per pen

28. 301-310 pigs per pen

29. 321-330 pigs per pen

30. 341-350 pigs per pen

31. 351-360 pigs per pen

$b_1(W_{ijkl_m}-\bar{W})$ = term for partial regression of Y on average weight per pen.

$b_2 (P_{ijk}-\bar{P})$ = term for partial regression of Y on average number of pigs per pen.

e_{ijklm} = random error.

CHAPTER IV

RESULTS AND DISCUSSION

The purpose of this study was to obtain an estimate of the value of the selling of feeder pigs, measured by price received per hundredweight as well as price per head, with as many sources of environmental variation as possible being removed.

No attempt was made to separate means within a subclass when three or more levels of effects were removed.

For convenience of discussion, the analysis of data collected from February, 1969 through September, 1970, inclusive, with average weight per pen as a continuous independent variable will be referred to as Analysis I.

The analysis of the data collected during the same period, analyzed with both average pen size and average weight per pen as continuous independent variables will henceforth be referred to as Analysis II.

Analysis III is the analysis of the data collected from October, 1970 through October, 1973 (in which grades 1 and 2 were combined and the new grade 5 added) with the same continuous independent variable (average weight per pen) as Analysis I.

Analysis IV is an analysis of the same data analyzed in Analysis III but with both average weight per pen and average pen size as continuous independent variables.

The least squares estimates and their standard deviation of

means of the environmental effects (Tables I, VI, XI, and XVI) on price per hundredweight and price per head of feeder pigs from Analyses I, II, III, and IV are presented in Tables II, VII, XII, and XVII; and the corresponding analyses of variance are presented in Tables II, VII, XII, and XVII, respectively.

The least squares means for year effect adjusted for grade, month of sale, number of pigs per pen and average weight per pen are presented in Tables III, VIII, XIII, and XVIII. The least squares means for the grade effects, adjusted for year, month of sale, and the average weight per pen for Analyses I, II, III, and IV are presented in Tables IV, IX, XIV, and XIX, respectively.

Finally, the least squares means for month of sale, adjusted for grade, year, number of pigs per pen and average weight per pen for Analyses I, II, III, and IV are presented in Tables V, X, XV, and XX, respectively.

The R^2 values as shown in Tables II, VII, XII, and XVII for Analyses I, II, III, and IV, respectively, represent the fraction of the variation attributable to the independent variables after variation due to previously included fixed environmental effects had been considered.

I. YEAR-OF-SALE EFFECTS

As expected, there were highly significant ($P < .01$) differences among years in prices received for feeder pigs per hundredweight and per head in all analyses. These differences are due largely to yearly

TABLE I

LEAST-SQUARES ESTIMATES[a] AND STANDARD ERROR--
OF THE PRICE RECEIVED--ANALYSIS I

Variable	Average Price Received Per CWT	Average Price Received Per Head
Intercept	71.16 ± .82	16.66 ± .41
Year		
1969	-10.73 ± .34	-5.20 ± .17
1970	10.73 ± .34	5.20 ± .17
Grade		
1	4.19 ± .67	2.24 ± .34
2	2.16 ± .30	1.01 ± .15
3	-0.05 ± .30	-0.25 ± .15
4	-6.30 ± .40	-3.00 ± .15
Month		
January	-9.92 ± .69	-4.80 ± .34
February	-2.81 ± .63	-1.16 ± .31
March	-13.23 ± .46	-0.91 ± .22
April	-15.78 ± .51	-0.65 ± .25
May	-14.66 ± .44	-0.69 ± .22
June	-2.53 ± .50	-1.34 ± .25
July	-1.12 ± .44	-0.54 ± .22
August	5.42 ± .50	2.66 ± .25
September	5.07 ± .50	2.60 ± .25
October	3.33 ± .44	1.63 ± .22
November	0.81 ± .58	0.32 ± .29
December	45.42 ± .50	2.88 ± .22
Pen Size		
1-10	-0.96 ± .65	-0.92 ± .32
11-20	-0.40 ± .64	0.07 ± .32
21-30	-0.06 ± .65	0.27 ± .33
31-40	0.03 ± .65	-0.01 ± .33
41-50	-0.47 ± .71	-0.13 ± .36
51-60	0.30 ± .71	0.07 ± .36
61-70	-0.99 ± .85	-0.32 ± .42
71-80	0.30 ± .83	-0.04 ± .42
81-90	-0.32 ± .94	0.05 ± .47
91-100	0.37 ±1.06	0.13 ± .53

TABLE I (Cont'd)

Variable	Average Price Received Per CWT	Average Price Received Per Head
101-110	-0.19 ± .99	0.16 ± .49
111-120	-0.23 ±1.04	-0.06 ± .52
121-130	1.14 ±1.23	0.72 ± .61
131-140	0.40 ±1.46	-0.02 ± .73
141-150	1.91 ±1.40	0.46 ± .70
151-160	8.50 ±2.57	1.57 ±1.28
161-170	-2.49 ±3.11	-0.46 ±1.56
171-180	0.88 ±3.11	0.92 ±1.56
181-190	0.04 ±2.24	0.25 ±1.12
191-200	-3.00 ±4.37	-1.17 ±2.19
201-210	-0.25 ±4.37	0.03 ±2.19
211-220	2.65 ±4.38	0.09 ±2.19
221-230	-3.12 ±3.11	-1.12 ±1.56
231-240	-14.66 ±5.38	0.38 ±2.19
261-270	10.62 ±2.61	-0.92 ±1.47
Regression of Y on:		
Avg. wt./pen	-0.44352	0.14444

[a]Estimates are deviations from the overall adjusted means when unequal numbers exist per subclass. The overall arithmetic mean of price per hundredweight and price per head was $40.69 and $20.80, respectively.

TABLE II

ANALYSIS OF VARIANCE OF PRICES RECEIVED--
ANALYSIS I

Source	Degrees of Freedom	Mean Square: Average Price Per CWT	Mean Square: Average Price Per Head
Year of Sale	1	20614.106*	4842.106*
Grade of Pig	3	2997.542*	686.273*
Month of Sale	11	1113.109*	263.773*
Pen Size	24	20.023	7.255
Regression of Y on: Avg. wt./pen	1	22544.420*	2391.047*
Residual	1080	20.325	5.091
R^2		0.835	0.789

*P < .01.

TABLE III

LEAST-SQUARES MEANS ADJUSTED FOR GRADE, MONTH, PEN SIZE AND AVERAGE WEIGHT PER PEN-- ANALYSIS I

Source	No. of Observations	Mean Price Per Head	Mean Price Per CWT
1969	862	$19.12	$36.90
1970	259	29.52	58.37

TABLE IV

LEAST-SQUARES MEANS ADJUSTED FOR YEAR, MONTH, PEN SIZE AND AVERAGE WEIGHT PER PEN-- ANALYSIS I

Source	No. of Observations	Mean Price Per Head	Mean Price Per CWT
Grade			
1	27	$26.56	$51.82
2	486	25.33	49.79
3	350	24.07	47.59
4	258	21.32	41.34

TABLE V

LEAST-SQUARES MEANS ADJUSTED FOR GRADE, YEAR, PEN SIZE AND AVERAGE WEIGHT PER PEN-- ANALYSIS I

Source	No. of Observations	Mean Price Per Head	Mean Price Per CWT
Month			
January	108	$19.52	$37.71
February	88	23.16	44.83
March	136	23.41	46.31
April	80	23.67	46.06
May	115	23.63	46.17
June	80	22.98	45.11
July	111	23.78	46.51
August	80	26.99	53.06
September	81	26.92	52.70
October	114	25.96	50.96
November	60	24.65	48.44
December	68	27.20	53.77

TABLE VI

LEAST-SQUARES ESTIMATES[a] AND STANDARD ERRORS--
OF THE PRICE RECEIVED--
ANALYSIS II

Variable	Average Price Received Per CWT	Average Price Received Per Head
Intercept	71.22 ± .76	17.00 ± .38
Year		
1969	-10.82 ± .33	-5.20 ± .17
1970	10.82 ± .33	5.20 ± .17
Grade		
1	4.23 ± .66	2.28 ± .33
2	2.25 ± .29	1.08 ± .15
3	-0.04 ± .30	-0.21 ± .15
4	-6.44 ± .79	-3.15 ± .33
Month		
January	-10.14 ± .68	-4.81 ± .34
February	-2.84 ± .63	-1.18 ± .31
March	-1.30 ± .46	-0.92 ± .23
April	-1.55 ± .50	-0.72 ± .25
May	-1.48 ± .43	-0.70 ± .22
June	-2.55 ± .50	-1.36 ± .25
July	-1.11 ± .44	-0.54 ± .22
August	5.40 ± .50	2.63 ± .25
September	5.14 ± .50	2.63 ± .25
October	3.34 ± .43	1.65 ± .22
November	1.06 ± .57	0.44 ± .29
December	6.03 ± .60	2.88 ± .26
Regression of Y on:		
No. pigs/pen	0.00649	0.00398
Avg. wt./pen	-0.45508	0.13036

[a]Estimates are deviations from the overall adjusted means when unequal numbers exist per subclass. The overall arithmetic mean of price per hundredweight and price per head was $40.69 and $20.80, respectively.

TABLE VII

ANALYSIS OF VARIANCE OF PRICES RECEIVED--
ANALYSIS II

Source	Degrees of Freedom	Mean Square: Average Price Per CWT	Mean Square: Average Price Per Head
Year of Sale	1	21154.715*	4888.850*
Grade of Pig	3	3639.064*	867.654*
Month of Sale	11	1147.930*	270.354*
Regression of Y on:			
No. of pigs/pen	1	47.553	17.889
Avg. wt./pen	1	32962.805*	2704.901*
Residual	1103	20.294	5.127
R^2		0.832	0.784

*P < .01.

TABLE VIII

LEAST-SQUARES MEANS ADJUSTED FOR GRADE, MONTH, PEN SIZE AND AVERAGE WEIGHT PER PEN-- ANALYSIS II

Source	No. of Observation	Mean Price Per Head	Mean Price Per CWT
1969	862	$18.87	$36.51
1970	259	29.27	58.14

TABLE IX

LEAST-SQUARES MEANS ADJUSTED FOR YEAR, MONTH, NUMBER PIGS PER PEN AND AVERAGE WEIGHT PER PEN-- ANALYSIS II

Source	No. of Observations	Mean Price Per Head	Mean Price Per CWT
Grade			
1	27	$26.35	$51.56
2	486	25.14	49.57
3	350	23.86	47.28
4	258	20.92	40.88

TABLE X

LEAST-SQUARES MEANS ADJUSTED FOR GRADE, YEAR, NUMBER PIGS PER PEN AND AVERAGE WEIGHT PER PEN--
ANALYSIS II

Source	No. of Observations	Mean Price Per Head	Mean Price Per CWT
Month			
January	108	$19.26	$37.18
February	88	22.89	44.49
March	136	23.15	46.02
April	80	23.35	45.77
May	115	23.36	45.84
June	80	22.70	44.77
July	111	23.52	46.21
August	80	26.69	52.72
September	81	26.69	52.46
October	114	25.72	50.66
November	60	24.51	48.38
December	68	26.96	53.37

TABLE XI

LEAST-SQUARES ESTIMATES[a] AND STANDARD ERRORS--
OF THE PRICE RECEIVED--
ANALYSIS III

Variable	Average Price Received Per CWT	Average Price Received Per Head
Intercept	65.38 ± .99	13.78 ± .47
Year		
1970	-10.75 ± .29	-5.45 ± .13
1971	-16.60 ± .24	-8.47 ± .11
1972	5.04 ± .25	2.63 ± .12
1973	22.31 ± .29	11.29 ± .23
Grade		
1	4.67 ±1.76	2.45 ± .82
2	0.80 ± .52	0.40 ± .24
3	-0.60 ± .49	-0.27 ± .23
4	-5.86 ± .50	-3.09 ± .24
5	0.99 ± .61	0.51 ± .47
Month		
January	-8.72 ± .51	-4.57 ± .24
February	-2.14 ± .50	-1.20 ± .23
March	2.23 ± .48	1.09 ± .22
April	6.29 ± .42	2.96 ± .20
May	3.76 ± .44	1.87 ± .20
June	-1.45 ± .43	-0.66 ± .20
July	4.29 ± .42	2.29 ± .20
August	4.88 ± .43	2.60 ± .20
September	1.51 ± .44	0.65 ± .21
October	-3.64 ± .50	-1.62 ± .24
November	-5.89 ± .53	-0.12 ± .25
December	-1.12 ± .40	-3.29 ± .20
Pen Size		
1-10	-1.35 ± .80	-1.30 ± .38
11-20	-1.34 ± .79	-0.94 ± .37
21-30	-0.96 ± .77	-0.57 ± .36
31-40	-0.92 ± .78	-0.62 ± .36

TABLE XI (Cont'd)

Variable	Average Price Received Per CWT	Average Price Received Per Head
41-50	-1.03 ± .80	-0.63 ± .37
51-60	0.64 ± .80	0.26 ± .37
61-70	0.79 ± .84	0.15 ± .39
71-80	0.93 ± .88	-0.04 ± .41
81-90	0.04 ± .93	-0.01 ± .43
91-100	1.49 ± .94	0.54 ± .44
101-110	0.42 ±1.00	-0.03 ± .47
111-120	-0.60 ±1.06	-0.19 ± .50
121-130	1.68 ±1.23	0.21 ± .58
131-140	-0.21 ±1.36	-0.51 ± .64
141-150	1.80 ±1.37	0.46 ± .64
151-160	-0.15 ±1.32	0.06 ± .62
161-170	-2.78 ±2.01	-1.60 ± .94
171-180	4.86 ±2.76	1.93 ±1.30
181-190	0.19 ±3.17	0.53 ±1.49
191-200	-2.99 ±2.49	-1.57 ±1.17
201-210	-1.34 ±2.39	-1.02 ±1.12
211-220	-0.49 ±3.46	-0.96 ±1.62
221-230	-0.70 ±3.86	-1.02 ±1.81
231-240	5.57 ±3.85	3.13 ±1.81
241-250	-2.26 ±7.63	-0.49 ±3.58
261-270	1.82 ±5.41	1.83 ±2.54
271-280	-3.24 ±7.63	-1.29 ±3.58
301-310	4.96 ±5.43	3.16 ±2.55
321-330	-7.82 ±5.42	-3.03 ±2.54
341-350	-3.82 ±5.42	-1.03 ±2.54
351-360	6.81 ±6.10	-4.59 ±2.01
Regression of Y on:		
Avg. wt./ pen	-0.39540	0.17240

[a]Estimates are deviations from the overall adjusted means when unequal numbers exist per subclass. The overall arithmetic mean of price per hundredweight and price per head was $44.64 and $21.21, respectively.

TABLE XII

ANALYSIS OF VARIANCE OF PRICES RECEIVED--
ANALYSIS III

Source	Degrees of Freedom	Mean Square: Average Price Per CWT	Mean Square: Average Price Per Head
Year of Sale	3	161,704.938**	41,751.689**
Grade of Sale	4	5,521.179**	1,542.133**
Month of Sale	11	5,403.757**	1,376.451**
Pen Size	30	101.239*	28.162**
Regression of Y on: Avg. wt./pen	1	60,192.031**	11,443.117**
Residual	3191	61.47	13.524
R^2		0.83	0.836

*P < .05.

**P < .01.

TABLE XIII

LEAST-SQUARES MEANS ADJUSTED FOR GRADE, MONTH, PEN SIZE AND AVERAGE WEIGHT PER PEN-- ANALYSIS III

Source	No. of Observations	Mean Price Per Head	Mean Price Per CWT
1970	723	$17.46	$33.70
1971	987	14.43	27.84
1972	855	25.53	49.49
1973	676	34.19	66.76

TABLE XIV

LEAST-SQUARES MEANS ADJUSTED FOR YEAR, MONTH, PEN SIZE AND AVERAGE WEIGHT PER PEN-- ANALYSIS III

Source	No. of Observations	Mean Price Per Head	Mean Price Per CWT
Grade			
1	13	$25.35	$49.12
2	732	23.30	45.25
3	1056	22.63	43.85
4	951	19.81	38.59
5	489	23.42	45.44

TABLE XV

LEAST-SQUARES MEANS ADJUSTED FOR GRADE, YEAR, PEN SIZE AND AVERAGE WEIGHT PER PEN-- ANALYSIS III

Source	No. of Observations	Mean Price Per Head	Mean Price Per CWT
Month			
January	225	$18.33	$35.73
February	235	21.71	42.30
March	260	24.00	46.68
April	337	25.87	50.73
May	311	24.78	48.21
June	312	22.24	43.00
July	327	25.20	48.73
August	321	25.51	49.33
September	298	23.55	45.96
October	233	21.29	40.81
November	203	19.98	38.56
December	179	22.42	43.34

TABLE XVI

LEAST-SQUARES ESTIMATES[a] AND STANDARD ERRORS--
OF THE PRICE RECEIVED--
ANALYSIS IV

Variable	Average Price Received Per CWT	Average Price Received Per Head
Intercept	65.06 ± .83	13.53 ± .39
Year		
1970	-10.67 ± .28	-5.41 ± .13
1971	-16.59 ± .24	-8.44 ± .11
1972	5.04 ± .24	2.63 ± .11
1973	22.22 ±1.11	11.22 ± .88
Grade		
1	4.53 ±1.75	2.32 ± .82
2	0.85 ± .51	0.44 ± .24
3	-0.49 ± .49	-0.18 ± .23
4	-5.93 ± .50	-3.15 ± .23
5	1.04 ± .64	0.57 ± .35
Month		
January	-8.85 ± .51	-4.61 ± .24
February	-2.28 ± .50	-1.24 ± .23
March	2.19 ± .48	1.08 ± .22
April	6.21 ± .42	2.91 ± .20
May	3.77 ± .43	1.84 ± .20
June	-1.32 ± .43	-0.62 ± .20
July	4.36 ± .42	2.33 ± .20
August	4.94 ± .43	2.61 ± .20
September	1.45 ± .44	0.63 ± .21
October	-3.58 ± .50	-1.60 ± .24
November	-5.82 ± .53	-2.89 ± .25
December	-1.07 ± .41	-0.44 ± .18
Regression of Y on:		
No. pigs/pen	0.01133	0.00686
Avg. wt./pen	-0.40913	0.16094

[a]Estimates are deviations from the overall adjusted means when unequal numbers exist per subclass. The overall arithmetic mean of price per hundredweight and price per head was $44.64 and $21.21, respectively.

TABLE XVII

ANALYSIS OF VARIANCE OF PRICES RECEIVED--
ANALYSIS IV

Source	Degrees of Freedom	Mean Square: Average Price Per CWT	Mean Square: Average Price Per Head
Year of Sale	3	162,687.925*	41,846.542*
Grade of Pig	4	6,041.338*	1,727.266*
Month of Sale	11	5,475.666*	1,384.820*
Regression of Y on:			
No. pigs/pen	1	586.102*	215.181*
Avg. wt./pen	1	84,963.043*	13,147.378*
Residual	3220	61.677	13.598
R^2		0.827	0.833

*P < .01.

TABLE XVIII

LEAST-SQUARES MEANS ADJUSTED FOR GRADE, MONTH, PEN SIZE AND AVERAGE WEIGHT PER PEN-- ANALYSIS IV

Source	No. of Observations	Mean Price Per Head	Mean Price Per CWT
1970	723	$17.00	$33.31
1971	987	13.97	27.39
1972	855	25.04	49.03
1973	676	33.64	66.21

TABLE XIX

LEAST-SQUARES MEANS ADJUSTED FOR YEAR, MONTH, NUMBER PIGS PER PEN AND AVERAGE WEIGHT PER PEN-- ANALYSIS IV

Source	No. of Observations	Mean Price Per Head	Mean Price Per CWT
Grade			
1	13	$24.73	$48.51
2	732	22.85	44.84
3	1056	22.23	43.49
4	951	19.27	38.06
5	489	22.98	45.02

TABLE XX

LEAST-SQUARES MEANS ADJUSTED FOR GRADE, YEAR, NUMBER PIGS PER PEN AND AVERAGE WEIGHT PER PEN-- ANALYSIS IV

Source	No. of Observations	Mean Price Per Head	Mean Price Per CWT
Month			
January	225	$17.80	$35.13
February	235	21.17	41.71
March	260	23.50	46.18
April	337	25.32	50.20
May	311	24.25	47.75
June	312	21.79	42.67
July	327	24.74	48.35
August	321	25.02	48.93
September	298	23.04	45.44
October	233	20.81	40.41
November	203	19.52	38.17
December	179	21.98	42.90

fluctuations in supply and demand relationships as reflected by market prices, including both current feeder pig prices and prices expected when the feeder pigs are finished for market.

In 1970, in Analysis I, these data indicate that feeder pigs sold for $10.40 more per head and $21.46 more per hundredweight than did pigs in 1969.

In Analysis II, with the number of pigs per pen and average weight per pen as continuous variables, pigs in 1970 sold for $10.38 more per head and $21.62 more per hundredweight than did pigs in 1969.

Other investigators have shown that there was a significant effect with reference to year effects.

II. GRADE EFFECTS

Grade of pig had a highly significant ($P < .01$) effect on both of the dependent variables, price received per hundredweight and the price received per head in all analyses.

Pigs grading 1 in Analysis I sold for an average of $10.39 per hundredweight and $5.24 per head more than pigs grading 4, and $4.24 per hundredweight and $2.49 per head more than pigs grading 3. Grade 2 sold for $2.03 less per hundredweight and $1.23 less per head than pigs grading 1; whereas in Analysis II the differences among grades both from the standpoint of price received per hundredweight and price received per head were in the same degree of magnitude. Pigs grading 1 compared to those grading 4 returned to the producers $10.67 more per hundredweight and $5.43 more per head.

In Analysis III give grades were involved. When the 1 and 2 grades were combined which are in fact grade 5 in the analyses, these pigs sold for $6.85 more per hundredweight and $3.60 more per head than did those pigs grading 4. There were less differences in pigs grading 2 and 3 than in any other classification from the standpoint of both price per hundredweight and price per head.

In Analysis IV, the magnitude of difference between those pigs grading 1 and 2 combined (grade 5 in the analyses) was $6.96 more per hundredweight and $3.71 more per head as compared to those pigs grading 4.

Waddell (1965) and Donaldson (1970) both agreed that grade of pigs had a significant effect on prices received for feeder pigs. This agrees with McFall's study (1969), which showed that grade 1 pigs sold for $0.66 per hundredweight more than grade 2 pigs and $2.46 more than grade 3 pigs. Grade 1 and 2 pigs are also more efficient feed converters according to Sharp (1974).

III. MONTH-OF-SALE EFFECTS

As would be expected, month of sale was a highly significant source of variation. In Analyses I and II, pigs sold in December brought significantly more per hundredweight and per head than did pigs sold in any other month of the year; whereas in Analysis III pigs sold in April returned more per hundredweight and more per head than did pigs sold during any other month of the year. The same trend existed in Analysis IV.

In Analysis I pigs sold during April sold for less than pigs sold during any other month of the year. In Analysis II pigs sold during January sold for less per hundredweight and per head than did pigs sold during any other month of the year.

In Analysis III pigs marketed in January sold for less than pigs sold during any other month of the year. This was also true in Analysis IV.

Certainly, these differences which are in fact fixed environmental effects were sure to exist. The available feed supply and the predicted prices of finished hogs as revealed in the future's market both played a large part in these sources of variation.

Donaldson (1970) and Sharp (1974) found that prices were highest in February, March, April and September, while prices were lowest in January and November.

IV. PEN SIZE EFFECTS

In Analysis I and III the average number of pigs per pen, in increments of 10, was considered as a discrete variable. These differences, although large, were not a significant source of variation. In Analysis I, pigs in pen sizes of 261-270 sold for more per hundredweight and per head than did pigs in any other category; whereas in Analysis III, pigs in pens of 351-360 sold for more per hundredweight than did pigs in any other pen size category. These data indicate that pigs purchased in this sale either were purchased by farmer feeders or by a limited number of order buyers who regrouped these pigs into truck load lots prior to shipping to their final destination for feeding.

The observation was made during these sales that the number of order buyers was extremely small and that this situation did exist.

Waddell (1965) and McFall (1969) found that there was an advantage in selling pigs in larger lots as compared to smaller lots. Pigs selling in lots of 16-30 head averaged higher than any other grouping, according to Waddell. McFall reported prices received were higher for pigs in pens of 31 or more.

V. AVERAGE-WEIGHT-PER-PEN EFFECTS

Differences in average weight per pen were highly significant ($P < .01$) sources of variation in prices received in all analyses. When the price received per hundredweight was regressed on average weight per pen in Analyses I, II, III and IV with all other sources of variation held constant, these data indicate in all analyses that as average weight per pen increases, the price per hundredweight decreases. This in general reflects the buyers' willingness to pay more per hundredweight for lightweight pigs than for heavy pigs.

When average price received per hundredweight and average price received per head was regressed on average number of pigs per pen, a significant difference did not exist.

When the average price received per head was regressed on average weight per pen, these data indicate that, as average weight per pen increases, so does average price per head received. These data indicate that, although lightweight pigs sell for more per hundredweight than heavy pigs, the price per head increases about $0.14. Thus, according

to these data selling lightweight pigs is undesirable provided the cost of gain is less than $0.14 per pound.

The R^2 values obtained from the data in Analysis I indicate that 83 and 79 percent of the variation existed in average price per hundredweight and average price per head, respectively, as explained by the model designated. This same trend in comparable magnitude existed in the other three analyses.

Donaldson (1970) and Sharp (1974) reported that as average weight per pen increased, the price per hundredweight decreased. McFall (1969) indicated a definite advantage for carrying feeder pigs to 45 pounds and a disadvantage for carrying pigs to 55 pounds.

CHAPTER V

SUMMARY AND CONCLUSIONS

Records from 4,362 pens (250,625 pigs) sold in the Carthage feeder pig sales from 1969 through 1973 were studied to evaluate the effects of grade, average weight per pen, pen size, month and year of sale on the average price received per hundredweight and per head for feeder pigs.

The data in Analyses I and II were for the period February, 1969 through September, 1970, in which average weight per pen was 53.05 pounds, average number of pigs per pen was 37.38, with average prices per hundredweight and per head of $40.69 and $20.80, respectively.

The data in Analyses III and IV were for the period October 1970 through 1973, in which average weight per pen was 52.95 pounds, average number of pigs per pen was 51.90, with an average price per hundredweight and per head of $44.64 and $21.21, respectively.

This study revealed that year of sale had a significant effect on the price received per hundredweight and per head for feeder pigs. As would be expected, the sources of variation of year of sale are fixed and environmental effects did exist.

Grade of pig had a highly significant effect on both of the dependent variables, price received per hundredweight and the price received per head in all analyses. In Analysis I, grade 1 pigs sold for $10.39 per hundredweight and $5.24 per head more than pigs grading 4, and $4.24 per hundredweight and $2.49 per head more than pigs grading 3.

Grade 2 pigs sold for $2.03 less per hundredweight and $1.23 less per head than pigs grading 1; whereas in Analysis II, the differences among grades both from the standpoint of price received per hundredweight and price received per head were in the same degree of magnitude. Pigs grading 1 compared to those grading 4 returned to the producers $10.67 more per hundredweight and $5.43 more per head.

In Analysis III, grades 1 and 2 pigs were combined and sold for $6.85 more per hundredweight and $3.60 more per head than did those grading 4.

In Analysis IV, pigs grading 1 and 2 were combined and sold for $6.96 more per hundredweight and $3.71 more per head than those pigs grading 4.

Month of sale had a highly significant effect on price received per hundredweight and per head. In Analyses I and II, pigs sold in December brought significantly more per hundredweight and per head than did pigs sold in any other month of the year. In Analyses III and IV, pigs sold in April brought more per hundredweight and more per head than any other month of the year.

Pigs sold for less in April in Analysis I and pigs sold for less in January in Analyses II, III and IV than any other month of the year.

Pen size did not have a significant effect on prices received for feeder pigs in any analyses. In Analysis I, pigs in pen sizes of 261-270 sold for more per hundredweight and per head than did pigs in any other category; whereas in Analysis III, pigs in pens of 351-360 sold for more per hundredweight than did pigs in any other pen size.

Differences in average weight per pen were highly significant sources of variation in prices received in all analyses. When the price received per hundredweight was regressed on average weight per pen in Analyses I, II, III and IV with all other sources of variation held constant, these data indicate in all analyses that as average weight per pen increases, the price per hundredweight decreases.

When average price received per hundredweight and average price received per head was regressed on average number of pigs per pen, a significant difference did not exist.

When the average price received per head was regressed on average weight per pen, these data indicate that, as average weight per pen increases, so does average price per head received. These data indicate that, although lightweight pigs sell for more per hundredweight than heavy pigs, the price per head increases about $0.14. Thus, according to these data selling lightweight pigs is undesirable provided the cost of gain is less than $0.14 per pound.

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LITERATURE CITED

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APPENDIX

APPENDIX

TABLE XXI

FORMAT USED FOR IBM CARDS

Date	Code	IBM Card Column Number
Pen Number	Use actual no.	1-5
No. pigs/pen	Use actual no.	6-8
Total wt./pen	Use actual no.	9-13
Avg. wt. pig/pen	Use actual no.	14-15
Grade of pig		16-17
No. 1	01	
No. 2	02	
No. 3	03	
No. 4	04	
No. 5	06	
Pen Size (no. of pigs/pen)		18-19
1-10	01	
11-20	02	
21-30	03	
31-40	04	
41-50	05	
51-60	06	
61-70	07	
71-80	08	
81-90	09	
91-100	10	
101-110	11	
111-120	12	
121-130	13	
131-140	14	
141-150	15	
151-160	16	
161-170	17	
171-180	18	
181-190	19	
191-200	20	

TABLE XXI (Cont'd)

Date	Code	IBM Card Column Number
Pen Size		
201-210	21	
211-220	22	
221-230	23	
231-240	24	
241-250	25	
251-260	26	
261-270	27	
271-280	28	
301-310	31	
321-330	33	
341-350	35	
351-360	36	
Pen Weight (avg. wt. of pigs/pen)		20-21
25-30	01	
31-35	02	
36-40	03	
41-45	04	
46-50	05	
51-60	06	
61-70	07	
71-80	08	
81-90	09	
91-100	10	
Price/cwt./pen	Use actual price	22-25
Month of Sale		26-27
January	01	
February	02	
March	03	
April	04	
May	05	
June	06	
July	07	
August	08	
September	09	
October	10	
November	11	
December	12	

TABLE XXI (Cont'd)

Date	Code	IBM Card Column Number
Year of Sale		28-29
1969	69	
1970	70	
1971	71	
1972	72	
1973	73	
Price/head/pen	Use actual price	30-33

VITA

Jack C. McDaniel was born February 24, 1944 in Jackson County, Tennessee. He received his elementary and secondary education in the public schools of Putnam County and was a 1962 graduate of Cookeville Central High School, Cookeville, Tennessee.

In September of 1962, he entered Tennessee Technological University, Cookeville, to study agriculture and was awarded his Bachelor of Science Degree in Agronomy in 1969. While attending Tennessee Tech, Mr. McDaniel was a member of the American Society of Agronomy.

In September of 1969, he joined The University of Tennessee Agricultural Extension Service staff. His first appointment was in Smith County, Tennessee, where he served as assistant county agent. He is now serving as an assistant extension agent in the same location.

Mr. McDaniel enrolled in The University of Tennessee Graduate School to attain a Master's Degree in Animal Science which he expects to receive in the commencement exercises in March 1975.

He served in the 3rd/117th Infantry, Tennessee National Guard from 1965-1971.

He is a member of the Honor Society of Gamma Sigma Delta at The University of Tennessee.