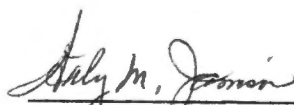


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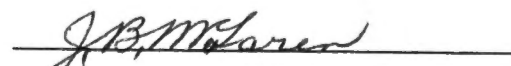
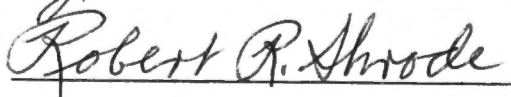
To the Graduate Council:

I am submitting herewith a thesis written by Michael Lynn Sharp entitled "Effect of Selected Variables on Price Received for Feeder Pigs in the Sevierville Feeder Pig Sales." I recommend that it be accepted for nine quarter hours credit in partial fulfillment of the requirements for the degree of Master of Science, with a major in Animal Husbandry.



Haley Jamison, Major Professor

We have read this thesis and
recommend its acceptance:

Accepted for the Council:



Vice Chancellor
Graduate Studies and Research

EFFECT OF SELECTED VARIABLES ON PRICES RECEIVED FOR FEEDER
PIGS IN THE SEVIERVILLE FEEDER PIG SALE

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

Michael Lynn Sharp

March 1974

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ABSTRACT

Records from 3,293 pens (99,014 pigs) sold in the Sevierville demonstrational feeder pig sales from 1961 through 1972 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 the feeder pigs sold.

The data in Analysis I and II were for the period May 20, 1961, through March 30, 1970, in which average weight per pen was 54.47 pounds, average number of pigs per pen was 24.79, with average prices per hundredweight and per head of \$30.08 and \$15.71, respectively.

Data in Analysis III and IV were for the period April 1, 1970, through December 30, 1972, in which average weight per pen was 53.21 pounds, average number of pigs per pen was 35.12, with an average price of \$31.81 per hundredweight and \$16.11 per head.

There were highly significant differences among years in prices received for feeder pigs per hundredweight and per head as expected.

Grade of pig had a highly significant effect on price per hundredweight and per head received for feeder pigs in all analyses. In Analysis I, grade 1 pigs sold for \$1.26 more per hundredweight and \$0.93 per head more than grade 2 pigs, for \$2.99 more per hundredweight and \$1.47 per head more than grade 3 pigs and for \$5.29 more per hundredweight and \$2.73 per head more than grade 4 pigs. The inclusion of average number of pigs per pen in Analysis II as a continuous variable did not influence the magnitude of the least squares grade means.

In Analysis III, grades 1 and 2 pigs combined sold for \$9.73 more per hundredweight and \$4.16 per head more than grade 5 pigs, for \$5.71 more per hundredweight and \$2.33 per head more than grade 4 pigs, and for \$1.72 more per hundredweight and \$0.85 more per head more than grade 3 pigs. The comparisons in Analysis IV showed about the same differences as Analysis III. Therefore, the inclusion of average number of pigs per pen as a continuous variable, as in Analysis I and II, did not influence the magnitude of the least-squares grade means.

Month of sale had a significant effect on price received per hundredweight and per head. Analyses I and II indicated that the highest prices were received during April and October; whereas, in Analyses III and IV, prices were highest in April and May. The lowest price received in Analyses I and II was during January, which also was the lowest-price month in Analyses III and IV.

There was a definite price advantage per hundredweight and per head for pigs selling in larger pens. Analysis I indicated pigs sold in pens of 41-50, 121-130, 141-150, and 151-160 sold for more per hundredweight than any other pen-size classification; but pen size had no significant ($P < .05$) effect on price received per head although pigs in pens of 141-150 did bring more per head than any other pen-size classification.

In Analysis III, pen size had a significant ($P < .05$) effect on price both per hundredweight and per head. The pigs in pens of 181-190, 151-160, and 131-140 sold for more per hundredweight and per head than any other pen-size classification.

Price differences due to differences in average weight per pen were highly significant ($P < .01$) in all analyses. When price per hundredweight was regressed on average weight per pen with all other sources of variation held constant, these data indicated that as average weight per pen increased, price per hundredweight decreased.

When price per head was regressed on average weight per pen, as average weight increased so did average price per head. These data indicated lightweight pigs sell for more per hundredweight; however, with every pound increase in average weight, price per head increased \$0.18. Thus selling lightweight pigs is undesirable, provided the cost of gain is less than \$0.18 per pound.

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CHAPTER I

INTRODUCTION

The first Sevierville demonstrational feeder pig sale was organized because of a need for higher quality and more constant numbers of feeder pigs for the local swine feeders. The first sale was held on May 20, 1961, under the direction of local feeders and the county extension personnel. The success of this sale aroused sufficient interest for producers and feeders to organize the Sevier County Livestock Association. The association was formed with the purpose of fostering and promoting the livestock industry in Sevier County.

The Sevier County Livestock Association, following its unique organization, began to sponsor regularly scheduled feeder pig sales. These sales held at Sevierville, Tennessee, were conducted with cooperation from The University of Tennessee, Tennessee Livestock Association and the State Department of Agriculture.

Sevier County's area is well suited for swine production; however, most producers do not raise enough pigs to attract individual buyers. These swine producers were once at the mercy of the country buyer, but they now can develop feeder pig enterprises on their farms with assurance of a market for their pigs. Also, with this type of marketing program, producers are able to market larger pens of pigs which are uniform in size and quality.

Sevierville's feeder pig sale must be recognized as an important part of the East Tennessee livestock industry. The number of pigs increased from 1,053 in 1961 to 17,140 in 1972 while the income increased from \$14,322.16 in 1961 to \$396,257.87 in 1972.

Since the beginning of the Sevierville feeder pig sale, no statistical analysis of the results has been made. The results of this study should aid producers in planning for increased production, improving pig quality and improving the marketing of feeder pigs in Sevier County and Tennessee. The objective of this study was to evaluate the effects of: grade, weight, pen size, month, and year on the price producers received for their pigs sold in the Sevierville sale from 1961 through 1972.

averages. Also, seasonal movements varied with average weights of the feeder pigs marketed.

The price producers received for feeder pigs followed closely the price received for slaughter hogs. Buyers were willing to pay for feeder pigs according to what they expected to receive for those pigs as slaughter hogs and the price of corn. The feeder pigs usually sold for a premium above slaughter price if the corn-hog ratio was favorable or would be discounted should the ratio be unfavorable. The corn-hog ratio is 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.

Specialization in the swine industry in recent years has stimulated the production of feeder pigs or pigs for sale to swine feeders and, at the same time, has created new marketing problems. Pooling is a relative new comer in feeder pig marketing practice. However, in several areas producers have improved their marketing by selling their pigs in pooled pens, pooling their pigs, with other producer's pigs of a similar weight and grade. This also has stimulated the production of higher quality pigs.

Hass et al. (1962) reported that producers in a six-state area pooled approximately 157,700 feeder pigs in 1959. Their increased returns over other markets ranged from \$0.25 to \$7.50 more for a 50-pound pig. The estimates of increase varied between marketing agencies and states. The range was \$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 \$0.50 to \$5.00 per hundredweight in Ohio.

These workers found pen size to be an important factor affecting the price of pooled feeder pigs and one over which the market agency had no control. The smallest number of pigs that should be sold as a pen appeared to be 10 to 29 pigs, the most common pen size being 50 to 74 pigs and the largest pen size being 125 to 224 pigs. The larger volume agencies attracted larger numbers of pigs and buyers. It was concluded that if producers are to realize full value for feeder pigs they must have an effective marketing system that provides (1) efficient movement and handling and (2) a pricing mechanism that will reflect the true value of their pigs.

A study of the feeder pig sales held in Sevierville, Tennessee, by O'Neal (1964) indicated the main purpose of that feeder pig sale was to realize a satisfactory price through combining a large volume of pigs into uniform pens to attract several buyers. This method of marketing feeder pigs has been successful for the Sevierville sale as it appeals to both producers and buyers. The producer can market all his feeder pigs at one time where there is a sufficient volume of pigs in uniform pens by weight and grade to attract several buyers. Also, the buyer can purchase in a short time a large volume of pigs of the weight and grades that fulfill his requirements. O'Neal (1964) also indicated that if these feeder pig sales are to remain successful, a steady volume of high quality, meat type pigs that exceed 45 pounds must be maintained. According to this study, buyers were interested in high quality uniform pens of pigs weighing 45 to 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 to 50 pounds. The Missouri feeder pig sales were accepting pigs up to 100 pounds for sale. These pigs were profitable for the producers, and it was thought that the reasons were: (1) pigs weighing over 70 pounds were in demand to glean corn fields in the fall and (2) serum plants and garbage feeders were in need of pigs weighing 80 or more pounds.

The future's outlook for slaughter hog prices, when these feeders' pigs will be ready for market had a definite effect on the prices received for the pigs sold as feeders. There was a good demand for 60- to 70-pound pigs in the Missouri sales on a year-around basis.

Tremendous strides have been made toward changing the swine of the United States from the "fat" to the "lean" type. However, one has only to visit a terminal livestock market or feeder pig sale to see that a large number of "fats" are still being marketed, according to Tracy (1972).

The grade of a feeder pig is determined by evaluating its logical slaughter potential and 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. In these feeder pig standards, logical slaughter potential is determined by a composite appraisal of the development of the muscular and skeletal system. Both of these factors have an important effect on development of lean and fat as the animal grows and, therefore, on the expected slaughter grade.

Most feeder pigs are marketed when relatively young and before reaching a weight of 125 pounds. In pigs at this age, sex exerts little influence on the basic factors for determining the feeder grade. The standards are equally applicable for grading barrow, gilt, and boar pigs. It is recognized that sex may influence the market price in some instances, mainly of boar pigs,

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. The grade 1 and 2 percentage increased from 33.9 in 1971 to 37.8 in 1972; the grade 3 percentage was at 38 to 39 and grade 4 declined from 17.7 percent in 1971 to 14.9 in 1972, with others declining from 10.2 to 8.3 percent from 1971 to 1972, respectively.

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 were becoming more quality conscious, according to Hicks (1972). He stated that as in the past, the price per hundredweight received showed a definite advantage for carrying the pigs to 45 pounds, and a decline in the advantage for carrying pigs to 55 pounds. The advantage was for grade 1 and 2, grade 3 and 4. However, the advantage declined as the grade declined. The year differences, as expected, accounted for a large portion of the price variation. The grade 1 and 2 feeder pig averaging 50 pounds in 1971 sold at \$29.54 per hundredweight and at \$51.25 in 1972; the grade 3 averaging 49 pounds sold at \$27.62 per hundredweight in 1971 and at \$49.99 in 1972;

the grade 4 averaging 46 pounds in 1971 sold at \$23.63 per hundredweight and at \$45.61 in 1972.

Waddell (1965) found in a study of the Cookeville, Tennessee, feeder pig sale that grade had a significant effect on the price producers received for feeder pigs. The grade 1 pigs sold for an average of \$0.77 per hundredweight more than grade 2 pigs and \$2.65 more than grade 3 pigs. The grade 2 pigs sold for an average of \$1.88 more than grade 3 pigs. However, the difference in price between grade 1 and 2 pigs was not as marked as the difference between the grade 2 and 3 pigs.

The estimates of differences in price per hundredweight due to pen size or number of pigs in the pen indicated a definite price advantage for feeder pigs sold in larger pens. Pigs sold in pens of 1 to 15 averaged less than any other pen size. The pigs sold in pens of 16 to 30 averaged more than those of any other grouping. These pigs in pens of 16 to 30 head averaged \$0.75 more per hundredweight than did the 1- to 15-head pen size. The analysis indicated very little difference between the 16- to 30-pen size and the 31- and over-pen size classification. The results indicate the desirability of penning pigs in uniform pens of 16 head or more.

The pens of pigs having an average weight of 31 to 40 pounds sold for the highest price, \$26.26 per hundredweight, while those averaging 66 pounds sold for the lowest price, \$19.60 per hundredweight. The difference between the two weight groups of \$6.60 per hundredweight was highly significant. These differences between other weight groups also were highly significant. The price received per hundredweight decreased in a linear fashion from the 31- to 40-pounds to the 66- or more-pounds

weight class. The results indicate that the buyers first preference was the 31- to 40-pound weight class followed by the 41- to 50-pound pigs weight class.

The analysis indicated a highly significant difference between months in price received. The prices received in April were significantly higher than prices in all other months while December prices were significantly lower than any other month. As expected, there were highly significant differences among all years in price per hundredweight received. These differences reflect the adjustments to feeder pig supply and demand as influenced by present market hog prices and the future prices of market hogs.

The Waddell (1965) analysis indicated that if the producer is to receive the highest per-hundredweight price he should produce grade 1 feeder pigs weighing 31 to 40 pounds to be sold in pens of 16 or more.

Jamison et al. (1970) found in a study of the Weakley County 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 did the grade 3 pigs.

There was a definite price advantage for feeder pigs sold in larger pens. The pigs penned in pens of 1 to 15 and 16 to 30 pigs averaged less per hundredweight than did those penned in pens of 31 to 73 pigs. The pigs penned in pens of 31 and more sold for an average of \$3.18 per hundredweight more than those penned in pens of 1 to 15 pigs, thus indicating the desirability of pooling feeder pigs in uniform pens of 31 or more pigs per pen.

The pens of pigs averaging 31 to 40 pounds in weight averaged higher in price per hundredweight than any other weight class. In general, the heavier the average weight, the lower the price per hundredweight received. The pigs in pens averaging 31 to 40 pounds sold for \$39.73 per hundredweight while pens of pigs averaging 66 pounds or more sold at \$27.34 for a significant difference of \$12.39.

The month of sale had a highly significant effect on price received. The highest average price received was in September, while the lowest was in November, for a significant difference of \$8.60 per hundredweight. There were highly significant differences among years and prices received per hundredweight for feeder pigs.

Thus, the study indicates the importance of having sufficient volume of pigs so that pigs can be penned for sale in pens of desired size, weight, and grade.

The analysis by Donaldson (1970) of the Cookeville feeder pig sale as to the effect of grade on price received, the results were within the range of the findings of Waddell (1965) and Jamison et al. (1970) who reported that grade 1 pigs sold for more per hundredweight than the grade 2 pigs, and the grade 2 pigs sold for more than the grade 3 pigs.

The effects of pen size or number of head per pen on price per hundredweight received indicated an advantage for pigs sold in larger pens. Other studies including those of Jamison et al (1970), Waddell (1965), and Hass et al. (1962) indicated advantages for pigs sold in larger pens.

Donaldson's (1970) work indicates that feeder pig buyers were willing to pay a higher price for pigs in pen sizes that would make a

truck load. The capacity of a 14-foot, double-deck hog van is approximately 120 head of 55-pound pigs.

CHAPTER III

EXPERIMENTAL PROCEDURE

I. SOURCE OF DATA

The records were available from the Sevierville, Tennessee, Feeder Pig Sales from the first sale held in 1961 through the 1972 sale year. The complete data from these sales were used for analysis in this study.

A total of 99,014 pigs varying in weight and grade in 3,293 pens of varying size were analyzed in this study to determine the effects of different variables: (1) pen size--number of pigs per pen, (2) pen weight--average weight of pen, (3) grade of pig, and (4) month and year of sale on the price received per hundredweight and per head of feeder pigs in the Sevierville, Tennessee, sales.

II. RULES AND REGULATIONS OF THE SEVIERVILLE

FEEDER PIG SALE

The following regulations and procedures apply to all sales that are held:

1. All pigs must be farrowed and produced on the farm of the consignor.
2. All pigs must be healthy and from a healthy herd.
3. All pigs will be inspected on the farm of the consignor for health and growth.
4. The Sevierville Feeder Pig Sale reserves the right to refuse

any questionable pigs, especially garbage fed and pigs consigned by non-producers.

5. All breeds and crossbreeds of pigs will be accepted.

6. All male pigs must be castrated and clear by the time of the sale.

7. All pigs will be accepted at weights from 25 to 100 lbs. for grading; 40 to 60 lbs. is recommended.

8. All pigs must be consigned by 12:00 noon on Tuesday before the sales on the first and third Friday of each month.

9. All pigs will be inspected a second time before they are graded and weighed.

10. All pigs will be graded, weighed, penned, and sold in uniform pens.

11. A veterinarian will inspect all pigs before the sale.

12. All consignors must have a Tennessee Department of Agriculture Certification Form completed and a Tennessee Feeder Pig Marketing Card.

13. You must be a member of the Sevier County or a Livestock Association in your county, and present your membership card.

14. A fee of \$0.70 will be charged for each pig sold. A \$0.05 charge per pig for insurance that covers the pig from farm through marketing will be collected by the auction company.

15. The management of the sale will be the Sales Committee.

III. CONSIGNMENT PROCEDURE

When a producer markets pigs through the Sevierville Feeder Pig Sale, he must consign these pigs to the County Agricultural Extension Office in his county by 12:00 noon on Tuesday before the sales on the first and third Friday each month. The County Extension Leader issues a certification that he is a bonafide feeder pig producer.

The Extension Leader in turn forwards the consignment and certification to the feeder pig sales chairman for the Sevierville sale. The sales chairman issues the producer a Tennessee Department of Agriculture Marketing Card. The producer must present the marketing card and membership card to his county livestock association each time he markets pigs. The marketing card is valid for one year.

IV. INSPECTION

The producer consigns his pigs to the sale; then a member of the sales committee visits the farm to inspect the pigs for health, growth and any abnormalities such as bussels, knots, ruptures, or diseases. The pigs are inspected a second time upon arrival at the sale by the sales chairman for any abnormalities the producer may have overlooked as the pigs were loaded for market or that might have developed after farm inspection. The producer presents a valid marketing card to the chairman along with a livestock association membership card at the time of the second inspection.

All pigs consigned to the sale are inspected by an approved veterinarian, just prior to sale time, for general overall health and abnormalities.

V. GRADE AND GRADING OF FEEDER PIGS

The pigs at the Sevierville sale are farm and producer identified by numbered ear tags. These ear tag numbers are recorded on a receiving ticket with the producer's name and address.

The pigs are sorted by weight then graded into the various feeder pig grades as follows:

1. Grade 1: The pigs indicate superior length and have a large frame, and superior width between legs, having very thick muscling as evidenced by thick full hams and shoulders and well turned back. The pigs present a well balanced appearance, with trimness throughout and a very thrifty condition, and should feed out as a U. S. No. 1 market hog.

2. Grade 2: The pigs are moderate in length and frame, having moderately thick muscling evident in the hams and shoulders. The back usually appears slightly full and well rounded. The pigs present a well balanced appearance, but the side has begun to lose its trimness. They should be in thrifty condition and should feed out as a U. S. No. 2 market hog.

3. Grade 3: The pigs are slightly short in length and small in frame, with legs set fairly close and with slightly thin muscling throughout. The hams and shoulders are slightly thin and flat, and the back appears moderately full and thick and at 220 pounds will have a high degree of fatness and grade as a U. S. No. 3 market hog.

4. Grade 4: These pigs are short in length and have thin muscling throughout and a small frame. The hams are thin and rather flat, particularly in the lower parts towards the shanks, with legs being

very close together due to thin muscle. The back appears slightly flat, and the width at the topline usually is greater than at the underline. These pigs are expected to feed out as U. S. No. 4 market hogs, having a very high degree of fatness.

5. Grade 5 or Utilities: The pigs are often small for their age, and the head appears to be larger than normal. They often appear unthrifty and rough, indicating disease or poor care. The hams and shoulders are thin and flat and taper toward the shanks. The back is thin and lacks fullness. The utility pig could produce a U. S. No. 1, 2, 3, or 4 carcass if the unthrifty condition is corrected but, if it is not, will finish as utility.

VI. WEIGHING OF PIGS

As the pigs are unloaded, they are graded and sorted by the grader into uniform lots according to size. Each lot is then weighed. The consignor receives a copy of the weight ticket which lists (1) total weight, (2) number of pigs, (3) average weight range, (4) grade of pigs, and (5) pen number of each group. After the consignor's pigs are graded and weighed, he will have several tickets which provide a complete record of his pigs.

VII. PENNING OF PIGS

As each lot of pigs comes off the scales, they are penned according to grade and weight. The carbon copy of the weight ticket is sent to the Auction 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.

VIII. SELLING OF PIGS

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

IX. 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 IX which may be found in the Appendix.

From May, 1961 through March, 1970, inclusive, the pigs were graded into four grades and sold in four grades; whereas, from April, 1970 through December, 1972, the pigs were sorted into four grades; but grades 1 and 2 were combined 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 to 30 pounds, 31 to 35 pounds, 36 to 40 pounds, 41 to 45 pounds, 46 to 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 250 head. In order to obtain a more realistic estimate of pen-size effects, the data were divided into 25 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 analysis 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:

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

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

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 the l^{th} pen size.

Y_{ijkl} = the average price per hundredweight and the average price per head received for pigs sold in the i^{th} year, j^{th} grade, and the k^{th} month of sale.

μ = population mean price per hundredweight and price per head if equal numbers existed in all subclasses.

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

$i = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12$ as follows:

1. 1961
2. 1962
3. 1963
4. 1964
5. 1965
6. 1966
7. 1967
8. 1968

9. 1969

10. 1970

11. 1971

12. 1972

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

$j = 1, 2, 3, 4, 5, 6$, as follows:

1. Grade 1

2. Grade 2

3. Grade 3

4. Grade 4

5. Grade 5

6. Grade 1 and 2 (in second model)

m_k = effect of k^{th} month.

$k = 1, 2, \dots, 12$ 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_1 = effect of 1th pen size.

1 = 1, 2, . . . , 25 as follows:

1. 0-10 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

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

$b_1' (W_{ijkl} - \bar{W})$ = term for partial regression of Y on average number of pigs.pen.

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

e_{ijklm} = random error.

e_{ijkl} = random error.

CHAPTER IV

RESULTS AND DISCUSSION

For convenience of discussion, the analysis of data collected from May 20, 1961, through May 30, 1970, 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 April 1, 1970, through December 31, 1972, (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 of means of the environmental effects on price per hundredweight and price per head of feeder pigs from Analyses I, II, III, and IV are presented in Tables I, II, III, and IV; and the corresponding analyses of variance are presented in Tables V, VI, VII, and VIII, respectively.

TABLE I
LEAST-SQUARES MEANS AND STANDARD ERRORS--
ANALYSIS I

Variable	Number of Pens	Average Price Received Per Cwt.(Y)	Average Price Received Per Head (Y)
Overall Mean	1612	30.33 $\pm$.51	16.26 $\pm$.25
Year			
61	70	25.49 $\pm$.78	13.73 $\pm$.40
62	137	24.55 $\pm$.67	13.15 $\pm$.34
63	177	20.07 $\pm$.64	11.20 $\pm$.32
64	162	20.92 $\pm$.64	11.37 $\pm$.32
65	83	33.19 $\pm$.72	18.11 $\pm$.37
66	112	34.37 $\pm$.66	18.63 $\pm$.34
67	171	28.02 $\pm$.60	15.01 $\pm$.30
68	230	26.10 $\pm$.53	14.15 $\pm$.27
69	369	35.48 $\pm$.48	18.78 $\pm$.25
70	101	55.07 $\pm$.67	27.43 $\pm$.34
Grade			
1	448	32.71 $\pm$.51	17.54 $\pm$.26
2	655	31.45 $\pm$.48	16.61 $\pm$.24
3	349	29.72 $\pm$.57	16.07 $\pm$.29
4	160	27.42 $\pm$.65	14.81 $\pm$.33
Month			
January	57	19.28 $\pm$.83	10.86 $\pm$.42
February	225	29.83 $\pm$.57	16.10 $\pm$.29
March	72	31.40 $\pm$.78	16.47 $\pm$.40
April	56	33.59 $\pm$.80	17.49 $\pm$.41
May	245	32.60 $\pm$.55	17.72 $\pm$.28
June	68	30.11 $\pm$.75	15.94 $\pm$.38
July	31	30.15 $\pm$.94	16.38 $\pm$.48
August	208	32.01 $\pm$.57	17.07 $\pm$.29
September	84	31.98 $\pm$.70	17.12 $\pm$.35
October	65	34.12 $\pm$.74	18.25 $\pm$.38
November	393	28.40 $\pm$.49	15.37 $\pm$.25
December	108	30.42 $\pm$.64	16.31 $\pm$.32

TABLE I (continued)

Variable	Number of Pens	Average Price Received Per Cwt.(Y)	Average Price Received Per Head(Y)
Pen Size			
1-10	584	29.56 $\pm$.24	15.25 $\pm$.12
11-20	383	29.67 $\pm$.28	15.49 $\pm$.14
21-30	216	29.74 $\pm$.34	15.81 $\pm$.17
31-40	135	30.44 $\pm$.43	15.65 $\pm$.22
41-50	85	30.64 $\pm$.52	16.00 $\pm$.26
51-60	61	30.03 $\pm$.61	15.91 $\pm$.31
61-70	35	29.56 $\pm$.77	15.99 $\pm$.39
71-80	31	30.25 $\pm$.83	16.11 $\pm$.42
81-90	17	29.85 $\pm$ 1.09	16.43 $\pm$.55
91-100	18	30.32 $\pm$ 1.06	16.11 $\pm$.54
101-110	12	20.34 $\pm$ 1.28	16.63 $\pm$.65
111-120	7	20.71 $\pm$ 1.68	15.76 $\pm$.85
121-130	12	31.25 $\pm$ 1.29	16.87 $\pm$.65
131-140	4	28.53 $\pm$ 2.20	15.90 $\pm$ 1.12
141-150	6	31.45 $\pm$ 1.80	17.25 $\pm$.91
151-160	4	31.26 $\pm$ 2.19	16.46 $\pm$ 1.10
161-170	1	29.05 $\pm$ 4.35	15.38 $\pm$ 2.20
231-240	1	35.18 $\pm$ 4.35	19.62 $\pm$ 2.20
Regression of Y on:			
Avg. wt./pen		-0.1909	0.1801

TABLE II
LEAST-SQUARES MEANS AND STANDARD ERRORS--
ANALYSIS II

Variable	Number of Pens	Average Price Received Per Cwt.(Y)	Average Price Received Per Head(Y)
Overall Mean	1612	29.82 $\pm$.20	15.59 $\pm$.10
Year			
61	70	24.95 $\pm$.60	13.09 $\pm$.30
62	137	24.08 $\pm$.45	12.50 $\pm$.23
63	177	19.60 $\pm$.41	10.57 $\pm$.21
64	162	20.43 $\pm$.41	10.70 $\pm$.21
65	83	32.70 $\pm$.53	17.44 $\pm$.27
66	112	33.88 $\pm$.47	17.95 $\pm$.24
67	171	27.51 $\pm$.38	14.32 $\pm$.19
68	230	25.57 $\pm$.32	13.46 $\pm$.16
69	369	34.96 $\pm$.23	18.10 $\pm$.12
70	101	54.55 $\pm$.53	27.74 $\pm$.27
Grade			
1	448	32.23 $\pm$.25	16.87 $\pm$.13
2	655	30.95 $\pm$.22	15.95 $\pm$.11
3	349	29.19 $\pm$.29	15.38 $\pm$.14
4	160	26.92 $\pm$.41	14.15 $\pm$.21
Month			
January	57	18.84 $\pm$.67	10.21 $\pm$.34
February	225	29.30 $\pm$.31	15.42 $\pm$.16
March	72	30.95 $\pm$.60	15.83 $\pm$.30
April	56	33.11 $\pm$.63	16.85 $\pm$.32
May	245	32.09 $\pm$.30	17.02 $\pm$.15
June	68	29.60 $\pm$.58	15.30 $\pm$.29
July	31	29.72 $\pm$.81	15.71 $\pm$.41
August	208	31.50 $\pm$.33	16.39 $\pm$.16
September	84	31.47 $\pm$.52	16.43 $\pm$.26
October	65	33.58 $\pm$.59	17.54 $\pm$.30
November	393	27.88 $\pm$.23	14.69 $\pm$.12
December	108	29.85 $\pm$.46	15.63 $\pm$.23
Regression of Y on: Average weight/pen		-0.1912	0.1799
Regression of Y on: Average no. pigs/pen		0.0106	0.0123

TABLE III
LEAST-SQUARES MEANS AND STANDARD ERRORS--
ANALYSIS III

Variable	Number of Pens	Average Price Received Per Cwt.(Y)	Average Price Received Per Head(Y)
Overall Mean	1681	31.80 $\pm$.56	16.79 $\pm$.25
Year			
70	416	29.06 $\pm$.63	15.43 $\pm$.29
71	714	32.87 $\pm$.59	12.87 $\pm$.27
72	551	42.47 $\pm$.60	22.06 $\pm$.27
Grade			
1+2	533	36.09 $\pm$.54	18.62 $\pm$.25
3	540	34.37 $\pm$.59	17.77 $\pm$.27
4	448	30.38 $\pm$.66	16.29 $\pm$.30
5	160	26.36 $\pm$.77	14.46 $\pm$.35
Month			
January	108	25.10 $\pm$.85	13.27 $\pm$.39
February	121	32.16 $\pm$.83	17.11 $\pm$.38
March	113	31.82 $\pm$.85	16.77 $\pm$.38
April	140	36.95 $\pm$.77	19.12 $\pm$.35
May	152	36.54 $\pm$.75	19.02 $\pm$.34
June	148	32.99 $\pm$.75	17.47 $\pm$.34
July	143	33.34 $\pm$.77	17.83 $\pm$.35
August	185	33.12 $\pm$.72	17.48 $\pm$.32
September	175	33.75 $\pm$.74	17.55 $\pm$.33
October	115	30.12 $\pm$.82	16.10 $\pm$.37
November	130	27.71 $\pm$.75	14.67 $\pm$.34
December	151	27.98 $\pm$.75	15.06 $\pm$.34
Pen Size			
1-10	517	30.24 $\pm$.32	14.86 $\pm$.14
11-20	322	30.34 $\pm$.38	15.46 $\pm$.17
21-30	190	30.67 $\pm$.49	15.69 $\pm$.22
31-40	136	30.07 $\pm$.58	15.70 $\pm$.26
41-50	117	31.35 $\pm$.64	16.34 $\pm$.29
51-60	80	31.34 $\pm$.75	16.29 $\pm$.34
61-70	74	31.70 $\pm$.79	16.72 $\pm$.36
71-80	49	32.66 $\pm$.96	16.99 $\pm$.44
81-90	41	30.93 $\pm$ 1.04	16.35 $\pm$.47

TABLE III (continued)

Variable	Number of Pens	Average Price Received Per Cwt.(Y)	Average Price Received Per Head (Y)
91-100	30	33.72 $\pm$ 1.22	17.41 $\pm$.55
101-110	31	30.37 $\pm$ 1.20	16.07 $\pm$.54
111-120	17	33.87 $\pm$ 1.61	18.04 $\pm$.73
121-130	19	35.26 $\pm$ 1.52	17.27 $\pm$.69
131-140	13	32.50 $\pm$ 1.84	18.51 $\pm$.83
141-150	11	30.16 $\pm$ 1.99	16.42 $\pm$.90
151-160	9	34.83 $\pm$ 2.21	18.08 $\pm$ 1.00
161-170	5	30.24 $\pm$ 2.95	16.58 $\pm$ 1.34
171-180	4	32.35 $\pm$ 3.29	17.75 $\pm$ 1.49
181-190	7	36.19 $\pm$ 2.50	19.10 $\pm$ 1.13
191-200	3	32.21 $\pm$ 3.80	17.74 $\pm$ 1.72
201-210	1	24.17 $\pm$ 6.57	13.00 $\pm$ 2.97
221-230	2	33.66 $\pm$ 4.65	17.78 $\pm$ 2.10
231-240	3	32.56 $\pm$ 3.81	17.97 $\pm$ 1.72
Regression of Y on:			
Average weight/pen		-0.2315	0.1790

TABLE IV
LEAST-SQUARES MEANS AND STANDARD ERRORS--
ANALYSIS IV

Variable	Number of Pens	Average Price Received Per Cwt.(Y)	Average Price Received Per Head(Y)
Overall Mean	1681	30.79 $\pm$.19	15.69 $\pm$.09
Year			
70	416	28.10 $\pm$.35	14.35 $\pm$.16
71	714	22.82 $\pm$.26	11.75 $\pm$.12
72	551	41.44 $\pm$.31	20.95 $\pm$.14
Grade			
1 & 2	533	35.19 $\pm$.30	17.63 $\pm$.14
3	540	33.45 $\pm$.29	16.79 $\pm$.13
4	448	29.23 $\pm$.33	15.06 $\pm$.15
5	160	25.28 $\pm$.53	13.26 $\pm$.24
Month			
January	108	24.07 $\pm$.65	12.18 $\pm$.30
February	121	31.12 $\pm$.62	16.00 $\pm$.28
March	113	30.78 $\pm$.64	15.62 $\pm$.29
April	140	35.93 $\pm$.56	17.97 $\pm$.26
May	152	35.56 $\pm$.54	17.88 $\pm$.25
June	148	31.96 $\pm$.55	16.37 $\pm$.25
July	143	32.41 $\pm$.56	16.76 $\pm$.25
August	185	32.17 $\pm$.49	16.43 $\pm$.22
September	175	32.75 $\pm$.50	16.48 $\pm$.23
October	115	29.16 $\pm$.63	15.03 $\pm$.29
November	130	26.67 $\pm$.59	13.56 $\pm$.27
December	151	26.88 $\pm$.54	13.94 $\pm$.25
Regression of Y on: Average weight/pen		-0.2343	0.1732
Regression of Y on: Average no. pigs/pen		0.0143	0.0146

TABLE V
ANALYSIS OF VARIANCES OF PRICES RECEIVED--
ANALYSIS I

Source	Degrees of Freedom	Mean Square	
		Average Price Per Cwt.	Average Price Per Head
Year of Sale	9	7871.730**	2008.179**
Grade of Pig	3	1082.913**	280.864**
Month of Sale	11	978.485**	242.140**
Pen Size	17	13.114 NS	8.666*
Regression of Y on: Avg. wt./pen	1	19839.446**	17649.377**
Residual	1570	18.629	4.776

*P < .05.

**P < .01.

TABLE VI
ANALYSIS OF VARIANCE OF PRICES RECEIVED--
ANALYSIS II

Source	Degrees of Freedom	Mean Square	
		Average Price Per Cwt.	Average Price Per Head
Year of Sale	9	7956.217**	2023.239**
Grade of Pig	3	1141.752**	291.917**
Month of Sale	11	983.683**	242.357**
Regression of Y on:			
No. of pigs/pen	1	93.825**	127.032**
Avg. wt./pen	1	20257.046**	17934.573**
Residual	1586	18.523	4.741

**P < .01.

TABLE VII
ANALYSIS OF VARIANCE OF PRICES RECEIVED--
ANALYSIS III

Source	Degrees of Freedom	Mean Square	
		Average Price Per Cwt.	Average Price Per Head
Year of Sale	2	50249.897**	12269.507**
Grade of Pig	3	4270.380**	743.442**
Month of Sale	11	1592.841**	381.982**
Pen Size	22	68.631**	39.495**
Regression of Y on: Avg. wt./pen	1	26112.390**	15611.030**
Residual	1641	42.705	8.760

**P < .01.

TABLE VIII
ANALYSIS OF VARIANCE OF PRICES RECEIVED--
ANALYSIS IV

Source	Degrees of Freedom	Mean Square	
		Average Price Per Cwt.	Average Price Per Head
Year of Sale	2	50964.412**	13420.165**
Grade of Pig	3	4864.608**	919.036**
Month of Sale	11	1651.243**	388.570**
Regression of Y on:			
No. of pigs/pen	1	452.412**	470.734*
Avg. wt./pen	1	30420.470**	16620.775*
Residual	1662	42.801	8.888

*P < .05.

**P < .01.

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 largely due to yearly 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.

Other studies including Barnhart et al. (1957), Sewell (1962), Waddell (1965), and Donaldson (1970) also have indicated that year of sale was a large source of variation.

II. GRADE EFFECTS

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

Pigs grading 1's in Analysis I sold for an average of \$5.29 per hundredweight and \$2.73 more per head than pigs grading 4's, and \$2.99 per hundredweight and \$1.47 per head more than pigs grading 3's. Grade 2 pigs sold for \$1.26 less per hundredweight and \$0.93 per head less than pigs grading 1's. The inclusion of average number of pigs per pen in Analysis II as a continuous variable did not influence the magnitude or the least-squares estimates of grade means.

In Analysis III grades 1 and 2 combined sold for an average of \$9.73 per hundredweight and \$4.16 per head more than pigs grading 5; grade 4 pigs, on the average, sold for \$5.71 per hundredweight and \$2.33

less than pigs grading 1 and 2; pigs grading 3 sold for \$1.72 per hundredweight and \$0.85 per head less than pigs grading 1 and 2.

In Analysis IV, on the average, pigs grading 1 and 2 sold for \$9.91 per hundredweight and \$4.37 per head more than pigs grading 5. Other comparisons in Analysis IV indicate the same magnitude of differences as in Analysis III. Therefore, the inclusion of average number of pigs per pen in Analysis IV as a continuous variable did not influence the magnitude of the least-square grade means.

In Analysis III and IV these data indicate that the price spread between grades 1 and 2 and grade 5 pigs and other grades could be due to the relatively high relationship between grade at sale and slaughter grade or quality (Hicks, 1972).

These findings are in general agreement with those reported by Jamison et al. (1970), Donaldson (1970), and Waddell (1965).

III. MONTH-OF-SALE EFFECTS

These data indicate that month of sale had a significant effect on price received per hundredweight and price per head of feeder pigs. Analyses I and II indicate that prices received from feeder pigs were, on the average, highest during April and October; whereas, in Analysis III and IV, prices received were highest during April and May.

The month in which the lowest price per hundredweight and per head received in Analysis I and II was January; January was the lowest month for prices per hundredweight and per head in Analysis III and IV, also. These findings are in agreement with those reported by Barnhart (1957), Waddell (1965), Jamison et al. (1970), and Donaldson (1970).

The personal observations of feeder pig buyers indicate that they were willing to pay more per hundredweight, thus more total dollars, for lightweight pigs in April due to warmer weather and less handling problems. The buyers in October were willing to pay more per hundredweight for heavyweight pigs due to colder weather and feeders using the heavier pig to glean grain fields.

IV. PEN-SIZE EFFECTS

In Analyses I and II the average number of pigs per pen, in increments of 10, was considered as a discrete variable.

Least-square differences in price per hundredweight and price per head due to variation in pen size indicate a definite price advantage for pigs in larger pens.

With respect to price received per hundredweight, Analysis I indicates that pigs sold in pens of 41-50, 121-130, 141-150, and 151-160 brought more than pigs in any other pen-size classification.

These data, Analysis I, indicate that pen size had no significant effect on price received per head. However, pigs sold in pens of 141-150 brought more per head than pigs in any other pen-size classification.

In Analysis III pen size had a significant effect on the price received per hundredweight and per head. The pigs in pen sizes of 181-190, 151-160, and 131-140 sold for more per hundredweight and per head than pigs in any other pen-size classification.

The pigs included in Analysis I from 1961-1970 were purchased by local farmer feeders; however, from 1969 and continuing through 1972, order buyers were purchasing a much higher percentage of the pigs. The

order buyers were attracted to the Sevierville sales by the reputation of Tennessee feeder pigs and the large volumes of higher quality pigs which could be obtained.

Other workers have reported advantages for selling pigs in larger pen sizes including Hass et al. (1962), O'Neal (1964), Waddell (1965), Jamison et al. (1970), and Donaldson (1970).

V. AVERAGE-PEN-WEIGHT EFFECTS

Differences in average weight per pen were a highly significant ($P < .01$) source of variation in price in all analyses.

When the price received per hundredweight was regressed on average weight per pen in Analyses I and III with all other sources of variation held constant, these data, indicate in both analyses that as average weight per pen increased the price per hundredweight decreased. This, in general, reflects the generally recognized buyer's willingness to pay more per hundredweight for lightweight pigs than for heavier pigs.

When price received per hundredweight was regressed on average weight per pen and on the number of pigs per pen, in Analysis II and IV, the magnitude of the regression estimate was similar to that obtained in Analyses I and III.

When price per head received was regressed on average weight per pen, as average weight per pen increased so did average price per head received. These data indicated also that although lightweight pigs sell for more per hundredweight, for every pound increase in average weight, price per head increased \$0.18. Thus, according to these data, selling

lightweight pigs is undesirable, provided the cost of gain is less than \$0.18 per pound. This is implied in Analyses II and IV also.

CHAPTER V

SUMMARY AND CONCLUSIONS

Records from 3,292 pens (99,014 pigs) sold in the Sevierville demonstrational feeder pig sales from 1961 through 1972 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 sold.

The data in Analysis I and II were for the period May 20, 1961, through March 30, 1970, in which average weight per pen was 54.47 pounds, average number of pigs per pen was 24.79, with average prices per hundredweight and per head of \$30.08 and \$15.71, respectively.

The data in Analysis III and IV were for the period April 1, 1970, through December 30, 1972, in which average weight per pen was 53.21 pounds, average number of pigs per pen was 35.12, with an average price of \$31.81 per hundredweight and \$16.11 per head.

There were highly significant differences among years in prices received for feeder pigs per hundredweight and per head as expected.

Grade of pig had a highly significant effect on price per hundredweight and per head received for feeder pigs in all analyses. In Analysis I, 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. The inclusion of average number of pigs per pen

in Analysis II as a continuous variable did not influence the magnitude of the least-squares grade means.

In Analysis III, grades 1 and 2 pigs combined sold for \$9.73 more per hundredweight and \$4.16 per head more than grade 5 pigs, for \$5.71 per hundredweight and \$2.33 per head more than grade 4 pigs and for \$1.72 more per hundredweight and \$0.85 more per head more than grade 3 pigs. The comparisons in Analysis IV showed about the same differences as Analysis III. Therefore, the inclusion of average number of pigs per pen, as in Analysis I and II, did not influence the magnitude of the least-squares means.

Month of sale had a significant effect on price received per hundredweight and per head. Analyses I and II indicated that the highest prices were received during April and October; whereas, in Analyses III and IV, prices were highest in April and May. The lowest price received in Analyses I and II was during January, which also was the lowest-price month in Analyses III and IV.

There was a definite price advantage per hundredweight and per head for pigs selling in larger pens. Analysis I indicated pigs sold in pens of 41-50, 121-130, 141-150, and 151-160 sold for more per hundredweight than any other pen-size classification; but pen size had no significant ($P < .05$) effect on price received per head although pigs in pens of 141-150 did bring more per head than any other pen-size classification.

In Analysis III, pen size had a significant ($P < .05$) effect on price both per hundredweight and per head. The pigs in pens of 181-190, 151-160, and 131-140 sold for more per hundredweight and per head

than any other pen-size classification.

Price differences due to differences in average weight per pen were highly significant ($P < .01$) in all analyses. When price per hundredweight was regressed on average weight per pen with all other sources of variation held constant, these data indicated that as average weight per pen increased, price per hundredweight decreased.

When price per head was regressed on average weight per pen, as average weight increased so did average price per head. These data indicated lightweight pigs sell for more per hundredweight; however, with every pound increase in average weight, price per head increased \$0.18. Thus, selling lightweight pigs is undesirable, provided the cost of gain is less than \$0.18 per pound.

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LITERATURE CITED

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APPENDIX

TABLE IX
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	05	
No. 6	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	
201-210	21	
211-220	22	
221-230	23	
231-240	24	
241-250	25	

TABLE IX (continued)

Date	Code	IBM Card Column Number
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	
Year of Sale		28-29
1961	61	
1962	62	
1963	63	
1964	64	
1965	65	
1966	66	
1967	67	
1968	68	
1969	69	
1970	70	
1971	71	
1972	72	
Price/head/pen	Use Actual Price	30-33

VITA

Michael Lynn Sharp was born in Claiborne County, Tennessee, on January 22, 1942. He received his primary and secondary education in the schools of Claiborne County. He was graduated in May, 1959 from Powell Valley High School at Speedwell, Tennessee.

He received his first two years of college work at Lincoln Memorial University at Harrogate, Tennessee. Then because of a continued interest in the study of agriculture, in the Fall of 1961, he enrolled at The University of Tennessee, Knoxville, Tennessee. He was graduated with a B.S. degree in Animal Husbandry in May, 1964.

After receiving his B.S. degree, he accepted employment as Herdsman with Haystack Angus Ranch at Longmont, Colorado, and later with Black Watch Farms of Fishkill Plains, New York. In August, 1966, he joined the staff of the Agricultural Extension Service, The University of Tennessee, as Assistant County Agent of Sevier County and he is currently serving in this capacity.

In 1970, he entered Graduate School at The University of Tennessee on a part-time basis to attain a Master's degree in Animal Husbandry, which he expects to receive in March, 1974.

He was married in July, 1965, to Billie Diana Herrell of Middlesboro, Kentucky. They have one daughter, Melody Lynn, age seven.