

# **FARROW-to-FINISH HOG PRODUCTION in ALABAMA**

**With Emphasis on  
Sow Leasing Arrangements**

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# **FARROW - to - FINISH HOG PRODUCTION**

## **In ALABAMA with Emphasis on**

### **Sow Leasing Arrangements\***

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#### **INTRODUCTION**

**S**WINE PRODUCTION in Alabama has become more specialized. Moreover, recent advances in swine production technology and the prospect for favorable prices have increased interest in the swine industry. Production may be confined either to producing feeder pigs or finishing feeders to market weight. Many producers, however, do both jobs in one operation such as in a farrow-to-finish operation. In feeder pig operations, producers raise only feeder pigs selling 40-50-pound pigs at 8 to 10 weeks of age. A finishing operation only depends on purchased feeder pigs that are fed to market weight of 180-240 pounds before being sold.

More recently a variation of the farrow-to-finish operation has been introduced to Alabama hog farmers, that of sow leasing where the farmer leases rather than owns breeding stock. The farmer pays a lessor royalties, usually at the time offspring from certain farrowings are sold. Royalties vary in price depending upon which litter is being sold.

Since sow leasing has been practiced in Alabama only a few years, farmers are generally unfamiliar with the procedure. A swine producer considering leasing should compare the cost of owning and the cost of leasing breeding stock before entering into any contract. Both sow leasing and regular farrow-to-finish operations are studied in this report.

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\*\* Former graduate research assistant and Professor of Agricultural Economics, respectively. Acknowledgment is due Dr. S. C. Bell for his helpful advice and assistance.

## **OBJECTIVES OF STUDY**

Many farm operators are now considering swine as a supplemental enterprise in their farming operation. Reliable budgets are needed to determine whether a hog enterprise should be added to the farm situation. Economies of size are very important in any type of farming enterprise, particularly hog production. Information on size economies and advantages of different types and sizes of hog operations are needed to determine which swine operation, if any, to add. This study, thus, had the following specific objectives:

1. to study new methods of hog production such as sow leasing.
2. to determine economies of size in regular farrow-to-finish operations.
3. to develop budgets for farrow-to-finish operations.
4. to compare sow leasing with conventional types of farrow-to-finish operations.

## **METHOD OF STUDY**

Names of farmers with large swine operations were obtained from County Extension Chairmen. Questionnaires were sent to these farmers, seeking basic information about their operations and their willingness to answer additional and more detailed questions. Data were then collected from these farmers by personal interviews. Only producers with larger farrow-to-finish operations and sow leasing arrangements were interviewed. Farrow-to-finish operators had, at least, 70 sows. Sow leasing operators had, at least, 105 sows. Usable questionnaires were obtained for four sow leasing operations and sixteen farrow-to-finish operations. Data were collected for the year 1971. It was not a good price year for hog farmers. Average price for market hogs was \$18.78 per hundredweight. The highest monthly average was \$21.38, reported at the Selma market. These prices were less than half those reached in 1973.

### **Cost Procedures**

Grain produced on the farm and fed to hogs was charged at the average price received by farmers for grain as reported by Alabama Crops and Livestock Reporting Service. Grain purchased was charged at the price reported paid by the farmer. All other feeds, such as supplements, minerals, vitamins, antibiotics, and pig starter were charged at the prices reported by farmers.

All other variable expenses were charged at the prices reported by farmers. Buildings and equipment were insured at the rate of \$.375 per one hundred dollars of estimated value new.

Tax charges were based on the average value of land, buildings, and vehicles. These items were taxed at 15 percent of their average value applying the millage rate of the county in which a farm was located.

Hired labor was charged at the rate reported by the farmer. Family and operator's labor was charged at \$1.65 per hour.

Interest was charged at the rate of 6 percent on the average value of fixed capital and the average value of the breeding herd.

Depreciation was calculated by the straight line method. Buildings were given an expected life of 20 years with a salvage value of 5 percent. Equipment was divided into two classes, equipment with salvage value such as machinery, feed bins, mixer mills, and equipment without salvage value such as hog waterers, and feeders. Fences, watering systems, lagoons, and equipment without salvage value, were allowed an expected life of 10 years. Miscellaneous items were allowed a useful life of 10 years and a salvage value of 5 percent.

## **FARROW-TO-FINISH OPERATIONS**

### **Description of Farms and Operators**

The types of buildings used for these operations varied. A few farrowing houses were very elaborate but a majority was of simple pole type construction. All buildings had either concrete or slatted floors. The main source of heat for young pigs was heating lamps. Sprinklers and fans were used to cool large hogs in the summer time.

Breeds used by these farmers varied from farm to farm. All farmers used crosses in their operations with Yorkshire, Hampshire, and Landrace the predominant breeds. Other breeds, such as Duroc, Poland, and Spotted-Poland were little used.

Five of the sixteen producers were using performance tested boars. These are boars that have been tested for rate and efficiency of gain and have also had carcass quality tests conducted on their litter mates.

Some of the personal characteristics of the farmers were as follows:

<i>Characteristics</i>	<i>Av. number of years</i>
Age.....	38.1
Formal education.....	14.1
Experience operating a farm.....	15.8
Experience raising hogs.....	8.5

### Investment Costs

Prospective and current swine producers need to know the cost of establishing or expanding hog operations. In this study many factors affected investment costs such as, degree of mechanization, size of operation, and degree of integration. As mechanization was substituted for labor, greater investment was required. Costs per head were affected by the size of operation. Integrated operations with feed mills had greater capital investment.

Other things affecting investment costs were location of farms and farmers selection of resources to be used. Some farmers used a minimum amount of resources while others had more resources than were needed.

Buildings and equipment made up 49 to 58 percent of the total investment in the three groups, Table 1. Investments were \$285.65, \$206.55, and \$263.08 per sow for small, medium, and large groups, respectively. The buildings in the medium group were of lower cost construction resulting in a lower investment

TABLE 1. INITIAL AVERAGE INVESTMENT IN CAPITAL ASSETS PER SOW FOR SELECTED FARROW-TO-FINISH OPERATIONS, ALABAMA, 1971

Item	Producer groups		
	Small <sup>1</sup>	Medium <sup>2</sup>	Large <sup>3</sup>
<b>Land, buildings and equipment</b>			
Land.....	\$ 83.12	\$ 57.07	\$ 39.69
Fencing.....	18.96	9.37	11.97
Buildings and equipment.....	285.65	206.55	263.08
Water system.....	9.38	13.01	20.83
Office equipment.....	.06	.87	5.97
Vehicles.....	122.23	46.52	35.99
Total (excluding land).....	\$436.28	\$276.32	\$337.84
Total.....	\$519.40	\$333.39	\$377.53
<b>Brood stock</b>			
Sows and gilts.....	\$ 55.67	\$ 53.22	\$ 65.17
Boars.....	7.08	7.06	13.05
Total.....	\$ 62.75	\$ 60.28	\$ 78.22
Total (excluding land).....	\$499.03	\$336.60	\$416.06
Total.....	\$582.15	\$393.67	\$455.75

<sup>1</sup> Small includes herds of: 70, 80, 84, 86, 88, 93, and 98 sows.

<sup>2</sup> Medium includes herds of: 112, 120, 120, 130, and 155 sows.

<sup>3</sup> Large includes herds of: 180, 183, 200, and 415 sows.

per sow. This is supported by the fact that more labor was required for this group. These farms substituted labor for mechanization. It is unlikely that economies of size was a factor in investment cost in buildings.

The medium sized group had the lowest investment per sow with \$393.67 as compared to \$582.15 for the small group and \$455.75 for the large group. This advantage for the middle group probably is explained by the lower investment cost in buildings. Actually, excluding land cost, producers in the large group had higher investment cost in all items, except for vehicle costs, than producers in the medium sized group. However, the large group had lower investment cost per sow in land, fencing, buildings, equipment, and vehicles than did the smaller producer group.

### **Costs and Returns**

Feed was the major cost item for all producer groups followed by the cost of labor. Feed cost accounted for 70.81 percent, 69.74 percent, and 65.84 percent of all costs for small, medium, and large producer groups, respectively, Table 2. The large group had a considerable advantage in non-feed variable costs. Cost per sow decreased from \$61.05 to \$31.11 as group size increased from small to large. Fixed costs were lowest for the medium group at \$43.40 per sow.

The total cost per sow was least for the large producer group at \$429.56 and greatest for the small producer group at \$705.75. The middle group had a total cost per sow of \$602.44. Size economies probably is an influencing factor, but other reasons also exist. Feed costs were much lower for the large group, primarily due to fewer hogs sold per sow. In the middle group lower building cost was a factor.

Gross receipts per sow were \$630.91, \$637.43, and \$517.22 for small, medium, and large producer groups, respectively, Table 3. Included in gross receipts were gross sales plus the change in inventory per sow. Gross sales included sale of finished hogs, culled sows, and boars.

The medium group achieved greater production from their sows with 14.67 head sold, or 3,118.65 pounds of pork sold per sow. Production dropped considerably in the large group with only 2,369.35 pounds of pork, or only 10.66 head sold per sow. Sales of the small group were slightly less than the medium group with 3,105.38 pounds of pork or 13.57 head per sow. The larger

TABLE 2. AVERAGE TOTAL COSTS PER SOW FOR SELECTED  
FARROW-TO-FINISH OPERATIONS, ALABAMA, 1971

Item	Producer groups		
	Small <sup>1</sup>	Medium <sup>2</sup>	Large <sup>3</sup>
<b>Feed cost</b>			
Feed purchased.....	\$506.26	\$420.17	\$289.79
Inventory change.....	6.47	0.00	6.95
Total.....	\$499.79	\$420.17	\$282.84
<b>Non-feed variable costs</b>			
Replacement stock.....	\$ 12.29	\$ 1.69	\$ 10.05
Veterinary and vaccination.....	8.60	15.69	5.46
Hauling.....	15.65	7.25	6.27
Electricity.....	5.49	8.28	4.09
Telephone.....	.56	.78	.41
Miscellaneous.....	2.91	4.77	.00
Repairs.....	11.23	2.16	3.29
Interest on operating capital.....	4.32	4.11	1.54
Total.....	\$ 61.05	\$ 44.73	\$ 31.11
<b>Fixed costs</b>			
Capital depreciation.....	\$ 38.54	\$ 21.10	\$ 23.82
Insurance.....	1.76	1.16	1.39
Interest.....	29.94	20.19	24.96
Taxes.....	1.44	.95	1.15
Total.....	\$ 71.68	\$ 43.40	\$ 51.32
<b>Other costs</b>			
Land.....	\$ 4.99	\$ 3.42	\$ 2.38
Labor.....	68.24	90.72	61.91
Total.....	\$ 73.23	\$ 94.14	\$ 64.29
Total cost (excluding land and labor).....	\$632.52	\$508.30	\$365.27
Total cost.....	\$705.75	\$602.44	\$429.56

<sup>1</sup> Small includes herds of: 70, 80, 84, 86, 88, 93, and 98 sows.

<sup>2</sup> Medium includes herds of: 112, 120, 120, 130, and 155 sows.

<sup>3</sup> Large includes herds of: 180, 183, 200, and 415 sows.

producer group compensated for its lack of production with lower costs per sow.

Returns to land, labor, and management per sow were a minus \$1.61, a positive \$129.13, and a positive \$151.95 for the small, medium, and large groups, respectively. These returns, of course, do not reflect a charge for land or labor. Returns to labor and management, per sow, with land charged at 6 percent of purchase price, were minus \$6.60, a positive \$125.71, and a positive \$149.57 per sow for the small, medium, and large groups. Using the labor charge reported by the farmer or, \$1.65 per hour, the cost of labor was subtracted to give a return to management. Returns to management, per sow, were a minus \$74.84 for the small group, a positive \$34.99 for the medium group, and a positive \$87.66 for the large group. With the investments per sow given in Table 8, the percent earned on investment was a minus 1.31 for the small group, a plus 8.98 for the medium group, and a plus 26.8 for the large group.



TABLE 3. AVERAGE TOTAL COSTS AND RETURNS PER SOW FOR SELECTED FARROW-TO-FINISH OPERATIONS, ALABAMA, 1971

Item	Producer groups		
	Small <sup>1</sup>	Medium <sup>2</sup>	Large <sup>3</sup>
Number of head sold per sow.....	13.57	14.67	10.66
Pounds of pork sold per sow.....	3,105.38	3,118.65	2,369.35
<b>Gross receipts</b>			
Gross sales.....	\$582.17	\$580.08	\$440.26
Inventory change.....	48.74	57.35	76.96
Total.....	\$630.91	\$637.43	\$517.22
<b>Costs</b>			
Feed.....	\$499.79	\$420.17	\$282.84
Non-feed variable.....	61.05	44.73	31.11
Fixed.....	71.68	43.40	51.32
Total.....	\$632.52	\$508.30	\$365.27
<b>Returns</b>			
Returns to land, labor and management.....	\$-1.61	\$129.13	\$151.95
Cost of land.....	4.99	3.42	2.38
Returns to labor and management.....	-6.60	125.71	149.57
Cost of labor.....	68.24	90.72	61.91
Return to management.....	-74.84	34.99	87.66
Average investment.....	582.15	393.67	455.75
Percent earned on investment.....	-1.31	8.98	26.8

<sup>1</sup> Small includes herds of: 70, 80, 84, 86, 88, 93, and 98 sows.

<sup>2</sup> Medium includes herds of: 112, 120, 120, 130, and 155 sows.

<sup>3</sup> Large includes herds of: 180, 183, 200, and 415 sows.

In summary, economies of size are indicated since net returns increased as size increased. Also indicated, however, was a decrease in production as size increased. Apparently there were cost reductions that offset this decrease in production. If producers in the large group had received the same production from their sows as the other producers, returns per sow would have been considerably greater.

### Farrow-To-Finish Budgets

The success or failure of hog production is affected by many factors. Some of these factors are, (1) number of pigs weaned per litter, (2) hogs marketed per sow, (3) feed efficiency or feed conversion ratio, (4) death losses, (5) disease problems, (6) weight of pigs at weaning, and (7) managerial ability of farmer. All factors noted above are influenced by managerial ability. For this reason farrow-to-finish budgets were computed to determine the nature of returns that would be possible for producers with above average ability.

Budgets have been prepared for both 100- and 200-sow farrow-to-finish operations, tables 4 and 5. Slightly above average levels

TABLE 4. ESTIMATED COSTS AND RETURNS FOR A 100-SOW FARROW-TO-FINISH OPERATION, BUYING FEED

Item	Description	Unit	Quantity	Rate	Amount
<b>Receipts</b>					
Market hogs.....	1,600 @ 220 lb. each	cwt.	3,520.00	\$ 40.00	\$140,800.00
Culled sows.....	20 @ 350 lb. each	cwt.	70.00	\$ 30.00	2,100.00
Culled boars.....	4 @ 350 lb. each	cwt.	14.00	\$ 20.00	280.00
Total receipts.....					\$143,180.00
<b>Cash expenses</b>					
Feed.....	complete feed	ton	72.08	\$ 160.00	\$115,328.00
Replacement stock.....	boars	head	4	\$ 250.00	1,000.00
Veterinarian and vaccination.....		head	100	\$ 10.58	1,058.00
Hauling.....		head	100	\$ 7.52	752.00
Electricity.....		mo.	12	\$ 57.33	688.00
Telephone.....		mo.	12	\$ 5.00	60.00
Miscellaneous.....		yr.	1	\$ 265.00	265.00
Repairs.....		yr.	1	\$ 303.00	303.00
Interest on operating capital (\$15,700 for 3 mos. at 8%).....				\$ 314.00	314.00
Total cash expense.....					\$119,768.00
<b>Fixed costs</b>					
Capital depreciation.....				\$2,834.00	\$ 2,834.00
Insurance.....				\$ 135.00	135.00
Interest.....				\$2,194.00	2,194.00
Taxes.....				\$ 108.00	108.00
Total fixed cost.....					\$ 5,271.00
Returns to land, labor and management.....					\$ 18,141.00

Assumptions were: (1) 16.2 market hogs produced per sow per year, (2) overall feed ratio 4 pounds of feed per pound of gain.

TABLE 5. ESTIMATED COSTS AND RETURNS FOR A 200-SOW FARROW-TO-FINISH OPERATION, BUYING FEED

Item	Description	Unit	Quantity	Rate	Amount
<b>Receipts</b>					
Market hogs.....	3,200 @ 220 lb. each	cwt.	7,040.00	\$ 40.00	\$281,600.00
Culled sows.....	40 @ 350 lb. each	cwt.	140.00	\$ 30.00	4,200.00
Culled boars.....	8 @ 350 lb. each	cwt.	28.00	\$ 20.00	560.00
Total receipts.....					\$286,360.00
<b>Cash expenses</b>					
Feed.....	complete feed	ton	144.16	\$ 160.00	\$230,656.00
Replacement stock.....	boars	head	8	\$ 250.00	2,000.00
Veterinarian and vaccination.....		head	200	\$ 10.58	2,116.00
Hauling.....		head	200	\$ 6.00	1,200.00
Electricity.....		mo.	12	\$ 91.50	1,098.00
Telephone.....		mo.	12	\$ 5.00	60.00
Miscellaneous.....		yr.	1	\$ 424.00	424.00
Repairs.....		yr.	1	\$ 484.00	484.00
Interest on operating capital (\$25,100 for 3 mos. at 8%).....				\$ 502.00	502.00
Total cash expense.....					\$238,540.00
<b>Fixed costs</b>					
Capital depreciation.....				\$3,947.00	\$ 3,947.00
Insurance.....				\$ 224.00	224.00
Interest.....				\$4,045.00	4,045.00
Taxes.....				\$ 186.00	186.00
Total fixed cost.....					\$ 8,402.00
Returns to land, labor and management.....					\$ 39,418.00

Assumptions were: (1) 16.2 market hogs produced per sow per year, (2) overall feed ratio 4 pounds of feed per pound of gain.

of production were assumed. More important assumptions were 16 market hogs sold per sow per year and an overall feed ratio of 4 pounds of feed per pound of pork sold.

Other budget computations were based on average results of hog operations of similar size included in this study and market conditions existing in early 1974. Assumptions were, (1) market hogs were valued at \$40.00 per hundredweight, (2) culled sows were valued at \$30.00 per hundredweight, (3) culled boars were valued at \$20.00 per hundredweight, and (4) a complete feed ration was valued at \$160.00 per ton.

For the 100-sow herd total returns to land, labor, and management were \$18,141.00 or \$181.41 per sow. Total receipts which included the sale of market hogs and culled brood stock, were \$143,180.00. The total cost was \$125,039.00. The major cost item was feed at \$115,328.00.

The 200-sow herd was assumed to possess greater economies of size than the 100-sow herd, as indicated by the study data. These lower costs per sow were in the areas of hauling, electricity, repairs, interest on operating capital, and miscellaneous costs. Costs other than these were assumed to be approximately the same on a per unit basis.

Total receipts for a 200-sow operation were \$286,360.00, Table 5. Total costs were \$246,942.00; thus the return to land, labor, and management was \$39,418.00. The returns to land, labor, and management per sow were \$197.09 per year.

## **SOW LEASING**

The use of leasing arrangements has occurred in Alabama only within the past few years. The number of hogs grown under leasing contracts, based on this study, is not large, yet such contracts represent a variation of farrow-to-finish production which farmers may wish to consider.

### **Description of Farms and Operators**

Size of operations ranged from 105 to 282 sows per herd. Cross-breed hogs were produced on all farms. Breeds used were Yorkshire, Hampshire, and Duroc. Age of the operators ranged from 25 to 40 years. All four had attended college, had 8.5 years of farm experience and had 6 years experience in hog production.

### **The Leasing Contract**

Duration of leasing contracts were for periods that extended from a minimum of 27 months to a maximum of 48 months. At

TABLE 6. SCHEDULE OF RENTAL PAYMENTS FOR SOW LEASING  
OVER A PERIOD OF 48 MONTHS

Rental period	Date due	Amount <sup>1</sup>
<b>Gilts</b>		
1st .....	On delivery	\$15.00
2nd .....	11th month after delivery	90% value of market hog <sup>2</sup>
3rd .....	23rd month after delivery	75% value of market hog
4th .....	28th month after delivery	10% value of market hog
5th .....	34th month after delivery	10% value of market hog
6th .....	40th month after delivery	10% value of market hog
7th .....	46th month after delivery	10% value of market hog
Total rent .....		\$15.00 + 205% of the value of market hog
<b>Boars</b>		
1st .....	On delivery	\$25.00
2nd .....	11th month after delivery	200% value of market hog
Total rent .....		\$25.00 + 200% of the value of market hog

<sup>1</sup> These payments are reduced by a rental refund. The rental refund is derived from the salvage value of the sow—(value of a 220 lb. market hog—\$5.00) (0.75). There is no rental refund on boars.

<sup>2</sup> The value of a market hog is the value of a U.S. grade 1-2, 220-pound market hog at the highest average price paid for the month at a selected midwestern market.

the end of the period, sows were sold and a new batch of gilts was delivered to the producer if both parties agreed to renew the contract. Table 6 shows a schedule of rental payments for sow leasing for a 48-month period.

### Investment Costs

Investment requirements for sow leasing were not greatly different from farrow-to-finish operations. Average total investment for sow leasing operations was \$458.63 per sow, Table 7. The average investment, for all the regular farrow-to-finish operations studied was \$477.19 per sow. Investment per sow in sow leasing arrangements ordinarily should be lower since there is no investment in brood stock. This zero investment, however, is somewhat offset by the cost of buildings in this study. Buildings were newer and more modern in the sow leasing arrangements than in most of the regular farrow-to-finish operations.

### Costs and Returns in Sow Leasing Arrangements

The total cost per sow for leasing operations was \$446.93 or \$398.42 excluding land and labor, Table 8. The major cost, as in other operations, was the cost of feed; \$276.50 per sow. Non-feed variable cost was \$64.27 per sow, including \$39.07 for the

TABLE 7. INITIAL AVERAGE INVESTMENT IN CAPITAL ASSETS PER SOW FOR  
SELECTED FARROW-TO-FINISH AND SOW LEASING OPERATIONS,  
ALABAMA, 1971

Item	Producer groups	
	Sow leasing <sup>1</sup>	Farrow-to-finish <sup>2</sup>
<b>Land, buildings and equipment</b>		
Land .....	\$ 9.70	\$ 59.96
Fencing .....	5.41	13.43
Buildings and equipment .....	397.17	251.76
Water system .....	2.46	14.41
Office equipment .....	1.86	2.30
Vehicles .....	42.03	68.25
Total (excluding land) .....	\$448.93	\$350.15
Total .....	\$458.63	\$410.11
<b>Brood stock</b>		
Sows and gilts .....	\$ .00	\$ 58.02
Boars .....	.00	9.06
Total .....	\$ .00	\$ 67.08
Total (excluding land) .....	\$448.93	\$417.23
Total .....	\$458.63	\$477.19

<sup>1</sup> Sow leasing includes herds of: 105, 175, 175, and 282 sows.

<sup>2</sup> Farrow-to-finish includes herds of: 70, 80, 84, 86, 88, 93, 98, 112, 120, 120, 130, 155, 180, 183, 200, and 415.

cost of leasing. Fixed cost was \$57.63 per sow and other costs were \$48.51 per sow.

TABLE 8. AVERAGE TOTAL COSTS PER SOW FOR SELECTED FARROW-TO-FINISH  
OPERATIONS ON SOW LEASING CONTRACTS, ALABAMA, 1971<sup>1</sup>

Item	Amount
<b>Feed costs</b> .....	\$276.50
<b>Non-feed variable costs</b>	
Leasing .....	\$ 39.07
Veterinary and vaccination .....	4.54
Hauling .....	6.00
Electricity .....	3.09
Telephone .....	.55
Miscellaneous .....	3.20
Repairs .....	.86
Interest on operating capital .....	6.98
Total .....	\$ 64.29
<b>Fixed costs</b>	
Capital depreciation .....	\$ 27.28
Insurance .....	1.61
Interest .....	26.94
Taxes .....	1.80
Total .....	\$ 57.63
<b>Other costs</b>	
Land .....	\$ .90
Labor .....	47.61
Total .....	\$ 48.51
Total cost (excluding land and labor) .....	\$398.42
Total cost .....	\$446.93

<sup>1</sup> Sow leasing includes herds of: 105, 175, 175, and 282 sows.

TABLE 9. AVERAGE TOTAL COSTS AND RETURNS PER SOW FOR SELECTED FARROW-TO-FINISH OPERATIONS ON SOW LEASING CONTRACTS, ALABAMA, 1971<sup>1</sup>

Item	Amount
Number of head sold per sow.....	7.66
Pounds of pork sold per sow.....	1,642.18
<b>Gross receipts</b>	
Gross sales.....	\$323.45
Inventory change.....	87.73
Total.....	\$411.18
<b>Costs</b>	
Feed.....	\$276.50
Non-feed variable.....	64.29
Fixed.....	57.63
Total.....	\$398.42
<b>Returns</b>	
Returns to land, labor and management.....	\$ 12.76
Cost of land.....	.90
Returns to labor and management.....	11.27
Cost of labor.....	47.61
Return to management.....	-36.34
Average investment.....	463.88
Percent earned on investment.....	-1.83

<sup>1</sup> Sow leasing includes herds of: 105, 175, 175, and 282 sows.

Production of swine from sow leasing operations was disappointing. The number of head sold per sow averaged only 7.66 and the average pounds of pork sold per sow was 1,642.18, Table 9. Gross receipts per sow were \$411.18, including the sale of market hogs, culled brood stock, and the change in inventory. Returns to land, labor, and management was \$12.76. With land charged at 6 percent, the return to labor and management was \$11.27 per sow. The return to management only was a minus \$36.34 per sow. Percent earned on investment was a minus 1.83.

### **Sow Leasing Compared With Regular Farrow-To-Finish Operations**

Table 10 shows how sow leasing compared with regular farrow-to-finish operations. Farrow-to-finish operations were divided into two groups. Group A included farrow-to-finish operations which were smaller than the sow leasing operations and group B included operations that were approximately the same size.

Returns to land, labor, and management per sow were minus \$1.61 for group A, \$78.44 for group B and \$12.76 for sow leasing operators. Producers using sow leasing contracts had greater returns than the small group of farrow-to-finish operators but not as great as those in the large group.

TABLE 10. AVERAGE TOTAL COSTS AND RETURNS PER SOW FOR SELECTED FARROW-TO-FINISH AND SOW LEASING OPERATIONS, ALABAMA, 1971

Item	Farrow-to-finish group A <sup>1</sup>	Farrow-to-finish group B <sup>2</sup>	Sow leasing <sup>3</sup>
Number of head sold per sow.....	13.57	13.32	7.66
Pounds of pork sold per sow.....	3,105.38	2,872.98	1,642.18
<b>Gross receipts</b>			
Gross sales.....	\$582.17	\$595.73	\$323.45
Inventory change.....	48.74	54.10	87.73
Total.....	\$630.91	\$649.83	\$411.18
<b>Costs</b>			
Feed.....	\$499.79	\$453.73	\$276.50
Non-feed variable.....	61.05	57.24	64.29
Fixed.....	71.68	60.50	57.63
Total.....	\$632.52	\$571.39	\$398.42
<b>Returns</b>			
Returns to land, labor and management.....	\$-1.61	\$ 78.44	\$ 12.76
Cost of land.....	4.99	4.24	.90
Returns to labor and management.....	-6.60	74.20	11.86
Cost of labor.....	68.24	51.85	47.61
Return to management.....	-74.84	22.35	-35.75
Average investment.....	582.15	505.43	463.88
Percent earned on investment.....	-1.31	12.41	-1.83

<sup>1</sup> Farrow-to-finish group A includes herds of: 70, 80, 84, 86, 88, 93, and 98 sows.

<sup>2</sup> Farrow-to-finish group B includes herds of: 112, 120, 120, 130, 155, 180, 183, and 200 sows.

<sup>3</sup> Sow leasing includes herds of: 105, 175, 175, and 282 sows.

### Leasing and Owning, Farrow-To-Finish Budget Comparison

Since costs and returns are affected by differences in management practices, feed efficiency, and disease control, budgets were constructed to compare sow leasing with regular farrow-to-finish operations. Budgets were confined to the cost of leasing and the cost of owning breeding stock, assuming other cost and returns would not be affected. A time period of 12 years was chosen since hog facilities should last from 10 to 20 years and it is unlikely that a producer could justify construction of permanent type facilities for a briefer period. Moreover, this would afford a completion of three 4-year leasing arrangements.

Cost of leasing includes deposits plus rental payments less any refunds. Table 11 shows the order of payments due in one of the more common leasing contracts for a 48 months period being used by Alabama producers.

There is no cash rental cost in owning one's breeding stock. The cost of owning, however, includes some costs that would not



TABLE 11. ADJUSTED SCHEDULE OF RENTAL PAYMENTS FOR SOW LEASING OVER A PERIOD OF 48 MONTHS

Rental period	Date due	Amount <sup>1</sup>
<b>Gilts</b>		
1st .....	On delivery	\$15.00
2nd .....	11th month after delivery	28% value of market hog <sup>2</sup>
3rd .....	23rd month after delivery	20% value of market hog
4th .....	28th month after delivery	10% value of market hog
5th .....	34th month after delivery	10% value of market hog
6th .....	40th month after delivery	10% value of market hog
7th .....	46th month after delivery	10% value of market hog
Total rent .....		\$15.00 + 88% of the value of market hog
<b>Boars</b>		
1st .....	On delivery	\$30.00
2nd .....	11th month after delivery	100% value of market hog
Total rent .....		\$30.00 + 100% of the value of market hog

<sup>1</sup> These payments are reduced by a rental refund. The rental refund is derived from the salvage value of the sow—(value of a 220 lb. market hog—\$5.00) (0.75). There is no rental refund on boars.

<sup>2</sup> The value of a market hog is the value of a U.S. grade 1-2, 220 pound market hog at the highest average price paid for the month at a selected midwestern market.

be incurred if sows and boars were rented. These include interest paid on the cost of the original gilts and all boars purchased, and the difference in the purchase price of each boar and gilt and the salvage value.

After the initial purchase of the breeding herd, the farmer usually selects replacement gilts from hogs produced on his farm, avoiding a possibly higher price for purchased gilts.

In order to make valid comparisons between owning and leasing, the following assumptions were made:

1. Market hogs were valued at \$40.00 per hundredweight.
2. Culled sows were valued at \$30.00 per hundredweight.
3. Culled boars were valued at \$20.00 per hundredweight.
4. The average weight of culled sows and boars was 350 pounds.
5. There were 8 boars for each 100 sows.
6. All leasing rentals were paid within 15 days of invoice.
7. The value of breeding boars was \$250.00.
8. The value of breeding gilts was the market cost plus \$20.00 per head or \$108.00.
9. Interest on borrowed money was charged at 8 percent.
10. The length of leasing agreement was for 48 months.

These assumptions approximated market conditions in early

1974 as nearly as possible. It was also assumed that transportation costs would be the same for both operations.

A sow leasing budget over a period of 12 years involving three contracts of 100 sows each for 48 months follows:

Deposit on gilts, 300 at \$15.00 .....	\$ 4,500.00
Rent paid on gilts, value of 615 market hogs at \$88.00 (with 2% discount <sup>1</sup> ).....	\$53,037.60
Deposit on boars, 24 at \$25.00 .....	\$ 600.00
Rent paid on boars, value of 48 market hogs at \$88.00 (with 2% discount <sup>2</sup> ).....	\$ 4,139.52
Total.....	\$62,277.12
Less rental refund (350 × 30¢) — (\$83 × 75%) = \$42.75 × 300 .....	\$12,825.00
Total amount paid .....	\$49,452.12
Annual cost (Total amount paid/12).....	\$ 4,121.01

<sup>1</sup> Based on terms of the contract in use.

<sup>2</sup> Based on terms of the contract in use.

A budget for the cost of owning 100 sows over a period of 12 years follows:

Interest on initial cost of breeding herd, (100 gilts at \$108.00 × 8% × 12 years).....	\$10,368.00
Interest on 24 boars at \$250 each, (6,000 × 8% × 4 years average).....	\$ 1,920.00
Difference in purchase price of gilts and salvage value of sows (100 × \$108.00 — \$105.00).....	\$ 300.00
Difference in purchase price of boars and salvage value of boars (24 × \$250 — 24(350 pounds × 20¢).....	\$ 4,320.00
Total cost of owning .....	\$16,908.00
Annual cost (Total/12).....	\$ 1,409.00

The previous budget for owning breeding stock also assumes that the farmer makes no payments on the principal. In actuality a farmer would have to make payments on the principal in order to secure a loan on breeding stock. A budget for owning breeding stock paying interest on the average investment of the breeding stock is as follows:

Interest on initial cost of breeding herd, (100 gilts at an average value of \$106.50 × 8% × 12 years).....	\$10,224.00
Interest on 24 boars at an average value of \$160.00 (3,840 × 8% × 4 years averaged).....	\$ 1,228.80
Difference in purchase price of gilts and salvage value of sows (100 × \$108.00 — \$105.00).....	\$ 300.00
Difference in purchase price of boars and salvage value of boars (24 × \$250 — 24(350 pounds × 20¢).....	\$ 4,320.00
Total cost of owning .....	\$16,072.80
Annual cost (Total/12).....	\$ 1,339.40

If interest is paid on the principal, this gives the farmer even greater advantages over leasing. By making payments on the principal the cost of owning is cut by \$69.60 per year or \$825.20 for the entire period.

### **Possible Conditions For Leasing**

With the annual cost of owning breeding stock averaging \$1,409.00 compared to \$4,121.01 for sow leasing, (assuming no payments on principal) it is not likely that swine producers would choose leasing, based entirely on cost differences revealed in budget comparisons. There are other conditions, however, which might favor leasing arrangements.

One condition might involve the inability to increase volume without outside assistance. If limited investment capital were available a swine producer might wish to invest all available capital in buildings and equipment choosing to pay rent on breeding stock. Results of this study tend to support this possibility. Producers with leasing arrangements, for example, had greater returns than the regular farrow-to-finish producers with smaller sow herds.

Leasing breeding stock may provide an opportunity for the producer to upgrade the quality of his sow herd. Rental expense might very well be justified by increased returns from better quality sows. Of course, the leasing company is not the only source of superior breeding stock.

An additional reason for leasing would be the need for managerial assistance by the farmer. Such assistance could be of great value to an inexperienced farmer. However, the contract generally used by these farmers stipulated a management service fee for additional visits above one per year. For this reason, managerial assistance, if greatly needed, could be expensive. There are, of course, possibilities for assistance without charge, such as the county agricultural extension office.

If leasing sows will provide at least \$2,712.01 worth of extra income per year with the same annual operating cost, the possibility of renting could be considered. Improvements in litter size, feed conversion, percentage lean cuts and freedom from certain diseases would be means of offsetting the additional cost. Specifically, to achieve the additional income would require one of the following:

1. The sale of 153 additional market hogs annually with feed cost assumed to be the only added cost.
2. A price premium of at least \$.76 per 100 pounds or \$1.68 per market hog above that usually received.
3. A reduction in the overall feed ratio from 4.0 to 3.9 pounds of feed per pound of gain.

Unless one of these goals can be achieved, leasing of breeding stock is not likely to be a feasible alternative.

It is unlikely that sow leasing will improve hog production by amounts mentioned earlier. Quality brood stock can be obtained from sources other than sow leasing in Alabama. Therefore, sow leasing would not be beneficial to most Alabama farmers unless for the reasons other than cost differences which were mentioned previously.

However, if sow leasing cost were comparable to the cost of owning, leasing could very well find a place in Alabama hog production, mainly due to its possible use for expansion purposes. A suggested rental payment schedule designed so that the cost of leasing is comparable to the cost of owning is shown in Table 11.

Using the schedule in Table 11, the following budget was constructed.

A sow leasing budget over a period of 12 years involving three contracts of 100 sows each for 48 months follows:

Deposit on gilts, 300 at \$15.00.....	\$ 4,500.00
Rent paid on gilts, value of 264 market hogs at \$88.00 (with 2% discount).....	\$22,767.36
Deposit on boars, 24 at \$30.00.....	\$ 720.00
Rent paid on boars, value of 24 market hogs at \$88.00 (with 2% discount).....	\$ 2,069.76
Total.....	\$30,057.12
Less rental refund ( $350 \times 30\%$ ) — ( $\$83 \times 75\%$ ) = $\$42.75 \times 300$ .....	\$12,825.00
Total amount paid.....	\$17,232.12

The difference in this 12-year budget for leasing and owning is \$324.12. This would amount to a cost of \$27.00 more per year for sow leasing, which would be comparable to owning breeding stock.

If sow leasing is to continue some changes must be made along the lines mentioned above. This is evidenced by the number of people who were displeased with sow leasing in this study and also by a study conducted in Indiana.<sup>2</sup> In the Indiana study over half the farmers producing under sow leasing arrangements did not renew their contracts.

## SUMMARY

In regular farrow-to-finish operations, total investments per sow were \$582.15, \$393.67, and \$455.75 for small, medium, and large

<sup>2</sup> BURSCH, WILLIAM G. Sow Leasing and Contract Hog Feeding: An Analysis of Producer Characteristics and Incentives, SB 17, Agricultural Experiment Station, Purdue University, West Lafayette, Indiana, August 1973.

groups, respectively. Total cost per sow (excluding land and labor) was \$632.52 for the small group, \$508.30 for the medium group, and \$365.27 for the large group.

Total receipts were \$630.91, \$637.43, and \$517.22 per sow for small, medium, and large groups, respectively. Returns to land, labor, and management per sow were minus \$1.61, a positive \$129.13, and a positive \$151.95 for small, medium, and large groups, respectively. Returns to labor and management, per sow, were minus \$6.60, a positive \$125.71, and a positive \$149.57 per sow for the small, medium, and large groups. Management returned a minus \$74.84 for the small group, a positive \$34.99 for the medium group, and a positive \$87.66 for the large group. Percent earned on investment per sow was minus 1.31 for the small group, a plus 8.98 for the medium, and a plus 26.8 for the large group.

The total investment per sow for sow leasing operations was \$458.63 as compared to \$477.19 for all regular farrow-to-finish operations studied.

Total cost per sow for leasing operations was \$398.42, excluding land and labor cost. Gross receipts per sow for these operations was \$411.18 per sow. Return to land, labor, and management was \$12.76. Return to labor and management was \$11.27 per sow. The return to management was a minus \$36.34 per sow and percent earned on investment was a minus 1.83. When returns were compared to regular farrow-to-finish operations, producers using sow leasing contracts had greater returns than the small farrow-to-finish operations but less than larger operations.

Budget comparisons made over a 12-year period showed that sow leasing cost an additional \$2,712.01 per year over a modern arrangement where breeding stock was owned. Over a 12-year period this would be a difference of \$32,544.12.

## **CONCLUSIONS**

In regular farrow-to-finish operations, investment cost per sow was dependent both on size of operation and type of buildings. The medium producer group's investment was less than the larger producer group because of less modern facilities. Returns increased as size of operation increased. Variations in returns within the groups also indicated that management was an important factor also.

The additional cost of rental payments that accompanies leasing operations must be offset by increased production. If costs

are not offset by increased efficiency, sow leasing will not be as profitable as regular farrow-to-finish operations of equal size. The exact amount of extra production that is needed to put sow leasing on an equal basis with regular farrow-to-finish operations depends on the contract. In the contract studied, by budget comparisons, at least \$2,712.01 worth of extra income was needed to equate the two operations. If sow leasing is to continue to exist or grow, leasing cost must be comparable to the cost of owning.

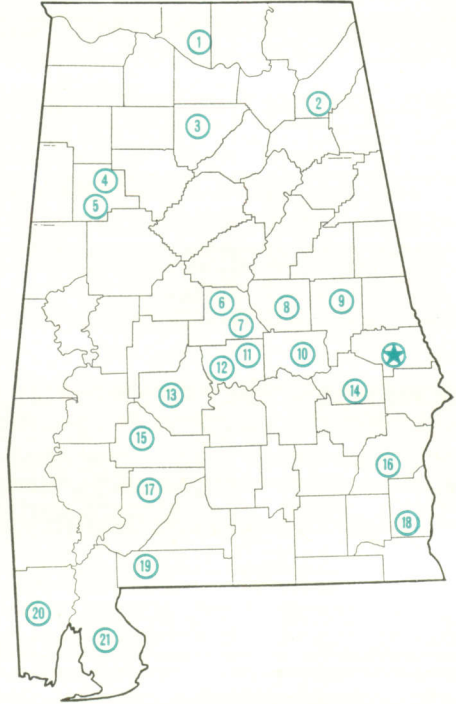
This study indicated that economies of size were present in larger swine operations but due to the lack of proper management in many of these operations the economies were wasted. Management was an important factor in all operations. In large operations with good management economies of size existed. In large operations with poor management no economies were shown. Therefore, it is possible to have economies of size by increasing herd size and by employing adequate management.



# Alabama's Agricultural Experiment Station System

## AUBURN UNIVERSITY

With an agricultural research unit in every major soil area, Auburn University serves the needs of field crop, livestock, forestry, and horticultural producers in each region in Alabama. Every citizen of the State has a stake in this research program, since any advantage from new and more economical ways of producing and handling farm products directly benefits the consuming public.



### Research Unit Identification

#### ★ Main Agricultural Experiment Station, Auburn.

1. Tennessee Valley Substation, Belle Mina.
2. Sand Mountain Substation, Crossville.
3. North Alabama Horticulture Substation, Cullman.
4. Upper Coastal Plain Substation, Winfield.
5. Forestry Unit, Fayette County.
6. Thorsby Foundation Seed Stocks Farm, Thorsby.
7. Chilton Area Horticulture Substation, Clanton.
8. Forestry Unit, Coosa County.
9. Piedmont Substation, Camp Hill.
10. Plant Breeding Unit, Tallassee.
11. Forestry Unit, Autauga County.
12. Prattville Experiment Field, Prattville.
13. Black Belt Substation, Marion Junction.
14. Tuskegee Experiment Field, Tuskegee.
15. Lower Coastal Plain Substation, Camden.
16. Forestry Unit, Barbour County.
17. Monroeville Experiment Field, Monroeville.
18. Wiregrass Substation, Headland.
19. Brewton Experiment Field, Brewton.
20. Ornamental Horticulture Field Station, Spring Hill.
21. Gulf Coast Substation, Fairhope.