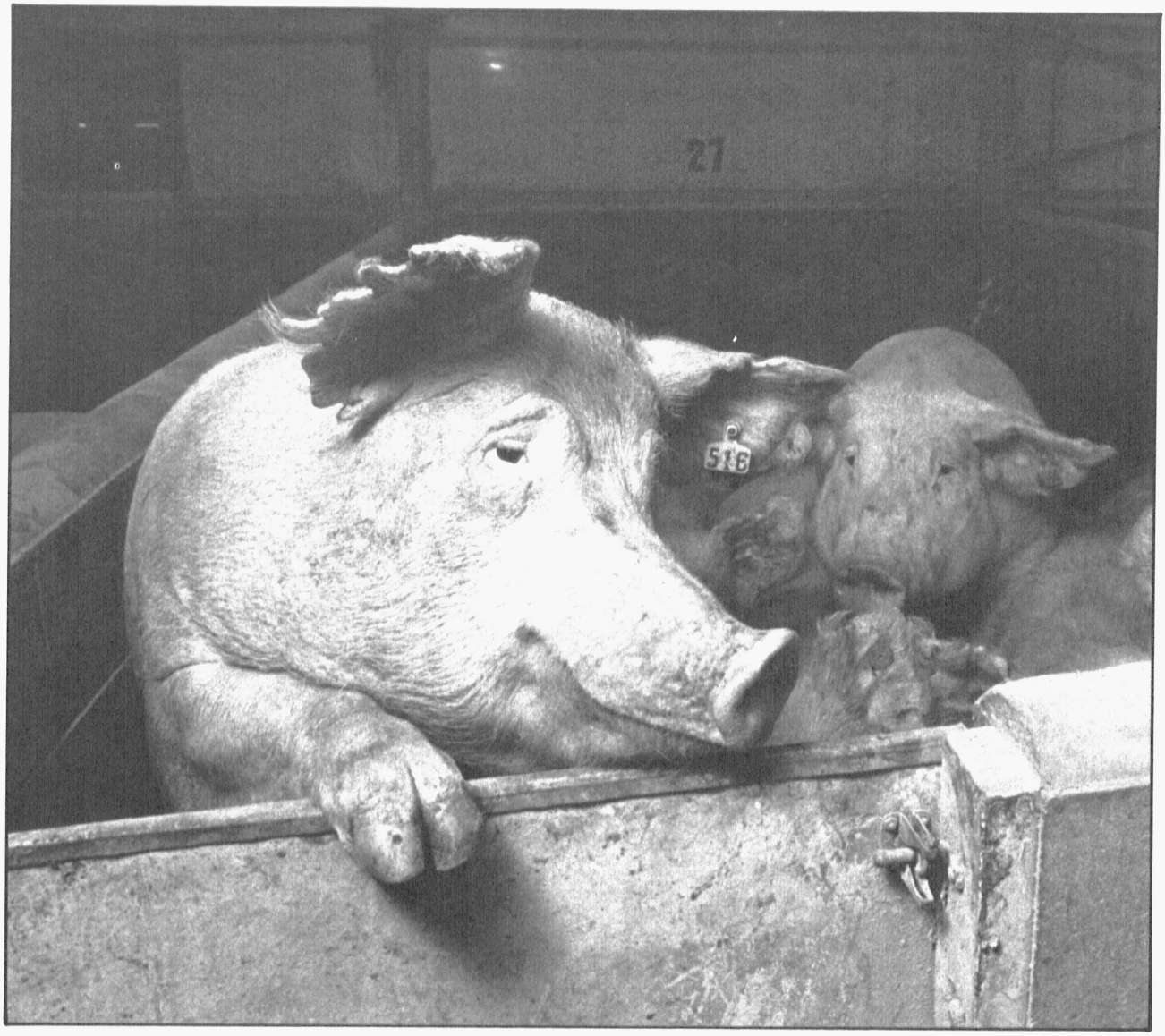

Before Tax Versus After Tax Cash Flows For Feeder Pig Factories

James B. Kliebenstein

SR 252

Published by the University of Missouri-Columbia
10/80

BEFORE TAX VERSUS AFTER TAX CASH FLOWS FOR FEEDER PIG FACTORIES

Introduction

In evaluating farm investments it is important to be able to compare cost versus returns. For today's farmers, financial management is as important as production management. Annual dollars of inflow need to be compared to annual dollars of outflow. All too often, this dollar inflow-outflow analysis is done on a before tax money flow rather than after tax money flow basis. The more valid comparison is an after tax basis.

Effective market rates of interest are affected by the borrowers tax bracket as interest payments are tax deductible. Increases in the tax bracket have the effect of decreasing the effective market interest rate. The effective market rate of interest can be calculated by the following formula:

$$EI = MI\ (1-T)$$

Where:

EI = Effective market rate of interest

MI = Market rate of interest (quoted from bankers)

T = Tax bracket

Thus, if the market rate of interest (MI) is ten percent, an individual in the 30 percent tax bracket has an effective market rate of interest (EI) of seven percent.

Swine production in the United States is trending towards fewer and more concentrated and capital intensive production units (2). One phase of this movement has been the increased number of feeder pig factories. These factories are usually totally confined and specialize in feeder pig production. The facilities are capital intensive requiring labor and management which is highly skilled. Production practices such as twelve day weaning, year-round

farrowing, and exceeding 2 litters per sow annually are established goals. In essence, these units have transformed feeder pig production into a factory like process. Capacities of these systems may run from 200 to 400 or in excess of 1000 sows.

This report presents the impacts of tax brackets on after tax as compared to before tax cash flow analysis in feeder pig production. A highly specialized capital intensive feeder pig production system is used in completing the analysis. However, the approach and results are not unique to feeder pig factories. Results are applicable to any investment with a capital structure similar to that of a feeder pig factory. It can include such investments as cattle feedlots and dairy systems.

Objectives and Methodology

A previous study provided information on feeder pig factories in Missouri in 1976 (1). In that report, a summary of Missouri feeder pig factory ownership patterns, credit suppliers, investments, cost of production (before tax), management structures, farrowing performance and reasons for ownership were presented.

The purpose of this study is to evaluate before and after tax cash flows for a feeder pig factory. The case selected for analysis is felt to be representative of the typical Missouri feeder pig factory.

Specific objectives of this study are to:

1. Examine cash flow feasibility under varying feeder pig production levels.
2. Evaluate the effects of varying equity levels, production levels, and interest rates on before tax break-even cash flows.
3. Evaluate the effects of varying equity levels, production levels, and interest rates on after tax break-even cash flows.

Before tax cash flows are calculated as follows:

$$BTCF = VC + I + P$$

Where:

BTCF = Before Tax Cash Flows

VC = Variable Production Costs excluding interest (feed, utilities, insurance, medicine, supplies administration, taxes, and labor)

I = Annual interest payments

P = Annual principal payment

As calculated in this report, cash flows represent cash production costs. They represent a break-even price that would be necessary to cover all cash production costs. Labor and administration (management) are treated as cash production costs since they are hired in most feeder pig factories. For computational purposes interest and debt payments are separated from the other production cost items. This simplifies the annual cash flow analysis as debt is retired.

After tax cash flows include costs similar to before tax with adjustments made for the tax bracket. Necessary adjustments are shown in the equation below:

$$ATCF = (1 - T)\ VC + (1 - T)\ I + P - T(D) + E$$

Where:

ATCF = After Tax Cash Flows

T = Average Tax Bracket

VC = Variable Production Cost excluding interest (feed, utilities, insurance, medicine, supplies, administration, taxes, and labor).

I = Annual interest payments

P = Annual principal payments

D = Depreciation

E = Income Taxes

To evaluate before tax and after tax cash flows, a case study approach has been selected. Production, cost, and return records were maintained by the feeder pig factory selected. The record information provided a point from which to base the analysis. Investment and production information for the case study selected are provided later in this report.

To indicate the importance of equity levels on cash flows, equity levels were varied from 20 to 50 percent in ten percent increments. These levels are not proposed to be representative of all feeder pig factories, but they do cover the range of the majority in Missouri. Interest rates compared are 10 and 14 percent.

In addition to varying equity and interest rate levels, three levels of feeder pig production were also assumed. The levels were 6,336 (low), 7,200 (medium), and 8,092 (high), pigs per year for a 450 sow operation. This represents 14, 16, and 18 pigs per sow per year respectively. These levels are higher than the averages indicated by Missouri Mail-In-Record swine production records. Thus, estimates provided in this report may be slightly optimistic.

To evaluate tax impacts on after tax cash flows, tax brackets of 0, 20, 30, 40, and 50 percent are compared for each equity level, feeder pig production level and interest rate level. These present average tax levels for the investors. Marginal tax brackets would be higher. Comparisons are made across the equity levels, feeder pig production levels, interest rates, and tax brackets studied. The case study unit is assumed to be a Subchapter-S Corporation. Therefore, taxes are paid by the individual members. Income and expenses are transferred to the owners.

Case Study Description

The case study feeder pig operation is a 450 sow unit. The firm is a Subchapter-S Corporation with the five farmer-owners constituting the corporation board of directors. The board did a detailed financial plan in

preparation for the venture. Financing was arranged through a Production Credit Association loan.

The feeder pig factory is operated by a full-time hired manager with supplemental labor hired. The production goal is 9 pigs per litter with sows remaining in the production herd for six litters. Farrowing is continuous.

Total investment in the factory was $647,000. A breakdown of the respective investment in buildings and equipment, land, livestock, etc. is presented in Table 1. Dollars of equity and borrowed funds for the selected equity percentages are shown in Table 2.

The following assumptions were used in preparing calculations and comparisons in the case study.

1. The initial loan is to be paid off in 10 years.
2. The loan is an even principal payment type with interest on outstanding balance to be paid annually.
3. Loan principal payments plus interest are made annually.
4. Two market interest rates are used for comparison. The first is 14 percent and the second 10 percent.
5. The start-up costs of the feeder pig factory is $647,000 of which $30,000 is for operating credit to be used to purchase supplies until the first group of feeder pigs is sold.
6. Operating expenses are paid through the use of a revolving loan of up to $30,000. The average operating loan value is $15,000.
7. State and Federal Income Taxes are paid by the members as the legal form of business is a Subchapter-S Corporation. Therefore, after tax cash flows refer to individual members cash flows.

Cash Production Costs Except Principal and Interest

Prinicpal and interest costs were singled out from other cash production costs in the analysis as they vary with the equity level. Moreover, they also vary with the length of the loan. Cash expenses, excluding principal and

interest per pig under the three production efficiency levels are presented in Table 3. All feed was purchased pre-mixed and ready to put in the feeder. Total cash expenses excluding principal and interest for the three production levels were $22.14, $20.60, and $19.06 per 30 pound pig respectively.

Cash Production Costs Including Principal, Interest, and Adjusted for Depreciation

When principal and interest payments are included, cash expenses vary according to equity levels and interest rates. Additionally, depreciation affects the after tax cash flows. Annual depreciation values are shown in Table 4. Depreciation was calculated using the straight-line method. For tax purposes, building, equipment, and miscellaneous items are depreciated over 10 years with the boars and initial sow herd depreciated over three years. Replacement sows are raised within the herd, whereas, all boars are purchased. Initially there were 12 boars purchased at $450.00 each while the 450 sows were purchased for $192.00 each. Using this information, total depreciation was $81,670 the first three years and $52,800 the last seven years. Investment credit was not considered as it is not affected by the tax bracket. Annual effects may vary but all investment credits are typically recouped by the end of the useful life of the asset.

A break-even cash flow analysis was chosen for presenting study results. Break-even is that price necessary to cover all annual cash obligations in producing a 30 pound feeder pig. Tables 5 through 9 present break-even prices for the various production, equity and tax bracket scenarios when the interest rate is 14 percent. Tables 11 through 15 present similar information for the 10 percent interest rate. Values presented in these tables represent feeder pig prices needed to cover all cash production costs, including debt retirement and income taxes.

After tax break-even cash flow calculations are affected by prinicpal and interest payments, depreciation, other cash production costs such as feed purchased, utilities, veterinary expenses, etc., and the tax bracket. The after tax cash flow formula presented earlier was as follows:

$$ATCF = (1 - T)\ VC + (1 - T)\ I + P - TD + E$$

From this, break-even cash flows would be calculated as follows:

$$R = (1 - T)\ VC + (1 - T)\ I + P - TD + E$$

Where:

R = Break-even cash flow price received (receipts)

Moving income tax (E) to the left hand side of the equation provides:

$$R-E = (1 - T)\ VC + (1 - T)\ I + P - TD$$

Furthermore for break-even conditions:

$$R(1-T) = R - E$$

Thus:

$$R(1-T) = (1 - T)\ VC + (1 - T)\ I + P - TD$$

$$R = \frac{(1 - T)\ VC + (1 - T)\ I + P - TD}{1 - T}$$

Where:

ATCF = After tax cash flow

R = Break-even cash flow price received (receipts)

T = Average tax bracket

VC = Variable Production Cost excluding interest

I = Annual interest payment

P = Annual principal payment

D = Depreciation

E = Income tax

After tax break-even cash flows are presented in Table 6 for 14, 16, and 18 pigs per sow per year when the tax bracket is 20 percent. Using the above formula shows that the first break-even cash flow value in Table

6 (upper left hand corner--14 pigs/sow/yr.) is calculated as follows:

$$R = \frac{(.8)\ (\$22.14) + (.8)\ (\$11.768) + (\$8.169) - (.2)\ (\$12.889)}{.8}$$

$R = \$40.90$

All other calculations are made using the same formula.

Effects of Changing Equity Levels

The importance of equity levels can be observed in any of the Tables 5 through 9. For illustrative purposes use Table 5. This is the zero tax bracket or before tax table.

For example, when comparing equity level impacts, break-even cash flow per pig in year one at the low production level ranges from $34.73 when equity is 50 percent to $42.08 when equity is 20 percent. This is an increase of $7.35 per pig or 24.50¢ per pound of feeder pig produced. For the average and high production levels these respective figures are $6.47 and $5.76 per pig or 21.56¢ and 19.20¢ per pound of feeder pig produced. Equity levels have a substantial impact on break-even cash flows for feeder pig factories.

Effects of Changing Production Levels

Production level impacts can be similarly compared using any of Tables 5 through 9. Again for illustrative purposes use Table 5. Similar equity levels for the same year can be compared within the Table to provide an analysis of impacts of production levels on survival. For example, in year one when equity is 20 percent, cash flow per pig decreased by $3.94 by increasing production from 14 pigs per sow per year (low) to 16 pigs per sow per year (medium). This is a reduction of 13.13¢ per pound of feeder pig produced. By increasing production from 16 to 18 (high) pigs per sow per year, feeder pig cash flows are further reduced

by $3.47 per pig (11.56¢ per pound). Thus, by increasing pigs per sow per year by four pigs (14 to 18) break-even cash flows are reduced by 24.70¢ per pound produced; or $7.41 per 30 pound feeder pig produced. When equity was 50 percent, pig break-even cash flows were decreased by $3.06 (10.2¢ per pound) and $2.76 (9.2¢ per pound) during the first year by increasing pig production per sow to the medium and then to the high level respectively.

It is imperative that the highly leveraged (low equity) operation maintain a high production level if it is to meet cash flow committments. Above average production levels are vital to survival at these high leverage levels; there is less room for error, breeding problems, etc. The importance of production levels to business or firm survival is magnified by comparing break-even cash flows for the low production level (14 pigs per sow per year) and 50 percent equity (Table 5) with those for the high production level (18 pigs per sow per year) and 20 percent equity (Table 5). Break-even cash flows for the high production highly leveraged combination were slightly less than for the lowly leveraged low production position. Thus, limited dollars can be spread much further if production levels are kept up.

Over the past few years the average market price of purchased feeder pigs has been around $24.00 to $27.00 per 30 pound pig. Current prices are substantially lower. Given the assumptions of the case study, production efficiency and/or equity needs to be quite high if the market price is to be greater than either after or before tax cash flow during the first few years of the factory operation. For the medium (Table 5; 16 pigs per sow per year) and low production (14 pigs per sow per year) levels (Table 5), cash production expenses exceeded $27.00 per hundred weight for essentially all

equity levels. The picture is only slightly better for the high production, high equity situation. Even with the high production level the $27.00 base purchase cost is exceeded during the initial years for the high equity situations.

Before tax cash flows for the low production level with 50 percent equity are approximately the same as for the medium production level with 30 percent equity or the high production level with 15 percent equity. This approximate relative equity-production level relationship holds throughout the case study feasibility range studied.

Effects of Changing Tax Brackets

For after tax comparisons Table 5 can be compared with Tables 6, 7, 8, and 9. Either of the three production levels can be used for comparison. A quick examination of these tables shows that cash flows for a 30 pound feeder pig are affected by the tax bracket the producer is in. Specific examples are cited below to illustrate this point.

For the low feeder pig production level and 20 percent equity, cash expenses per pig in year one is $42.08 for the zero tax bracket (Table 5) as compared to $37.36 when the tax bracket is 50 percent (Table 9). This is $140.26 and $124.52 respectively per hundred pounds of feeder pig produced. Therefore, break-even cash flows are $4.72 less per pig produced within the 50 percent tax bracket as compared to the zero tax bracket level. Producers in higher tax brackets can maintain slightly lower pig production levels then those in lower tax brackets. Assuming 6,336 pigs (14 pigs per sow per year) are produced per year, total break-even cash flows are $29,905 less for producers in the 50 percent tax bracket as compared to those in the zero tax bracket (Table 10). When the equity level is 50 percent the difference in cash production cost per pig between the zero

and 50 percent tax bracket is $7.79--a total difference of $49,357 for the system (low production level).

The higher the tax bracket the greater was the difference in cash production costs between tax brackets. For example, with equity at 20 percent, the difference in cash production costs between the 40 and 50 percent tax bracket ($1.51) is greater than the difference between the 20 and 30 percent tax bracket ($.85). At the 50 percent equity level the difference between the 40 and 50 percent tax bracket is $2.60 per pig while the difference per pig between the 20 and 30 percent tax bracket is $1.39 (low production level). Relative results are similar for all production levels.

After tax cash flow comparisons are vital to the overall evaluation of investment alternatives. The type of investment and how it fits into the tax structure can be very important and should not be overlooked. As shown above, after tax cash flows are affected by the tax bracket of the producer. For example, during the initial year of the loan, a producer with 18 pigs per sow per year, 50 percent equity and in the zero tax bracket (Table 5) has slightly higher cash production costs than does the producer with 14 pigs per sow per year, 50 percent equity, and in 50 percent tax bracket (Table 9). At the 50 percent equity level the difference between the zero and 50 percent tax bracket was about equivalent to 4 pigs per sow per year.

Over the past few years market prices for feeder pigs have averaged near $27.00 per 30 pound pig. For most scenarios in this study, after tax cash flows are greater than this $27.00 base market value. For the low production level, this is true for essentially all tax brackets, years, and equity levels studied. For the high production level, break-even cash

flow is lower than the base market value for most years and tax brackets when equity is 40 percent or higher and the tax bracket is 30 percent or higher. Lower equity levels and tax brackets created cash flow problems. The intermediate production level had break-even cash flow values which are greater than the base market value for most years and tax combinations when equity is 50 percent and the tax bracket is 40 percent or above.

Effects of Changing Interest Rates

Interest rate comparisons can be made by comparing Table 5 with Table 11, Table 6 with Table 12, Table 7 with Table 13, Table 8 with Table 14, or Table 9 with Table 15. The prior tables represent 14 percent interest while the latter tables in each group represent a 10 percent interest rate. For illustrative purposes use Tables 5 and 11. Table 5 represents a 14 percent interest rate while Table 11 represents a 10 percent interest rate.

When the equity level is 20 percent and 14 pigs are produced per sow after tax cash production cost per pig in year one is reduced by $3.27 by decreasing interest from 14 to 10 percent. When the equity level is 50 percent the comparable reduction is $2.04 per pig. These values are the same for all tax brackets. As pig production levels increase impacts of reduced interest rates are lessened slightly. Impacts of interest rate changes on production systems are shown in Table 16. By reducing cash production costs by $3.27 in the example above, system break-even costs are reduced by $20,718 in year one.

To illustrate the overall impact of production levels, equity levels. tax brackets, and interest rates, comparisons between Table 5, Table 9, and Table 15 can be made. Table 5 reports the lowest tax bracket (zero) and lowest level of production studied. In year one, break-even cash flows for the low production, zero tax, and low equity (Table 5) producer is $42.08 per feeder pig produced. Break-even cash flow for the high production, zero tax

and low equity producer is $34.67 per feeder pig produced (Table 5). Thus, for the zero tax bracket individual break-even cash flow is reduced by $7.41 per feeder pig produced by increasing pigs per sow by four pigs. Comparatively, for the high production, high tax bracket, and low equity producer, the break-even cash flow per feeder pig produced is $30.97 (Table 9)--a further reduction of $3.70 due to tax bracket. At the 50 percent equity level, break-even cash flow per feeder pig produced is $34.73 for the low production--low tax level versus $22.82 for the high production--high tax level--a difference of $11.91 per pig. By decreasing the interest rate to 10 percent break-even cash flow is $21.22--a further reduction of $1.60 per pig. Therefore, year 1 after tax cash break-even flows per pig were reduced from $42.08 to $21.82 by moving from the worst to the best scenario. After tax cost were almost cut in half.

Thus, there are differences between after tax cash flows for feeder pig producers. Tax brackets, production levels, equity levels, and interest rates all are important in the survival of the feeder pig factory. Production levels appear to be the most vital, followed by the equity level, the tax bracket, and the interest rate.

Summary and Conclusions

When making investment decisions it is imperative that the investors tax bracket is considered. All too often decisions are made on before tax rather than the after tax cost comparisons. As shown in this study, after tax cash flow comparisons are important. Tax brackets have a very real impact on the cash flow of the operation.

For this study, a feeder pig factory case study was used to compute before and after tax break-even cash flows. For the feeder pig factory, production, equity levels, tax brackets, and interest rates all were varied in determining the viability of the factories cash flow over time. Produc-

tion levels studied in this report were 14, 16, and 18 pigs per sow per year. Equity levels studied were 20, 30, 40, and 50 percent while tax brackets studied were 0, 20, 30, 40, and 50 percent. All were compared with 10 and 14 percent interest rates.

As the equity level increased from 20 to 50 percent, before tax break-even cash flows decreased by approximately $7.35 per feeder pig produced at the low level of production. These corresponding figures for the average and high level of production were approximately $6.47 and $5.76 per feeder pig produced respectively.

Production levels were also important to the survival of feeder pig factories. For example, break-even cash flow for the low feeder pig production level with an equity level of 50 percent was similar to that of the high feeder pig production level at the 20 percent equity level. Thus, owners of feeder pig factories can, by increasing pigs produced per sow annually from 14 to 18, lower the equity level from 50 to 20 percent and remain at the same break-even cash flow. Increased production levels allow owners with limited resources to stretch their capital over a greater number of hogs. Similarly by increasing the production level it can allow producers to lower their cash cost of producing feeder pigs. Fixed production costs can be spread over more pigs. Additionally, maintenance costs of the sow is not significantly influenced by the number of pigs farrowed. As the pigs farrowed per sow increases these maintenance costs are spread over more feeder pigs.

Tax bracket impacts were also evident. As the tax bracket increased from zero to 50 percent, break-even cash flow decreased by $4.72 per feeder pig produced, when the equity level was 20 percent and pigs produced were at the low level. At the high feeder pig production level this reduction was $3.70 per feeder pig produced. At the 50 percent equity levels the respec-

tive reductions were $7.79 and $6.09.

Interest rates also impacted on the break-even cash flows. As the interest rate decreased from 14 to 10 percent, reduction in year one break-even cash flows ranged from $1.60 per pig for the high equity-high production level to $3.24 per pig for the low equity low production level.

When combining equity levels, production levels, tax brackets, and interest rates the after tax break-even cash flows were reduced rather dramatically. For all production levels, swine producers in high tax brackets had lower after tax break-even cash flows than did those in lower tax brackets.

Implications

Implications of this study are many and varied. They vary according to assumptions made. The study shows that cash flows for feeder pig production in a factory setting are influenced substantially by the swine producers tax bracket, equity level, per sow production level and interest rates. Listed below are some questions influenced by the direction swine production takes.

1. What are the implications for a young individual getting started in swine production? What is and will be the competitive situation for these types of individuals?
2. In what resources do beginning young farmers have a competitive advantage in swine production? Can these resources offset areas where they are in a competitively disadvantageous position, such as the tax bracket and possibly interest rates?
3. What role should the tax structure and production efficiency play in the success or failure of a swine operation?
4. What are the implications for the future structure of the swine production industry? In the same vein, are their implications for the swine marketing system?
5. What will be the impacts on concentration of swine production?
6. What are the implications with respect to labor and management in swine production?
7. Will the swine cycle be altered in the future?
8. What are the implications for financial institutions servicing the swine industry?
9. What about problems of waste disposal in swine production?

10. Will disease problems become more of a concern for swine producers?

This is not an exhaustive list but are some which we feel need further examination for some possible answers.

TABLE 1

Feeder Pig Factory Investment

Item	Investment
Building and Equipment	$450,000
Land	$ 15,000
Livestock	$ 92,000
Misc (generators, etc.)	$ 60,000
Operating Credit[1]	$ 30,000
TOTAL	$647,000

[1]This is operating credit that is needed for the first six months. It is included in the original loan value and paid off over the ten year loan life.

TABLE 2

Loan Values and Equity for

the Feeder Pig Factory Case Study

Equity Level (percent)	Dollars Borrowed	Dollars Equity	Total Investment
20	$517,600	$129,400	$647,000
30	$452,900	$194,100	$647,000
40	$388,200	$258,800	$647,000
50	$323,500	$323,500	$647,000

TABLE 3

Cash Production Cost Excluding Principle

and Interest for a 30 Pound Pig

Under Production Levels of 14, 16, and 18 Feeder Pigs Per Sow Per Year

Item	Pigs Per Sow Per Year		
	14	16	18
	Dollars Per 30 Pound Pig		
Feed	$14.82	$13.66	$12.50
Utilities	1.19	1.08	.97
Insurance	.36	.33	.30
Medicine	1.59	1.50	1.41
Supplies	1.09	1.00	.91
Administration	.55	.50	.45
Taxes	.14	.13	.12
Labor	2.40	2.40	2.40
Total	$22.14	$20.60	$19.06

TABLE 4

Annual Depreciation for the Feeder Pig Factory[1/]

Year	Building, Equipment and Miscellaneous[2/]	Boars[3/]	Sows[4/]	Total
1	$51,000	$1,800	$28,870	$81,670
2	51,000	1,800	28,870	81,670
3	51,000	1,800	28,870	81,670
4	51,000	1,800		52,800
5	51,000	1,800		52,800
6	51,000	1,800		52,800
7	51,000	1,800		52,800
8	51,000	1,800		52,800
9	51,000	1,800		52,800
10	51,000	1,800		52,800

[1/] Straight Line Depreciation is used.

[2/] Investment in buildings, equipment and miscellaneous is $510,000.

[3/] Twelve boars at $450. Boars are replaced every 3 years.

[4/] 450 sows at $192 each.

TABLE: 5
BREAK EVEN COST PER 30 POUND PIG BY EQUITY LEVEL
FOR 14, 16, AND 18 PIGS PER SOW PER YEAR
INTEREST RATE 14%
TAX BRACKET = 0.00

YEAR	EQUITY LEVEL (PERCENT) 20	30	40	50
	14 PIGS PER SOW PER YEAR DOLLARS PER PIG			
1	42.08	39.63	37.18	34.73
2	40.93	38.63	36.32	34.01
3	39.79	37.63	35.46	33.30
4	38.65	36.62	34.60	32.58
5	37.50	35.62	33.74	31.87
6	36.36	34.62	32.89	31.15
7	35.22	33.62	32.03	30.44
8	34.07	32.62	31.17	29.72
9	32.93	31.62	30.31	29.01
10	31.78	30.62	29.46	28.29
	16 PIGS PER SOW PER YEAR DOLLARS PER PIG			
1	38.14	35.99	33.83	31.67
2	37.14	35.11	33.08	31.05
3	36.13	34.23	32.32	30.42
4	35.13	33.35	31.57	29.79
5	34.12	32.47	30.81	29.16
6	33.11	31.59	30.06	28.53
7	32.11	30.70	29.30	27.90
8	31.10	29.82	28.55	27.27
9	30.09	28.94	27.79	26.64
10	29.09	28.06	27.04	26.01
	18 PIGS PER SOW PER YEAR DOLLARS PER PIG			
1	34.67	32.75	30.83	28.91
2	33.78	31.97	30.16	28.35
3	32.88	31.18	29.49	27.79
4	31.98	30.40	28.82	27.24
5	31.09	29.62	28.15	26.68
6	30.19	28.83	27.47	26.12
7	29.30	28.05	26.80	25.56
8	28.40	27.27	26.13	25.00
9	27.51	26.48	25.46	24.44
10	26.61	25.70	24.79	23.88

TABLE: 6
BREAK EVEN COST PER 30 POUND PIG BY EQUITY LEVEL
FOR 14, 16, AND 18 PIGS PER SOW PER YEAR
INTEREST RATE 14%
TAX BRACKET = 0.20

	EQUITY LEVEL (PERCENT)			
	20	30	40	50
	14 PIGS PER SOW PER YEAR			
YEAR	DOLLARS PER PIG			
1	40.90	38.19	35.49	32.78
2	39.75	37.19	34.63	32.06
3	38.61	36.19	33.77	31.35
4	38.61	36.33	34.05	31.77
5	37.46	35.33	33.19	31.06
6	36.32	34.33	32.34	30.34
7	35.17	33.33	31.48	29.63
8	34.03	32.33	30.62	28.91
9	32.89	31.32	29.76	28.20
10	31.74	30.32	28.90	27.49
	16 PIGS PER SOW PER YEAR			
YEAR	DOLLARS PER PIG			
1	37.11	34.73	32.34	29.96
2	36.10	33.84	31.59	29.33
3	35.09	32.96	30.83	28.70
4	35.09	33.09	31.08	29.08
5	34.08	32.20	30.33	28.45
6	33.08	31.32	29.57	27.82
7	32.07	30.44	28.82	27.19
8	31.06	29.56	28.06	26.56
9	30.06	28.68	27.31	25.93
10	29.05	27.80	26.55	25.30
	18 PIGS PER SOW PER YEAR			
YEAR	DOLLARS PER PIG			
1	33.75	31.63	29.51	27.39
2	32.85	30.84	28.84	26.83
3	31.96	30.06	28.17	26.27
4	31.95	30.17	28.39	26.60
5	31.06	29.39	27.71	26.04
6	30.16	28.60	27.04	25.48
7	29.27	27.82	26.37	24.92
8	28.37	27.04	25.70	24.36
9	27.47	26.25	25.03	23.80
10	26.58	25.47	24.36	23.25

TABLE: 7
BREAK EVEN COST PER 30 POUND PIG BY EQUITY LEVEL
FOR 14, 16, AND 18 PIGS PER SOW PER YEAR
INTEREST RATE 14%
TAX BRACKET = 0.30

YEAR	EQUITY LEVEL (PERCENT) 20	30	40	50
	14 PIGS PER SOW PER YEAR DOLLARS PER PIG			
1	40.05	37.17	34.28	31.39
2	38.91	36.17	33.42	30.67
3	37.77	35.16	32.56	29.96
4	38.58	36.12	33.66	31.20
5	37.43	35.12	32.80	30.48
6	36.29	34.12	31.94	29.77
7	35.14	33.11	31.08	29.05
8	34.00	32.11	30.23	28.34
9	32.86	31.11	29.37	27.62
10	31.71	30.11	28.51	26.91
	16 PIGS PER SOW PER YEAR DOLLARS PER PIG			
1	36.36	33.82	31.28	28.74
2	35.36	32.94	30.53	28.11
3	34.35	32.06	29.77	27.48
4	35.06	32.90	30.73	28.57
5	34.06	32.02	29.98	27.94
6	33.05	31.14	29.23	27.31
7	32.04	30.26	28.47	26.68
8	31.04	29.38	27.72	26.05
9	30.03	28.50	26.96	25.43
10	29.03	27.62	26.21	24.80
	18 PIGS PER SOW PER YEAR DOLLARS PER PIG			
1	33.09	30.83	28.56	26.30
2	32.19	30.04	27.89	25.74
3	31.30	29.26	27.22	25.18
4	31.93	30.00	28.08	26.15
5	31.03	29.22	27.41	25.59
6	30.14	28.44	26.73	25.03
7	29.24	27.65	26.06	24.47
8	28.35	26.87	25.39	23.91
9	27.45	26.09	24.72	23.35
10	26.56	25.30	24.05	22.79

TABLE; 8
BREAK EVEN COST PER 30 POUND PIG BY EQUITY LEVEL
FOR 14, 16, AND 18 PIGS PER SOW PER YEAR
INTEREST RATE 14%
TAX BRACKET = 0.40

	EQUITY LEVEL (PERCENT)			
	20	30	40	50
	14 PIGS PER SOW PER YEAR			
YEAR	DOLLARS PER PIG			
1	38.93	35.80	32.67	29.54
2	37.79	34.80	31.81	28.82
3	36.64	33.80	30.95	28.11
4	38.54	35.83	33.13	30.43
5	37.39	34.83	32.27	29.71
6	36.25	33.83	31.42	29.00
7	35.11	32.83	30.56	28.28
8	33.96	31.83	29.70	27.57
9	32.82	30.83	28.84	26.86
10	31.67	29.83	27.99	26.14
	16 PIGS PER SOW PER YEAR			
YEAR	DOLLARS PER PIG			
1	35.38	32.62	29.86	27.11
2	34.37	31.74	29.11	26.48
3	33.36	30.86	28.35	25.85
4	35.03	32.65	30.27	27.89
5	34.02	31.77	29.52	27.27
6	33.02	30.89	28.76	26.64
7	32.01	30.01	28.01	26.01
8	31.00	29.13	27.25	25.38
9	30.00	28.25	26.50	24.75
10	28.99	27.37	25.74	24.12
	18 PIGS PER SOW PER YEAR			
YEAR	DOLLARS PER PIG			
1	32.21	29.75	27.30	24.85
2	31.31	28.97	26.63	24.29
3	30.42	28.19	25.96	23.73
4	31.90	29.78	27.67	25.55
5	31.00	29.00	26.99	24.99
6	30.11	28.22	26.32	24.43
7	29.21	27.43	25.65	23.87
8	28.32	26.65	24.98	23.31
9	27.42	25.86	24.31	22.75
10	26.53	25.08	23.64	22.19

TABLE; 9
BREAK EVEN COST PER 30 POUND PIG BY EQUITY LEVEL
FOR 14, 16, AND 18 PIGS PER SOW PER YEAR
INTEREST RATE 14%
TAX BRACKET = 0.50

YEAR	EQUITY LEVEL (PERCENT) 20	30	40	50
	14 PIGS PER SOW PER YEAR DOLLARS PER PIG			
1	37.36	33.88	30.41	26.94
2	36.21	32.88	29.56	26.23
3	35.07	31.88	28.70	25.51
4	38.48	35.44	32.40	29.35
5	37.34	34.44	31.54	28.64
6	36.19	33.44	30.68	27.92
7	35.05	32.44	29.82	27.21
8	33.91	31.44	28.97	26.49
9	32.76	30.44	28.11	25.78
10	31.62	29.43	27.25	25.06
	16 PIGS PER SOW PER YEAR DOLLARS PER PIG			
1	33.99	30.94	27.88	24.83
2	32.98	30.05	27.13	24.20
3	31.98	29.17	26.37	23.57
4	34.98	32.30	29.63	26.95
5	33.97	31.42	28.87	26.32
6	32.97	30.54	28.12	25.69
7	31.96	29.66	27.36	25.06
8	30.96	28.78	26.61	24.43
9	29.95	27.90	25.85	23.80
10	28.94	27.02	25.10	23.17
	18 PIGS PER SOW PER YEAR DOLLARS PER PIG			
1	30.97	28.26	25.54	22.82
2	30.08	27.47	24.87	22.26
3	29.18	26.69	24.19	21.70
4	31.86	29.47	27.09	24.71
5	30.96	28.69	26.42	24.15
6	30.06	27.91	25.75	23.59
7	29.17	27.12	25.08	23.03
8	28.27	26.34	24.40	22.47
9	27.38	25.56	23.73	21.91
10	26.48	24.77	23.06	21.35

TABLE;10
DIFFERENCE IN SYSTEM BREAK EVEN COST BETWEEN THE 50 AND ZERO PERCENT TAX BRACKETS BY EQUITY LEVEL FOR 14, 16, AND 18 PIGS PER SOW PER YEAR

EQUITY LEVEL (PERCENT)

YEAR	20	30	40	50
		14 PIGS PER SOW PER YEAR DOLLARS PER FACTORY		
1	29905	36432	42831	49357
2	29905	36432	42831	49357
3	29905	36432	42831	49357
4	1077	7476	13939	20465
5	1077	7476	13939	20465
6	1077	7476	13939	20465
7	1077	7476	13939	20465
8	1077	7476	13939	20465
9	1077	7476	13939	20465
10	1077	7476	13939	20465
		16 PIGS PER SOW PER YEAR DOLLARS PER FACTORY		
1	29880	36432	42840	49320
2	29880	36432	42840	49320
3	29880	36432	42840	49320
4	1080	7560	13968	20448
5	1080	7560	13968	20448
6	1080	7560	13968	20448
7	1080	7560	13968	20448
8	1080	7560	13968	20448
9	1080	7560	13968	20448
10	1080	7560	13968	20448
		18 PIGS PER SOW PER YEAR DOLLARS PER FACTORY		
1	29940	36333	42806	49280
2	29940	36333	42806	49280
3	29940	36333	42806	49280
4	1051	7525	13999	20472
5	1051	7525	13999	20472
6	1051	7525	13999	20472
7	1051	7525	13999	20472
8	1051	7525	13999	20472
9	1051	7525	13999	20472
10	1051	7525	13999	20472

TABLE; 11
BREAK EVEN COST PER 30 POUND PIG BY EQUITY LEVEL
FOR 14, 16, AND 18 PIGS PER SOW PER YEAR
INTEREST RATE 10%
TAX BRACKET = 0.00

	EQUITY LEVEL (PERCENT)			
	20	30	40	50
	14 PIGS PER SOW PER YEAR			
YEAR	DOLLARS PER PIG			
1	38.81	36.77	34.73	32.68
2	37.99	36.05	34.11	32.17
3	37.18	35.34	33.50	31.66
4	36.36	34.62	32.89	31.15
5	35.54	33.91	32.27	30.64
6	34.73	33.19	31.66	30.13
7	33.91	32.48	31.05	29.62
8	33.09	31.76	30.44	29.11
9	32.27	31.05	29.82	28.60
10	31.46	30.33	29.21	28.09
	16 PIGS PER SOW PER YEAR			
YEAR	DOLLARS PER PIG			
1	35.27	33.47	31.67	29.88
2	34.55	32.84	31.14	29.43
3	33.83	32.21	30.60	28.98
4	33.11	31.59	30.06	28.53
5	32.39	30.96	29.52	28.08
6	31.67	30.33	28.98	27.63
7	30.96	29.70	28.44	27.18
8	30.24	29.07	27.90	26.73
9	29.52	28.44	27.36	26.28
10	28.80	27.81	26.82	25.83
	18 PIGS PER SOW PER YEAR			
YEAR	DOLLARS PER PIG			
1	32.11	30.51	28.91	27.32
2	31.47	29.95	28.43	26.92
3	30.83	29.39	27.95	26.52
4	30.19	28.83	27.47	26.12
5	29.55	28.27	27.00	25.72
6	28.91	27.71	26.52	25.32
7	28.27	27.16	26.04	24.92
8	27.63	26.60	25.56	24.52
9	27.00	26.04	25.08	24.12
10	26.36	25.48	24.60	23.72

TABLE; 12
BREAK EVEN COST PER 30 POUND PIG BY EQUITY LEVEL
FOR 14, 16, AND 18 PIGS PER SOW PER YEAR
INTEREST RATE 10%
TAX BRACKET = 0.20

	EQUITY LEVEL (PERCENT)			
	20	30	40	50
	14 PIGS PER SOW PER YEAR			
YEAR	DOLLARS PER PIG			
1	37.63	35.33	33.03	30.74
2	36.81	34.62	32.42	30.23
3	36.00	33.90	31.81	29.72
4	36.32	34.33	32.34	30.34
5	35.50	33.61	31.72	29.83
6	34.68	32.90	31.11	29.32
7	33.87	32.18	30.50	28.81
8	33.05	31.47	29.88	28.30
9	32.23	30.75	29.27	27.79
10	31.42	30.04	28.66	27.28
	16 PIGS PER SOW PER YEAR			
YEAR	DOLLARS PER PIG			
1	34.23	32.21	30.19	28.17
2	33.51	31.58	29.65	27.72
3	32.79	30.95	29.11	27.27
4	33.08	31.32	29.57	27.82
5	32.36	30.70	29.03	27.37
6	31.64	30.07	28.49	26.92
7	30.92	29.44	27.95	26.47
8	30.20	28.81	27.42	26.02
9	29.48	28.18	26.88	25.57
10	28.76	27.55	26.34	25.12
	18 PIGS PER SOW PER YEAR			
YEAR	DOLLARS PER PIG			
1	31.19	29.39	27.59	25.79
2	30.55	28.83	27.11	25.39
3	29.91	28.27	26.63	24.99
4	30.16	23.60	27.04	25.48
5	29.52	28.04	26.56	25.08
6	28.88	27.48	26.08	24.68
7	28.24	26.92	25.60	24.28
8	27.60	26.36	25.12	23.88
9	26.96	25.80	24.64	23.49
10	26.32	25.24	24.16	23.09

TABLE; 13
BREAK EVEN COST PER 30 POUND PIG BY EQUITY LEVEL
FOR 14, 16, AND 18 PIGS PER SOW PER YEAR
INTEREST RATE 10%
TAX BRACKET = 0.30

YEAR	EQUITY LEVEL (PERCENT) 20	30	40	50
	14 PIGS PER SOW PER YEAR DOLLARS PER PIG			
1	36.79	34.31	31.83	29.35
2	35.97	33.59	31.21	28.84
3	35.15	32.83	30.60	28.33
4	36.29	34.12	31.94	29.77
5	35.47	33.40	31.33	29.26
6	34.65	32.69	30.72	28.75
7	33.84	31.97	30.10	28.24
8	33.02	31.26	29.49	27.73
9	32.20	30.54	28.88	27.22
10	31.39	29.83	28.27	26.70
	16 PIGS PER SOW PER YEAR DOLLARS PER PIG			
1	33.49	31.31	29.12	26.94
2	32.77	30.68	28.59	26.49
3	32.05	30.05	28.05	26.04
4	33.05	31.14	29.23	27.31
5	32.33	30.51	28.69	26.86
6	31.61	29.88	28.15	26.41
7	30.89	29.25	27.61	25.96
8	30.18	28.62	27.07	25.52
9	29.46	27.99	26.53	25.07
10	28.74	27.36	25.99	24.62
	18 PIGS PER SOW PER YEAR DOLLARS PER PIG			
1	30.53	28.59	26.64	24.70
2	29.89	28.03	26.16	24.30
3	29.25	27.47	25.69	23.90
4	30.14	28.44	26.73	25.03
5	29.50	27.88	26.25	24.63
6	28.86	27.32	25.78	24.23
7	28.22	26.76	25.30	23.83
8	27.58	26.20	24.82	23.43
9	26.94	25.64	24.34	23.03
10	26.30	25.08	23.86	22.63

TABLE; 14
BREAK EVEN COST PER 30 POUND PIG BY EQUITY LEVEL
FOR 14, 16, AND 18 PIGS PER SOW PER YEAR
INTEREST RATE 10%
TAX BRACKET = 0.40

	EQUITY LEVEL (PERCENT)			
	20	30	40	50
	14 PIGS PER SOW PER YEAR			
YEAR	DOLLARS PER PIG			
1	35.66	32.94	30.22	27.49
2	34.85	32.22	29.60	26.98
3	34.03	31.51	28.99	26.47
4	36.25	33.83	31.42	29.00
5	35.43	33.12	30.80	28.49
6	34.62	32.40	30.19	27.98
7	33.80	31.69	29.58	27.47
8	32.98	30.97	28.97	26.96
9	32.17	30.26	28.35	26.45
10	31.35	29.54	27.74	25.94
	16 PIGS PER SOW PER YEAR			
YEAR	DOLLARS PER PIG			
1	32.50	30.10	27.71	25.31
2	31.78	29.47	27.17	24.86
3	31.06	28.85	26.63	24.41
4	33.02	30.89	28.76	26.64
5	32.30	30.26	28.22	26.19
6	31.58	29.63	27.68	25.74
7	30.86	29.00	27.15	25.29
8	30.14	28.37	26.61	24.84
9	29.42	27.74	26.07	24.39
10	28.70	27.12	25.53	23.94
	18 PIGS PER SOW PER YEAR			
YEAR	DOLLARS PER PIG			
1	29.65	27.52	25.38	23.25
2	29.01	26.96	24.90	22.85
3	28.37	26.40	24.42	22.45
4	30.11	28.22	26.32	24.43
5	29.47	27.66	25.84	24.03
6	28.83	27.10	25.36	23.63
7	28.19	26.54	24.88	23.23
8	27.55	25.98	24.40	22.83
9	26.91	25.42	23.92	22.43
10	26.27	24.86	23.44	22.03

TABLE; 15
BREAK EVEN COST PER 30 POUND PIG BY EQUITY LEVEL
FOR 14, 16, AND 18 PIGS PER SOW PER YEAR
INTEREST RATE 10%
TAX BRACKET = 0.50

YEAR	EQUITY LEVEL (PERCENT) 20	30	40	50
	14 PIGS PER SOW PER YEAR DOLLARS PER PIG			
1	34.09	31.03	27.96	24.90
2	33.27	30.31	27.35	24.39
3	32.46	29.60	26.74	23.88
4	36.19	33.44	30.68	27.92
5	35.38	32.72	30.07	27.41
6	34.56	32.01	29.46	26.90
7	33.74	31.29	28.84	26.39
8	32.93	30.58	28.23	25.88
9	32.11	29.86	27.62	25.37
10	31.29	29.15	27.00	24.86
	16 PIGS PER SOW PER YEAR DOLLARS PER PIG			
1	31.12	28.42	25.72	23.03
2	30.40	27.79	25.18	22.58
3	29.68	27.16	24.65	22.13
4	32.97	30.54	28.12	25.69
5	32.25	29.91	27.58	25.24
6	31.53	29.28	27.04	24.79
7	30.81	28.66	26.50	24.34
8	30.09	28.03	25.96	23.89
9	29.37	27.40	25.42	23.44
10	28.66	26.77	24.88	22.99
	18 PIGS PER SOW PER YEAR DOLLARS PER PIG			
1	28.42	26.02	23.62	21.22
2	27.78	25.46	23.14	20.82
3	27.14	24.90	22.66	20.42
4	30.06	27.91	25.75	23.59
5	29.43	27.35	25.27	23.19
6	28.79	26.79	24.79	22.79
7	28.15	26.23	24.31	22.39
8	27.51	25.67	23.83	21.99
9	26.87	25.11	23.35	21.59
10	26.23	24.55	22.87	21.19

TABLE;16
DIFFERENCE IN SYSTEM BREAK EVEN COST BETWEEN THE 10 AND 14 PERCENT INTEREST RATES BY EQUITY LEVEL FOR 14, 16, AND 18 PIGS PER SOW PER YEAR

EQUITY LEVEL (PERCENT)

YEAR	20	30	40	50
	14 PIGS PER SOW PER YEAR DOLLARS PER FACTORY			
1	20718	10857	15523	12925
2	18627	16283	14002	11658
3	16536	14446	12418	10327
4	14509	12672	10897	9060
5	12418	10897	9313	7793
6	10327	9060	7729	6462
7	8300	7206	6209	5195
8	6209	5448	4658	3864
9	4118	3674	3104	2597
10	2090	1774	1584	1267
	16 PIGS PER SOW PER YEAR DOLLARS PER FACTORY			
1	20664	18144	15552	12960
2	18576	16272	14040	11664
3	16560	14472	12384	10368
4	14472	12672	10872	9072
5	12384	10872	9288	7776
6	10368	9072	7776	6480
7	8280	7200	6192	5184
8	6264	5400	4680	3888
9	4176	3600	3096	2592
10	2016	1800	1584	1296
	18 PIGS PER SOW PER YEAR DOLLARS PER FACTORY			
1	20634	18126	15536	12947
2	18611	16264	13999	11652
3	16507	14484	12380	10357
4	14565	12623	10843	9063
5	12380	10843	9305	7768
6	10276	9063	7763	6473
7	8253	7201	6230	5178
8	6149	5241	4612	3884
9	4126	3641	3074	2539
10	2023	1780	1537	1294

Bibliography

(1) Wilken, Charles P., James B. Kliebenstein, and Leroy F. Rottmann, "A Look At Missouri Feeder Pig Factories", Special Report No. 240, College of Agriculture, University of Missouri, Columbia, Missouri.

(2) Rhodes, V. James, Calvin Stemme, and Gleen Grimes, "Large and Medium Volume Hog Producers," Special Report 223, University of Missouri, Columbia, Missouri.