

# **THE FEASIBILITY OF A Cooperatively Owned Large-Scale Hog Farrowing System in North Dakota**

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## FOREWORD

Interest in the feasibility of a cooperatively owned large-scale hog farrowing system has been shown by hog producers in North Dakota. The producers realize the problems in securing a continuous supply of disease free feeder pigs of uniform quality during fluctuating price periods. Lack of published data concerning large-scale farrowing systems makes decisions regarding the feasibility and negotiation with lending institutions difficult.

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## HIGHLIGHTS

The initial investment required to establish a 660-sow farrowing unit is \$450,000. The initial investment includes 46% for livestock and equipment and 54% for land and buildings.

The average monthly operating expenses for a 660-sow farrowing unit producing 1,000 feeder pigs per month is \$227,244 annually. Feed expenses alone constitute approximately two-thirds of the short-term operating expense.

The average break-even prices for the farrowing system range from \$17.12 to \$29.73 depending upon the financial arrangements and feed price levels considered.

Three assumed feeder pig price levels of \$30, \$28, and \$25 per head were used to determine the loan repayment capabilities of the hog farrowing system. The three price levels are based on historic prices and estimates of future price trends. The time required for loan repayment varied from 5 years, under a combination of 75% long-term financing and \$30 feeder pig prices, to 13 years under 85% long-term financing and \$25 feeder pig prices.

The overall average profit per pig was \$4.35 for the enterprise with \$337,500 borrowed long-term capital (75% financing) and a 15 year repayment period. By increasing the amount of long-term borrowed capital by \$45,000, to a level of \$392,500 (or 85% financing), the overall average profit per pig decreased to \$3.94.

In analyzing the break-even prices of a system under alternative levels of borrowed capital it is concluded that there is a \$.42 profit advantage per pig of borrowing 75% rather than 85% under any of the feed price levels considered. It should be noted however, that in order to finance the enterprise with 75% borrowed capital, rather than 85%, will require an additional \$45,000 which would have to be provided by the investor-owners of the farrowing system.

Based on the findings of this research, and in accordance with the feed costs, feeder pig prices, levels of financing, and other assumptions specified in the analysis, it is concluded that the operation of a large-scale hog farrowing system is feasible in North Dakota.

FEASIBILITY OF A COOPERATIVELY OWNED  
LARGE-SCALE HOG FARROWING SYSTEM  
IN NORTH DAKOTA

by

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INTRODUCTION

Previous research reveals that the return on investment in hog finishing enterprises in North Dakota has averaged approximately 15 percent in recent years, which is significantly above the average return on investment of most other farm enterprises. Although the number of hogs produced in North Dakota fluctuates from year to year in accordance with the national hog cycle, the average number of hogs being produced has remained at approximately the same level during the past 30 years. No long term increase or decrease in hog numbers is apparent.

The most common type of swine enterprise on North Dakota farms is the farrow to finish operation. Producers with this type of operation have farrowing buildings and equipment and also have facilities to feed pigs to slaughter weight.

Because of available automation, including self-feeders, and waterers, and mechanized waste removal equipment, an individual hog producer is capable of feeding a substantially larger number of feeder pigs than he is able to farrow without additional hired labor for the farrowing operation.

Some hog producers purchase additional feeder pigs to feed with the pigs that they themselves farrow. Problems, however, are encountered with the practice of purchasing and combining feeder pigs. Obtaining feeder pigs from a number of farms or from public markets increases the possibility of disease organisms being introduced into the herd. Uniformity of slaughter hog type and quality is difficult to maintain when feeder pigs are obtained from different sources, as a result market price discounts are often applied to slaughter hogs sold. Combining feeder pigs from different sources does not allow a complete analysis of the feeding or breeding program because of the additional variables that are included in the analysis and which affect the results.

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<sup>1</sup>Bedker is a research associate, Dunn is the program coordinator of the Research-Extension Rural Development Project, and Petry is an assistant professor, Agricultural Economics Department, North Dakota State University, Fargo, North Dakota.

## Need For Study

Hog producers in North Dakota have expressed interest in establishing arrangements assuring an adequate supply of disease-free feeder pigs of a uniform quality that could be purchased within a predetermined price range. These conditions can be achieved with various forms of vertical integration, including single ownership of the farrowing and feeding enterprise, contractual agreements between separate owners of farrowing and feeding enterprises, and through cooperative ownership of the farrowing system by hog producers.

The cooperative method of ownership in the hog farrowing and feeding industry is becoming quite common in a number of states. A common arrangement is to allocate the number of feeder pigs produced among the owners of the farrowing system in relation to the number of shares owned.

The establishment of a large-scale specialized farrowing system has been attempted by hog producers in North Dakota. Limited information and the substantial capital requirements for such systems have inhibited establishing a large-scale cooperatively owned system in the state.

This study will provide information for producers who are considering establishing and operating a large-scale hog farrowing system, and to credit institutions that supply the capital required to establish and operate the enterprise.

## Purpose of the Study

The purpose of this study is to determine the feasibility of a cooperatively owned large-scale hog farrowing system in North Dakota.

The specific objectives are:

1. Determine the resource requirements and initial investment necessary to establish a large-scale hog farrowing system.
2. Determine the annual costs and returns of operating a large-scale hog farrowing system.
3. Determine the break-even price for large-scale production of feeder pigs with alternative financial arrangements and feed price levels.
4. Determine the loan repayment capabilities of a large-scale hog farrowing system based on projected feeder pig price levels.



## Scope

A preliminary survey was made of cooperatively-owned large-scale hog farrowing systems in the north central area of the United States. The survey was conducted to identify and select a typical sized farrowing enterprise from existing cooperatively owned farrowing systems that could be used as a model for a detailed cost and returns analysis.

A 660-sow farrowing unit in which pigs are farrowed and fed to approximately 40 pounds was identified as a common sized unit and is the size of enterprise selected for analysis.

The 660-sow farrowing enterprise is considered to be large enough to economically justify full-time specialized personnel yet small enough to be directly managed by one person. A 660-sow unit allows efficient use of facilities through the production of approximately 1,000 feeder pigs per month.

Information used in this study regarding the loan repayment requirements for borrowed capital was obtained from various financial institutions in North Dakota. A 15 year repayment period and long-term borrowed capital levels of 75% and 85% of the total long-term capital requirements are used in this study. The 15-year repayment and the percent of long-term capital financing is within the lending tolerances of the financial institutions in the state.

Information regarding machinery, equipment, labor, capital and other resource requirements was obtained from equipment suppliers and from records of large-scale hog farrowing systems currently operating in other areas of the North Central Region. These data were modified where necessary to reflect current price situations and to localize construction costs and other fixed costs common to North Dakota. Estimates of ration costs were obtained from research conducted by the Department of Animal Science at North Dakota State University.

## Procedure

A cash flow approach was used in determining the feasibility of a 660-sow farrowing unit in North Dakota. This approach is used to emphasize the timing of projected costs and returns rather than to use average investments and returns, which is indicative of the conventional budget approach. By use of the cash flow method, this study will critically evaluate the loan repayment capabilities of the hog farrowing system during the early years of operation.

Through the use of the cash flows the necessary selling price per feeder pig, which will allow the farrowing system to break-even over the 15-year repayment period, are determined. The annual break-even prices, included in the analysis, will illustrate the minimum price required per 40-pound feeder pig to cover total annual costs of production for each year of operation.

Six alternative cash flows were used in the analysis to determine the system's cost of producing a 40-pound feeder pig. The break-even prices illustrate what effect the two alternative financing levels and three different feed price levels have on the cash flow of the hog farrowing system.

There are a number of financial arrangements available to hog producers anticipating implementation of a cooperatively owned hog farrowing system. The cost of producing a 40-pound feeder pig depends, to a great extent, on the amount of long-term capital which is borrowed. The amount borrowed, in turn, depends largely upon the stockholders' initial equity in the unit. The two alternative amounts of long-term capital borrowed (for financing buildings, land, equipment, and live-stock) that were selected for analysis were 75 and 85 percent.

In view of the large variation in feed prices, three different feed price levels will be considered in determining the effect that changes in feed price levels have on the break-even price of a large scale hog farrowing system. The feed price levels selected for inclusion in this study are; 1974 feed price levels; a 50 percent decrease in 1974 feed price levels and a 50 percent increase in feed price levels.

Break-even prices based on 1974 feed price situations will be compared to market prices for feeder pigs. This analysis will provide an indication of the profitability of the large-scale hog farrowing system.

The cash flow approach will also be implemented in determining the loan repayment capabilities of the large-scale hog farrowing system under varying feeder pig price levels. The repayment capability will be measured by determining the length of time necessary for a hog farrowing system to generate sufficient income to repay the long-term borrowed capital and operate entirely on revenue generated by the enterprise. The feeder pig price levels used in the analysis are \$25, \$28, \$30 per feeder pig.

#### DESCRIPTION OF MODEL USED

A cash flow model is used to determine the net income generation-potential of a farrowing system under two alternative financing levels and three feed price levels. The break-even prices resulting from the computed cash flows illustrate the capital required, on an annual basis, throughout each of the 15 years of operation.

#### Repayment of Capital Borrowed

The method of repayment on the initial loan is based on an annual pay back with equal principal payments each year and with the interest on the unpaid balance being paid on the yearly anniversary date of the initial loan. The operating capital is assumed to be borrowed during the month it is used. Interest on the outstanding borrowed

operating capital is computed on a monthly basis and the interest is to be paid annually along with the long-term principal payment and interest.

The cash flow is such that the required operating capital which is borrowed is paid off prior to the end of the seventh year of operation. The amount of the loan which is borrowed for equipment and breeding stock is programmed to be paid off by the end of the tenth year.

At the end of the tenth year, it is assumed that a new set of equipment is purchased for the system at a cost of \$92,400. The \$92,400 is the estimated cost of purchasing an entire set of new equipment and does not include credit for possible salvageable equipment at the end of the initial ten year period. The replacement equipment is scheduled to be financed over a ten year period and paid off in ten equal principal payments plus interest on the outstanding principal. The amount borrowed on buildings and land is programmed to be paid off at the end of 15 years. The interest rate used in the cash flow model is 9 percent for both the initial capital borrowed and the outstanding operating capital borrowed.

The cost of producing a 40-pound feeder pig is calculated on an annual basis. The total costs include: The principal payments, interest on unpaid principal balance; interest on borrowed operating capital; and operating capital for the year. These costs are divided by the number of pigs to be produced during the year to arrive at a per pig cost. The cost of producing a 40-pound feeder pig is averaged over the first seven years of operation and on an annual basis for each year thereafter. By calculating a cost per pig based on the initial seven year period the cost per pig during the first year, when production is minimal, is spread over the time required to pay off the outstanding operating capital. The cost calculated by the cash flow is the break-even price of feeder pigs for each respective year.

#### Cost Requirements

The capital requirements of a large-scale hog farrowing system are divided into two categories: 1) long-term investment capital and 2) short-term operating capital. The capital requirements included in this analysis pertain to the operation of a 660-sow farrowing unit and include costs of raising feeder pigs to a weight of 40 pounds.

#### Long-term Investment Capital

The initial investment required to establish a 660-sow farrowing unit totaled \$450,000 based on 1974 cost levels (Table 1). The initial investment includes 46 percent for livestock and equipment, and 54 percent for land and buildings. In this study, the long-term capital requirements include the initial cost of breeding stock required

for the farrowing system. The estimated cost of the breeding stock is \$114,400, which is approximately 25 percent of the estimated long-term capital requirements. The long-term investment cost of the large-scale farrowing system excluding livestock is \$335,600.

TABLE 1. LONG-TERM INVESTMENT REQUIREMENTS FOR A 660-SOW FARROWING UNIT, 1974.

Item	Cost
<b>LAND AND BUILDINGS</b>	
Farrowing and feeding buildings	\$186,000
Landscaping, well and lagoon	20,000
Employee housing	30,000
Land--20 acres @ \$360 per acre	<u>7,200</u>
Total	\$243,200
<b>LIVESTOCK AND EQUIPMENT</b>	
Farrowing and feeding equipment	\$ 86,000
Light truck	3,500
Office equipment	250
660 sows @ \$165 each	108,900
20 boars @ \$275 each	5,500
Miscellaneous	<u>2,650</u>
Total	\$206,800
	<u>\$450,000</u>

#### Short-Term Capital Investment

The average monthly operating expense for a 660-sow farrowing unit producing 1,000 pigs per month is \$18,937, (which is equal to \$227,244 annually) based on 1974 feed price levels (Table 2). Herd replacement costs, assuming the replacement of 35 percent of the herd annually accounts for approximately 9 percent of the monthly operating expenses. Repairs, utilities, drugs, veterinary services, and miscellaneous supplies account for about 14 percent of the monthly expenses. Labor, including salaries for three full-time employees, represents about 12 percent of the operating expenses of the system.

Feed expenses alone constitute approximately two-thirds of the short-term operating expenses. A variation in feed prices has a significant affect on the amount of short-term operating capital required. For example, an increase in feed prices of 50 percent increases the monthly operating capital from \$18,937 to \$24,765 or by \$5,828. Conversely, a decrease in feed prices of 50 percent lowers the amount of monthly operating capital from \$18,937 to \$13,110.

TABLE 2. OPERATING EXPENSES FOR A PROPOSED 660-SOW FARROW TO FEEDER PIG UNIT BASED ON 1974 FEED PRICE LEVELS.

Month	Herd Repl.	Repair	Feed	Util	Drugs Vet	Misc. Suppl.	Insur.	Soc. Sec.	Labor	Oper. Exp.
-----Dollars-----										
1.		210	6,730	1,150	250	60	250	180	900	9,730
2.		210	6,730	1,150	250	60	250	180	900	9,730
3.		210	6,730	1,150	250	60	250	310	1,550	10,510
4.		420	6,730	1,150	500	120	250	310	1,550	11,030
5.		420	8,769	1,150	500	120	250	310	1,550	13,069
6.		420	11,655	1,150	500	120	250	310	1,550	15,955
7.		630	11,655	1,150	750	180	250	440	2,200	17,255
8.		630	11,655	1,150	750	180	250	440	2,200	17,255
9.		630	11,655	1,150	750	180	250	440	2,200	17,255
10.		630	11,655	1,150	750	180	250	440	2,200	17,255
11.		630	11,655	1,150	750	180	250	440	2,200	17,255
12.		630	11,655	1,150	750	180	250	440	2,200	17,255
13.		630	11,655	1,150	750	180	250	440	2,200	17,255
14.		630	11,655	1,150	750	180	250	440	2,200	17,255
15.		630	11,655	1,150	750	180	250	440	2,200	17,255
16.		630	11,655	1,150	750	180	250	440	2,200	17,255
17.		630	11,655	1,150	750	180	250	440	2,200	17,255
18.		630	11,655	1,150	750	180	250	440	2,200	17,255
19.	1,682	630	11,655	1,150	750	180	250	440	2,200	18,937
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180	1,682	630	11,655	1,150	750	180	250	440	2,200	18,937

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## Feed Costs and Requirements

Feed cost, as indicated in Table 2, is the highest annual cost item incurred in operating a large-scale hog farrowing system. Feed requirements (Table 3) for sows and boars account for 58 percent (\$80,762.80) of the feed costs while the feed cost for pigs, which are fed to a weight of 40 pounds (\$59,087.40), account for the remaining 42 percent of the feed expenses.

TABLE 3. ANNUAL FEED COSTS FOR 660-SOW FARROWING UNIT, 1974.

Class	Number	Type of Ration	Pounds of Feed Per Head	Pounds of Feed Per Year	Feed Cost Per cwt.	Annual Feed Cost
Producing sows	600	Gestation	1,600	966,000	\$5.30	51,198.00
Producing sows	600	Lactation	645	387,000	5.64	21,826.80
Non-producing sows	60	Gestation	1,825	109,500	5.30	5,803.80
Boars	20	Gestation	1,825	36,500	5.30	<u>1,934.50</u>
TOTAL COST FOR SOWS AND BOARS						\$ 80,762.80
Pigs	12,420	Starter	20	248,400	9.85	24,467.40
Pigs	12,000	Grower	50	600,000	5.77	<u>34,620.00</u>
TOTAL COST FOR PIGS						\$ 59,087.40
TOTAL ANNUAL COST						\$139,850.20

SOURCE: LaDon Johnson, extension animal scientist, Cooperative Extension Service, North Dakota State University, Fargo, North Dakota, unpublished data and Brown, Larry A, William D. Gorman, and George R. Dawson, Feasibility of Hog Production in the Four Corners Economic Development Region, Agricultural Experiment Station Research Report #259, New Mexico State University, Las Cruces, New Mexico.

It is assumed that the gestation period for sows is 114 days, the lactation period is 28 days, and the average open period is 16 days for a total period from breeding to rebreeding of 158 days per sow. Sows are assumed to farrow 2.3 times per year with eight pigs weaned per sow.<sup>2</sup>

<sup>2</sup>Lytle, P.W. and Robert J. Boyd, Feeder Pig Farrowing Firms: How They Work, Department of Agricultural Economics, University of Nebraska, Lincoln College of Agriculture, Lincoln, Nebraska, p. 5.

A 14.5 percent protein gestation ration is assumed to be fed to the sows during gestation at a rate of 5 pounds per day for the first 85 days and then increased proportionately to 10 pounds per day by the end of the 114th day of the gestation period. Boars and non-producing sows<sup>3</sup> are assumed to be fed the same ration as for gestating sows but at a constant rate of 5 pounds per head per day. A ton of the gestation ration is based upon feed ingredients and prices which include 1,800 pounds of barley at \$2.25 per bushel and 200 pounds of 39 percent protein sow supplement at \$11 per 100 pounds.<sup>4</sup>

A 16 percent protein ration would be fed to producing sows during lactation at a rate of 12 pounds per sow per day. One ton of the lactation ration would be composed of 1,700 pounds of barley and 300 pounds of 39 percent protein sow supplement.

A commercially prepared 18 percent protein ration at \$9.85 per 100 pounds is included as the feeder pig starter ration. It is estimated that each feeder pig would consume approximately 20 pounds of the ration from birth to weaning.

From weaning until the pigs weigh approximately 40 pounds, a 16 percent protein grower ration would be fed. A total of about 50 pounds of grower ration is based upon ingredients and prices which include 1,700 pounds of barley at \$2.25 per bushel and 300 pounds of 38 percent protein hog supplement at \$11.85 per 100 pounds.

#### HISTORIC FEEDER PIG PRICES

Feeder pig prices have traditionally fluctuated in accordance with slaughter hog prices and therefore, closely follow the cyclical price pattern set by slaughter hogs (Figure 1). Hog production and prices have traditionally fluctuated in a cyclical pattern. The cyclical pattern of hog production and prices is based on the theory that producers respond to current price situations. When hog production is profitable, primarily from favorable hog prices, farmers respond by increasing production. As production increases at a more rapid rate than demand, prices tend to decline. Through lags in the reaction time of producers, the biology of the production process, and because of imperfect knowledge of the market situation, the result is an overreaction in the market price of slaughter hogs.

Feeder pig prices have climbed to relatively higher levels, especially in 1973, than they had in the past. This price increase was largely due to an increasing demand for red meat, including pork, in the United States as well as in developing countries around the world.

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<sup>3</sup>Nonproducing sows are defined as nonbred sows that have exceeded the 16-day open period.

<sup>4</sup>Feed prices were obtained from a sample of local feed suppliers during 1974.

An analysis of 40-pound feeder pigs sold at North Dakota livestock markets from 1965 through 1974 reveals that the average price over the ten-year period was \$19.71 per head.

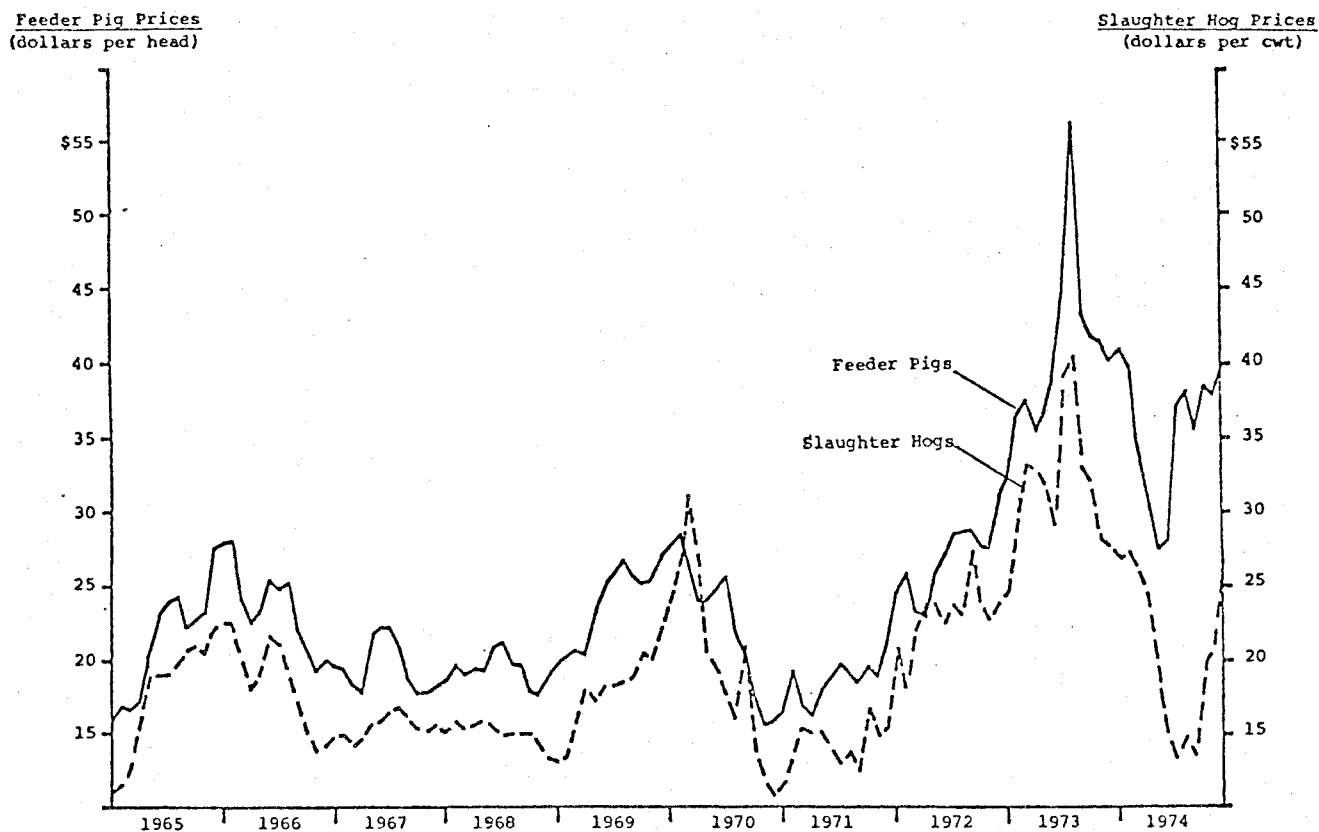


Figure 1. Monthly Prices of U.S. 1-2, 30-50 Pound Feeder Pigs and U.S. 1-2, 200-240 Pound Barrows and Gilts, North Dakota, 1965-1974.

SOURCE: Petry, Timothy A., *North Dakota Livestock Price Statistics*, Agricultural Economics Statistical Series 21-75, Department of Agricultural Economics, Agricultural Experiment Station, North Dakota State University, Fargo, North Dakota, May, 1975.

There is considerable variation, as shown in Figure 2, in feeder pig prices throughout the ten-year period. The variation in prices can be largely explained by the fluctuations in the number of slaughter hogs produced. Because of the large variation in prices a simple average of the feeder pig prices does not, in itself, provide a meaningful value which can be used to estimate the annual returns from a hog farrowing operation. Therefore, a linear trend line was fitted to the feeder pig price data and is presented in Figure 2. The linear trend line illustrates the tendency for feeder pig prices, on the average, to increase over time. The trend line during the 120 months from 1965 through 1974, shows an increase from a trend line price of \$14.35 in January, 1965 to \$25.00 at the end of December, 1974. This indicates an average increase in price of \$1.07 per pig per year.



(dollars per head)

11

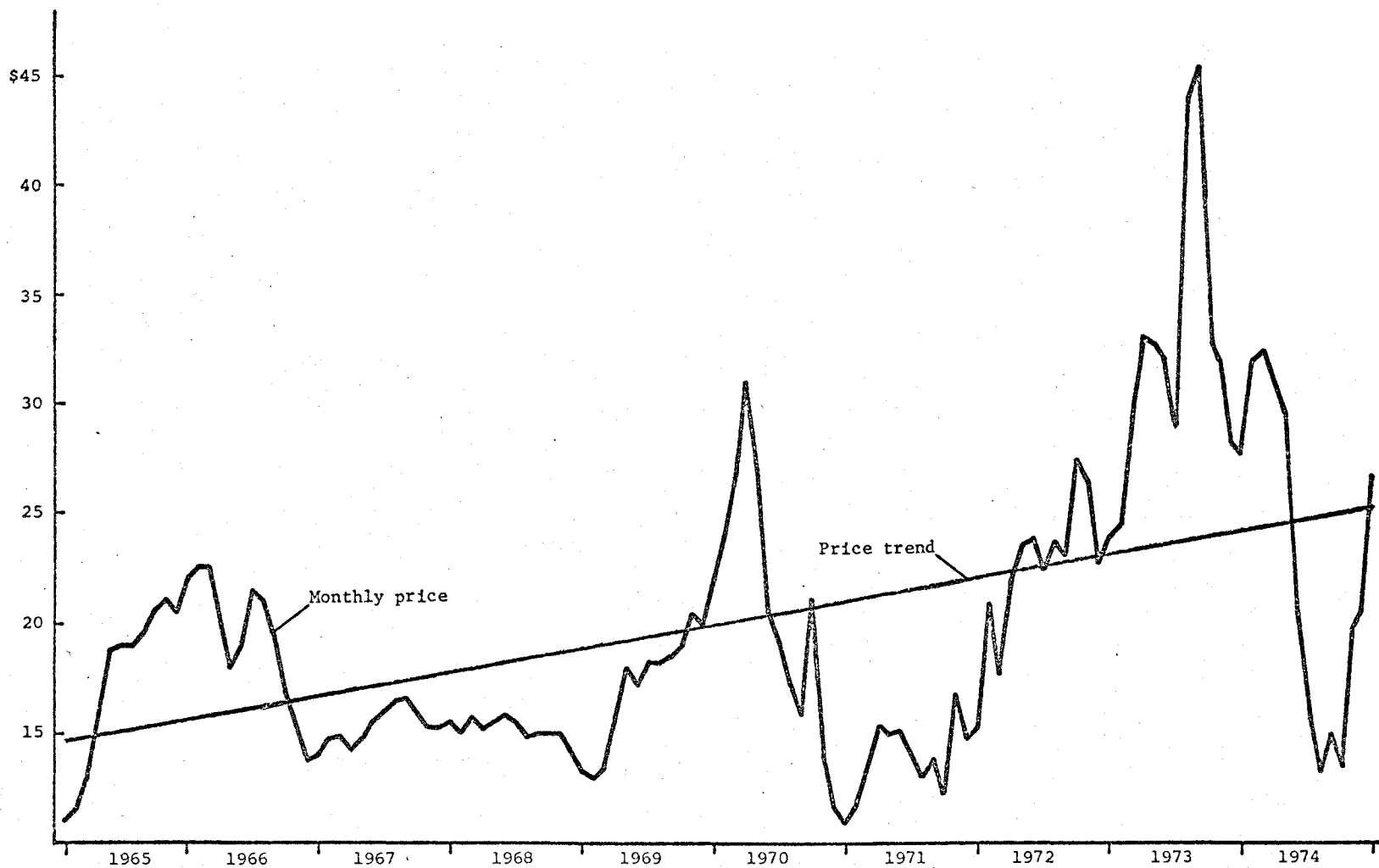


Figure 2. Monthly Prices and Price Trends for U.S. 1-2, 30-50 Pound Feeder Pigs, North Dakota, 1965-1974.

SOURCE: Petry, Timothy A., North Dakota Livestock Price Statistics, Agricultural Economics Statistical Series 21-75, Department of Agricultural Economics, Agricultural Experiment Station, North Dakota State University, Fargo, North Dakota, May, 1975.

It should be noted that during the period from the latter part of 1966 to the latter part of 1969, the average price per pig did not reach the price level represented by the trend line. This illustrates the point that a trend line is useful in estimating the general price level and the trend over time but is not intended to be used as an estimate of feeder pig prices at any one point in time.

The conclusions that can be drawn, based on the data presented in Figure 2, is that feeder pig prices will likely continue to fluctuate and that the trend of feeder pig prices will continue in an upward direction. However, extending the trend line to predict the price of 40-pound feeder pigs in future years is very difficult to do with a reasonable degree of accuracy, especially for any specific point in time.

Because of the difficulty in determining a reliable price in the future for feeding pigs the economic implications of three price levels will be analyzed. The prices considered were selected by using both historic prices and estimates of future price trends. A price of \$30 per pig approximates the average market price of 40-pound feeder pigs sold in North Dakota during 1973 and the first half of 1974. The \$30 price represents the upper level of market prices which have historically occurred in the feeder pig market. A price of \$28 per pig is the approximate average price paid for 40-pound feeder pigs during 1973-1974. The \$25 per 40-pound feeder pig represents the lower level estimate of average prices that could be experienced in the feeder pig market in the foreseeable future.

#### BREAK-EVEN PRICES

In the following section, the break-even prices of a 660-sow farrowing unit under alternative financial arrangements and feed price levels are determined.

The break-even price for 40-pound feeder pigs under two levels of financing and three levels of feed costs are analyzed over a 15 year period (Table 4). The two financial levels considered are long-term borrowed capital levels of 75 and 85 percent. The three feed cost levels considered include: The average cost levels during 1974; cost levels 50% above the 1974 average; and 50% below the 1974 average.

#### Borrowed Capital of 75 Percent

The owners of the 660-sow farrowing unit would need to provide \$112,500 of the total investment of \$450,000 under the 75 percent level of borrowed capital (Table 4). Of the \$337,500 borrowed, 54 percent (\$182,250) represents the investment in buildings and land. This amount is programmed to be paid off in equal amounts over 15 years, which is the repayment length assumed in this analysis. The remaining 46 percent (\$155,250) of the long-term capital borrowed represents

TABLE 4. BREAK-EVEN PRICES PER FORTY POUND FEEDER PIG BY FINANCE LEVEL AND FEED PRICES, 1974.\*

Year	75% Borrowed Capital			85% Borrowed Capital		
	1974 Feed Price Level	50% Increase in Feed Prices	50% Decrease in Feed Prices	1974 Feed Price Level	50% Increase in Feed Prices	50% Decrease in Feed Prices
-----Price Per Head-----						
1	\$25.06	\$31.47	\$18.65	\$25.68	\$32.10	\$19.27
2	25.06	31.47	18.65	25.68	32.10	19.27
3	25.06	31.47	18.65	25.68	32.10	19.27
4	25.06	31.47	18.65	25.68	32.10	19.27
5	25.06	31.47	18.65	25.68	32.10	19.27
6	25.06	31.47	18.65	25.68	32.10	19.27
7	25.06	31.47	18.65	25.68	32.10	19.27
8	22.28	28.14	16.43	22.74	28.52	16.90
9	22.11	27.94	16.29	22.54	28.37	16.71
10	21.91	27.74	16.08	22.30	28.13	16.48
11	21.87	27.69	16.04	22.07	27.89	16.23
12	21.70	27.54	15.88	21.89	27.72	16.07
13	21.55	27.37	15.72	21.72	27.55	14.89
14	21.39	27.22	15.56	21.54	27.37	15.72
15	21.22	27.05	15.39	21.38	27.20	15.54
-----AVERAGE BREAK-EVEN PRICE-----						
	23.22	29.31	17.13	23.64	29.73	17.55

\*Detailed analysis used in calculating break-even prices and the resulting cash flows for the enterprise at alternative financial arrangements and feed price levels are included in the Appendix.

expenditures for livestock and equipment. The borrowed capital for livestock and equipment is programmed to be paid off in equal payments over a ten-year period. A new set of equipment at an estimated replacement cost of \$92,400 is scheduled for purchase at the end of the 10th year.

#### Borrowed Capital of 85 Percent

The owners of the farrowing unit would need to provide only \$67,500 of the total investment of \$450,000 under the 85 percent level of financing (Table 4). Borrowed long-term capital under 85 percent financing amounts to \$382,500.

The break-even price per pig for the initial 7 year period is considerably higher than the break-even price for the 8th to the 15th years of operation. The year-to-year decrease in the break-even price is a result of the reduction in the amount of outstanding long-term borrowed capital which, consequently, decreases the interest cost each year.

#### LOAN REPAYMENT CAPABILITIES UNDER ALTERNATIVE FEEDER PIG PRICE LEVELS

In the preceding section, the break-even prices for 40-pound feeder pigs were computed. In this section, cash flows are used to analyze the loan repayment capabilities of the hog farrowing system based on three assumed feeder pig price levels; \$25, \$28, and \$30 per head.

The alternative repayment schedules of long-term borrowed capital, based on three selected feeder pig price levels, represent repayment schedules for a hog farrowing system under long-term borrowed capital levels of 75 and 85 percent (Table 5). Detailed annual cash flows illustrating the amount of capital generated by the hog farrowing system under the alternative feeder pig prices and financial levels are included in the Appendix.

The time required for loan repayment varies from 13 years under a combination of 85 percent financing and \$25 feeder pig prices to 5 years under 75 percent financing and \$30 feeder pig prices. The repayment capability of the system with 85 percent of the capital borrowed is 13, 7, and 6 years based on assumed prices of \$25, \$28, and \$30 respectively. This is a somewhat longer repayment period than is required for a system using 75 percent borrowed capital. The repayment periods of a system with 75 percent of the capital borrowed are 11, 6, and 5 years on assumed prices of \$25, \$28, and \$30 respectively.

TABLE 5. REPAYMENT CAPABILITY OF A 660-SOW FARROWING UNIT UNDER ALTERNATIVE FINANCE LEVELS AND FEEDER PIG PRICES.

75% Borrowed Capital		85% Borrowed Capital	
Feeder Pig Price (dollars per head)	Length of Repayment (years)	Feeder Pig Price (dollars per head)	Length of Repayment (years)
\$25	11*	\$25	13*
\$28	6	\$28	7
\$30	5	\$30	6

\*Includes an adequate amount of time to accumulate sufficient income to repay the additional purchase of new replacement equipment (\$92,400).

Regardless of which of the three price levels assumed, the enterprise would be capable of paying off the initial investment within the 15 year loan repayment period restraint under both the 75 and 85 percent borrowed capital levels. The capital reserves of the system may be utilized in a variety of ways. The reserves may be expended in the form of dividends to the investors in the hog farrowing system. Reserves could also be held to pay unforeseen expenses which may arise in the operation of the system. The handling of the reserve accounts may also take into account income tax considerations. Income taxes were excluded from this analysis. Utilization of reserves will depend on the financial and legal arrangements set by the investor-owners of the large-scale hog farrowing system.

COMPARISON OF BREAK-EVEN PRICES WITH CURRENT FEEDER PIG MARKET PRICES

In the discussion which follows, the cost of operating a large-scale hog farrowing system is compared to 1973-1974 market prices for feeder pigs to determine the profitability of farrowing and feeding pigs to 40 pounds through a large-scale hog farrowing system (Table 6). The comparison provides an estimation of the profit per pig that could be obtained from producing feeder pigs in a large-scale system and selling the 40-pound pigs at market prices.

TABLE 6. BREAK-EVEN PRICES OF A 660-SOW FARROWING UNIT, AND ESTIMATED PER PIG PROFIT, UNDER ALTERNATIVE FINANCE LEVELS AND 1974 FEED PRICE LEVELS.

Year	75% Borrowed Capital		85% Borrowed Capital	
	Break-Even Price (per head)	Per Pig Profit*	Break-Even Price (per head)	Per Pig Profit*
1-7	\$25.06	\$2.52	\$25.68	\$1.90
8	22.28	5.30	22.74	4.84
9	22.11	5.47	22.54	5.04
10	21.91	5.67	22.30	5.28
11	21.87	5.71	22.07	5.51
12	21.70	5.88	21.89	5.69
13	21.55	6.03	21.72	5.86
14	21.39	6.19	21.54	6.04
15	21.22	6.36	21.38	6.20
AVERAGE	23.22	4.36	23.64	3.94

\*Based on the 1973-1974 average feeder pig price of \$27.58 per pig.

#### Borrowed Capital of 75 Percent

For the enterprise with \$337,500 borrowed long-term capital and a 15 year repayment period, the necessary break-even price ranges from \$25.06 per feeder pig during the early years to \$21.22 during the later years of the repayment period (Table 6).

The average market price for 40-pound feeder pigs during 1973 and 1974 was \$27.58 per pig.<sup>5</sup> The average break-even price for the enterprise over the 15 year repayment period is \$23.22. Based on these calculations the overall average profit per pig is \$4.36. The per pig profit for the initial 76,250 pigs produced is \$2.52 while the profit for the 12,000 pigs produced in the 15th year is \$6.36 per pig.

#### Borrowed Capital of 85 Percent

By increasing the amount of initial long-term borrowed capital by \$45,000 (from \$337,500 to \$382,500), the break-even price is slightly higher over the length of the repayment period for the 85% compared to the 75% level. The average break-even price for an enterprise borrowing \$382,500 in initial capital is \$23.64. Based

<sup>5</sup>Petry, Timothy A., North Dakota Livestock Price Statistics, Agricultural Economics Statistical Series 21-75, Department of Agricultural Economics, Agricultural Experiment Station, North Dakota State University, Fargo, North Dakota, May, 1975.

on a feeder pig market price of \$27.58 the margin, or economic profit, per pig is \$3.94. The profit on the initial 76,250 feeder pigs produced during the first seven years of operation would amount to \$1.90 per pig. During the 15th year of operation, the profit would be \$6.20 per pig.

Regardless of feed price levels used in calculating the break-even price for feeder pigs it is apparent that the first seven years, in which the break-even prices are highest (and profits are lowest) would be critical to the economic success of the enterprise. The initial seven year break-even price, for an enterprise borrowing 75 percent of its long-term capital, is \$1.84 higher (\$25.06 - \$23.22) than the average break-even price calculated over the entire repayment schedule. Likewise the initial seven year break-even price, for an enterprise borrowing 85 percent of its long-term capital, is \$2.04 higher (\$25.68 - \$23.64) than the average break-even price.

The cost advantage of borrowing 75 percent rather than 85 percent is evident in that there is a \$.42 (\$23.64 - \$23.22) per pig cost advantage when comparing the two levels of financing. It should be noted that in order to finance the enterprise with 75 percent borrowed capital rather than 85 percent will require an additional \$45,000 which will have to be provided by the investor-owners of the farrowing system. This \$45,000 represents an additional private cost to the owners and should be taken into consideration when assessing the overall profitability of the farrowing enterprise.

## APPENDIX



APPENDIX TABLE 1-A. BREAK-EVEN PRICES PER FORTY POUND FEEDER PIG PRODUCED, BASED ON A \$450,000 HOG FARROWING SYSTEM WITH \$382,500 BORROWED LONG-TERM CAPITAL, FIFTEEN YEAR REPAYMENT SCHEDULE AND 1974 FEED PRICE LEVELS.

Year	Number of Pigs Produced	Operating Expenses	Principal Payment	Interest on Outstanding Principal	Cum. Interest on Additional Borrowed Capital	Total Annual Costs	Break-Even Price Per Pig*
1	4,250	\$173,554	\$31,365	\$34,425	\$4,999	\$244,343	\$25.68
2	12,000	217,152	31,365	31,602	7,505	287,624	25.68
3	12,000	227,244	31,365	28,779	6,375	293,763	25.68
4	12,000	227,244	31,365	25,956	5,080	289,645	25.68
5	12,000	227,244	31,365	23,134	3,413	285,156	25.68
6	12,000	227,244	31,365	20,311	1,704	280,624	25.68
7	12,000	227,244	31,365	17,488	430	276,527	25.68
8	12,000	227,244	31,365	14,665	0	273,274	22.74
9	12,000	227,244	31,365	11,842	0	270,451	22.54
10	12,000	227,244	31,365	9,019	0	267,628	22.30
11	12,000	227,244	23,010	14,512	0	264,766	22.07
12	12,000	227,244	23,010	12,442	0	262,696	21.89
13	12,000	227,244	23,010	10,371	0	260,625	21.72
14	12,000	227,244	23,010	8,300	0	258,554	21.54
15	12,000	227,244	23,010	6,229	0	256,483	21.38

\*The break-even price of \$25.68 is the average price needed for feeder pigs during the first seven years of production. This price would allow the total annual cost of production to be covered and the operating loans retired by the end of the seventh year of production.

APPENDIX TABLE 1-B. ANNUAL CASH FLOW BASED ON BREAK-EVEN FEEDER PIG PRICES FOR A \$450,000 HOG FARROWING SYSTEM WITH \$382,500 LONG-TERM BORROWED CAPITAL, FIFTEEN YEAR REPAYMENT SCHEDULE AND 1974 FEED PRICE LEVELS.

Year	Break-Even Price Per Pig	Number of Pigs Produced	Annual Gross Income	Total Annual Costs	Annual Net Income	End of Year Balance*
1	25.68	4,250	\$109,140	\$244,343	-\$135,203	-\$135,203
2	25.68	12,000	308,160	287,624	20,536	-114,667
3	25.68	12,000	308,160	293,763	14,397	-100,270
4	25.68	12,000	308,160	289,645	18,515	-81,755
5	25.68	12,000	308,160	285,156	23,004	-58,751
6	25.68	12,000	308,160	280,624	27,536	-31,215
7	25.68	12,000	308,160	276,527	31,633	418
8	22.74	12,000	272,880	273,274	-394	24
9	22.54	12,000	270,480	270,451	29	53
10	22.30	12,000	267,600	267,628	-28	25
11	22.07	12,000	264,840	264,766	74	99
12	21.89	12,000	262,680	262,696	-16	83
13	21.72	12,000	260,640	260,625	15	98
14	21.54	12,000	258,480	258,554	-74	24
15	21.38	12,000	256,560	256,483	77	101

\*The end of year balance is based on the break-even prices derived in Appendix Table 1-A and presented in column 2.

APPENDIX TABLE 2-A. BREAK-EVEN PRICES PER FORTY POUND FEEDER PIG PRODUCED BASED ON A \$450,000 HOG FARROWING SYSTEM WITH \$382,500 BORROWED LONG-TERM CAPITAL, FIFTEEN YEAR REPAYMENT SCHEDULE AND A 50% INCREASE IN FEED PRICES FROM 1974 LEVELS.

Year	Number of Pigs Produced	Operating Expenses	Principal Payment	Interest on Outstanding Principal	Cum. Interest on Addition Borrowed Capital	Total Annual Costs	Break-Even Price Per Pig*
1	4,250	\$232,191	\$31,365	\$34,425	\$ 6,907	\$304,888	\$32.10
2	12,000	287,082	31,365	31,602	10,152	360,201	32.10
3	12,000	297,174	31,365	28,779	8,620	365,938	32.10
4	12,000	297,174	31,365	25,956	6,887	361,382	32.10
5	12,000	297,174	31,365	23,134	4,743	356,416	32.10
6	12,000	297,174	31,365	20,311	2,357	351,207	32.10
7	12,000	297,174	31,365	17,488	585	346,612	32.10
8	12,000	297,174	31,365	14,665	0	343,204	28.52
9	12,000	297,174	31,365	11,842	0	340,381	28.37
10	12,000	297,174	31,365	9,019	0	337,558	28.13
11	12,000	297,174	23,010	14,512	0	334,696	27.89
12	12,000	297,174	23,010	12,442	0	332,626	27.72
13	12,000	297,174	23,010	10,371	0	330,555	27.55
14	12,000	297,174	23,010	8,300	0	328,484	27.37
15	12,000	297,174	23,010	6,229	0	326,413	27.20

\*The break-even price of \$32.10 is the average price needed for feeder pigs during the first seven years of production. This price would allow the total annual cost of production to be covered and the operating loans retired by the end of the seventh year of production.

APPENDIX TABLE 2-B. ANNUAL CASH FLOW BASED ON BREAK-EVEN FEEDER PIG PRICES FOR A \$450,000 HOG FARROWING SYSTEM WITH \$382,500 LONG-TERM BORROWED CAPITAL, FIFTEEN YEAR REPAYMENT SCHEDULE AND A 50% INCREASE IN FEED PRICES FROM 1974 LEVELS.

Year	Break-Even Price Per Pig	Number of Pigs Produced	Annual Gross Income	Total Annual Costs	Annual Net Income	End of Year Balance*
1	\$32.10	4,250	\$136,425	\$304,888	\$-168,463	\$-168,463
2	32.10	12,000	385,200	360,201	24,999	-143,464
3	32.10	12,000	385,200	365,938	19,262	-124,202
4	32.10	12,000	385,200	361,382	23,818	-100,384
5	32.10	12,000	385,200	356,416	28,784	-71,600
6	32.10	12,000	385,200	351,207	33,993	-37,607
7	32.10	12,000	385,200	346,612	38,588	981
8	28.52	12,000	342,240	343,204	-964	17
9	28.37	12,000	340,440	340,381	59	76
10	28.13	12,000	337,560	337,558	2	78
11	27.89	12,000	334,680	334,696	-16	62
12	27.72	12,000	332,640	332,626	14	76
13	27.55	12,000	330,600	330,555	45	121
14	27.37	12,000	328,440	328,484	-44	77
15	27.20	12,000	326,400	326,413	-13	64

\*The end of year balance is based on the break-even prices derived in Appendix Table 2-A and presented in column 2.

APPENDIX TABLE 3-A. BREAK-EVEN PRICES PER FORTY POUND FEEDER PIG PRODUCED BASED ON A \$450,000 HOG FARROWING SYSTEM WITH \$382,500 BORROWED LONG-TERM CAPITAL, FIFTEEN YEAR REPAYMENT SCHEDULE AND A 50% DECREASE IN FEED PRICES FROM 1974 LEVELS.

Year	Number of Pigs Produced	Operating Expenses	Principal Payment	Interest on Outstanding Principal	Cum. Interest on Additional Borrowed Capital	Total Annual Costs	Break-Even Price Per Pig*
1	4,250	\$114,917	\$31,365	\$34,425	\$3,089	\$183,796	\$19.27
2	12,000	147,222	31,365	31,602	4,848	215,037	19.27
3	12,000	157,314	31,365	28,779	4,109	221,567	19.27
4	12,000	157,314	31,365	25,956	3,238	217,873	19.27
5	12,000	157,314	31,365	23,134	2,158	213,971	19.27
6	12,000	157,314	31,365	20,311	1,089	210,079	19.27
7	12,000	157,314	31,365	17,488	268	206,435	19.27
8	12,000	157,314	31,365	14,665	0	203,344	16.90
9	12,000	157,314	31,365	11,842	0	200,521	16.71
10	12,000	157,314	31,365	9,019	0	197,698	16.48
11	12,000	157,314	23,010	14,512	0	194,836	16.23
12	12,000	157,314	23,010	12,442	0	192,766	16.07
13	12,000	157,314	23,010	10,371	0	190,695	15.89
14	12,000	157,314	23,010	8,300	0	188,624	15.72
15	12,000	157,314	23,010	6,229	0	286,553	15.54

\*The break-even price of \$19.27 is the average price needed for feeder pigs during the first seven years of production. This price would allow the total annual cost of production to be covered and the operating loans retired by the end of the seventh year of production.

APPENDIX TABLE 3-B. ANNUAL CASH FLOW BASED ON BREAK-EVEN FEEDER PIG PRICES FOR A \$450,000 HOG FARROWING SYSTEM WITH \$382,500 LONG-TERM BORROWED CAPITAL, FIFTEEN YEAR REPAYMENT SCHEDULE AND A 50% DECREASE IN FEED PRICES FROM 1974 LEVELS.

Year	Break-Even Price Per Pig	Number of Pigs Produced	Annual Gross Income	Total Annual Costs	Annual Net Income	End of Year Balance*
1	\$19.27	4,250	\$ 81,898	\$183,796	\$-101,898	\$-101,898
2	19.27	12,000	231,240	215,037	16,203	-85,695
3	19.27	12,000	231,240	221,567	9,673	-76,022
4	19.27	12,000	231,240	217,873	13,367	-62,655
5	19.27	12,000	231,240	213,971	17,269	-45,386
6	19.27	12,000	231,240	210,079	21,161	-24,225
7	19.27	12,000	231,240	206,435	24,805	580
8	16.90	12,000	202,800	203,344	-544	36
9	16.71	12,000	200,520	200,521	-1	35
10	16.48	12,000	197,760	197,698	62	97
11	16.23	12,000	194,760	194,836	-76	21
12	16.07	12,000	192,840	192,766	74	95
13	15.89	12,000	190,680	190,695	-15	80
14	15.72	12,000	188,640	188,624	16	96
15	15.54	12,000	186,480	186,553	-73	23

\*The end of year balance is based on the break-even prices derived in Appendix Table 3-A and presented in column 2.

APPENDIX TABLE 4-A. BREAK-EVEN PRICES PER PIG PRODUCED ON A \$450,000 HOG FARROWING SYSTEM WITH \$337,500 BORROWED LONG-TERM CAPITAL, FIFTEEN YEAR REPAYMENT SCHEDULE AND 1974 FEED PRICE LEVELS.

Year	Number of Pigs Produced	Operating Expenses	Principal Payment	Interest on Outstanding Principal	Cum. Interest on Additional Borrowed Capital	Total Annual Costs	Break-Even Price Per Pig*
1	4,250	\$173,554	\$27,675	\$30,375	\$5,060	\$236,664	\$25.06
2	12,000	217,152	27,675	37,884	7,413	280,124	25.06
3	12,000	227,244	27,675	25,394	6,279	286,592	25.06
4	12,000	227,244	27,675	22,903	5,007	282,829	25.06
5	12,000	227,244	27,675	20,412	3,397	278,728	25.06
6	12,000	227,244	27,675	17,921	1,683	274,523	25.06
7	12,000	227,244	27,675	15,431	421	270,771	25.06
8	12,000	227,244	27,675	12,940	0	267,859	22.28
9	12,000	227,244	27,675	10,449	0	265,368	22.11
10	12,000	227,244	27,675	7,958	0	262,877	21.91
11	12,000	227,244	21,390	13,784	0	262,418	21.87
12	12,000	227,244	21,390	11,858	0	260,492	21.70
13	12,000	227,244	21,390	9,933	0	258,567	21.55
14	12,000	227,244	21,390	8,008	0	256,642	21.39
15	12,000	227,244	21,390	6,083	0	254,717	21.22

\*The break-even price of \$25.06 is the average price needed for feeder pigs during the first seven years of production. This price would allow the total annual cost of production to be covered and the operating loans retired by the end of the seventh year of production.

APPENDIX TABLE 4-B. ANNUAL CASH FLOW BASED ON BREAK-EVEN FEEDER PIG PRICES FOR A \$450,000 HOG FARROWING SYSTEM WITH \$337,500 LONG-TERM BORROWED CAPITAL, FIFTEEN YEAR REPAYMENT SCHEDULE AND 1974 FEED PRICE LEVELS.

Year	Break-Even Price Per Pig	Number of Pigs Produced	Annual Gross Income	Total Annual Costs	Annual Net Income	End of Year Balance*
1	\$25.06	4,250	\$106,505	\$236,664	\$-130,159	\$-130,159
2	25.06	12,000	300,720	280,124	20,596	-109,563
3	25.06	12,000	300,720	286,592	14,128	-95,435
4	25.06	12,000	300,720	282,829	17,891	-77,544
5	25.06	12,000	300,720	278,728	21,992	-55,552
6	25.06	12,000	300,720	274,523	26,197	-29,355
7	25.06	12,000	300,720	270,771	29,949	594
8	22.28	12,000	267,360	267,859	-499	95
9	22.11	12,000	265,320	265,368	-48	47
10	21.91	12,000	262,920	262,877	43	90
11	21.87	12,000	262,440	262,418	22	112
12	21.70	12,000	260,400	260,492	-92	20
13	21.55	12,000	258,600	258,567	33	53
14	21.39	12,000	256,680	256,642	38	91
15	21.22	12,000	254,640	254,717	-77	14

\*The end of year balance is based on the break-even prices derived in Appendix Table 4-A and presented in column 2.

APPENDIX TABLE 5-A. BREAK-EVEN PRICES PER FORTY POUND FEEDER PIG PRODUCED BASED ON A \$450,000 HOG FARROWING SYSTEM WITH \$337,500 BORROWED LONG-TERM CAPITAL, FIFTEEN YEAR REPAYMENT SCHEDULE AND A 50% INCREASE IN FEED PRICES FROM 1974 LEVELS.

Year	Number of Pigs Produced	Operating Expenses	Principal Payment	Interest on Outstanding Principal	Cum. Interest on Additional Borrowed Capital	Total Annual Costs	Break-Even Price Per Pig*
1	4,250	\$232,191	\$27,675	\$30,375	\$ 6,970	\$297,211	\$31.47
2	12,000	287,082	27,675	27,884	10,070	352,711	31.47
3	12,000	297,174	27,675	25,394	8,545	358,788	31.47
4	12,000	297,174	27,675	22,903	6,848	354,600	31.47
5	12,000	297,174	27,675	20,412	4,775	350,036	31.47
6	12,000	297,174	27,675	17,921	2,412	345,182	31.47
7	12,000	297,174	27,675	15,431	617	340,897	31.47
8	12,000	297,174	27,675	12,940	0	337,789	28.14
9	12,000	297,174	27,675	10,449	0	335,298	27.94
10	12,000	297,174	27,675	7,958	0	332,807	27.74
11	12,000	297,174	21,390	13,784	0	332,348	27.69
12	12,000	297,174	21,390	11,858	0	330,422	27.54
13	12,000	297,174	21,390	9,933	0	328,497	27.37
14	12,000	297,174	21,390	8,008	0	326,472	27.22
15	12,000	297,174	21,390	6,083	0	324,647	27.05

\*The break-even price of \$31.47 is the average price needed for feeder pigs during the first seven years of production. This price would allow the total annual cost of production to be covered and the operating loans retired by the end of the seventh year of production.

APPENDIX TABLE 5-B. ANNUAL CASH FLOW BASED ON BREAK-EVEN FEEDER PIG PRICES FOR A \$450,000 HOG FARROWING SYSTEM WITH \$337,500 LONG-TERM BORROWED CAPITAL, FIFTEEN YEAR REPAYMENT SCHEDULE AND A 50% INCREASE IN FEED PRICES FROM 1974 LEVELS.

Year	Break-Even Price Per Pig	Number of Pigs Produced	Annual Gross Income	Total Annual Costs	Annual Net Income	End of Year Balance*
1	\$31.47	4,250	\$133,747	\$297,211	-\$163,464	-\$163,464
2	31.47	12,000	377,640	352,711	24,929	-138,535
3	31.47	12,000	377,640	358,788	18,852	-119,683
4	31.47	12,000	377,640	354,600	23,040	-96,643
5	31.47	12,000	377,640	350,036	27,604	-69,039
6	31.47	12,000	377,640	345,182	32,458	-36,581
7	31.47	12,000	377,640	240,897	36,743	162
8	28.14	12,000	337,680	337,789	-109	53
9	27.94	12,000	335,280	335,298	-18	35
10	27.74	12,000	332,880	332,807	73	108
11	27.69	12,000	332,280	332,348	-68	40
12	27.54	12,000	330,480	330,422	58	98
13	27.37	12,000	328,440	328,497	-57	41
14	27.22	12,000	326,640	326,572	68	109
15	27.05	12,000	324,600	324,647	-47	62

\*The end of year balance is based on the break-even prices derived in Appendix Table 5-A and presented in column 2.

APPENDIX TABLE 6-A. BREAK-EVEN PRICES PER FORTY POUND FEEDER PIG PRODUCED BASED ON A \$450,000 HOG FARROWING SYSTEM WITH \$337,500 BORROWED LONG-TERM CAPITAL, FIFTEEN YEAR REPAYMENT SCHEDULE AND A 50% DECREASE IN FEED PRICES FROM 1974 LEVELS.

Year	Number of Pigs Produced	Operating Expenses	Principal Payment	Interest on Outstanding Principal	Cum. Interest on Additional Borrowed Capital	Total Annual Costs	Break-Even Price Per Pig*
1	4,250	\$114,917	\$27,675	\$30,375	\$3,150	\$176,117	\$18.65
2	12,000	147,222	27,675	27,884	4,757	207,538	18.65
3	12,000	157,314	27,675	25,394	4,012	214,395	18.65
4	12,000	157,314	27,675	22,903	3,166	211,058	18.65
5	12,000	157,314	27,675	20,412	2,098	207,499	18.65
6	12,000	157,314	27,675	17,921	1,049	203,959	18.65
7	12,000	157,314	27,675	15,431	253	200,673	18.65
8	12,000	157,314	27,675	12,940	0	197,929	16.43
9	12,000	157,314	27,675	10,449	0	195,438	16.29
10	12,000	157,314	27,675	7,958	0	192,947	16.08
11	12,000	157,314	21,320	13,784	0	192,488	16.04
12	12,000	157,314	21,390	11,858	0	190,562	15.88
13	12,000	157,314	21,390	9,933	0	188,637	15.72
14	12,000	157,314	21,390	8,008	0	186,712	15.56
15	12,000	157,314	21,390	6,083	0	184,787	15.39

\*The break-even price of \$18.65 is the average price needed for feeder pigs during the first seven years of production. This price would allow the total annual cost of production to be covered and the operating loans retired by the end of the seventh year of production.

APPENDIX TABLE 6-B. ANNUAL CASH FLOW BASED ON BREAK-EVEN FEEDER PIG PRICES FOR A \$450,000 HOG FARROWING SYSTEM WITH \$337,500 LONG-TERM BORROWED CAPITAL, FIFTEEN YEAR REPAYMENT SCHEDULE AND A 50% DECREASE IN FEED PRICES FROM 1974 LEVELS.

Year	Break-Even Price Per Pig	Number of Pigs Produced	Annual Gross Income	Total Annual Costs	Annual Net Income	End of Year Balance*
1	\$18.65	4,250	\$ 79,263	\$176,118	-\$96,855	-\$96,855
2	18.65	12,000	223,800	207,538	16,262	-80,593
3	18.65	12,000	223,800	214,395	9,405	-71,188
4	18.65	12,000	223,800	211,058	12,742	-58,446
5	18.65	12,000	223,800	207,499	16,301	-42,145
6	18.65	12,000	223,800	203,959	19,841	-22,304
7	18.65	12,000	223,800	200,673	23,127	823
8	16.43	12,000	197,160	197,929	-769	54
9	16.29	12,000	195,480	195,438	42	96
10	16.08	12,000	192,960	192,947	13	109
11	16.04	12,000	192,480	192,488	-8	101
12	15.88	12,000	190,560	190,562	-2	99
13	15.72	12,000	188,640	188,637	3	102
14	15.56	12,000	186,720	186,712	8	110
15	15.39	12,000	184,680	184,787	-107	3

\*The end of year balance is based on the break-even prices derived in Appendix Table 6-A and presented in column 2.