ESTIMATED BUDGETS FOR SEPARATE-SITE SWINE PRODUCTION

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Summary

Budgets were developed to help Kansas swine producers analyze the economics of separate-site production. Return on investment (ROI) was estimated at 9.5% in each of the three production phases. Returns over total costs were very sensitive to transfer price between phases (weaned pig and feeder pig price) as well as production efficiencies and input costs.

(Key Words: Economics, Budgets, Separate-Site Production.)

Introduction

The modern practice of dividing traditional farrow-to-finish hog production into three distinct phases is revolutionizing the swine industry. The age separation practice, known as segregated early weaning (SEW), produces healthier, more efficient pigs and helps to maximize the genetic potential of today's breeding stock. The most popular modern production system is a three-site, all-in, all-out system consisting of a breeding-gestation-farrowing site, a nursery site, and a growing-finishing site. The ability to take advantage of this technology may help Kansas hog producers remain competitive in the industry.

Because this technology is relatively new in Kansas, budgets reflecting this technology need to be estimated or projected so interested producers can make informed decisions concerning future production. Although it is important for producers to develop budgets based on their own production level and costs, relevant records often will not be available to adequately evaluate a new or different technology. The following three budgets were estimated to help producers evaluate the economic potential of separate site swine production utilizing new technology in Kansas. The following is a brief discussion of the budgets. For a more detailed listing of assumptions used in the budgets, a copy of the complete budget can be requested from your county Extension office.

Procedures

Economic Costs vs. Cash-Flow Costs. Cash-flow costs can, and often are, significantly different than economic costs. Cash-flow costs are those costs that require an out-of-pocket payment. Economic costs, as defined here, are all costs that need to be paid in the long run and include labor, depreciation, and interest on investment. The following budgets are based on economic costs so they should give an indication of long-run profit potential.

Price and Cost Assumptions. Relevant prices and costs should be used for developing budgets. Historical averages (5 year) are used here for finished pig price and feed costs. Other variable costs are based on historical records and projections made by the authors.

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Historically, if pigs were not finished, they were marketed as 40- to 50-lb feeder pigs and a market price on which to base projections was available. However, a reliable market for early-weaned (10 lb) pigs does not currently exist. Also, the value of a feeder pig coming out of the nursery from an SEW program may not be comparable to the value of a traditional feeder pig going through an auction because of better quality and health. Therefore, values for both the weaned pig and feeder pig need to be estimated. These values are estimated by allocating the income received from the finished pig back to the individual phases by percent of total costs occurring in each phase. Prices also are estimated by examining what prices would result in all three phases earning a comparable return on investment at average production with a given finished-pig price. It is important to note that production levels will change cost per pig significantly. Thus, the estimated values for weaned pigs and feeder pigs using this methodology are very dependent on production levels.

Production Level. Costs per unit and net returns in swine production are highly dependent on production levels. The following estimated budgets include three different production levels. Production levels vary for a number of reasons, such as livestock quality/genetics, weather, input levels, and management. Budgeting at multiple production levels can help producers examine the financial risk of a livestock enterprise that is related directly to production risk.

Production levels for farrowing operations are assumed to vary with differences in the number of pigs sold per litter and the number of litters per sow per year. Varying these two factors results in different numbers of pigs sold per sow per year. Thus, returns are very sensitive to number of weaned pigs marketed per sow per year. This is because many costs will decrease on a per-pig basis as production increases. Production levels for nursery and finisl ing operations are assumed to vary with ifferences in the feed efficiency. Varying his production factor, which has a major impact on profitability, allows an analysis of alternative projected economic results.

Capital Investment. The capital invested in farrowing, nursery, and finishing facilities varies greatly and is dependent upon the size and type of facilities constructed. The success of the SEW concept is dependent upon high quality facilities that require large capital investments. Investment costs here are based on current costs projections and depreciated over 10 years. Salvage values are estimated at 20% for buildings and 0% for equipment at the end of 10 years. A central farrowing house with liquid manure facilities and slotted floors is estimated at $1,980 per sow (66 sq. ft. per sow), with the equipment inside the building costing an additional $800 per sow. The gestation building is estimated to cost $360 per sow (20 sq. ft. per sow), and the equipment inside the building is estimated to cost an additional $150 per sow. A nursery building with liquid manure handling facilities and narrow slotted floors is estimated to cost $102 per pig (3.5 sq. ft. per pig), with the equipment inside the building costing an additional $8 per pig. A finishing building with liquid manure handling facilities and a totally slatted floor is estimated to cost $144 per pig (8 sq. ft. per pig), with the equipment inside the building costing an additional $20 per pig. Office facilities, site preparation, and miscellaneous items also are included in the capital requirements for all budgets. The capital requirements are assumed to be the same for all production levels. Thus, fixed costs per pig are functions of throughput, which varies in the farrow-to-wean budget, but is held constant in the nursery and finishing budgets.

Results and Discussion

Using the average production level, net return on investment (ROI) is approximately 9.5% for each of the three phases. Approximately 30% of the total cost of producing a finished pig occurs in the farrow-to-wean phase. Based on this and equating ROI between phases, a weaned pig price of $33.50 and feeder pig price of $51.75 are

incorporated into the budgets. The break-even price for weaned pigs is approximately $32 per head at average production. However, increasing pigs weaned per sow per year from 19 to 22 decreases the break-even price to less than $28 per head. In the farrow-to-wean budget, many costs are relatively fixed once production begins (do not vary as productivity per sow varies). Therefore, productivity level represents the biggest risk and has the biggest impact on weaned pig break-even price per head and profitability.

In many cases, the nursery and finishing phases are aggregated, because the same person is doing both. However, they are separated from a budgeting standpoint here, because they represent two separate production phases. The nursery phase has more input price risk than does the farrowing phase, but production efficiency and health are still major risk concerns. Using a purchase (transfer in) price of $33.50 for a 10-lb pig requires a selling (transfer out) price of $51.75 per head for the 60-lb feeder pig to achieve a similar ROI as the other phases.

The finishing phase has a larger percent of total costs that vary directly with the level of production. Therefore, the finishing phase has more input price risk than either the nursery or farrowing phases. Production efficiency and health are still major concerns, but managing input costs, specifically feed, in the finishing budget will have a big impact on profitability. Using a purchase (transfer in) price of $51.75 for a 60-lb feeder pig and the 5-year average of $45.75/cwt for the finished pig results in an ROI of 9.5%.

Mark Nelson, Swine Farm Manager

Table 1. Farrow-to-Weaned Pig Cost-Return Projections

Item	Marketable pigs weaned/sow/year 16.0	19.0	22.0	Your farm
Variable Cost per Pig Sold:				
1. Grain	$4.13	$3.51	$3.07	
2. Protein	2.30	1.97	1.73	
3. Base mix: vitamins, minerals, etc.	1.14	0.97	0.85	
4. Pig starter	0.00	0.00	0.00	
5. Feed processing	0.57	0.49	0.43	
6. Labor	7.29	6.14	5.30	
7. Veterinary, drugs, and supplies	1.10	1.00	0.90	
8. Utilities, fuel, and oil	1.65	1.50	1.35	
9. Transportation and marketing costs	0.55	0.50	0.45	
10. Building and equipment repairs	1.29	1.09	0.94	
11. Breeding/genetic charge (sum of lines a to d)	6.15	5.29	4.66	
a. Depreciation	(2.90)	(2.44)	(2.11)	
b. Semen	(2.00)	(1.79)	(1.64)	
c. Interest	(1.14)	(0.96)	(0.83)	
d. Insurance	(0.11)	(0.10)	(0.08)	
12. Profession fees (legal, accounting, etc.)	0.55	0.50	0.45	
13. Interest on 1/2 variable costs	0.65	0.53	0.44	
A. Total Variable Costs	$27.38	$23.48	$20.56	
Fixed Costs per Pig Sold:				
14. Depreciation on buildings and equipment	5.54	4.66	4.03	
15. Interest on buildings and equipment	3.70	3.12	2.69	
16. Insurance and taxes on buildings and equipment	0.63	0.53	0.46	
B. Total Fixed Costs	$9.87	$8.31	$7.18	
C. Total Costs per Pigs Sold	$37.25	$31.80	$27.74	
Returns per Pig Sold				
17. Weaned pig	$33.50	$33.50	$33.50	
D. Gross Returns per Pig Sold	$33.50	$33.50	$33.50	
E. Returns over Variable Costs (D - A)	$6.12	$10.02	$12.94	
F. Returns over Total Costs (D - C)	($3.75)	$1.70	$5.76	
G. Weaned Pig Break-Even Price, $/head				
18. To cover variable costs	$27.38	$23.48	$20.56	
19. To cover total costs	$37.25	$31.80	$27.74	
H. Total Feed Costs (lines 1 to 5)	$8.14	$6.94	$6.07	
20. Cwt pork produced	0.10	0.10	0.10	
21. Feed cost/cwt	$81.41	$69.41	$60.70	
I. Asset Turnover (D/Investment) /1	42.41%	50.36%	58.31%	
J. Net Return on Investment [(F + 11c +13 + 15)/Investment] /1	2.20%	9.48%	16.92%	

/1 Investment equals total value of breeding herd and buildings and equipment.

Table 2. Feeder Pig Nursery Cost-Return Projections

Item	Feed efficiency (feed/gain, lb) 2.00	1.80	1.60	Your farm
Variable Cost per Pig Sold:				
1. Grain	$2.29	$2.06	$1.83	
2. Protein	2.88	2.59	2.30	
3. Base mix: vitamins, minerals, etc.	1.84	1.66	1.47	
4. Pig starter	2.12	1.91	1.70	
5. Feed processing	0.45	0.41	0.36	
6. Labor	0.92	9.92	9.92	
7. Veterinary, drugs, and supplies	0.50	0.50	0.50	
8. Utilities, fuel, and oil	0.25	0.25	0.25	
9. Transportation and marketing costs	0.50	0.50	0.50	
10. Building and equipment repairs	0.39	0.39	0.39	
11. Profession fees (legal, accounting, etc.)	0.25	0.25	0.25	
12. Interest on 1/2 variable costs and weaned pig	0.61	0.60	0.59	
A. Total Variable Costs	$12.99	$12.03	$11.06	
Fixed Costs per Pig Sold:				
13. Depreciation on buildings and equipment	1.57	1.57	1.57	
14. Interest on buildings and equipment	1.15	1.15	1.15	
15. Insurance and taxes on buildings and equipment	0.23	0.23	0.23	
B. Total Fixed Costs	$2.94	$2.94	$2.94	
C. Total Costs per Pigs Sold	$15.94	$14.97	$14.01	
Returns per Pig Sold				
16. Feeder pig	$51.75	$51.75	$51.75	
17. Less cost of weaned pig	33.50	33.50	33.50	
18. Less death loss	1.55	1.55	1.55	
D. Gross Returns per Pig Sold	$16.70	$16.70	$16.70	
E. Returns over Variable Costs (D - A)	$3.70	$4.67	$5.63	
F. Returns over Total Costs (D - C)	$0.76	$1.73	$2.69	
G. Feeder Pig Break-Even Price, $/head				
19. To cover variable costs	$48.05	$47.08	$46.12	
20. To cover total costs	$50.99	$50.02	$49.06	
H. Total Feed Costs (lines 1 to 5)	$9.58	$8.62	$7.66	
21. Cwt pork produced	0.48	0.48	0.48	
22. Feed cost/cwt pork	$19.88	$17.89	$15.90	
I. Asset Turnover (D/Investment) /1	45.00%	45.00%	45.00%	
J. Net Return on Investment [(F + 12 +14)/Investment] /1	6.77%	9.35%	11.93%	

/1 Investment equals total value of breeding herd and buildings and equipment.

Table 3. Finishing Barn Cost-Return Projections

Item	Feed efficiency (feed/gain, lb) 3.30	3.10	2.90	Your farm
Variable Cost per Pig Sold:				
1. Grain	$20.19	$18.96	$17.74	
2. Protein	10.98	10.31	9.65	
3. Base mix: vitamins, minerals, etc.	4.10	3.85	3.60	
4. Pig starter	0.00	0.00	0.00	
5. Feed processing	2.75	2.58	2.41	
6. Labor	1.96	1.96	1.96	
7. Veterinary, drugs, and supplies	0.80	0.80	0.80	
8. Utilities, fuel, and oil	0.25	0.25	0.25	
9. Transportation and marketing costs	2.00	2.00	2.00	
10. Building and equipment repairs	0.82	0.82	0.82	
11. Profession fees (legal, accounting, etc.)	0.50	0.50	0.50	
12. Interest on 1/2 variable costs and feeder pig	2.40	2.36	2.32	
A. Total Variable Costs	$46.74	$44.40	$42.05	
Fixed Costs per Pig Sold:				
13. Depreciation on buildings and equipment	4.87	4.87	4.87	
14. Interest on buildings and equipment	3.49	3.49	3.49	
15. Insurance and taxes on buildings and equipment	0.67	0.67	0.67	
B. Total Fixed Costs	$9.03	$9.03	$9.03	
C. Total Costs per Pigs Sold	$55.77	$53.42	$51.08	
Returns per Pig Sold				
16. Finished pig	$112.09	$112.09	$112.09	
17. Less cost of feeder pig	51.75	51.75	51.75	
18. Less death loss	2.24	2.24	2.24	
D. Gross Returns per Pig Sold	$58.10	$58.10	$58.10	
E. Returns over Variable Costs (D - A)	$11.36	$13.70	$16.04	
F. Returns over Total Costs (D - C)	$2.33	$4.67	$7.01	
G. Feeder Pig Break-Even Price, $/head				
19. To cover variable costs	$41.11	$40.16	$39.20	
20. To cover total costs	$44.80	$43.84	$42.89	
H. Total Feed Costs (lines 1 to 5)	$38.01	$35.71	$33.41	
21. Cwt pork produced	1.80	1.80	1.80	
22. Feed cost/cwt pork	$21.11	$19.83	$18.55	
I. Asset Turnover (D/Investment) /1	52.36%	52.36%	52.36%	
J. Net Return on Investment [(F + 12 +14)/Investment] /1	7.40%	9.48%	11.55%	

/1 Investment equals total value of breeding herd and buildings and equipment.