KANSAS FARM MANAGEMENT & MARKETING HANDBOOK

KSU Farm Management Guide MF-2151

Feeder Pig Nursery Cost-Return Projection

Department of Agricultural Economics

K-STATE Kansas State University

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

Kevin C. Dhuyvetter
Extension Agricultural Economist
Farm Management

Mike D. Tokach
Extension Livestock Production
and Management, NE

Rodney Jones
Extension Agricultural Economist
Livestock Production

Production Practices

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 maximize the genetic potential of today's breeding stock. The ability to take advantage of this technology may help Kansas hog producers remain competitive in the industry.

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 grower-finishing site. This budget is designed to serve as an economic guide to the nursery phase of the production process.

Production Level

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

Production levels for SEW nursery operations are assumed to vary due to differences in the feed efficiency of the pigs in the nursery. Varying this production factor allows an analysis of alternative projected economic results.

Capital Investment

The capital invested in nursery 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. The investment shown in Table 1 was used for the cost-return projections. Producers should use their own figures and recalculate the fixed cost before construction.

A nursery building with liquid manure handling facilities and narrow slotted floors is estimated to cost $102 per pig (3.5 square feet per pig), with the equipment inside the building costing an additional $10 per pig. Office facilities, site preparation, and miscellaneous items are also included in the capital requirements. The capital requirements are assumed to be the same for all production levels, so fixed costs per pig are the same for all production levels.

Returns

Returns to the nursery stage accrue from the sale or transfer of feeder pigs. Feeder pigs produced in SEW nursery programs are typically heavier and of better quality than those reflected in most commonly reported feeder pig markets. The price of the feeder pig used in this budget was arrived at by simultaneously calculating a weaned pig price and a feeder pig price such that the return on investment for the three phases of production (farrow to wean, nursery, and finish) were approximately equal given the assumed costs in each budget and the market hog price in the finishing budget. Any feeder pig price used for SEW budgets will need to include a significant premium beyond average feeder pig prices to account for quality differences.

Feed Costs

Feed costs were calculated based on the four-phase diet system proposed in the *Kansas Swine Nutrition Guide* for each efficiency level. Feed costs account for a large component of the total costs per pig sold and vary considerably across efficiency levels.

The break-even price needed to cover all costs (line 20) is sensitive to changes in feed prices and to the purchase price of the weaned pig. Also, for a given expected break-even selling price, the maximum amount a producer can pay for the weaned pig (line 17) is sensitive to feed prices. The amount that these break-even selling or purchase prices need to be adjusted as feed prices vary is revealed in Table 2.

Table 1. New Facility Investment—1,200 Pigs

	Investment			
Building Type	**Per Space**	**Per Square Foot**	**Capacity**	**Total Investment**
Nursery Bldg.	$102 / Pig	$29.14 / Sq. Ft.	1,200 Pigs	$122,400
Equip.	10 / Pig			12,000
Other (Office, Site, etc.)				15,000
			TOTAL	$149 ,400

Information Included in Nursery Budget:

	Productivity level		
Feed efficiency (feed/gain, lbs.)	2.00	1.80	1.60
Average daily gain	0.94	0.94	0.94
	Pounds fed per pig		
1. Grain: sorghum @ $3.89 per hundredweight	53.9	48.6	43.2
2. Protein: soybean meal @ $172 per ton	28.5	25.7	22.8
3. Base mix: vitamins, minerals @ $370 per ton	9.0	8.1	7.2
4. Pig starter: @ $540 per ton	8.5	7.7	6.8

5. **Feed processing:** total tons of feed fed times $10 per ton.
6. **Labor:** based on quarter–time employee at $33,000 per year (salary + benefits) divided by pigs sold per year.
7. **Veterinary, drugs, and supplies:** costs for prevention and control of disease.
8. **Utilities, fuel, and oil:** telephone, utilities, fuel, and oil allocated to swine enterprise.
9. **Transportation and marketing costs:** trucking, commissions, etc.
10. **Buildings and equipment repairs:** annual building and equipment repairs allocated to swine enterprise calculated as 2.5 percent of the total investment.
11. **Professional fees (legal accounting, etc.):** business and miscellaneous costs allocated to swine enterprise.
12. **Interest on variable costs:** calculated on cost of weaned pig and one-half of variable costs at a rate of 9 percent for 56 days.
13. **Depreciation on buildings and equipment:** based on the total original cost less salvage value of buildings and equipment on a per pig basis divided by the estimated life. The budget value is based on a total investment for buildings of $136,800 with a salvage value of 10 percent and an equipment investment of $12,000 with a salvage value of zero. A useful life of 15 years is used for buildings and 10 years for equipment.
14. **Interest on buildings and equipment:** interest is charged on one-half the average investment [(initial cost + salvage value) ÷ 2] for buildings and equipment at a rate of 9 percent divided by the number of feeder pigs sold per year.
15. **Insurance and taxes on buildings and equipment:** based on 0.25 percent (insurance) and 1.5 percent (taxes, buildings only) times the original cost divided by the number of feeder pigs sold per year.
16. **Feeder pig sales:** based on per head price of a 60-pound feeder pig at $38.80 per pig.
17. **Less cost of weaned pig:** based on per head price of a 10-pound weaned pig at $25.45 per pig.
18. **Less death loss:** based on 3 percent of the value of feeder pig.
19. **Average selling price of feeder pig to cover variable costs:** calculated by adding the cost of a weaned pig (line 17) to total variable costs (line A). This value is adjusted by death loss to obtain the average break-even price per head.
20. **Average selling price of feeder pig to cover total costs:** calculated the same as for variable costs except total costs (line C) are used.
21. **Hundredweight of pork produced:** weight of feeder pig sold adjusted for death loss minus weight of weaned pig purchased divided by 100.

I. **ASSET TURNOVER:** (returns per pig divided by investment) asset turnover is the percentage of investment recovered by total returns. Inverting this measure allows different enterprises to be compared on the basis of capital required to generate a dollar of gross income.

J. **NET RETURN ON INVESTMENT:** [(returns over total costs + interest on variable costs + interest on fixed costs) ÷ by investment] net return on investment is the percentage return on investment capital (both borrowed and equity). This measure enables comparisons to be made among enterprises and other investment alternatives.

COST-RETURN PROJECTION — FEEDER PIG NURSERY

	Feed efficiency (feed/gain, lbs)			
	2.0	**1.8**	**1.6**	**Your Farm**
VARIABLE COSTS PER PIG SOLD:				
1. Grain	$ 2.10	$ 1.89	$ 1.68	
2. Protein	2.45	2.20	1.96	
3. Base mix: vitamins, minerals, etc.	1.66	1.50	1.33	
4. Pig starter	2.30	2.07	1.84	
5. Feed processing	0.50	0.45	0.40	
6. Labor	1.09	1.09	1.09	
7. Veterinary, drugs, and supplies	0.75	0.75	0.75	
8. Utilities, fuel, and oil	1.00	1.00	1.00	
9. Transportation and marketing costs	0.50	0.50	0.50	
10. Building and equipment repairs	0.49	0.49	0.49	
11. Professional fees (legal, accounting, etc.)	0.25	0.25	0.25	
12. Interest on weaned pig and 1/2 variable costs	0.44	0.43	0.43	
A. TOTAL VARIABLE COSTS	$ 13.53	$ 12.62	$ 11.72	
FIXED COSTS PER PIG SOLD:				
13. Depreciation on buildings and equipment	1.24	1.24	1.24	
14. Interest on buildings and equipment	0.97	0.97	0.97	
15. Insurance and taxes on buildings and equipment	0.32	0.32	0.32	
B. TOTAL FIXED COSTS	$ 2.53	$ 2.53	$ 2.53	
C. TOTAL COSTS PER PIG SOLD (A + B)	$ 16.07	$ 15.16	$ 14.25	
RETURNS PER PIG SOLD				
16. Feeder pig	38.80	38.80	38.80	
17. Less cost of weaned pig	25.45	25.45	25.45	
18. Less death loss	1.16	1.16	1.16	
D. GROSS RETURNS PER PIG SOLD	$ 12.19	$ 12.19	$ 12.19	
E. RETURNS OVER VARIABLE COSTS (D–A)	$ -1.35	$ -0.44	$ 0.47	
F. RETURNS OVER TOTAL COSTS (D–C)	$ -3.88	$ -2.97	$ -2.06	
G. FINISHED PIG BREAK-EVEN PRICE, $/head:				
19. To cover variable costs	$ 40.15	$ 39.24	$ 38.33	
20. To cover total costs	$ 42.68	$ 41.77	$ 40.86	
H. TOTAL FEED COSTS (lines 1 through 5)	$ 9.01	$ 8.11	$ 7.21	
21. Hundredweight pork produced	0.48	0.48	0.48	
22. Feed cost per hundredweight pork produced	$ 18.70	$ 16.83	$ 14.96	
I. ASSET TURNOVER (D ÷ INVESTMENT)[1]	26.99%	26.99%	26.99%	
J. NET RETURN ON INVESTMENT [(F + 12 + 14) ÷ INVESTMENT][1]	-5.48%	-3.48%	-1.49%	

[1]Investment equals total cost of weaned pig and buildings and equipment.

Table 2. Sensitivity of break-even price needed to cover total costs (line 20)

	Feed efficiency (feed/gain, lbs)		
	2.00	**1.80**	**1.60**
Feeder pig break-even selling price in budget	$42.68	$41.77	$40.86
Maximum purchase price for weaned pig in budget	$21.62	$22.52	$23.41
Factor	**Change in break-even selling or purchase price**		
$0.50/hundredweight change in grain price	$0.27	$0.24	$0.22
$10/ton change in soybean meal price	$0.14	$0.13	$0.11
$20/ton change in base mix	$0.09	$0.08	$0.07
$25/ton change in starter	$0.11	$0.10	$0.09
5.0% change in feed efficiency	$0.45	$0.41	$0.36
1.0% change in death loss	$0.41	$0.41	$0.41
Factor	**Change in break-even selling price**		
$2.50/head change in weaned pig price	$2.53	$2.53	$2.53
Factor	**Change in break-even purchase price**		
$4.00/head change in feeder pig price	$3.83	$3.83	$3.83

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