

Feeder Pig Nursery Cost-Return Budget

Department of Agricultural Economics



Kansas State University Agricultural Experiment Station and Cooperative Extension Service

Kevin C. Dhuyvetter
Agricultural Economist
Farm Management

Glynn T. Tonsor
Agricultural Economist
Livestock Marketing

Mike D. Tokach
Swine Specialist
Nutrition

Steve S. Dritz
Swine Specialist
Veterinary Medicine

Joel DeRouchey
Livestock Specialist

Production Practices

The practice of dividing traditional farrow-to-finish hog production into distinct phases is a common practice in 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.

One of the most popular modern production systems 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 feeder pig nursery budget includes three different production levels due to varying feed efficiencies. 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 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 \$125 per pig space (3.5 sq. ft. per pig), with the equipment inside the building costing an additional \$13 per pig space. 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 building and equipment 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 less the cost of weaned pigs or the transfer price from the farrowing phase and possibly the sale of manure (or value captured if used on producer owned land). Feeder pigs produced in SEW nursery programs are typically heavier and of better quality than those reflected in most commonly reported feeder pig markets. Thus, the feeder pig price used for SEW budgets will generally include a significant premium over average feeder pig prices to account for quality differences. 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 exactly equal given the assumed costs in each budget (middle productivity level) and the market hog price in the finishing budget. For additional discussion pertaining to pricing SEW weaned and feeder pigs using this approach see MF2221, *Estimating the Value of Segregated Early Weaned Pigs*.

Feed Costs

Feed costs account for a large component of the total costs per pig sold, and vary considerably across efficiency levels. Feed costs in these budgets were calculated using corn, DDGS, and soybean meal-based diets and the 5-phase diet system for each efficiency level as recommended by the K-State swine nutrition guidelines. The diets used here do not contain added fat, but producers need to evaluate potential fat additions to diets on a case-by-case basis. Table 2 provides a partial breakdown of the different feed ingredients and their relative costs. Producers using alternative ingredients, such as grain sorghum, may achieve lower feed costs. The break-even price needed to cover all costs (Line 21) is sensitive to changes in feed prices and to the purchase price of the weaned pig. Also, for a given selling price, the maximum amount a producer can pay for the weaned pig (Line 2) is sensitive to feed prices. The amount these break-even selling or purchase prices need to be adjusted as feed prices and other factors vary are revealed in Table 3.

Table 1. New Facility Investment—1,200 Pigs (Nursery)

Building Type	Investment		Capacity	Total Investment
	Per Pig Space	Per Square Foot		
Nursery Building	\$125	\$41.67 / Sq. Ft.	1,200 Pigs	\$150,000
Equipment	13			15,000
Other (Office, Site, etc.)				12,000
TOTAL				\$177,000

Information Included in Nursery Budget:

	Productivity level		
Feed efficiency (feed/gain, lbs)	1.75	1.65	1.55
Average daily gain	0.90	0.90	0.90

1. **Feeder pig sales:** based on per head price of 60 pound feeder pig at \$64.80 per pig.
2. **Less cost of weaned pig:** based on per head price of 13 pound weaned pig at \$47.36 per pig.
3. **Less death loss:** based on 3.0 percent of the value of feeder pig (with feed and transportation/marketing cost adjustment).
4. **Manure credit:** based on nitrogen (N) and phosphate (P_2O_5) excreted per hog sold with manure stored in a deep pit (assumed 85% retained N from excreted amount) that would be available the following year for crop production valued at \$0.66/lb of N and \$0.60/lb of P_2O_5 less an application cost of \$0.01/gallon.
5. **Grain:** corn – see Table 2
6. **Distillers:** distillers grains with soluble (DDGS) – see Table 2
7. **Protein:** 46.5% soybean meal (SBM) – see Table 2
8. **Other ingredients:** all ingredients other than grain, DDGS, SBM, and complete feeds – see Table 2
9. **Complete feeds:** SEW and Transition diets – see Table 2
10. **Feed processing:** total tons of feed fed per pig sold – see Table 2
11. **Labor:** Based on 1/3-time employee at \$40,310/year (salary + benefits) divided by pigs sold/year.
12. **Veterinary, drugs, and supplies:** costs for prevention and control of disease.
13. **Utilities, fuel, and oil:** telephone, utilities, fuel and oil allocated to swine enterprise.
14. **Transportation and marketing costs:** trucking, commissions, etc.
15. **Buildings and equipment repairs:** annual building and equipment repairs allocated to the swine enterprise calculated as 2.5% of the total investment.
16. **Professional fees (legal accounting, etc.):** business and miscellaneous costs allocated to swine enterprise.

17. **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 \$162,000 with a salvage value of 10% and an equipment investment of \$15,000 with a salvage value of 0%. A useful life of 25 years is used for buildings and 15 years for equipment.
18. **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 6.5 percent divided by the number of feeder pigs sold per year.
19. **Insurance and taxes on buildings and equipment:** based on 0.25% (insurance) and 1.5% (taxes, buildings only) times the original cost divided by the number of feeder pigs sold per year.
20. **Interest on operating costs:** calculated on cost of weaned pig and one-half of operating costs at a rate of 6.5 percent for 54 days.
21. **Average selling price of feeder pig to cover total costs:** calculated by adding cost of weaned pig (Line 2) to total costs (Line C). This value is adjusted by death loss to obtain the average breakeven price per head.
- F. **TOTAL FEED COSTS:** sum of all feed costs including processing charge (lines 5-10).
22. **Cwt of pork produced:** weight of feeder pig sold adjusted for death loss minus weight of weaned pig purchased divided by 100.
23. **Feed cost/cwt pork:** total feed costs per hundredweight of pork produced (line F ÷ line 22).
- G. **ASSET TURNOVER:** (gross returns per pig plus cost of weaned 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.
- H. **NET RETURN ON INVESTMENT:** [(returns over total costs + interest on buildings and equipment + interest on weaned pig and operating costs) ÷ investment] Net return on investment is the percentage return on investment capital (both borrowed and equity). This measure enables comparisons to be made between enterprises as well as other investment alternatives.

FEEDER PIG NURSERY COST-RETURN PROJECTIONS

	Feed efficiency (feed/gain, lbs)			Your Farm
	1.75	1.65	1.55	
RETURNS PER PIG SOLD:				
1. Feeder pig	\$ 64.80	\$ 64.80	\$ 64.80	
2. Less cost of weaned pig	47.36	47.36	47.36	
3. Less death loss	1.66	1.68	1.69	
4. Manure credit	0.57	0.47	0.38	
A. GROSS RETURNS PER PIG SOLD	\$ 16.34	\$ 16.23	\$ 16.12	
COSTS PER PIG SOLD:				
5. Grain	\$ 5.29	\$ 4.97	\$ 4.66	
6. Distillers (DDGS)	1.55	1.46	1.36	
7. Protein	4.13	3.88	3.63	
8. Other ingredients	2.07	1.95	1.82	
9. Complete feeds	1.62	1.62	1.62	
10. Feed processing	0.76	0.72	0.67	
11. Labor	1.69	1.69	1.69	
12. Veterinary, drugs, and supplies	1.45	1.45	1.45	
13. Utilities, fuel, and oil	2.29	2.29	2.29	
14. Transportation and marketing costs	1.59	1.59	1.59	
15. Building and equipment repairs	0.56	0.56	0.56	
16. Professional fees (legal, accounting, etc.)	0.30	0.30	0.30	
17. Depreciation on buildings and equipment	0.87	0.87	0.87	
18. Interest on buildings and equipment	0.80	0.80	0.80	
19. Insurance and taxes on buildings and equipment	0.37	0.37	0.37	
B. SUBTOTAL	\$ 25.34	\$ 24.52	\$ 23.69	
20. Interest on weaned pig and ½ operating costs	0.56	0.56	0.55	
C. TOTAL COSTS	\$ 25.90	\$ 25.07	\$ 24.24	
D. RETURNS OVER TOTAL COSTS (A - C)	\$ -9.57	\$ -8.84	\$ -8.11	
E. BREAK-EVEN FEEDER PIG SELLING PRICE, \$/head:				
21. To cover total costs	\$ 74.36	\$ 73.64	\$ 72.91	
F. TOTAL FEED COSTS (lines 5 - 10)	\$ 15.43	\$ 14.60	\$ 13.77	
22. Cwt. pork produced	0.45	0.45	0.45	
23. Feed cost/cwt pork	\$ 34.13	\$ 32.30	\$ 30.46	
G. ASSET TURNOVER [(A + 2) ÷ Investment] ¹	91.2%	91.0%	90.9%	
H. NET RETURN ON INVESTMENT				
[(D + 18 + 20) ÷ Investment] ¹	-11.75%	-10.72%	-9.68%	

¹Investment equals total value of weaned pig, buildings, and equipment.

Table 2. Feed Requirements and Costs for Three Levels of Feed Efficiency

Feed	Feed Efficiency (feed/gain, lbs)						Average cost/ton ¹
	1.75	1.65	1.55	1.75	1.65	1.55	
	Pounds fed per pig sold			Cost per pig sold			
Corn (\$6.87/bu)	43.1	40.5	38.0	\$5.29	\$4.97	\$4.66	\$128.29
Soybean meal (\$415/ton)	19.9	18.7	17.5	\$4.13	\$3.88	\$3.63	\$100.06
DDGS (\$279/ton)	11.1	10.4	9.8	\$1.55	\$1.46	\$1.36	\$37.58
Other ingredients	4.1	3.9	3.6	\$2.07	\$1.95	\$1.82	\$50.18
Complete feeds	4.0	4.0	4.0	\$1.62	\$1.62	\$1.62	\$41.89
Processing (\$19.51/ton)	78.3	73.6	68.9	\$0.76	\$0.72	\$0.67	\$18.50
TOTAL	82.3	77.6	72.9	\$15.43	\$14.60	\$13.77	\$376.50

¹ Portion of the total diet cost attributed to a particular ingredient (based on middle productivity level).

Table 3. *Sensitivity of break-even price needed to cover total costs (Line C)*

	Feed efficiency (feed/gain, lbs)		
	1.75	1.65	1.55
Feeder pig break-even selling price in budget	\$74.36	\$73.64	\$72.91
Maximum purchase price for weaned pig in budget	\$37.89	\$38.60	\$39.33
Factor	Change in break-even selling or purchase price		
\$0.50/bu. change in grain price	\$0.38	\$0.35	\$0.33
\$10/ton change in soybean meal price	\$0.10	\$0.09	\$0.09
\$10/ton change in DDGS price	\$0.05	\$0.05	\$0.05
\$50/ton change in other ingredients price	\$0.10	\$0.10	\$0.09
\$50/ton change in complete feeds price	\$0.10	\$0.10	\$0.10
5.0% change in feed efficiency	\$0.71	\$0.67	\$0.63
1.0% change in death loss	\$0.63	\$0.63	\$0.64
Factor	Change in break-even selling price of feeder pig		
\$2.50/head change in weaned pig price	\$2.52	\$2.52	\$2.52
Factor	Change in break-even purchase price of weaned pig		
\$4.00/head change in feeder pig price	\$3.84	\$3.84	\$3.84

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In each case, credit Kevin C. Dhuyvetter et al., *Feeder Pig Nursery Cost-Return Budget*, Kansas State University, December 2012.

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