



Farrow-to-Weaned Pig Cost-Return Projection

Department of Agricultural Economics



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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 breeding-gestation-farrowing 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 farrowing operations are assumed to vary due to 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.

Capital Investment

The capital invested in farrowing 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 central farrowing house with liquid manure facilities and slotted floors is estimated at \$1,980 per sow (66 square

feet 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 square feet per sow), and the equipment inside the building is estimated to cost an additional \$150 per sow. 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 significantly lower for higher production levels.

Returns

Returns to the farrowing stage accrue from the sale or transfer of weaned pigs. Though expected in the future, reliable markets for early-weaned (10-pound) pigs have not been developed to date. The price of the weaned 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.

Producers also receive income from the sale of culled breeding stock. In this budget the income from the sale of culls is accounted for by including an assumed salvage value in the depreciation component of the breeding/genetic charge. Therefore, income from culls is entered as a reduction in costs rather than an increase in returns so the returns are representative of the true objective of the enterprise (producing weaned pigs).

Feed Costs

Feed costs were calculated using a grain sorghum and soybean-meal-based diet. The *Kansas Swine Nutrition Guide* served as a basis for calculating feed requirements for each production level. Feed costs vary considerably across production levels. The break-even price needed to cover all costs (line 19) is particularly sensitive to changes in grain sorghum and soybean meal prices. The expected break-even prices for a range of grain and soybean meal prices for each of the three production levels are presented in tables 2, 3, and 4.

Table 1. New Facility Investment — 1,200 Sows

Building Type	Investment		Capacity	Total Investment
	Per Space	Per Square Foot		
Farrowing Bldg. Equip.	\$1,980 / Sow 800 / Sow	\$30 / Sq. Ft.	220 Sows	\$ 435,600 176,000
Gestation Bldg. Equip.	360 / Sow 150 / Sow	18 / Sq. Ft.	1220 Sows	403,200 168,000
Other (Office, Site, etc.)				60,000
			TOTAL	\$1,242,800

Information Included in Farrow-to-Wean Budget:

	Productivity level		
Pigs weaned/sow/year	16.00	19.00	22.00
Weaned pigs sold/litter	8.00	8.94	9.78
Litters/sow/year	2.00	2.13	2.25
	Pounds fed per pig sold*		
1. Grain: sorghum @ \$3.82 per hundredweight	97.8	83.2	72.5
2. Protein: soybean meal @ \$170 per ton	22.8	19.5	17.2
3. Basemix: vitamins, minerals: @ \$415 per ton	5.5	4.7	4.1
4. Pig starter: @ \$608 per ton	0.0	0.0	0.0
5. Feed processing: total tons of feed fed times \$10 per ton.			
6. Labor: based on 5 full-time employees at \$32,000 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 percent of the total investment.			
11. Breeding/genetic charge:			
a. Depreciation — difference between purchase price and cull value divided by years of useful life. Based on gilt purchase price of \$205 per head and cull value of \$96 per head, boar purchase price of \$500 per head and cull value of \$108 per head. Useful life is estimated at 2 years for sows and 2.5 years for boars. A sow-to-boar ratio of 120:1 is assumed.			
b. Semen — based on artificial insemination charge of \$16 per litter.			
c. Interest — interest is charged on the average breeding herd investment [(purchase price + cull value)÷2] at a rate of 10 percent divided by the number of weaned pigs sold per year.			
d. Insurance — averages approximately 1 percent of the total breeding herd investment divided by the number			

of pigs sold per year.

12. **Professional fees (legal accounting, etc.):** business and miscellaneous costs allocated to swine enterprise.
13. **Interest on variable costs:** calculated on one-half of variable costs at a rate of 10 percent for the number of months per litter.
14. **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 \$898,800 with a salvage value of 10 percent and an equipment investment of \$344,000 with a salvage value of zero. A useful life of 15 years is used for buildings and 10 years for equipment.
15. **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 10 percent divided by the number of weaned pigs sold per year.
16. **Insurance and taxes on buildings and equipment:** based on 0.25 percent (for insurance) and 1.5 percent (for taxes paid on buildings only) times the original cost divided by the number of weaned pigs sold per year.
17. **Weaned pig sales:** based on a 10-pound weaned pig at \$27.50 per pig.
18. **Average selling price of weaned pig to cover variable costs:** equals total variable costs (line A).
19. **Average selling price of weaned pig to cover total costs:** equals total costs (line C).
20. **Hundredweight of pork produced:** weight of weaned pig sold.
- I. **ASSET TURNOVER:** (returns per pig divided by investment) Asset turnover is the percent 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 breeding herd + 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 other enterprises and investment alternatives.

*Annual feed fed to sow divided by weaned pigs sold per year.

COST-RETURN PROJECTION — FARROW TO WEANED PIG

	Marketable pigs weaned/sow/year			Your Farm
	16	19	22	
VARIABLE COSTS PER PIG SOLD:				
1. Grain	\$ 3.76	\$ 3.20	\$ 2.79	
2. Protein	1.96	1.68	1.48	
3. Base mix: vitamins, minerals, etc.	1.16	0.98	0.86	
4. Pig starter				
5. Feed processing	0.63	0.54	0.47	
6. Labor	8.33	7.02	6.06	
7. Veterinary, drugs, and supplies	1.10	1.00	0.90	
8. Utilities, fuel, and oil	1.71	1.55	1.40	
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 through d)	6.54	5.61	4.94	
a. <i>Depreciation</i>	3.49	2.94	2.54	
b. <i>Semen</i>	2.00	1.79	1.64	
c. <i>Interest</i>	0.96	0.81	0.70	
d. <i>Insurance</i>	0.10	0.08	0.07	
12. Professional fees (legal, accounting, etc.)	0.55	0.50	0.45	
13. Interest on 1/2 variable costs	0.68	0.55	0.45	
A. TOTAL VARIABLE COSTS	\$ 28.26	\$ 24.22	\$21.19	
FIXED COSTS PER PIG SOLD:				
14. Depreciation on buildings and equipment	4.60	3.87	3.35	
15. Interest on buildings and equipment	3.47	2.92	2.52	
16. Insurance and taxes on buildings and equipment	0.86	0.73	0.63	
B. TOTAL FIXED COSTS	\$ 8.93	\$ 7.52	\$ 6.50	
C. TOTAL COSTS PER PIG SOLD (A + B)	\$ 37.19	\$ 31.74	\$27.68	
RETURNS PER PIG SOLD				
17. Weaned pig	27.50	27.50	27.50	
D. GROSS RETURNS PER PIG SOLD	\$ 27.50	\$ 27.50	\$27.50	
E. RETURNS OVER VARIABLE COSTS (D–A)	\$ –0.76	\$ 3.28	\$ 6.31	
F. RETURNS OVER TOTAL COSTS (D–C)	\$ –9.69	\$ –4.24	\$–0.18	
G. WEANED PIG BREAK-EVEN PRICE, \$ per head:				
18. To cover variable costs	\$ 28.26	\$ 24.22	\$21.19	
19. To cover total costs	\$ 37.19	\$ 31.74	\$27.68	
H. TOTAL FEED COSTS (lines 1 through 5)	\$ 7.51	\$ 6.40	\$ 5.60	
20. Hundredweight, pork produced	0.10	0.10	0.10	
21. Feed cost per hundredweight (line H ÷ line 20)	\$ 75.08	\$ 64.02	\$55.97	
I. ASSET TURNOVER (D ÷ INVESTMENT) ¹	35.35%	41.97%	48.60%	
J. NET RETURN ON INVESTMENT				
[(F + 11c + 13 + 15) ÷ INVESTMENT] ¹	-5.90%	0.04%	6.16%	

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

Table 2. Sensitivity of breakeven price needed to cover total costs (line 19) to changes in grain sorghum and soybean meal prices — Pigs weaned/sow/year = 16.0

Grain sorghum price/cwt.	Soybean meal price, \$/ton					
	\$125	\$150	\$175	\$200	\$225	\$250
	Breakeven price of weaned pig, \$/head					
\$3.25	\$36.08	\$36.38	\$36.67	\$36.97	\$37.26	\$37.56
3.50	36.34	36.63	36.92	37.22	37.51	37.81
3.75	36.59	36.88	37.18	37.47	37.77	38.06
4.00	36.84	37.13	37.43	37.72	38.02	38.31
4.25	37.09	37.39	37.68	37.98	38.27	38.56
4.50	37.34	37.64	37.93	38.23	38.52	38.82
4.75	37.60	37.89	38.19	38.48	38.77	39.07

Table 3. Sensitivity of breakeven price needed to cover total costs (line 19) to changes in grain sorghum and soybean meal prices — Pigs weaned/sow/year = 19.0

Grain sorghum price/cwt.	Soybean meal price, \$/ton					
	\$125	\$150	\$175	\$200	\$225	\$250
	Breakeven price of weaned pig, \$/head					
\$3.25	\$30.80	\$31.05	\$31.30	\$31.55	\$31.81	\$32.06
3.50	31.01	31.26	31.52	31.77	32.02	32.27
3.75	31.23	31.48	31.73	31.98	32.23	32.49
4.00	31.44	31.69	31.94	32.20	32.45	32.70
4.25	31.65	31.91	32.16	32.41	32.66	32.91
4.50	31.87	32.12	32.37	32.62	32.88	33.13
4.75	32.08	32.33	32.59	32.84	33.09	33.34

Table 4. Sensitivity of breakeven price needed to cover total costs (line 19) to changes in grain sorghum and soybean meal prices — Pigs weaned/sow/year = 22.0

Grain sorghum price/cwt.	Soybean meal price, \$/ton					
	\$125	\$150	\$175	\$200	\$225	\$250
	Breakeven price of weaned pig, \$/head					
\$3.25	\$26.86	\$27.08	\$27.30	\$27.52	\$27.74	\$27.96
3.50	27.04	27.26	27.48	27.71	27.93	28.15
3.75	27.23	27.45	27.67	27.89	28.11	28.34
4.00	27.41	27.64	27.86	28.08	28.30	28.52
4.25	27.60	27.82	28.04	28.27	28.49	28.71
4.50	27.79	28.01	28.23	28.45	28.67	28.90
4.75	27.97	28.20	28.42	28.64	28.86	29.08

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