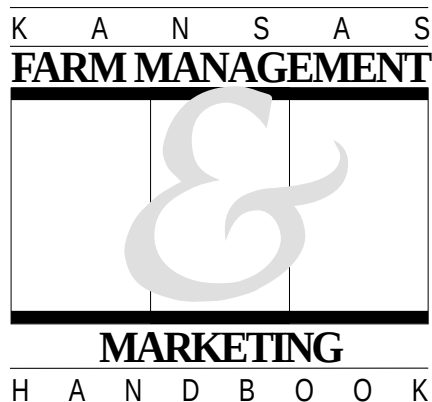




Farrow-to-Finish Swine Cost-Return Projection

Department of Agricultural Economics



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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 farrow to finish 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 Requirements

Capital invested in swine facilities varies greatly for farrow-to-finish swine enterprises. The investment shown in Table 1 was used for the cost-return projections. Use your own figures and recalculate the fixed cost before construction. A trend toward higher investments and lower labor requirements has occurred.

A central farrowing house with liquid manure facilities and slotted floors is estimated at \$2,000 per sow (66 square feet per sow), with the equipment inside the building costing an additional \$800 per sow. A nursery building with a totally slotted floor (metal or plastic) will cost about \$102 per pig (3.5 square feet per pig), with the equipment inside the building costing an additional \$10 per pig. The gestation building is estimated to cost \$400 per sow (20 square feet per sow), and the equipment inside the

building is estimated to cost an additional \$180 per sow. A total confinement finishing building is estimated to cost \$160 per pig (8 square feet per pig), with the inside equipment adding another \$25 per pig. Office facilities, site preparation, and miscellaneous items also are 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.

Feed Costs

Feed costs were calculated using grain sorghum and soybean-meal-based diets. The *Kansas Swine Nutrition Guide* served as a basis for calculating feed requirements at each stage of production. Feed costs vary considerably across production levels. The break-even price needed to cover all costs (line 18) is 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.

Returns

Producers receive income primarily from the sale of finished pigs. Additional income is received 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 business (producing finished pigs).

Table 1. New Facility Investment—150 Sows

Building Type	Investment		Capacity	Total Investment
	Per Space	Per Square Foot		
Farrowing Bldg. Equip.	\$2,000 / Sow 800 / Sow	\$30.30 / Sq. Ft.	30 Sows	\$ 60,000 24,000
Nursery Bldg. Equip.	102 / Pig 10 / Pig	29.14 / Sq. Ft.	530 Pigs	54,060 5,300
Finishing Bldg. Equip.	160 / Pig 25 / Pig	20 / Sq. Ft.	1,020 Pigs	163,200 25,500
Gestation Bldg. Equip.	400 / Sow 180 / Sow	20 / Sq. Ft.	140 Sows	56,000 25,200
Other (Office, Site, etc.)				60,000
TOTAL				\$473,260

Information Included in Farrow-to-Finish Budget:

	Productivity level		
	15.0	17.5	20.0
Finished pigs sold/sow/year	15.0	17.5	20.0
Finished pigs sold/litter	7.50	8.25	8.90
Litters/sow/year	2.00	2.13	2.25

Pounds fed per pig sold*

1. **Grain:** sorghum @ \$3.89 per hundredweight 620.7 605.9 595.0
2. **Protein:** soybean meal @ \$172 per ton 156.8 153.5 151.1
3. **Base mix:** vitamins, minerals @ \$370 per ton 33.9 33.1 32.5
4. **Pig starter:** @ \$540 per ton 7.8 7.8 7.8
5. **Feed processing:** total tons of feed fed times \$10 per ton.
6. **Labor:** based on 1 full-time person 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, checkoff, 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 \$198 per head and cull value of \$87 per head, boar purchase price of \$800 per head and cull value of \$90 per head. Useful life is estimated at 2 years for sows and 2.5 years for boars. A sow-to-boar ratio of approximately 20:1 is assumed.
 - b. **Semen**—artificial insemination charge, etc.
 - c. **Interest**—interest is charged on the average breeding herd investment [(purchase price + cull value) ÷ 2] at a rate of 9 percent divided by the number of finished pigs sold per year.
 - d. **Insurance**—averages approximately 1 percent of the total breeding herd investment divided by the number of finished 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 9 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 \$392,995 with a salvage value of 10 percent and an equipment investment of \$80,000 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 9 percent divided by the number of finished pigs sold per year.

16. **Insurance and taxes on buildings and equipment:** based on original cost times 0.25 percent (insurance) and 1.5 percent (taxes, buildings only) divided by the number of finished pigs sold per year.

17. **Finished pig sales:** based on a 250-pound finished pig and a market price of \$33.04 per hundredweight.

18. **Average selling price of finished pig to cover variable costs:** calculated by dividing total variable costs (line A) by finished pig selling weight.

19. **Average selling price of finished pig to cover total costs:** calculated the same as for variable costs except total costs (Line C) are used.

20. **Hundredweight of pork produced:** weight of finished pig sold.

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 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.

**Includes annual feed fed to sow and boar divided by finished pigs sold per year.*

COST-RETURN PROJECTION — FARROW-TO-FINISH

	Finished pigs sold/sow/year			
	15.0	17.5	20.0	Your Farm
VARIABLE COSTS PER PIG SOLD:				
1. Grain	\$ 24.16	\$ 23.59	\$ 23.16	
2. Protein	13.46	13.17	12.97	
3. Base mix: vitamins, minerals, etc.	6.28	6.12	6.01	
4. Pig starter	2.11	2.11	2.11	
5. Feed processing	4.10	4.00	3.93	
6. Labor	14.67	12.55	10.99	
7. Veterinary, drugs, and supplies	4.13	3.75	3.38	
8. Utilities, fuel, and oil	2.86	2.60	2.34	
9. Transportation and marketing costs	2.00	2.00	2.00	
10. Building and equipment repairs	4.21	3.60	3.15	
11. Breeding/genetic charge				
a. Depreciation	4.70	4.02	3.52	
b. Semen				
c. Interest	1.00	0.85	0.75	
d. Insurance	0.11	0.09	0.08	
12. Professional fees (legal, accounting, etc.)	2.20	2.00	1.80	
13. Interest on 1/2 variable costs	1.89	1.66	1.48	
A. TOTAL VARIABLE COSTS	\$ 87.86	\$ 82.12	\$ 77.66	
FIXED COSTS PER PIG SOLD:				
14. Depreciation on buildings and equipment	14.04	12.01	10.52	
15. Interest on buildings and equipment	10.25	8.77	7.68	
16. Insurance and taxes on buildings and equipment	3.15	2.69	2.36	
B. TOTAL FIXED COSTS	\$ 27.44	\$ 23.48	\$ 20.56	
C. TOTAL COSTS PER PIG SOLD (A + B)	\$ 115.30	\$ 105.60	\$ 98.22	
RETURNS PER PIG SOLD				
17. Finished pig	82.60	82.60	82.60	
D. GROSS RETURNS PER PIG SOLD	\$ 82.60	\$ 82.60	\$ 82.60	
E. RETURNS OVER VARIABLE COSTS (D–A)	\$ -5.26	\$ 0.48	\$ 4.94	
F. RETURNS OVER TOTAL COSTS (D–C)	\$ -32.70	\$ -23.00	\$ -15.62	
G. FINISHED PIG BREAK-EVEN PRICE, \$/cwt:				
18. To cover variable costs (A ÷ cwt. pork produced) ...	\$ 35.14	\$ 32.85	\$ 31.07	
19. To cover total costs (C ÷ cwt pork produced)	\$ 46.12	\$ 42.24	\$ 39.29	
H. TOTAL FEED COSTS (lines 1 through 5)	\$ 50.11	\$ 49.00	\$ 48.18	
20. Hundredweight. pork produced	2.50	2.50	2.50	
21. Feed cost per hundredweight pork (line H ÷ line 20)	\$ 20.04	\$ 19.60	\$ 19.27	
I. ASSET TURNOVER (D ÷ INVESTMENT) ¹	36.49%	42.65%	48.72%	
J. NET RETURN ON INVESTMENT				
[(F + 11c + 13 + 15) ÷ INVESTMENT] ¹	-8.64%	-6.05%	-3.37%	

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

Table 2. Sensitivity of break-even price needed to cover total costs (Line 19) to changes in grain sorghum and soybean meal prices—Pigs sold/sow/year = 15.0

Grain sorghum price/cwt	Soybean meal price, \$/ton					
	\$125	\$150	\$175	\$200	\$225	\$250
	Break-even price of finished pig, \$/cwt					
\$3.25	\$42.99	\$43.79	\$44.60	\$45.40	\$46.20	\$47.00
3.50	43.63	44.43	45.23	46.03	46.83	47.64
3.75	44.26	45.06	45.86	46.67	47.47	48.27
4.00	44.90	45.70	46.50	47.30	48.10	48.91
4.25	45.53	46.33	47.13	47.94	48.74	49.54
4.50	46.17	46.97	47.77	48.57	49.37	50.17
4.75	46.80	47.60	48.40	49.21	50.01	50.81

Table 3. Sensitivity of break-even price needed to cover total costs (Line 19) to changes in grain sorghum and soybean meal prices—Pigs sold/sow/year = 17.5

Grain sorghum price/cwt	Soybean meal price, \$/ton					
	\$125	\$150	\$175	\$200	\$225	\$250
	Break-even price of finished pig, \$/cwt					
\$3.25	\$39.19	\$39.97	\$40.76	\$41.54	\$42.32	\$43.11
3.50	39.81	40.59	41.37	42.16	42.94	43.73
3.75	40.43	41.21	41.99	42.78	43.56	44.34
4.00	41.04	41.83	42.61	43.40	44.18	44.96
4.25	41.66	42.45	43.23	44.01	44.80	45.58
4.50	42.28	43.07	43.85	44.63	45.42	46.20
4.75	42.90	43.68	44.47	45.25	46.04	46.82

Table 4. Sensitivity of break-even price needed to cover total costs (Line 19) to changes in grain sorghum and soybean meal prices—Pigs sold/sow/year = 20.0

Grain sorghum price/cwt	Soybean meal price, \$/ton					
	\$125	\$150	\$175	\$200	\$225	\$250
	Break-even price of finished pig, \$/cwt					
\$3.25	\$36.29	\$37.06	\$37.83	\$38.60	\$39.37	\$40.14
3.50	36.90	37.67	38.44	39.21	39.98	40.75
3.75	37.50	38.27	39.04	39.82	40.59	41.36
4.00	38.11	38.88	39.65	40.42	41.19	41.96
4.25	38.72	39.49	40.26	41.03	41.80	42.57
4.50	39.32	40.09	40.87	41.64	42.41	43.18
4.75	39.93	40.70	41.47	42.24	43.01	43.78

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