

Farrow-to-Finish Swine Cost-Return Budget



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Production Level

Costs per unit and net returns in livestock production are highly dependent on production levels. The following estimated farrow-to-finish swine budget includes three different production levels, i.e., three levels of finished pigs sold per sow per year. 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 level, in terms of pigs/sow/year, for farrow-to-finish operations is 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 central farrowing house with liquid manure facilities and slotted floors is estimated at \$2,508 per sow (66 sq. ft. per sow), with the equipment inside the building costing an additional \$1,150 per sow. The gestation building is estimated to cost \$600 per sow (20 sq. ft. per sow), and the equipment inside the building is estimated to cost an additional \$235 per sow. A nursery building with total slotted floors will cost about \$125 per pig (3.5 sq. ft. per pig), with the equipment inside the building costing an additional \$13 per pig. A total confinement finishing building (deep pit) is estimated to cost \$188 per pig (7.5 sq. ft. per pig), with the inside equipment adding another \$29 per pig. Office facilities, site preparation, and miscellaneous items also are included in the capital requirements. The capital require-

ments are assumed to be the same for all production levels, thus building and equipment costs per pig are significantly lower for higher production levels.

Returns

Producers receive income primarily from the sale of finished pigs. Additional income is received from the sale of culled breeding stock and possibly the sale of manure (or value captured if used on producer owned land). 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 as an increase in returns so that the returns are representative of the true objective of the business (producing finished pigs). A manure credit is included that is based on the amount of nitrogen and phosphate excreted that would be available to crops the following year valued at the price of commercial fertilizer less the cost of applying the liquid manure.

Feed Costs

Feed costs were calculated using corn, dried distillers with soluble (DDGS), and soybean meal-based diets for all production phases (gestation, lactation, nursery, and finish). The first two feeding phases in the nursery use the K-State SEW and Transition diets purchased as complete feeds. Feed requirements at each stage of production are based on K-State swine nutrition guidelines. 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 corn and soybean meal prices. The expected break-even prices for a range of corn and soybean meal prices for each of the three production levels are presented in Tables 3, 4, and 5 (DDGS prices remain in the same proportion to corn price as in the base budget).

Table 1. New Facility Investment — 1,200 Sows (Farrow-to-Finish)

Building Type	Investment		Capacity	Total Investment
	Per Space	Per Square Foot		
Farrowing Building	\$2,508 / Sow	\$38.00 / Sq. Ft.	220 Sows	\$551,760
Equipment	1,150 / Sow			253,000
Gestation Building	600 / Sow	30.00 / Sq. Ft.	1,120 Sows	672,000
Equipment	235 / Sow			263,200
Nursery Building	125 / Pig	41.67 / Sq. Ft.	4,000 Pigs	500,000
Equipment	13 / Pig			50,000
Finishing Building	188 / Pig	25.00 / Sq. Ft.	9,000 Pigs	1,687,500
Equipment	29 / Pig			258,750
Other (Office, Site, etc.)				198,000
			TOTAL	\$4,434,210

Information Included in Farrow-to-Finish Budget:

	Productivity level		
	2.20	2.30	2.40
Litters/sow/year	2.20	2.30	2.40
Death loss in nursery, %	3.00	3.00	3.00
Death loss in finishing barn, %	4.00	4.00	4.00
Finished pigs sold/litter	8.47	9.11	9.70
Finished pigs sold/sow/year	18.6	21.0	23.3

1. **Finished pig sales:** based on a 275 pound finished pig and a market price of \$69.72 per cwt (see MF1013 for details).
2. **Less death loss:** based on death loss in nursery and finisher times the value of market hog (with feed and transportation/marketing cost adjustment).
3. **Manure credit:** based on nitrogen (N) and phosphate (P₂O₅) 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 \$0.55/lb of N and \$0.52/lb of P₂O₅ less an application cost of \$0.01/gallon.
4. **Grain:** corn – see Table 2
5. **Distillers:** distillers grains with soluble (DDGS) – see Table 2
6. **Protein:** 46.5% soybean meal (SBM) – see Table 2
7. **Other ingredients:** all ingredients other than grain, DDGS, SBM, and complete feeds – see Table 2
8. **Complete feeds:** SEW and Transition diets – see Table 2
9. **Feed processing:** total tons of feed fed per pig sold – see Table 2
10. **Labor:** based on 7.5 full-time employees at \$41,520/year (salary + benefits) divided by pigs sold/year.
11. **Veterinary, drugs, and supplies:** costs for prevention and control of disease.
12. **Utilities, fuel, and oil:** telephone, utilities, fuel and oil allocated to swine enterprise.
13. **Transportation and marketing costs:** trucking, commissions, etc.
14. **Buildings and equipment repairs:** annual building and equipment repairs allocated to swine enterprise calculated as 2.5% of the total investment.
15. **Breeding/genetic charge:**
 - a. **Depreciation:** difference between purchase price and cull value divided by years of useful life. Based on gilt purchase price of \$304/head and cull value of \$223/head, boar purchase price of \$700/head and cull value of \$256/head. Useful life is estimated at 1.9 years for sows and 2.5 years for boars. A sow/boar ratio of approximately 120:1 is assumed.
 - b. **Semen:** based on artificial insemination charge of \$17.50/litter (2.5 straws @ \$7.00/straw).

- c. **Interest:** interest is charged on the average breeding herd investment [(purchase price + cull value) ÷ 2] at a rate of 6.5 percent divided by the number of finished pigs sold per year.
- d. **Insurance:** averages approximately 1.0 percent of the total breeding herd investment divided by the number of finished pigs sold per year.
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 \$3,609,260 with a salvage value of 10% and an equipment investment of \$824,950 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 finished pigs sold per year.
19. **Insurance and taxes on buildings and equipment:** based on original cost times 0.25% (insurance) and 1.5% (taxes, buildings only) divided by the number of finished pigs sold per year.
20. **Interest on operating costs:** calculated on one-half of operating costs at a rate of 6.5 percent for the number of months per litter.
21. **Average selling price of finished pig to cover total costs:** calculated by dividing total costs (Line C) by finished pig selling weight times 100.
- F. **TOTAL FEED COSTS:** sum of all feed costs including processing charge (lines 4-9).
22. **Cwt. of pork produced:** weight of finished pig sold.
23. **Feed cost/cwt pork:** total feed costs per hundredweight of pork produced (line F ÷ line 22).
- G. **ASSET TURNOVER:** (gross 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.
- H. **NET RETURN ON INVESTMENT:** [(returns over total costs + interest on breeding herd + interest on buildings and equipment + interest on 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.

FARROW-TO-FINISH COST-RETURN PROJECTIONS

	Finished pigs sold/sow/year			Your Farm
	18.6	21.0	23.3	
RETURNS PER PIG SOLD:				
1. Finished pig.....	\$ 191.73	\$ 191.73	\$ 191.73	_____
2. Less death loss.....	9.20	9.25	9.30	_____
3. Manure credit.....	6.48	6.32	6.20	_____
A. GROSS RETURNS PER PIG SOLD.....	\$ 189.01	\$ 188.80	\$ 188.63	_____
COSTS PER PIG SOLD:				
4. Grain.....	\$ 48.15	\$ 47.40	\$ 46.81	_____
5. Distillers (DDGS).....	12.10	11.91	11.75	_____
6. Protein.....	28.56	28.23	27.97	_____
7. Other ingredients.....	6.42	6.28	6.18	_____
8. Complete feeds.....	1.57	1.57	1.57	_____
9. Feed processing.....	8.47	8.34	8.24	_____
10. Labor.....	13.93	12.39	11.15	_____
11. Veterinary, drugs, and supplies.....	5.25	5.00	4.75	_____
12. Utilities, fuel, and oil.....	6.26	5.57	5.01	_____
13. Transportation and marketing costs.....	7.67	7.67	7.67	_____
14. Building and equipment repairs.....	4.96	4.41	3.97	_____
15. Breeding/genetic charge				_____
a. Depreciation.....	2.38	2.12	1.91	_____
b. Semen.....	2.07	1.92	1.80	_____
c. Interest.....	0.93	0.83	0.75	_____
d. Insurance.....	0.14	0.13	0.11	_____
16. Professional fees (legal, accounting, etc.).....	1.66	1.47	1.32	_____
17. Depreciation on buildings and equipment.....	8.27	7.36	6.62	_____
18. Interest on buildings and equipment.....	6.97	6.20	5.58	_____
19. Insurance and taxes on buildings and equipment.....	2.92	2.59	2.33	_____
B. SUBTOTAL.....	\$ 168.69	\$ 161.39	\$ 155.49	_____
20. Interest on ½ operating costs.....	2.06	1.90	1.77	_____
C. TOTAL COSTS PER PIG SOLD.....	\$ 170.75	\$ 163.29	\$ 157.26	_____
D. RETURNS OVER TOTAL COSTS (A-C).....	\$ 18.25	\$ 25.51	\$ 31.37	_____
E. BREAK-EVEN FINISHED PIG PRICE, \$/cwt:.....				_____
21. To cover total costs.....	\$ 59.74	\$ 57.08	\$ 54.93	_____
F. TOTAL FEED COSTS (lines 4-9).....	\$ 105.27	\$ 103.74	\$ 102.52	_____
22. Cwt. pork produced.....	2.75	2.75	2.75	_____
23. Feed cost/cwt pork.....	\$ 38.28	\$ 37.72	\$ 37.28	_____
G. ASSET TURNOVER (A ÷ Investment)¹.....	87.9%	98.8%	109.7%	_____
H. NET RETURN ON INVESTMENT				_____
[(D + 15c + 18 + 20) ÷ Investment] ¹	13.12%	18.02%	22.94%	_____

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

Table 2. Feed Requirements and Costs for Three Levels of Sow Productivity

Feed	Productivity Level, finished pigs sold/sow/year						Average cost/ton ²
	18.6	21.0	23.3	18.6	21.0	23.3	
	Pounds fed per pig sold ¹			Cost per pig sold			
Corn (\$4.95/bu)	544.7	536.3	529.5	\$48.15	\$47.40	\$46.81	\$117.60
Soybean meal (\$452/ton)	126.5	125.0	123.9	\$28.56	\$28.23	\$27.97	\$70.04
DDGS (\$198/ton)	122.2	120.2	118.6	\$12.10	\$11.91	\$11.75	\$29.54
Other ingredients	21.2	20.7	20.3	\$6.42	\$6.28	\$6.18	\$15.59
Complete feeds	4.0	4.0	4.0	\$1.57	\$1.57	\$1.57	\$3.90
Processing (\$20.80/ton)	814.5	802.2	792.3	\$8.47	\$8.34	\$8.24	\$20.70
TOTAL	818.5	806.2	796.3	\$105.27	\$103.74	\$102.52	\$257.36

¹Includes annual feed fed to sow and boar divided by finished pigs sold per year.

²Portion of the total diet cost attributed to a particular ingredient.

Table 3. Sensitivity of break-even price needed to cover total costs (Line C) to changes in corn and soybean meal prices – Finished pigs sold/sow/year = 18.6

Corn price, \$/bu.	Soybean meal price, \$/ton						
	\$377	\$402	\$427	\$452	\$477	\$502	\$527
	Break-even price of finished pig, \$/cwt.						
\$3.75	\$52.60	\$53.18	\$53.76	\$54.35	\$54.93	\$55.51	\$56.10
4.15	\$54.39	\$54.98	\$55.56	\$56.14	\$56.73	\$57.31	\$57.89
4.55	\$56.19	\$56.77	\$57.36	\$57.94	\$58.52	\$59.11	\$59.69
4.95	\$57.99	\$58.57	\$59.15	\$59.74	\$60.32	\$60.90	\$61.49
5.35	\$59.78	\$60.37	\$60.95	\$61.53	\$62.12	\$62.70	\$63.28
5.75	\$61.58	\$62.16	\$62.75	\$63.33	\$63.91	\$64.50	\$65.08
6.15	\$63.38	\$63.96	\$64.54	\$65.13	\$65.71	\$66.29	\$66.88

Table 4. Sensitivity of break-even price needed to cover total costs (Line C) to changes in corn and soybean meal prices – Finished pigs sold/sow/year = 21.0

Corn price, \$/bu.	Soybean meal price, \$/ton						
	\$377	\$402	\$427	\$452	\$477	\$502	\$527
	Break-even price of finished pig, \$/cwt.						
\$3.75	\$50.05	\$50.62	\$51.20	\$51.78	\$52.35	\$52.93	\$53.51
4.15	\$51.81	\$52.39	\$52.97	\$53.54	\$54.12	\$54.70	\$55.27
4.55	\$53.58	\$54.16	\$54.74	\$55.31	\$55.89	\$56.46	\$57.04
4.95	\$55.35	\$55.93	\$56.50	\$57.08	\$57.66	\$58.23	\$58.81
5.35	\$57.12	\$57.69	\$58.27	\$58.85	\$59.42	\$60.00	\$60.58
5.75	\$58.88	\$59.46	\$60.04	\$60.61	\$61.19	\$61.77	\$62.34
6.15	\$60.65	\$61.23	\$61.80	\$62.38	\$62.96	\$63.53	\$64.11

Table 5. Sensitivity of break-even price needed to cover total costs (Line C) to changes in corn and soybean meal prices – Finished pigs sold/sow/year = 23.3

Corn price, \$/bu.	Soybean meal price, \$/ton						
	\$377	\$402	\$427	\$452	\$477	\$502	\$527
	Break-even price of finished pig, \$/cwt.						
\$3.75	\$47.99	\$48.56	\$49.13	\$49.70	\$50.27	\$50.84	\$51.41
4.15	\$49.73	\$50.30	\$50.87	\$51.44	\$52.01	\$52.58	\$53.16
4.55	\$51.48	\$52.05	\$52.62	\$53.19	\$53.76	\$54.33	\$54.90
4.95	\$53.22	\$53.79	\$54.36	\$54.93	\$55.50	\$56.07	\$56.64
5.35	\$54.96	\$55.53	\$56.10	\$56.68	\$57.25	\$57.82	\$58.39
5.75	\$56.71	\$57.28	\$57.85	\$58.42	\$58.99	\$59.56	\$60.13
6.15	\$58.45	\$59.02	\$59.59	\$60.16	\$60.73	\$61.30	\$61.88

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In each case, credit Kevin C. Dhuyvetter et al., *Farrow-to-Finish Swine Cost-Return Budget*, Kansas State University, April 2014.