

Profit Sensitivities to Feed Price and Pig Price with Varying Production Levels

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■ Situation

In the last two and a half years, it has proved difficult, if not impossible, to derive any significant profit from hog farming in Canada. The combination of high feed costs, high Canadian dollar, low hog prices and high levels of farm production are the contributing factors to the severe losses incurred by Canadian hog farmers. High feed costs are attributed to the demand created from the ethanol industry, speculative investors holding numerous long positions in the futures market and from reduced carry over of corn, wheat and other feed grains. Secondly, Canada's strong national balanced budget and sound monetary policy, coupled with Canada's endowment of natural resources strengthened Canada's dollar. This significantly appreciated our dollar against the U.S. and consequently discounted Canadian farm gate receipts. Lastly, many Canadian producers' maintained high levels of production in an attempt to reduce the pressures of high costs. The strategy of promoting high levels of production when variable costs are very high may not provide the best answer for maximized profit.

■ Problem

Producers in Canada are efficient in the areas of production, although high levels of production in the midst of high feed cost and low hog prices may not necessarily be what is best for the bottom line. Producers are influenced by many stakeholders, such as feed and drug companies, gilt and semen providers and research based institutions. All of these stakeholders promote the point of view that improvement in production practices, specifically output, will drive down costs. The problem is that this train of thought may only hold

true under certain economic conditions, under certain levels of feed costs, under certain hog prices or for certain hog production farms, levels and types.

■ Case Study

Hog farming is dynamic, and astute business people know that change is frequent and unpredictable. The purpose of this session is to demonstrate a spreadsheet unique to the hog farming industry that is capable of creating sensitivities to costs and revenues such as variable and fixed costs, volume of animals produced in a time period, pig price and the effects of those relationships on profit. The goal is to show that under severe economic strain or that of better conditions, management of costing structures is not as straight forward as some industry representatives suggest, and that expending resources to improve volume of pigs produced may not always be the best approach for profit under severely depressed economic conditions.

By varying costs, volume of pigs produced and revenue per pig, this spreadsheet that we have developed will derive sensitivities to profit in a farrow to 50 lb operation and a farrow to finish operation. The ability to study sensitivities is a very important accounting/economic tool for farm managers. By analyzing the effects of sensitivities to profit, a farm manager is able to make sound business decisions that can either minimize losses or maximize profits. The process of changing variables is known as creating “what if” scenarios. “What if” questions can include:

- What if we raised the price per pig received?
- What if we increased the pigs produced per month, or decreased amount of pigs produced?
- What if we could lower or increase the farms variable or fixed costs?

The possible scenarios are endless. Good risk management considers “what if” scenarios as a method of decision making. Before we jump into the program it is important that costs and revenues are explained. Some of the key words that need to be understood are:

Fixed Costs - A fixed cost remains the same regardless of the amount of pigs produced or level of production the farm has. An example of fixed costs is sow feed (if sow inventory remains the same), labor and insurance.

Variable Costs - A variable cost changes proportionally with the volume pigs or levels of production. For example, nursery and feeder pig feed is a variable cost.

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Scenario #1: Feed Price High - Pig Price Low

Scenario Parameters		Production pigs/sow/y	Profit/loss, \$/month		
			23	25	27
Market Price, \$/kg	0.90	Farrow to 23 kg	- 56,469.	- 54,031.	- 51,594.
Nursery Feed, \$/pig	20	23 kg to Finish	- 85,544.	- 92,983.	- 100,421.
Finisher Feed, \$/pig	80	Farrow to Finish	- 142,013.	- 147,014.	- 152,015.

Comments: When feed prices are very high, and pig prices are very low the more pigs a farm producers under a farrow to finish model the more money they will lose. However, under a farrow to 23 kg model, where fixed costs have a higher percentage of total costs, it is still advantageous to maintain high production levels.

Scenario #2: Feed Price High - Pig Price High

Scenario Parameters		Production pigs/sow/y	Profit/loss, \$/month		
			23	25	27
Market Price, \$/kg	1.80	Farrow to 23 kg	10,806.	19,094.	27,381.
Nursery Feed, \$/pig	20	23 kg to Finish	20,225.	21,983.	23,742.
Finisher Feed, \$/pig	80	Farrow to Finish	31,031.	41,077.	51,123.

Comments: When feed prices are high and pig prices are high, profit is maximized when the farm maintains high levels of production in both types of production models.

Scenario #3: Feed Price Low - Pig Price High

Scenario Parameters		Production pigs/sow/y	Profit/loss, \$/month		
			23	25	27
Market Price, \$/kg	1.80	Farrow to 23 kg	22,019.	31,281.	40,544.
Nursery Feed, \$/pig	14	23 kg to Finish	65,775.	71,495.	77,214.
Finisher Feed, \$/pig	55	Farrow to Finish	87,794.	102,776.	117,758.

Comments: When feed prices are low and pig prices are high, profit is maximized with high production levels.

Scenario #4: Feed Price Low - Pig Price Low

Scenario Parameters		Production pigs/sow/y	Profit/loss, \$/month		
			23	25	27
Market Price, \$/kg	0.90	Farrow to 23 kg	- 45,256.	- 41,844.	- 38,431.
Nursery Feed, \$/pig	14	23 kg to Finish	- 39,994.	- 43,471.	- 46,949.
Finisher Feed, \$/pig	55	Farrow to Finish	- 85,250.	- 85,315.	- 85,380.

Comments: When feed prices are low and pig prices are low, losses in a farrow to 23 kg are minimized with high production. In a farrow to finish model, there were no differences among low levels of production compared to higher levels of production.

■ Conclusion

Levels of production in a farrow to finish operation have significant impact on the bottom line under two of the four scenarios we have analyzed. From our observations, we have demonstrated that when the revenue per hog is below

that of a variable cost structure, the advantages of chasing reduced fixed cost are eliminated. When revenue does not cover variable costs, the advantages of gained in fixed cost savings through high output are quickly eroded, and this situation promotes financial losses. This would suggest that maintaining high pig production levels during any combination of feed cost level or any type of pig price level is not always the best option for the bottom line. Our model has shown that there are significant disadvantages to maintaining constant high production during periods of low pig prices/high feed costs and low pig prices/low feed costs in a farrow to finish operation.

It is impossible to show all scenarios and the reality is that each farm has its own. We have tried to keep a simple approach by showing the relationships among fixed and variable costs, and productivity and income, in a few scenarios. Keep in mind that usually there is about 4% lowering of a fixed cost for every one pig per sow increase in production in a farrowing house, but it also does not take much to increase your fixed costs with regards to labor, piggy decks management or other increased inputs to produce higher productivity. This \$1.50 reduction in fixed costs can be eaten up very quickly through increased costs in chasing higher productivity. In addition, the fixed cost saving created by reproduction efficiencies can result in substantial additional losses in the finishing when revenue is below variable costs, i.e. when pig prices are low and feed prices are high.

The four scenarios that we have developed produced the following results:

Scenario #1 - When feed prices are very high and pig prices are very low it is best not to have high production output or expend resources to chase high levels of production in a farrow to finish operation. In this situation, losses are minimized by having lower levels of production. Strategies that minimize losses could include the elimination of costly practices or inputs aimed at improving higher levels of production output.

Scenario #2 - Another observation is that when pig prices and feed prices are low, there is no difference in the amount of losses incurred from any levels of production within a farrow to finish operation. This suggests that chasing high production levels has no benefit when both feed and pig prices are low in a farrow to finish operation.

Scenario #3 - In a farrow to 50 lb operation, our analysis shows that profitability is always enhanced when production is maximized.

Scenario #4 - A manager's ability to match production levels to economic situation may prove to be a worthwhile strategy in maximizing profit or minimizing losses in a farrow to finish operation. On the other hand, in a farrow to 50 lb operation, profitability is always enhanced from high production output.

For too long our philosophy of raising pigs has been weighted way too much with the idea of opportunity profit derived from throughput, leaving the understanding of costs in the shadows. We need to understand our cost in relationship to productivity and revenue, and only then can we make wise decisions. Be clear that the optimum management strategies when raising pigs for a profit are substantially different than when raising pigs for a loss.