

Monitoring Performance of Finishing Pigs for Decision Making

Bob Hunsberger

River Junction Management Inc, Woolwich Rd 45, R.R. # 2, ON N0B 2V0
Email: rhunsber@uoguelph.ca

▪ Introduction

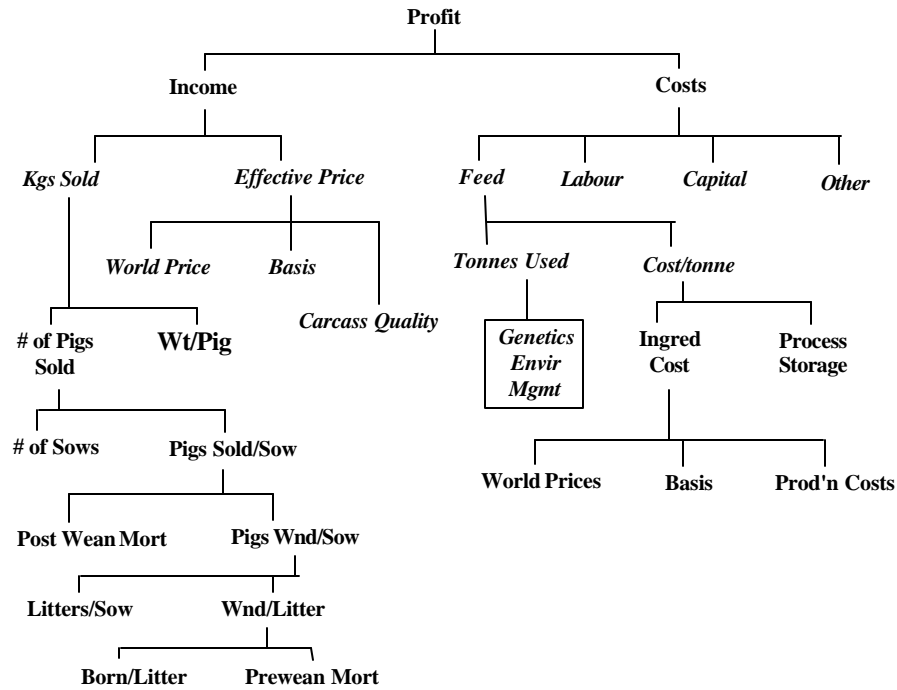
When operating a hog production business, the key word is "business". A hog production unit is established with a profit target in mind. The profit is measured as return on total assets (ROTA) and return on net assets (RONA). Production units that have operated according to plan have achieved ROTA's of 10 to 15% and RONA's of 10 to 30% depending on the degree of leverage used. Failure to meet the targeted ROTA is virtually always traceable to one of three things.

- ▶ Lower than expected effective price.
- ▶ Higher than expected feed costs.
- ▶ Lower than expected production.

The intent of this presentation is to focus on these three factors and key monitoring points in the pricing and production processes. The flow chart shown in Figure 1 describes a way of viewing the production process and financial performance.

Picturing the business in this way may help visualize the trade-offs between various parameters. In the classic hog production discussion of outdoor or low cost housing vs. new environmentally controlled buildings, we can see that one cost component, capital, is low but typically labour goes up and feed may go up seasonally. Similarly, if the number of pigs sold is too low, it can be addressed by increasing the number of sows or by improving sow productivity. Which alternative to pursue first requires economic analysis of the individual situation and constant refinement in response to changing economic and production conditions.

Figure 1: Profit and Production Flow Chart



However, the primary objective of all performance monitoring activities is to evaluate and predict cash flow. Predictability of cash flow is the underlying driving factor behind this discussion.

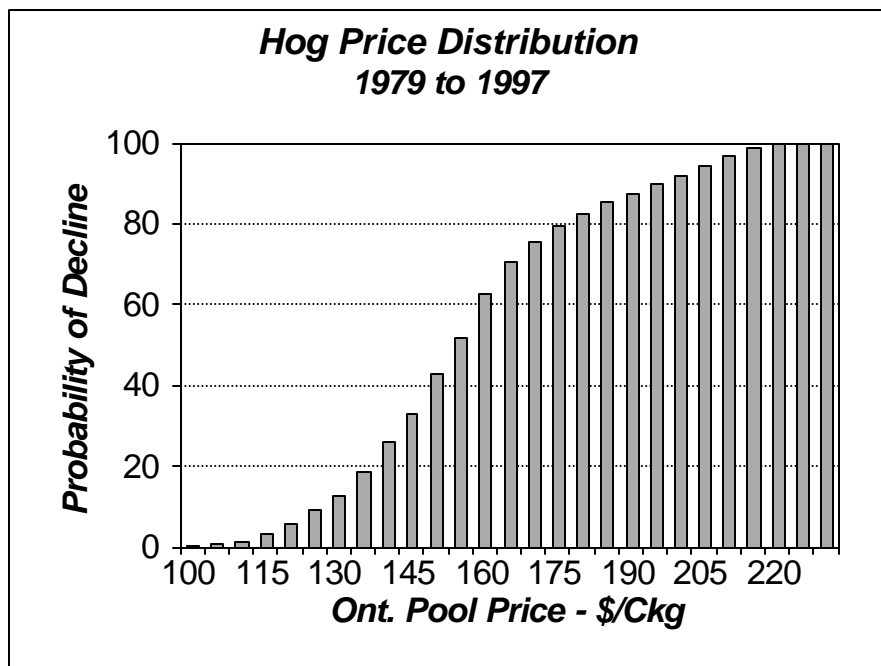
▪ Predicting Effective Price

The hog price between farm and plant is the most important number in a hog production business. In recent years, more attention has been paid to hedging opportunities and the use of futures markets. This discussion has resulted from the recognition that hog market fluctuations are extreme. Frequently, major market movements occur suddenly and sometimes unexpectedly. This raises the danger that a producer could hedge in a small profit after a period of depressed prices and miss the large profits that result from a major market move. Similarly, prolonged high prices tend to lead to optimism and reluctance to hedge when the opportunities are good. Figure 2 shows the Ontario weekly hog price over a prolonged period of time on a cumulative frequency

distribution. When market conditions present prices at the high end of the distribution, an aggressive program is more justified than when prices are low.

The chart displays a range of prices on the X-axis. The Y-axis shows the percentage of time that the price has been under a particular price point during the period 1979 to 1997. For example the price has been under \$175 per 100kg 80% of the time.

Figure 2: Ontario weekly hog price, 1979 to 1997



While the hog price is the single most important number, there is little that can be done about it on a day to day basis. Therefore, the monitoring procedure calls for a weekly review of pricing options and reading a trusted market analysis newsletter. Action should be taken when strong profit opportunities are available for an extended period of time into the future and when the newsletter writer says to “get short”.

The other contributor to effective price is the carcass quality and negotiated contract price. Contract negotiations will require considerable time once every year or two. Carcass quality is affected by genetics, nutrition and management systems. It requires nothing more than good regular stockmanship care, and

attention to grading reports. If the grades appear to be substandard for the genetics and nutrition program, some problem solving action will be required. Grading slip analysis should always include weight distribution analysis.

▪ **Predicting Number of Pigs Sold**

If the targeted number of pigs is being sold at the targeted price, the income side of the system is covered. The sale of pigs, however, has one year of planning and production behind it. This includes one or two months to order, retain and prepare gilts, four months of gestation and five to six months of growth. Therefore, producers need to monitor production activities upstream to ensure that the production process is progressing satisfactorily.

As Gary Dial has noted in some of his writings, many production system problems begin with too few sows in the herd. Assuming that the sow herd is at a targeted number and the gilt pool is big enough, the main monitoring point becomes number of weekly breedings. If breeding targets are being missed, investigation should search for the cause. The starting point will be sow herd size and gilt pool size. From there, herd health and production consultants can assist in tracing paths through the various components of estrus stimulation and detection.

If sow herd size and breedings are acceptable and number of pigs sold is unacceptable, the problem is between breeding and marketing. Monitoring the number of weekly farrowings will rule out or it will indicate that farrowing rate as a problem parameter. Monitoring the number of piglets weaned weekly will evaluate pre-weaning mortality.

In a smooth flowing system that is designed to finish all of the pigs produced, the sale of weaners can be a significant flag. It indicates either over-production in the sow herd, slow growth in the finishing system, or high variability in production levels. Any of these may require further investigation.

Table 1 outlines the key production monitoring variables and some suggested target levels.

Table 1: Key production variables to monitor weekly.

Parameter	Weekly Target per 100 Sows	Actual
# of Breedings	5.6	
Litters Born	4.5	
Pigs Weaned	43	
Weaners Started	42	
Weaners Sold	0	
Market Hogs Sold	41	
Gross Revenue	\$6,100	
Feed Used (tonnes)	13.6	
\$ Spent	\$3,000	

▪ General Cost Control

The costs associated with the non-feed components of production represent from 20% to 45% of total costs. Generally they will be determined by the overall business structure and are not easily modified. Still, they are significant and should be part of the monthly evaluation process. Higher than expected costs in this area indicate that further investigation is required.

The decisions that affect capital cost are made once when the business is planned. Similarly, many other costs such as electricity, insurance, taxes and repairs can only be minimally affected once the initial system is designed.

Labour cost is also, at least in part, a function of the production system and the equipment purchased. Secondly, labour is affected by human resource management skills. The degree of satisfaction and productivity of employees in a hog unit is a direct reflection of management. Labour cost over-runs might signal a need for employee training and management upgrades.

Routine monitoring of non-feed costs usually requires nothing more than regular financial accounting and reporting and comparing those monthly numbers to targets.

The key cost, however, is feed cost and it requires more breakdown. The per tonne cost of feed is a function of feed ingredient prices. Primary feed ingredient markets can be treated like the hog market. Maintain a charting system to put current prices in a historical perspective and purchase a service to analyze appropriate purchase times.

Market risk management analysts can have an unbiased approach to an emotional topic. Farm managers get clouded by what they “hope” will happen. The business plan will contain budgeted feed costs and when market conditions allow those costs to be met or exceeded a purchasing program should be begun. When feed ingredients are higher than the targeted costs the decision gets more difficult. This is particularly true in a rising market when farm managers may hope that a decline will present a buying opportunity. Technical chart analysis may be the most appropriate way to make purchasing decisions. Like so many other decisions, market analytical decisions require judgment. Judgments are always influenced by biases. It is therefore, appropriate to retain independent advice regarding this specialized area.

▪ **Monitoring Production, Growth and Feed Use**

The blocks on the flow chart (Figure 1) called ***Tonnes Used*** and ***Genetics, Environment and Management*** are key control areas. The term ***Management*** is used to refer to stockmanship, animal comfort with humans, health status, system maintenance, ration selection and many other routine daily and long range operating tasks. While ***Tonnes Used*** is obviously affected most by the number of pigs being produced, it is also affected by these key growth production parameters.

The hypothesis is that these parameters (genetics, environment and management) are reflected in feed intakes, feed conversions, and growth rates. A secondary hypothesis is that the primary reflection of these parameters is increased variability. As an example, assume that a group of finishing pigs is invaded by an infectious agent. The result of this is that the pigs most affected eat less and those not affected keep eating at the same rate. The result is that the average daily gain declines because some animals grow more slowly or not at all. The mean declines and the standard deviation increases. The unaffected pigs continue to grow at about the same rate but the bottom end pigs drag down the average performance. The disparity, between the biggest and smallest pigs in the group, increases. Variability is, therefore, a key monitoring indicator of performance.

In extreme cases, increased variation is obvious, particularly if it is caused by health breaks. Changes in performance caused by environmental factors such as temperature fluctuations, crowding or psychological stresses are less obvious. Additionally, biological processes involve some natural variation and it is difficult to detect subtle increases in variability.

One method of assessing the degree of variation in a group is to weigh several of the heaviest and several of the lightest pigs. In a group entering a finishing barn, for example, a low variation group might have average weight of 26 – 27

kg with the lightest pigs being about 20 – 21 kg and the heaviest being 30 – 31 kg. A high variation group might have the same upper weight limit but the mean would be smaller, perhaps 23 – 24 kg and the lightest pigs would be 15 – 16 kg. We expect that the high variation group will have lower average daily feed intake, have a wider range in growth rates, take longer to empty the barn at shipping time, and have poorer carcass quality. Table 2 summarizes these effects and show the effect variation has on shipping interval.

Table 2: Relationship between variation in a group of pigs and average daily gain and shipping interval.

Parameter	Low Variation	High Variation
Avg Start Wt.	25 kg	23 kg
Heaviest	30 kg	30 kg
Lightest	20 kg	15 kg
Best ADG	950 g	920 g
Worst ADG	750 g	600 g
Start shipping	12th week	13th week
Finish shipping	16th week	18th week

The two biggest indicators of changes in the growth production parameters are daily feed and water intake. Many poultry producers have been monitoring daily feed and water intakes for years. In hog production, this technique is not as well used. An appropriate management technique is to build a database of expected levels for these indicators.

In batch growing situations, monitoring average daily feed intake (ADFI) is easier than in continuous use barns. This is because the expected ADFI can be more readily predicted when all pigs in the barn are the same age and weight. If a range of ages and weights are being fed out of the same bin, the feed intake may change in relation to shifts in the weight of the average pig in the barn.

In both batch and continuous cases, however, the important control point is the change in feed intake from one day to the next. Poultry growers have typically used scales on feed bins and feed flow meters to monitor daily use. Water flow meters are also an important tool for evaluating changes in animal growth and

health. It seems likely that equipment for these purposes will improve in the future. By using these techniques, the barn manager will be able to anticipate group performance and quickly respond to growth slow downs.

▪ Conclusion

Hog production is a biological process. In any biological process there are an infinite number of records that can be kept. When designing a farm record keeping system it is important to keep the end in mind. That end is to keep the business moving toward its profitability objectives. The primary record-keeping tool to accomplish this is the financial reporting system. Most modern accounting systems will report quantities as well as dollars. That should take care of number of pigs sold, kilograms sold and effective price. The same will be true for feed costs and quantities. The inventory system will reflect numbers of sows and growing animals in the growing process.

The purpose of production record systems is to anticipate looming problems in a very complex process. The points outlined are intended to throw up flags that signal further investigation. The objective of the entire record keeping system is to maintain uniform production and cash-flow as well as cost control.

As hog production moves forward, monitoring average daily feed intake and water consumption may become common practice as a method of anticipating growth efficiency problems. Uniform, consistent growth represents a significant opportunity for improving building utilization and capital efficiency. It has received too little attention in the past.

