

MANAGEMENT BY MEASUREMENT

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INTRODUCTION

Most people, at one time or another, have thought about trying to do something better. Thinking about doing something better, or thinking about making a change, can be the easy part. Quite often, actually making the change is not. Trial and error is one approach that has been used in the past. Unfortunately, this approach can sometimes be seen as jumping to conclusions without enough study of the problem(s) and the results can be less than expected. Another approach is to conduct an extensive study of the problem before a change is tried. This can often lead to complete paralysis as nothing actually gets done, tested or changed. There are 3 basic questions that should be addressed when trying to make a change.

What are we trying to accomplish?

What changes can we make that will result in improvement?

How will we know that a change is an improvement?

These questions provide a foundation for managing both change and improvement. Focusing on these questions stresses learning, by testing changes on a small scale rather than studying the problem before any changes are attempted. The key to improvement is to manage your measurements. One of the best skill sets that can be used in order to provide rapid learning and to make changes that improve your operation is the Plan – Do – Study - Act (PDSA) Cycle. The PDSA Cycle is a flexible model that has been used in many different situations and incorporating this into your everyday management decisions will help to make changes to your operation that will not only be successful, but will also improve your bottom line.

AN EXAMPLE

As we enter an unprecedented period of risk for swine producers, understanding the sources of risk being served up from the many sources of risk and developing systematic strategies with coherent tactics to reduce the farm's exposure to it will be important. What we would like to accomplish over the next year is to understand the sources of risk and put in place strategies to mitigate it. As a measurable outcome, we would like to operate within a narrower spectrum of the total riskiness or price and cost variability that occurs. Some of the risks faced by pork producers in the next decade are outlined below.

Input Cost Risk

Subsidized and mandated use of ethanol has tied the price of corn to the price of oil. The factors which influence the price of oil can now exert influence on the price of corn unrelated to its use or demand as a feed ingredient. Oil prices vary with supply and demand which can include politicization of supply (oil as a weapon) as well as the relative value of the dollar against other major world currencies since the world oil trade is conducted in dollars. The implication is that nominal feed ingredient prices can rise even in the face of falling livestock demand as currency valuations change. Instability in the world economic situation is spinning increased price risk into livestock production costs.

Political Risks

In the great asset bubble burst of 2008, world grain prices doubled and in some cases tripled in a very short period of time. This led over 40 countries to ban exports of key grain and meat supplies in order to preserve local supplies and avoid food panics and political upheaval. This hoarding action served to slow the market based adjustment of world prices since grains could not move freely from lower priced areas to higher priced areas. Some countries began to make long term plans to reduce their exposure to global market shortages by making long term **leases** and purchases of arable land in other countries such as Africa, Brazil and parts of Asia to grow their own future supplies and prevent future shortages from their own domestic production. These privatized supplies may cause future price volatility as they may represent significant sources of future world grain stocks that may be withheld from global trade to reduce food security issues for owner countries.

Global Trade and Export Related Price Risks

Many developed countries have reached saturation levels of pork production with respect to domestic demand. When these countries possess global strategic advantages for crop or livestock production, the only way to grow is through increasing reliance on exports. Exports by countries with comparative production advantages is a win-win for all on a global basis but exports can be highly variable, subjecting the exporting country periodically to large volumes of perishable food commodities forced upon a saturated domestic demand. Factors impacting export volatility include new trade barriers or requirements, sudden outbreak of export-stopping disease or food safety issues/contaminations, hysterical reactions affecting demand (H1N1), political tactics such as embargoes, sudden changes in the relative values of trading country currencies etc. Increasing growth by relying on ever increasing domestic production destined for foreign markets is a siren song of increasing benefits coupled with the prospect of periodic train-wrecks.

Quality Risk

Packers are constantly refining their pricing grids to deliver the most value for them in their meat and processed product markets. As the pork trade has changed from a highly competitive, disaggregated market, characterized by large numbers of buyers and sellers of commodity pork, to one of integrated production and processing coupled with long term supply contracts into large

distribution chains, pricing has changed to support the development of increased uniformity of production. A one pound difference in total carcass weight can increase or decrease the value of the entire carcass by 5% to 25% depending on the packing grid. Understanding production variance and implementing strategies to reduce it is becoming increasingly important. Endogenously reducing variation through improved health and by creating a more consistently ideal production environment and feeding protocol throughout the life of the animals, as well better selection strategies for market ready animals, pays large dividends. In addition, centering the total mass of reduced variance (weight) carcasses over the most valuable price points of the buying grid will produce a consistently higher profitability even when profits are low and losses occur.

Forward Pricing

Using futures markets or pre-pricing (or forward pricing) strategies to lock margins rather than hog prices and input costs independently is becoming an important tool in reducing the level of total income and financial risk faced by modern farms. There is no longer anything we can call a “high” or “low” hog price. June CME lean hog contract prices for 2009 sold at \$100/cwt in the late summer of 2008 but future corn prices and bean meal prices were so high at the time, locking a margin was very difficult. High and low prices are very relative terms. We are interested in monitoring opportunities to capture profits (a combination of input and output prices which results in a profit) rather than locking high hog prices or low feed prices independently.

The PDSA cycle is a scientific approach to change and improvement. Sometimes referred to as the “Shewart Cycle” (originally developed by Walter Shewart in the 1930’s) or the “Deming Cycle”, as W. Edwards Deming successfully promoted and used this method, starting in the 1950’s.

PLAN

Identify an opportunity and plan a change. Part of the plan will involve figuring out what things are going wrong (identifying the problem) and to come up with ideas for solving these problems. Plan not only what you are going to do, but also figure out how you will know if the plan actually works! Not all change is an improvement. The plan for a test or change should cover who will do what, when, and where. Part of the plan is also deciding what data will need to be collected. Set objectives and then outline the tasks or activities that are required to put the plan into action. Nothing can be more frustrating than planning a change, making a change and then not knowing whether or not it made any difference. Deciding how you will know if anything is better is often overlooked in this stage.

In our example we have decided to try two relatively simple changes to reduce the variability of prices and costs which are present in the market and in doing so, we hope to improve overall profitability and increase our access to capital.

1. Our first plan is to collect individual carcass data from our packer in an electronic format. Most packers will provide this through email if a producer requests it. Once we are collecting this data we will measure the average weight marketed and the standard deviation of pig weights marketed to test our farm's variability of production. As a target for the year, we will attempt to reduce the standard deviation of individual market weights by 20% (which is an achievable goal for most producers). We will do this through a variety of improvements in selection strategies and health and management practices focusing on providing more consistently high quality care to our pigs.

2. We learn how to calculate and track what is commonly called the “hog crush”, the margin which forward pricing opportunities are offering for hogs and feed ingredients or prepared feeds. We will develop a marketing plan which “locks” margin in increments when prearranged targets are met. For instance, when a future margin of \$25/head is available, we will forward price 50% of our production, when \$20/head is available, we will forward price 30% of our production, when \$15/head is available we will forward price 15% of production and so on.

DO

Easy – carry out the plan! But maybe not - testing a change is not always easy. Often, things may happen that were not actually planned. Or the change may not impact anything that you are measuring. We may begin measuring standard deviation of marketed weights and gradually reduce it only to find that a new disease has entered our herd and despite our efforts, erased the gains we have made in variance reduction. There could also be some unwanted side effects. The best approach is to test the plan on a small scale. This is important, as small scale tests or changes are more effective and easier to carry out. If the plan involves too many changes, or is too difficult or hard to do, the results may be hard to evaluate and you could end up with outcomes that do not mean a lot or are hard to interpret. We would like to establish a baseline of variation first and then attempt to reduce it but factors such as changes in management, vacations of key employees and new diseases entering the herd may cloud our results. Changing too many things at one time can also be the cause of misleading results. Try and make any changes in a way that can be both observed and understood. So, carry out the test and record your results long with any associated problems or unexpected data. The end result of testing the plan is to evaluate the impact of a change and to learn about different alternatives. The next step is to analyze or “study” your data.

STUDY

The real emphasis of this phase is to build new knowledge. Study is the driver for learning. Without it, improvement is nearly impossible. Often, the Plan and Do portions are completed while the Study portion is NOT being performed well or regularly. Studying the available literature on variation and its causes, consulting with the farm's veterinarian and soliciting observations and recommendations from those directly involved in pig care can not only provide increased information but help build a team effort.

Forward pricing requires the help of someone experienced with markets. Local university extension or agricultural economists can provide important literature and guidance. Your packing plant procurement division can inform you of programs that are offered for locking prices of pigs just as feed dealers almost always offer forward pricing programs for their products. The key to remember is that we are locking margins, a combination of pig pricing and feed pricing rather than trying to independently lock a “high” hog price and/or a “low” feed price.

ACT

What you decide to do here all depends on what you learned during the Study part of the cycle. If the experiment was successful, it would now be time to implement any change(s) on a larger scale. These changes need to become part of the normal practice in your business. If the experiment was only partially successful, or not successful at all, you would need to start the cycle again, but with a different or modified plan. Once a satisfactory result is obtained, and the changes are included in your day-to-day procedures, then is it time to repeat the whole cycle of Plan – Do – Study – Act again, with a new problem or challenge. The more you do it, the more improvements that you make, the better your business will be.

CONCLUSIONS

Improvement comes from the application of knowledge. To use the PDSA effectively, adapt it to your own situation. There is no need to spend weeks studying a problem. It may be better to start the cycle with a Study rather than a Plan, as you usually have to figure out what your current situation is before you charge off and make changes. Try out ideas on a small scale as this can save you a substantial amount of time, effort and money. With forward pricing, you can execute a plan on paper for several weeks or months without actually committing yourself to the prices to see how your plan would have turned out prior to actually making financial commitments.