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# Breeding herds and the pursuit of profit

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## A food industry context

There is little point in focusing on the breeding herd operations management factors that influence profitability without first understanding the rightful place of the breeding herd in the grand scheme of things. To establish a common foundation of understanding, there are several "facts" to agree on before proceeding to the swine breeding herd.

### Fact #1

Without consumer demand for animal-origin protein, no one in or associated with today's pork industry has a viable business or a sustainable job. Regardless of what beliefs we might hold dear, those of us involved in the pork industry must clearly understand that our making a sustainable living within the overall food industry is not a certainty nor is it an entitlement.

### Fact #2

Pork not only competes with other forms of animal-origin protein (e.g., poultry, beef, fish) for the protein consumer's food dollar, it also competes with a number of other non-animal protein sources (e.g., grains).

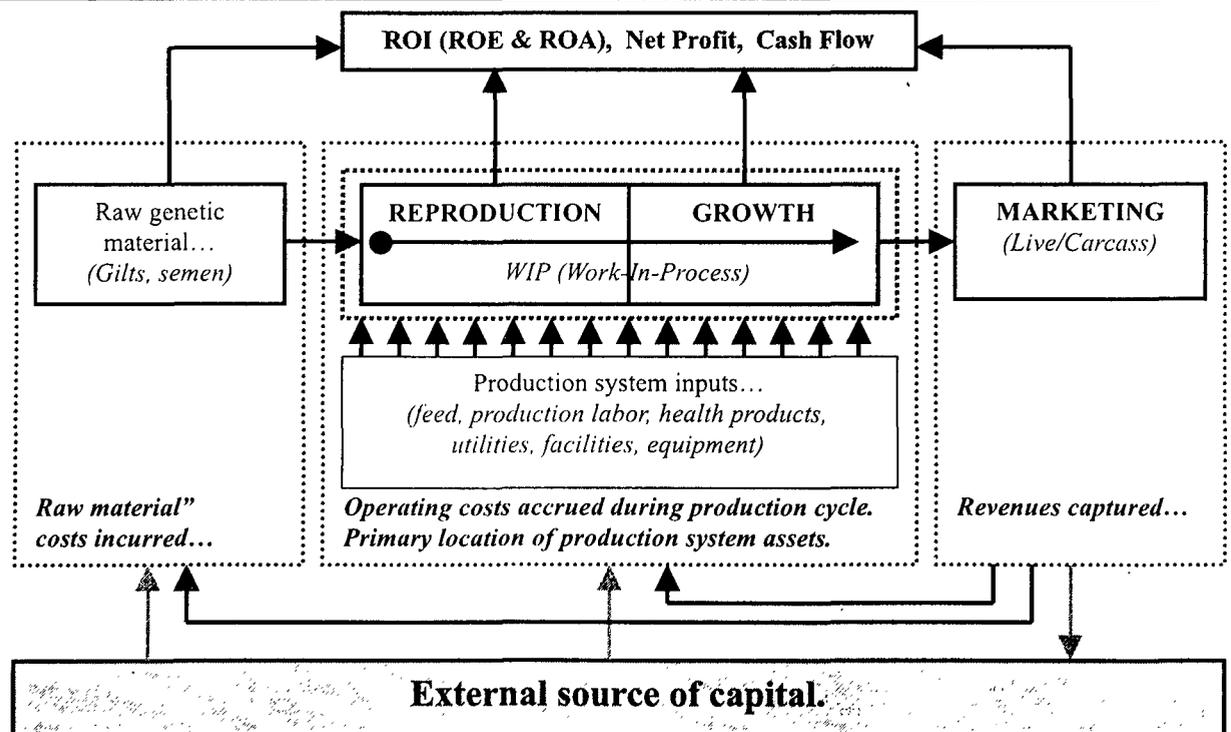
### Fact #3

Access to the protein consumer involves multiple layers of business entities, each with their own profit-based business motives for existing and operating in their chosen food industry niche.

### Fact #4

The nature of businesses operating in a competitive environment is such that those that intend to survive and thrive are motivated to maximize sustainable profits by striking an optimal balance between maximizing throughput, minimizing operating expense, and minimizing inventory.

Figure 1. A model depicting the sources of costs, revenues, assets, and debt that drive summary financial measures for pig production systems



### **Fact #5**

Each business entity is therefore compelled to not only make every effort to out-compete other “like” businesses for sales to their common customers (e.g., competition among packers for the wholesaler’s and retailer’s dollar, or competition among food retailers for the consumer’s food dollar), they are also compelled to minimize the cost inputs needed to create their required product through applying a “make-or-buy” decision process and related strategies.

### **Fact #6**

Inherent in a decision to “buy” are a number of basic strategies that may be applied, some being unsustainable and others sustainable. Which “buy” strategy is used depends on the relationship between product demand, production capacity, and input availability (and, of course, the competitive business philosophy of those selecting the strategy).

We’ve experienced a perfect example of an application of an unsustainable strategy for a pork industry operating within a capitalistic market economy over the past 15–18 months, and the effects will likely be felt for at least another 6–12 months:

- Demand for pork (domestically and internationally) has been relatively flat and “soft,” not meeting the expectations of many.
- There were—and are—perceived and real pressures on the construction and/or expansion of pig production facilities, with objections ranging from concerns about water/air quality (odor, ground water contamination), to those relating to the industrialization of pig production and the disappearance of the traditional family farm.
- Pork production, primarily owing to substantial expansion (fueled by a number of real factors as well as perceptions) and secondarily due to net gains in production efficiency, exceeded “available” packer capacity (note: “aligned” or “closed” packer capacity that is integrated/coordinated with commercial pig production via ownership or contracts would not be considered “available”).
- In a pig system producing a finished commodity product that cannot be stored live for any appreciable period of time (for both biological and financial [cash flow] reasons), non-aligned pig producers were (and always will be) in a position of having to market pigs to an open market within a reasonable transport distance on a scheduled basis with no real alternatives.
- Where demand was relatively flat, and where packer/processor capacity was exceeded for an extended period of time, there was an obvious and profound downward pressure on pig prices. Further, in the con-

text of “Fact #5,” there was no strictly business motivation (as opposed to social or moral reasons that often lead to governmental action through legislation) to do anything to limit the price free-fall.

- Clearly, the “free-fall” in prices far exceeded the “break-even” of even the most cost-efficient pig producers. All producers (save those within owned or contract-aligned pork production systems) lost money, regardless of their physical and input cost efficiency. This is clearly an unsustainable market environment for non-aligned pig producers.
- For non-aligned (open system) packer/processors, this placed them (from a business standpoint) in a very advantageous short-term position for making profits that far exceed those of closed (integrated or aligned) pork production systems. However, in the long-term, these same non-aligned packer/processors will find it necessary to become integrated/aligned with pig production as the non-aligned pig producers who supplied their raw material liquidate their businesses or join an integrated/aligned system.
- Closed (aligned) pork production systems that contain both pig production and pork packing/processing entities are in no position to take advantage of an open market price free-fall to purchase packer raw material (live pigs). They can only do what they were designed to do in the first place: produce a controlled, consistent, and known quality product that serves their targeted customers at the lowest sustainable cost. Their ability to compete with “open system” packer/processors in the wholesale arena may be impaired in the short-term, but as non-aligned producers exit the industry or align themselves with packer/processors, that disadvantage will disappear. Within such closed systems, there will be pressure to reduce input costs, accepting increased negative production effects and risks, as well as at the risk of sacrificing product (pork) quality.

### **Fact #7**

The decision to “make” (packer/processor owning/contracting of pig production) has been and will continue to be exercised aggressively, as is evidenced by the continued efforts by many to integrate genetic production and commercial production in with packing, processing, distribution, and wholesaling of pork products. The decision to “make” is not always driven by a cost-reduction goal, but may be more importantly driven by product exclusivity, quality, conformance, and consistency goals.

### **Fact #8**

Today’s innovations, advanced technologies, and unique product characteristics will become tomorrow’s commodities. That which commands a premium today will become

a requirement for participation tomorrow. Need an example? High quality genetics producing lean carcasses. What was once something pig producers could invest in to capture a premium is now required to “play the game” at all.

The point of this introduction is not to suggest that examining the breeding herd factors that influence production profitability aren’t important. Rather, the point is that we understand that this topic must always be viewed within its proper context, and given its appropriate priority for action. It is neither the highest nor the lowest priority area to examine.

Attention by pig producers and pig production systems must first be directed at those areas of greatest priority: establishing, maintaining, and growing a market for the product (pork); in other words, increasing throughput. This requires first of all product (pork) quality, conformance, and consistency that meets customer needs; second it requires sufficient product output; and third it necessitates acceptable “raw material” costs (semen and gilts). Beyond that, we have moved far enough down the priority list and have reached a point at which production efficiency and purchasing can be addressed.

For the aligned pig producer—more specifically the breeding herd manager—within an integrated/aligned pork production system there is a greater ability to let others within the system deal with the product market dynamics and issues. Focusing on breeding herd factors that contribute to system profitability is justifiable. All too often our production systems are designed to encourage and reward “local” production phase efficiency and output that, even though there appears to be a local positive impact with a positive system impact assumed, actually has a net negative impact on system performance.

For the non-aligned pig producer and his or her advisors, there is little point to continue on with a discussion of managing the breeding herd factors that influence operation profitability until the more influential and much higher priority issues described above are addressed. It is not even a matter of what is the best approach for business health—it is, quite literally, a matter of business survival.

Two quotes, the first from W. Edwards Deming and second from Donald J. Wheeler, succinctly summarize the main points of this introduction:

“Hard work and best efforts will by themselves not produce quality or a market.”

—W. Edwards Deming

“Survival is not compulsory.”

—Donald J. Wheeler

## **A pork production system context**

Breeding herds are a substantial source of expense. Yet they are responsible for far less expense than are the

growth phases of pig production. The breeding herd not only represents a source of expense for an operation (a fact that we tend to focus far too heavily on because it is so visible), it is our only source of the raw genetic material for growth. All of the genetic potential performance that can be capitalized on during the growth production phases is represented in the weaned pig. Thus, the breeding herd has a profound influence on growth performance—and ultimately final system financial performance—in two ways:

- The breeding herd is where the cost of genetic decisions are incurred and where decisions geared toward reducing genetic costs (good for the breeding herd cost structure) can be detrimental to growth performance and, in turn, overall system financial performance.
- The breeding herd is where non-genetic influences first (from conception through weaning) can begin to negatively affect the genetic potential for a pig’s maximum possible growth performance and meat quality which is realized later on.

While it may be true that—by far—most of the costs for producing a market-ready pig are incurred during growth (nursery-to-finishing), overall performance during growth (efficiency and output) is highly dependent on what happened earlier in the breeding herd. A common disconnect in our logic is to pay undue attention to the point at which an expense is incurred (genetic costs), but at which little or none of the value generated by that expense is realized (growth and meat quality); see **Figure 2**.

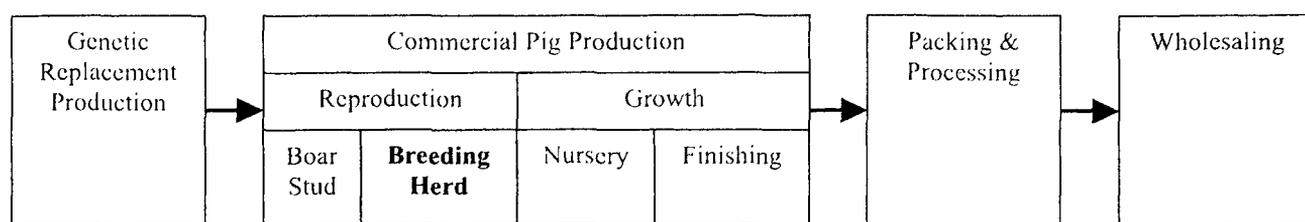
## **Perspective on the swine breeding herd**

Breeding herds don’t exist to capture profit (the only exception being the non-aligned farrow-to-wean operation, whose days are numbered).

The swine breeding herd has only one purpose for a pork production enterprise: to produce high quality raw material (weaned pigs) to which value is added during post-weaning growth, and for which value is captured at the point of sale for that enterprise (ranging from live pigs, to carcasses, lean cuts, wholesale, or retail meat). That purpose is not best served by producing weaned pigs at the lowest possible total or per pig cost. Neither is that purpose best served by maximizing output (pigs weaned per year) or efficiency (pigs weaned per breeding female or crate per year). That purpose is best served by finding the elusive balance between quality and consistent quantity of weaned pig output, and the input costs it takes to create that level of output.

We cannot find a balance by viewing the breeding herd as a profit center. Breeding herds only produce weaned pigs as raw material for continued growth while consuming

Figure 2. A pork production system model



operating inputs. Selling culls does not generate revenues, such cull sales only represent a salvage value for one of the two “raw materials” contained within the breeding herd for producing weaned pigs. Further, in nearly all production systems, the product of the breeding herd (weaned pigs) is not sold on an open market, but is, instead, transferred at cost to the next stage of production (growth), with revenues being captured later when live pigs, carcasses, primal cuts, or wholesale cuts are sold outside of the business entity.

In the traditional and purely technical sense, the breeding herd really should be considered a cost center.

Yet, we also cannot find this balance by viewing the breeding herd as a traditional cost center either. Why? Viewed with only a traditional cost center mentality, our singular goal for breeding herd operations would have to be minimizing the cost per weaned pig. We would purchase the cheapest possible genetics and feed with which we could obtain our desired farrowing rate and litter size, and we would attempt to push as many pigs out the farrowing room doors as possible whenever we can get them with little or no regard to variation and its implications for nursery/finishing or for later packing/processing.

The contribution of the breeding herd to the financial performance of a pork production enterprise is commonly measured as a cost per weaned pig when the weaned pigs are loaded out to the nurseries. Although this metric does measure the relationship between accrued breeding herd costs and production output, it is inadequate for judging the full impact these costs have on overall financial performance. Why? One reason is that the most important role played by genetics in the pork production enterprise is not in reproduction, yet genetics costs are invariably assessed in the breeding herd when their most important contribution to business operations is during pre-harvest growth and harvest.

## The impact of the breeding herd on ROA and ROE

The swine breeding herd affects return-on-equity (ROE) and return-on-assets (ROA) in each of four ways:

- the number, consistency, and quality of weaned pigs produced that go on to be sold and generate revenues (i.e., the impact on gross sales),
- the costs associated with the purchase of the raw materials (gilts and semen) necessary to create these weaned pigs of the necessary quality characteristics (i.e., the impact on gross expenses),
- the costs associated with purchasing the production inputs needed to transform the raw materials into finished product (weaned pigs) (i.e., the impact on gross expenses), and
- the point-in-time value of the animal inventory (i.e., its value as a business asset).

Given these influences, the goal of the breeding herd is to produce a consistent, predictable supply (on-target with minimum variation) of high quality (healthy and vigorous) weaned pigs that retain as much of their original genetic performance potential (growth and meat quality) as possible.

## The myth of production maximization

The breeding herd goal stated in the prior section must support a higher level goal of maximized sustainable profitability for the entire business. Typically, this is translated by breeding herd production managers as “maximize breeding herd efficiency” and/or “maximize breeding herd output.” However strong may be our belief that maximizing efficiency or even output of the breeding herd positively contributes to the goal of the production system, it is a belief that may actually be counterproductive.

“Most of the time, your struggle for high efficiencies is taking you in the opposite direction of your goal!”

—Eliyahu M. Goldratt

If the breeding herd is not the primary constraint in the production system, then investing resources to further increase efficiency and output are at best misguided. In such a case, resources are better directed at: [1] identifying the true primary constraint, and [2] directing resources to resolve that constraint.

While it is true that excess production can usually be sold, it is also likely that: [1] the costs involved in establishing and maintaining a market for excess production are too

often overlooked or underestimated, and [2] the net revenue (sales revenue-cost-of-sales) will likely pale in comparison to the value of resolving a primary constraint.

## **Breeding herd production variation and aim**

What does increased variation in weaned pig output cost? Most may speculate that such variation costs the pig/pork producing business little, fewer others may speculate that it costs a lot. The reality is that we really don't have a clue. Why? We have never before considered aggressive efforts to control variation as important because we have always accepted the belief (myth?) that biological systems inherently have a high degree of variability that is "normal" and essentially unmanageable.

"As we reduce the virus of variability, we find savings in time and money we never knew were there, savings which our methods of accounting hide so cleverly that we think that waste is 'normal'."

### **—Myron Tribus**

Variation in weekly weaned pig production is very likely much more costly to overall business performance and profitability than any of us imagine. While some initial work has been done in the last several years describing the production factors that contribute to variation in weekly weaned pig output, much effort remains to define the effect that this variability has on overall production system financial performance.

"Understanding variation is the key to success in quality and business."

### **—W. Edwards Deming**

## **Cost management in the breeding herd**

There is a classic quote, "A rose by any other name would smell as sweet." The corollary to this saying in the breeding herd is, "A fixed cost is a fixed cost by any other name". With the possible exceptions of piglet animal health products (iron, vaccines, medications) and piglet creep feed, nearly all costs incurred by the breeding herd in a facility of given size and capacity running at an appropriate and stable level of breeding female inventory are fixed.

Those costs that we classically think of as fixed are facility and equipment depreciation, interest, property taxes, and insurance. Yet other costs that during the pig growth production phases are classically considered as variable should be considered fixed costs in the breeding herd. Feed? Fixed. Labor? Fixed. Utilities? Fixed. Transport? Fixed. Replacement females and semen? Fixed. Shampoo, soap, and toilet paper? Fixed!

In the context of the breeding herd, costs considered as fixed are those which do not increase or decrease in direct relationship with the number of product units being produced (weaned pigs). A breeding herd site of 2,500

sows doesn't consume significantly more feed, require any more employees, or use any more electricity or LP when producing 45,000 pigs per year or 55,000 pigs per year.

A classic method for managing fixed costs is to maximize production output so as to "dilute" fixed costs as much as possible, thus increasing profit at a given sale price. For the type of fixed costs that are committed to service when a facility is built and stocked (we'll call these depreciable fixed costs—land lease payments, buildings, site preparation, equipment, initial genetic inventory) and whose initial value is "consumed" over time (as depreciation), there is an apparently sensible logic for such an approach... on the surface. This classic logic assumes that total output increases that may also lead to more variability in incremental (e.g., weekly) output are "harmless" to the performance of downstream production and product quality. However, this notion is suspect.

For those breeding herd fixed costs that are purchased and consumed on an ongoing basis (we'll call these expensed fixed costs, others may use the term semi-fixed or semi-variable to describe them—feed, labor, utilities, replacement genetics), unlike their depreciable counterparts, improvements and increases that are justified by incremental improvements in product output and/or quality can be made without retrofitting or rebuilding a farm.

For example, modifying the diet/feeding level or labor employed in such a way that cost is added in these categories should be justified by a consistent increase in the quantity and/or quality of the product produced (weaned pigs). It should be remembered that the tangible value of such an improvement may not be reflected in reducing the overall cost to produce a weaned pig (it may not change at all, or even increase), but may not be realized until these pigs are grown out and/or harvested.

A big part of our reluctance to make decisions that may increase levels of expensed fixed cost categories is our current inability to measure their value in any other way than by how much weaned pig cost is reduced. Developing and using a system that allows for the reasonably accurate measurement of this type of value would allow production systems to break out of their cost-minimization box and pursue a value maximization strategy instead.

## **Applying the philosophies of continuous improvement and theory of constraints**

The philosophy of continuous improvement has been around a long time. It has been used by various industries since just prior to World War II. The theory-of-constraints (TOC) has also been around and applied for a number of years. Yet what these philosophies have to offer those involved in the pork industry have been largely overlooked until very recently.

To discuss the management of breeding herd factors with the intent of improving overall system performance without having ways to enable and measure such improvement is pointless. One of the best investments that any production system and production system advisor can make is to understand these philosophies and begin to apply them in their system(s). Without this specific action, all we are really doing with our efforts is supporting guesswork and subjectivity. With what is at stake today in this industry, we can no longer afford to under-perform in this way.

“If you try to improve the performance of a system of people, machines, and procedures, by setting numerical goals for the improvement of individual parts of the system, the system will defeat you and you will pay a price where you least expected to.”

—Myron Tribus

## Final remarks

While summary financial metrics like ROE and ROA are useful as standardized relative measures of performance for benchmarking other similar and dissimilar businesses, they—just like all financial outcome measures—are limited in their value for actually enabling system improvement.

ROE and ROA have no direct value in enabling improvement of swine breeding herd performance. However, in situations where the swine breeding herd is the primary constraint to production system performance, improving breeding herd performance can be reflected in measures like ROE and ROA.

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