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An approach to market-driven pork production

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The future swine industry will be market-driven, meaning that the pork industry will have the ability to produce products that our customer/consumers desire and respond rapidly as desired changes. To remain sustainable, the U.S. swine industry must increase domestic pork consumption by increasing public acceptance, and increase international demand by competing against other countries with higher perceived meat quality and improved food safety. Today's consumer wants assurances that his or her food is nutritious, safe, and produced under acceptable standards. Third party verification of the food production process will become a method to assure consumers of these attributes. The old swine industry was a poor model by which to accomplish these goals; it could be characterized as:

- an uncoordinated system of input suppliers (genetics, nutrition, animal health);
- an adversarial relationship between producer and packer; and,
- a "push through" system in that carcasses were created by producers and packers then marketed the product supplied to them.

The future swine industry, however, has been defined by International Pig Letter (Dec 97) as having the following characteristics:

- Consumers will drive pork production.
- Pork production will be part of the food chain.
- Markets will be based on partnerships, alliances, and specifications. Suppliers will be viewed as partners.
- Product liability will be traced to the producers.
- Markets will be accessible via volume and quality criteria, including leanness, eating quality, taste, and food safety.
- Export markets will drive a significant share of product demand.
- The industry will be comprised of food producers.
- Producers will be interdependent, taking advantages of alliances and vertical integration.
- There will be a wide range of products and many markets.
- Production will be mechanized and knowledge/technology driven.
- There will an emphasis on capacity utilization/return on equity.
- Producers will use computerized records.
- Producers will enjoy improved working conditions, status, and income.

The pork 'food chain'

The swine industry model that encompasses all these characteristics is now called a "pork food chain". A pork food chain requires a vertically coordinated system either by ownership—such as the large vertical integrators today—or "virtual" integrated systems, also known as vertically coordinated systems. Either way, the "pork food chain" may be described schematically as in **Figure 1**.

For pork food chain systems to rapidly respond to consumer demands, they must influence all points in the production process, including genetics, nutrition, health, preharvest handling, food safety, and marketing arrangements. When the interaction of all these inputs into a system are evaluated, the ability of one to affect the others is more clearly understood. In addition, the cost/benefit relationship of each is also more clearly understood.

Genetics

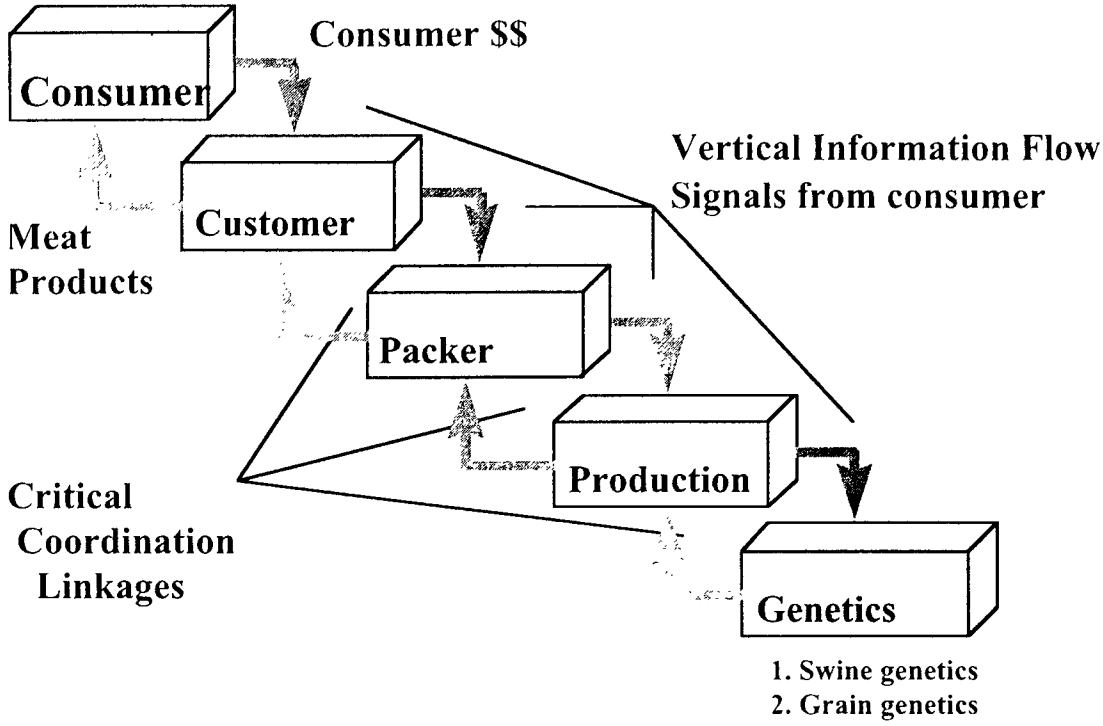
Genetic companies in the past have directed their research and development towards products that fit the majority of producers within the swine industry. In the future, genetic suppliers will become partners with systems that produce genetic products for that system's unique needs.

Nutrition

The influence of nutrition on the final product is manifested in several ways, the most prominent being nutrition's effect on growth and performance. Additional nutritional influences include:

- altered muscle composition;

Figure 1. The pork 'food chain'



- altered fat characteristics;
- improved meat color;
- retains more water;
- provides health benefits to consumers; and,
- increased food safety.

Health

Maintenance of a high-health-status system is not only desirable for increased profitability, but also for the reduced prevalence of pathogens (of human concern) and the decreased need of antibiotics (and, therefore, a reduced risk of residue). The system should also have a protocol defined for antibiotic use (feed, water, injectable) and other feed additives such as growth promotants.

Pre-harvest handling

It has been well demonstrated that the effects of excellent genetics, nutrition, and production practices on meat quality can all be negated through poor handling processes from the time of loading through to the cooler. Known critical control points include:

- feed withdrawal;
- stress at loading (temperature, hot shots, ramp design);
- stress during trucking (temperature, stocking density, truck design, distance);
- stress during unloading (time to unload, hot shots, temperature, ramp design); and,
- stress in plant (stand time, hot shots, temperature, drive to restrainer, restrainers, stunning, stun-stick time, kill-cooler time, scalding process, cool down rate).

Within a vertical system, all negative effects on meat quality can be addressed by a systems approach. In the "old" pork industry, blame for poor meat quality was simply placed on the "other" participants.

Food safety

Consumers today expect a safe product. To promote one product as being "safer" than another would create consumer confusion. Instead, systems will have verifiable food safety programs—with traceability—that will give assurances to the customer that the system's products are safe. Foreign buyers, especially from Japan, already give preference to systems that have food safety programs in place. Large supermarket chains in the U.S. are quickly following suit. Customers, much as branded product companies, want to protect their product reputation by food safety assurances from their suppliers.

NPPC PQA Level III , a food safety awareness program, was a good start toward food safety. The industry will rapidly move on to programs such as HACCP or ISO programs that are third party verified. Only vertically coor-

dinated systems can implement these programs on a scale that produces large quantities of these carcasses.

Marketing arrangements

Vertically coordinated systems have a unique challenge to define the costs versus the benefits of each input. Because of the complicated interactions between these inputs—and the inherent uncertainties of a biological system—establishing the financial reward for value created will be a dynamic process. The true added value will often not be defined until a product is actually available and consumers respond by purchasing that product at a higher price. Marketing arrangements, therefore, will be system-specific and will most likely require various methods to define added value.

The need for the swine industry to increase overall pork consumption, either via increased consumer acceptance and/or the displacement of other protein sources, does come at a cost; some of these costs include:

- Production
  - information systems;
  - genetic improvement (meat quality vs. production performance);
  - nutrition (meat quality vs. least cost formulations and/or best feed conversion);
  - pre-harvest handling (meat quality vs. efficient production and transportation); and,
  - food safety (added costs, monitoring, records).
- Packing
  - facilities (ramps, restrainers, stunners, coolers);
  - records (trolley ID, veterinary data capture, traceability systems); and,
  - marketing (new product development, system "brand value").

The new swine industry, therefore, will be a "pull through" system where the customer/consumer define meat quality/safety, and coordinated systems produce that desired product. This will not be an easy transition as there are many old paradigms that must be broken down and new ones created that involve partnership mentalities with trust.

Conclusion

In conclusion:

- "Pork food chain" systems will be market-driven and represent the future of the swine industry.
- The pork industry is moving from a commodity market to a "branded" market.
- The pork industry is moving to a point at which a large segment of the market will require special specifications, including segments like:
  - international markets;
  - large supermarket chains; and,
  - case ready.
- Third party verification of a system's process, such as the USDA Process Verification Program, will become increasingly important to assure the consumer that our product is safe, nutritious, and traceable.
- Independent producers will become aligned with a system.