

Lessons in Genetics from the Pork Industry—Jim Pillen

Introduction

Producing pork has been a passion of Pillen Family Farms since 1984 when I partnered with my father to raise 60 sows on dirt lots just northwest of Columbus, NE. We evolved into selling wean pigs and genetic multiplication in the 1990's, building our first 2500 sow farm in 1993 across the road from our home farm. Over the next two decades, we grew the business with two major goals in mind: create high quality jobs in rural Nebraska and sell 8 million lbs/sow/year. Today, Pillen Family Farms has grown to 75,000 sows farrow-to-finish. In 2018, we completed the final piece of vertical integration by purchasing the former Hormel packing plant in Fremont, Nebraska, via our ownership in Wholystone Farms. We take pride in the privilege and responsibility to feed 13 million people.

I became involved in the swine genetics business early in my career from two different avenues. From 1991 to 1996 I consulted as a veterinarian for a major genetic supplier within their nucleus operations located in Oklahoma. In addition, our production company became involved in the multiplication of gilts for sale to commercial pork producers. These experiences were extremely influential on my understanding of the value genetics can deliver, or not deliver, to a commercial producer. It became increasingly evident to me that a successful genetic program can have only one goal...to provide the genetic potential to achieve world-class performance for the pork producer. The belief I formulated then, and have retained to this day, is that a genetic program run by producers, for producers, is essential for the long-term success of the production businesses that compose our industry.

The opportunity to gain direct influence on the direction of a genetic program arrived in 2003 with the purchase of a small, local genetic supplier known then as Danbred North America. At the time, the company was tied to the Danish National Breeding program which was a producer-owned, producer-directed genetic program designed to purely serve the needs of the Danish producer. This approach to genetic improvement fit well with our beliefs about genetic suppliers and gave us the opportunity to gain influence on the product we were using every day in our commercial system and help U.S. producers gain access to world-class genetics. In 2012, our position was further solidified when we separated from Danbred and rebranded as DNA Genetics, also becoming an independent genetic supplier with complete control over the direction of the genetic program. Since the original purchase, DNA Genetics has grown to become the second largest genetic supplier in the U.S. and Canada with genetic influence on "2 out of 5 Strips of Bacon".

Today, I hope to share some lessons we've learned as pork producers that have driven us toward providing genetics that pork producers need to remain competitive.

The Best Pig Always Wins

It goes without saying that a genetic supplier needs to understand the end consumer and the product they desire. Pork must possess the quality attributes (taste, texture, tenderness, fat content, juiciness) that keep a consumer returning. However, to reach this end goal supply chain economics, particularly live production costs, are critical.

Over the last two decades, there has been a dramatic shift in terminal sires used at the commercial level. In 2003, we estimate that only about 30% of the pork produced in the U.S. was sired by a purebred Duroc boar. The remaining 70% of pigs were produced using Pietran and Hampshire-based terminal sires. This occurred because the industry made the shift to leaner pigs with higher cutability and the need for the producer to improve feed efficiency to better compete with poultry. The Pietran and Hampshire-based lines, at the time, delivered the carcass premiums and the cost of production demanded by the industry, whereas Duroc lagged. Producers essentially voted with their production costs on the type of sire line they would use.

The rise of the export market, and the profitability it represented, began a push for improved meat quality from packers and the Duroc could deliver this in a far superior way compared to the dominant sire lines at the time. The only thing holding the industry back from the switch was having a Duroc line that could deliver the production performance to compete, combined with the meat quality attributes the packers were pushing for. This is where the Duroc line available through DNA Genetics was on the forefront of driving the industry toward a Duroc sire. The focus on producer needs for performance in growth, feed conversion and carcass cutability had produced a Duroc line that could compete and win against the Pietran and Hampshire lines in these traits, but also brought superior pork quality.

Today we estimate that Duroc sires produce more than 80% of all market pigs and more than half of those (40-45%) are produced by the DNA Line 600 Duroc boar. The Duroc as a terminal sire has become the Angus of the pork industry. This transition would have never happened without identifying what the producer required to remain competitive. It was not meat quality that drove the change, it was the ability to produce the requested quality at the lowest possible cost throughout the supply chain that did. The lesson is to understand the true economics of your customer and center everything in the genetic program on making them successful.

Keep it Simple, but Do What it Takes

Creating competitive genetic progress is not a high-tech, difficult to understand formula. It is created by disciplined data collection on a large scale, accurate ranking of animals, selecting and retaining the best and culling based on data. There are no secrets in the genetics business. What differentiates suppliers is the discipline of implementing the fundamentals. Championship teams master the fundamentals

and execute them every play. The same is true in a genetic program and one must believe this and stay focused. It is the fundamentals that create the opportunity for applying technology when it makes sense to do so. Not implementing the fundamentals 100% of the time results in second place, at best.

One reality of genetic improvement is that the larger the nucleus herd size, the more progress is possible. This is due to measuring more animals and the associated improvement in accuracy of breeding values along with lower inbreeding and preservation of genetic variation over the long-term. To achieve competitive progress, we reduced our product lines to be derived from three nucleus populations: purebred Duroc, Yorkshire and Landrace. Our commercial pig is a Duroc terminal sire produced from a F1 cross of the Yorkshire and Landrace. We do not make space or time for other sire lines or a range of female lines. Maintaining large populations of these three nucleus lines allowed us to focus our genetic program and maximize genetic improvement within each for the benefit of the commercial producer. We do not try to make a pig for every situation, but one that is the best for the core of our business, and that wins a lot of games.

Be In Front of the Industry

Genetic improvement takes a long time to move from its creation at the nucleus to a commercial environment. Five to 7 years in a swine genetic pyramid. As a producer, in addition to taking care of the daily events we all cope with, we must be looking ahead and be ready to change to remain competitive. There are two examples of how we have been able to do this with our genetic supply.

First, the sow we use in our commercial operations had become more productive over time. Genetics had improved for pigs born alive and we were getting more pigs than we ever had before. However, we were working harder than we ever did before to wean those pigs and move them through our system. This required more skilled labor, which is always in short supply. We did not see this type of genetic progress letting up and we knew we had to move toward a sow that is more self-reliant and able to be highly productive on her own. We talked with a large range of customers representing a broad swath of the industry and we know we are not alone in our assessment of what the sow of the future had to look like. This resulted in undertaking a complete change in our selection program which began over eight years ago.

We wanted a highly productive female that produced large litters of uniform and large pigs that thrived in the pre-weaning environment, and weaned at a heavy weight. Weight at birth and weight at weaning were key drivers of survival both pre-weaning and in the nursery post-weaning. After a lot of debate and discussion, we landed on a 'keep it simple' goal. We wanted a sow that produced and weaned 14, 14-pound pigs at 21 days of age...and we wanted the sow to do this on her own. This goal became known as 14:14:21 and has become the driver of the genetic program.

Setting this as our target, we set about developing a selection program to hit that target. This included not only selecting for litter size, but forcing the additional pigs produced to be of higher quality by selecting sows that produce a larger pig at birth. Larger pigs have better pre-weaning survival rates. We implemented selection for teat count to improve the ability of a sow to nurse more pigs and began selection for sows that improved pre-weaning growth rate that resulted in a heavier pig at weaning.

Given what has been implemented, we can now predict from the genetic trend in each trait when we will hit our goal of 14:14:21. It is realistic that this will become our average sow in 8-10 years based on current genetic trends. A labor becomes more difficult, and more tools (like antibiotics) will be less available to us as an industry, the direction we are taking the sow line will leave us prepared as a producer to remain competitive in the industry of the future.

As a second example, our family decided in 2018 to forward integrate into the packing segment of the business through ownership in Wholystone Farms with their packing plant in Fremont, NE. This integration step was important for us to commit to, but is also a general viewpoint throughout the industry as the ties and ownership between production, packing and processing continue to become more coordinated. Being involved at this level of the pork chain provides insights that can be applied to our genetic program that will have a positive impact across the industry.

How this will impact the genetic program is still evolving, but we will clearly be moving from a program that is designed to 'drop the pig at the dock' to one that will involve the impact of genetics within the plant itself. This will likely include more emphasis on the yield of wholesale carcass cuts, meat quality and from a production standpoint, traceability of product. The value proposition will change which will in turn drive the genetic program we require to be successful.

Perhaps the lesson in both examples is the need to understand the direction of the industry, deeply understand the economics that are associated with a successful pork chain and to be bold enough to act so that the genetics required are available when the industry needs them

Conclusion

Producing food for the world is the noblest of professions. At a time when so much of what we believe in and do every day appears to be under attack, it is important that we persevere, educate and continue to produce food in a sustainable manner. Being involved in packing, production and genetics has been humbling, but also has given us a unique and comprehensive viewpoint to leverage and create value for the industry. At no time in our history of producing food have we produced so much abundance, with so small of input. Next year, we can all confidently make the same statement again. Genetics, world-class production and great people with great ideas will continue to keep this statement a reality.

Just remember, the best pig wins, keep it simple, but do what it takes, and keep looking ahead to stay in front.