PIC® Newsletter - Summer 2016

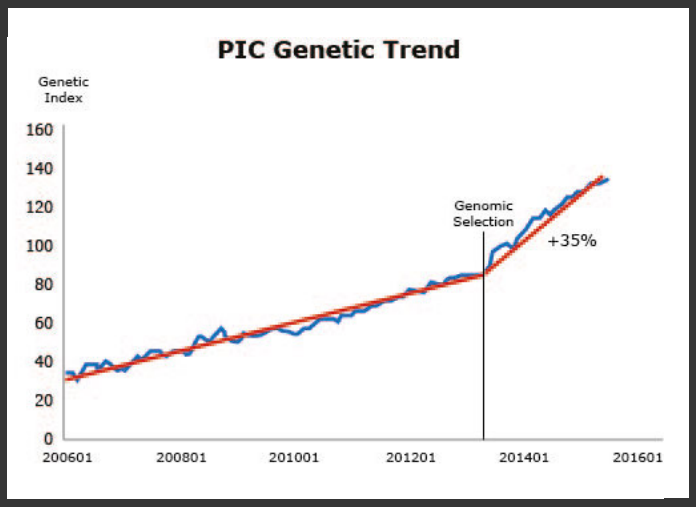
The next step-change in genetic improvement – Sequencing the PIC Genome

Relationship Based Genomic Selection

In 2013, PIC was the first porcine genetics company to utilise tens of thousands of genotypes per animal to increase annual genetic improvement across all lines and traits. This new way of selection, Relationship Based Genomic Selection, used our repository of millions of pedigrees and traits along with the new genotypes to improve all lines and all traits faster than ever before.

Three years into this process we are realising historically unprecedented genetic trends at the commercial pig level.

Our genomics programme only works with the vast database of unique traits valued by the pork supply chain. In addition to unique traits such as individual piglet birth weight, we will collect growth, FCR, lean, robustness, primal yield, and meat quality traits on over 170,000 commercially pedigree pigs composed of full-programme PIC maternal and terminal genetics during the next 12 months.



Through this programme we test every elite sire that impacts the global PIC genetic improvement programme.

While we believe these programmes are creating a sustainable pipeline of the most elite genetics for our customers, we continue to re-invest in the next wave of technologies that will allow our customers to expand their competitive advantage.

Sequencing the PIC Genomes

The genome of the domestic pig has around 3 billion nucleotides, similar in size to humans. Today, PIC captures a small portion of the sequence (around 80,000 locations) in our genetic improvement programme. Every young boar and its dam produced in PIC genetic nucleus farms are genotyped with this platform. However, if full sequence information were available we could increase genetic improvement at even a faster rate.

Ongoing sequencing work in humans has led to many breakthroughs in how to better understand

disease, make new and improved vaccines, identify more genes, and treat cancer to name a few. While these things have indirect and parallel benefits for animals, the vast amount of work in this area has improved the quality of sequencing technology and markedly driven down the cost of sequencing. Today, while still not practically affordable to sequence all PIC animals born into the genetic supply chain, we are investing heavily to better understand and exploit this technology.

In November 2015, we embarked upon a collaboration with the Roslin Institute to fully sequence the genome of over 14,000 PIC animals. These animals represent all terminal and maternal lines in the PIC gene bank with corresponding economically important performance data, which drive today's genetic improvement programme.

We believe there are numerous possibilities with this project. Minimally, we will be able to further enhance benefits in accuracy of Relationship Based Genomic Selection by having all genome sequence information possible from any one animal. Other possibilities include identifying resistance genes for diseases that challenge our industry. We will also utilise the findings to further understand new areas of epigenetics as well as maximising combining ability of specific genotypes for PIC commercial products. By re-investing in the future of genetic improvement in this multi-million pound project, we believe we will deliver the fastest genetic improvement to our customers in the history of PIC.

Martin Lewis wins TVC award

Martin Lewis won this year's Thames Valley Cambac Pig Marketing (TVC) Andrew Stockings Memorial Trophy sponsored by PIC for the highest percentage of finished pigs in the Q-box based on weight and backfat measure P2.

Martin farms 250 sows and 100 acres of arable in Herefordshire in partnership with his Father Malcolm since 1982, and is third generation Pig farmer.

The business has never previously used PIC genetics and 3 years ago Martin decided to make three significant changes to his business: He changed from a weekly farrowing system to five week batch weaning, he changed the herd vet to Annie Davis of the George Vet Group Malmesbury and also changed his genetics to PIC.

The farm has always produced their own gilts within herd, so GP1010's were bought in and crossed with GP1020 semen, more recently Martin has switched to the GP1020 gilt with GP1010 semen.

Using the Camborough as his commercial sow and the PIC337 sire line.

Martin commented "That following all the changes and upheaval it was good to now be seeing the benefit."

Martin is married with 3 daughters and cousin to Craig of PIC's Genetic Service team.

About TVC:
TVC is a leading Pig Marketing Co-operative in the United Kingdom. The Company was established in the mid 70's and markets farmers' pigs to all the leading processors in the United Kingdom.

Managing Late Breeders

Summary

The necessity to stay competitive forces producers all over the world to continually analyse their performance and costs to drive continual improvement. Small changes in some indicators can have a big economic impact. The occurrence of late breeders is one of the variables that should be reviewed, understood and fixed when the incidence rate increases or the interval becomes extended. In many situations the cause and subsequently, the solution, can be identified and targeted for improvement. The goal of this article is to provide definitions to better understand the implications of a longer weaning-to-service interval and also provide a set of practical interventions.

Introduction

A deep understanding of the cost structure, at every production phase, is required to thrive in volatile times. It is well known that after feed cost the second biggest input cost of the market pig is the cost of the weaned pig. Late breeders and procedures including skipping a heat increase the number of non-productive-days, negatively affecting the number of litters per sow per year, which in turn can decrease throughput and increase the cost of producing a weaned pig.

Definition

A late breeder is a sow that does not show oestrus within the first 7 days after weaning. It becomes an issue when its prevalence is > 1% of the average sow inventory at any given time, when breed back is < 90% or when the farm average wean-to-service interval is consistently > 7 days. Seasonality may play a role by depressing feed intake. When this reduction of intake is found, younger parity females are especially vulnerable to delayed return to oestrus and subsequently, may increase the occurrence in this group.

System Review

The table below summarises the most relevant points that should be reviewed and a set of meaningful interventions to address the issue.

Management Strategy	Standard	Intervention
Boar exposure & heat detection	> Sow to boar ratio: <200 > Boar quality: older than 11 months; high libido > Begin from: day of weaning > Frequency: 7 days a week > Man-power: enough for 1 full time employee to spend 1 hour/day per every 120 farrowings per week	> Plan annual boar replacement to have enough boars older than 11 month of age. > Keep boars in good physical shape by not over feeding them > Maintain boar libido > Do heat detection as early in the morning as possible > Make sure heat exposure and detection is getting done over weekends and holidays, starting same day of weaning

Management Strategy	Standard	Intervention
Management decisions	> Farms can skip sows after breed target is achieved and they are worth retaining > There is no KPI for skip-a-heat, but a lower number is always better > Quantify the cases and understand why females are skipped	> Achieving breed target: (a)Consider culling every P3+ that has not cycled after day 7 post-weaning; (b) high performing farms could consider culling every late breeder, if cost-effective > If approved by law and available in your region, pharmacological interventions can be utilised during critical season at weaning in P1s (ask your herd veterinarian)
Oestrus in farrowing	> Target is none > Potential cause: Poor lactation cycle associated with low litter sizes and/or low number of pigs nursed > Potential cause: Poor lactation cycle associated with nursing disruptions, generated by scours and too many untimely fostering events	> Load P1s with 14+ piglets from farrowing > Fostering done within day 1 and later around day 3-5 to take care of poor doing piglets > As much as possible, avoid fostering events after day 7 and minimise partial weanings or bump weanings
Feed usage and body weight dynamics	> Targeted feed usage depends largely on lactation length and nutritional profile. Assuming typical UK diets, gestation feed usage range goes from 720 to 815 kg/sow/year, while lactation feed usage is 370 to 465 kg/sow/year > Body weight in gilts at first breeding: 135 to 160 kg > Body weight at first farrowing: 135 to 160 kg (net weight so piglets and placenta excluded) > Body weight loss in lactation (P1) <5% > Fresh water always available. Flow rate in farrowing drinkers >½ gal per minute. Free access in weaning area > Full feed from farrowing to next breeding	> Make sure feed is always fresh and available > Flush water lines periodically during the hot weather > Wet feeding can be a good tool to increase feed intake in lactation but has to be well managed to prevent issues with feed quality > When facilities and flow allow, wean younger females to common barn areas that allow for specialised management and feeding > Check rectal temperature and aggressively treat fever in sows after farrowing
Stress avoidance	> Vaccinations in lactation and weaning-to-service period must be avoided > P1 grouped together both in farrowing and weaning area > Water and feed available in quantity and quality > Breeding area should be cool and dry	> Receive weaned sows in clean spaces > Individual treatment of any sow with condition that might impact feed intake (rubber mats, bedding material) > Minimise/avoid vaccinating sows when feed intake needs to be maximised (sows in lactation and weaned sows)
The wild cards	> Mycotoxins in feed > Ovarian pathology can be associated to individual cases but seldom to a massive incidence of late breeders	> Use mycotoxin binder when having diets with high level of mycotoxins. For reference www.extension.umn.edu/agriculture/swine/effects-of-mycotoxins www.food.gov.uk/business-industry/ farmingfood/crops/mycotoxinsguidance/animalfeed/ > Weaned sows should get min 14 hours at >250 lux of light

Justification & Interventions

A longer wean-to-service interval negatively impacts the litters farrowed per sow per year. The financial impact of this delay is strongly dependent on the geography, as it creates variations in feed, labour and facilities costs. Our experience suggests a decrease of 0.02 litters per sow per year with every additional day added to the wean-to-service interval for the farm. In terms of increased wean pig cost, and not considering the impact of the lost opportunity profit from unrealised pigs, the cost per inventoried sow is up by £5 to £8 per year, per every 10% of weaned sows that are late breeders.

PIC UK Ltd • Alpha Building • London Road • Stapeley • Nantwich • CW5 7JW
Phone 01270 616711