

# Differentiated Parity Management

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## Introduction

In our view, everything that sets up sows for good lifetime performance happens before first weaning. Many research groups (Foxcroft and Aherne, 2001; Dagorn et al., 1997; Caugant et al., 1999; Foxcroft et al., 2004) have looked at the impact of age at first estrus, weight at first estrus, backfat at first estrus and age at first mating. The conclusion of all these studies is that these factors had a low impact on first litter size and maybe some impact on longer retention in the herd. In another research review, Kirkwood and Aherne (1999) stated, “with the exception of extremes in the previous mentioned factors, these had not big influence on productivity and longevity of sows, but the care during the first gestation and lactation could be very important”. In reality, general body condition at first weaning is probably the most important factor for retention in the herd.

## The Goals

Last fall, a good friend and nutritionist, Michel Vignola from Shur-Gain, who is part of the team that developed the nutrition program for our system, summarized the situation very well in a technical bulletin (Vignola 2004). For him, in order of importance, these are the criteria for insuring long-term retention of gilts in the breeding herd:

- Full acclimatization of the animal prior to breeding.
- Breed gilts at the second estrus after puberty.
- Try to breed them between 135 and 145 kg of body weight (with a good protein body mass)
- Breed at a minimum of 190 days of age with an average of 200 to 230 days.
- Breed them with an average of 15 to 17 mm of backfat (this is probably the least important factor). In reality, the goal is 18 to 20 mm of backfat at first farrowing.

Looking at these criteria, in reality there is generally no argument about the first two, and the third one is needed in relation to the age at second estrus. Looking more closely at weight, if gilts weigh more than 140 kg at less than 175 days of age, they will probably not have good legs, and on the other hand, if they weigh less than 135 kg at more than 250 days, they will never survive in the herd.

This tells us that we need to avoid the extremes of growth rate in our gilt development programs.

In a system with optimum management, the key factor is to know exactly the weight, age and backfat at first mating for each animal. This enables management to adjust the gilt development program over time and also to adjust feeding regime during the first gestation. This is crucial to maximize feed intake during first lactation.

## **Parity Segregation**

So far, we have talked a lot about the requirements but we have not looked at how to make it happen. In our system, much has been learned with the implementation of parity segregation. For many reasons, almost 10 years ago, we elected to specialize the breeding herd based on parity rank, in a production system with 12,000 sows in production today (R. Robitaille Inc., Québec). Basically, the entire system is viewed as a large herd.

We have a dedicated barn for raising gilts, one for gilt breeding, one for gilt farrowing and P1 sow rebreeding, and several sow herds with P1+ sows. In these P1 + sow herds, replacements are brought in as re-bred P1 sow and are moved to the mature sow farms as P2 females at 50-70 days of pregnancy. Another very important component of this system is related to the fact that the progeny from P1 sows are raised in different buildings than the progeny of P2+ sows. In a nutshell, this is what we call “*parity segregation*”.

My aim in this review is not to discuss parity segregation, specifically, but to show how we have used this technology to help us in producing a good P1 sow at weaning. In reality, there are two choices; you take care of the gilts properly up to their first farrowing, or you do not. However, if you don't, do not expect exceptional results with them as P1 females, and even more important, for the rest of their productive lives.

Many people build gilt development units, have a specific section or building for gilts, and have special feed for first lactation, but still do not achieve good results. We believe this is because they do not consistently focus on the critical steps of good P1 management. We need to be committed to succeed. This is mainly what parity segregation management gives us. We are able to specialize staff on specific items, get results on a weekly basis, and are able to give feedback to our staff. All of this will keep staff motivation very high and would reward them.

## **Walking Through the Steps**

### **Acclimatization**

Usually today there is a considerable difference in health status between the donor herd and the receiving herd. The greater the difference is, the greater the challenge. In our mind, it is a must that any setback related to health challenges after acclimatization needs to happen before 130 days of age. After that time, health-related limitations in growth performance will interfere with sexual development. We are also seeking for an animal in which immunity will be well developed prior to introduction. Depending on the disease, this immunity could need as long as 100 days to develop.

In our system, we are using small, dedicated finishing barns operated on an all-in all-out basis. Our replacement gilts are moved into these buildings at around 25 kg body weight. Two weeks post-entry we perform serum injection of “seeder” pigs for PRRS. Two days post-inoculation, those seeder pigs are placed at the ratio of 1 per pen of 20 untreated gilts. We are using a strain of PRRS that is the most prevalent in our system. We also place the boars that will be needed subsequently for heat detection and also young vasectomized boars for subsequent boar exposure in these finishing barns.

## **Gilt Development**

In addition to this PRRS exposure, we are also doing other things to specifically improve gilt development:

- Giving them 0.9 square meters per animal in the finishing barn.
- Using a diet that will maximize protein deposition up to 135 days of age, followed by a diet that will lean more toward backfat deposition. Levels of minerals in these diets are also higher than what would be normally used for growing pigs.
- We focus on a specific light pattern after 150 days of age (16 hours a day).
- Ideally, we would like to perform boar exposure in these finishing barns after 150 days of age but we haven't found a way to do this yet.
- All the needed vaccinations (Parvovirus, as an example) is done toward the end of their stay in those barns.

## **Pre-Breeding for Gilts**

At an average of 185 days of age or 125 kg of body weight, gilts are moved to our gilt breeding barn. They are placed in pens of 10 equipped with self-feeders. Boar exposure is performed upon arrival, either with very good fenceline contact, or preferably with direct contact with vasectomized boars. Heat detection is performed twice a day and as soon as they are detected in heat, gilts are moved to the breeding area. At time of movement they are individually weighed to determine if they will be mated at the subsequent heat or if we will skip one more heat to achieve target weight (protein mass) at breeding. In the breeding area they are crated, but in crates equipped with self-feeders.

Gilts continue to be fed ad libitum until mating. All incoming gilts that have not shown estrus within 28 days after arrival will be automatically culled. In practice, for the past 3 months, 92% of our gilts have been detected in heat.

## **Gilt Breeding**

Because previous estrus date had been recorded, we know when the next estrus should happen. Boar exposure starts 3 days prior to this date. Estrus is detected twice a day in an attempt to accurately detect onset of estrus. First mating is done 12 hours after detection and then every 12 hours until the gilt is no longer standing. Our gilts are mated an average of 2.8 times per estrus.

Immediately after the last insemination, gilts are moved to the gestation barn.

At that time, they are weighed again and probed for backfat. We are using three different feeding regimes based on these results, and these feeding regimes continue for the first 100 days of gestation. We are using smaller gestation crates for the P1 sows. Our conception rate at first mating had been at 88% for quite a few years now.

## **Gilt Farrowing**

Around 80 days of gestation, gilts are moved to our gilt farrowing barn. A specific pre-farrowing vaccination program is used. At around 95 days of gestation, diet is increase by 1 kilo per day. If needed, they will be fed 2 or 3 times a day to maximize feed intake. We are currently investigating the possibility of using a specific diet for this pre-farrowing period.

At proper time, gilts are moved to the farrowing crates. We are also using smaller farrowing crates and a specific, denser, lactation diet. Gilt will be induced to farrow at 115 days of gestation (instead of 114 for mature sows).

After 6 days of lactation, if needed, milk replacer is added in the farrowing crate for the piglets. We are also routinely removing one or two piglets 2 days prior to the expected weaning date (we are weaning 3 times a week so practically we are removing those piglets at the previous weaning).

We are farrowing an average of 110 gilts per week in two different barns. We have averaged 11.5 total born for the last 6 months. Our average weaning age is 17.7, with an average piglets weaned of 10.1 and an adjusted 21-day weaning weight of 59 kg.

### **P1 Breeding**

At weaning, all P1 sows receive Regumate® for 5 days. This treatment starts the day of weaning. They are crated, fed ad lib using individual self feeders and kept on the same lactation diet. There is no boar exposure while they are on Regumate®.

When Regumate® is withdrawn, boar exposure starts. They are mated 12 hours after onset of estrus and inseminated every 12 hours until they stand.

90% of our P1 animals are showing estrus within 11 and 15 days post-weaning with an average of 13.8 days. Our conception rate for the last six months has been at 93%. Any P1 sows that have not shown estrus within 20 days after Regumate® treatment (25 days post weaning) are injected once with PG600. If they are not in heat within 10 days post PG600 injection, they are culled. Subsequent litter size (P2) is 12.5 pigs total born. Our culling rate after first parity is 18%.

Average sow parity for our entire system is 4.4 with a replacement rate of 48% including a mortality rate of 7.5%.

### **Are We Smart?**

The ultimate question is - are we smart? The answer is certainly - No. We just follow what should be done. There is tremendous research and literature published on this topic, we just don't argue with these results and try to find practical ways to implement these recommendations.

Do we get exceptional results? Certainly not, but we are getting good production results on a consistent basis. We are not smarter than anyone else and, from time to time, there is non-compliance with the ideal system developed for different reasons (usually related to elements not completely under our control), and we immediately see differences in results. Knowledge is there, this is just a matter of being focused, dedicated and on the farm day after day.

Specific management for gilts from 100 days of age to the mating for their second parity is a must to achieve good results. It doesn't matter if we manage a 100 sow unit or a 25,000 sow system, we need to find a way to apply the technology.

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