Gilt management for improved sow lifetime productivity

Jennifer Patterson (jennifer.patterson@ualberta.ca) and George Foxcroft, Livestock Gentec, University of Alberta

Key Points:

- Successful replacement gilt management starts at birth
- A low individual birth weight and a "Low litter birthweight sow phenotype" are key factors determining the efficiency of replacement gilt production
- Good gilt selection and pre-breeding programs remove early culling for reproductive problems as a factor in sow life time productivity

---

Gilt are the foundation of good production (Tubbs, 2015) and drive farm success (Ketchem and Rix, 2015). Low individual gilt birth weights have been linked to increased pre-weaning mortality (Magnabosco et al., 2015), poor growth until finishing, compromised ovarian and uterine development (Deligeorgis et al., 1985), fewer pigs produced over three parities and earlier removal from the herd (Magnabosco et al. 2016). At sow level, a low litter "birth weight phenotype"(BWP) carries all the same risks as a low individual birth weight, but as a "litter" trait. As part of a National Pork Board-funded project to investigate links between litter BWP and sow lifetime productivity (SLP) conducted in collaboration with Holden Farms Inc., litter BWP was determined over at least two successive parities. Multiplication sows (n = 651) were then classified as having either a low (L, < 1.18 kg, n=63), low-medium (LM, ≥1.16 to ≤ 1.36 kg, n=281), medium-high (MH, > 1.36 and ≤ 1.6 kg, n=254) or high (H, > 1.6 kg, n=53) average litter BWP. Low BWP sows produced progeny with limited survivability after birth, poor retention during gilt development, and overall had a lower efficiency of replacement gilt production. Although BWP had a significant effect on weight and growth rate at the time of Pre-Selection (170 days), when puberty stimulation commenced at around 182 days of age, BWP did not affect the days to recorded first estrus. Therefore, the growth performance of even the lighter gilts born did not delay the onset of pubertal estrus. Furthermore, for those low birth weight pigs that survived and were selected as replacements on the basis of a recorded pubertal estrus event, a low BWP did not affect total pigs born over four parities, or longevity in the sow herd. In contrast, gilts born in litters with a high BWP had lower retention rates in the sow herd.

Take home messages: Low birth weights affect the efficiency of replacement gilt production because these gilts either die, or are voluntarily non-selected because of relatively poor growth performance: However, if they survive, they have an equal chance of being bred and have better performance in the breeding herd that had high birth weight gilts.

Irrespective of gilt origin, earlier maturing gilts that have a recorded standing heat (HNS) within 30 days of starting boar exposure are the premium "Select" gilt population. They are inseminated earlier, have fewer non-productive days (NPD), are culled less due to reproductive problems, have higher farrowing rates, have more pigs born alive and are culled later (see Patterson and Foxcroft, 2019). To be reliable and cost-effective, the stimulation program must involve daily direct contact between the gilts and high libido boars: This maximizes the "boar effect" and drives the efficiency in the gilt development unit (GDU). Adequate resources need to be allocated to the GDU (staffing, facilities, focus and time) and daily records of GDU performance should drive key management decisions (e.g. PG600 intervention). Only breeding-eligible gilts with a recorded HNS should be delivered to the sow farm or moved to the pre-breeding area. Breeding gilts at 2nd or 3rd estrus, at a target body weight of 135-150 kg, and after utilizing at least a 14-day pre-breeding "acclimation period" during which gilts are essentially on full feed, are the next crucial steps in optimizing SLP.

Take home message: Individual recording of gilt performance in the GDU is as critical as, and has longer-lasting consequences than, individual recording of breeding sow performance after weaning.

References

Deligeorgis, S.G., P.R. English, G.A. Lodge and Foxcroft,G.R. (1985) Interrelationships between growth, gonadotrophin secretion and sexual maturation in gilts reared in different litter sizes. Animal Production Science. 41, 393-401.

Ketchem, R. and M. Rix. (2015) Does gilt performance dictate farm success? National Hog Farmer. http://www.nationalhogfarmer.com/animal-well-being/does-gilt-performance-dictate-farm-success.

Tubbs, J. (2015) Sow Longevity: it begins with the gilt. http://www.ohiopork.org/media/sow-longevity-gilts-ohio-swine-health-symposium-2015.pdf

Magnabosco, D., E.C.P. Cunha, M.L. Bernardi, I. Wentz and F.P. Bortolozzo. (2015) Impact of the birth weight of Landrace x Large White dam line gilts on mortality, culling and growth performance until selection for breeding herd. Acta Scientiae Veterinari. 43, 1274.

Magnabosco, D., M.L. Bernardi, I. Wentz, E.C.P. Cunha and F.P. Bortolozzo. (2016) Low birth weight affects lifetime productive performance and longevity of female swine. Livestock Science. 184, 119-125.

Patterson, J and G. Foxcroft (2019) Gilt management for improved sow lifetime productivity. Advances in Pork Production. 30. 145