# Gilt Development

A successful gilt development program is vital to a production system because it has a direct effect on reproductive performance and sow lifetime productivity. While many management practices such as boar exposure and estrus detection affect reproductive performance, a solid nutrition program is also required. This fact sheet will focus on bodyweight targets and nutritional program recommendations from weaning to first breeding.

## Nutritional Program Recommendations

A gilt nutritional program should be designed to meet the nutrient demands for adequate protein growth and bone and reproductive tract development. The gilt nutritional program begins at weaning and continues until the end of the first lactation. Designing the nutritional program should focus on avoiding nutrient deficiencies and preventing over conditioning upon entry into the sow herd.

Optimizing growth rate early in the gilts' life has been shown to be beneficial for lifetime productivity. During the preweaned stage, inadequate colostrum consumption after birth can lead to reduced growth rate. A reduction in growth rate during the preweaning stage could lead to delays in puberty attainment and negatively affect reproductive tract development (Vallet et al., 2016). Research has shown that creating smaller litters for gilts destined for the sow population post-farrowing to reduce suckling pressure is beneficial for preweaning growth rate, reproductive performance, and lifetime productivity (Flowers, 2019). Therefore, it is recommended to create smaller litters for gilts destined for the sow population to potentially benefit colostrum intake and lifetime productivity.

During the nursery stage, dietary nutrient recommendations should be similar to commercial pig requirements. This is because a reduction in postweaning gain can lead to decreases in successful mating and reproductive performance (Athorn et al., 2017). During the grow-finish period, ad libitum feeding of a grow-finish diet with moderate levels of energy and amino acids is recommended. This is because increasing the lysine:calorie ratio above normal grow-finish levels shows no evidence for effects on puberty onset or ovulation rate, while severe restriction can lead to delayed puberty (Calderón Díaz et al., 2015). Furthermore, severely restricting energy below growth and maintenance requirements in an effort to slow growth rate during rearing can lead to delays in the expression of estrus (Miller, 2011).

Dietary calcium and phosphorous concentrations fed from 50 to 300 lb should be increased compared to diets fed to commercial finishing pigs to maximize bone mineral content (NRC, 2012). Although this does not necessarily alter growth performance or effect structural soundness, it provides improved bone strength characteristics.

The age and body weight of gilts moved to the breeding herd from the gilt developer facility may affect how diets are formulated. If the replacement gilts are moved to the breeding herd well in advance of typical market weight, then development diets should be fed to match the needs of the growing gilt If replacement gilts are moved to gestation at regular market weight prior to first breeding, they are often switched to gestation diet. This is done in an effort to increase key vitamins such as choline, biotin, pyridoxine and folic acid that are necessary for embryo development. When gilts are moved to gestation before breeding, they are generally limit fed. In this case, approximately 2 weeks prior to breeding, feed intake should be increased by approximately 2 lb per gilt per day to increase energy intake. The increased energy intake can increase the number of eggs ovulated prior to breeding. This practice is commonly referred to as "flushing" (Whitney et al., 2010).

After breeding, feed intake should be adjusted to regular gestation levels to match her body condition. This should be done to avoid rapid weight gain during gestation and preventing over conditioned gilts entering their first lactation. Over conditioned gilts will have decreased lactation feed intake and negative subsequent reproductive performance.

## Body Criteria Targets Before 1st Breeding

Target body weight for gilts at breeding should be between 300 to 340 lb to optimize reproductive performance and longevity in the sow herd. This weight threshold is needed at breeding to ensure gilts will not lose excessive protein reserves during their first lactation. Gilts generally have lower lactation feed intake which results in increased mobilization of protein stores for milk production and can lead to decreased reproductive performance (Clowes, 2003). Furthermore, breeding gilts

at lighter or heavier weights can decrease total born over their entire lifetime or potentially result in increased stillborn pigs and lameness issues, respectively (Williams et al., 2005). Finally, backfat is not a reliable predictor of subsequent reproductive performance. This is because greater amount of backfat accumulation in gilts shows no evidence for an improvement in reproductive performance (Filha et al., 2010). Accumulating protein reserves is more important as increases in fat accumulation are lost by weaning after the first litter and excess losses in protein reserves can lead to decreased reproductive performance (Gill, 2006).

Therefore, bodyweight should be used as the target criteria before first breeding to optimize reproductive performance. Also, avoiding deficiencies or oversupply of nutrients in the diet helps achieve long-term reproductive success of gilts.

## References


Athorn, R.Z., K.L. Bunter, and J.R. Craig. 2017. Early lifetime performance parameters affecting selection and reproductive success in gilts. Animal Production Science. 57:2466-2466. doi:10.1071/ANv57n12Ab141

Calderón Díaz, J.A., J.L. Vallet, C.A. Lents, D.J. Nonneman, J.R. Miles, E.C. Wright, L.A. Rempel, R.A. Cushman, B.A. Freking, G.A. Rohrer, and C. Phillips. 2015. Age at puberty, ovulation rate, and uterine length of developing gilts fed two lysine and three metabolizable energy concentrations from 100 to 260 d of age. Journal of Animal Science. 93:3521-3527. doi:10.2527/jas.2014-8522

Clowes, E. J., F. X. Aherne, G. R. Foxcroft, and V. E. Baracos. 2003. Selective protein loss in lactating sows is associated with reduced litter growth and ovarian function. Journal of Animal Science. 81:753-764. doi:10.2527/2003.813753x

Filha, WS Amaral, M. L. Bernardi, I. Wentz, and F. P. Bortolozzo. 2010. Reproductive performance of gilts according to growth rate and backfat thickness at mating. Animal Reproduction Science. 121:139-144. doi:10.1016/j.anireprosci.2010.05.013

Flowers, W.L. 2019. Sow longevity and neonatal management. Proceedings of the London Swine Conference. 18:3-9.

Gill, B. P. Body composition of breeding gilts in response to dietary protein and energy balance from thirty kilograms of body weight to completion of first parity. 2006. Journal of Animal Science. 84:1926-1934. doi:10.2527/jas.2005-203

Miller, P. S., R. Moreno, and R. K. Johnson. 2011. Effects of restricting energy during the gilt developmental period on growth and reproduction of lines differing in lean growth rate: responses in feed intake, growth, and age at puberty. Journal of Animal Science. 89:342-354. doi:10.2527/jas.2010-3111

NRC. 2012. Minerals. 11th revised edition. National Academy Press. Washington D.C.

Vallet, J.L., J.A. Calderón-Díaz, K.J. Stalder, C. Phillips, R.A. Cushman, J.R. Miles, L.A. Rempel, G.A. Rohrer, C.A. Lents, B.A. Freking, and D.J. Nonneman. 2016. Litter-of-origin trait effects on gilt development. Journal of Animal Science. 94:96-105. doi:10.2527/jas.2015-9644

Whitney, M. H., C. Masker, and D. J. Mesinger. 2010. Replacement gilt and boar nutrient recommendations and feeding management. U.S. Pork Center Extension.142.

Williams N, Patterson J, and G.R. Foxcroft. 2005. Non-negotiables of gilt development. Advanced Pig Production. 16:1–9.