

ANIMAL SCIENCE

Title: Effects of Nutrition During Gilt Development on Sow Lifetime Productivity of Two Prolific Maternal Lines; **NPB #04-178**

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Date Submitted: May 16, 2008

Scientific Abstract: Reducing sow culling rates could greatly reduce costs of production in US swine herds. Little previous research has been done to determine whether management of gilts during the development period affects their subsequent longevity as sows. Gilts of two prolific lines that differed in lean growth rate were developed with ad libitum access to feed during the entire growing period or with daily restriction of feed to 75% of ad libitum from 123 d of age to breeding. The lines were LW/LR industry cross females or a cross of the NE selection line Line 45 with an industry maternal line (L45X). The same sires were used across both types dams of gilts so that project females of the two crosses were half sibs. Restricting intake reduced weight and backfat deposition similarly in both lines. Weights of gilts entering the breeding herd were 143.3 and 120.3 kg for LW/LR gilts developed with ad libitum or restricted intake, respectively, and 140.8 and 116.8 kg for L45X gilts. Tenth rib backfat depths at these weights were 2.79 and 1.90 cm for LW/LR and 2.88 vs 1.84 for L45X gilts. Significantly fewer LW/LR gilts developed with restricted feeding expressed pubertal estrus during the development period than LW/LR gilts fed ad libitum (78.0 vs 91.5%). Gilt management regimen did not affect the proportion of L45X gilts that expressed pubertal estrus (94.2 vs 97.1% for restricted and ad libitum fed gilts, respectively). Output per breeding female was greater for L45X gilts and for gilts developed with restricted intake. L45X gilts produced 2.37 ($P < 0.01$) more live pigs per breeding female through Parity 4 than LWxLR females. Gilts developed on the restricted feeding regimen produced 2.93 ($P < 0.01$) more live pigs per breeding female than those developed on the ad libitum regimen. When output was expressed per female with a Parity 1 litter, L45X gilts produced 0.79 ($P = 0.24$) more live pigs through Parity 4 than LW/LR. Females developed on the restricted feeding regimen produced 3.7 ($P < 0.01$) more live pigs than those with ad libitum access to feed. An increase in weight at 226 d was associated with increased likelihood of a Parity 1 litter only for L45X gilts developed with restricted feeding (increase in probability of $0.0068 \pm 0.0031/\text{kg}$ of weight). An increase of backfat at 226 d was associated with increased likelihood of producing a Parity 1 litter only for LW/LR gilts (ad libitum = $0.013 \pm 0.006/\text{mm}$; restricted = $0.031 \pm 0.009/\text{mm}$). Weight and backfat at Parities 1 and 2 did not affect the likelihood of another litter, but greater weight loss from farrowing to weaning a Parity 1 litter reduced ($P = 0.07$) the likelihood of a Parity 2 litter. Restricting intake during the gilt development period resulted in fewer gilts expressing puberty so that they could be mated at 2nd or later estrus by 235 d of age, but enhanced the lifetime production of females that entered the breeding herd.

These research results were submitted in fulfillment of checkoff funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer reviewed

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