

Title: Capturing genetic potential for greater sow lifetime productivity -
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Investigator: Dr. George Foxcroft, University of Alberta

Co-Investigators: Dr. William Flowers – North Carolina State University
Dr. Robert Knox – University of Illinois

Project Manager: Jennifer Patterson

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Scientific Abstract

A low litter birth weight phenotype reduces the retention rate of potential replacement gilts.

J. Patterson¹, G. Foxcroft¹, N. Holden², M. Allerson², A. Hanson², E. Triemert², L. Bruner³, J-C Pinilla⁴

¹Swine Research & Technology Centre, University of Alberta, Edmonton, Alberta, Canada, T6G 2E1;

²12346 Hall Avenue, Northfield, Minnesota, 55057; ⁴PIC Global Technical Services - Reproduction, Hendersonville, Tennessee, 37075

On the basis of data collected over at least two successive parities in the Preliminary Trial, nucleus/multiplication sows (n = 651) were classified as having either low (L, < 1.15 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 birth weight phenotype (ALBW_P). Within 12 h after birth, live gilts born to these sows (n = 7552) received a unique ear ID tag and retention rate (RR) was determined from birth until pre-selection to enter the breeding herd (pre-pubertal gilts at 170 d of age) having applied the standardized selection criteria. RR was analyzed as a Chi square using the PROC FREQ procedure of SAS. RR was lower (P ≤ 0.05) for L than for LM, MH and H sows within 4 d after birth (91.4, 94.1, 95.4, and 95.6 %, respectively), at 24 d of age (81.4, 84.5, 87.2,

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For more information contact:

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and 86.9 %, respectively), at 70 d of age (66.7, 75.4, 78.7, and 79.2 %, respectively) and at 170 d (42.6, 52.3, 55.3, and 56.2 %, respectively). As has been reported for low individual pig birth weights, retention of gilts born to sows with the L ALBW_P was compromised. Effects of L ALBW_P on final selection and on sow lifetime productivity was then determined, using standard selection protocols in GDUs with purpose-built BEAR facilities. ALBW_P did not affect the days to recorded first estrus or the proportion of gilts recoded in estrus. However, ALBW_P was positively associated with pubertal weight and estimated breeding weight, and negatively associated with retention in the breeding herd. Higher pre-selection growth rates, and long entry to service intervals are therefore seen as important risk factors for retention in the breeding herd. In contrast, ALBW_P did not affect the proportion of gilts selected and initially bred, or total pigs born over four parities. Two key factors therefore seem to affect the overall production outcomes on large commercial swine operations. Firstly, a low ALBW_P has implications for inefficient genetic transfer to the level of terminal-line production and the high relative maintenance costs of nucleus sows that produce very few replacement gilts in their productive lifetime. At the level of the production nucleus/multiplication unit, the ability to predict a low ALBW_P can be directed at strategic culling decisions. Secondly, implementation of highly efficient GDU/BEAR selection programs are needed to minimize entry-to-service intervals and to mitigate the risk that overweight gilts at breeding will have poor retention in the breeding herd.