

## ANIMAL SCIENCE

**Title:** Large scale SNP association analyses of feed efficiency and longevity – NPB #08-190

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### Scientific Abstract

Many traits financially important to hog producers are either expensive or time-consuming to measure or difficult to successfully select animals for based on low heritabilities. Feed efficiency and sow longevity are examples of such traits. If genetic markers can be used efficiently in marker-assisted selection (MAS) to improve these traits, producers would see a large impact on their profits. Feed efficiency and its relationship to growth and backfat were assessed in this genetic marker association study by analyzing residual feed intake (RFI), average daily feed intake (ADFI), average daily gain (ADG), and backfat (BF). Sow longevity depends significantly on the structural soundness of sows' feet and legs. Many feet and leg structure traits, such as overall leg action and front leg pastern conformation, were analyzed in the present study to address this objective. All traits were analyzed in Yorkshire and/or Landrace x Yorkshire crossbreds with a total of 1550 animals genotyped. Genetic effects were fitted using a Bayesian model averaging approach (Bayes-C) that simultaneously fitted various combinations of 250-325 SNPs (approximately 0.5% of the SNPs segregating in the population). Many well-known and newly discovered regions of significance were identified based on build 9 of the porcine genome during analyses for each of these traits. An example of a well-known gene is *MC4R* which was found again to be associated with ADFI, ADG, and BF in the current study. Hundreds of new regions of significance were also identified which will require more in-depth research to confirm their effects. Overall, results look promising for delivering markers for marker-assisted selection to benefit hog producers.

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