Use of IGF2 gene for carcass yield and pork quality in Canadian pigs

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Insulin-like growth factor 2 (IGF2) gene, located at the distal tip of chromosome 2, plays an important role in mammalian growth. Gene mapping studies have consistently indicated large QTL effect of IGF2 gene on carcass leanness. Recently, a single nucleotide regulatory mutation (SNP) in IGF2 gene has been identified to be the cause. This mutation in IGF2 gene has been reported to add 3-4% more lean meat to hogs.

The frequency and effects of this gene were studied by Canadian Centre for Swine Improvement (CCSI) to develop strategy and guidelines for using the gene in the Canadian swine industry. As part of the ongoing research, DNA samples from 274 AI boars and 255 purebred barrows and gilts have been tested. More samples from breeders across Canada are in the process. The results obtained so far shows that both lean and fat alleles are segregating in the Canadian pig population. The frequency of the fat allele was 17.5% and 4%, respectively among Landrace and Yorkshire AI boars tested. The frequency in the purebred pigs tested so far was 24%, much higher than that in AI boars. The pigs were also tested for carcass and meat quality at the Lacombe Research Centre of AAFC. Those carrying two copies of the lean allele (IGF2+/+) had lower backfat thickness, higher lean depth, and larger loin eye area. There was no significant effect on marbling and drip loss while the meat colour was slightly lighter. These results are consistent with the forgoing studies in Europe and USA.

This gene has important practical implications for the pig industry because it has large effects. Boars tested for IGF2 gene can be used to either increase or decrease the backfat and lean yield in market hogs. The gene tests will help producers to produce hogs with desired level of leanness according to the needs of the packing plants.