Pig Leanness Insulin-like growth factor 2

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Pig Leanness Insulin-like growth factor 2 gene status in South Africa

The Large White and Landrace are the predominant pig breeds used in the South African industry. Due to consumer demands, selection of leaner pigs receive attention in selection programmes. IGF2 is an imprinted gene, paternally expressed with a positive association with an increase in lean yield.

The aim of this study was to investigate the effect of the IGF2 gene in the two South African populations with regard to meat and fat quality traits. The first phase of the study was to determine the frequencies of the IGF2 genotypes in South African pig populations. Frequencies varied from as high as 95% of the G/G genotype in the Duroc to as low as 9% of the A/A genotype in the Large White. IGF2 genotypes were determined to generate sufficient progeny that were finished at a slaughter weight of 100 kg.

Carcass, meat and fat quality traits were measured. For the majority, of meat quality traits (pH, water-holding capacity, colour, eye muscle area, drip loss, thiols and thiobarbituric acid reactive substances), the IGF2 genotypes did not differ significantly ($P<0.05$).

There was significant genotype effect on warm and cold carcass weights where the A/A genotype had lower weights compared to the G/G genotype.

The pH values varied from 5.8 to 6.10, indicating the absence of pale, soft exudative meat. The G/G genotype displayed differences ($P<0.05$) with a mean value of 5658 mm^2 for eye muscle area where the G allele is associated with more fat. Colour measurements for 24 hours post mortem were not different between the IGF2 genotypes ($P>0.05$).

The colour measurements from 1 to 7 days' post mortem increased across all breed* genotype combinations for b* and Chroma measurements. Warner Bratzler shear force displayed differences ($P<0.05$) for the IGF2 genotypes. The G/G genotype displayed more tender pork. Fat free dry matter of belly fat was the only significant measurement with a genotype effect where the A/A genotype had the highest percentage of 9.18%. The G/G genotype had a higher

mean value for fat content in muscle compared to backfat in this study, although not significant in the number of samples tested. Interesting to note that the A/A genotype tended to have more fat in the belly. The IGF2 genotypes were significant for the SFA's (C15:0, C16:0, C17:0 and C20:0) in belly fat where the A/A was higher compared to A/G and G/G genotypes. The double bond index and iodine values were higher in A/A genotypes which is consistent with leaner animals. Results of this study is comparable with other studies showing that IGF2 did not have any negative effect on meat and fat quality traits.

This study has highlighted that there is potential for using IGF2 gene as a genetic tool for selection of leaner pigs.