Thesis Abstract

Endogenous Insulin-like Growth Factor I (IGF-I) in Growth and
Reproductive Performance of Boars (*Sus scrofa* L.)
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Insulin-like Growth Factor I (IGF-I) is a 7.6 kDa, 70 amino acid residue peptide hormone that has been shown to be involved in the metabolic regulation of growth and reproduction in livestock. The present study was undertaken to quantify the concentrations of plasma free IGF-I in growing and senior purebred boars and determine whether the plasma free IGF-I concentration can be used as a selection criterion for growth and reproductive traits. A total of fourteen (n= 14) Landrace boars were bled, weighed and monitored for ADG, backfat thickness and scrotal length at 15 and 24 weeks of age. Plasma samples were extracted from the blood and plasma free IGF-I concentrations were measured using the DSL 10-9400 Active free IGF-I Enzyme-Linked Immunosorbent (ELISA) kit. Eleven (n= 11) senior purebred boars (i.e. Duroc=2; Pietrain=4; Large White=2 and Landrace=3) were bled at the same period and the extracted blood plasma were also analyzed for concentrations of plasma free IGF-I using the same ELISA kit. Experimental Landrace boars data on live weight, ADG, backfat thickness and scrotal length were correlated with their levels of plasma free IGF-I. While data of semen characteristics and reproductive performances of the senior purebred boars were also correlated with their plasma free IGF-I levels.

This study has demonstrated a significant decrease (P= 0.0001) in the circulating plasma free IGF-I concentration of Landrace boars from 15 to 24 weeks of age. Furthermore, correlation of plasma free IGF-I concentration with growth traits showed a positive association with ADG (r= 0.72575) while negative associations were established with backfat thickness (r= -0.41236), scrotal length (r= -0.700016) and live weight (r= -0.57916). Plasma free IGF-I concentration was also found to be significantly higher (P= 0.0097) in breeds of leaner body composition (i.e. Pietrain and Duroc vs Large White and Landrace) among purebred senior boars. More so, plasma free IGF-I showed no significant associations with the semen characteristics and reproductive traits except for the Litter Size Born Normal (LSBN) of the purebred senior boars. Results of this study suggest that circulating plasma free IGF-I is related to leaner body composition and to certain extent reproductive traits in swine.