

87 Effect of sire estimated breeding value (EBV) for growth rate on correlated pork quality traits. C. E. Wagner*¹, E. Huff-Lonergan¹, A. A. Sosnicki^{2,1}, S. B. Jungst², and S. M. Lonergan¹, ¹*Iowa State University, Ames*, ²*PIC North America, Franklin, KY*.

Variation in pork quality attributes like water holding capacity and tenderness continues to reduce value of fresh pork. The objective of this study was to investigate if genetic selection of sires for improved growth rate is associated with changes in fresh pork quality. A pig population derived from the cross between a commercial line of Duroc sires and white line dams was subdivided according to the sires' estimated breeding value (EBV) for age at 125 kg. Differences in age at 125 kg was achieved by slaughtering pigs sired by High EBV growth boars (n=48), Low EBV growth boars (n=48) or a control group (n =32). Loin pH and temperature decline curves were monitored on each carcass. Fresh pork quality characteristics and water holding capacity were monitored at 2 d postmortem. Sensory traits (juiciness, tenderness, chewiness, flavor, and off-flavor) and texture (star probe) were measured 10 d postmortem. Proteolysis was estimated by desmin degradation and μ -calpain autolysis at 2 d postmortem. Pork quality data were analyzed in a one-way analysis of variance by sire EBV group for growth. Progeny were divided into groups based on sire EBV group into a High EBV group and Low EBV group. Correlations among quality data were evaluated for both groups. Drip loss was correlated to all measurements of pH in the High EBV group and all except 6hr pH in the Low EBV group. Drip loss was also correlated to age at 125 kg in the Low EBV group, but was not correlated in the High EBV group. Drip loss was not correlated to any indices of proteolysis in either group. Juiciness was correlated to 2 h pH in the High EBV group and 24 h pH and 10 d pH in the Low EBV group. Similar correlations for juiciness and age at 125 kg were observed for both the High and Low EBV groups (.252 and .366, respectively). Juiciness was correlated to μ -calpain autolysis in the High EBV group but not the Low EBV group. Tenderness was similarly correlated with 24hr pH for both the High and Low EBV groups (.248 and .270), and was also correlated to 48 h and 10 d pH in the Low EBV group. Tenderness was correlated to indices of proteolysis (calpastatin activity and μ -calpain autolysis) in the High EBV group but not the Low EBV group. Chewiness was only correlated to 24 h pH in the High EBV group, but was correlated to 2, 6, and 24 h and 10 d pH in the Low EBV group. All indices of proteolysis (calpastatin activity, μ -calpain autolysis, and desmin degradation) were correlated with chewiness in the High EBV group but not the Low EBV group. Star probe was correlated to 48 h pH in the High EBV group and 24 h pH in the Low EBV group. Star probe was also correlated to calpastatin activity and presence of 78 kDa μ -calpain subunit in both the High and Low EBV groups (.320 and .278; .283 and .234), and also presence of 76 kDa μ -calpain subunit in the High EBV group but not the Low EBV group. The results demonstrate the complexity of inheritance and genetic correlations among pig growth and muscle/meat quality characteristics. It is plausible to reason that pork water-holding capacity and sensory characteristics are dependent on a combination of particular genetic background/breeding program and individual genetic predisposition of the animal for growth performance.