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## Meat and Muscle Biology™



## Effects of Sire Line, Slaughter Weight, and Gender on Pork Quality and Yield Characteristics

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## Objectives

The U.S. swine industry has placed a premium on lean growth to meet growing consumer demand for lean, affordable pork products. At the same time, growing global demand for pork as well as increased penetration of pork into the foodservice market has led to emphasis on genetic lines of pigs that produce high quality pork products. As the U.S. pork industry continues to grow it is important to understand how slaughter weight impacts carcass value in lines of pigs selected for lean growth and those selected for meat quality.

## Materials and Methods

In this study, lean yield line (LYL) and meat quality line (MQL) boars were mated to PIC C-42 females to determine the effects of sire line, gender, and slaughter endpoint on carcass quality and yield attributes. Three pigs within a litter and gender category were randomly assigned to slaughter weights of 113, 136, and 159 kg. Upon reaching their assigned weight, pigs were slaughtered under inspection. A total of 108 offspring from 18 litters were evaluated. After slaughter, loin pH was measured and carcasses were chilled at  $-2^{\circ}\text{C}$ . After 24 h, loin pH<sub>u</sub>, carcass muscle score (CMS), carcass length, tenth rib back fat (TRBF), last rib back fat (LRBF), loin eye area (LEA), NPPC color and marbling scores, and Hunter L\* a\* b\* were measured in the longissimus muscle. Carcasses were fabricated, and primal and subprimal weights were recorded. After fabrication, samples were removed from the loin for proximate composition, drip loss, and Warner Bratzler and slice shear force (14 d aged) determination. Skinless belly dimensions (length, width, and depth) and firmness were recorded. Data were analyzed using GLM procedures with the main effects and interactions of sire line, gender, and slaughter endpoint and LSMEANS were separated using LSD.

## Results

The LYL had higher ( $P < 0.01$ ) CMS than the MQL, but the MQL had longer ( $P = 0.01$ ) carcasses than the LYL. The MQL had more ( $P < 0.01$ ) TRBF and LRBF than the LYL. LEA and LRBF increased as weight increased ( $P < 0.01$ ), along with an increase ( $P < 0.01$ ) in TRBF from 113 to 136 kg. The LYL gilts had darker ( $P < 0.05$ ) loin color scores than the MQL gilts. As expected, the MQL had higher ( $P < 0.01$ ) marbling scores than the LYL, with no differences ( $P = 0.29$ ) noted across slaughter endpoints. Hot carcass weight was heavier ( $P < 0.01$ ) for the MQL vs. LYL. Primal weights and boneless cut yield increased ( $P < 0.01$ ) as slaughter weight increased. The LYL exhibited greater ( $P \leq 0.03$ ) cut yields when expressed as a percentage of side weight than the MQL for the lean cuts; however, the MQL exhibited greater ( $P \leq 0.05$ ) cut yields than the LYL for the fatter cuts. The LYL and gilts had a higher ( $P < 0.01$ ) percent fat free lean than the MQL and barrows, respectively. Lipid content was higher ( $P < 0.01$ ) in the longissimus from the MQL vs. LYL and barrows vs. gilts. Slice shear values were lower ( $P = 0.01$ ) for the LYL than the MQL, but Warner Bratzler shear did not differ.

## Conclusion

Consistent advantages in lean yield existed in the LYL compared to the MQL. Increasing slaughter weight increased the pounds of boneless cuts; however, due to fat accumulation, increasing slaughter weight negatively impacted lean yield for both lines. No quality differences were found as carcass weight increased; however the MQL carcasses had higher marbling scores than the LYL. Advantages in meat quality were not as consistent across sire lines as were advantages in yield.