

PORK QUALITY

Title: Frequency and effects of the Napole Gene in the U.S. Pork Industry
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Ohio State University Pork Quality Study - Phase I

Abstract

Improvement of meat quality is one of the primary goals of the pork industry. Many genetic and environmental factors contribute to the quality of fresh and processed meat products. The dominant Rendement Napole gene (RN) has been found to have both positive and negative effects on pork quality. Currently, the best method for classification of animals as RN positive (RN⁺RN⁺, RN⁺rn⁺) or RN negative (rn⁺rn⁺) is the glycolytic potential test (GP). High glycolytic potential indicates that the animal is a carrier of the RN gene. This study investigates the effect of GP on pork quality traits for a population of 523 post-mortem *longissimus dorsi* samples from the 1998 National Barrow Show Progeny Test. Animals were classified as RN positive (n=23), or RN negative (n=500), based on a GP threshold of 160 μ moles lactate equivalents per gram for the population bimodal distribution. Objective muscle quality measurements, subjective taste panel characteristics, carcass measurements and performance traits were collected on each animal. All animals utilized for this analysis were free of the stress gene. Residual correlations between GP and ultimate pH, Instron tenderness, water holding capacity, cooking loss, and Minolta color score were -.54, .12, .22, .25 and .29, respectively. RN positive pigs (n=23) had significantly ($p \leq .001$) higher glycolytic potential (182.3 vs 109.5 μ mole/g) than RN negative pigs (n=500). RN positive pigs also had significantly ($P < .01$) lower pH (5.4 vs 5.6), poorer water holding capacity (.054 vs .037 mg), greater cooking loss (22.7 vs 19.3%) and paler Minolta color (25.0 vs 23.3) than RN negative pigs. No statistical differences were found between normal and RN carrier pigs for Instron tenderness, juiciness and tenderness scores. No differences were also observed for backfat, loin muscle area, or average daily gain between the two groups. Breed was a significant source of variation for all traits evaluated. Berkshire and Chester White breeds exhibited significantly ($p < .001$) lower GP values than Hampshire samples. The results of this study agree with previous research indicating that high GP values are associated with lower pH, poorer water holding capacity, higher cooking loss, and paler color. The differences in GP across breeds warrant future studies to determine the relationship of GP with muscle quality and sensory traits.

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