



The Effects of Improvest on Carcass and Belly Quality: A Meta-Analysis

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Objectives

Immunological castration (with Improvest, *gonadotropin releasing factor analog-diphtheria toxoid conjugate*) provides an effective alternative to physical castration. Although meta-analyses have been conducted to evaluate the effects of immunological castration (IC) on live performance, these reviews have not evaluated the effects on carcass cutability and belly quality. Therefore, the objective was to evaluate the value of Improvest through a meta-analysis of carcass attributes.

Materials and Methods

Pigs in all studies were administered Improvest according to manufacturer's recommendations. To ensure relevance to U.S. packers, only studies utilizing U.S. cutting standards were included. A total of 7 studies were used to determine the effect of Improvest on carcass cutability and belly quality characteristics. Lean cutting yield (LCY) was defined as: $LCY = [\text{carcass cutting yield components} - \text{natural fall belly}] / \text{chilled side wt} \times 100$. Carcass cutting yield (CCY) was determined using the following equation: $CCY = [(\text{whole ham} + \text{trimmed loin} + \text{Boston butt} + \text{picnic} + \text{natural fall belly} + \text{spare-ribs}) / \text{chilled side wt}] \times 100$. To evaluate the effects of HCW of IC barrows on carcass cutting yields, IC barrows were grouped by HCW as light (< 90.9 kg), average (90.9 to 97.7 kg), or heavy (> 97.7 kg). The effect of HCW in PC barrows was not estimated. Belly thickness was calculated as the average of eight individual thickness measurements. Commercially processed bacon slicing yield was determined using the equation: $\text{No. 1 slice yield} = (\text{sliced wt} / \text{cooked wt of belly}) \times 100$. A 5 yr average of primal prices was used to calculate total value difference between carcasses of equal weights from IC

and PC barrows using carcass cutting yield estimates from this meta-analysis. Data were analyzed using the MIXED procedure of SAS (SAS Inst. Inc., Cary, NC) with fixed effects of Improvest treatment or HCW group. Study was included as a random effect.

Results

Lean cutting yield of IC barrows was 1.39% units greater ($P < 0.0001$) than PC barrows (70.89 vs. 69.50%). Similarly, CCY of IC barrows was 1.23% units greater ($P < 0.001$) compared with physically castrated (PC) barrows (86.80 vs. 85.56%). Therefore, based on CCY, value of IC barrows was increased by \$2.44 compared with PC barrows. As HCW of IC barrows increased, both CCY and LCY declined linearly ($L; P < 0.01$), with lighter IC barrows having a 1.46% unit advantage in CCY compared with heavy IC barrows ($P < 0.01$). Natural fall bellies of PC barrows comprised a greater ($P < 0.05$) percentage of side weight than those from IC barrows (15.80 vs. 15.50%). Bellies from IC barrows were thinner ($P < 0.0001$) than PC barrows, but thicker ($P < 0.03$) than gilts (3.55 vs. 3.83 and 3.23 cm). Slicing yield of bacon from IC barrows was 3.43% less ($P < 0.0001$) compared with PC barrows (84.24 vs. 87.66%). However, belly yield and slicing yield differences were minimized when IC barrows were marketed at a heavier weight.

Conclusion

Improvest increased CCY and LCY compared with PC barrows. However, this cutability advantage decreased as IC barrows were slaughtered at heavier weights. Bellies from IC barrows were thinner and had reduced bacon slicability compared with bellies of PC barrows, however these differences were minimized when IC barrows were slaughtered at heavier weights.