EFFECT OF TERMINAL SIRE LINE AND TIMING OF IMMUNOCASTRATION ON PERFORMANCE, CARCASS, AND MEAT QUALITY

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I. OBJECTIVES

In past decades, pig breeding companies in Europe have focused strongly on producing the highest quantity of lean meat at the lowest cost. A side effect of this intense selection towards leanness is a lowered eating quality of the pork. The intention to stop surgical castration in the European Union makes the meat quality issues even more prominent. In this respect, immunocastration could offer an alternative for entire male production to guarantee acceptable meat quality. However, more insight is needed into the effect of timing of the second vaccination and the influence of the genetics used to further optimize this alternative for meat quality as well as carcass quality.

II. MATERIALS AND METHODS

This study aimed to evaluate the effect of timing of the second vaccination of Improvac® (Zoetis, Belgium) (V2) in crossbred fattening pigs of 3 different terminal sire lines on lean meat content and meat quality traits ($pH_{35min\ pm}$, drip loss, intramuscular fat [IMF]) of the loin. A homozygous stress positive (*RYR1*) (BP+) and homozygous stress negative Piétrain sire line (BP−) of Belgian origin and a Duroc sire line of Canadian origin (CD) were included for comparison. Within BP+ and BP−, there were 4 treatment groups: gilts (G), and immunocastrates (IC) with a V2 at average pen weight of 55 kg (IC_{early}), 70 kg (IC_{middle}), and 90 kg (IC_{late}). Within CD, there were 3 treatment groups: G, and IC with V2 at 65 kg (IC_{middle}) and 85 kg (IC_{late}). Across 5 rounds, 440 animals were selected and allocated to these 11 treatment groups. Twenty animals per treatment were selected to assess meat quality. For all analyses, pen was used as the experimental unit. A linear mixed model was used with sire line and treatment group and their interaction as fixed factors and cold carcass weight as covariable. Slaughter date and pen number was included as random effect to account for repeated measurements within pens. A Tukey post hoc partial F-test split per sire line and treatment group was used to compare means in order to deal with the unbalanced experimental setup.

III. RESULTS

Lean meat content was significantly higher for BP+ and BP− compared to CD within the treatment groups ($P < 0.05$). For meat quality, $pH_{35minpm}$ was significantly lower for the BP+ compared to BP− and CD within all treatment groups ($P < 0.05$), except within IC_{late} ($P = 0.103$). Drip loss differed between sire lines: in the case of IC_{late}: CD < BP+ and BP− ($P < 0.001$); IC_{middle} and G: CD ≤ BP+ ≤ BP− ($P < 0.05$); and IC_{early}: BP− < BP+ ($P = 0.052$). IMF was higher for CD compared to BP+ within IC_{middle} and compared to BP+ and BP− within G ($P < 0.05$), whereas there was no effect of sire line within IC_{early} ($P = 0.669$) or IC_{late} ($P = 0.102$). Lean meat content differed between treatment groups: for BP+: $IC_{early} \leq IC_{middle} \leq IC_{late} \leq G$ ($P = 0.003$); BP−: $IC_{early} \leq IC_{middle}$ and $IC_{late} \leq G$ ($P = 0.006$); and CD: $IC_{early} \leq IC_{late} \leq G$ ($P = 0.017$). There

was no effect of treatment group on the meat quality traits ($pH_{35min\ pm}$, drip loss, and IMF) (all $P > 0.05$).

IV. CONCLUSION

In general, meat quality was best in offspring of CD, followed by BP−, and was the lowest for BP+; however, BP+ and BP− had the highest lean meat content. Meat quality did not differ significantly between G and IC, nor between IC treatments. Lean meat content was higher for G compared to IC, and a trend to a lower lean meat content with a longer interval between V2 and slaughter was observed.

Keywords: gilts, immunocastrates, pork quality, terminal sire line, timing immunocastration