Immunological castration of fattening gilts using Vivax® consistently results in increased feed intake and weight gain

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Introduction

Immunization against GnRF using Vivax® (Zoetis), also called Improvac®, Improvest® and Innosure®, is recently used in fattening gilts to suppress ovarian function and occurrence of estrus. As in males, immunocastration in females is associated with an increase in appetite and weight gain, offering potential production benefits.[1,2] A program of production studies provided the opportunity to look in detail at the consistency and magnitude of these effects.

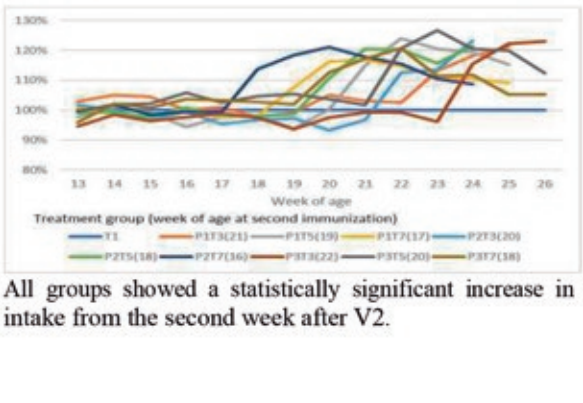
Materials and Methods

The program was conducted in three phases, each being a separate batch of gilts, with slaughter ages of 25, 24 and 26 weeks respectively. Each phase included 480 animals randomly allocated to 8 groups of 60 at 12 weeks of age. 4 (those shown) were fed *ad libitum* and 4 were feed restricted. T3, 5 and 7 all received two doses of Vivax® with the second (V2), which produces immunocastration, at 4, 6, and 8 weeks pre-slaughter respectively. Age at time of V2 consequently ranged from 16 to 22 weeks. T1 groups remained untreated. Gilts were housed by treatment in pens of 5, with pens randomly distributed. Feed consumption per pen was recorded daily and average feed intake per pig calculated weekly. Pigs were weighed weekly.

The 3 phases used different slaughter ages and were done at different times under different environmental conditions. Results of daily mean feed intake and body weights were therefore analyzed using a general linear mixed model with repeated measures by phase, respectively. The average daily weight gains were calculated from the analysis of body weights in the period from V2 to slaughter and comparison was made between treated groups and their own phase control in each phase.

Results

Figure 1 shows feed intake progression over time. Figure 1. Mean feed intake (weekly) of gilts in groups T3, T5 and T7 from phases (P) 1, 2 and 3, expressed as a percentage of the within-phase T1



All groups showed a statistically significant increase in feed intake from the second week after V2.

Table1. Summarizes the impact on weight gain. Average daily weight gain (ADG, kg) of ad lib fed gilts in the period from V2 to slaughter.

	ADG	ADG T1	% change
T3 (period 4 weeks pre-slaughter)			
Phase 1	0.958	0.883	+8.5*
Phase 2	1.148	0.966	+18.9**
Phase 3	1.025	0.841	+22.0**
T5 (period 6 weeks pre-slaughter)			
Phase 1	0.940	0.872	+7.8**
Phase 2	1.079	0.969	+11.4**
Phase 3	1.031	0.912	+13.1**
T7 (period 8 weeks pre-slaughter)			
Phase 1	0.921	0.895	+2.8
Phase 2	1.046	0.961	+8.8**
Phase 3	0.996	0.920	+8.3**

*P≤0.05, **P≤0.01.

Conclusions and Discussion

In all immunized groups feed intake rose rapidly from the second week after V2, typically peaking at over 120% of the control group after 3 to 4 weeks, but remaining substantially higher at 8 weeks. There was no obvious impact of age at V2 on the response pattern. Immunization also consistently increased ADG after V2, although less so in Phase1, where growth performance generally may have been impacted by hot and variable weather. The relative improvement appears to decrease with increasing time from V2 to slaughter, although the lower benefit is applicable to a longer period.

From a production perspective, immunocastration of gilts offers a reliable way to increase feed intake and growth. Impact on feed conversion will be discussed elsewhere and may be positive, neutral or negative depending on the balance of ADFI and ADG effects. The higer impact of IC on ADG seen with a shorter V2 to slaughter period (T3) may increase the likelihood of FCR improvement. Timing of treatment relative to slaughter and feeding regimen are both variables that can be manipulated to achieve production objectives and maximize profitability.

References

1. Bohrer, B,M, et al. 2014, J of Animal Science 92, 4719-4724.
2. Rodrigues, L.A. et al. 2019, Animal 13, 1326-1331.