

# IMPROVAC® IMMUNIZED BOARS COMPARED TO SURGICAL CASTRATES: CONTROL OF BOAR TAIN AND GROWTH PERFORMANCE

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## Introduction

International competition is driving the pig meat production chain to invest more in food safety, animal welfare, traceability and leaner animals. Raising intact male pigs for meat production eliminates the need for surgical castration and enables better production efficiency when compared to castrated pigs. However, consumer acceptance of fresh pork from intact male pigs is hindered by the taint compounds. Androstenone (a steroid produced by testes) and skatole (produced by bacteria in the gut) have been recognised to be the major causes of taint (Babol *et al.*, 2002). This study was conducted to evaluate the efficiency of Improvac®, a vaccine directed against gonadotrophin – releasing factor (GnRF), to control boar taint and to allow improved growth performance by rearing entire male pigs rather than surgically castrated male pigs.

## Materials and Methods

**Animals.** A total of 48 male pigs, 18-22 days old, initial weight 4.2 – 8.5 kg, from the same farm and genetic origin were allocated systematically according to presentation order into two experimental groups (T01-24 surgically castrated and T02-24 Improvac® vaccinated). Improvac® was administered subcutaneously as two 2mL doses; the first dose at about 15 weeks and the second dose at about 19 weeks of age. Two critically ill pigs from group T01 were withdrawn from the study.

**Production performance.** At the end of the experimental period the following parameters were evaluated: mean weight (MW), average daily weight gain (ADG), feed efficiency (FE), and meat yields (MY) in half carcass.

**Slaughter.** The animals were kept in the evaluation station for 20 weeks then slaughtered in a commercial abattoir at 23 weeks. The chilled carcasses were transported to the Meat Technology Centre and prepared for boning purposes according to the methodology described by Walstra and Merkus (1996).

**Evaluations.** Serum testosterone analysis was performed according to Nunes (1982). Skatole and androstenone fat assays evaluations followed the methodology modified by Oliveira *et al.*, (1999).

**Statistical analysis.** The statistical design was based on randomised block design blocked on pen location. Mean of weights, feed efficiency, average daily weight gain, carcass evaluations, and androstenone levels were analysed using general linear models with terms including the fixed effect of treatment group and the random effect of block, assessed at 5% significance level.

## Results and Discussion

Table 1 contains the results of the boar taint compounds for both treatment groups. Only two animals (both in group T02) had a testosterone value above the limit of detection (0.1 pg/mL). No animals in either group had a value for skatole above the accepted sensory threshold limit of 0.2 µg/g (Desmoulin *et al.*, 1982). There were no significant differences between Improvac® vaccinated and surgically castrated pigs for androstenone levels, which were under the accepted sensory threshold limit of 1.0 µg/g (Bonneau *et al.*, 1993), confirming the efficiency of the Improvac® vaccine. Improvac® vaccinated pigs had a significantly higher mean weight, higher average daily weight gain and better feed efficiency, and higher meat yields than surgically castrated pigs (Table 2). This agrees with the results of Meccauley *et al.*, (2003) who reported that Improvac vaccinated pigs may be a means of maintaining high weight gain in the period while maximizing growth performance in finishing boars. Carcass weight was higher in T02 but not significant. Moreover, there was an increase in the amount of meat in some commercial cuts such as leg ( $P=0.052$ ), tenderloin ( $P<0.05$ ), shoulder, belly, and ventral part of the belly ( $P<0.05$ ), representing economical advantages for the pork industry since both markets, fresh and processed products, are reached simultaneously.

## Conclusions

Improvac® was highly effective in controlling boar taint compounds and in suppressing testosterone to levels comparable to those normally found in surgically castrated pigs. Improvac® boars had a significantly better mean weight, average daily weight gain, feed efficiency, and total meat yield compared to surgically castrated pigs.

**Table 1:** Serum testosterone, skatole and androstenone fat values.

Evaluations	Surgically Castrated (n=22)*	Improvac Vaccinated (n=24)	P Values
Testosterone (pg/ml):			
< 0.1 n (%)	22 (100%)	22 (92%)	N/A
0.4 – 2.2 n (%)	0 (0%)	2 (8%)	
Skatole (µg/g):			
< 0.2 n (%)	22 (100%)	24 (100%)	N/A
Androstenone (µg/g):			
Geometric mean	0.32	0.28	0.37

\* Two critically ill pigs from the surgically castrated group were withdrawn from the study.

**Table 2:** Growth performance values.

Production Parameters	Surgically Castrated	Improvac Vaccinated	P Values
Mean Weight (kg)	124.41	137.76	0.0025
Average Daily Gain (kg/day)	0.851	0.944	0.0032
Feed Efficiency	2.467	2.237	<0.0001
Carcass Weight (kg)	103.82	108.93	0.09
Meat Yields	26.640	29.057	0.0052

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