

DUROC AND PIETRAIN CROSSES: BOAR TAINT AND DRESSING LOSS

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Skatole levels in fat were lower in DLY crosses compared with PLY crosses, whereas PLY had the lowest androstenone level. Dressing loss was highest among DLY crosses, regardless of whether the pigs were fed liquid feed or dry feed.

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Abstract

This report presents results for dressing loss and boar taint recorded in randomized samples from offspring of DanBred Duroc boars or German Pietrain boars crossed with DanBred LY sows. These analyses constitute part of a comprehensive trial investigating productivity differences between DanBred Duroc and German Pietrain boars. Productivity results are published separately [6, 7].

Analyses revealed differences between DLY and PLY crosses that may affect the value of the pig:

- Skatole levels in fat were lower in DLY pigs and there was a tendency to lower rejection rates due to skatole than among PLY pigs. However, androstenone levels in fat were lower among PLY (there is today no international agreed rejection limit for androstenone).
- DLY crosses had a greater dressing loss than PLY crosses, regardless of feeding strategy.

Background

It is crucial that DanBred pig producers are able to produce finishers with the largest profit possible under conditions that benefit animal welfare and comply with environmental requirements. For decades, the combination of Duroc boars and Landrace and Yorkshire hybrid sows (DLY) has been

the preferred combination in Denmark and is still the one used by most Danish pig producers today. In some European countries, however, in particular Germany, Spain, France, Belgium and the Netherlands, many pig producers use Pietrain as sire line. Pietrain is a popular breed known for a high lean meat percentage, and some slaughterhouses pay an extra bonus for finishers if pig producers can prove that they are sired by Pietrain boars.

The aim was to analyse boar taint in offspring of German Pietrain vs DanBred Duroc boars and to determine dressing loss in PLY and DLY crosses.

Materials and method

This report presents the analysis results for dressing loss and boar taint recorded in randomized samples from offspring of DanBred Duroc boars or German Pietrain boars crossed with DanBred LY sows. This constitutes a part of a comprehensive trial investigating productivity differences between DanBred Duroc and German Pietrain boars. For this trial, finishers were produced using either German Pietrain or DanBred Duroc boars crossed with DanBred LY sows (PLY, DLY) and fed liquid feed restricted, ad lib pelleted feed or ad lib meal feed. For detailed information on farms and production routines, see trial report no. 1160 [7].

Boar taint

The male pigs originated from only one farm. In each litter, half of the pigs were castrated, and the other half remained intact. Androstenone and skatole levels in one fat sample from each male pig were analysed at the DMRI Technological Institute using the HPLC method [4]. Today, skatole levels are used for determining whether to reject a male pig due to boar taint, but in the future, both skatole and androstenone levels are expected to be included in the assessment as both compounds contribute to boar taint.

Dressing loss

Dressing loss and slaughter factor were analysed for individual pigs selected randomly at birth in three herds. These pigs were weighed at 08:00 the day before slaughter, and dressing loss was determined on the basis of live weight the day before slaughter compared with carcass weight recorded at the slaughterhouse. The farms practised one of the following feeding strategies:

1. Liquid feed meal, restricted
2. Dry feed meal, ad lib
3. Dry feed pellets, ad lib

Statistical analyses

Skatole and androstenone were logarithmically transformed to normalise residual variations and were subsequently subject to analysis in a linear model with carcass weight and breed as covariates, and random effect of slaughter day. Estimates were transformed back and are presented as medians.

Dressing loss was subject to analysis in a linear model with cross, farm and gender as explanatory variables.

Results and discussion

Boar taint

The lowest skatole level was found in DLY pigs, but the average level was very low for both crosses. With the current rejection limits for skatole of 0.25 ppm, rejection rates were 3% for DLY and 7% for PLY. Androstenone levels in fat were averagely 0.8 ppm higher in DLY pigs compared with PLY (table 1). Both compounds affect boar taint. Today, androstenone levels are **not** used to reject male pigs at slaughter in Denmark, and there is **no** internationally agreed rejection limit for androstenone.

Table 1. Male pigs; analyses of skatole and androstenone shown as median (ns= not significant, tendency $0.05 < P < 0.10$)

	DLY	PLY	Significance
Pigs	146	164	
Carcass weight, kg	81.4	81.5	Ns
Skatole (ppm)	0.04	0.07	$P < 0.05$
Skatole > 0.25 ppm, %	3	7	$P = 0.07$
Androstenone (ppm)	1.70	0.92	$P < 0.0001$

Dressing loss

Results showed no interaction between farm and cross-combination (table 2). Dressing loss was higher among DLY crosses compared with PLY crosses, regardless of feeding strategy (table 3). The correlation between live weight and carcass weight differed significantly: 1.32 for DLY and 1.30 for PLY (SEM 0.03), corresponding to a dressing loss for DLY of 24.2% and for PLY 23.1%.

The values for DLY crosses correspond with findings in previous studies comparing crosses and purebreds where pigs were also weighed the morning before slaughter. These studies found a correlation of 1.31 between live weight and carcass weight and a dressing loss of 23.7%, though at a carcass weight of only 70 kg [5].

Table 2. Dressing loss and slaughter factor, based on weight the day before slaughter and carcass weight, effect of feeding strategy/farm (one using pelleted feed, two using dry meal feed and one using liquid feed), and cross (estimates and SEM).

Feeding strategy	Duroc				Pietrain			
	Ad libitum			Restricted	Ad libitum			Restricted
	Dry pelleted	Dry meal (1)	Dry meal (2)	Liquid meal	Dry pelleted	Dry meal (1)	Dry meal (2)	Liquid meal
Pigs	36	135	35	106	53	139	32	113
Live weight, kg	118	117	116	112	109	110	112	110
Carcass weight, kg	88	88	89	86	83	85	88	86
Dressing loss, %	25.4	24.7	23.2	23.2	23.8	22.7	21.4	21.8
Live weight: slaughter weight ratio (STD)	1.34 (0.054)	1.32 (0.032)	1.31 (0.033)	1.31 (0.051)	1.32 (0.048)	1.30 (0.057)	1.28 (0.021)	1.28 (0.041)

Table 3. Slaughter factor based on weight the day before slaughter and carcass weight, DLY and PLY crosses (estimates and SEM)

	Cross	
	Duroc	Pietrain
Live weight:slaughter weight ratio (STD)	1.32a (0.003)	1.30b (0.003)

a,b: values with different superscripts are significantly different between farms and within cross ($p < 0.05$).

Conclusion

DLY male pigs had lower skatole levels in fat compared with PLY, and they also had the highest androstene levels. The lowest dressing loss was found among DLY crosses, regardless of feeding strategy.

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