

Poster presentation

Selection against boar taint: a simulation study

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Introduction

Quality of food in terms of health and taste has high standards in the Western society and consumers do not accept meat with an off-flavour. Therefore in most of Europe, castration of male pigs shortly after birth is done to prevent the production of meat with an unfavourable odour and flavour, the so called 'boar taint'. However, castration is a surgical intervention which is of growing concern in the society and becoming an issue for animal welfare.

Boar taint and underlying components are heritable (Table 1) which implies possibilities for breeding against high levels of boar taint in a population.

The goal of this study is to show, in a simulation study, the possibilities to select against boar taint.

Materials and methods

Purebred pig populations were simulated in the program SelAction [1].

The following heritabilities and percentages of boar taint were used:

- $h^2 = 0.2$, percentage boars with boar taint = 20%; group 22

- $h^2 = 0.4$, percentage boars with boar taint = 20%; group 42

- $h^2 = 0.2$, percentage boars with boar taint = 30%; group 23

- $h^2 = 0.4$, percentage boars with boar taint = 30%; group 43

The following assumptions were made: 5 years of selection, 500 sows, 30 breeding boars, 470 production boars, litterindex 2.2, 3500 boar piglets, selection on ADG (average daily gain) and BF (backfat), per year 75% culling (in the selection for breeding) because of other reasons (eg. exterior, inbreeding, etc). The selection trait is the odour detected by an electronic sensor or by a panel. Boar taint

Table 1: Published heritability of boar taint and underlying components.

Component	h^2 (range in literature)
Boar taint ¹	0.13 to 0.54
Androstenone ²	0.13 to 0.87
Skatole ³	0.19 to 0.34

¹ Jonsson and Pederson, 1974; Jonsson and Pederson, 1979

² Bonneau and Sellier, 1986; Fouilloux et al., 1997; Jonsson and Pederson, 1974; Jonsson and Pederson 1979, Johnsson and Joergensen 1989; Sellier and Bonneau 1988; Willeke et al., 1987

³ Pedersen, 1998

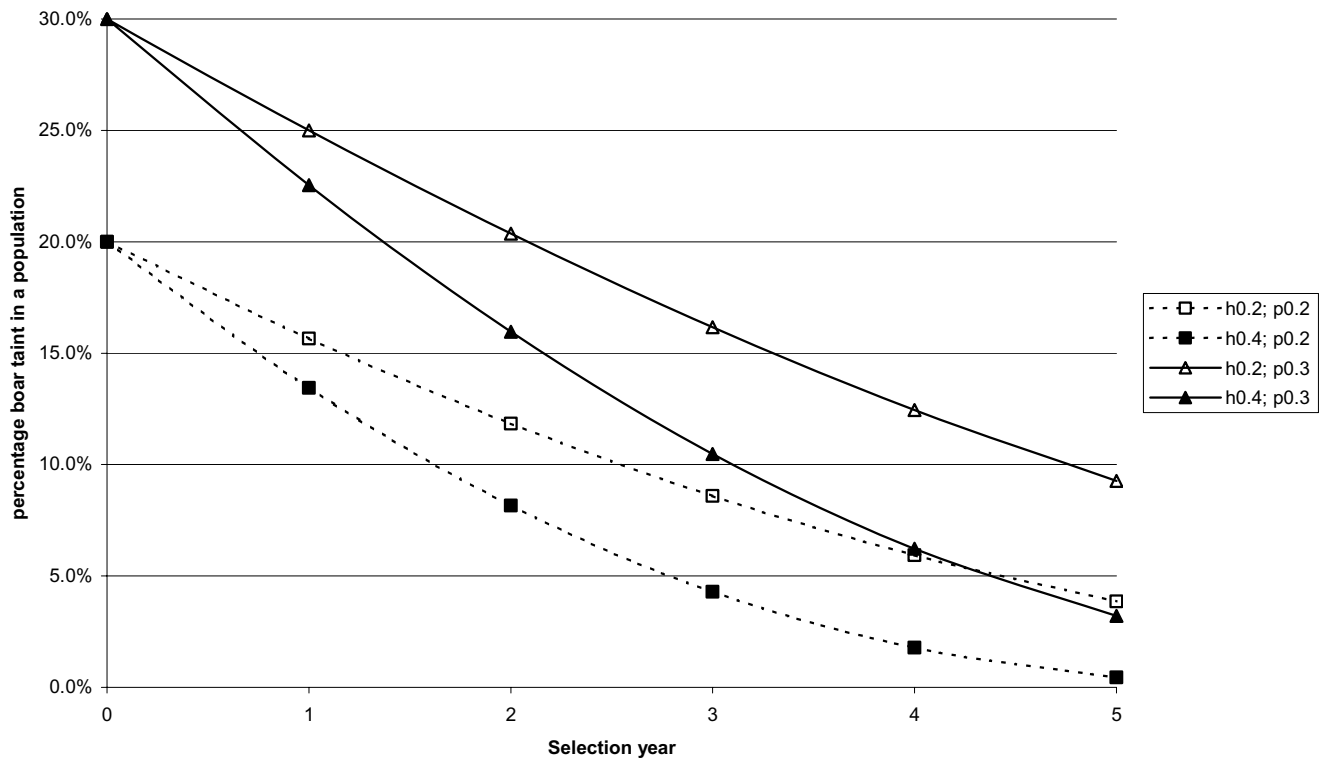


Figure 1 Four populations ($h^2 = 0.2$ or 0.4 ; and percentage of boar taint in the population of $p = 0.2$ or 0.3) during 5 year of selection against boar taint.

is a binomial trait with the variation = $p * (1-p)$ in the population. Genetic correlations with production traits are assumed.

Results

The percentage of boar taint can decrease with a maximum of 5.7%, 8.6%, 6.6% and 7.5% in the first year of selection for the populations 22, 42, 23 and 43, respectively.

After 5 years of selection there is simulated that there are 3.9%, 0.5%, 9.3% and 3.2% boars with boar taint left in the population for 22, 42, 23 and 43, respectively (Figure 1). Under the restriction of keeping 80% of the genetic improvement of growth and backfat.

Conclusion and Discussion

This simulation study shows that it is possible to select against boar taint.

This simulation is done in 1 population but slaughter pigs are a combination of 3 to 4 lines. Therefore, selection should take place in all lines; this will increase the cost of selection against boar taint. Correlated response on reproductive traits was ignored.

References

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