The value of commercial farm-management data to evaluate Pietrain boars for vitality and robustness

W. Gorssen, N. Buys and S. Janssens

KU Leuven, Livestock Genetics, Department of Biosystems, 3001 Heverlee, Belgium

Problem definition and objective

Modern pig farmers desire easy to manage and economically efficient animals. Drivers for this trend are globalization, climate change and an increased public concern in animal health and welfare.

Breeding more viable and robust pigs can offer a solution. However, selection is usually restricted to sow lines.

This research investigated the option of selecting on terminal Pietrain boar lines to improve the vitality of crossbred offspring via commercial farm management data.

Results

1. Vitality scores have a low to intermediate heritability (11,0%).
2. No adverse genetic correlations between vitality scores and reproduction parameters were observed.
3. Changing the genetic standard deviation (σ_a) of vitality one unit upwards, improves the mean vitality with 7,9% (Genetic Coefficient of Variation; GCV).
4. The genetic sire effect was responsible for 24,1% of the explained variance. Substantial genetic progress can be made by selection on terminal Pietrain boars.

Genetic parameter	Vitality score	TNBA	NBD
h^2 (hpd)	11,0% (2,7-19,3)	6,5% (1,1-12,2)	14,2% (7,2-21,4)
% Explained variance sire	24,1%	8,8%	14,5%
GCV (hpd)	7,9% (3,9-10,5)	6,2% (2,5-8,5)	4,3% (3,1-5,3)

Table 1. Genetic parameters of the investigated traits vitality score, Total Number Born Alive (TNBA) and total Number Born Dead (NBD). Heritability (h^2) and Genetic Coefficient of Variation (GCV) are given with 95% highest posterior density (hpd) values between brackets.

Conclusions

Selection in terminal boar lines has a great potential to improve pig vitality

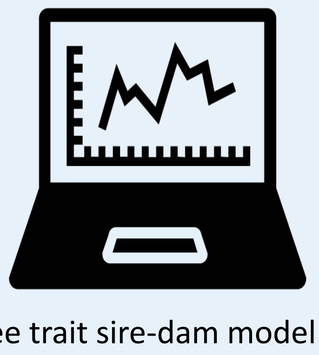
Commercial farm management data are abundantly available and can be implemented in breeding programs

Dataset	
Scored litters	5937
Period	January 2016 – May 2018
Pig farms	6
Pietrain boars	732
Commercial sows	2708

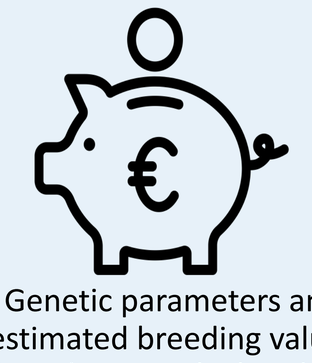
Table 2. Metrics of the used dataset. A full pedigree (up to 15 generations) was available for Pietrain boars. For commercial sows, pedigree was available up to 2 generations.

Methods

Litters were ordinally scored within 24 hours after birth by the same person per commercial farm from 0 (low vitality) to 5 (high vitality). Litter data were available via online farm management system Cercosoft.



Three trait sire-dam model was analyzed via Thrgibbs1f90. Fixed effects were farm, year-season, sow parity and gestation length.



Genetic parameters and estimated breeding values (EBVs) were calculated for Pietrain boars. EBVs were implemented in breeding scheme of Vlaamse Pietrain Fokkerij vzw.

Wim Gorssen
wim.gorssen@kuleuven.be

Flanders
is agriculture and fisheries

VPF

Research funded by the
Vlaamse Piétrain Fokkerij vzw

KU LEUVEN