

Longitudinal feed intake deviations at the pen level as a resilience indicator for pigs

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Problem definition and objective

Modern pig farmers need resilient and easy to manage animals. Drivers for this trend are intensification and an increased public concern in animal health and welfare.

Breeding more resilient pigs can offer a solution. However, phenotyping resilience is challenging and costly, especially on the individual level.

This research investigated feed intake deviations of groups of fullsib and halfsib pigs as a potential indicator for resilience. Genetic parameters were estimated, and pen feed intake deviations associated with health and welfare related traits.

Results

- 1. The resilience trait $lnMSE_{FI}$ had a low heritability (11.8%)
- 2. Large effect of common environment (44.5%)
- 3. Moderate genetic correlation with feed intake ($r_g=0.59$): scaling effect?
- 4. Low correlations which were not significantly larger than zero with health and welfare related traits, such as mean pen tail wound score, mortality and lameness

Table 1. Metrics of the used datasets and heritability estimates.
A full pedigree (up to 15 generations) was available for the 352 Piétrain sires.
For the 679 commercial sows, pedigree was available up to 6 generations.

	Dataset
Evaluated pens between 2020-2023	704
Group feed intake records	16,669
Pens with scored abnormalities	152
Evaluated age trajectory	90-160 days

Conclusions

Deviations in pigs’ group feed intake has low heritability, but large environmental impact

Unclear relationship between pen level feed intake deviations and pigs’ resilience: more research needed

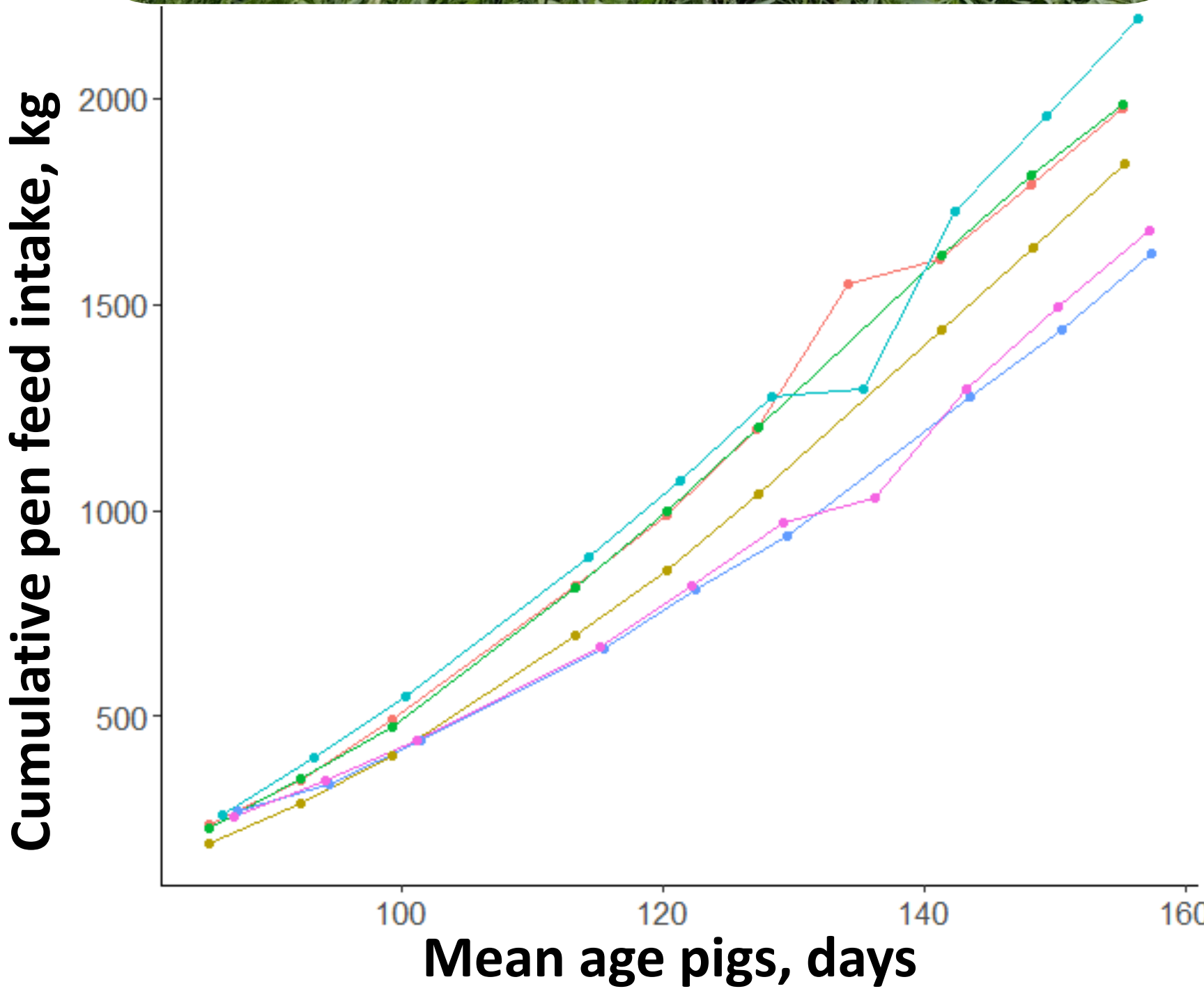
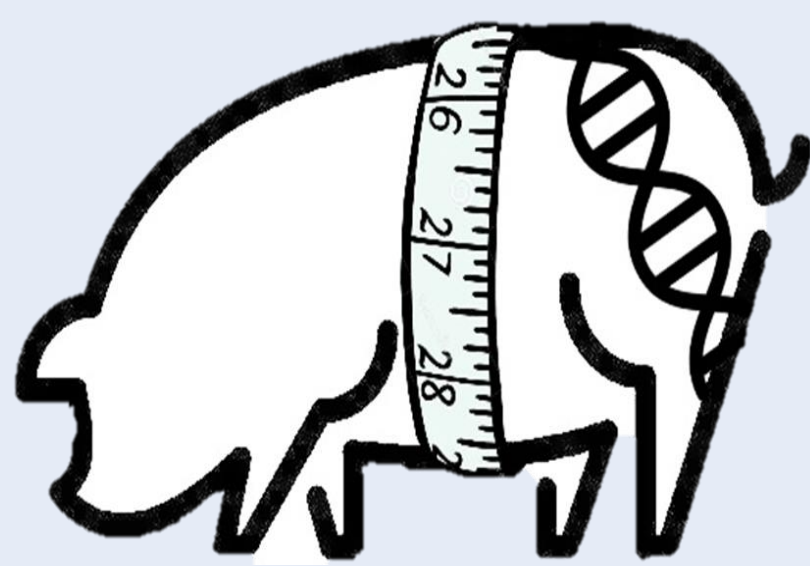


Figure 1. Cumulative pen feed intake (kg) versus the mean age of pigs (d). Different pens are colored and show variable levels of feed intake deviations.

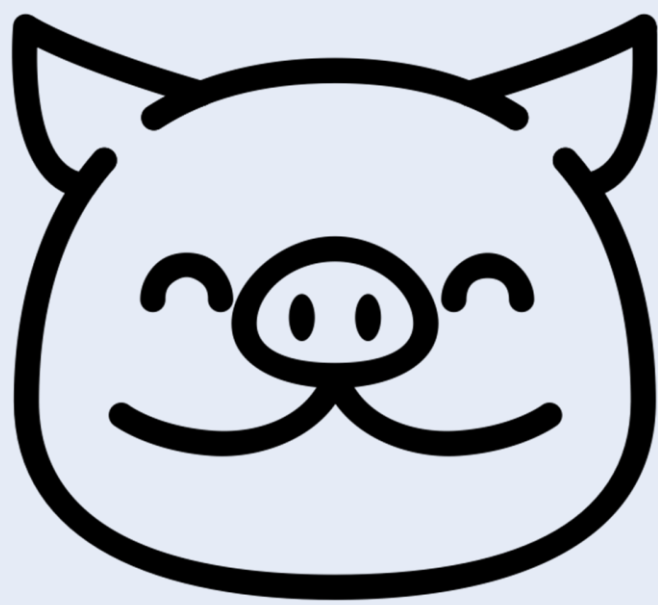
Methods



Group feed intake of pens of 7-15 finishing pigs (fullsibs and halfsibs with same Piétrain sire) were recorded via an automated feeding system. Pigs were manually weighed at entrance and before slaughter and carcass quality traits were collected at slaughterhouse. Health and welfare traits were scored by a trained professional during weighing for a subset of 152 pens.



Resilience trait $lnMSE_{FI}$ was calculated as the natural logarithm of the mean squared error of predicted vs observed pen feed intake after linear modeling. Genetic modeling via remlf90.



Correlation with health and welfare related traits estimated. Evaluated traits were tail and ear biting wounds, lameness, mortality, umbilical hernias and hematomas



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