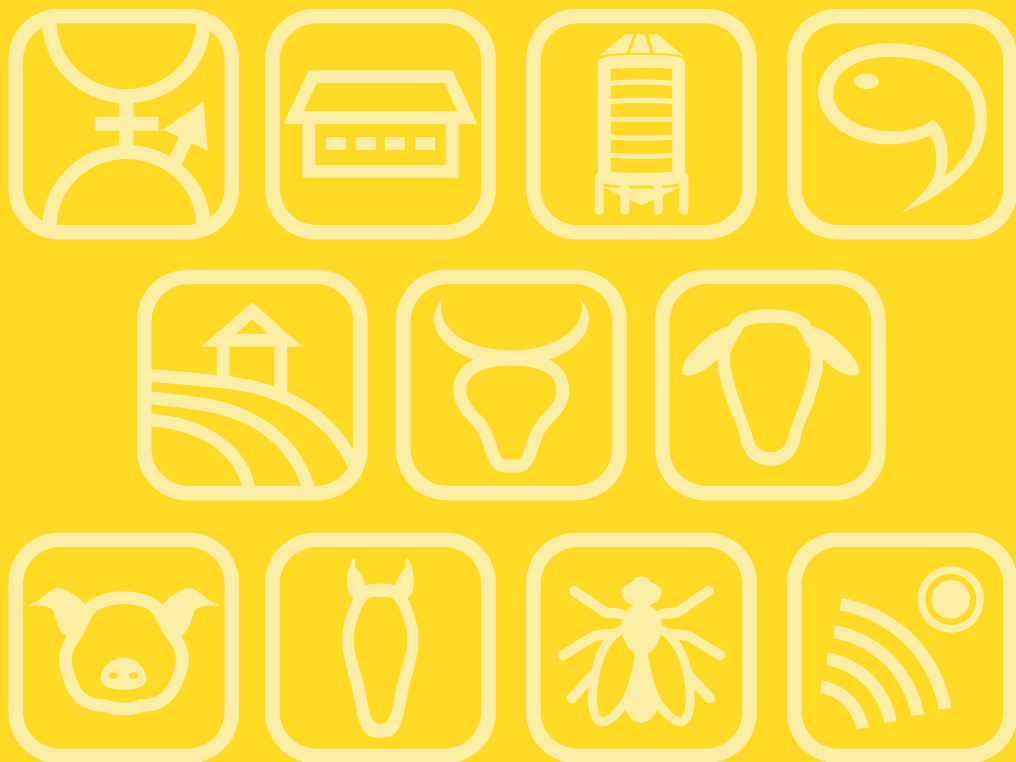


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Genetic determinism of resilience to unrecorded challenges in pigs

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Selection of animals able to maintain their performance under variable environmental conditions is needed. Pigs in selection farms are raised in a monitored and controlled environment (e.g. temperature). However, pigs could be exposed to challenges/disturbances unrecorded and from unknown origin. Therefore, resilience in pigs remains important. The probability of the occurrence of an unrecorded environmental challenge at a given day was estimated from daily feed intake (DFI) data, and the genetic determinism of resilience to such events was evaluated. In total, 186,242 DFI records recorded automatically from 2,517 Large White males were used. The pedigree involved 5,649 individuals. For each day (within each batch), the probability of the occurrence of a challenge was computed via a mixture model. As a result, unrecorded events of environmental challenges affecting pigs' DFI were identified. Days with a high probability of having a high coefficient of variation (CV) were related to the occurrence of an environmental challenge. The probabilities (p) of high CV (stressful day) were used as a covariate in a reaction norm model (RNM) as an environmental descriptor, ranging from a non-challenging environment ($p=0$) to a challenging one ($p=1$). Variance components were estimated using the average information restricted maximum likelihood method. The mean probability of being a day with a high CV was 0.10; thus most of the days have a low probability of the occurrence of a challenge. The genetic correlation between level and slope was 0.06 ± 0.13 in RNM. This value suggests that selecting for decreased DFI would have a minimal effect on the animal's sensitivity to challenging environmental conditions.