Genetic analyses of posture traits automatically recorded from video data of pigs.

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Larger, cost-effective production units have led to less human-animal interactions in pig production. Together with rising consumer demand for animal welfare, this makes pig behaviour more relevant to monitoring in breeding programs. Breeding companies should ensure that selection does not alter behaviour negatively and that animals are calm, sociable and harmless, thriving in future production systems. However, measuring behaviour on the scale required for modern breeding programs presents challenges. An automatic recording system for behaviour from video data has been developed. The aim of the current study was to perform the first genetic analysis of inference data from this system. This includes posture traits and their relevance to production traits as a step towards identifying potential proxy traits for more complex behaviours. Modules for automatically detecting, tracking and identifying pigs were applied to 8 days of video data from 700 boars of a sire line. From this deployment, the following traits were predicted: Average minutes spent standing, sitting, eating, drinking and lying per day. Overall, the heritabilities for posture traits ranged from 0.06 – 0.12, with large standard errors. Genetic correlations to average daily gain, feed conversion ratio, loin depth at 120 kg and backfat at 120 kg were estimated, but no significant correlations were identified. However, the correlations ranged from -0.86 to 0.83. For instance, a negative genetic correlation was estimated between minutes spent sitting and average daily gain, suggesting that sitting behaviour may be linked to poor growth. This could be indicative of other health issues, like lameness. Similarly, bivariate genetic analyses between posture traits and ear and tail lesions were performed, but due to low frequency of lesions, the analyses did not converge. Looking to the future, prediction models for complex behaviours are under development for recording behaviours like tail- and ear biting and belly nosing. This study received funding from the Fund for Research Fees for Agricultural Products and Agricultural Agreement Research Fund (FFL/JA) through project number 321409.