3. Estimation of resilience parameters based on activity measured with computer vision following LPS injection

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Resilience could be referred to as an animal's ability to successfully adapt to a challenge, characterized by a relatively quick return to the pre-challenge state, including normal activity levels and behaviours. Pigs have distinct diurnal activity patterns. The level of activity patterns could be influenced by housing conditions and deviations from these patterns could be utilised to quantify resilience, and However, human observations of these patterns are labour intensive and not feasible in practise. In this study we show the use of a computer vision tracking algorithm to quantify resilience based on activity patterns in response to a lipopolysaccharide (LPS) sickness challenge. 144 pigs were housed in either barren or enriched pens. Four out of six pigs per pen were injected with LPS, the remaining two received a saline injection and served as controls. Results showed enriched housed pigs were more active than barren housed pigs pre-injection of LPS. LPS injected animals showed a dip in activity followed by a recovery period, as expected. This was not observed in the saline-control animals. Individual variation in recovery patterns may provide important information regarding resilience of individual pigs. Although no effects of housing were identified regarding resilience, these results demonstrate the usefulness of a computer vision tracking algorithm to measure resilience using proposed resilience parameters, and contributes to future on-farm applications.

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