

## 12. Measuring interaction with enrichment material in weaned fattening pigs by using a Radio Frequency Identification system and a combination of sensor technologies

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Measuring changes in interaction of pigs with enrichment material (EM) can be used as (early) indicator of welfare problems. In this study, a low frequency radio frequency identification (RFID) system and a combination of different non-invasive sensor technologies were validated for measuring interaction with the EM (hanging chain with a ball and piece of wood connected to it) in pens with weaned fattening pigs. Each pen consisted of six pigs fitted with RFID ear tags. Per pen, an RFID antenna was placed around the EM (at a height of approx. 60 cm, connected to a reader), a tri-axial accelerometer (TAA) was attached to the EM (top of the chain), a passive infrared detector (PID) was placed above the EM and a video camera was placed above the pen. Video images were used to feed Neural Network Model Algorithms (NNMA) and for behavioural observations. Interaction with the EM was manually scored per second per pig for 30 minutes of video footage per pen per week and compared with data from the RFID system and the combination of sensor technologies. Performance of the RFID system on its own was moderate (F1 score= 0.519), a combination of all sensor technologies + RFID (F1 score = 0.546) and a combination of TAA and NNMA (F1 score = 0.530) performed slightly better, whereas a combination of TAA, NNMA and RFID system (F1 = 0.485) performed slightly worse. Further analysis will show whether different combinations of sensor technologies will have better performance.