The Pig Cough Monitor in the EU-PLF project: results and multimodal data analysis

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Abstract

Precision Livestock Farming (PLF) combines the principles of process control technology with animal sciences. An example of PLF is the Pig Cough Monitor (PCM) developed by SoundTalks, which performs a continuous automated measurement of porcine respiratory health through sound analysis. This paper provides results and a thorough analysis of the data obtained in the course of the FP7 EU-PLF project. This project investigates the economic applicability of PLF technology in the EU. It aims to collect data from 60 pig-fattening rounds, in 10 farms geographically distributed over Europe. It combines both qualitative (expert animal assessments, farmer input, slaughterhouse data) as well as quantitative input data (PCM cough sound data, inputs as well as data from other PLF-technologies). Results presented in earlier work have demonstrated the effectiveness of the PCM in a real-world farm setting for 3 selected cases, as evaluated by combining cough data and expert animal assessments. The cough data itself were analyzed in terms of the Cough Index (CI), defined as the number of cough groups (episodes) detected per day. As more data have become available over the course of the EU-PLF project, new results are presented here. We again employ the CI as the principal analysis measure; however, the interpretation of the course of cough over a fattening round is improved by combining both quantitative and qualitative input data in a more structured approach. In conclusion, the PCM is demonstrated to detect anomalies in the respiratory health status in a real-world setup.

Keywords: precision livestock farming, acoustic monitoring, fattening pigs, EU-PLF, pig cough monitor