Application of machine learning technology to predict reproductive performance in sows

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This study applied a series of data science technologies (i.e. data mining and machine learning) to analyze the reproductive performance in sows. Data, including growth and reproductive performance of sows, collected from a commercial pig farm in Taiwan were utilized to build a machine learning model for the prediction of reproductive performance in sows, allowing producers to accordingly make decisions of keeping or culling sows. In total, 150 sows' records were used in this study. Prediction performance was validated by using a test set extracted from the records prior to model training. Results showed that the best accuracy of predicting the live-born of third parity was 79%. Through the application of variable importance analysis, which is capable of explaining the feature contributions to the accurate prediction, some top predictive features were 1st parity liveborn, 1st parity weaning number, 1st parity total born, 1st parity litter size, 1st parity high total born and gilt ages at first mating. The results revealed that the application of machine learning was able to improve the selection of sows, helping the decision making on management.

Key word: artificial intelligence, machine learning, data mining, reproductive performance.