



## **16. New Milk Recording Methods and Services**

### **Title presentation**

Predicting the Milk Yield Curve of Dairy Cows in the Subsequent Lactation Period Using Deep Learning

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### **Abstract**

Existing lactation models predict milk yields based on a fixed amount of observed milk production in early lactation. In contrast, this study proposes a model to predict the entire lactation curve of dairy cows by leveraging historical milk yield information observed in the preceding cycle. More specifically, we present a deep learning framework to encode the model inputs, predict the latent representation of the milk yield sequences and generate the corresponding lactation curves. Results show that the proposed framework outperforms the baseline models and that during the first 26 days of lactation, the model's predictions are more accurate than those of a state-of-the-art lactation model which is able to leverage the observed milk yields. As a result, the framework presented in this study allows farmers to increase their forecast horizon with respect to predicting its herd's total production and hence facilitates optimal herd management. Additionally, the model can be used to compare a cow's actual and expected milk yield over the entire course of the lactation cycle. This in turn can help to accelerate disease detection and enhance current animal monitoring systems. Finally, as the model incorporates the impact of health and reproduction events as well as herd management on the cow's productivity, future earnings and costs can be estimated more accurately.