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Validation of individual feed intake records using a 3D camera system in commercial farms

Presenter: Jan Lassen, vikinggenetics, Denmark
E-mail: jalas@vikinggenetics.com

Session: Sustainability in the context of animal recording

Authors: Jan Lassen Jørn Rind Thomasen Søren Borchersen

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ABSTRACT

Individual measures of feed intake are costly and time consuming using scale based measures in commercial farms. A 3D camera system called CFIT has been developed over the recent 6 years. A part of the development is a validation of the camera method to get reliable daily individual measures of feed intake. In this study, scales were used in a commercial herd where only one cow could eat from the feed that was on the scale at a given time. Scale measures and corresponding camera measures were compared to make a validation of the camera method for daily feed intake. A total of 6 Jersey cows were used for the study. Each cow was in trial for 7 days. Each cow was fed once a day and the feed was pushed together 3 times a day. The feed was a maize and grass silage based TMR feeding and equivalent to the feed that was distributed to all the other cows in the herd.

Individual feed intake was estimated at any visit during the day. The last image of the feed before a visit was stored together with the first image of the feed after a visit. These 2 surfaces were subtracted to estimate the feed intake for a visit. All visits for a day were summed to daily intake.

Mean daily feed intake was 54.7 kilo for the scale based measure and 120.3 liters for the camera based method. The squared correlation between the two measurements was 0.90 across days and cows and root mean square error was 1.85 kilo.

The results suggests that data from 3D cameras can be used to make reliable large-scale individual records for feed intake in indoor-housed dairy cattle. This data can be used to make genetic evaluations and management decisions in the future. The current CFIT system also consists of an identification part as well as a prediction model for individual body weight predicted on images of the back of the cow.

The feed intake and body weight data is measured throughout lactation, which opens up for estimation of genetic correlation between efficiency and health traits which are frequent in early lactation. Using 3D



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camera data opens up for individual measures of other individual phenotypes that are expensive and difficult to measure. This includes health, welfare and behavioral traits.

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