

Should future feed evaluation systems include a description of fermentation kinetics in the rumen?

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Organic matter digestibility of feedstuff for dairy cows, which relates to the nutritional value of a feed, has historically been determined as the percentage of dry matter of a feed that has been degraded after 48 hours of incubation in the rumen. After 48 hours, the gas production from the degradation of the feeds has for most feeds reached a plateau and no further significant degradation of the feeds are expected to happen in the rumen. NorFor, the Nordic feed evaluation system, uses a model for feed degradation in the rumen that includes a degradation rate in percentage per hour for starch, crude protein, NDF and a rest fraction.

To test the accuracy of the feed degradation model used in NorFor, the degradation rate of 12 feedstuffs were examined in two *in vitro* fermentations, using rumen fluid from two jersey heifers as the inoculate.

10 feedstuffs were run in quadruples in each fermentation, while 2 feedstuffs were run in triplicates. The ANKOM system was used to register the gas production for each sample during the fermentations. Half the samples were removed and filtered after 9 hours of fermentation, while the remaining samples were removed and filtered after 48 hours of fermentation. The dry matter degradation for each sample was measured post filtering.

There were significant differences in the dry matter degradation between the feedstuffs for both the 9 hour samples and the 48 hour samples and within the feedstuffs between the 9 hour samples and the 48 hour samples.

Some feedstuffs had significantly different dry matter degradation at 9 hours, but not at 48 hours.

Following the two fermentations, chemical composition of each feedstuff will be used in the NorFor degradation model to create a degradation curve. Degradation curves for each feedstuff estimated from the gas production in the two *in vitro* fermentations will then be compared to the degradation curves for the same feedstuffs created by the NorFor model.

By comparing the different degradation curves at specific timepoints significant differences can be uncovered and used to estimate the accuracy of the NorFor degradation model on different feedstuffs.