

Feed quality evaluation by near infrared reflectance spectroscopy (NIRS) for the crop - pork value chain

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Feed is the highest cost of pork production, and energy is the largest component of this cost. The digestible energy (DE) content among batches within each of the western Canadian feed grains such as barley may vary up to 20%. This variation cannot be predicted accurately using density [bushel weight] or takes too long to be assessed using chemical or in vitro digestibility analyses. Therefore the objective was to develop an NIRS calibration to predict the DE content of feed grains rapidly and establish a rapid evaluation system to serve the crop – pork value chain.

Calibration equations, based on established in-vitro digestibility techniques were developed to predict the DE content of barley (n=221) and wheat (n=99). These calibrations are unique in North America in that they have been validated in the pig model for energy digestibility. The calibrations for barley are extremely accurate [standard error of cross validation (SECV) = 62.0 kcal/kg; $R^2 = 0.88$]. Similarly, the wheat calibration has a SECV of 72.1 kcal/kg and a R^2 of 0.82.

The resulting calibrations have been made accessible to the crop – pork value chain. Samples can be submitted by mail or in person and estimated DE values can be provided rapidly.

Implications: For the first time, NIRS calibrations to predict DE content of cereal grains are available for use by the western Canadian crop – pork value chain based on locally-developed calibrations.

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