4B-105: *Screening of new lines of cereals grains for inclusion in NIRS calibrations for predicting nutritional quality of feed ingredients for pigs*

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Aims and Objectives:

To improve the accuracy and robustness of NIR calibrations for predicting the energy content of cereal grains for pigs.

Key Findings:

- The diet pelleting process accounted for more than 50% of the non-grain variation in Faecal DE measurements and reinforced the need for partial replication of the pelleting process in pig digestibility experiments.
- Highly significant (P<0.01) differences were obtained in Faecal DE values between and within grain types (wheat, barley, triticale, sorghum, maize).
- Natural paddock germination tended to reduce the Faecal DE content of barley and wheat, while artificial germination of sorghum for 24 h increased Faecal DE content by approximately 1 MJ/kg as fed, but continuing germination for 48 h reduced the response to approximately 0.5 MJ/kg.
- Adding grains from the Pork CRC projects to the original set used to develop the NIR calibration in PGLP, increased the accuracy or precision.
- The latest NIR calibrations can predict Faecal DE with a standard error of ± 0.26 MJ/kg as fed compared with ± 0.38 MJ/kg as fed in the PGLP calibration.
- The latest calibration can predict Faecal DE content within 0.52 MJ/kg as fed with 95% confidence.
- There is further opportunity to improve the robustness of the calibration by increasing the PRD value above 3.0. The current RPD of 2.65 is regarded by NIR specialists as being good for predicting values for unknown samples, but should be improved by adding more maize and other cereal grains to the calibration.
- Comparison of calibrations based on whole grain scans with those based on milled grain scans suggests there is little difference in calibration statistics or the mean values predicted by each calibration for all grains used in PGLP and Pork CRC experiments.
- For most grains, different values were predicted from calibrations based on whole grain scans compared with those from milled grain calibration.
- Milled grain calibrations can be removed from the AusScan suite, and whole grain calibrations should be the focus because it is faster, removes milling effects/differences and does not involve additional expense of grain milling.

Application to Industry:

The upgraded whole grain calibration should be adopted by AusScan and the milled grain calibration removed from commercial application.