



## **4B-103: Selection of Feed Wheat and/or Barley Varieties for the Australian Pig Industry**

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### **Background**

Improving reliability and consistency in energy and protein supplies for pig diets will benefit Australian pig producers. Such benefits are likely to include: (a) reduced variation in the annual cost of pig feed, (b) reduced total cost of pig feed, (c) a wider range of feed ingredients available to more producers, and (d) a closer match of diet specifications to pig requirements. To this end, the CRC for an Internationally Competitive Pork Industry initiated an Innovative Grain Production research program. Expected outcomes of this program focused on delivering commercial quantities of cereals (and pulses) of high yield and high energy content and acceptable nutritional characteristics for pigs, with cost-effective agronomy, and appropriate marketing arrangements for grain and pig producers.

The objectives of this particular project were to determine if breeding varieties of wheat and barley specifically for the pig industry, and with enhanced yield and digestible energy (DE) contents, could be achieved. An additional aim was to gain a greater understanding of the nutritional characteristics of grain, in particular wheat, that affect the DE content.

### **Methodology**

This research project involved the collaborative support of Murdoch University, the Department of Agriculture and Food WA (DAFWA) and InterGrain (IG). Under the guidance of IG, breeding programs for wheat and barley lines were conducted in Southern Australia. These lines were assessed for yield as well as characteristics such as starch, protein, fibre components and DE content (using AusScan) to generate a valuable data set of wheat characteristics important to the pig industry.

### **Key Findings/Conclusions**

Breeding a specific feed wheat or barley to outcompete existing varieties in both yield and DE content was not possible. However, analyses of data from this research indicated that there is an interaction between site and DE indicating that environmental factors contribute to the level of DE in grain. There is also evidence to suggest that varying levels of DE in grain may be determined more by a variety effect than a site effect. Moreover, the findings from this research support the NIRS testing of grain varieties destined for pig feed. In addition, and analyzing the NIRS spectrum associated with other grain characteristics, such as hardness, indicated that environmental conditions at a site can have an impact on the grain quality. The main strategy to arise from this research is continued support of NIRS analyses. Results suggested that there is variation in DE in grain and by using AusScan, pig producers could better select their inputs and hence achieve a more cost effective output. With on-going development of the AusScan technology it could be expected that its associated cost will decrease and therefore accessibility should increase.

### **Potential Users of Information (including value assessment)**

Results suggested that DE in grain is determined by genotype and environment and hence it would be rational for pig producers to consider high DE wheat, barley and triticale varieties, subject to assessment with AusScan, when making grain purchasing decisions. By knowing the DE of varieties, producers can make better decisions about what grain to purchase and the effect on DE of mixing different varieties. This information would be relatively simple and inexpensive to obtain and could result in significant cost reductions for producers.

In terms of improving NIRS calibrations methods, the results supported removing the environmental differences to enable a more accurate prediction of grain-traits than that currently available.