Effects of feeding high- and low-fibre fractions of air-classified, solvent-extracted canola meal on diet nutrient digestibility and growth performance of weaned pigs

Xun Zhou1, Matthew A. Oryschak2, Ruurd T. Zijlstra1, and Eduardo Beltranena1,2

1University of Alberta, 2Alberta Agriculture and Rural Development, Edmonton, AB, Canada

Background

- Canola meal is the second most world-traded supplemental protein meal after soybean meal for animal feeding.
- The nutritional value of canola meal is limited by its relatively high fibre content.
  - Fibre content reduces its energy value and the energy density of diets including canola meal, which can affect pig growth.
  - Fibre also reduces the extent of digestibility of other nutrients.
- Due to its fibre content, canola meal has a lower energy value and amino acid digestibility compared to soybean meal.
- Means to reduce the fibre content of solvent-extracted canola meal include processing.
- Air-classification is a constant, dry fractionation process that separates air-suspended canola meal particles according to shape and mass yielding 2 distinct fractions.
- The light particle fraction has reduced fibre and somewhat enriched protein content. The heavy particle fraction has enriched fibre and somewhat reduced protein content.

Hypothesis

- Feeding the air-classified light and heavy fractions of B. napus and B. juncea canola meal could improve and worsen, respectively, nutrient digestibility and growth performance of weaned pigs compared with feeding the parent meals.

Objectives

- To determine diet apparent total tract digestibility (ATTD) of gross energy, crude protein, and dry matter.
- To compare the growth performance of weaned pigs fed canola parent meals or their air-classified fractions.

Materials and Methods

- **Milling and Air Classification of Parent Meals**

- **Test Ingredients**

- **Phase Test Diets**

- **Test Ingredients**

- **Results and Discussion**

  - For both diet nutrient digestibility and growth performance, no interaction \( P > 0.10 \) was found between feeding the canola species and parent meals or air-classified fractions.
  - Feeding *B. juncea* resulted in greater ATTD of DM and GE compared to *B. napus*, which can be attributed to the thinner seed coat. Feeding the light fractions increased the ATTD of DM, GE and CP compared to the parent meals and heavy fractions, which can be explained by the reduced fibre content of the light fractions.
  - Pigs fed *B. juncea* had overall lower ADFI than pigs fed *B. napus* because of higher glucosinolate content in *B. juncea* that likely depressed feed intake. No difference in ADFI was found among pigs fed different air-classified fractions.
  - Feeding the light fractions resulted in 19g/d ADG improvement compared to feeding the parent meals.
  - Pigs fed *B. juncea* had greater G:F than pigs fed *B. napus*, which can be explained by the lower fibre content of *B. juncea* improving diet digestibility. Pigs fed the light fractions had higher G:F than those fed either the parent or the heavy fractions because of reduced fibre content as well as smaller particle size.

Conclusion

- Air classification reduced the fibre content and enhanced the nutritional value of canola meal. Compared to the parent meals, feeding the low-fibre fractions improved diet ATTD of DM, GE and CP, but only had a minor effect on growth performance of weaned pigs.

Acknowledgements

- Agriculture and Agri-Food Canada
- Agriculture and Agri-Food Canada