



Dietary Cereal Affects Intestine Bacteria Numbers in Weaned Pigs

Murray D. Drew¹ Ph.D., Alberto E. Estrada¹ Ph.D., Andrew G. van Kessel¹ Ph.D., E. David Ekpe Ph.D., and Ruurd T. Zijlstra Ph.D.

Summary

Dietary ingredients may be an important component of control of intestine health. A study was conducted with 45 weaned pigs fed diets based on corn, barley, or wheat. Digesta was collected from the small intestine and caecum. Dietary cereal grain or dietary fibre may affect bacteria populations in the intestine.

Introduction

Intestine health in weaned pigs is presently partly manipulated by dietary antibiotics. Cereal grain may compose up to 70% of diets of weaned pigs, and cereal fibre may impact bacteria populations in the intestine. The objective was to characterize the bacteria populations in the small intestine of weaned pigs fed the three main cereals in western Canada.

Experimental Procedures

Diets containing corn, barley, or wheat as the main cereal but not antibiotics were formulated to a similar nutrient content. Diets were fed for three weeks to weaned pigs. Fifteen pigs per treatment were killed to collect digesta, which was analyzed for bacterial profiles using plating techniques. Performance was measured on a pen basis.

Results and Discussion

Switching dietary cereal caused some changes in profiles of the major bacteria populations at the end of the small intestine (ileum; Figure 1) and in the caecum (Figure 2). Diarrhea was not observed in the experiment. Changes in dietary ADF were correlated to enterobacteria in the ileum ($r = -0.30$), and lactobacilli and clostridia in the caecum ($r = 0.31$ and 0.34). Feed efficiency but not body weight gain or feed

intake was correlated to lactobacilli in the ileum ($r = -.43$)

Research is needed to fully explain how diet formulations affect intestine health.

Implications

The fibre composition of ingredients and therefore diets may impact intestinal bacteria populations. The relation between ingredients and intestinal health is presently ignored in diet formulations. Further

research is required to characterize this relationship and bacteria populations in further detail, because control of intestine health may become an increasing challenge with ongoing reductions in access to antibiotics.

Acknowledgements

Strategic program funding provided by Sask Pork, Alberta Pork, Manitoba Pork, and Saskatchewan Agriculture and Food Development Fund. Project funding was provided by Finnfeeds International Ltd, Canola Council of Canada, and NSERC.

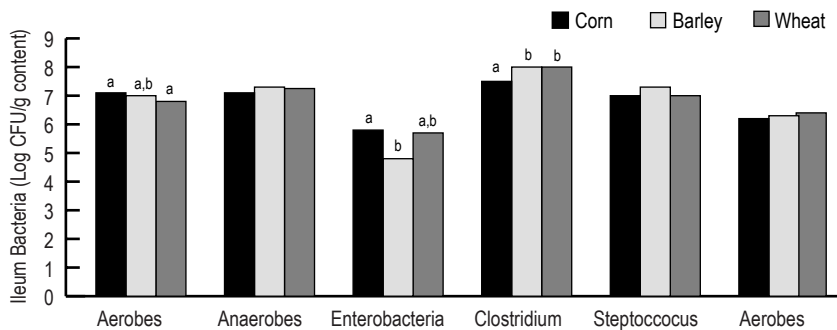


Figure 1 Effects of main dietary cereal on bacteria populations in the small intestine of weaned pigs.

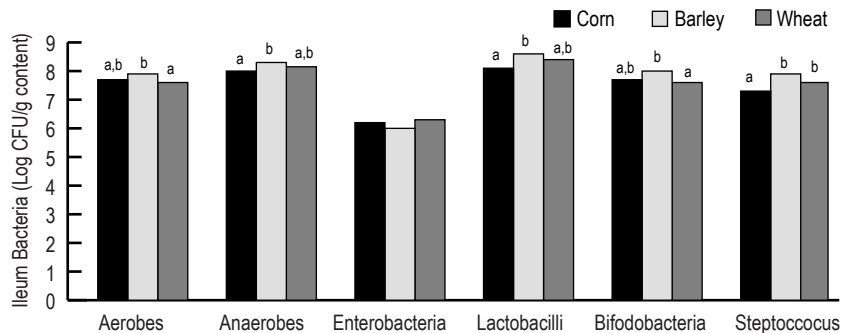


Figure 2 Effects of main dietary cereal on bacteria populations in the caecum of weaned pigs.