Towards a new feeding approach of neonatal and weanling piglets for optimizing nutritional status, immunity and microbiota and minimizing the use of antibiotics

Frédéric Guay, Laval University
Dominic Poulin-Laprade, Sherbrooke Research and Development Centre (AAFC)

Why is this project important?

An important challenge for producers in the pre- and post-weaning period is to provide feed that will allow a good transition between drinking sow milk and eating dry feed. So far, previous research on this subject has shown that:

- Overall pig performance may be improved by using weanling feed that contains defatted bovine colostrum and that is enriched with vitamins and additives linked to prebiotic/antimicrobial activities.
- Naked oats contain highly digestible starch and could be interesting for peri-weaning diets that could positively affect piglet growth and microbiota.
- The establishment of microbial populations and intestinal expression of some genes related to immune response were differently regulated in low weight suckling piglets compared to high weight piglets at 16 days of age.

Therefore, commercial swine producers would benefit from having new piglet feeding approaches that takes this new knowledge into consideration. These new strategies would help enhance gut health and piglet robustness from birth to post-weaning, minimize reliance on in-feed antibiotics, and maximize performance.

What will researchers do?

Researchers will evaluate new feeding strategies and their impacts on:

- Low weight and high weight piglets
- Gut development and maturation, including the immune system, digestive functions and epithelial robustness.
- Microbiota diversity and activity in the ileum, caecum and colon.

What will be the benefit of this research?

Results from this research will allow recommendations to be made to producers and other stakeholders about feeding plans that will improve piglet robustness and resilience to enteric infection in the absence of antibiotics. In addition, the identified blood and feces markers will offer breakthrough information and tools to measure pigs' intestinal and systemic response to pathogens, and evaluate feeding strategies to improve their resilience.

What has been done so far?

As of 2021: An animal trial that tested different feeding strategies was completed in March 2020. Analyses are still ongoing, as there were significant delays caused by the closure of laboratories due to COVID-19 related restrictions.

Two animal trials were carried out in 2019-2021 at Laval University. One studied the effects of naked oats and supplements of medium chain fatty acids and yeast extracts, and the other on the impact of bovine colostrum. While the analyses of the first trial have been completed, those of the second trial are currently in progress.

Collaborators

Alexandre Thibodeau	University of Montreal
Mylène Blais	Agriculture and Agri-Food Canada
Yves Desjardins	Laval University
Étienne Yergeau	*Institut national de la recherche scientifique*

Project status

Currently in progress.
Results expected in 2023.

Additional resources and information about this project

Additional resources

- Ayers, K. (2019, February). Getting at the "Guts' of piglet health. *Better Pork.* pp. 6-14. https://www.betterfarming.com/flippingbook/better-pork/2019/february/#6
- AAFC (2019, April). Strategy for healthy piglets without antibiotics. *Agriculture and Agri-Food Canada Agri-Info Newsletter*. http://www.agr.gc.ca/eng/news/agri-info-newsletter/?id=1419351635969

Peer-reviewed articles and abstracts

- Lessard, M., Blais, M., Beaudoin, F., Deschene, K., Verso, L., Bissonnette, N., Lauzon, K., Guay, F. (2018, December). Piglet weight gain during the first two weeks of lactation influences the immune system development. Abstract. *Veterinary Immunology and Immunopathology, 206.* pp. 25-34. https://doi.org/10.1016/j.vetimm.2018.11.005

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