The Effects of Feeding Sows the Probiotic Saccaromyces Boulardii Throughout Gestation and Lactation on Piglet Behavior and Well-being

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INTRODUCTION

- In animal agriculture, disease cost producers millions of dollars every year. Producers use feed additives to protect animals from pathogens and to improve their well-being. Feed additives interact with the gut microbiota, which helps regulate mucosal immunity.
- Gut microbiota in the gastrointestinal tract is an active organ due to its large number of cells. Gut microbiota with its metabolic and protective functions is able to affect positively the integrity of intestinal barrier against pathogen infections.
- Farm animals are often subjected to environmental stresses, which may cause an imbalance of gut microbiota and increase the chance for pathogen infection. In swine, weaning and post-weaning are one of the most vulnerable periods in young pig.
- Antibiotics is the primary source for producers to treat and control diseases. However the ban of all antibiotics as feed additives in the European Union and other countries due to the controversial issue of antibiotic resistance has resulted in an eager search for alternative feed additives.
- The goal of this research is to see how feeding probiotics, a possible alternative feed additive, to sows will effect their piglet's behavior and well-being.
- Probiotic is defined as "live microorganisms which, when administered in adequate amounts, confer a health benefit on the host" by acting as natural bioregulators.

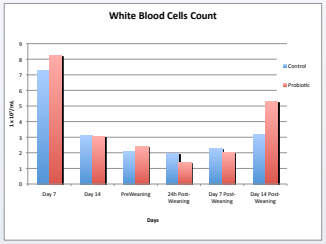
OBJECTIVE

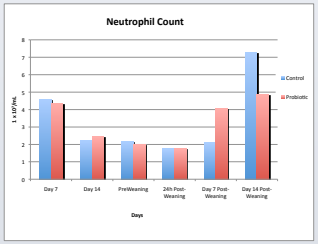
- To determine if feeding probiotics to sows during gestation and lactation will transfer in utero to impact piglet behavior and well-being.

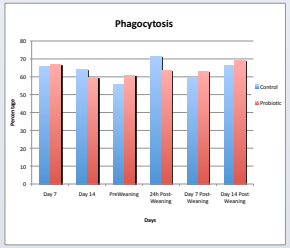
MATERIALS & METHODS

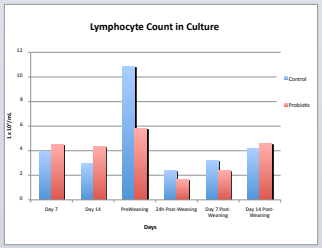
- Eighteen, York and Landrace, crossbred sows were housed in standard gestation crates at the University of Illinois Swine Research Center.
- Sows were randomly assigned to receive orally twice a day one of two treatments, a probiotic bolus or a placebo bolus.
- Treatment started 30 days before farrowing (day 84 of gestation) and continued until the end of lactation.
- Blood samples were collected from the piglets via jugular veni-puncture using vacutainers on day 0 (immediately after birth), 1, 7, 14, 21, and at 24 hours post-weaning and on day 7 and 14 post-weaning.
    - Various techniques were used to assess total white blood cell count, and lymphocytes and neutrophils were isolated.
- Functional immune assays were used to measure neutrophil chemotaxis (ability of cells to migrate toward sites of infection or inflammation), neutrophil phagocytosis (percentage of engulfment by cells), lymphocyte proliferation (ability of cells to respond to mitogens) and lymphocyte cytotoxicity (ability to respond to virally infected and tumor cells).
- Behavior was recorded 24 hours post-farrowing by a video camera. Behaviors documented were laying, standing, nursing bout, false nursing bout, no interaction, contact between piglets and contact with sow.

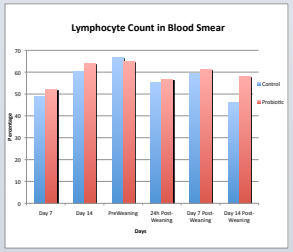
RESULTS











- Total white blood cells were higher on day 7 and day 14 of age for piglets whose dams were fed probiotic. All other days white blood cells were similar between treatment groups.
- Neutrophil counts peaked on day 7 post-weaning piglets whose dams were fed probiotics, however neutrophil counts peaked 14 days post-weaning in control group.
- Lymphocytes were higher for piglets in probiotic group during the first two weeks of age. On day of preweaning, lymphocyte counts were higher in the control group.
- Percentage of lymphocytes were similar until day 14 post-weaning when lymphocytes were higher for piglets in probiotic treatment.
- Phagocytosis was 10% higher for control piglets 24 h post-weaning. All other time points were similar between treatment groups.

CONCLUSIONS

This research supports the premise that probiotics have on effect on the piglet's well-being by measures of immune factors. Total white blood cells, neutrophils and lymphocyte counts all peaked certain days in the young piglet's life for both treatments. Although differences were not drastic, results could have been due to the variables in this research that need modification to improve the well-being of the piglets significantly. This proves that probiotics do have an effect and further research is needed to investigate the possibilities of feeding probiotics as a feed additive in the swine industry. As this research continues behavior data is to be determined.

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