



The effects of a diet containing mustard seeds meal on the microbiota in post-weaning piglets

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Abstract: The present study examines the potential of mustard seed meal (MSM) to modulate intestinal microbiota in post-weaning piglets. Twenty-four piglets were divided into four groups: control, LPS-challenged, MSM diet, and MSM+LPS-challenged. After 21 days, colonic content analysis showed that LPS increased *Enterobacter* and *Clostridium* while decreasing *Lactobacillus*. MSM alone had no significant effect, but in LPS-challenged piglets, MSM normalized *Lactobacillus* levels and reduced *Enterobacter* and *Clostridium*. These findings suggest that MSM can mitigate LPS-induced microbiota disruptions, highlighting its potential for improving gut health in piglets.

• Introduction

Zinc oxide is a commonly utilized therapeutic agent in the livestock industry, mitigating the adverse effects of weaning by improving growth rate, preventing associated diarrhea and reducing mortality.

Due to environmental concerns like antibiotic resistance and soil pollution, the EU plans to phase out intervention premixes containing zinc oxide by 2023.

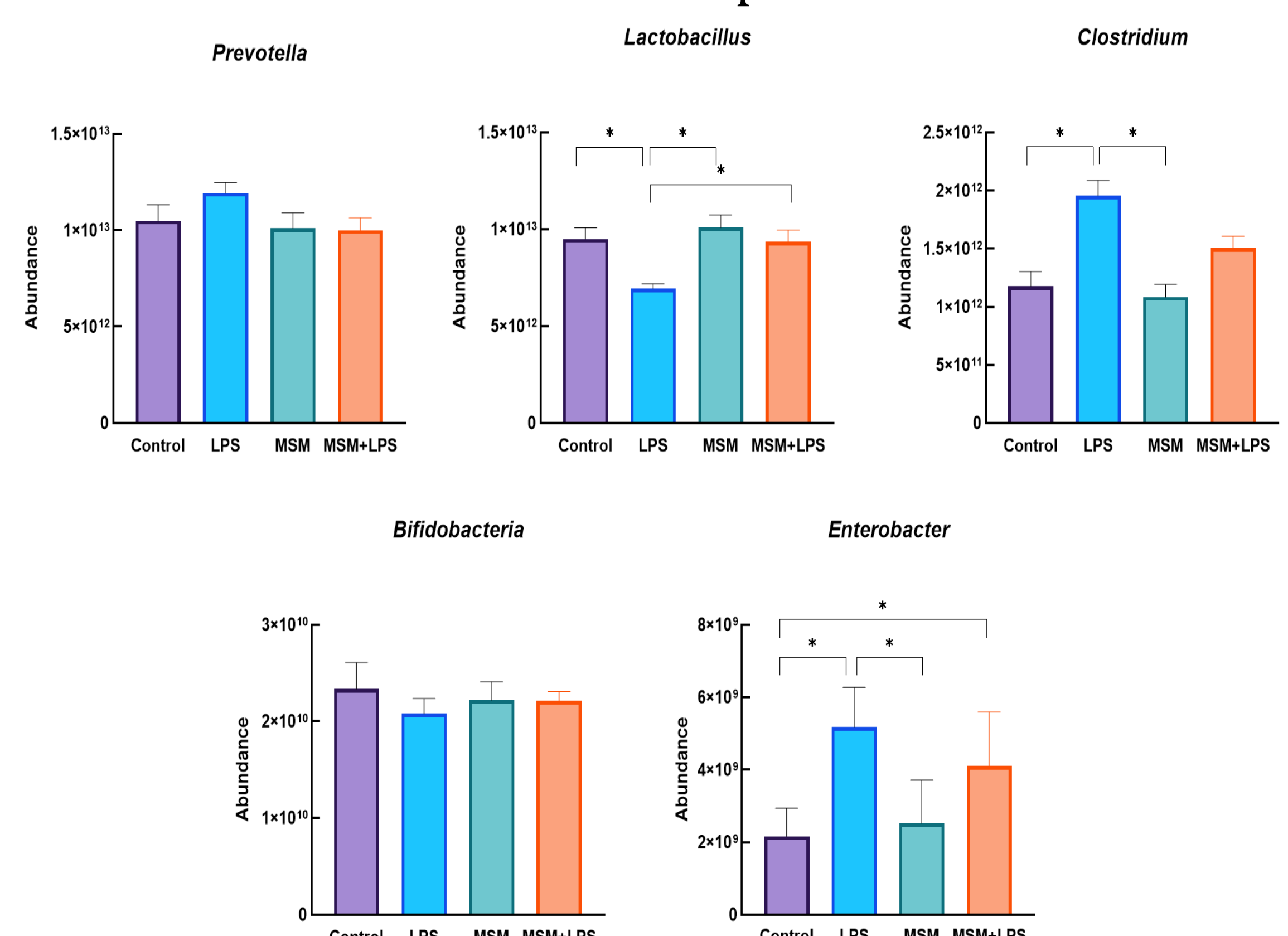
Motivated by the need to find alternative solutions, the present study investigates the potential of by-products derived from oilseed by-products (such as mustard), possessing bactericidal and anti-inflammatory properties to replace zinc oxide. The by-product capacity to decrease intestinal inflammation, diarrhea, and oxidative stress in piglets post-weaning was taken into study.

• Material and method

24 cross-bred TOPIG hybrid piglets were randomly allocated into four experimental groups based on their diet composition as follows: Control group receiving basal diet, LPS group challenged with *E. coli* lipopolysaccharides (LPS, 5µg/ml) and fed with basal diet, MSM group receiving diet including 8% mustard seed meal and MSM+LPS group fed 8% MSM diet and challenged with 5µg/ml LPS. After 21 days of feeding with dietary mustard meal, pigs were sacrificed and colonic content samples were collected and the effect of diets on the pig gut microbiota was assessed.

• Results and discussions

Bifidobacterium and *Prevotella* populations remained stable across all groups. LPS treatment increased *Enterobacter* and *Clostridium*, while reducing *Lactobacillus* populations compared to controls. Mustard meal alone didn't alter microbiota when compared to the control diet. However, in LPS-challenged piglets fed mustard seed meal, *Lactobacillus* levels normalized while *Enterobacter* and *Clostridium* decreased, suggesting mustard meal's potential in mitigating LPS-induced microbiota disruptions.



• Conclusions

The paper highlights the potential of mustard seed meal to counteract the adverse effects of the LPS on microbiota composition through modulation of specific bacterial populations.

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