

## **VPH-PP-07**

### **TITLE**

**FUNGI DERIVED FEED ADDITIVES BIND SALMONELLA TYPHIMURIUM AND ESCHERICHIA COLI AND INDUCE MACROPHAGE ACTIVATION.**

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### **CONTENT**

Fungi and their derivatives may play a role to reduce antimicrobial use in swine diets because of their antimicrobial and immunomodulatory properties and their ability to degrade substrate into bioactive compounds. In this research, copra meal, enzymatically hydrolyzed by fungi derived beta-mannanase (CM) and rye overgrown with mycelium of *Agaricus subrufescens* (ROM) were evaluated on macrophage activation and adhesion capacity to intestinal bacteria in vitro.

To measure adhesion capacity of CM and ROM to intestinal bacteria, a 96-well plate was coated with PBS (negative control) or a 1 % suspension of CM or ROM. The plate was incubated with a diluted *Salmonella typhimurium* or *Escherichia coli* culture. After a washing step to remove unattached bacteria, growth medium was added to the wells. Bacterial adherence was expressed in time (hours) to reach the initial bacterial culture concentration (less hours means better bacterial adherence). Macrophage activation was determined in another experiment. Plain medium (negative control), CM, ROM or LPS (positive control) were added to HD11 macrophage-like cells. After 48 hours, culture supernatant was collected and nitric oxide (NO) production was analyzed as a measurement of macrophage activation.

In vitro results showed a shorter growth time of *Salmonella typhimurium* for both CM (5,90±0 hours) and ROM (5,97±0,01 hours) compared to PBS (6,98±0,06 hours) and of *Escherichia coli* for ROM (5,67±0,15 hours) compared to PBS (7,11±0,52 hours). CM showed a slightly higher NO production (+9,4±0,3 ?M), while ROM showed a stronger activation (+31,8±2,6 ?M) and LPS showed the strongest activation (+60,8±2,4 ?M) of HD11 macrophages compared to plain medium.

In conclusion, in vitro studies showed both adhesion capacity of CM and ROM as shown by a reduction in growth time in the adhesion assay as well as macrophage activation. Therefore, CM and ROM may be useful to reduce antimicrobial use in pork production.