

Title: Pre-nitrate adaptation and chlorate supplementation to reduce *Salmonella*, *Escherichia coli*, and *Yersinia enterocolitica* in swine - **NPB #03-136**

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Abstract: An experimental chlorate product that targets the respiratory nitrate reductase enzyme of bacteria such as *Salmonella* and *Escherichia coli* has shown promising results in reducing concentrations of these bacteria in the gut of food animals. Because expression of the target enzyme is induced by nitrate, we conducted laboratory and animal studies to see if short-duration, low level nitrate or nitrocompound preconditioning would enhance the ability of an experimental chlorate product to kill these bacteria. Results from these studies showed that preconditioning the gut microflora of swine with low levels of nitrate or nitrocompounds markedly enhanced the ability of the chlorate product to kill *Salmonella* and *E. coli*. Moreover, results from laboratory studies showed that the nitrocompounds had the ability to kill *Yersinia*, another important pathogen of swine. Further studies are needed before these compounds can be fed as feed additives to animals, although it is likely that nitrate preconditioning may be more near to market than the nitrocompounds, which may require more comprehensive review by FDA.

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