

## PORK SAFETY

**Title:** Toll-like receptor agonist administration for the prevention of *Salmonella* colonization of the swine gut - **NPB #06-003**

**Investigator:** Kenneth J. Genovese

**Institution:** USDA-ARS, FFSRU, SPARC, College Station, TX 77845

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### Scientific Abstract:

Toll-like receptors (TLR) have been identified as important modulators of the innate immune response. Agonists for two of these receptors, TLRs 5 and 9, have been identified as being potent immunomodulators in avian and mammalian species. The purpose of the present studies was to evaluate the use of flagellin, a TLR 5 agonist, and CpG DNA, a TLR 9 agonist, and the combination of the two to reduce *Salmonella* colonization of the gut and organs of swine and determine if their administration to piglets had effects on innate immune functions of swine leukocytes. Piglets were treated with the agonists at birth by oral gavage, challenged with *Salmonella* 5 days later or after weaning, and then euthanized and cultured for the presence of *Salmonella*. Piglets treated with the agonists or the combination of the agonists had reductions in fecal shedding, organ invasion, and in gut contents of *Salmonella* as compared to control pigs both in pigs euthanized before and after weaning. In studies of the innate immune functions of swine leukocytes, piglets were bled and leukocytes isolated on days 4, 7, 14, and 21 post-treatment. Both flagellin and CpG and in combination were found to increase the oxidative burst and cellular degranulation of neutrophils isolated from treated pigs ( $P < 0.001$ ). These studies show that TLR agonists can be used on their own as innate immune stimulants and that these agonists had positive effects on *Salmonella* colonization in young pigs.

*These research results were submitted in fulfillment of checkoff funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer reviewed*

### For more information contact:

**National Pork Board, P.O. Box 9114, Des Moines, Iowa USA**

800-456-7675, **Fax:** 515-223-2646, **E-Mail:** [porkboard@porkboard.org](mailto:porkboard@porkboard.org), **Web:** <http://www.porkboard.org/>