
Sponsors

University of Minnesota

College of Veterinary Medicine

College of Agricultural, Food and Environmental Sciences

Extension Service

Swine Center

Editors

W. Christopher Scruton

Stephen Claas

Layout

David Brown

Logo Design

Ruth Cronje, and Jan Swanson;

based on the original design by Dr. Robert Dunlop

Cover Design

Sarah Summerbell

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, color, creed, religion, national origin, sex, age, marital status, disability, public assistance status, or sexual orientation.

Use of a Recombined Competitive Exclusion Culture to Protect Piglets Against *Salmonella choleraesuis*

Roger B. Harvey, Kenneth J. Genovese, Robin C. Anderson, David J. Nisbet
Food and Feed Safety Research Unit, USDA, ARS, College Station, TX 77845

Introduction Salmonellosis of swine annually causes economic losses to the swine industry. However, most of the concerns over *Salmonella* prevalence in swine are for public health reasons. Various methods have been employed to reduce the prevalence of *Salmonella* in swine, to include increased biosecurity, vaccination, improved hygiene, and segregated early weaning. Competitive exclusion (CE), which involves colonizing the gastrointestinal tract of young animals with a healthy gut microflora, has been shown to be an attractive strategy for protecting swine from salmonellae infections (1,2). We have developed a recombined, porcine-derived defined CE culture (RPCF) and have evaluated it for protective effects against *Salmonella choleraesuis* (SC) in young pigs.

Experimental design Forty-six, 12-hour-old piglets from the same farrowing barn were removed from sows and reared in nurseries. Eighteen piglets were assigned to a control group and 28 were dosed with 5 ml of the RPCF culture. The two groups were reared separately in specially configured nursery pens and fed an unmedicated commercial milk replacer. At 48 hours of age they were orally challenged with a novobiocin/naladixic acid-resistant strain of SC. Daily rectal swabs were taken from individual pigs and cultured for SC. At 7 days post-challenge, piglets were euthanized and samples of ileocolic lymph node, colon, ileocecal junction,

and cecal contents were cultured.

Results There was a significant decrease in SC cultured from lymph node, colon, ileocecal junction, and cecal contents of the RPCF group compared to the control group. Additionally, there was a decreased average time of shedding of SC by RPCF-treated piglets over the 7 day period when compared to the control piglets. This is similar to what we observed in earlier studies. In those studies, CE cultures that were not recombined, protected piglets against challenge with either SC or *S. typhimurium* (1,2). Due to licensing requirements by the FDA, defined, recombined cultures are a technical necessity prior to commercialization of such a product. In summary, these data are important because CE may be an intervention strategy for the control of *Salmonella* infections in pigs and could lead to the overall reduction of salmonellae in the pork chain.

References: 1. Anderson R, Stanker L, Young C, Buckley A, Genovese K, Harvey R, DeLoach J, Keith N, Nisbet D. 1999. Effect of competitive exclusion treatment on colonization of early-weaned pigs by *Salmonella* serovar Choleraesuis. *Swine Health Prod* 7:155-160. 2. Nisbet D, Anderson R, Harvey R, Genovese K, DeLoach J, Stanker L. 1999. Competitive exclusion of *Salmonella* serovar Typhimurium from the gut of early-weaned pigs. In: *Proceedings, 3rd Intl Symp Epidem Control Salmonella Pork*, pp. 80-82.