Perinatal Vaccination Against Salmonellosis

Ted T. Kramer, DVM, PhD
Iowa State University, Ames, IA

Dr. Ted Kramer has investigated various aspects of swine salmonellosis since 1980. These investigations consisted of a search for virulence criteria, affecting the humoral and CMI immune systems (1-4). An immunohistochemical assay was developed for detecting *Salmonella* in swine tissues (5). The role of iron and iron-binding proteins was investigated in salmonellosis of pigs (6,7). A search was made for spontaneous mutants and Tn10 induced mutants as potential vaccine strains (8). A porcine neutrophil survivor clone was recognized as a good vaccine candidate against swine paratyphoid (9,10). The effect of *S. choleraesuis* and of LPS on physiologic and immunologic liver functions was investigated (11). A search was made for a suitable indirect ELISA assay to detect carrier pigs (12).

Recently, the factors affecting vaccination of perinatal pigs with an experimental Aro A vaccine was investigated (Kramer and Stocker, manuscript in preparation). It was found that the presence or absence of maternal (colostral and milk) antibodies was the most important factor affecting perinatal immunity and the success of vaccination. The importance of this observation is twofold: (1) it points to the importance of preexisting maternal antibody in active immunization against salmonellosis of newborn pigs; and (2) it suggests that humoral immunity may be important in swine salmonellosis, contrary to the generally held view that immunity to salmonellosis is primarily cell-mediated. These points will be illustrated in the presentation.

1. R. W. Griffith and T. T. Kramer. Sensitivity of smooth *Salmonella cholerae-suis* var *kunzendorf* field strains to antibody complement under various conditions. Am. J. Vet. Res. 43:1413-1417 (1982).
2. R. W. Griffith and T. T. Kramer. Sensitivity of smooth *Salmonella cholerae-suis* var. *kunzendorf* to killing by porcine polymorphonuclear neutrophils and its relation to mouse virulence. Vet. Immunol. and Immunopath. 4:593-601 (1983).
3. R.W. Griffith, T.T. Kramer, and Connie M.McRill. Effects of cyclophosphamide on the immune response of pigs to *Salmonella cholerae-suis.* Am. J. Vet. Res. 45:1336-41 (1984).
4. R.W. Griffith, T.T. Kramer, and J.F. Pohlenz. Relationship between the antibody-complement susceptibility of smooth *Salmonella cholerae-suis* var *kunzendorf* strains and their virulence for mice and pigs. Am. J. Vet. Res. 45:1342-1348 (1984).
5. McRill, Connie, and T.T. Kramer. Application of the peroxidase-anitperoxidase immunoassay to the identification of Salmonellae from pure culture and animal tissues. J Clin Microbiol 20(2):281-284 (1984).
6. Kramer, T. T., R. W. Griffith, et al.. Iron and transferrin in acute experimental Salmonella cholerae-suis infection in pigs. Am J Vet Res 46: 451-455 (1985).
7. T.T. Kramer, Lois Saucke, R.W. Griffith, and J.P. Kunesh. Desferoxamine and iron dextran in acute Salmonella cholerae-suis infection in pigs. Am. J. Vet. Res. 47(7):1452-1457 (1986).
8. T.T. Kramer, P. Pardon, J. Marly, and S. Bernard. Conjunctival and intramuscular immunization of pigs with a live avirulent strain of *S cholerae-suis.* Am. J. Vet. Res.48:1072-1076 (1987).
9. Kramer, T.T., M.B. Roof, and R.R. Matheson. Vaccination of swine with an attenuated strain of *Salmonella choleraesuis.* Am J Vet Res. 53:444-448 (1992).
10. Roof, M.B., T.T. Kramer, J.A. Roth, and F.C. Minion. Characterization of a *Salmonella choleraesuis* isolate following repeated neutrophil exposure.Am J Vet Res 53:1328-1332
11. Kramer, T. and J. Rhiner. Detection and distribution of *Salmonella choleraesuis* in Iowa swine. Proc 96th Ann Meet, US Animal Health Assoc, Louisville, KY, Carter Printing Co, Richmond, VA (1992).
12. Kramer, T.T., G.W. Beran, and J.A. Rhiner. Comparison of IgG ELISA and bacteriologic diagnosis of swine salmonellosis. ISU Swine Research Report (1994) pp 153-157.