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based on the original design by Dr. Robert Dunlop

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Environmental prevalence of *Salmonella* on indoor and outdoor intensive swine farms

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Swine can harbor food-borne pathogenic bacteria in their gastrointestinal tracts such as *E. coli* O157:H7 and *Salmonella* spp; as many as 25% of U. S. swine may carry *Salmonella*. Housing sows in farrowing stalls or in farrowing crates has become controversial due to animal welfare-based criticisms. An alternative production system for sows and their litters is to keep them outdoors with access to farrowing huts.

One hundred and eight PIC-C22 sows were used to determine the effect of two different production systems on food-borne pathogenic bacteria of sows housed indoors in farrowing stalls (n = 104) compared to sows housed outdoors (n = 104) in English style farrowing huts. Sows were multiparous and were obtained from a single-source farm. Sows were fed once daily (8 am) a completely balanced sorghum based diet. This research was conducted over a 10 mo period from April 2001 to Jan 2002. A total of 8 one acre farrowing radials each contained one wallow.

Wall samples (n = 180) were collected monthly from both the stall and the hut using a 10 cm by 10 cm gauze swab and stored in a test tube until further processing. In addition a mud (n = 290) and water (n = 290) sample per wallow was collected. All samples were analyzed for *E. coli* O157 and *Salmonella* by using standard laboratory methods used in our lab.

No differences (P <0.05) were detected in *Salmonella* or *E. coli* O157

populations between indoor farrowing stalls and outdoor farrowing huts. There was a very low incidence of pathogenic bacteria during this study. All 8 wallows contained *Salmonella* spp. throughout the study (n = 49 *Salmonella* isolates), and these *Salmonella* isolates persisted within some wallows for >5 months and were spread between multiple wallows. *Salmonella* Give was isolated from outdoor sow feces during the study that was genetically indistinguishable by Pulsed-Field Gel Electrophoresis (PFGE) from *Salmonella* Give isolated from wallows (n = 33) throughout the study, indicating that pathogenic bacteria were cycling between swine and their environment.

In conclusion, we could not detect a difference between the incidence of food-borne pathogenic bacteria from swine raised indoors or outdoors, but the role of wallows in spreading *Salmonella* within a swine herd could be quite significant.