

Prevalence And Risk Factors for Antimicrobial Resistance among Fecal Enterococci Of Pigs And Farm Residents

Teneg Holy Akwar¹, Cornelius Poppe², Jeff Wilson^{1,3}, Richard J. Reid-Smith^{1,2} and Scott A. McEwen¹

¹ Department of Population Medicine, University of Guelph, Guelph, Ontario N1G 2W1, Canada. ² Laboratory for Foodborne Zoonoses, Health Canada, Guelph, Ontario N1G 3W4, Canada. ³ Foodborne, Waterborne & Zoonotic Infections Division, Health Canada, Guelph, Ontario N1G 4Y2, Canada.

519-824-4120 ext 54751, smcewen@uoguelph.ca

Background

There is a growing concern worldwide about antimicrobial resistance and the possible impact of antimicrobial use in animals on human and animal health. Enterococci are part of the normal human and animal gut flora that are also important opportunistic pathogens.

Objective

This study aimed to describe patterns and prevalence of antimicrobial resistance among fecal enterococci in pigs and farm residents and identify potential risk factors for antimicrobial resistance.

Results

A total of 809 isolates of enterococci from weaner and finisher pigs on 47 farrow-to-finish farms were tested for resistance to a panel of 17 antimicrobials. Overall resistance to specific antimicrobials tested varied from 0-88% depending on the antimicrobial tested. Fecal enterococci (n=507) were also isolated from 111 of the 115 farm residents from study farms that provided fecal samples. The prevalence of resistance in human isolates was broadly similar to pig isolates. Risk factors positively associated with antimicrobial resistance in human isolates included: number of hours per week spent in the pig barn by farmers; use of certain antimicrobials in pigs; farmers experiencing diarrhea within three months preceding the study; and consumption of any antimicrobials by farmers within 3 months prior to the study.

Take Home Message

This study indicates that enterococci of pigs constitute a potential reservoir of resistant bacteria and/or resistance genes that might be transferred to other bacteria of animals or humans. There is some evidence that increased exposure to pigs and / or the pig barn may increase the risk of resistance in enterococci of humans living on farms, but other factors also appear to be important. Further study is needed to determine if this relates to transfer of bacteria from animals to humans, or from exposure to antimicrobials in feed or other mechanisms.

Financial support was received from Health Canada, the Canadian Commonwealth Scholarship Program, and the University of Guelph-OMAF Animal Research Program.