

Feedlot study indicates no major links to antimicrobial resistance in humans

Calgary, Alta., Nov. 24, 2004 : The use of antimicrobial drugs in Canadian cattle production is not currently a major contributor to the development of resistant bacteria that threaten human health.

That's the indication of a much-anticipated, five-year study investigating antimicrobial resistance in Alberta feedlot cattle, led by the University of Calgary and Agriculture and Agri-Food Canada.

"The most significant resistance concerns that we went into the project looking for, turned out not to be an issue," says study leader Dr. Ron Read of the University of Calgary. Most notably, bacteria with resistance to vancomycin and methicillin, the top human health concerns speculatively linked to cattle production, were not found in Alberta feedlot cattle. Salmonella with multiple forms of resistance, widely thought to be in outbreak situations in food animals, were also not found. "Our study was helpful in closing the book on a number of resistance issues," says Read.

Only one form of resistance of potential concern for human medicine was found - E. coli strains with resistance to cephalosporins. However, the prevalence of this type of resistance in humans is extremely low and researchers consider the potential for relevant transfer from cattle to humans unlikely at this point. "We're in a situation where we've identified something that needs to be monitored," says Read. "We're fortunate that we have time to keep an eye on this situation and deal with it, because we're not seeing this resistance occurring in humans."

More on the study and Read's views are available in a new article on the Meristem Land and Science Web site, www.meristem.com. Land and Science is a service featuring information on the sustainability of agriculture, food production and the environment. It is presented by Meristem Information Resources Ltd., in co-operation with partners in agriculture, food, environment and life sciences.

The current edition of Land and Science also includes excerpts from Read's responses at a press conference held following his presentation on the antimicrobial resistance study, at the National Beef Science Seminar in Calgary, Nov. 16.

Over the past decade, a disturbing trend worldwide has been the emergence of microbe populations that are resistant to important antimicrobial agents used in veterinary and human medicine. "It's a very serious issue," says Read, associate professor, Medicine and Microbiology and Infectious Diseases, University of Calgary, Faculty of Medicine. "Obviously, as more agents are rendered less effective due to increased populations of antimicrobial resistant microbes, humans and animals that depend on those agents to battle disease become more vulnerable."

The more widely and frequently an antimicrobial is used, the greater the risk of antimicrobial resistance developing. This is because antimicrobial use places selection pressure on target microbe populations to evolve survival mechanisms.

Antimicrobial resistance that threatens human health is primarily associated with antimicrobial use in human medicine and the role of hospitals as reservoirs of resistant organisms. However, there has been widespread concern that antimicrobial use in livestock production is also a contributing factor, with resistant microbes transferred to humans through direct contact, the environment - including water channels - and through food products.

The new study was the most comprehensive of its kind and the first to examine Canadian cattle. The one potential issue identified, cephalosporin resistance, was a surprise finding and its significance is unknown, says Read. "The most important thing we can do is to continue to keep an eye on this phenomenon."

Health Canada is currently establishing a surveillance system for antimicrobial resistant organisms in agriculture. Read and colleagues have proposed that the resistant microbes identified in their study be included in this monitoring program. Production management changes may also be warranted, say the researchers.

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