Farm-grown superbugs: While the world acts, Canada dawdles

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Factory farms, where thousands of animals are crammed together, are driving the growth of antibiotic-resistant organisms that cause human diseases. Poultry, swine and cattle receive low doses of antibiotics to reduce infection and enhance growth. This off-label use helps bolster the bottom line, but in the process, bacteria are developing antimicrobial resistance, which affects human health. A March 2012 World Health Organization (WHO) report states that "urgent action is needed" to limit antibiotic use in agriculture.[1] It wants antibiotics to be prescribed to farm animals, instead of being routinely added to their feed. Many nations, including the United States, are taking action, but in Canada, only Quebec has passed regulations.

Agriculture plays a major role in promoting antibiotic resistance,[1,2] even after accounting for other factors such as overprescribing of antibiotics by physicians and suboptimal adherence by patients. Best available evidence according to WHO indicates that use in animals accounts for well over half of all antibiotic use.[1] In Canada, about 88% of the total volume (by weight of active ingredient) of antimicrobials distributed for sale are for use in animals.[3]

The more antibiotics are used — and, more importantly, misused — the more they selectively encourage the emergence of organisms resistant to them. Of greatest concern is the promotion of resistance to antibiotics that may currently represent the last resort for treating some highly resistant infections in humans. Use in farm animals of these antibiotics that are essential for use in humans, or of related drugs in the same class, such as avoparcin (a glycopeptide antibiotic similar to vancomycin) or virginiamycin (a streptogramin antibiotic similar to quinupristin–dalfopristin, which is our last line of defence if *Staphylococcus aureus* or *Enterococcus* infections develop resistance to vancomycin), is thus particularly alarming. The World Health Organization states that "the importance of food animals as reservoirs of resistant human pathogens is well documented."[1]

In 1986, Sweden banned prophylactic use of antimicrobials in farm animals.[2] Denmark banned this use of avoparcin in 1995 and virginiamycin in 1998. In 1997, the European Union (EU) banned the use of avoparcin as a growth promoter; two years later the EU recommended phasing out as soon as possible antibiotics used for growth promotion or from classes used in humans.[4] This was achieved by 2005.[5]

Most recently, in January 2012, the US Food and Drug Administration (FDA) tried to prohibit the off-label use of cephalosporin drugs in most food-producing animals because of the threat of antibiotic resistance to human health, as cephalosporins are first-line antibiotics for empiric treatment of a broad variety of infections in humans.[6] In March, a New York judge ruled that the FDA must restart a process begun 35 years ago to ban use of penicillin and tetracycline in animals for growth promotion.[7] The FDA has since asked food producers to voluntarily stop using antibiotics in livestock for nonmedical uses.[8]

In Canada, off-label drug use and prescribing is a practice of veterinary medicine; thus, it is regulated by the provinces. So far, only Quebec requires prescriptions for all antimicrobials for animals. Meanwhile, Health Canada, through its Veterinary Drugs Directorate, does not recommend off-label use for antimicrobials that are "of very high importance" to human health, including cephalosporins and fluoroquinolones, and is discussing the issue with the provinces.[9]

Canada should join its international counterparts and move toward banning off-label antimicrobial use in agriculture. Meanwhile, we should close loopholes in drug importation, mandate measurement and reporting of use, and scrutinize the contribution of veterinary prescriptions to appropriateness of antibiotic use. We should also support those food producers who are making efforts to increase standards of animal welfare and hygiene so as to reduce the perceived need for antimicrobials in the first place.

With stricter regulations, consumers of meat will have to pay more, but perhaps not as much as one might think. In Sweden, the resulting cost to consumers for retail meat has increased by only a few cents per kilogram.[10] It's a small price to pay in the ongoing struggle against antimicrobial resistance.

For references, see Appendix 1, available at www.cmaj.ca/lookup/suppl/doi:10.1503/cmaj.120561/-/DC1.

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