



## STATEMENT OF CONCERN

# Use of Medically-Important Antimicrobial Compounds in Animal Agriculture

April 2014

### Statement

The Canadian Public Health Association (CPHA) is concerned about the continuing use of antimicrobial compounds for prophylaxis and growth promotion in animal agriculture. This concern is based on available scientific evidence that indicates a linkage between the use of these compounds in animal agriculture and antimicrobial resistance in health care. The need to maintain antibiotic use for the treatment of human and animal disease is increasingly important due to the limited number of new antibiotics in development. Thus, the Association recommends:

- Restricting the use of antimicrobials in animal agriculture to the treatment of disease under the direction of a veterinary, and prohibiting the use of medically important compounds in animal agriculture;
- Rescinding the “own use” provision for the importation of antimicrobial compounds in animal agriculture of the *Food and Drugs Act* and Regulations; and
- Implementing surveillance activities to better identify the types of antimicrobial compounds used in animal agriculture and the full extent of their use.

### Background

Antimicrobial Resistance (AMR) occurs when bacteria and other microbes adapt to antimicrobial compounds, thereby reducing or eliminating their effectiveness for the treatment of disease. In Canada, rates of AMR infection and direct health care cost associated with these infections are increasing. Infections with Methicillin-resistant *Staphylococcus aureus* (MRSA), for example, doubled from 4.2 cases per 1000 in 2001 to 8.5 per 1000 in 2007.<sup>1</sup> Estimated direct health care costs associated with MRSA and AMR enteric bacteria are \$104 million to \$187 million annually.<sup>2</sup> AMR in human health has historically been a public health issue, and the subject of previous recommendations by CPHA to prescribe these drugs only according to their approved use.

Recently, the emergence of pan-resistant or nearly pan-resistant microorganisms has been demonstrated in Canada.<sup>3</sup> Most concerning are Gram-negative pathogens as they are becoming resistant to nearly all drugs that would be considered for treatment.<sup>4</sup> For example, carbapenem-resistant *Enterobacteriaceae* (CRE) has become resistant to almost all antibiotics available. Mortality rates from CRE are high; almost half of all patients who get a blood-stream infection caused by CRE die from the infection. Although these compounds are not specifically used in animal agriculture, they demonstrate the extent of the AMR problem and the need for care when prescribing and administering these products.

Recent developments described in the scientific literature have shown that the overuse of antimicrobials in food production animals can contribute to AMR. For example, a recent Danish study found that 11% of slaughter pigs had fecal samples positive for extended-spectrum cephalosporin-resistant *E.coli* and that a significantly higher prevalence of positive fecal samples were observed among pigs originating from farms with registered extended-spectrum cephalosporin consumption.<sup>5</sup> Scientific evidence also supports that AMR can be horizontally transferred from food production animals to humans. For example, a Dutch study demonstrated that 39% of multi-drug resistant *E.coli* found in poultry samples belonged to identical genotypes present in human clinical samples.<sup>6</sup> Furthermore, recent evidence indicates that bacteria can transfer their genetic resistance traits to the normal intestinal flora of animals and humans; and human, animal and environmental strains of multi-drug resistant *E.coli* displayed high clonal diversity, but harbored indistinguishable plasmids, indicating that such plasmids were transmitted between pigs and farm workers across multiple *E.coli* lineages.<sup>7</sup>

### **Current Status**

In 2011, the World Health Organization (WHO) released a report describing an “urgent need for action remediating antibiotic resistance through a holistic, inter-sectoral and multifaceted approach that includes all efforts to reduce unnecessary use of antibiotics, including those used in animal production”.<sup>8</sup> In addition, Sweden, Denmark and the European Union have banned non-therapeutic use of some or all antimicrobials used for the purpose of animal production.<sup>9</sup> More recently, the US Food and Drug Administration (FDA) asked the food animal-production industry to voluntarily adopt recommendations limiting the use of medically-important antimicrobial drugs in food-producing animals to those that are considered necessary for assuring animal health, and included provisions for veterinary oversight or consultation.<sup>10</sup>

In Canada, Health Canada’s policy on Extra-Label Drug Use (ELDU) also recommends veterinary oversight when using medically important antimicrobials, including extra-label use in food-production animals. Health Canada has also implemented the addition of warning statements on antimicrobial drug product labels specifying prudent use according to their specified approved conditions.<sup>11</sup>

In the province of Quebec, access to antibiotics for food-producing animals is through veterinary prescription and supervision.<sup>12</sup> All other Canadian provinces, however, follow the *Food and Drugs Act* and Regulations, which permits people engaged in animal husbandry to import quantities of antimicrobials to meet their own needs.<sup>13</sup> This clause allows large amounts of antimicrobials into Canada without surveillance of quantity or guarantees of quality. It also means that the food animal production industry can use antimicrobials on a large scale with limited oversight. It is estimated that of those products sold in Canada, about 88% of the total volume (by weight of active ingredient) of antimicrobials distributed for sale are for use in animals.<sup>14</sup> This number does not include those products that are imported under the “own use” provisions of the Act and Regulations. Presently, in Canada, there are no surveillance systems in place to monitor the total volume of antimicrobials being used in food animals.

Recently, the Ontario Medical Association (OMA)<sup>13</sup> and Community Hospital Infection Control Association (now renamed Infection Prevention and Control Canada)<sup>15</sup> have called for reductions of the use of antimicrobial compounds in animal husbandry.

### **Further Considerations**

A restricted number of new antibiotics are being developed and becoming available in the supply chain. Only two systemic antibacterial agents have been approved for use in humans by the U.S. FDA since 2008, compared to sixteen that were approved from 1983-1987. Furthermore, there have been no new classes of antibiotics to treat Gram-negative bacilli for more than 40 years.<sup>16</sup>

In addition, initial economic analyses indicate that the use of antibiotics in animal husbandry may not be cost effective. For example, an analysis of US animal agricultural practices has shown that, while the use of prophylactic antimicrobials increases the market value of chickens, it also increases production cost and results in net loss; thus, the withdrawal of prophylactic antimicrobials has been found to actually increase the net value of flocks.<sup>17</sup>

### **Discussion**

Emerging evidence is demonstrating that there may be a relationship between the use of antibiotics in animal husbandry and AMR in human medicine. This situation is complicated, in Canada, due to a lack of surveillance information concerning the use of anti-microbial compounds in animal husbandry or their potential effect on AMR, and the importation of antimicrobials through the own-use provision of the *Food and Drugs Act* and Regulations. Complicating factors include: the limited number of new antibiotics in research and development, and the limited economic information concerning the costs and benefits of antibiotic use for prophylaxis and growth promotion in animal husbandry. Recent evidence has demonstrated, however, a relationship between the use of antibiotics in animal husbandry and AMR in human-infection-causing microorganisms. As such, a cautious approach should be taken to the use of antibiotics in animal husbandry, similar to that taken in human medicine. As a result, CPHA recommends:

- A requirement for veterinary oversight for the use of antimicrobial compounds in animal agriculture, and a prohibition on the use of medically important antimicrobials for non-therapeutic purposes in food producing animals;
- Removal of the “own use” provision for the importation of antimicrobials from the *Food and Drugs Act* and Regulations; and
- Development of a surveillance system to monitor the volume and use of antimicrobials in the Canadian food animal-production industry.

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