

Antibiotic Resistance: We're All In This Together!

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We've all read in the news about the antibiotic resistance crisis in medicine – the dire stories about superbugs with the ability to survive in the face of the antibiotics that should kill them. A new report by the Council of Canadian Academies says that by 2050, about 40% of all bacterial infections in Canadian healthcare could be resistant, causing over 13,000 annual deaths at a healthcare cost of about \$7.6 billion annually¹. When infections that were once easily treatable become resistant, we are entering the “post-antibiotic era”.

We know that almost 80% of all antibiotics sold are used in livestock production, and the majority of this is in the class of in-feed and in-water tetracyclines². We don't know everything, but we know that use and misuse of antibiotics can lead to antibiotic resistance... this happens in hospitals, homes, doctors' offices, farms – anywhere antibiotics are used. How much of a problem is agriculture, and specifically dairy?

There are a variety of ways in which antibiotic resistance can transmit from animals to humans:

- Direct contact between animals and humans
- Shedding of resistant bacteria into the environment, eventually contacting humans
- Consumption of animal products with resistant bacteria

We really don't know how much of the blame agriculture deserves, but it is likely a small proportion in the grand scheme of things³. What we do know is that there is antibiotic resistance in agriculture, and when we use less antibiotics, resistance in in-contact humans and animal products decreases⁴. What I've always told people is this: We are all in this together. Regardless of where the bulk of the blame lies, anyone that uses antibiotics has the duty to ensure that they are used as responsibly as possible.

The Picture in Dairy

I've recently done a pilot project with the Ontario Animal Health Network (www.oahn.ca) where I analyzed antibiotic sales data from two veterinary clinics to calculate overall antibiotic sales rates in their client herds (68 in total for this study). I found some pretty interesting things. When comparing these results to previous research (over 10 years old), we're using about the same amounts⁵. What's more, our usage rates in the dairy industry are lower than other livestock commodities. For instance, in dairy drug usage rates averaged 11 doses/1000 cow-days; whereas in broiler chickens, rates varied up to 223 doses/1000 chicken-days⁶. Canadian chicken farmers are working hard to reduce this number and are making major changes in the industry. Antibiotic use in dairy was also lower than a recent World Health Organization study found in human populations (countries ranged between 5 and 64 doses per 1000 person-days)⁷. We also know that resistance patterns in mastitis bacteria and other pathogens have remained stable and relatively low over the years^{8,9}. In my mind, this is a good news story. **Regardless, we still have the responsibility to ensure that every millilitre of antibiotics we use is employed in a responsible manner.**

Responsible Use ≠ Never Use

What we need to do is find a balance – sick animals deserve antibiotics to give them the best chance at recovery. Responsible use is all about using antibiotics as required – the right drug, for the right bug, at the right dose, for the right amount of time. As little as necessary, as much as required. What can you do to make sure you're using antibiotics in the best manner? I've been involved in an

educational initiative called the Farmed Animal Antimicrobial Stewardship initiative (www.amstewardship.ca). We have a variety of resources geared at promoting responsible antibiotic use. Some things you can focus on:

- Vaccination and improved biosecurity to prevent disease
- Prompt disease recognition and treatment protocols (as always, work with your vet)
- More culturing and lab testing – especially mastitis cases.
 - o **Did you know up to 40% of all clinical mastitis cases are culture negative and don't need antibiotic treatment?**
- A solid relationship with your herd vet. They are the experts in animal health and can guide you to making the right treatment choices. When in doubt, ask your vet!

While much of the messaging is doom and gloom around antibiotic use and resistance in agriculture, I'd like to say that programs like Canadian Quality Milk, and later proAction, have really come a long way in promoting and ensuring responsible antibiotic use. I think we're doing a good job in dairy, but we can always do better. I encourage everyone to critically think about every dose of antibiotics they use and refine where possible. We're all in this together.

References

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