

Special Report Rapport spécial

New Quebec regulation on the use of antimicrobials of very high importance in food animals: Implementation and impacts in dairy cattle practice

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Introduction

Antimicrobial resistance (AMR) is a major concern for human and veterinary medicine of the 21st century (1). Antimicrobial usage (AMU) in food-producing animals is under scrutiny by the public. Therefore, some countries such as France, Belgium, and The Netherlands have enforced regulations to decrease AMU in food-producing animals and/or to limit the usage of antimicrobials that are of very high importance (Category I antimicrobials) in human medicine. Antimicrobials of this category used in food-producing animals in Canada are 3rd and 4th generation cephalosporins, fluoroquinolones, and polymyxins. On February 25, 2019, the Quebec government enforced a new regulation to restrict the use of Category I antimicrobials in food animals in the province. This special report presents the new regulation, its implementation in the dairy sector, the actions of stakeholders before the implementation, and finally, the possible impacts on veterinarians and dairy producers.

Quebec's new regulation

The new regulation has 2 components: i) the use of Category I antimicrobials in the treatment of disease, and ii) the use of Category I antimicrobials in the prevention of disease. In essence, this new regulation is as follows:

Bylaw 1.1. Administration, for curative use, of a medication belonging to the category of very high importance antimicrobials to an animal that will be used (or from which products will be used) as human food is restricted to clinical

cases that are not treatable with an antimicrobial of a lower importance category based on, for example, a culture and susceptibility testing.

Bylaw 1.2. It is forbidden to administer for a preventive purpose a medication that belongs to the category of very high importance antimicrobials to an animal that will be used (or from which products will be used) as human food.

The application of the regulation by dairy producers will be attested during regular farm inspection performed by an inspector of the “Ministère de l’Agriculture, des Pêcheries et de l’Alimentation du Québec” (MAPAQ). Dairy producers will need a valid veterinary prescription and a completed veterinary justification form for every prescription of Category I antimicrobials. Figure 1 is an example of a veterinary justification form.

The application of the regulation by a veterinarian will be examined during regular professional inspections performed by an inspector of the “Ordre des médecins vétérinaires du Québec” (OMVQ), the veterinary medical licensing board of Quebec.

Actions of stakeholders before implementation of the regulation

Many stakeholders have been proactive in Québec for several decades in trying to regulate AMU and monitor AMR. The main actions taken by stakeholders are described below.

Since 1984, a **veterinary prescription** has been mandatory to obtain veterinary drugs such as antimicrobials and anti-inflammatory agents. Thus, dairy producers have for a long time been in the habit of contacting their veterinarian to obtain antimicrobials. As of December 1, 2018, this rule has become widespread across Canada.

The **Quebec antimicrobial resistance surveillance program** was established in 1993 and is still in place today. It is a multi-species passive surveillance program which is unique in Canada. A report and a conference are presented each year for stakeholders to consult or to attend.

The **Quebec strategy for animal health and welfare** which contains an **antimicrobial stewardship component**, was established in 2011 by a stakeholder committee overseen by the MAPAQ. Since then, this committee has worked on several initiatives regarding AMU and AMR such as guidelines, tools, and a prudent use advertising campaign. Work to update the framework plan is ongoing.

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USE OF CATEGORY 1 ANTIBIOTICS

IDENTIFICATION			
OWNER /FARM /SITE:		PRESCRIPTION ID:	
		SPECIES :	
ID OF ANIMAL OR HERD OF ANIMALS TO BE TREATED: (name, n°, category and number)		SEX OF THE ANIMAL:	<input type="checkbox"/> M <input type="checkbox"/> F
DESCRIPTION OF THE ANIMAL: (breed or crossbreed, hair colour, special features, etc.)		AGE OR DATE OF BIRTH:	

MEDICAL CONDITION

The *Regulation Amending the Regulation respecting the administering of certain medications* prohibits the administration of a Category I: Very High Importance antibiotic for preventive purposes and such administration for curative purposes to an animal intended for human consumption or whose products are intended for human consumption is reserved exclusively for cases where it appears, for instance, after carrying out an antibiogram, that the administration of the medication of a class other than the classes of that category will not allow the treatment of the disease. *Please consult the Regulation for more information on the other conditions of use and on administration to embryonated eggs.*

Given the above Regulation, for each event involving the prescription of Category I antibiotics, the following conditions must be met:

Please check as appropriate:

- 1. The Category I antibiotic was prescribed after conducting an appropriate examination of the animal or population of animals and obtaining full knowledge of all the facts.
- 2. The diagnosis was established with great care; the information has been recorded in the file or will be as soon as possible.
- 3. All treatment options considered have been recorded in the file dated:
No antibiotic from a lower category of medications can be used to treat the condition in this specific case.
- 4. The client has been informed of the restrictions involving the use of Category I antibiotics and of the need to implement appropriate preventive measures whenever possible (vaccination, sanitary conditions, record of colostrum/mammary gland/reproduction/locomotor system, etc.).

VETERINARIAN ACKNOWLEDGMENT

By signing this form, I assume professional liability and certify that the information provided herein is accurate.

Signature of veterinarian and permit N°	Veterinary establishment	Date
	Client signature	Date

Figure 1. Example of a veterinary justification form.

In April 2015, the OMVQ implemented a **6-hour mandatory continuing education session on AMU and AMR** for all veterinarians in Quebec. This was a requirement for renewal of veterinary licenses. This continuing education program was delivered multiple times over a 2-year period and consisted of a 3-hour core session on principles of AMU and AMR and a 3-hour session on applied knowledge specific to each animal species.

In collaboration with professors of the Faculté de médecine vétérinaire de l'Université de Montréal, the "Association des médecins vétérinaires praticiens du Québec" (AMVPQ), the main veterinarian association working with food animals in Quebec, created a **3-hour continuing education program for dairy producers on AMU and AMR**. Three sessions were organized to explain the educational material to veterinarians. A total of 76 veterinarians attended the sessions out of the 421 veterinary members of the AMVPQ. At these sessions, veterinarians were trained to give one or several presentations to their dairy producers. More than 1650 dairy producers from the 5500 dairy farms in Quebec attended these presentations. The first hour was dedicated to basic information on bacteria, antimicrobials, AMR, proper manipulation and on-farm storage of antimicrobials, injection sites, and dosage calculations. The remaining 2 hours covered judicious AMU in specific infectious diseases such as mastitis, pneumonia, calf diarrhea, lameness, metritis, and retained placenta.

Over the years, publications in journals and in local congress and meetings have addressed the topics of AMR and AMU for veterinarians and dairy farmers.

Possible impacts on veterinarians and dairy producers

The main expected impact of the new regulation is a change in veterinarians' and dairy producers' mindset. The prescription habits of veterinarians will be modified and, therefore, a change in AMU is anticipated with better usage of diagnostic tests, and of infection prevention and control (IPC) measures.

Changes in prescription habits. As previously mentioned, Category I antimicrobials are no longer to be used for disease prevention. Thus, a dry-cow product containing such an antimicrobial cannot be prescribed for IPC. However, Category I antimicrobials can be prescribed to treat sick animals in 2 different situations.

1. If a licensed veterinarian concludes, based on the history of the animal or the herd, the physical examination with or without additional diagnostic tests such as milk culture or tracheal lavage, that only a Category I antimicrobial will cure the infection. Then, a prescription is made only for that animal and the required quantity of antimicrobial needed for that specific animal is dispensed. Furthermore, an official justification form is filled out by the veterinarian and provided to the dairy producer who has to keep the form in his/her farm's records.
2. When a sick animal needs treatment but is not examined by a licensed veterinarian. In this instance, the dairy producer can give the animal a Category I antimicrobial, but

only in specific situations and only if restrictive criteria are fulfilled. First, a written protocol needs to be in place by the herd veterinarian. Second, the protocol that includes a Category I antimicrobial to treat a specific case scenario has to be judged by the herd veterinarian as necessary based on the history of the animal or the herd, past physical examinations, or diagnostic tests previously performed on the herd. Third, the farm records need to be completed in a very comprehensive manner, thus allowing the veterinarian to monitor each dose of Category I antimicrobial that was administered to fill out a justification form. Finally, the protocol needs to be re-evaluated regularly to make sure it is still justified, and emphasis needs to be on IPC measures and improvement of herd management.

These changes in prescription habits are expected to have an impact on AMU. Products containing Category I antimicrobials are likely to be prescribed less often than before. The sale of those products is anticipated to decrease and, thus, the pharmacy inventory will decrease proportionally. The inventory of antimicrobials not listed in Category I, however, is likely to increase.

Before promulgation of the new regulation, a Category I antimicrobial with zero milk withdrawal was used to treat several diseases that could be treated with antimicrobials of other categories, but with milk withdrawal periods. On some occasions, cows with anorexia without an infectious disease identified or a veterinary diagnosis were also treated "just in case" with this same antimicrobial. This practice will likely be terminated with institution of the new regulation. Dairy producers will no longer have Category I antimicrobials available on-farm. Thus, the only antimicrobials to which they will have access to treat an animal, will have milk withdrawal periods. Producers will likely think twice before implementing an antimicrobial treatment because the milk will be lost for several days. For these reasons, overall AMU will decrease for all categories of antimicrobials. Globally, this will be a positive effect of the new regulation. However, there is a risk that in some cases, antimicrobial treatment will be delayed to avoid milk losses in animals that would have benefited from an earlier treatment. In such cases, there is a risk of increased animal suffering or decreased cure. Veterinarians and producers need to stay alert to avoid those kinds of negative consequences.

Diagnostic tests. Since veterinarians need to justify the use of Category I antimicrobials, more diagnostic tests are expected to be performed on-farm, in particular, bacteriological milk culture, tracheal lavage, fecal culture, and necropsy. This is an opportunity for veterinarians in Quebec to offer more disease investigation and management services than before, both at the individual animal and herd levels. In some situations, it allows justification of the use of Category I antimicrobials, but more importantly, and on many occasions, it allows veterinarians to justify using an antimicrobial of another category or no antimicrobial at all. These situations allow veterinarians to explain and teach dairy producers regarding situations in which antimicrobials are needed, the risk of development of AMR if antimicrobials are not used properly, disease pathophysiology, and IPC.

Prevention. The best way to avoid antimicrobial treatment is by using proper IPC measures. There is room for improvement

in management practices, environmental conditions, and disease prevention strategies such as the use of vaccines. For example, a dry and clean environment will contribute to prevention of mastitis or calf diarrhea, adequate ventilation will help to prevent pneumonia, and colostrum management will decrease prevalence of diarrhea and pneumonia in calves. Many IPC measures can be improved on-farm that will result in a decrease in disease incidence and consequently, a decrease in AMU and AMR.

In conclusion, the new regulation has now been implemented in Quebec. The veterinarians of the province must adapt and comply. Although it may have seemed counterintuitive at first, it was generally well-accepted by veterinarians and dairy producers. First, because they had been well-prepared over a long period

by several stakeholder initiatives. Second, because they saw the benefits and opportunities of improvement since they must do things differently. Now, the focus should be on the prevention of diseases rather than treating with antimicrobials. It is recommended that more diagnostic tests be performed with greater involvement of veterinarians in treatment decisions. These actions should lead to an overall significant decrease in AMU use, which should be promoted to consumers.

Reference

1. WHO, World Health Organization (2014). Antimicrobial resistance Global Report on surveillance; summary. 8 pages. Available from: http://apps.who.int/iris/bitstream/10665/112647/1/WHO_HSE_PED_AIP_2014.2_eng.pdf?ua=1 Last accessed December 12, 2019.