

Buyer Beware – Emerging Diseases Coming to Canadian Dairy Farms

David F. Kelton

Department of Population Medicine, Ontario Veterinary College, University of Guelph, Guelph ON N1G 2W1

Email: dkelton@uoguelph.ca

■ Take Home Messages

- ▶ Dairy farm biosecurity programs should include measures to keep out potentially emerging diseases, including Anaplasmosis, Salmonella Dublin, Q-Fever and Prototheca Mastitis.
- ▶ Dairy farmers should understand what cattle infected with these diseases might look like, so that they can recognize these diseases and if possible keep from introducing them into their herds.
- ▶ The single most important component of an effective biosecurity program is 'buyer beware.' Know what you are buying and who you are buying from. Ask about disease occurrence and disease testing in animals to be purchased AND the herd of origin.

■ Emerging Diseases

Many local, regional and national challenges face Canadian dairy producers on a daily basis. Attention is divided among many initiatives including Dairy Farmers of Canada's proAction initiative. One of the key components of proAction is biosecurity. Biosecurity is a term used broadly in the dairy industry to encompass the protection of people, animals and their environment against all forms of biological threat, including disease. Biosecurity for dairy herds includes at least four distinct, but not necessarily mutually exclusive, components. It includes minimizing the risk of A) incursion of foreign animal diseases (FAD) into the country (eg. Foot & Mouth Disease); B) spread of endemic diseases among herds and regions within the country (eg. Digital Dermatitis); C) spread of endemic diseases among individuals and management groups within a particular herd (eg. Johne's Disease); and D) transmission of zoonotic agents from animals to the people who work with the animals and/or consume their products (eg. *E. coli* O157) (Kelton, 2011). Among the group of dairy cattle diseases that do not fit well

into any of the preceding 4 groups are emerging diseases that may be endemic or at least more frequently found in neighbouring jurisdictions, are not listed as named FAD's by the Canadian Food Inspection Agency (CFIA) and are likely to be found more frequently in Canada in the coming months/years due to factors such as climate change or consumer concern. These include Anaplasmosis, Salmonella Dublin, Q-Fever and mastitis caused by Prototheca. The purpose of this presentation is to introduce Canadian dairy producers to these four emerging diseases so that they can be considered for inclusion in farm biosecurity planning.

■ Anaplasmosis

Anaplasmosis is a bacterial disease caused by *Anaplasma marginale* that can affect cattle, bison, elk, deer, sheep and goats, although only cattle commonly show signs of infection. Anaplasmosis is endemic in the United States and has been seen increasingly in Canada. It is currently a 'reportable disease' in Canada under the Health of Animals Act, which means that all suspected cases must be reported to the CFIA and that if confirmed, the infected animals are removed, exposed animals are tested and owners of destroyed animals are eligible for compensation. On April 1, 2014 Anaplasmosis will be removed from the list of 'reportable diseases' based on the expectation that the disease will continue to enter Canada from the United States and that eradication in Canada may no longer be feasible or economically justified. Details about the Anaplasmosis Program Adjustment can be found on the CFIA website (<http://www.inspection.gc.ca/animals/terrestrial-animals/diseases/reportable/anaplasmosis/2013-02-24/eng/1361763159979/1361763263785>).

Anaplasmosis is commonly referred to as a tick-borne disease, as ticks are the most common biological vector for this disease. As the ticks move further north in response to climate change, the disease will likely become endemic in Canada. The bacterium invades and multiplies in red blood cells. As such it can also be spread by blood-contaminated needles, hoof knives or dehorning instruments and by biting insects such as horseflies. As infection gets established red blood cells are destroyed, causing the animal to become anemic, the most common and perhaps most important clinical sign. Infected animals may also have a fever, be off feed, and become weak, depressed and/or dehydrated. Calves seldom show signs of illness when they become infected but can be important carriers of the disease, while older cattle not only will become sick, but up to 50% may die.

Dairy producers should be aware that Anaplasmosis may soon appear in Canadian dairy herds and should consult their herd veterinarian if they have animals showing any of the signs described above. In keeping with good biosecurity practice, always ask about the disease history of the animal(s),

cows or youngstock, being purchased and the herd of origin. Specifically ask if the herd has had any animals diagnosed with Anaplasmosis.

■ **Salmonella Dublin**

Salmonellosis is a common disorder of the gastrointestinal tract of many species of animals and humans. There are many strains of *Salmonella*, and the illness associated with each strain varies. While Salmonellosis is less frequently diagnosed in cattle than in some other farmed animals, there is a cattle host-adapted strain of the bacterium, *Salmonella* Dublin. This bacterium produces a respiratory illness in calves 1 week to 6 months of age and can cause fever, diarrhea and abortions in older animals. Infected carrier animals not showing signs of disease can maintain the infection in the herd by shedding the organism in their feces and milk during times of stress. Introduction of infected carriers into a herd without previous exposure could result in a significant herd outbreak of disease. Multi-drug resistant *Salmonella* Dublin has emerged as a concern in the northeastern United States, and has been identified as an emerging threat in eastern Canada.

Dairy herd owners should be alert for unusual illness such as pneumonia in cows and/or calves, with large numbers of sick animals and some deaths. As always, consult your herd veterinarian and consider that *Salmonella* can also infect people. This is another disease that should be included in a herd biosecurity plan, especially in the context of introducing new animals (cows or calves) to the herd. Dairy producers should consult the Dairy Biosecurity Standard (<http://www.inspection.gc.ca/animals/terrestrial-animals/biosecurity/standards-and-principles/dairy-farms/eng/1359657658068/1359658301822>) for guidance about best management practices for animal introductions. Herds that have identified *Salmonella* Dublin among their animals should employ appropriate within-herd biosecurity practices to prevent transmission to susceptible animals, especially newborn calves.

■ **Q-Fever**

Q-Fever is a zoonotic disease found world-wide that is caused by the bacterium *Coxiella burnetii* and can infect most ruminant species including cattle, sheep and goats. The disease is economically important and is most commonly reported in small ruminants as a cause of abortion, infertility, metritis and even chronic mastitis. Human outbreaks in the Netherlands since 2007 have brought the disease to the forefront of zoonotic diseases targeted for control in Europe. Studies have focused on people working with sheep, goats and cattle, and have concluded that abortion storms on goat farms were the primary source of human infection (van der Hoek, 2010).

North American studies have tended to focus on sheep and goats, but there is little doubt that *C. burnetii* is looming as a concern for the dairy cattle industry. While the direct economic impact of the disease on dairy herds might not be large, the indirect impact of consumer concerns over milk safety may stimulate action by dairy producers similar to that taken to control Johne's Disease over the last five years.

■ Prototheca Mastitis

Prototheca are species of algae that cause incurable acute or chronic mastitis in a very small proportion of dairy cows. These algae are commonly found in the farm environment and opportunistically infect the mammary gland, in some cases producing a chronic unresponsive mastitis that is similar to that caused by *Staphylococcus aureus*. Unsanitary or repeated intramammary infusions may be important risk factors for infection (Pieper, 2012). *Prototheca* mastitis is not new, but is being recognized as a cause of bovine mastitis more frequently. The addition of *Prototheca* to the CanWest DHI Mastitis PCR test will undoubtedly bring this pathogen some increased profile. In cows with a chronically elevated somatic cell count and poor response to intramammary antibiotic treatment, this cause of mastitis should be considered. Given that treatment is ineffective, culling of the cow or quarter is the most likely course of action.

■ References

- Kelton D.F. 2011. What's mine is yours – perspectives on biosecurity for Canadian dairy farms. *In: Western Canadian Dairy Seminar: Advances in Dairy Technology*. Red Deer, Alberta. Vol 23 p 343-348.
- Pieper, L., A. Godkin, U. Roesler, A. Polleichtner, D. Slavic, K.E. Leslie and D.F. Kelton. 2012. Herd characteristics and cow-level factors associated with *Prototheca* mastitis on dairy farms in Ontario, Canada. *J. Dairy Sci.* 95:5635-5644.
- Van der Hoek, W., F. Dijkstra, B. Schimmer, P.M. Schneeberger, P. Vellema, C. Wijkmans, R. ter Schegget, V. Hackert and Y. van Duynhoven. 2010. Q fever in the Netherlands: an update on the epidemiology and control measures. *Euro. Surveillance.* 15:11-14.



NOTES

NOTES