Johnne’s Disease Control in Canada – Coordinated Nationally – Delivered Provincially

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Introduction

Johnne’s Disease (JD) has long been identified as an important production limiting disease of dairy cattle. In recent years, concern over public scrutiny of Mycobacterium avium subspecies paratuberculosis (MAP) as a potential zoonotic agent has brought the disease to the forefront among producers groups across the country. While programs targeted at JD control have been developed and implemented provincially, the coordination of these programs at the national level remains an important issue to ensure some degree of uniformity of practice since cattle frequently move among provinces.

The Canadian Johnne’s Disease Initiative (CJDI) coordinates provincial JD control activities across Canada. Since its inception in July, 2009 the CJDI, funded by Dairy Farmers of Canada and the Canadian Cattlemen’s Association, has been guided by its Advisory and Technical Committees (each with representation from industry, veterinary schools, and provincial programs). The CJDI priorities are to increase education about and awareness of JD across Canada among dairy producers, veterinarians and allied industries; to encourage the development and implementation of control programs in all of the 10 provinces of Canada and where possible to support coordination among these programs; and to facilitate the development and funding of research programs in areas that will support the coordinated mission of JD control.

Aims and Objectives

Given that JD control is being delivered at the provincial level (Canada has 10 provinces – each with an important dairy industry), the aim of this document is to describe the structure, similarities and differences among these dairy programs and to highlight some of the important lessons learned during the early stages of program implementation.

The objectives are:

1 - To briefly compare the provincial dairy cattle programs in terms of key components, program administration, program delivery, status programs, testing and penetration.

2 - To describe lessons learned through the initial stages of provincial program implementation.
Provincial Programs

Nine of the ten Canadian provinces now have voluntary JD control programs in place. In most cases, the programs were producer initiated (in Québec the program was initiated by the provincial government, but with strong producer support) and are managed by committees that include producer group, provincial government, university, milk recording and veterinary association representatives. Below is a table that includes the year initiated, the anticipated duration of the program based on currently committed funding, dollars available and the principle organization(s) which initiated the program.

<table>
<thead>
<tr>
<th>Provincial Johne’s Disease Initiative:</th>
<th>Year Initiated / Duration:</th>
<th>$ invested / to invest:</th>
<th>Initiative Partners:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quebec Voluntary Paratuberculosis Prevention and Control Program</td>
<td>2007 -</td>
<td>$1.6 Million</td>
<td>Government – Academia- Industry</td>
</tr>
<tr>
<td>Ontario Johne’s Disease Education and Management Assistance Program</td>
<td>2010- 2014</td>
<td>$2.4 Million</td>
<td>Industry – Academia - Government</td>
</tr>
<tr>
<td>Manitoba Johne’s Disease Initiative</td>
<td>2010 - 2013</td>
<td>$175,000</td>
<td>Government - Industry - Academia</td>
</tr>
<tr>
<td>Alberta Johne’s Disease Initiative</td>
<td>2010 - 2013</td>
<td>$730,000</td>
<td>Industry – Academia-Government</td>
</tr>
<tr>
<td>Atlantic¹ Johne’s Disease Initiative</td>
<td>2011 - 2014</td>
<td>$1.1 Million</td>
<td>Government - Academia- Industry</td>
</tr>
<tr>
<td>British Columbia Johne’s Disease Initiative</td>
<td>2011 – 2013</td>
<td>$100,000</td>
<td>Government- Industry - Academia</td>
</tr>
<tr>
<td>Saskatchewan Johne’s Disease Working Group</td>
<td>Periodic meetings</td>
<td>–</td>
<td>Government - Academia – Industry</td>
</tr>
</tbody>
</table>

¹Atlantic Canada includes Nova Scotia, New Brunswick, Prince Edward Island, and Newfoundland and Labrador
All of the programs have four key elements in common. These include education of producers, veterinarians and the public, an on-farm risk assessment administered by a veterinarian, testing at either the herd and/or the cow level, and applied research. Details of each provincial program can be found on their respective websites:

Canadian Johne’s Disease Initiative:  [http://www.animalhealth.ca/Programs/Detail.aspx?id=24](http://www.animalhealth.ca/Programs/Detail.aspx?id=24)


Atlantic Provinces:  [http://www.atlanticjohnes.ca/](http://www.atlanticjohnes.ca/)


Ontario:  [http://www.johnes.ca/](http://www.johnes.ca/)

Québec:  [http://www.mapaq.gouv.qc.ca/fr/Productions/santeanimale/maladiesanimales/paratuberculose/](http://www.mapaq.gouv.qc.ca/fr/Productions/santeanimale/maladiesanimales/paratuberculose/)

Education about MAP, including its spread and control, is central to all of the provincial initiatives. Ranging from traditional forms of delivery (articles in magazines and journals and presentations at conferences and meetings) to novel approaches such as small group facilitated self-directed learning, this is a core element that is critical to the success and long term viability of each of these programs.

The Animal Health Risk Assessment and Management Plan (RAMP) is a questionnaire that guides the herd veterinarian and the producer through a step-by-step assessment of calving, calf raising and hygiene practices associated with good calf and cow health, and excellent milk quality. The goal is to identify risk factors that could allow MAP from a shedding cow to infect calves on the farm. After completing the questionnaire (risk assessment), the producer and the veterinarian decide what can and will be done in the next year to mitigate some of the identified risks as part of developing the “management plan”. Generally, acceptance of recommendations is good when producers realize that steps taken to reduce new MAP infections will also reduce other calf diseases caused by fecal-orally transmitted pathogens.

The RAMP is the most uniform component of the provincial programs, at least in part because there is a national standard for process that was developed by CJDI technical committee. Each provincial program has adhered to the standard, although the method of delivery does vary. Since private veterinary practitioners are conducting these assessments, training becomes an important component of the overall program. Methods used to train veterinarians ranges from one-on-one training to group training to on-line web-based methods.

While all of the Canadian programs have a testing component, the approach and test(s) used vary, as do the monetary incentives/subsidies to test. Some programs utilize environmental testing alone or in combination with individual cows testing, while others are based solely on individual cow test results. Cow tests in use include milk ELISA, serum ELISA, fecal culture
and fecal PCR. In each case the testing is done through either the provincial or regional diagnostic laboratory or the Dairy Herd Improvement (DHI) milk recording laboratory, all of which are accredited for the tests they are offering. The way these test results are used by the program and the veterinarians/producers varies among provinces, and details can be found on the respective program websites.

Many dairy producers who participate in these voluntary control programs and have therefore demonstrated a desire to control JD in their herd wish to have their efforts recognized. They also want to know how other herds in the country compare, particularly if they are in need of purchasing replacement animals for their herd. To meet this demand, most of the provincial programs have either a status or recognition program. In some cases the program simply issues a certificate of completion once a herd has met all of the program requirements, while others have a more complex status system which distinguishes among herds and recognizes herds of different JD risk. Given that cows are frequently bought and sold, and that they move within and between provinces, there is a need to harmonize these status programs.

The other major concern among dairy producers is the disposition of test-positive animals. Again, the programs vary in how they deal with animals identified as being test-positive with any of the approved test methods. For instance, in Quebec all producers who wish to access their individual cow test results must sign an affidavit stipulating that they will not sell any test positive animals. This restricted animal movement is enforced through a provincial animal traceability program that is unique to Quebec at this time. On the other hand, Ontario participants who wish to qualify for program funding support must remove all cows found with high titre (HT) tests (based on the milk ELISA test currently in use a positive test result is 0.1 or greater, while a High Titre is 1.0 or higher) NOT to another dairy herd or to the food chain, within 90 days of the testing date. Producers who remove these HT cows as required by the program receive $500 per cow to assist with on-farm changes to prevent MAP spread.

All of the provincial programs have associated research activities focused on JD control. Some of the programs fund research directly from their operating budgets, while others make program dollars available to researchers for provincial and federal matching fund applications. The research programs are generally coordinated by faculty at the local/provincial veterinary colleges. These researchers gather annually at a relatively informal research conference where progress is presented and new ideas for collaborative research are developed.

**Lessons Learned**

Many of the challenges posed by JD and its control relate to the long period of time between exposure to MAP and development of clinical disease, and the generally poor performance characteristics of the tests currently available for indentifying infected individuals. As direct consequence of these challenges, it is imperative that veterinarians and producers understand the implications and the terminology used in discussing JD control. For instance, there is generally a poor understanding of the difference between a ‘test-negative’ herd and a ‘Johne’s free’ herd. Perhaps it is not surprising, given that our previous disease control programs have focused on Brucellosis and Tuberculosis, disease which we have been successful in eradicating with a ‘test
and cull’ strategy. During the active stages of these eradication programs herds were tested annually and designated ‘test-negative’ herds as ‘free’ of disease. The fact that we test herds for JD and are not willing to call ‘test-negative’ herds ‘Johne’s free’ has confused producers and dairy industry advisors. We need to continue to educate all participants about this important distinction.

The introduction and training of veterinarians to deliver the RAMP has proven to be a great success. The private practitioners have been instrumental in recruiting participants and giving credibility to the programs. Veterinary involvement in the RAMP facilitates a discussion between the herd veterinarian and the dairy producer about important areas of the dairy enterprise (calving hygiene and calf rearing) which have largely been ignored on many farms. Deficiencies identified during the process are often easily corrected and generally lead to an overall decreased risk of calves contracting a number of important diseases transmitted fecal-orally. There is anecdotal evidence that the implementation of changes as a result of the RAMP assessment are contributing to a reduction in other endemic diseases including calf diarrhea. Given the current focus on biosecurity among all livestock and poultry industries, the JD control programs are proving to be very effective examples of implementation of targeted biosecurity on dairy farms across the country.

One of the most striking differences among the provincial JD programs is the approach to testing. These differences have been noted and the details for each program are described on the respective websites. These differences in testing have prompted many discussions among researchers, veterinarians and producers. While there clearly is no ‘best’ approach, the dialogue about the various strengths and weaknesses has contributed to the understanding of the limitations of testing in general, and has prompted further collaborative research evaluating tests and test strategies. Probably the biggest lesson that needs to be learned by most dairy producers is that by simply testing and culling test-positive cows, the disease cannot be simply eradicated. The notion that false-negative test results are common when testing individual animals with milk or serum ELISA, or fecal culture/PCR is unsettling at best.

A key element that has been continuously emphasized by dairy producer representatives sitting on our management committees is the importance of NOT allowing MAP infected cows to move freely from one herd (region) to another, and effectively spread the disease. While enforcement of movement restriction is currently limited to the province of Québec, the importance of educating dairy producers who must buy replacement cattle to ask about the health status of potential herd additions (Buyer Beware) needs to be a constant message.

The final lesson and challenge relates to the voluntary participation in the various programs. Given that these programs are producer initiated, the early enthusiasm drives uptake in the first year or two, but with time many of the programs suffer from decreased profile, decreased interest and decreased participation. The challenge is to find new ways to keep the program fresh, keep it prominent in the minds of producers and to generate messages that bring the sceptics and late adopters on board.