



**CANADIAN ANIMAL HEALTH COALITION**

**COALITION CANADIENNE POUR LA SANTÉ DES ANIMAUX**

# **The Canadian Voluntary Johne's Disease Prevention and Control Program**

Developed and Proposed by:

**The Johne's Disease Prevention and Control Program Project Committee**

**Canadian Animal Health Coalition**

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Agriculture and  
Agri-Food Canada

Agriculture et  
Agroalimentaire Canada



## ■ Executive Summary

### → Document Scope

This report is the result of a project to develop a Canadian Voluntary Johne's Disease (JD) Prevention and Control Program for beef and dairy cattle. The project is an extension of work initiated by a consortium of industry groups operating as the National Johne's Disease Management Group. The Group has targeted a completion date of May 2006 for development of the Prevention and Control Program.

The Project incorporates four core elements:

1. Examples of communications materials to raise awareness for the potential of JD in Canadian cattle and protocols for prevention and control
2. Risk Assessment and Best Management Practices (BMP) for producers and veterinarians in the beef and dairy sectors
3. A herd status program
4. Coordination process for concurrent and ongoing research

### → What is JD?

JD (*Paratuberculosis*) is infectious, chronic enteritis caused by *Mycobacterium avium* subsp. *paratuberculosis* (MAP). It results in intermittent diarrhea, loss of body condition and lower productivity in both beef and dairy cattle and it is considered to be non-treatable. JD is widespread in cattle populations in most countries with major dairy and beef industries. Subclinical infection is common and clinical infection is less common. The disease causes significant economic impact because of lower productivity and loss of future income (due to early culling). While commonly considered to be a "dairy" disease, beef cattle are also affected (in addition to other species not considered in this Program).

### → Program Purpose

The Program is designed to strengthen the Canadian dairy and beef industries' capacity to:

- Control the incidence of JD and prevalence of MAP infection (and eventually eradicate it – see Vision section of main Document)
- Reduce animal and economic losses related to the disease
- Ensure continued access or accelerate resumption of market access (which can currently be impacted if there is an absence of a JD Prevention and Control Program)
- Proactively position the Canadian dairy and beef cattle industries to respond in an informed and supportive manner if a proven link between JD in cattle and Crohn's Disease in humans is established



**This Program applies to both dairy and beef cattle ...**



## The Canadian Animal Health Coalition (CAHC)

### → Program Parameters

The Canadian Voluntary JD Prevention and Control Program:

- Utilizes and builds on the existing JD Control Program that is operating in Alberta
- Draws from a Pilot Project to implement a JD Control Program in Ontario
- Uses materials from both Ontario and Alberta as examples
- Incorporates the experiences of existing programs around the world, including in particular, Australia, The Netherlands and the United States (US)

### → Program Implementation

The Program will be:

- A national standard delivered provincially with the involvement of Agriculture Ministries/Departments, in consultation with industry, through practicing veterinarians
- Inclusive of a research component and continuing administrative support

### → Collaborative Initiative

The strength of this Program lies in national and cross sectoral collaboration of key stakeholders in Canada's cattle industry. The project to develop the Program was coordinated by the CAHC.

Industry	Government	Veterinary Colleges	Bovine Practitioners
Canadian Cattlemen's Association	British Columbia Agriculture and Lands	Western College of Veterinary Medicine University of Saskatchewan	Ontario Association of Bovine Practitioners
Dairy Farmers of Canada	Alberta Agriculture, Food and Rural Development	Ontario Veterinary College University of Guelph	Western Canadian Association of Bovine Practitioners
Holstein Canada	Saskatchewan Agriculture and Food	Faculty of Veterinary Medicine University of Montreal	Atlantic Bovine Practitioners Association
Canadian Animal Health Institute	Manitoba Agriculture Food and Rural Initiatives	Atlantic Veterinary College	
Canadian Livestock Genetics Association	Ontario Agriculture, Food and Rural Affairs Ministère de l'Agriculture, des Pêcheries et de l'Alimentation (Québec) Canadian Food Inspection Agency	University of Prince Edward Island	



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## Acronyms Used

AAFC	Agriculture and Agri-Food Canada
BMP	Best Management Practices
CAHSN	Canadian Animal Health Surveillance Network
CFIA	Canadian Food Inspection Agency
CRTI	Chemical, Biological, Radiological and Nuclear Research
CNPHI	Canadian Network of Public Health Intelligence
CVJDPCP	Canadian Voluntary Johne's Disease Prevention and Control Program
DHI	Dairy Herd Improvement
ELISA	Enzyme-linked immunosorbent assay
HTST	High temperature short time
JD	Johne's Disease
JDPP	Johne's Disease Prevention Pathway
JDSP	Johne's Disease Status Pathway
MAP	<i>Mycobacterium avium</i> subsp. <i>paratuberculosis</i> (Mptb = MAP)
NSERC	National Science Engineering and Research Council
PCR	Polymerase chain reaction
PHAC	Public Health Agency of Canada



## ■ Context

### → Johne's Disease (JD)

JD is an infectious chronic enteritis caused by *Mycobacterium avium* subsp. *paratuberculosis* (MAP). Symptoms of this untreatable disease include:

- Intermittent diarrhea
- Loss of body condition
- Production losses
- A highly weakened state in the terminal phase

The disease is widespread in cattle populations in most countries that have dairy and beef industries, and results in significant economic loss because of lower productivity and early culling. Subclinical infections with MAP are common while clinical cases of Johne's Disease are less common.

### → Incidence in Canada

Despite the demonstrated importance of JD in cattle, accurate information regarding prevalence and incidence of infection in Canadian dairy and beef herds is limited.

A recent study performed of cattle carcasses sampled at a slaughterhouse in Moncton, New Brunswick, revealed that 16% of the dairy cows in Atlantic Canada were infected (McKenna et al., 2004). This is a higher estimate of infection than has been indicated in previously published enzyme linked immunosorbent assays (ELISA) studies (VanLeeuwen et al., 2001). No comparable studies have been completed in other Canadian provinces. Other studies have been done, but these were used by the Committee as being representative.



**The economic impact of JD on the Canadian Dairy Industry is estimated at \$ 90 Million annually. (Chi et al., 2002)**

### → Cause of Infection

While it has been assumed that susceptibility for infection with MAP decreases with age and that calves older than twelve months rarely contract the disease, some researchers are testing this assumption. Infection in young calves generally occurs through the mouth. Bacteria are either ingested with milk that is contaminated with MAP or through oral exposure to feces contaminated with MAP. Infected cattle shed MAP in their feces once infection is established in their bodies – usually after two to five years, often in the absence of clinical signs of illness. JD may be introduced into a dairy herd through the purchase of an infected animal.



**It is projected that 16% of Canadian dairy cattle are infected.**



### → Testing Options

Control programs have been initiated worldwide based on vigorous herd testing and culling programs. Progress has been less than anticipated and subsequently there has been high attrition of participating herds. This lack of progress is due to the nature of JD and testing challenges.

Recently, The CanWest Dairy Herd Improvement Corporation (CanWest DHI) introduced a JD test that can be used on preserved DHI cow milk samples. The efficacy of the test was validated by The Ontario Veterinary College (Hendrick et al., 2005). The test makes it possible for large numbers of cows to be screened quickly and at a relatively low cost for evidence of MAP infection. When dairy farmers have an estimate of the extent of infection in their herds, they are then able to assess the value of a prevention and control program to their operation with their veterinarian.

Recent research at the Atlantic Veterinary College has demonstrated that culturing of pooled fecal samples may be a cost effective alternative to culturing of individual fecal samples for herd screening. (McKenna et al., submitted).

In a recent US study, manure samples collected from the alleyways were culture-positive in 77% of confirmed MAP positive dairy herds. Pooled manure samples of a large number of cows offers a cost effective testing option. Further investigation of pooled fecal sampling protocols under Canadian conditions is required.

### → Control Strategies

This document outlines a Canadian Voluntary JD Prevention and Control Program based on:

1. Minimal testing to first identify herds that need more intensive assistance to control JD
2. Decreasing calf exposure to all manure, milk and colostrums from animals shedding MAP
3. Use of BMP
4. Monitoring of progress over time

### → Eradication or Decrease of Prevalence

Although it is the ultimate target of most control programs, eradication of MAP infection in Canadian cattle is not realistic within the next 20 years. Herd level eradication of MAP infection is possible, but the costs may be prohibitive (Kalis, 2002). The proposed Program focuses on prevention of new infections through application of BMP suited to reducing identified risks on the farm.



### → Potential Link between MAP and Crohn's Disease

There is a potential association between MAP and Crohn's Disease – a chronic enteritis of humans (Kalis et al., 2000). Recent studies have shown that some people with Crohn's Disease are also infected with MAP. While a definitive cause/effect relationship has not been established, the evidence to support MAP infection as a cause of Crohn's Disease is mounting and there is reason to be concerned (Hermon-Taylor et al., 2000).

Based on studies that some MAP can survive certain pasteurization techniques (Grant et al., 2002), some Crohn's Disease patient organizations are communicating the message that drinking milk may be linked to the cause of Crohn's ([www.crohns.com](http://www.crohns.com)).

A recent study indicated that 15% of Ontario retail milk samples were PCR positive for MAP. At the same time, the study revealed that no live bacteria could be cultured from the milk. Elsewhere, viable MAP organisms have been cultured in retail milk in Ireland (Stabel, 2005). In a recent study on pasteurized retail milk in California, Minnesota and Wisconsin, 2.8% of the samples contained live MAP (Ellingson et al., 2005). A form of MAP organism may survive heat treatment of milk, particularly in HTST pasteurized milk (Gao et al., 2002). Although infected cows may shed small numbers of MAP in milk, the main source of pathogens in milk is through contamination with feces (Stabel, 2005). The prevalence of MAP in Canadian bulk and retail milk is not known.

### → The Need for a Control Program

In summary, JD is an infectious disease in dairy and beef cattle which results in economic loss to producers and the industry. JD potentially impacts human health through a possible association with Crohn's Disease and the need for a control program is widely recognized. Currently JD control programs are established in some countries and in Canada. New initiatives are underway in British Columbia, Alberta, Saskatchewan, Manitoba, Ontario and PEI. It is imperative that a national program standard be established for delivery through provincial programs.

#### Who benefits?

- Producers, and the industry at large, will realize a reduction in economic loss
- The industry will be proactively positioned to manage a possible link between MAP and Crohn's Disease
- Individual producers may be able to use the program to differentiate their products in the marketplace
- Provincial and Federal Governments will have access to a prepared program for adaptation and implementation



### ■ Vision • Mission • Objectives • Goals

Prior to developing the Program, the Project Committee established the following Vision, Mission, Objectives and Goals to guide discussion and direct development of this document.

#### → Vision

*To eradicate JD from the Canadian cattle herd*

#### → Mission Statement

*To promote BMP that will control the spread of JD and eliminate the organism from national beef and dairy cattle herds*

#### → Objectives

- *To decrease of JD and the prevalence of MAP infection in Canadian dairy and beef cattle*
- *To decrease the animal health and economic impact of JD on the Canadian cattle industry*
- *Reduce or eliminate MAP and/or its antigen in milk, beef cattle and in the environment*
- *Certification of herds as “low-risk” for JD*

#### → Goals

##### 1. Increase JD prevention and control in Canadian cattle – specifically:

- By the end of 2007, **10%** of Canadian cattle farmers will participate in a voluntary JD prevention program which meets a national standard
- Of the herds participating in the program, **65%** will be identified as having (or being suspected of having) JD (high-risk), while the balance (**35%**) will be considered low-risk
- Enrollment of herds across Canada will grow to 15% in the next year with the aim of full retention. This will help in targeting the program to herds that require the most assistance and thereby meet the expected outcome of the program
- Increasing awareness of the prevalence of JD in Canadian cattle:
  - By the end of 2006, **90%** of Canadian cattle farmers will have read and know that JD is a production limiting disease with economic impacts to the cattle industry and understand why and how JD impacts cattle
  - Engaging in knowledge transfer of the prevention and control of JD to Canadian food animal veterinarians and cattle farmers
  - By the end of winter 2007, **90%** of cattle farmers have read about and know principles on how to prevent the spread of MAP infection from cows to calves
  - By the end of winter 2007, **75%** of food animal veterinarians have read program materials and attended meetings discussing JD transmission, testing, and prevention/control strategies
  - Developing risk assessment and risk management tools that can be used uniformly across Canada; are user friendly; and scientifically defensible



## The Canadian Animal Health Coalition (CAHC)

### **2. Design an easy entry voluntary JD prevention and control program that will be implemented uniformly across Canada:**

- Program standards will be met through provincial delivery of the Program
- The Program will be approved by the participating organizations
- Cattle industry organizations' support will be essential for the continued success of the Program

### **3. Facilitate ongoing knowledge between Johne's researchers across Canada – specifically:**

- Starting June 2006, Canadian JD researchers will be aware of JD projects (past, current and planned for the future)
- This will be used by participating organizations to streamline research funding
- The resulting information will be used to continually update and improve our Canadian Program



## ■ Program Evolution

### → Existing Initiatives

The Canadian Voluntary JD Program was effectively developed by adapting existing domestic and international programs that have been modified and mirrored to create a unique program for Canadian producers. The proposed Program has resulted from this process and will evolve with changing knowledge and experience and will continue to do so.

Historically, global control programs have focused on vigorous testing of herds to control JD. Examples include:

- In 1998, the United States Animal Health Association approved the Voluntary Johne's Disease Herd Status Program for Cattle which relied heavily on testing of animals and removal of positive cattle from herds
- The Australian Johne's Disease control program, or the Johne's Disease Market Assurance Program, relied on the same principle

The progress made in these programs has been less than anticipated. High attrition rates of participating herds have generally resulted because of the high cost and testing challenges of JD. Some governments, (e.g. the US) have slowly decreased funding and forced modification to program approaches.

The proposed Canadian Voluntary JD Prevention and Control Program adopts a modified approach somewhat similar to those in the US, Australia and the Netherlands. The focus is not so much on testing to control JD but testing to:

- Trigger involvement in the program
- Aid in identification of herds that need more intensive assistance in controlling the disease
- Monitor progress over time

Part of the rationale is the vital importance of identifying higher prevalence herds and assisting herd owners to minimize spread of disease. In this way, more impact on controlling JD at the national level can be achieved.

In addition, the program is designed to help producers minimize the risk of disease on their farms through BMP that will control the spread of JD and eventually eliminate the organism altogether.

By implementing farm specific risk management protocols, there will be a decreased risk of transference of disease within the farm and eventually a decrease in the prevalence of disease within and between herds.



### → Parameters of the proposed Canadian Voluntary JD Program

Although many farmers believe they are ready for a certification program, research and experience in other countries indicates readiness may be premature in the Canadian context. In fact, it may be many years before most Canadian herds are truly ready for a certification process.

Therefore, initial parameters of the proposed Canadian Voluntary JD Program include:

- Ease of enrollment to ensure high participation rates
- Low start-up cost to producers to increase likelihood of participation
- Flexibility to allow herds to participate to varying degrees (It is expected that the Program will have varying levels of buy-in at the outset)
- Targeting positive JD herds and providing support and education to minimize the spread of the disease and to lower the incidence of new infections
- Minimal penalties – herds that test positive will be encouraged to participate at some level, and will not automatically be relegated back to the beginning of the test program

The proposed Canadian Voluntary JD Program has incorporated key experiences of the Alberta JD Working Group which identified the following recommendations:

- Keep things simple
- Minimize paperwork
- Focus on emphasizing a general increase of herd health by minimizing specific risk activities
- Minimize penalties for herds that test positive

### → Program Pathways

The proposed Canadian JD Program offers two pathways:

1. **The Prevention Pathway** (JD – Prevention Pathway or JD-PP) which is suited to herds not committed to testing and serves as an entry point for herds of high prevalence
2. **The Herd Status Pathway** (JD Status Pathway or JD-SP) which is suited to low prevalence or negative herds that are interested in testing



**Regardless of the pathway, the goal is to encourage as many herds as possible to participate in the proposed JD Program.**



### → Key Success Factors

The proposed Program is most likely to achieve success by:

- Increasing awareness of the prevalence of JD and MAP infection in Canadian cattle
- Engaging in knowledge transfer of the prevention and control of JD to Canadian veterinarians and cattle farmers
- Developing a standardized risk assessment and risk management tools that can be used across Canada
- Ensuring tools are user friendly and scientifically defensible

Experience with other JD control programs has proven that a simple test and cull program does not lead to increased participation or a reduced prevalence in disease. Testing should be the least emphasized aspect of a program, especially in the initial stages.

Globally, most programs have been re-structured to focus more on risk assessments and subsequent avoidance of infection to achieve reduction on-farm risk of JD transmission; between farm JD transmission; and the overall prevalence of JD.

The proposed Canadian JD Program has focused on the Johne's Disease Prevention Pathway (JD-PP) to deal with the positive herds and to de-emphasize testing. It outlines a starting point, but is expected to evolve in the future to reflect the needs of producers, the industry and the public; while including emerging advances in scientific knowledge and test technologies.



## ■ Program Specifics

→ Two Components



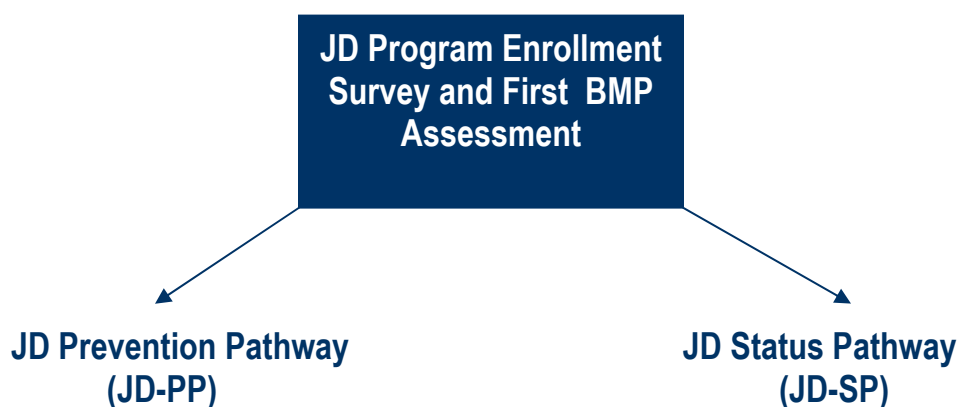
The decision by producers to participate in a Canadian Voluntary JD Program will be on a voluntary basis, motivated and stimulated by awareness and education.

The proposed Canadian Voluntary JD Prevention and Control Program is premised on two major components that can be accessed from two distinct pathways. The components are:

1. **A Best Management Practices (BMP) Assessment** – based on herd risk analysis of critical control points to avoid transmission of MAP. The BMP assessment will generate tangible recommendations based upon assessments performed by trained veterinary personnel. Self assessment is not an option at this point.
2. **Herd Testing** – based on herd characteristics and the prevalence of MAP infection. There are many herd-owners who will have a within-herd prevalence that will preclude them from entering any type of herd certification process. However, testing at some level may be beneficial to monitor herd progress and the effectiveness of herd risk management practices.

→ Two Pathways

There are two pathways for entry into the Canadian Voluntary JD Prevention and Control Program.



Herd-owners that either have knowledge of animals that are infected, or herd-owners that simply are not interested in vigorous testing may opt to pursue the JD Prevention Pathway (JD-PP). These herd-owners will participate in the program with yearly BMP assessments and follow-up assessment to track progress on recommended management changes as identified in their assessment. It is anticipated that the JD-PP will be of interest to the majority of producers initially.



Herds with a low prevalence will have the option to enter the JD Status Pathway (JD-SP). This pathway is designed to allow herd-owners to demonstrate their low herd prevalence through testing procedures that will be repeated on an annual basis. Initially, there may be very few herd-owners who will follow this route, but for herd-owners involved in the sale of genetics, this may be a desirable option.

### → Program Enrollment

The proposed Program begins with completion of a pre-assessment survey for each herd. The survey will assist the BMP assessor (the herd veterinarian) to gain prior knowledge of the farm; streamline the risk assessment process and assist the herd-owner and the veterinarian to decide on the most relevant and cost effective management options.

In order to stimulate interest on all farms (not just low prevalence farms) an intensive education and awareness campaign is required.

Path of entry into the Program will be based on:

- Survey results
- The BMP assessment
- The herd-owner's goals based on consultation between the assessor (the trained herd veterinarian) and the herd-owner

### → Provincial Coordination Commitment

The program is expected to be delivered by different routes in different provinces depending on varying factors including budgets, priorities, commitment of provincial organizations, etc.

Each province will require a provincial coordinator who will be responsible for:

- Increasing awareness of JD and the Canadian Voluntary JD Program
- Ensuring distribution and availability of educational materials
- Facilitating veterinary training
- Participating in national coordination activities
- Collecting and reporting data to the national data collection centre (proposed as The Canadian Animal Health Surveillance Network)



## ■ Best Management Practices

### → The Risk Assessment Procedure

One of the largest challenges in this proposed Program will be the design of the risk assessment procedure. This is because each herd has different risk management issues requiring a customized approach.

OMAFRA and CanWest DHI have developed dairy risk assessment forms which can be adapted and with permission, could be directly incorporated into the proposed Canadian JD Program. Forms will continue to evolve and include other existing materials and new relevant references as available. The national Program will be a blend of existing documents and new developments.

The CanWest DHI project also includes a pre-visit survey of the herd which is used to profile the herd for more than JD prevention. This provides the assessor with some prior knowledge of the herd and its potential areas of risk. It also motivates the producer to learn more about JD and its control. It also provides data for other studies.

Specific objectives need to be established for BMP on-farm assessments for the proposed Canadian Voluntary JD Program. Some of the key objectives in the CanWest DHI project include:

- Preventing calves from being exposed to infected animals and their manure
- Keeping calving areas clean and dry
- Avoiding feeding infective colostrum / milk
- Determining the presence and/or prevalence of disease; managing test-positive animals; eliminating high-risk animals
- Preventing contamination of feed, water and pastures
- Not purchasing animals infected with MAP
- Monitoring progress of herd management plan

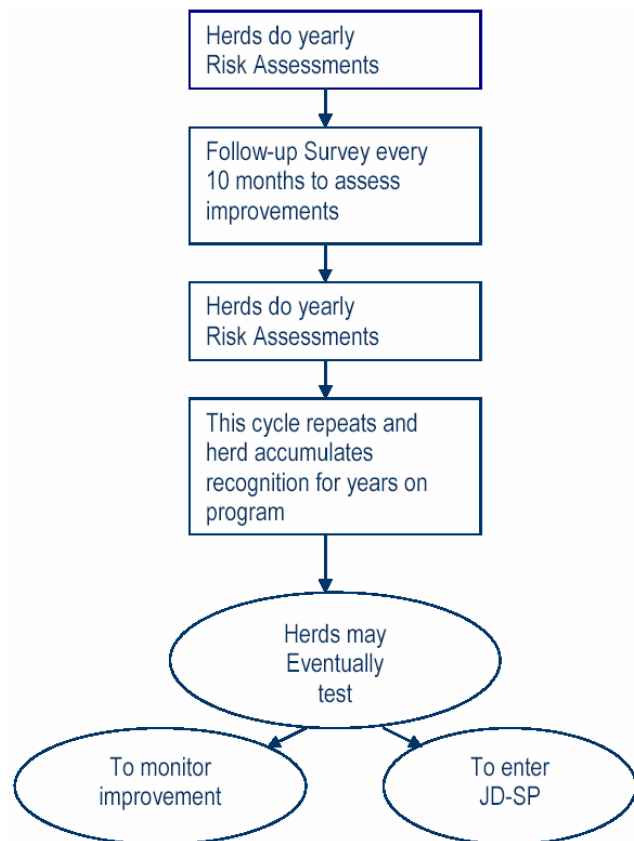
■ **The Johne's Disease Prevention Pathway (JD-PP)**

For many farms (particularly during the start-up years of the proposed Program), the JD-PP will be the most economically feasible.

**The primary goal of this pathway is to assist farms with JD to recognize areas of high risk for transmission on the farm; to implement risk mitigation strategies – thereby lowering the incidence of new infections with MAP.**

For producers who know they have infected cattle, but are not willing or able to remove infected animals, managing the whole herd to minimize the risk of MAP transmission will be beneficial.

Herds in this pathway will be required to repeat BMP assessments each year (within 14 months) with a follow-up management improvement checklist being sent out 10 months after their latest assessment to track progress on key recommendations. Testing will not be required for the JD-PP but would be advantageous to monitor herd progress over time.



Herd-owners can chose to remain in the prevention pathway and continually cycle through BMP assessments on a yearly basis. However, it is also possible for herds to leave the JD-PP and enter the JD-SP if desired.



**It is the goal of the program to attract as many herds as possible to this pathway.**

To reduce the national incidence of JD and prevalence of MAP, it is imperative this pathway be promoted to ensure that positive herds benefit from enrolling in the program. Improvements in this pathway will be gained through the implementation of BMP.

The BMP guidelines will resemble the current CanWest DHI and Alberta initiatives where Provincial Coordinators will implement a yearly validation/participation certificate for enrolled herds. It is likely that many herd-owners will not proceed to the JD-SP pathway, but will desire recognition of their efforts.

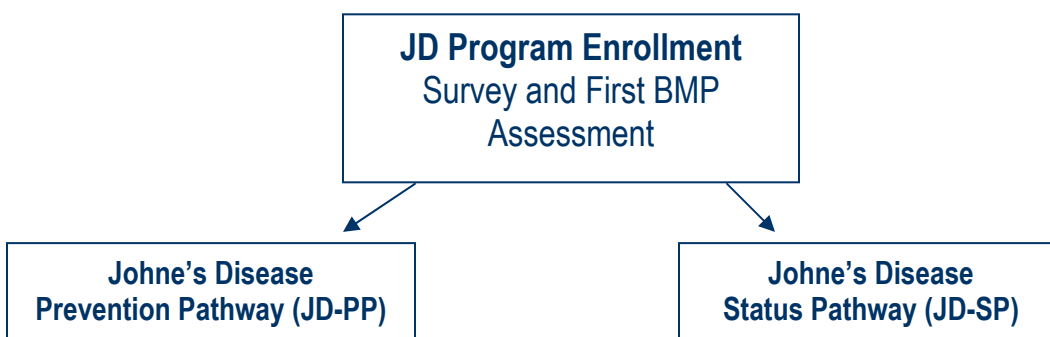


## ■ Johne's Disease Status Pathway (JD-SP)

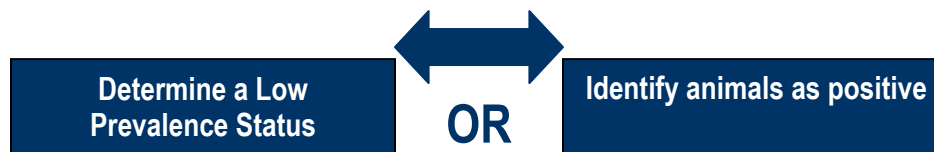
### ■ Entering the JD-SP

All herds entering the JD Status Pathway will be considered low risk and will have completed an enrollment process which includes:

- A pre-visit survey
- An initial BMP assessment



If the indicated route is the **JD-SP** – then based on the results of the survey, the risk assessment and a review of herd goals, a decision is made to pursue diagnostic testing to:



- Herds must be tested every 12 months
- Herds accumulate years of recognition for testing negative at certain points in the JD-SP
- If an animal is identified as positive, it must be culled from the herd and the herd moves to Stage One of the JD-SP
- If a positive animal is not removed within 45 days, the herd enters the JD-PP

### ■ Two Stages in the Status Pathway – Two Types of Diagnostic Testing

The two stages in the JD-SP incorporate two different types of diagnostic testing – one more stringent than the other.

Stage One	Stage Two
Screening tests that offer simple sample collection making it easier for producers – e.g. ELISA Testing	A more sensitive screening test using pooled fecal culture which has higher sensitivity and specificity





### ■ Stage One – Herds That Have Been Tested as Low Prevalence

To attain Stage One in the JD-SP, the herd must have completed a recent BMP assessment (within the last six months). Testing in Stage One will:

- Include an ELISA Test (milk or serum for dairy and beef herds) or
- Ensure strategic environmental fecal sampling and culturing (dairy and beef herds)
- Be done on animals that are in their second lactation or second calving or later
- Be completed on all animals in herds of less than 100 animals
- Be done on a random sampling of 100 eligible animals (determined by the Provincial Coordinator) for herds greater than 100 animals

### ■ Stage One Test Result Implications

ELISA Negative and Culture Negative	ELISA Positive
<p style="text-align: center;"></p> <p style="text-align: center;">Herd advances to Stage One</p>	<p style="text-align: center;"></p> <ul style="list-style-type: none"> <li>• Herd may perform fecal cultures on individual positive animals identified by ELISA to confirm or dispute status or simply cull the positive cows</li> <li>• If environmental fecal samples are positive, the herd must attempt to identify cow(s) that are positive through pooled fecal culture and/or individual fecal culture</li> <li>• All positive animals be removed from the herd to attain Stage One status</li> </ul>

A herd that is at Stage One may choose not to advance in the JD-SP to Stage Two. To maintain Stage One status, the herd must:

- Have a risk assessment and application of BMP performed annually
- Complete environmental fecal sampling every two years. If all samples are negative, the herd will retain its Stage One status
- If any samples are positive, the herd can individual fecal culture to identify positive animals. These animals must be removed from the herd to maintain Stage One Status in the JD-SP. If positive animals are not removed, the herd moves to the JD-PP
- To maintain Stage One status in the JD-SP, testing must be performed at least once during a maximum 24 month period





### ■ Stage Two – Herds with Decreased Likelihood of Fecal Shedding Cows

For herds to advance from Stage One to Stage Two, a herd must have:

- Completed a recent BMP assessment with the last six months
- Conducted pooled fecal cultures (10 cows or less per pool) from all cows. Again, cows must be in their second lactation or second calving or older.



### ■ Stage Two Test Result Implications

All Tests Negative	Positive Pooled Fecal Cultures
 Herd advances to Stage Two	 Herd must culture individual cows to determine which cows are positive Herd can choose to cull individual positive cows. If so, herd will retain Stage One status If the herd chooses to keep infected cows, the herd will move to the JD-PP

### ■ Maintaining Stage Two Status

A herd that attains Stage Two can maintain their status and accumulate years of recognition by:

- Pooled fecal culture every 12 months
- Having a risk assessment and BMP application every 12 months

All Tests Negative	Positive Pooled Fecal Cultures
 Herd maintains its Stage Two Status  Herd designated as JD-SP Stage Two – (X) Years	 Herd must culture individual cows to determine which cows are positive Herd can choose to cull individual positive cows to remain in JD-SP If the herd culls the infected cow(s) they will drop to Stage One for at least one year. To regain Stage Two status, they will to demonstrate a negative pooled test after waiting 12 months If the herd chooses to keep infected cows, the herd will move to the JD-PP



### ■ Culling Positive Animals

Throughout the JD-SP, animals that are identified as positive must be culled from the herd within 45 days of test results to:

- Decrease the likelihood of the animal(s) transferring the disease to other susceptible animals
- Allow the producer time to adapt to the loss of the animal(s) and make adjustment for lost production, conduct embryo transfer, etc.

Through education, producers will be encouraged to send these animals to slaughter rather than sell them as herd replacements.

### ■ Data Collection

Program success will depend on good national data collection (i.e. the Canadian Animal Health Surveillance Network – CAHSN). Key parameters include:

- The number of participating herds (dairy and beef) and
- The number of trained veterinarians and their locations
- MAP infection prevalence levels and trends

This CRTI project will develop a common software system for shared use by officials and future disease referencing. The CAHSN Project involves provincial government, private and public and laboratories and academic partners who are working together to integrate collation of animal disease surveillance data and WHO communications.

This type of software system is well established in human public health surveillance and messaging, known as the Canadian Network for Public Health Intelligence (CNPHI). The first pilot for the system is National BSE Surveillance, starting with the province of Manitoba. CFIA is in the development phase of BSE data systems development as the OIE rules have dictated a change in the surveillance requirements to include clinical attribute data with the negative BSE test results. After the pilot is running other provinces will be asked to join.

Avian Influenza (AI) is the next priority disease for integration into the CAHSN database system.

The system is modular and data collection is disease specific. The software includes a communication suite called Collaboration Centres (CC). The first is called the CCVO-CC to assist coordination of governance in Animal Health in Canada. It is being established for the Chief Veterinary Officers in each province as well as Dr. Brian Evans, Canada's Chief Veterinary Officer.

A second back up person as well as three Administrators for the CC will be needed to meet the requirements to run and manage the suites. Basically this is a virtual office that is personalized for individual and group needs to disseminate controlled access information. The second governance working group to be established as a Collaboration Centre will be the Canadian Animal Health Laboratory Network. It is hoped that these bodies will be assisted in their daily work made easier by this specially developed tool in CNPHI. It is hoped that Canadian disease surveillance efforts are enhanced by CNPHI's new computer system.

CAHSN may be an appropriate respiratory for the Canadian Voluntary JD Prevention and Control Program. Information to be collected i.e. privacy legislation, research needs etc. remains to be discussed. It will be timely to integrate, develop and implement the JD Prevention and Control Program within the new systems in the CAHSN.



## ■ Concurrent Research Program



**The Canadian Voluntary JD Prevention and Control Program is based on current knowledge.**

Because a high participation level in the Program is considered to be the number one priority, ease of enrollment and low cost of participation were important criteria in its design. The trade-off is – the recommended tests and the frequency of testing in the program, will not drive a JD-free status result in the short term. Current JD testing limitations and costs preclude assurance of a JD-free status.

The instruments used in the program are not optimal, and knowledge regarding the efficacy of BMP and test characteristics are not complete. Therefore, ongoing research will be required after program implementation to drive continuous improvement.

This research is designed to:

- List and prioritize research needs for JD prevention and control in Canada
- Create an inventory of studies planned and currently completed
- Propose a sustainable structure for JD research in Canada

It is intended that this is a living document that will be embraced by the Canadian JD researchers, and the commodities and the funding agencies involved.

### → Structure of Canadian Johne's Disease Research

Currently, there are several researchers employed by a variety of research centers and universities that conduct JD research. Two JD researchers, Drs. Steve Hendrick and Shawn McKenna, recently received their PhDs. Both have published extensively in the international scientific press. Dr. Steve Hendrick has recently moved to WVCM, Saskatoon and has stimulated JD research there.

Cooperation among the JD researchers and research groups is minimal and information is not exchanged on a regular basis. As a result, research projects are most often not multidisciplinary and the potential exists for duplication. Also participation at international conferences is not high, which can delay adaptation of improvements for JD prevention and control.

This situation would change rapidly if:

- JD researchers met on a regular basis
- A funding structure was implemented to stimulate cooperation within and outside Canada
- Interdisciplinary research, publication of results in scientific and farmers journals, and interchange of knowledge with other international groups was supported and encouraged

The research initiated and stimulated by this funding structure should contribute to the goals of the Canadian Voluntary JD Prevention and Control program.



## The Canadian Animal Health Coalition (CAHC)

### → Canadian JD Research Committee

The mandate of this National Committee is to:

- Initiate, prioritize and evaluate research proposals
- Make recommendations to funding agencies
- Monitor progress of research projects



**The Committee's main focus will be to evaluate the relevance of research for Canadian JD prevention and control.**

The Committee will comprise of representatives of key research institutes, cattle industry organizations and funding agencies. A key success factor for the Research Program will be cooperation between institutes and a collaborative focus on the benefits of the Research Program for all participants.

The Committee will have four meetings a year including two teleconferences and two face-to-face meetings.

### → Canadian JD Research Conference

An annual conference will be organized to facilitate interchange of knowledge between JD researchers and update cattle industry organizations and funding agencies on the progress of JD research. The conference will be opened by a review by an international JD researcher.

The Canadian JD Program Committee and the Canadian JD Research Committee will meet the day prior to the start of the conference.

### → Travel awards

Five travel awards of \$ 4000 each will stimulate the international presentation of results of the Canadian JD research, cooperation with international JD research groups and participation in international JD conferences. These competition based awards will recognize leading Canadian JD researchers.

### → Research Funding

The PESAC program of the DFC with matching funding of NSERC will serve as a model for the funding structure of Canadian JD Research. Funding will be needed for:

- Research projects
- Canadian JD Research Committee
- Canadian JD Research Conference
- Travel awards



## ■ Concurrent Research Themes

Six research themes are currently identified within JD research. Topics are prioritized within each theme. The inventory of research projects will provide a beginning for the JD Research Committee which is proposed.

### → Prevalence and economic impact

1. Economic impact in dairy and beef in Canadian herds
2. Herd and cow-level prevalence in Canadian beef and dairy
3. Prevalence in the environment (water, soil)

### → Evaluation of the Program

1. What is the effect of controlling JD on the prevalence/incidence of other fecally transmitted cattle diseases?
2. What is the compliance among farmers and veterinarians of advised management practices?
3. Does a program based on BMP result in decrease of prevalence?

### → Transmission

1. What is the role of surface and well water in the spread of JD within and between herds?
2. What other factors influence susceptibility?
3. Environmental viability
4. Acidifying and heat treating colostrum and milk
5. Age determined susceptibility - six months, 12 months, other?
6. Role of super-shedders?
7. Role of other species?
8. Can milk replacer be a source of infection with MAP

### → Tests

1. Sensitivity and specificity of milk ELISA in low prevalence herds
2. Environmental sampling in tie-stalls and beef herds
3. PCR bulk milk, feces, environmental samples

### → Processing

1. Prevalence (cfu's/ml) in Canadian bulk milk
2. What is the prevalence of recovering MAP or its antigen from meat of MAP positive animals?
3. Effect of heating milk, processing, on recovery of MAP?
4. Does microfiltering milk decrease the load with MAP or its antigen?

### → Crohn's Disease TBD



## ■ Paratuberculosis Studies in Canada

The following studies have recently been completed, are currently underway, or are planned. The research projects are presented by the research organization

### → Atlantic Veterinary College (Charlottetown)

#### **Age-determined susceptibility to infection with *Mycobacterium avium* subsp. *paratuberculosis***

Investigators: Herman Barkema (PI), Shawn McKenna, Fred Markham, Greg Keefe and John VanLeeuwen

**Objectives:** (1) Determine whether susceptibility for infection with *Mptb* decreases with increasing age; (2) Determine the minimal infectious dose (per age group); (3) Evaluate gamma-interferon as an early indicator of infection with *Mptb*; and (4) Establish a group of known infected animals for determination of sensitivity of tests.

**Status:** Planned, no funding yet

#### **The use of bulk milk and environmental samples in a voluntary Johne's Disease control program**

Investigators: Herman Barkema (PI), Greg Keefe, Shawn McKenna, and John VanLeeuwen

**Objectives:** (1) Determine the test characteristics of bulk milk culture and PCR; (2) Determine the prevalence of *Mptb* in PEI bulk milk; (3) Determine the sensitivity of culture of alleyway and manure storage samples from positive herd sites; and (4) Evaluate the incorporation of these tests into herds that participate in the JD Control Program.

**Status:** 40% funding guaranteed (TechPEI), matching funding requested in an Atlantic Innovation Fund (AIF) proposal

#### **Validation of sensitivity of different fecal pool sizes**

Investigators: Shawn McKenna, Ian Dohoo, and Herman Barkema

**Objectives:** Validate the sensitivities found in Shawn McKenna's PhD study with an external dataset.

**Status:** Funding will be requested from the AVC Dean's Council internal competition.



→ Western College of Veterinary Medicine (Saskatoon)

***Mycobacterium paratuberculosis* (Johne's Disease) infections of cow-calf herds: Environmental and wildlife reservoirs of infection**

Investigators: John Campbell (PI), Steve Hendrick, and Dale Douma

Institute(s): Western College of Veterinary Medicine, University of Saskatchewan

**Objectives:** (1) Identify the environmental areas on a cow-calf farm which become contaminated with *M. paratuberculosis* and to determine how long these areas remain infectious with a focus on the calving area especially during the calving season; (2) Establish if there are seasonal influences that affect the environmental contamination of these areas; (3) Determine which wildlife species commonly found on cow-calf farms contribute to the spread and persistence of MAP (4) Assess the potential of environmental sampling as an alternative to herd serological and fecal testing on cow-calf farms as a screening method.

**Status:** Funding provided by Beef Cattle Research Council, Saskatchewan Agriculture Development Fund, Saskatchewan Beef Development Fund.

**Literature review of Johne's Disease in beef cattle**

Investigators: Steve Hendrick (PI), and Dale Douma

**Objectives:** (1) To provide a comprehensive and critical review of the relevant literature surrounding Johne's disease in beef cattle and (2) To assess the economic risk that this disease presents to beef cattle producers in Western Canada. This review will summarize what is currently known in regards to: diagnostic testing, economics and production effects, best management practices, control programs in other countries and the potential link to Crohn's disease.

**Status:** Funding provided by the Alberta Beef Producers.

**Estimation of the economic losses caused by Johne's Disease in cow-calf herds**

Investigators: Steve Hendrick (PI)

Institute(s): Western College of Veterinary Medicine, University of Saskatchewan

**Objective:** To estimate the losses caused by infection with *MAP* in Canadian cow-calf herds

**Status:** Planned, no funding yet.

**Evaluation of best management practices for prevention of Johne's Disease in beef cattle.**

Investigators: Steve Hendrick

**Objectives:** 1) Estimation of the adoption of BMP to prevent infection with MAP in beef calves, 2) Estimation of the effect of these BMPs on the prevalence (incidence) of infection in beef calves. In this study, beef herds applying certain BMPs will be compared using a case-control study design.

**Status:** Planned, no funding yet.



→ **University of Guelph and Ontario Ministry of Agriculture, Food and Rural Affairs**

**Investigation of the prevalence, diagnosis and management of Johne's disease in Ontario dairy herds**

Investigators: Dave Kelton (Co-PI), Todd Duffield (Co-PI), Steven Hendrick, Kerry Lissemore, and Ken Leslie

Institute(s): Ontario Veterinary College, University of Guelph

**Objectives:** To establish the herd and cow-level prevalence of infection with MAP on Ontario dairy farms, identify herd-level risk factors associated with the presence of MAP infection and evaluate the usefulness of a milk ELISA test in a herd-level Johne's Disease control and surveillance program.

**Status:** Completed

**Studies of the effect of Monensin sodium for prevention, treatment and on diagnostic indicators of Johne's Disease infection in dairy herds**

Investigators: Todd Duffield (PI), Dave Kelton, Steven Hendrick, Kerry Lissemore, and Ken Leslie

Institute(s): Ontario Veterinary College, University of Guelph

**Objectives:** To assess the effect of Rumensin CRC® on the shedding rate of MAP organisms in the feces of dairy cattle and to evaluate the effect of Rumensin CRC® treatment on the detection of JD using various diagnostic tests, including serum and milk ELISA, fecal culture and fecal PCR.

**Status:** Ongoing – initial work was part of Dr. Steven Hendrick's DVSc graduate work.

**Examination of risk factors and management practices associated with Johne's Disease in Ontario dairy herds identified through a voluntary Johne's Disease milk testing program and veterinary practitioner farm assessment**

Investigators: Ann Godkin (Co-PI), Jocelyn Jansen (Co-PI), and Dave Kelton

Institute(s): Ontario Ministry of Agriculture and Food, CanWest DHI, Dairy Farmers of Ontario and Ontario Veterinary College, University of Guelph

**Objectives:** To evaluate the effectiveness of biosecurity programs for JD for Ontario dairy farms.

**Status:** The principle project is ongoing, but the research component of the project is awaiting funding.

→ **Other JD Research Centres (Projects not yet included)**

- FMV (Saint-Hyacinthe)
- Ontario Ministry of Agriculture, Food and Rural Affairs
- Beef Information Centre
- University of Manitoba (Winnipeg)
- McGill University (Montreal)
- Alberta Agriculture, Food and Rural Development (Edmonton)
- Agriculture and Agri-Food Canada
- Health Canada



## ■ Implementing and Sustaining the Program

### → Provincial Role (Implementation and Financial Support)

Successful implementation of the Program will require national commodity organizations to commit to raising awareness through their communication resources. Since the program is to be delivered provincially, producers and provincial organizations will need to create a perceived need for the Program and champion the priority for implementation with the provincial agricultural ministries or departments to drive financial support.

### → National Role (Coordination and Funding)

Implementation and maintenance of the program will require national coordination and funding assistance. Rationale for industry and government's participation can be supported by communicating the potential for:

- JD to impact animal health and productivity
- Potential trade ramifications
- Public health impact

### → Administrative Role

The prevention and control program as well as the research component require administrative support. Moreover, both require an operational model that clearly designates that the Program is industry driven.

Two models (Ideal and Minimalist) are illustrated graphically.

The budget for the Ideal Model is estimated at \$500,000 annually. (See Appendix Eight for full information and budget details). The Minimal Model does not address the Concurrent Research proposal which will be a key factor related to the success of the Program.

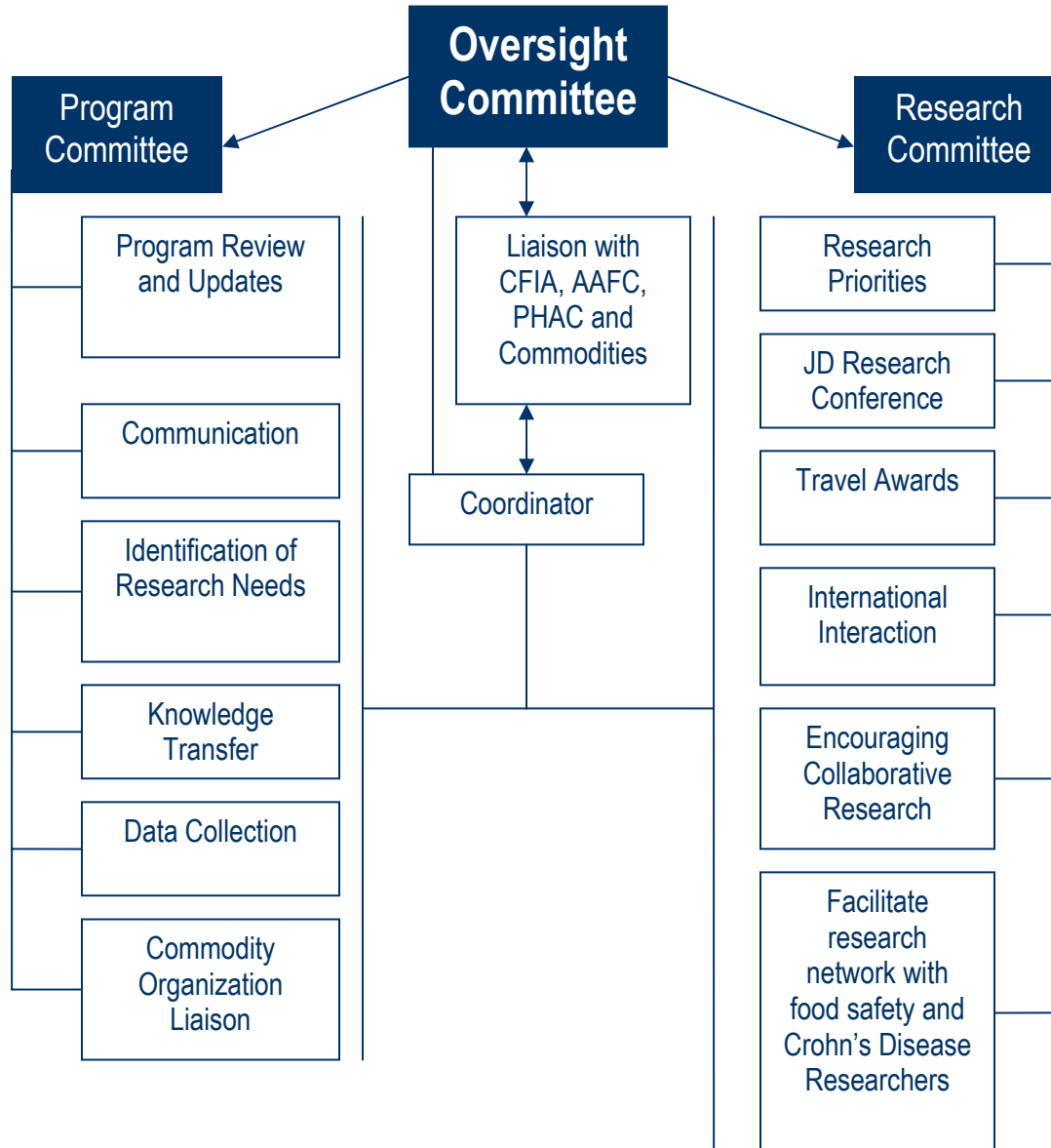
In developing the models and budgets, the following costs were incorporated:

- Travel expenses
- Time invested by Committee Chairs
- Paid Coordinator Position
- Communication strategy and tactics (electronic basis)

Funding is being sought for implementation at the national level for a three to five year period with support from the national cattle commodity organizations. Ongoing support will also be required and will be solicited during the implementation phase.

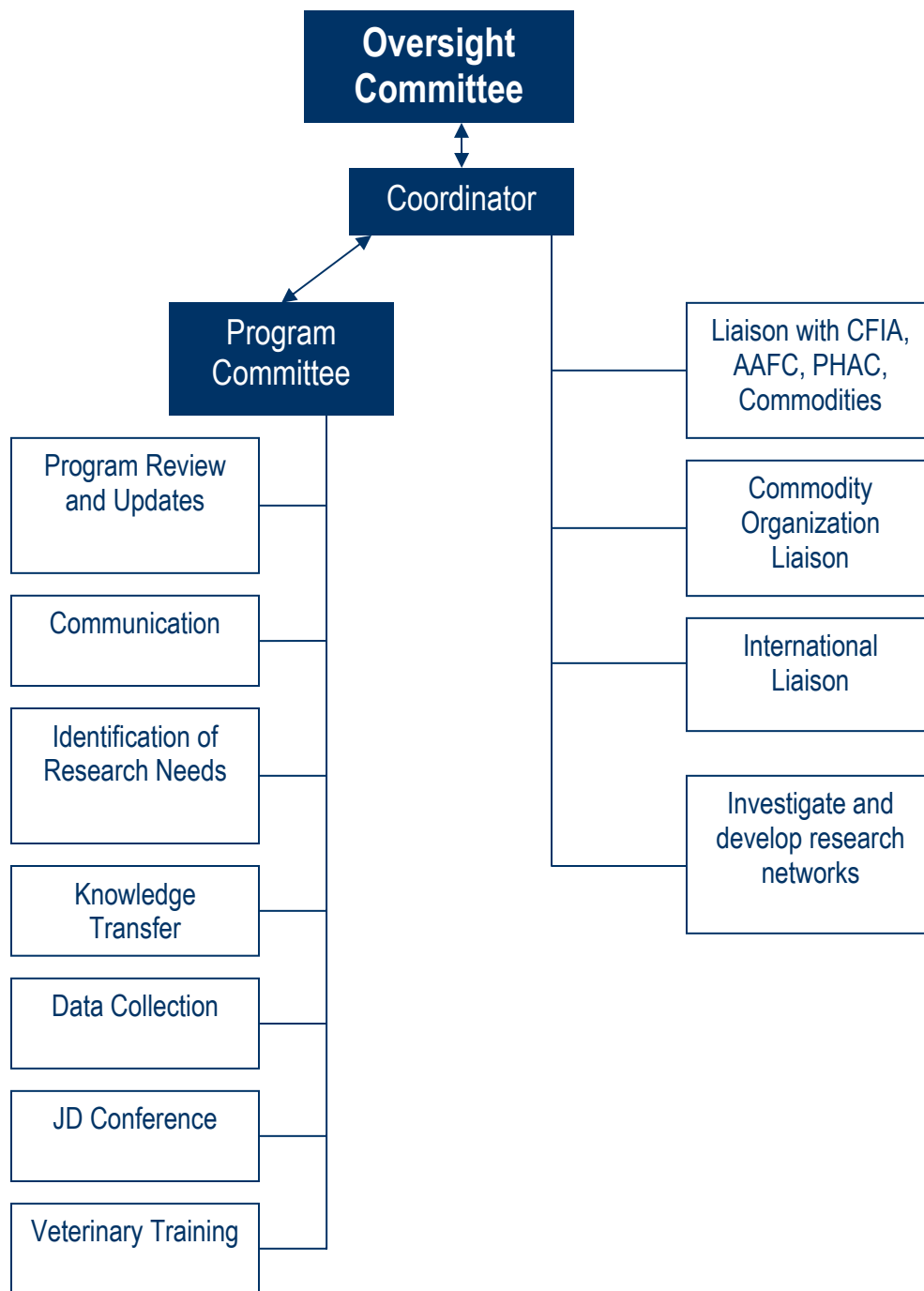


→ The Ideal Model





→ The Minimal Model





## □ Appendix One

### Project Committees/Meetings

#### Project Committee Representation

The position of Project Committee chair was held by the Dairy Farmers of Canada representative by choice of the project committee.

#### Commodity and Industry Groups

- Canadian Cattlemen's Association – Mr. Norris Sheppard
- Dairy Farmers of Canada – Mr. Rients Palsma replaced by Mr. Ron Versteeg
- Holstein Canada – Mr. Brian Leach
- Canadian Animal Health Institute – Dr. Randy Graham

#### CFIA

- Dr. Elliott Salsberg
- Dr. Christine Power, Disease Surveillance Unit

#### Provincial Representation

- British Columbia Ministry of Agriculture and Lands – Mr. Ronald Barker
- Alberta Ministry of Agriculture, Food and Rural Development – Dr. Gerald Hauer
- Saskatchewan Department of Agriculture and Food – Dr. LeeAnn Forsythe
- Manitoba Department of Agriculture Food and Rural Initiatives – Dr. Wayne Lees replaced by Dr. Glen Duizer
- Ontario Ministry of Agriculture, Food and Rural Affairs – Dr. Jocelyn Jansen, Dr. Ann Godkin (team approach)
- Ministère de l'Agriculture, Pêcheries et Alimentation de Québec – Dr. Geneviève Côté, Dr. France Sylvestre (team approach)

#### Academic Representation

- Atlantic Veterinary College – Dr. John VanLeeuwen, Dr. Herman Barkema and Dr. Shawn McKenna (team approach)
- St. Hyacinthe – Dr. Gilles Fecteau
- WCVI – Dr. Steve Hendrick
- OVC – Dr. Dave Kelton



### Veterinary Practitioner Representation

- Western Canada Association of Bovine Practitioners – Dr. John Campbell
- Ontario Association of Bovine Practitioners – Dr. Andrew MacLeod

### Other Interested Parties Maintained on Circulation List

- Dr. Rob Tremblay – Boehringer-Ingelheim
- Mr. Matt Taylor – Canadian Animal Health Coalition
- Mr. Rob McNabb – Canadian Cattlemen's Association
- Dr. Terry Hunt – Canadian Cattlemen's Association
- Mr. Rick McDonald – Canadian Livestock Genetics Association
- Dr. Chunu Mainali – Alberta Ministry of Agriculture, Food and Rural Development
- Dr. Rejean Bouchard – Dairy Farmers of Canada
- Mr. Keith Flaman – Holstein Canada

### Subcommittees:

The committee was divided into subcommittees which worked on specific parts of the Project, reporting to the Johne's Disease Prevention and Control Program project committee.

### Goals and Objectives Subcommittee

**Mandate:** To present draft goals and objectives for the program to the committee for finalization

- Dr. Herman Barkema
- Mr. Norris Sheppard
- Mr. Brian Leach
- Mr. Rients Palsma
- Dr. Jocelyn Jansen
- Dr. Ed Empringham

### Conference Subcommittee

**Mandate:** To present a conference plan to the committee for finalization

- Dr. Wayne Lees
- Dr. LeeAnn Forsythe
- Mr. Brian Leach
- Mr. Ron Barker
- Dr. Shawn McKenna
- Dr. Ed Empringham



### Knowledge Transfer Subcommittee

**Mandate:** To present a plan for the producer awareness and education components and the veterinarian training components of the JD control program. To review existing materials and develop new materials suited to the transfer of knowledge in the Program once approved.

- Dr. Jocelyn Jansen
- Mr. Norris Sheppard
- Dr. Randy Graham
- Dr. Ann Godkin
- Dr. Gilles Fecteau
- Mr. Ron Barker
- Dr. Geneviève Côté
- Dr. Andrew MacLeod
- Dr. Rob Tremblay
- Dr. Ed Empringham

### Prevention and Control Program Subcommittee

**Mandate:** To present a plan for a National Voluntary Johne's Disease Control Program which will follow the proposal from the working group in 2002, be scientifically sound and accessible to producers for consideration by the committee.

- Dr. Herman Barkema
- Dr. Shawn McKenna
- Dr. Steve Hendrick
- Dr. Gilles Fecteau
- Dr. Geneviève Côté
- Mr. Rients Palsma replaced by Mr. Ron Versteeg
- Mr. Norris Sheppard
- Dr. Elliot Salsberg
- Dr. Gerald Hauer
- Dr. Jocelyn Jansen
- Dr. John Campbell
- Dr. Glen Duizer
- Dr. Ed Empringham



### Concurrent Research Subcommittee

**Mandate:** To present a plan for ensuring that Canadian research about Johne's Disease is active and occurs within a system that provides the most efficiency and maximizes potential access to research funding.

- Dr. Dave Kelton
- Dr. Herman Barkema
- Mr. Brian Leach
- Dr. LeeAnn Forsythe
- Mr. Ron Barker
- Dr. Shawn McKenna
- Dr. Steve Hendrick
- Mr. Ron Versteeg
- Dr. Glen Duizer
- Dr. Ed Empringham

### Sustainability Subcommittee

**Mandate:** To develop a plan for funding the implementation of the Program, the ongoing requirements of the Program and the ongoing operational costs of the research proposal.

- Mr. Brian Leach
- Mr. Ron Versteeg
- Mr. Norris Sheppard
- Mr. Ron Barker
- Dr. Herman Barkema
- Mr. Matt Taylor
- Mr. Rob McNabb
- Mr. Keith Flaman
- Mr. Rejean Bouchard
- Dr. Ed Empringham

### Meeting Schedule Project Committee

**Meetings:**

- September 7, 2005 – Guelph
- November 9, 2005 – Montreal
- February 9, 2006 – Ottawa

**Teleconferences:**

- July 22, 2005
- August 9, 2005
- October 13, 2005
- December 12, 2006
- March 1, 2006
- April 3, 2006



### **Goals and Objectives Subcommittee**

Handled by email and discussion at the project committee meetings and teleconferences

#### Teleconferences:

- August 4, 2005
- September 29, 2005
- November 29, 2005

### **Knowledge Transfer Subcommittee**

#### Meetings:

- February 9, 2006

#### Teleconferences:

- October 6, 2005
- December 8, 2005

### **Prevention and Control Program Subcommittee**

#### Meeting:

- February 9, 2006

#### Teleconferences:

- October 3, 2005
- October 17, 2005
- October 31, 2005
- November 28, 2005
- December 14, 2005
- January 9, 2006
- February 24, 2006
- March 9, 2006
- March 23, 2006

### **Concurrent Research Subcommittee**

#### Meetings:

- February 10, 2006

#### Teleconferences:

- November 30, 2005
- December 30, 2005
- January 27, 2006

### **Sustainability Subcommittee**

#### Teleconferences:

- December 13, 2005
- March 2, 2006
- March 13, 2006



## □ Appendix Two

### Definition of Testing Procedures

#### → ELISA Testing

The use of enzyme-linked immunosorbent assays (ELISA) within the proposed Canadian Voluntary JD Prevention and Control Program involve the use of either a milk or serum assay. The proposed milk assay is the ELISA produced by AntelBio® and the serum assay would either be the HerdChek® (IDEXX Laboratories ELISA) or the Parachek™ (Pfizer/Biocor) ELISA.

The use of the AntelBio® ELISA on DHI milk samples simplifies the procedure of collection of samples. The use of this test has been validated by work done at the Ontario Veterinary College on JD positive herds (1). As part of the JD-SP to attain Stage One this assay could be used on samples collected as part of DHI testing of milk samples from cows of second lactation and greater.

Beef herds would have the option of using either of the serum ELISAs (determined by which of the two ELISAs their regional lab was using, either are acceptable) to gain Stage One of the JD-SP. The use of these ELISAs has been recently assessed in Canadian dairy cattle (2) and would perform similarly in beef cattle. Due to the seasonality of beef herds, collection of samples (blood) would likely coincide with management activities when all mature cows (second calving or greater) were being handled (i.e. vaccination, pregnancy diagnosis, etc.). Dairy herds could also utilize the serum ELISA if it was preferred over the milk assay.

#### → Environmental Fecal Testing

Another option for both dairy and beef herds to attain Stage One of the JD-SP would be to implement environmental fecal sampling of their herd. This strategy has the advantage of easy sample collection, while identifying herds as positive if they have any cattle that are high fecal shedders of the MAP bacteria. This testing strategy has been evaluated primarily on Minnesota dairy herds (3). The protocol requires that five samples of manure are collected from areas in which manure of all cattle would theoretically be represented (common walkways, manure storage areas, etc.). These samples are then cultured similar to a single fecal sample.

#### → Pooled Fecal Testing

For herds to move from JD-SP Stage One to Stage Two, pooled fecal samples of no more than 10 animals per pool will be utilized for both dairy and beef herds. Herds may choose to use smaller pool sizes (e.g. five cows per pool). This would minimize the number of retests of individual cows to identify the positive individual cow. However, pool sizes of 10 cows per pool have been evaluated as being a cost effective and efficient means of detecting an individual cow that is a high fecal shedder (4). For pooled samples, individual fecal samples are collected from each cow (directly from rectum, minimal or no lubrication) and each individual sample is sent to the laboratory. At the lab, two grams of feces from each cow to be represented in a pool are mixed together (total of 20 grams per pool). After thorough mixing, 2 grams from pooled sample is then used to perform the culture, through a procedure previously described for individual fecal samples (2).



→ Reference List

- (1) Hendrick SH, Duffield TE, Kelton DE, Leslie KE, Lissemore KD, Archambault M. Evaluation of enzyme-linked immunosorbent assays performed on milk and serum samples for detection of paratuberculosis in lactating dairy cows. *J Am Vet Med Assoc* 2005; 226(3):424-428.
- (2) McKenna SL, Keefe GP, Barkema HW, Sockett DC. Evaluation of three ELISAs for *Mycobacterium avium* subsp. *paratuberculosis* using tissue and fecal culture as comparison standards. *Vet Microbiol* 2005; 110(1-2):105-111.
- (3) Raizman EA, Wells SJ, Godden SM, Bey RF, Oakes MJ, Bentley DC et al. The distribution of *Mycobacterium avium* ssp. *paratuberculosis* in the environment surrounding Minnesota dairy farms. *J Dairy Sci* 2004; 87(9):2959-2966.
- (4) McKenna, S. L., Barkema, H. W., Keefe, G. P., and Sockett, D. C. Comparison of fecal pooling strategies for detection of *Mycobacterium avium* subsp. *paratuberculosis*. August 15, 2005 Copenhagen Denmark. International Colloquium on Paratuberculosis: 2005.



## □ **Appendix Three**

### **Previsit Survey and Risk Assessment Tool for Dairy from the CanWest DHI Project**

→ Linked PDF Documents

- Disclosure Statement for Dairy Risk Assessment and Pre Visit Documents - CanWest DHI and OMAFRA
- Part Two: Risk Assessment for Ontario and Western Canada
- Part Two: Previsit Survey



## Appendix Four:

### Beef Risk Assessment

→ Linked PDF Documents

- Risk Assessment for Beef Herds
- Pre Visit Survey for Beef Herds



## □ Appendix Five

### Veterinary Training

The delivery mechanism for the proposed Canadian Voluntary JD Prevention and Control Program is envisioned as being through trained herd veterinarians. Training will be required to ensure that there is an understanding of the program, to hone the veterinarian's skills in working with herd-owners to determine most appropriate BMP based on the Risk Assessment and to ensure that the necessary recording of required information is completed.

There are experiences in both Alberta and CanWest DHI project to serve as the basis for veterinary training. The Alberta materials have been compiled into a reference book which could easily be further refined to suit the proposed program. The CanWest DHI project is ongoing and training materials are still evolving. At the completion of the project, these materials may be available to the industry to serve as a resource for the development of a training module for veterinarians.

In the CanWest DHI project, which uses the dairy Risk Assessment that is included in Appendix Three and is intended to be a model for the CVJDPCP Dairy Risk Assessment, part of the training has been to help veterinarians determine the top few BMP that could be applied with most impact. At the next Risk Assessment if the BMP have been successfully applied, further steps can be taken.

The experience in the CanWest DHI project has been that the training needs to include a farm visit to actually see what is possible within the management system of the farm. This farm visit is seen as an essential part of the training module.

There is a modular web-based training program suited to the US programs available at the University of Wisconsin which has been customized to suit the individual requirements of some state JD control programs. The content of this training program has not been investigated and it is not known if it could be easily modified to suit the approach of the proposed Canadian program.

In the CanWest DHI program in which veterinary training was delivered in Ontario, Manitoba, Saskatchewan, Alberta and British Columbia, there was a common trainer to ensure standardization of approach. The option of a centralized training resource in the Canadian JD Committee needs to be considered to ensure standardization. In addition, it will be necessary to assess the need for retraining, the frequency of retraining and the form of retraining.

Ongoing updates for veterinarians could be provided through newsletters, a listserv and clinical forums.



## □ **Appendix 6**

### **Best Management Fact Sheets – Examples Beef and Dairy**

→ [Linked PDF Documents](#)

- [BMP Guide](#)
- [JD BMP Factsheet](#)



## □ Appendix Seven

### Examples of Messaging Materials

The Canadian JD Prevention and Control Program Committee acknowledges CanWest DHI for providing some of the following educational materials (PDF links) that are currently being used. They are included here as examples of materials that will be required.

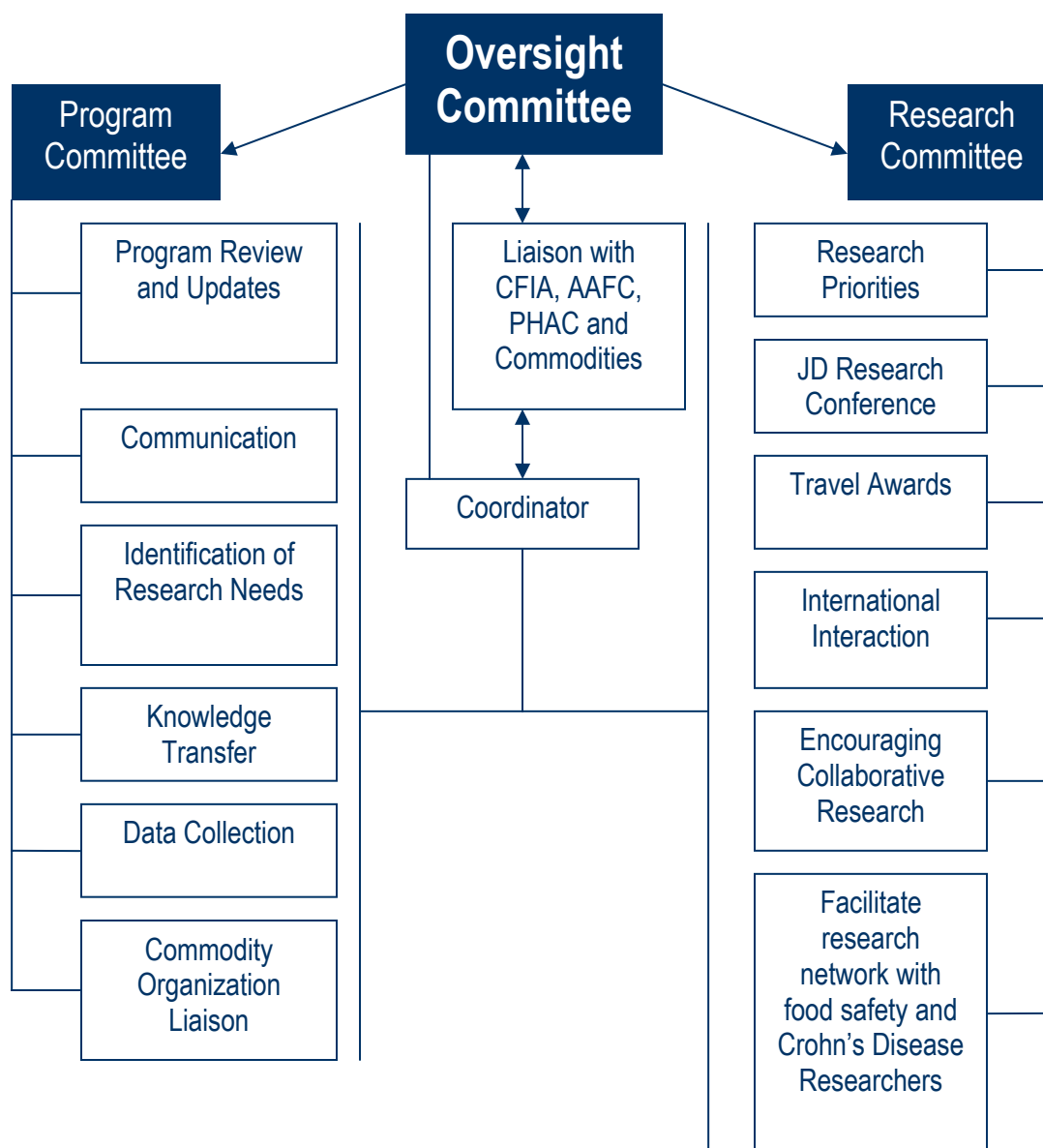
#### → Linked PDF Documents

- Communication Strategy
- Communication Coordinators and Contacts
- JD Fact sheet
- Using ELISA Test Results
- Understanding Your Johne's Report



## □ Appendix Eight Models for Implementation and Sustainability of the Program

→ Ideal Model





### → Explanatory Notes

#### **This structure is neutral of any administering organization**

Funding has not been considered although the Research Subcommittee has given some consideration to some funding options.

#### **Oversight Committee**

A small executive style committee comprised of industry delegate. The Chairs of the Program Committee and Research Committee should also sit on the Oversight Committee. This Committee will be responsible for:

- Hiring and managing coordinator
- Securing funding opportunities in conjunction with program and research committees
- Facilitating interaction between program and research committees
- Communicating on the overall initiative with industry and government
- Liaising with CFIA, AAFC and PHAC and other key governmental authorities
- Liaising with national commodity organizations on policy issues

#### **Comments**

- Provides industry leadership and control of structure and coordinator
- As signing authority for the organization, the Oversight Committee would control operational funding

#### **Program Committee**

Composed of industry, provincial, academic, bovine practitioner and federal representatives – total of 10. Has a chair who is selected from the committee by the committee members. The position of chair is recognized with an honorarium reflecting the commitment to the position. Committee is responsible for:

- Ensuring the Program is reviewed annually and updated to reflect current science and other realities
- Proactively considering Program direction and necessary research to meet that direction
- Ensuring the provincial data on program participation is being collected
- Ensuring that veterinary training is standardized in provincial delivery and that the training module is maintained and updated
- Communications and public relations messaging related to the program. The industry communications network would be utilized
- Liaising with the national and provincial cattle industry organizations on program related issues

#### **Details**

- It is expected that two to three meetings per year may be required initially with one of these at the time of the annual conference planned by the research committee. Additional work will be done by email, teleconference and/or a web portal.
- Committee expenses for travel are paid.
- Committee time is an in-kind contribution of participating organizations except for the Chair who will receive an honorarium.



### Comments

- The mix of input will provide good program oversight
- Selection of the Chair by the committee will result in the Chair having the respect of the committee as opposed to an appointed chair. Inaugural Chair may have to be appointed
- Not all provincial coordinators will sit on this committee but a method of selecting an appropriate number to represent the group will need to be found. There will likely need to be a subcommittee of provincial coordinators working with the coordinator to ensure uniformity between provinces
- An annual review of the Program to ensure the Program still meets scientific scrutiny; the needs of trade, public health; and producers in terms of easy access and compliance. This may involve surveys of compliance with BMPs, prevalence surveys and assessment of uptake
- It will be necessary for the committee to do some strategic planning of where the Program should go and thus influence the research priorities in time for planned changes
- Veterinary training is a key component of the Program. Training needs to be standardized between provinces and refresher modules must be developed. It will be necessary for the Program Committee to meet annually with the veterinary trainers to review and assess the training program and materials
- The Program Committee will need to ensure that consistent messaging occurring in all provinces and provide support when required.

### Research Committee

Composed of industry, provincial, academic, bovine practitioner and federal representatives – total of 10.

Has a Chair who is selected from the committee by the committee members. The position of Chair is recognized with an honorarium reflecting the commitment to the position. The Committee is responsible for:

- Ensuring research fund for allocation
- Establishing research priorities, calling for proposals and selecting successful applicants and makes allocations.
- Hosting an annual JD research conference
- Administering travel awards to assist researchers attending international conferences
- Facilitating international interaction through attendance and participation at international meetings and inclusion of international representation at the annual research conference
- Encouraging collaborative research through research priorities
- Facilitating a research network including Johne's Disease researchers, food safety researchers and Crohn's Disease Researchers

### Details

- It is expected that two to three meetings per year may be required initially with one of these at the time of the annual conference planned by the research committee. Additional work will be done by email, teleconference and/or a web portal.
- Committee time is an in-kind contribution of participating organizations except for the Chair who will receive an honorarium.



### Comments

- The mix of input will provide good program oversight
- Selection of the Chair by the committee will result in the Chair having the respect of the committee as opposed to an appointed Chair. The inaugural Chair may have to be appointed.
- The research fund would be similar to the DairyGen example to which dairy organizations make a contribution annually and DairyGen has control of those research funds within the established research priorities and procedures. DairyGen is viewed as a peer review committee.
- The annual conference would provide a forum for exchange of research but also an opportunity for related meetings to occur and the subsequent exchange of ideas.
- Participation internationally would occur through the inclusion of international presenter(s) in the annual conference and by the provision of travel grants to allow the participation of researchers in international forums.
- Collaborative research allows maximum use of research investment.
- Interaction with researchers in food safety and Crohn's Disease would provide the opportunity for collaborative and cross-sectoral research building the skills and interests of each research group.

### Coordinator

- Responds directly to the Oversight Committee
- Facilitates the activities of the two committees
- Acts on behalf of all of the committees through attendance at meetings and conferences; making government and industry contacts; and providing secretariat services

### Comments

- Will require secretarial support
- It is difficult to estimate the time commitment for the coordinator initially. However, in the first two years, time will be invested establishing administrative systems for the Program. In subsequent years, the coordinator's time will be contingent on the number of herds involved in the Program

### Communication Tools

This is essentially a virtual organization requiring an efficient electronic communication platform including:

- Website – public and secure access – the public site could have reference materials on it for producers, veterinarians, the general public etc. It could also provide appropriate links to related sites
- List serve – would assist in moving information out to the list in an automated way.
- Email
- Teleconference
- Annual meeting, two to three committee meetings/year
- Industry communication network
- Coordinator contact with industry, government and international contacts



→ Draft Budget (Ideal Model)

### Canadian Voluntary JD Prevention and Control Program

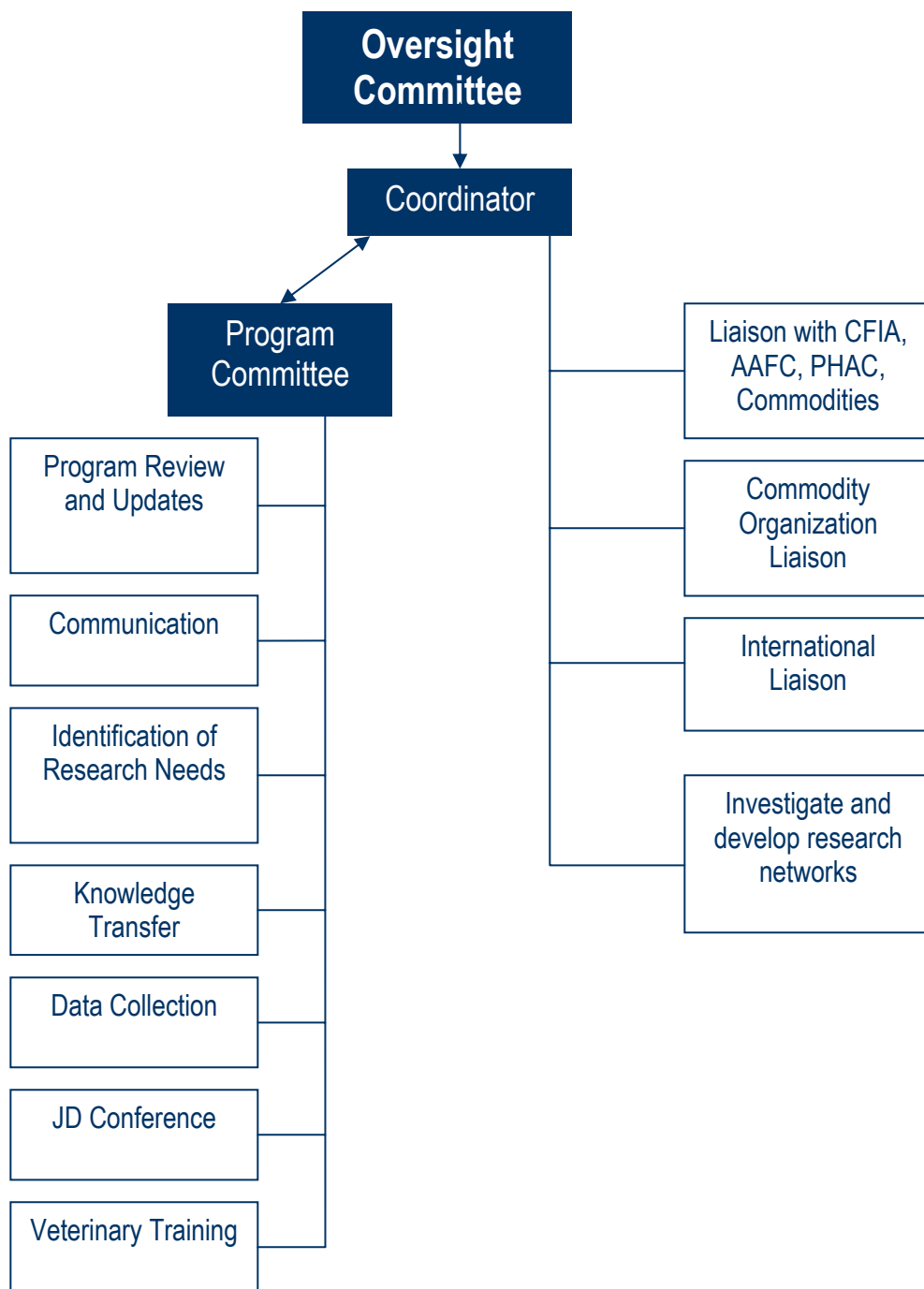
	Oversight Committee		Research Committee		Program Committee	
	Cash (\$)	In-kind (\$)	Cash (\$)	In-kind (\$)	Cash (\$)	In-kind (\$)
Coordinator	33333		33333		33333	
Coordinator Travel	5000		5000		5000	
Committee Chair		5000	20000		6000	
Secretarial services and office	20000		20000		20000	
Committee member travel	12000		20000		20000	
Committee Representation		21600		32400		32400
Conference	10000		20000		10000	
Conference travel - committee members		6000		10000		10000
Conference Planner			4000			
Keynote Speaker for Conference			5000			
Website Development			15000		5000	
Financial Management	2000		5000		1000	
Teleconferences	600		1200		1200	
Travel Awards			2			
<b>Subtotal</b>	<b>82933</b>	<b>32600</b>	<b>168533</b>	<b>42400</b>	<b>101533</b>	<b>42400</b>
Total Cash	353000					
Total In-kind	117400					
<b>Total</b>	<b>470400</b>					

**Notes:**

- Research Funding for Allocation is unknown and this will need input from commodities
- Costs of conference could be reduced with registration fee, commercial displays and sponsorships



→ Minimal Model





### → Explanatory Notes



#### **This structure is neutral of any administering organization**

Funding has not been considered although the Research Subcommittee has given some consideration to some funding options.

#### **Oversight Committee**

A small executive style committee comprised of industry delegates. The Committee is responsible for:

- Hiring and managing coordinator
- Securing funding opportunities in conjunction with program and research committees
- Determining future organizational requirements

#### **Through the Coordinator:**

- Communicating on the overall initiative with industry and government
- Liaising with CFIA, AAFC and PHAC and other key governmental authorities
- Liaising with national commodity organizations on policy and program issues
- Liaising internationally

#### **Comments**

- Provides industry leadership and control of structure and coordinator
- As signing authority for the organization, the Oversight Committee would control operational funding

#### **Program Committee**

Composed of industry, provincial, academic, bovine practitioner and federal representatives – total of 10  
Has a Chair who is selected from the committee by the committee members. The position of Chair is recognized with an honorarium reflecting the commitment to the position. The Committee:

- Ensures the Program is reviewed annually and updated to reflect current science and other realities
- Proactively considers Program direction and necessary research to meet that direction
- Ensures the provincial data on program participation is being collected
- Ensures that veterinary training is standardized in provincial delivery and the training module is maintained and updated
- Is responsible for communications and public relations messaging related to the Program. The industry communications network would be utilized.



### Details

- It is expected that two to three meetings per year may be required initially with one of these at the time of an annual conference. Additional work will be done by email and/or a web portal
- Committee expenses for travel are paid
- Committee time is an in-kind contribution of participating organizations except for the Chair who will receive an honorarium

### Comments

- The mix of input will provide good Program oversight
- Selection of the Chair by the committee will result in the Chair having the respect of the committee as opposed to an appointed Chair. Inaugural Chair may have to be appointed
- Not all provincial coordinators will sit on this committee but a method of selecting an appropriate number to represent the group will need to be found. There will likely need to be a subcommittee of provincial coordinators working with the coordinator to ensure uniformity between provinces
- An annual review will be required to ensure the Program continues to meet scientific scrutiny, the needs of trade, the needs of public health and the needs of producers in relation to easy access and compliance. This may involve surveys of compliance with BMP, prevalence surveys and assessment of uptake
- It will be necessary for the committee to do strategic planning where the Program should go and thus influence the research priorities in time for planned changes in the program
- Veterinary training is a key component of the program. This needs to be standardized between provinces and refresher modules must be developed. It will be necessary for the Program Committee to meet annually with the veterinary trainers to review and assess the training program and materials
- The Program Committee will need to ensure that consistent messaging is occurring in all provinces and provide support when required

### Coordinator

- Responds directly to the Oversight Committee
- Facilitates the activities of the Oversight Committee and the Program Committee
- Acts on behalf of the committees through attendance at meetings and conferences; making government and industry contacts; and providing secretariat services

### Comments

- Will require secretarial support
- It is difficult to estimate the time commitment for the coordinator initially. However, in the first two years, time will be invested establishing administrative systems for the Program. In subsequent years, the coordinator's time will be contingent on the number of herds involved in the Program



### Communication Tools

This is essentially a virtual organization requiring an efficient electronic communication platform including:

- Website – public and secure access – the public site could have materials on it of use to producers or the general public and appropriate links to related sites
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- Email
- Teleconference
- Annual meeting, two to three committee meetings/year
- Industry communication network
- Coordinator contact with industry, government and international contacts

→ Draft Budget (Minimal Model)

### Canadian JD Prevention and Control Program

	Oversight Committee		Program Committee	
	Cash (\$)	In-kind(\$)	Cash (\$)	In-kind (\$)
Coordinator	20000		40000	
Coordinator Travel	5000		5000	
Committee Chair		5000	6000	
Secretarial services and office	10000		20000	
Committee member travel	12000		20000	
Committee Representation		21600.		32400
Conference			30000	
Conference travel - committee members		6000		10000
Conference Planner			4000	
Keynote Speaker for Conference			5000	
Website Development			20000	
Financial Management	4000		1000	
Teleconferences	600		1200	
<b>Subtotal</b>	<b>51600</b>	<b>32600</b>	<b>152200</b>	<b>42400</b>
Total Cash	203800			
Total In-kind	75000			
<b>Total</b>	<b>278800</b>			



## □ Appendix Nine Web links for JD, MAP and Crohn's Disease

There are many useful websites particularly in the US and Australia that provide information and links related to MAP and JD. The Project Committee felt that it was more appropriate to catalogue these links as an electronic library.

In the course of the project, a bibliography was not developed through literature review. Rather, there was reliance on the academic members of the project committee, two of which had recently completed their PhDs in aspects of JD

Johne's Control Centre - University of Wisconsin	<a href="http://www.johnes.org/dairy/control.html">http://www.johnes.org/dairy/control.html</a>
USDA/APHIS	<a href="http://www.aphis.usda.gov/vs/nahps/johnes/">http://www.aphis.usda.gov/vs/nahps/johnes/</a>
Paratuberculosis Awareness & Research Association (PARA) is an organization of Crohn's Disease patients, their families and others who are concerned about the relationship between MAP (Mycobacterium avium subspecies paratuberculosis) and Crohn's Disease.	<a href="http://www.crohns.org">http://www.crohns.org</a> Information on Canada can be found at: <a href="http://www.crohns.org/governments/canada.htm">http://www.crohns.org/governments/canada.htm</a>
US Animal Health Association	<a href="http://www.usaha.org/committees/">http://www.usaha.org/committees/</a> Activities and membership of the USAHA Committee on JD
Johne's Disease Integrated Program JDIP is a cooperative initiative of 21 universities and the USDA. The web site is a public resource for an interdisciplinary consortium of researchers.	<a href="http://www.jdip.org">http://www.jdip.org</a>
GD - Dutch Animal Health Service	<a href="http://www.animalhealthservice.nl/frames/frame07.htm">http://www.animalhealthservice.nl/frames/frame07.htm</a>
International Association for Paratuberculosis The IAP is an international, non-profit, charitable and scientific organization for the advancement of research in MAP	<a href="http://www.paratuberculosis.org">www.paratuberculosis.org</a>

Wisconsin Milk Marketing Board

<http://producer.wisdairy.com/dairyresources/results.asp?heading=%27herd+health%27&subheading=%27infectious+diseases%27>