

Johne's Disease

**Overview of research needs and
research currently conducted**

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Goals JD program Canada

- Mission (=long-term objective): to eradicate JD in Canada
- Decrease prevalence of infection with MAP in dairy and beef cattle and their products
 - Better animal health and farm economics
 - Elimination of MAP in milk, beef and the environment

Goals

Prevalence

- shedders
- animals/herd
- herds
- milk/beef
- environment

JD Prevention and Control Program

Knowledge level

Concurrent Research

Analysis of Strengths and Weaknesses



Strengths

- Low cost
 - Doesn't rely entirely on test and cull
 - Easy entry
- High participation level expected

Weaknesses

- Prevalence is not known
- Adoption level of BMPs is not known
- Age-dependent susceptibility to infection based on very small old study

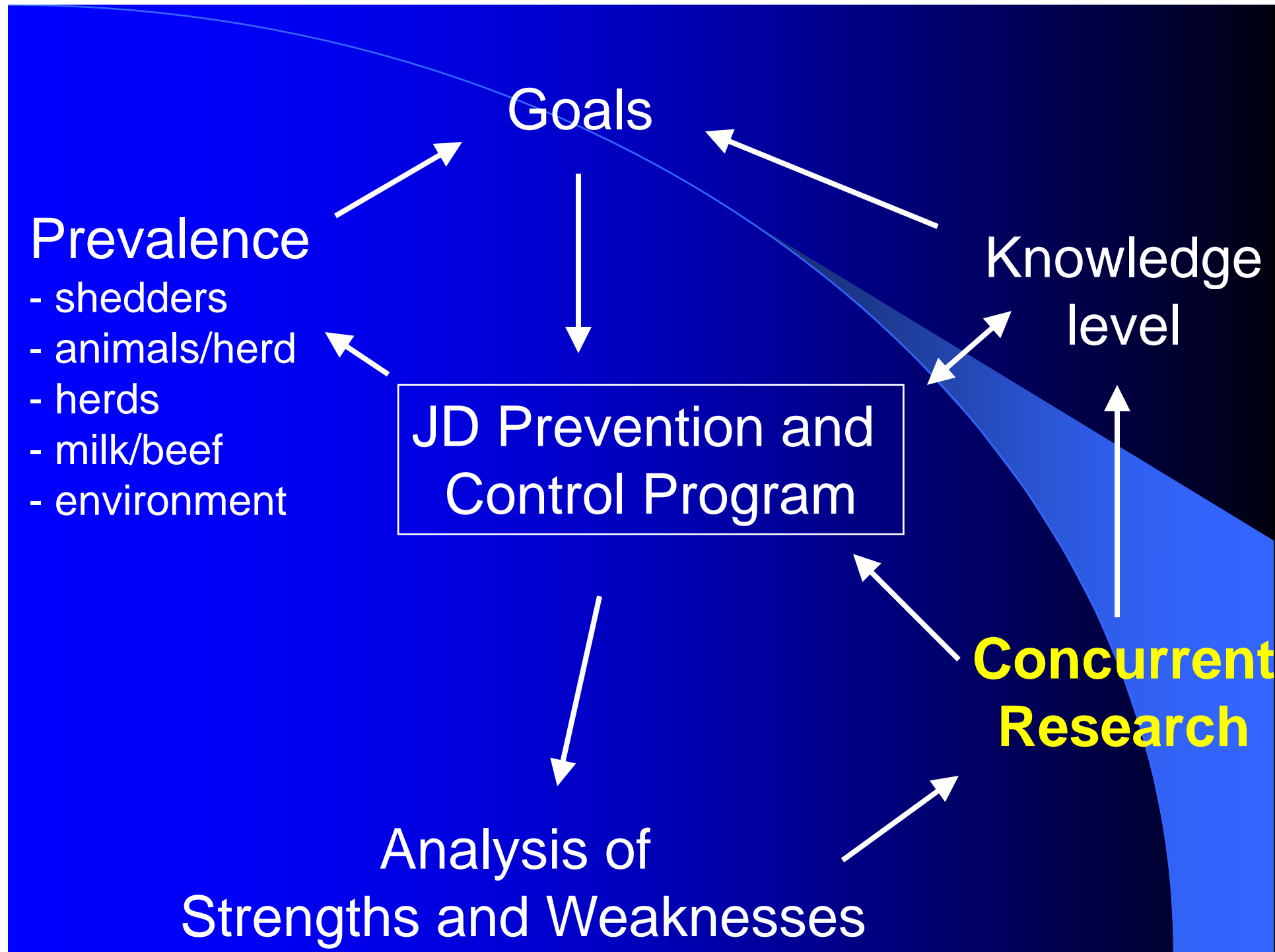
- ELISAs only validated in high prevalence herds
- Environmental samples have never been used in Canadian herds (e.g. beef herds and tie-stalls)

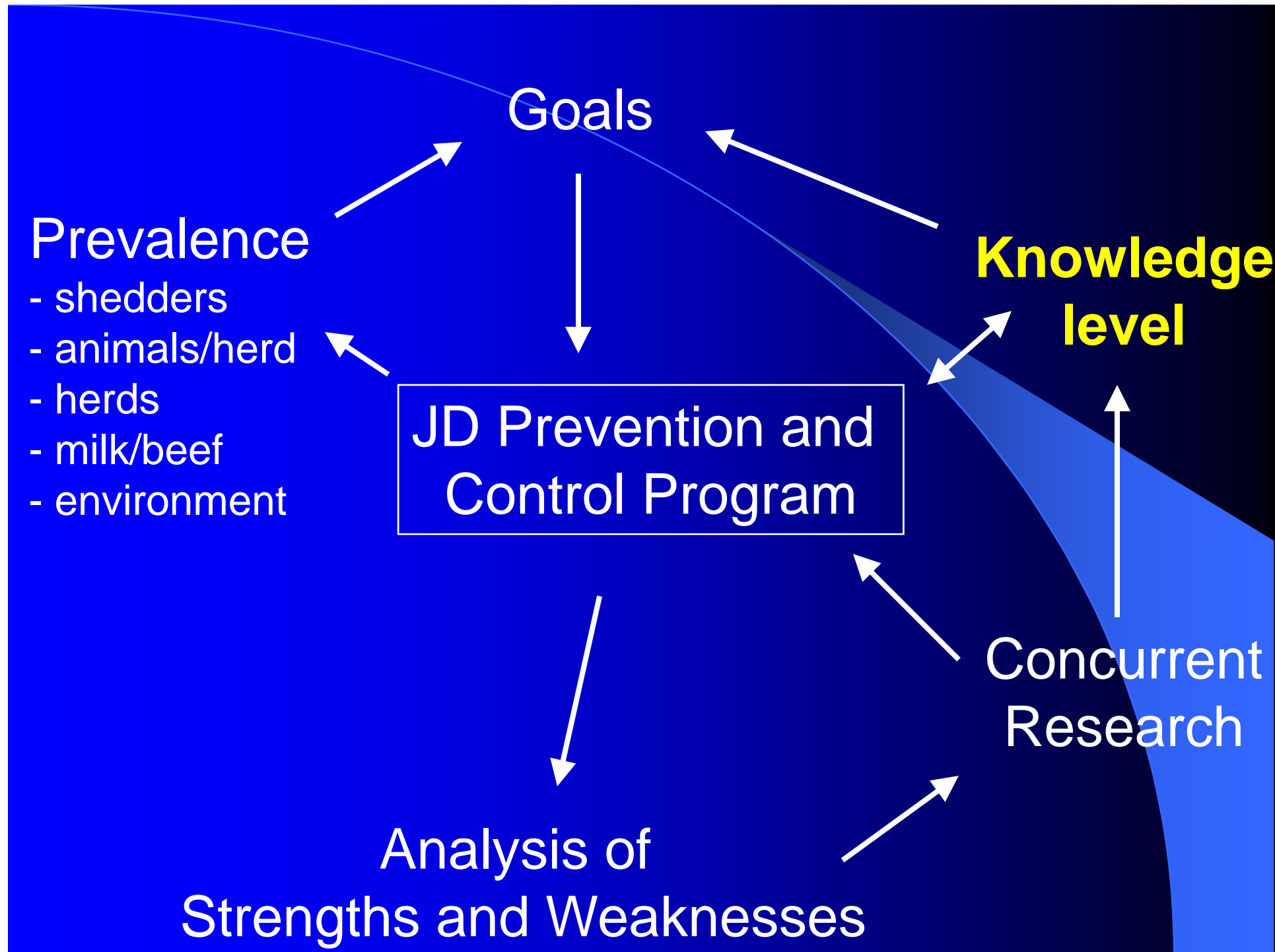
Weaknesses

The major threats are, however:

- farmers underestimate the prevalence by a factor 10
- beef farmers think that this is a dairy problem (if they have heard of the disease)
- because the link with Crohn's is not 100% proven, too many people wait till it may be too late

So, a knowledge transfer program is needed





Why is a research program essential?

- The program is not perfect
 - Tests
 - BMPs
- If you want to measure the achievements of a program you have to start with a baseline and measure its progress

**'A good plan today is better
than a perfect plan tomorrow'**

General George Patton Jr.

Do we know enough to start a program?

- YES
- TB was controlled with the same level of knowledge
- And frankly we don't have a real choice if we take quality of our products seriously

Studies currently conducted

- Very difficult to make an overview because of low level of interaction between groups

Current Canadian JD research

- Several groups are doing JD research
- Not a lot of contact between JD groups
- Very few contacts with international JD groups
- Nearly no multidisciplinary research
- Fragmented funding

→ No prioritization, while duplication is possible

JD 'groups' in Canada

- PEI
- Guelph
- Saint-Hyacinthe
- Saskatoon
- AB

PEI

Shawn McKenna, Greg Keefe, John VanLeeuwen (and Herman Barkema) (dairy)

- Testing of alleyway and manure storage samples
- Evaluation of MAP milk ELISA
- Evaluation of MAP bulk milk culture, PCR and ELISA
- Control of JD using milk ELISA and risk assessment

Guelph

Dave Kelton, Riki Sorge and OMAFRA

- Evaluation of a risk assessment based JD control program (dairy)

Saint-Hyacinthe

Marie Archambault and Gilles Fecteau

- Projects in the pipe-line on improving tests using phages

Saskatoon

Steve Hendrick and John Campbell

- Best management practices for the prevention and control of JD in western Canadian beef herds
- Role of wild-life and environmental survivability of MAP in JD in beef herds
- Early detection of MAP in dairy calves

Manitoba

Denis Krause

- Use of on-farm composting to dispose of JD infected cattle

Alberta

Jeroen de Buck and Herman Barkema in cooperation with Hernan Ortegon and Gerald Hauer (AAF) and CD researchers at UofC

- Research programs at UofC starting
- At this moment, mainly research in the role of MAP in Crohn's disease
- Evaluation on a phage-based rapid test for MAP
- Proposal for a demonstration project in beef herds (next year)

Research themes

- Prevalence and economic impact
- Evaluation of the program
- Transmission
- Tests
- Processing
- Crohn's disease

Prevalence and economic impact

- Economic impact in dairy and beef
- Herd- and cow-level prevalence in Canada: beef and dairy
- Prevalence in the environment (water, soil) - **SK**

Prevalence

- The prevalence in Canadian dairy and beef cattle is not known
- Most beef farmers think that this is a dairy problem
- The economic impact in Canadian cattle is based on serum ELISAs
- The prevalence in the environment is not known

**'You can't control what you
don't measure'**

Edward Demming

But, we know that

- the herd-level prevalence in Canadian cattle herds is high
- the economic impact in farms is substantial
- the prevalence in the environment also will be high

Evaluation of the program

- Does the JD program result in a decrease of prevalence of MAP-infection? ~ ON
- Adoption of advised BMPs? - ON
- Effect of controlling JD on occurrence of other fecal-oral transmitted infections?

Transmission of infection

- Role of surface and well water in the spread within and between herds
- Factors that influence susceptibility
- Age-determined susceptibility
- Environmental viability ~ **SK**
- Acidifying colostrum
- Role of super-shedders
- Role of other species - **SK**
- Can milk replacer be a source of MAP?

Tests

- Test characteristics of milk ELISA in low prevalence herds – ON, PEI
- Environmental sampling in tie-stalls and beef herds – SK, PEI
- PCR bulk milk, faeces, environmental samples - PEI

Processing

- Prevalence in Canadian bulk milk
- Recovery of MAP or its antigen in meat of MAP-positive animals
- Effect of heating milk and processing
- Does microfiltering milk decrease the load of MAP or its antigen?

Crohn's disease

- Prevalence of MAP in CD patients – AB
- MAP strains in different species – AB
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Proposed JD research

- Research committee
- Meetings
- International interaction
- Funding

JD Research committee

- Initiate, prioritize and evaluate research
 - Make recommendations for funding
 - Monitor progress of research
 - Stimulate cooperation between institutes
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- Consists of researchers, delegates of commodities and funding agencies
 - Chair/coordinator

Meetings

- Facilitate interchange of knowledge between JD researchers
- Update the partners on the progress of the JD program and JD research
- JD research committee

International interaction

- Early uptake of new ideas
- Prevent duplication of research
- Show the results of Canadian JD program and research
- Involvement of international researchers in Canadian JD research
- Travel awards needed

Funding needed for:

- Knowledge transfer
- Research projects
- JD research committee + its coordinator
- JD conference
- Travel awards

Questions?

