



Canadian Food  
Inspection Agency

Agence canadienne  
d'inspection des aliments

## Canadian Food Inspection Agency



### **Our vision:**

To excel as a science-based regulator, trusted and respected by Canadians and the international community.

### **Our mission:**

Dedicated to safeguarding food, animals and plants, which enhances the health and well-being of Canada's people, environment and economy.

## ***The role of diagnosticians in terrestrial animal disease surveillance CAHLN presentation, May 2013***

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***Epidemiology and Surveillance Section***

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# Surveillance is...

Ongoing, Systematic

Collection

Collation

Analysis

Interpretation

**of Animal Health Data**

**And Dissemination of Results for Decision Making**

2012 OIE Terrestrial Animal Health Code



# Why do we do surveillance in CFIA?

- To establish Canada's freedom from key terrestrial animal diseases
- To ensure effectiveness of disease control programs
- To facilitate export market access

Bovine brucellosis  
Pseudorabies  
Bluetongue  
Swine brucellosis  
BSE  
Trichinellosis  
Anaplasmosis  
Bovine tuberculosis  
NAI



## Meat and Poultry Trade

Interprovincial

\$23.1 B

and

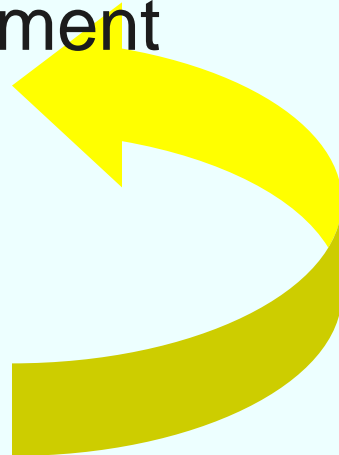
+

International

\$4.4 B

## Live Animal Trade

Unrestricted  
Interprovincial  
Movement



International  
Sales

\$1.7 B

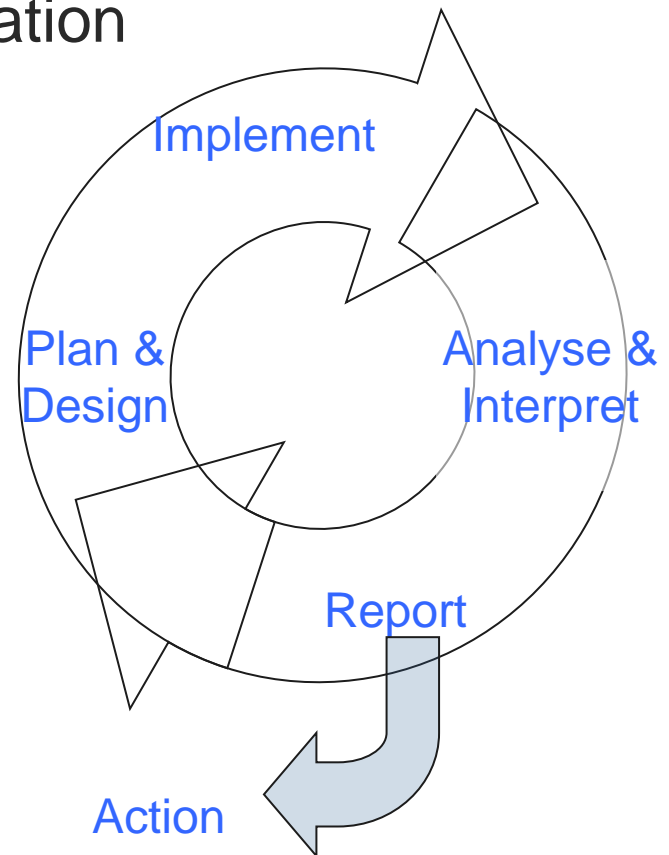


# How do we do surveillance in CFIA?

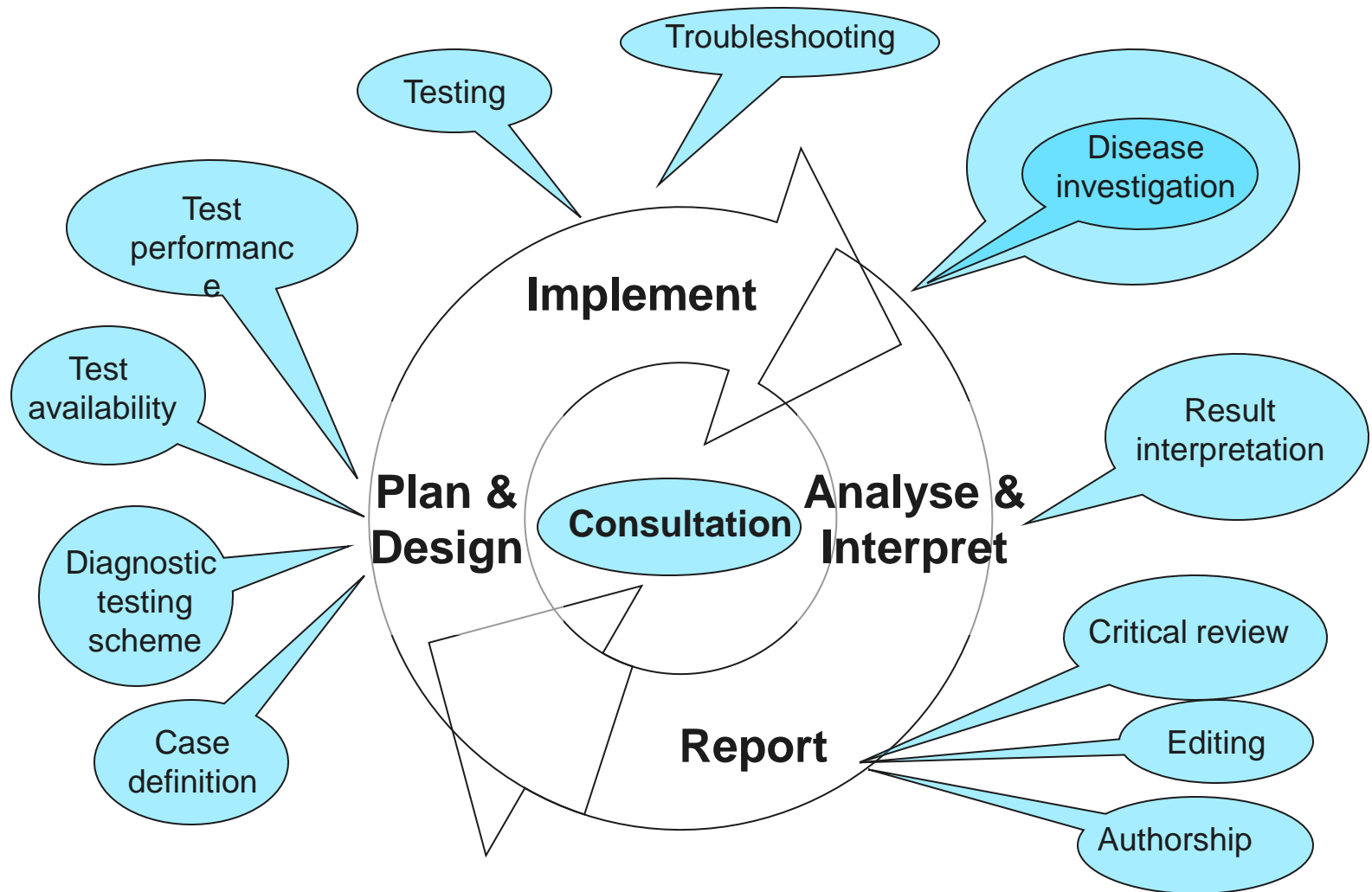
- Collaborative framework
- Provide leadership - coordination
- Plan
- Design
- Implement
- Analyse
- Interpret
- Report

Collaborative

- Operations
- Science (Labs)
- Programs
- Industry /Pract vets
- Communication products
- Peer review publications
- Comprehensive reports



# Laboratories involved in every part of surveillance



# Testing: A critical element of surveillance

*Surveillance involves the detection of disease or infection according to appropriate case definitions and based on the results of one or more tests for evidence of infection or immune status.*

2012 OIE Terrestrial Animal Health Code. Chapter 1.4

# Case definition – The cornerstone



- Must be defined before first surveillance sample is collected
- Need for a clear case definition for:
  - Disease response
  - Interpretation of surveillance results
  - OIE reporting
- Need for inter-Branch Communication / Collaboration
  - The case definition – Programs
  - How to achieve it – Science and Ops

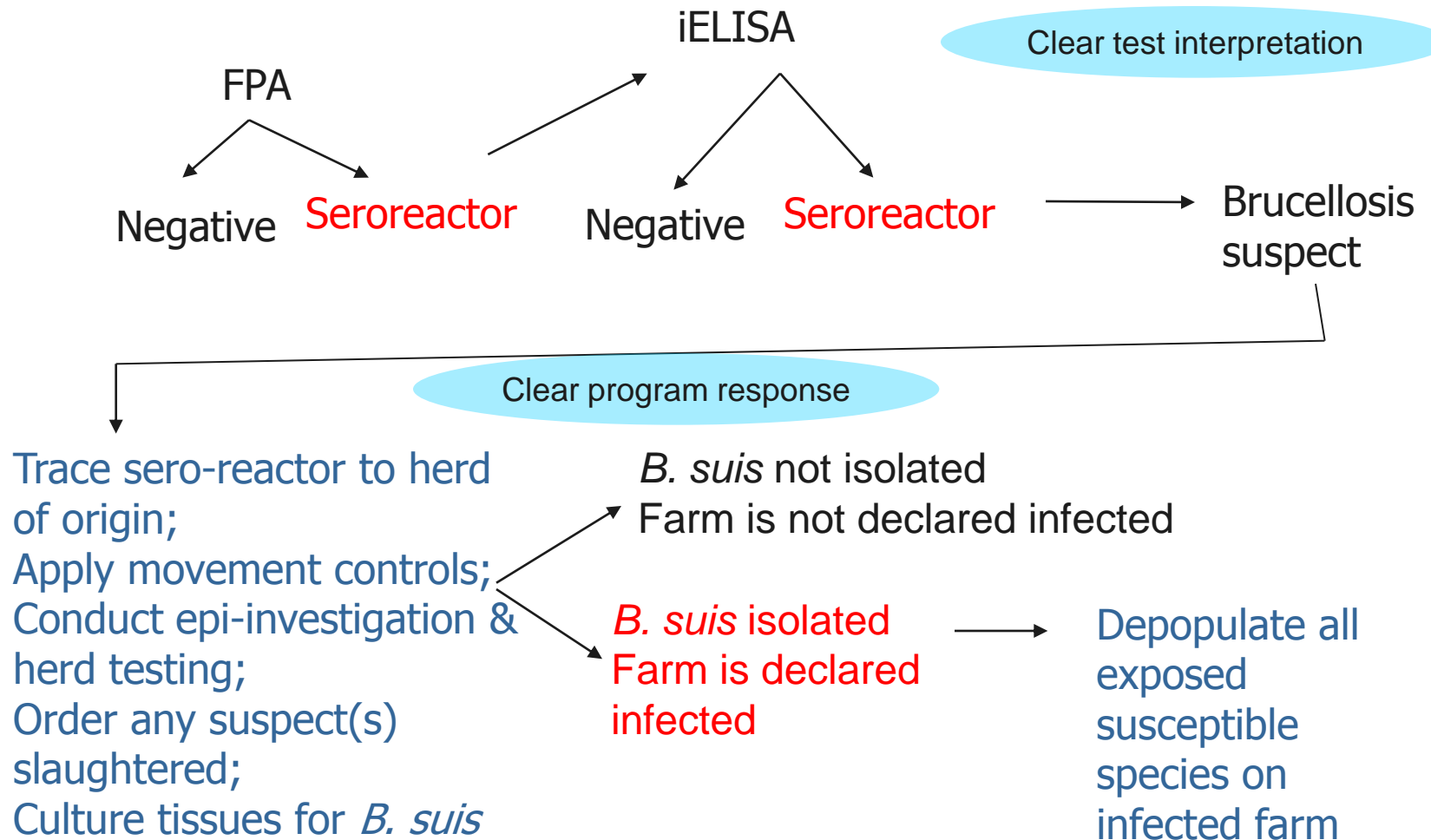


# Case definition for brucellosis



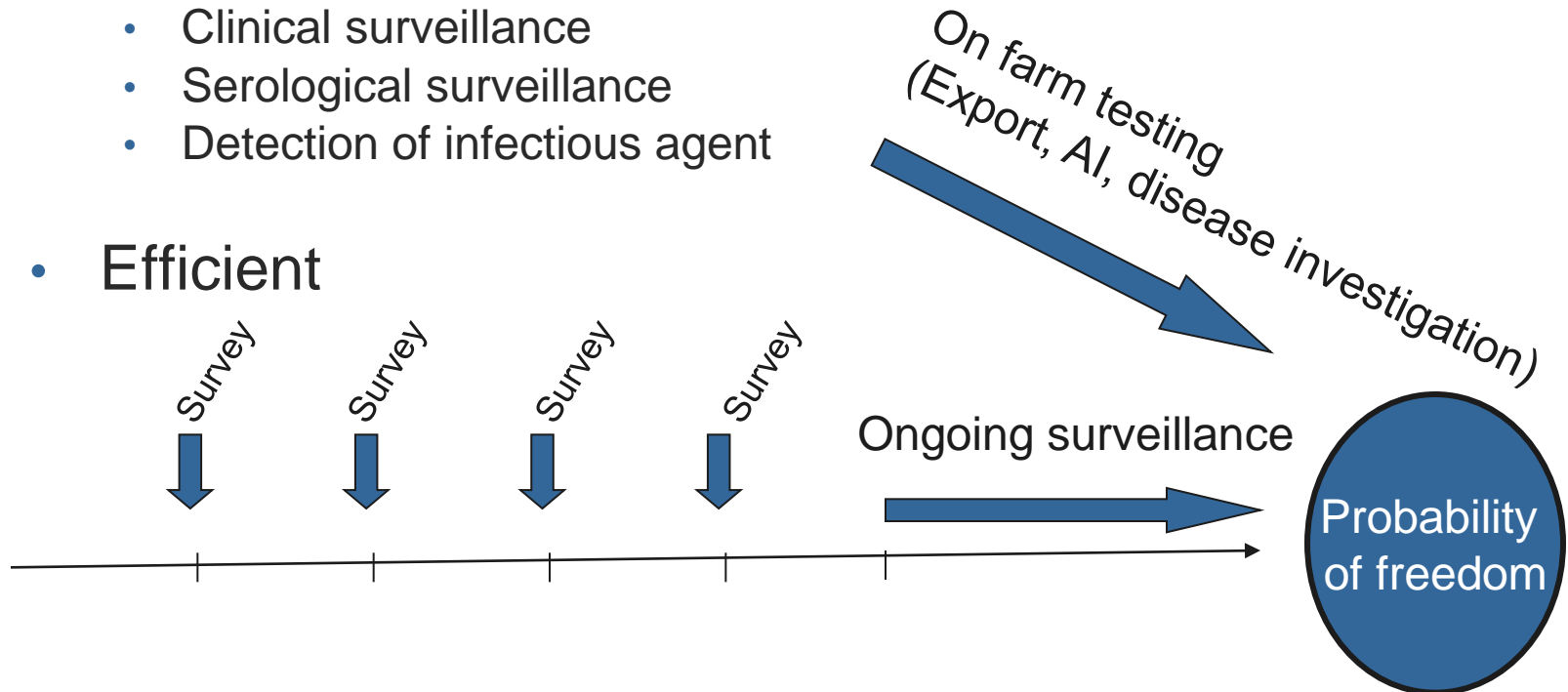
- A **Brucellosis suspect** is any animal which has Brucellosis in the differential diagnoses or tests positive to OIE approved and CFIA validated screening and ancillary tests for that species.
- A **Brucellosis positive animal** is an animal in which the CFIA confirms the diagnosis of *Brucella sp.* by growth of the organism in culture with definitive identification by CFIA approved methods.

# Use of case definition in disease control response



# Surveillance Evolution - From periodical surveys to ongoing surveillance

- Collaborative structure
- Incorporates various sources of surveillance data:
  - Passive surveillance
  - Clinical surveillance
  - Serological surveillance
  - Detection of infectious agent
- Efficient



# Scenario tree (freedom) model concepts

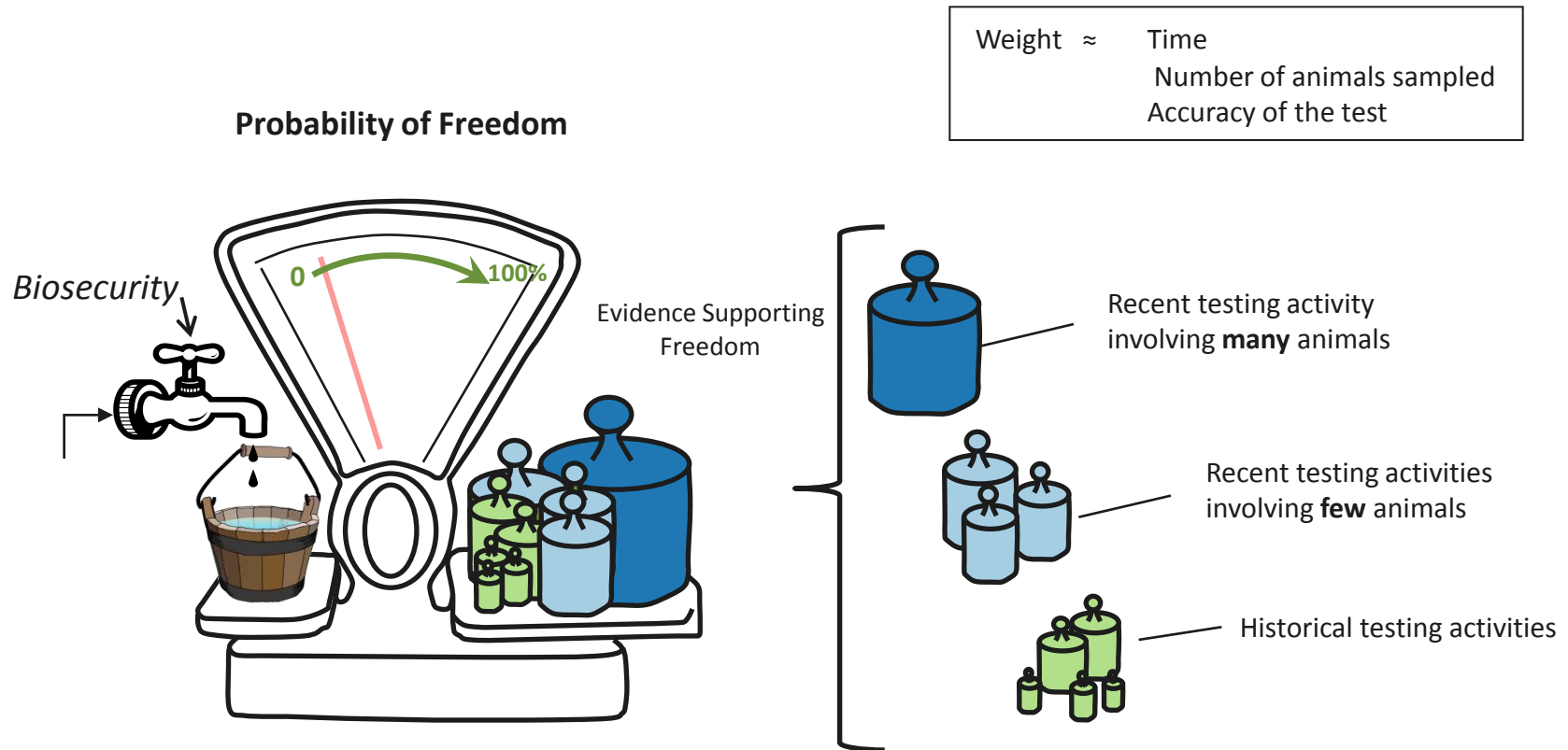


Illustration by R. Vanderstichel, AVC of concept by A. Cameron, AusVet

# Scenario Tree modelling

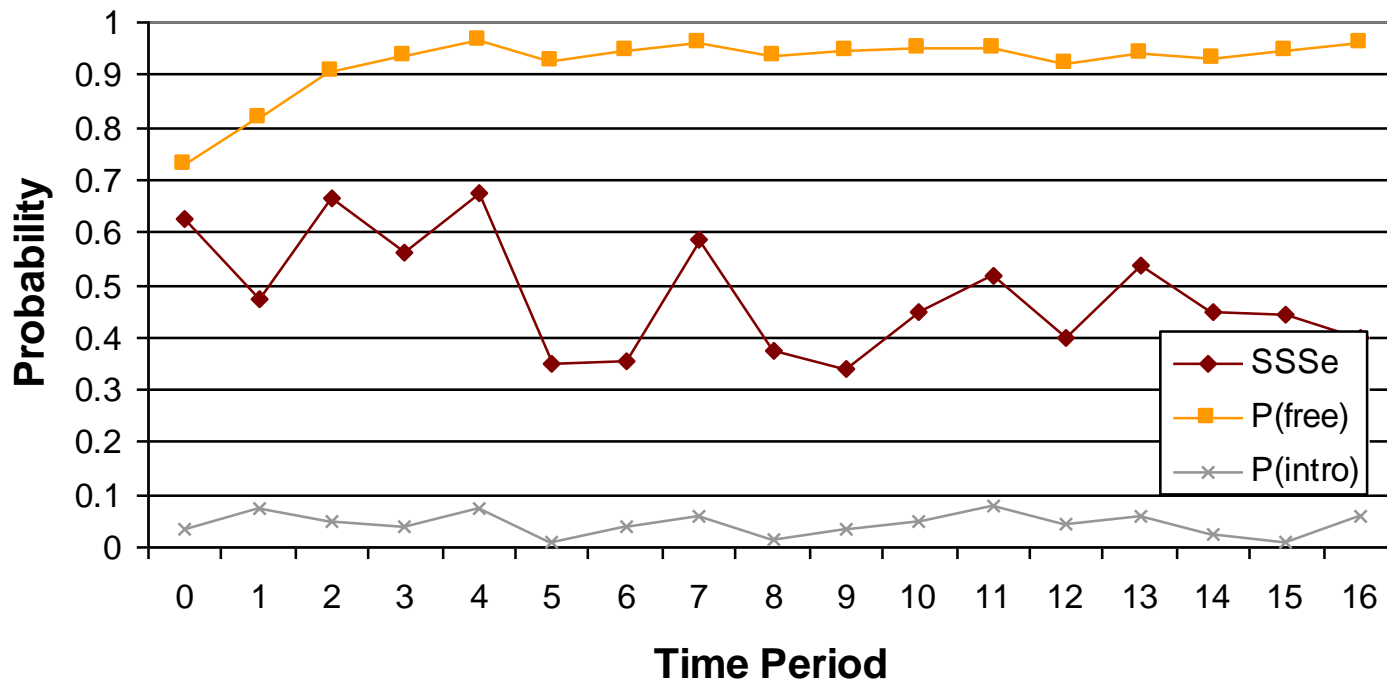
- Allows use of multiple sources of data, each weighted according to it's surveillance value
  - Makes use of historical data
  - Efficiency in work already done by lab (export, dis. Ctrl)
- Parameter input – validity of estimates
  - Sensitivity, specificity of tests
  - Probability of introduction of disease (RA)
  - Risk factors
- Output:
  - Sensitivity of the surveillance system (SSSe)
  - Probability of freedom
- OIE supported, international recognition through publications

# Surveillance system Se (SSSe)

	Disease Present*	Disease absent	
Disease detected by SS	A	B	PVP
Disease non-detected by SS	C	D	PVN
	SSSe	SSSp	

\* At level p

# Output for scenario tree model – Surveillance system sensitivity (SSSe) and probability of freedom



# We never know what challenges lie ahead: *Anaplasma* in bovine serological survey BSS 07-08

**Table 9:** Apparent Seroprevalence of Anaplasmosis by Province of Origin and Kit Lot Used

Province	OCT08 Kit Lot (%)	JUN09 Kit Lot (%)
BC	7.32 (48/656) <sup>a</sup>	2.22 (5/225) <sup>a</sup>
AB	2.32 (81/3498) <sup>bd</sup>	0.52 (3/576) <sup>ab</sup>
SK	2.99 (70/2338) <sup>b</sup>	0.60 (10/1679) <sup>ab</sup>
MB	0.64 (6/932) <sup>c</sup>	0.15 (1/654) <sup>ab</sup>
ON	0.14 (1/690) <sup>c</sup>	0.08 (1/1296) <sup>b</sup>
QC	0.80 (5/625) <sup>cd</sup>	0.00 (0/970) <sup>b</sup>
ATL	1.54 (1/65) <sup>abcd</sup>	0.00 (0/211) <sup>ab</sup>
N/A	1.45 (11/759) <sup>*</sup>	0.32 (1/308) <sup>*</sup>
National	2.33 (223/9563)	0.35 (21/5919)

Identical letters indicate a non-significant difference between provinces for a given kit lot.  
\*Samples without a province of origin (N/A) were not included in the statistical analysis.

Epidemiological analysis of data suggested difference in *Anaplasma* reactors in BC

Within affected herds	Mb	BC
Apparent seroprevalence	6.28%	0.27%
Proportion PCR+/ELISA+	95.55%	4.39%

## Cross-Canada Disease Report Rapport des maladies diagnostiquées au Canada

An update on bovine anaplasmosis (*Anaplasma marginale*) in Canada

Krista J. Howden, Dorothy W. Geale, Julie Paré, Elizabeth J. Golsteyn-Thomas, Alvin A. Gajadhar

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A novel *Ehrlichia* genotype detected in naturally infected cattle in North America

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