



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.

***Surveillance, scenario tree models and claim of disease freedom at the national level***

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Canada

# Outline

- New trends in OIE surveillance standards
- Quantitative approaches to confirm “freedom” of diseases
- Context of surveillance



# The OIE definition of surveillance

- ❖ Surveillance means the systematic ongoing collection, collation, and analysis of information related to animal health and the timely dissemination of information to those who need to know so that action can be taken
- ❖ In general, surveillance is aimed at
  - **demonstrating the absence of disease,**
  - **determining the occurrence or distribution of disease**
  - **while also detecting as early as possible exotic or emerging diseases**

# Types of surveillance

| Type of surveillance  |  | Examples  |
|---|--|---|
| Measuring disease occurrence of diseases known to occur in Canada | Baseline   | Wildbird surveys for Avian Influenza  |
|   | Detecting increased occurrence (early warning)           |   |
|   | Detecting decreased occurrence (part of disease control) | TB, BSE, CWD  |
| Determine presence/absence of diseases (FAD surveillance)         | Confirm freedom  | CanNAISS<br><br>CanSwineSurv<br><br>Bovine sero survey<br><br>Trichinella in meat (Food safety) |
|   | Early warning (new emerging diseases)                    | Wildbird surveys for Avian Influenza and West Nile  |



United Nations

WHO      FAO

Codex  
Alimentarius

**GATT / SPS 1994**

**OIE 1924**

**WTO**

**Reporting**

**Standards**

**Trade negotiations/disputes**



# The international scene before 1994

- ❖ The veterinary authorities protected the zoosanitary status of the country
- ❖ Risk avoidance – zero risk  
– if in doubt keep it out
- ❖ This was seen as (often unnecessary) “political” trade barriers but from a veterinary stand point it is an easy solution



# 1994 marks the beginning of change

- ❖ The GATT (General Agreement on Tariffs and Taxes) Uruguay round was signed April 15, 1994
  - Established the World Trade Organization (WTO) and
  - A major output was the Sanitary and Phytosanitary agreement (SPS agreement)

# The SPS agreement (1994)

- ❖ Aims to facilitate trade and protect human, animal or plant life or health.
- ❖ Dictates that sanitary measures must be **scientifically based** and not more restrictive than necessary
- ❖ Recommends the use of international standards from the World Organization for Animal Health (**OIE**)
- ❖ Stresses that more restrictive measures than those in the international standards must be justified through **risk analysis**



# Surveillance to confirm freedom over the last 25 years

- ❖ **Qualitative approach** to claim freedom (**prior to 1994**)
  - The veterinary authorities stated the zoosanitary status
  - Survey(s) to support the claim were rare
  
- ❖ **1<sup>st</sup> quantitative approach** – (1994 to ?) adapting to SPS – science based
  - OIE set standards for surveys to confirm freedom
  - Principles
    - if two countries conducted the “same” survey they were equally likely to be free
    - One-shoe-fits-all
  - (Proportional) random sampling, high diagnostic sensitivity (prescribed tests etc.), inflexible sample sizes

# Surveillance to confirm freedom new challenges

## ❖ **2<sup>nd</sup> quantitative approach** – modern (2007)

➤ New trend in OIE standards to confirm freedom

➤ Veterinary Authorities

- Justify design based on epidemiology, disease, history etc.
- Latitude to choose design prevalence, sampling method(s) and diagnostic test(s)

➤ Calculate surveillance system sensitivity, probability of freedom

- Combine surveillance data
  - Historical surveillance data
  - Multiple current data sources

➤ Provide plan and context

- Description of veterinary infrastructure, laboratory capacity, industry, production methods etc.

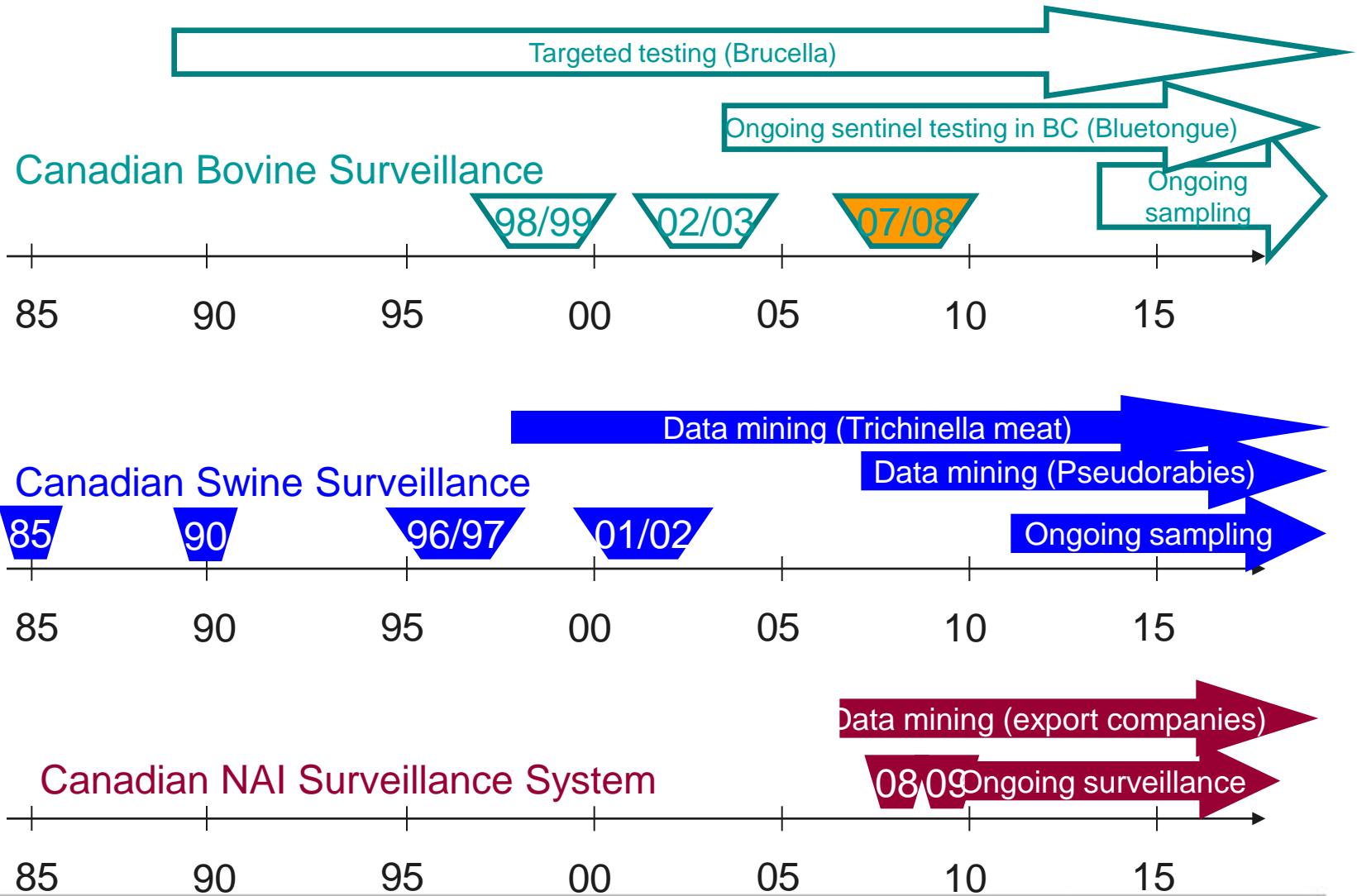
New  
Responsibility

More  
Transparency

Better  
Documentation



# ESS examples



# Freedom & risk before and after 1994

**Freedom in a geographical region (country)**



**Freedom in a population (Notifiable Avian Influenza in poultry)**

**Zero risk**



**Acceptable low level (prevalence)**



# Responsibility & documentation

## ❖ To justify

- design based, design prevalence, sampling method(s) and diagnostic test(s)

## ❖ We provide the context of surveillance in a comprehensive report including descriptions of

- Disease epidemiology in Canada
- Industry, production methods, population etc.
- Veterinary infrastructure & diagnostic capacity
- Laws, regulations, jurisdiction
- Design and organization of surveillance activities
- Stakeholder involvement
- Surveillance results



# Transparency

## ❖ Epidemiologic analysis - scenario trees

- Combine surveillance data
- Calculate surveillance system sensitivity & probability of freedom
- Presentation of models is challenging but critical for validation

## ❖ Standardized presentation of surveillance results\*

- (1) definitions to describe the objective of the model,
- (2) initial time period,
- (3) input parameters,
- (4) data,
- (5) model settings & structure
- (6) outputs,
- (7) validation

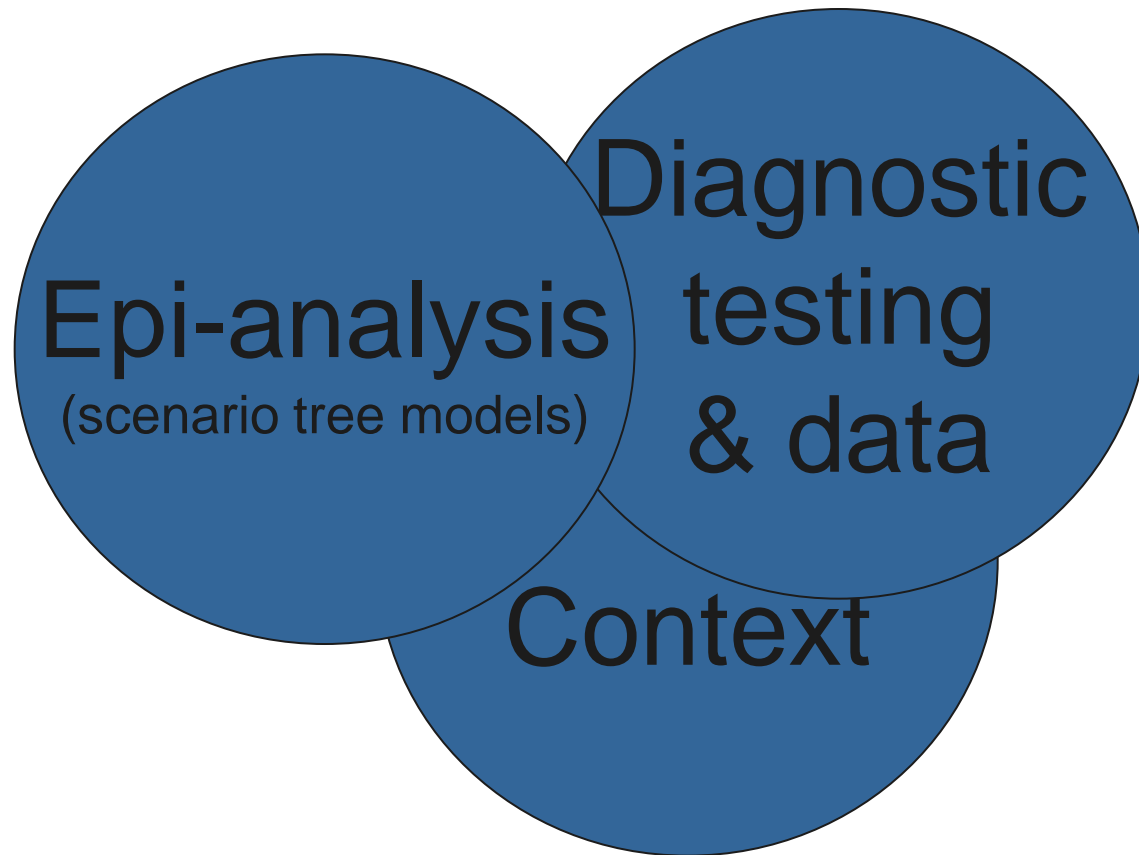
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\*Vanderstichel, Christensen, Stryhn, Hurnik. 2013. Standards for reporting surveillance information in freedom from infection models by example of *Trichinella* in Canadian market hogs. PVM (Accepted March 2013).

# Conclusion

- ❖ New trends in OIE surveillance standards
  - New responsibilities, new demands on transparency and documentation
  
- ❖ 1st and 2nd quantitative approach to confirm “freedom”
  - Canada applies both approaches
  
- ❖ The context of surveillance
  - Is needed to meet OIE and document surveillance including scenario tree models
  - Comprehensive reports

# Claim of freedom





**Merci! / Thank you!**

**Questions?**



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