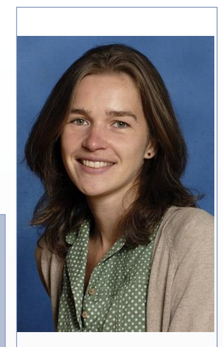
Brucellosis in Belgium: from freedom of disease to case detection

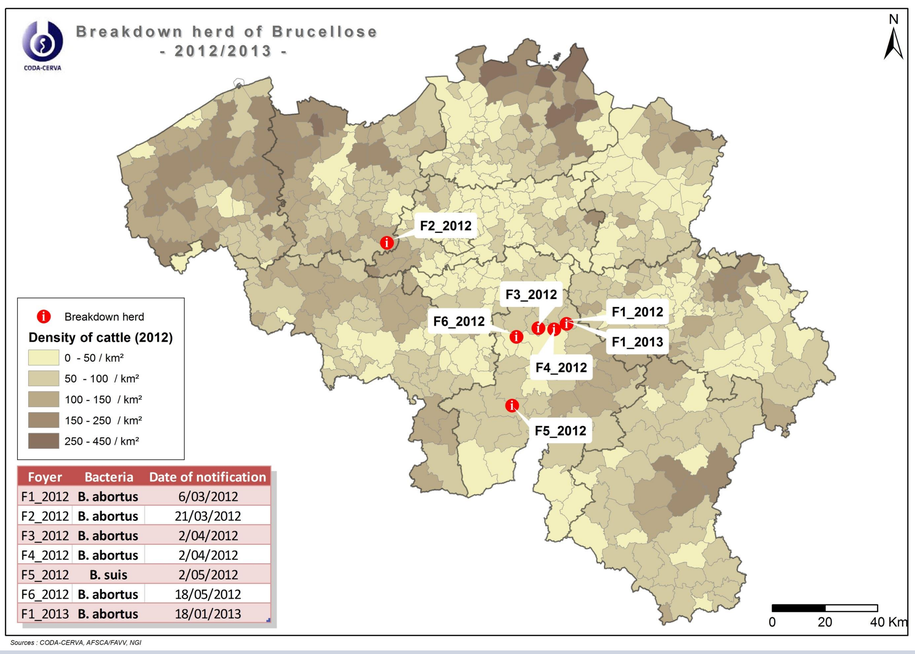


CODA CERVA Veterinary and Agrochemical Research Center - Groeselenberg, 99 B-1180 BRUSSELS BELGIUM phone : +32(0)2 379 04 00 www.coda-cerva.be

Sarah Welby[1], David Fretin[2], Flavien Riocreux[1], Jacques Godfroid[3], Luc Vanholme[4], Hein Imberechts[2], Yves Van der Stede[1, 5]

[1]CODA-CERVA, Veterinary and Agrochemical Research Centre, Unit: Coordination Veterinary Diagnosis-Epidemiology and Risk Analysis (CDV-ERA), Belgium
[2]CODA-CERVA, Veterinary and Agrochemical Research Centre, Unit: Bacteriology, Belgium
[3]UiT, Artic University of Norway, Faculty of Biosciences, Fisheries and Economics, Norway
[4]FASFC, Federal Agency for the Safety of the Food Chain, Section Animal Health, Belgium
[5] Ghent University of Veterinary Medicine, Laboratory of Veterinary Immunology, Belgium

Context & Aims



Foyer	Bacteria	Date of notification
F1_2012	**B. abortus**	6/03/2012
F2_2012	**B. abortus**	21/03/2012
F3_2012	**B. abortus**	2/04/2012
F4_2012	**B. abortus**	2/04/2012
F5_2012	**B. suis**	2/05/2012
F6_2012	**B. abortus**	18/05/2012
F1_2013	**B. abortus**	18/01/2013

Figure 1: Belgian breakdown herds in 2012-2013

- Belgium, **officially brucellosis** free since 2003 (EC Decision 2003/467/EC).
- In 2009, in accordance with EU regulation (64/432/EEC), **targeted surveillance system** encouraging passive surveillance via screening of **abortions and purchase** rather than a wide active surveillance system with yearly testing of 1/3 of the cattle population.
- In 2012, 5 B. abortus breakdowns were detected via abortion notification and further tracing on and back. Also, 1 B. suis breakdown was detected (through bulk milk testing).

Given the current targeted surveillance system in 2013:

- **How confident are we in the official free status, given that no new cases are detected after a full year surveillance?**
- **How effective is this surveillance system for case detection?**

Material & Methods

- **Belgium active cattle herd population** (2013): **26208 herds** and **2500747 cattle**
- **Brucellosis surveillance components:**
  - *Bulk milk testing (ELISA): all dairy herds*
  - *Winter screening (SAW EDTA): simple random sample of herds that did not notify abortions*
  - *Imported cattle from free and non free countries (SAW EDTA and ELISA): all imported cattle*
  - *Abortions foetus (CULTURE) and their mother (SAW EDTA): all abortions mandatory notified*
  - *Purchased cattle (SAW EDTA): simple random sample*

All positive results are further confirmed with an in house ELISA at CODA (National Reference Laboratory)

- **National Cattle Registration System Database (SANITEL) and Laboratory Integrated Management System (LIMS)**:
  - ✓ Summarise information for each active herd in 2013 (excluding fattening herds)
  - ✓ **Adjusted** expected prevalence at herd level 0,1% (64/432/EEC)
  - ✓ Proportion tested
  - ✓ **Herd sensitivity**

	Population		Tested	
	Cattle	Herd	Cattle	Herd
Abortions			9507	9259
Dairy	979720	8804	979720	8804
Purchase	337685	14255	14390	5287
Import from free country	4582	811	4582	811
Import from non free country	1079	91	1079	91

- Model Risk 3,0 (Vose Software®)
  - ✓ Relative sensitivity of each component for claiming freedom (Methods described by Martin et al., 2007)
  - ✓ Relative sensitivity of each component for case detection (Methods described by Cameron, 2012)

- *Martin PAJ, Camron AR, Greiner M. Demonstrating freedom from disease using multiple complex data sources: 1: A new methodology based on scenario trees. Prev Vet Med, 2007 (79), 71-97*
- *Cameron AR. Scenario-tree analysis for the evaluation of case-detection surveillance. Proceedings of the 13th International Symposium on Veterinary Epidemiology and Economics, 2012, 181*

Results & Discussion

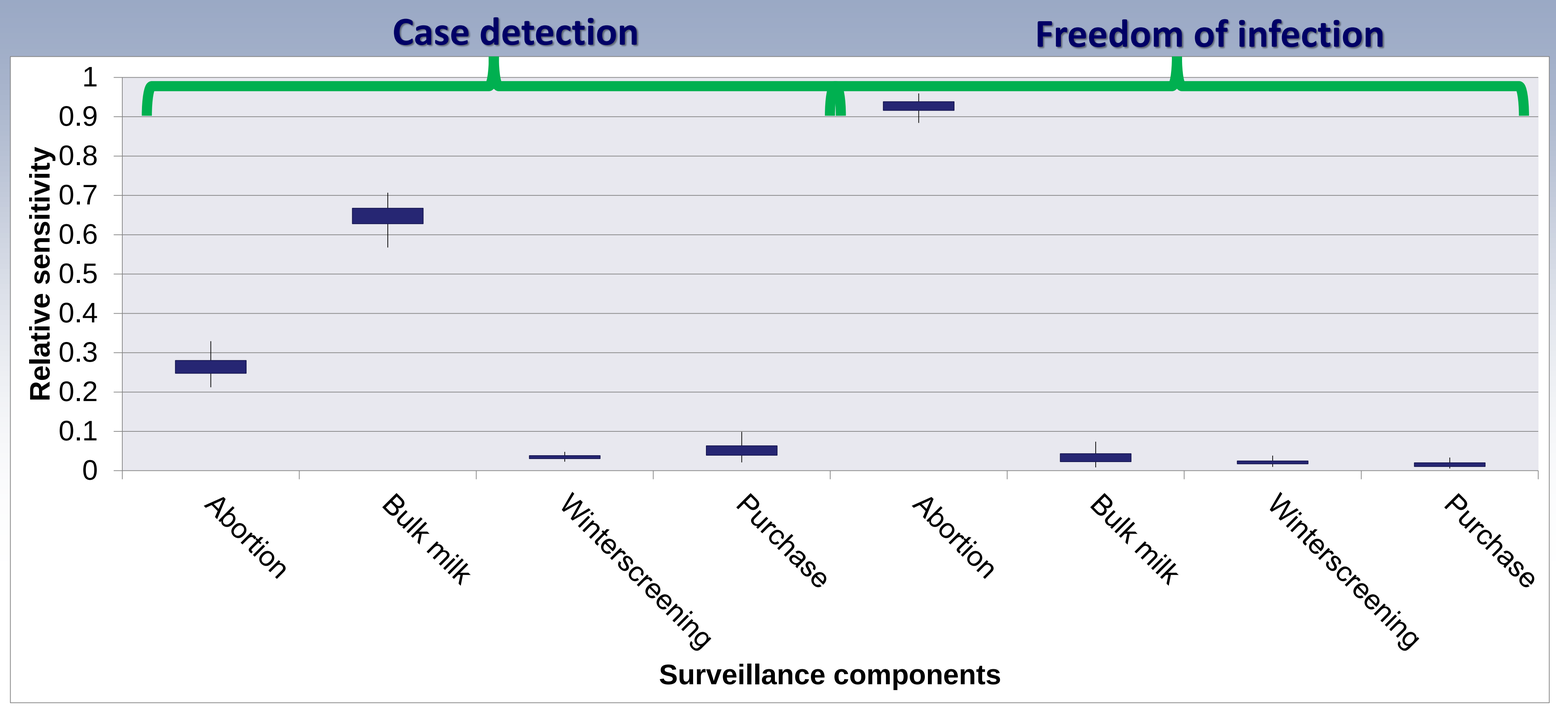


Figure 2: Relative sensitivity for each surveillance component in terms of proving freedom and case detection

The present study clearly shows the **importance of passive surveillance and notification of abortions** for the surveillance of Brucellosis in Belgium. These surveillance components have shown to be effective to **comply with the aim of proving freedom of infection** AND **case detection**, providing **abortions** are **all notified and tested**.