

The surveillance programme for *Brucella abortus* in cattle in Norway 2013

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The surveillance programme for *Brucella abortus* in cattle in Norway 2013

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Brucella abortus in cattle was not detected in 2013.

Introduction

Eradication of bovine brucellosis in Norway was achieved in 1950 (1, 2).

Since 1994, the EFTA Surveillance Authority (ESA) has recognised Norway as a state officially free from brucellosis as described in ESA Decision 66/94/COL, later replaced by ESA Decision 227/96/COL.

A surveillance and control programme for *Brucella abortus* was launched in 2000. All samples were negative in 2000, 2001, 2003 and 2004. In 2002 however, two bulk milk samples were antibody positive. Further investigation did not confirm these positive results and it was concluded that the positive serological results most likely were false positive reactions.

Since 2005 the programme has consisted of passive clinical surveillance.

The Norwegian Food Safety Authority is responsible for carrying out the programme. The Norwegian Veterinary Institute is in charge of planning the programme, performing the analyses and reporting the results. The samples are collected by inspectors of the Norwegian Food Safety Authority.

Aim

The aim of the programme is to document freedom from *Brucella abortus* in cattle according to demands in Directive 64/432/EEC with amendments, and to contribute to the maintenance of the present favourable situation.

Material and methods

Herd criteria for submission of clinical material are:

- abortions occurring between the fifth month of pregnancy and 14 days before expected birth
- at least two abortions within this pregnancy period the last twelve months

Material for submission:

- foetus and the foetal membranes
- blood sample from the cow collected within 21 days after the abortion

Post-mortem investigations

Foetuses are subjected to a full autopsy. Specimens from lungs, myocardium, liver, kidneys, (half) brain, and foetal membranes are fixed in 10% neutral phosphate-buffered formalin. The specimens are processed according to a standard routine protocol, sectioned at 2-3 µm and stained with haematoxylin and eosin.

Bacteriological investigations

Foetal membranes and organs from the aborted foetus (liver, spleen and stomach contents) are sampled. Samples are cultured on selective *Brucella* agar containing 5% horse serum, Amphotericin B, Bacitracin, Polymyxin B and Vancomycin at 37°C in a 10% CO₂ atmosphere. The media are examined regularly and incubated for up to 14 days. Suspicious bacterial colonies are examined by Gram and modified Ziehl-Neelsen staining, and tested for production of catalase and oxidase. Further confirmation is performed with realtime PCR (IS711) and Bruce ladder.

Table 1. Number of foetuses and cows examined for brucellosis in the Norwegian cattle population during the years 2000-2013

Year	Material	Dairy cattle		Beef cattle		Total	
		Animals	Herds	Animals	Herds	Animals	Herds
2000	Foetuses					17	14
2001	Foetuses	21	18	0	0	21	18
2002	Foetuses	18	17	10	6	28	23
2003	Foetuses	30	25	4	3	34	28
2004	Foetuses	25	21	2	2	27	23
	Cows	28	19	2	2	30	21
2005	Foetuses	16	14	8	7	24	21
	Cows	48	26	8	4	56	30
2006	Foetuses	11	11	0	0	11	11
	Cows	19	13	1	1	20	14
2007	Foetuses	11	10	1	1	12	11
	Cows	14	11	1	1	15	12
2008	Foetuses	20	17	2	1	22	18
	Cows	42	19	5	2	47	21
2009	Foetuses	14	11	5	3	19	15
	Cows	19	11	7	3	26	10
2010	Foetuses	9	8	3	3	12	11
	Cows	30	15	14	4	44	19
2011	Foetuses	7	7	2	1	9	8
	Cows	42	17	10	3	52	20
2012	Foetuses	11	10	1	1	12	11
	Cows	47	20	1	1	48	21
2013	Foetuses	37	31	7	4	44	35
	Cows	130	64	22	7	152	71

Serology

Blood sampling is limited to one sample taken within two weeks after the abortion. The blood sample is tested in duplicates for antibodies against *Brucella abortus* in an indirect ELISA (Svanova®). If the result is doubtful or positive, the sample is retested in duplicates using the same ELISA. If the result is negative when retested, the sample is concluded to be negative for antibodies against *Brucella abortus*. If the result is doubtful or positive, new blood sample from the suspected animals is taken and tested as described above. Doubtful or positive samples in ELISA tests are subjected to a complement fixation test (CF). If the CF test is negative the sample is concluded to be negative for antibodies against *Brucella abortus*. If the CF test is also positive, the result is reported and new blood sample

from the suspected animals is required and tested. In addition there will be a need for immediate follow up with post-mortem and bacteriological investigations.

Results and discussion

A total of 44 fetuses from 35 different herds and blood samples from 152 cows originating from 71 different herds were analysed in 2013 (Table 1).

One dairy cow tested positive in the indirect ELISA and a new sample from the same individual was submitted. The new sample was also positive in ELISA test and was therefore subjected to a complement fixation test (CF) which was negative. The sample was concluded to be negative for antibodies against *Brucella abortus*.

Post-mortem investigations of fetuses in 2013 did not reveal pathological changes indicative of brucellosis, and all bacteriological and serological investigations were negative for *Brucella abortus*.

In conclusion, there was no detection of *Brucella abortus* in cattle in Norway in 2013. With the exception of a single relapse in 1953, bovine brucellosis has not been detected in Norway since 1950 (1, 2).

References

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The Norwegian Veterinary Institute (NVI) is a nationwide research institute in the fields of animal health, fish health, and food safety. The primary mission of the NVI is to give research-based independent advisory support to ministries and governing authorities. Preparedness, diagnostics, surveillance, reference functions, risk assessments, and advisory and educational functions are the most important areas of operation.

The Norwegian Veterinary Institute has its main laboratory in Oslo, with regional laboratories in Sandnes, Bergen, Trondheim, Harstad og Tromsø, with about 360 employees in total.

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The Norwegian Food Safety Authority (NFSA) is a governmental body whose aim is to ensure through regulations and controls that food and drinking water are as safe and healthy as possible for consumers and to promote plant, fish and animal health and ethical farming of fish and animals. We encourage environmentally friendly production and we also regulate and control cosmetics, veterinary medicines and animal health personnel. The NFSA drafts and provides information on legislation, performs risk-based inspections, monitors food safety, plant, fish and animal health, draws up contingency plans and provides updates on developments in our field of competence.

The NFSA comprises three administrative levels, and has some 1300 employees.

The NFSA advises and reports to the Ministry of Agriculture and Food, the Ministry of Fisheries and Coastal Affairs and the Ministry of Health and Care Services.

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