

## The surveillance and control programme for *Brucella melitensis* in small ruminants in Norway

*Annette H. Kampen*

*Jorunn Mork*

*Madelaine Norström*

*Siv Klevar*



*Editor Ann-Charlotte Karlsson*

*Technical editor Hanne Mari Jordsmyr*

*Scientific editors Hege Hellberg and Ståle Sviland*

*National Veterinary Institute*



## Annual Reports 2009

### Surveillance and control programmes for terrestrial and aquatic animals in Norway

**Title**

The surveillance and control programme for *Brucella melitensis* in small ruminants in Norway

**Publisher**

National Veterinary Institute  
PO Box 750 Sentrum  
N-0106 Oslo  
Norway

Fax: + 47 23 21 60 01  
Tel: + 47 23 21 60 00  
E-mail: [vipost@vetinst.no](mailto:vipost@vetinst.no)  
Homepage: [www.vetinst.no](http://www.vetinst.no)

Design: Hanne Mari Jordsmyr,  
National Veterinary Institute

Front page photo: Anne-Mette Kirkemo

ISSN 1503-1454

**Example of citation:**

Kampen A, Mork J, Norström M, Klevar S. The surveillance and control programme for *Brucella melitensis* in small ruminants in Norway. Annual report 2009. In: Karlsson AC, Jordsmyr HM, Hellberg H, Sviland S (editors). Surveillance and control programmes for terrestrial and aquatic animals in Norway. Oslo: National Veterinary Institute; 2010.

© National Veterinary Institute

Any use of the present data should include specific reference to this report.

*Brucella melitensis* was not detected in any sheep flock or goat herd sampled in 2009.

## Introduction

Brucellosis in sheep and goats is mainly caused by *Brucella melitensis*, although infection with *Brucella abortus* and *Brucella ovis* can also occur. The infection usually results in abortion in pregnant females and can cause orchitis and epididymitis in affected males (1, 2). *Brucella melitensis* infection is a zoonosis, and the bacterium causes a serious infection in humans known as Malta fever, characterised by undulant fever, chills, sweat and debilitation (2).

*Brucella melitensis* is prevalent in sheep and goats in several Mediterranean countries (1), but has never been diagnosed in animals in Norway or any of the other Nordic countries (3, 4). Brucellosis is classified as a list A disease in Norway and is notifiable to the Office International des Epizooties.

After the agreement on the European Economic Area in 1994, Norway achieved status as free from *Brucella melitensis* in small ruminants on a historical basis. However, documentation is required to maintain the status. Hence, a surveillance and control programme for *Brucella melitensis* in sheep was established in 2004, and goats were included in the programme from 2007.

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

## Aims

The aims of the programme are to document freedom from *Brucella melitensis* in sheep and goats according to the demands in EU Directive 91/68/EEC with amendments and to contribute to the maintenance of this favourable situation.

## Materials and methods

During the years 2003-2008, ram circles and their member flocks registered by The Norwegian Sheep and Goat Breeders Association constituted the target population for the programme. In 2009, the programme focused on breeding flocks of other breeds not previously tested. Approximately 15 flocks from each of eight different breeds and 30 semi-domesticated feral sheep were randomly selected for testing, resulting in 144 flocks. In addition, sheep from 900 randomly selected flocks were included. All flocks included in the selection during the last three years were excluded from the selection frame. In total, 1044 flocks were selected.

In goats, 115 of a total of 1,300 goat flocks were selected for sampling.

In flocks of less than 30 animals, all animals were sampled. In flocks of 30 to 100, 100 to 200, and more than 200 animals, samples from 30, 35, and 40 animals were analysed, respectively. The number of flocks in the surveillance and control programme for *Brucella melitensis* in small ruminants in 2009 is given in Table 1.



Photo: Anne-Mette Kirkemo



Table 1. Results and total number of flocks within the frame of the Norwegian surveillance and control programme for *Brucella melitensis* in small ruminants in 2004-2009.

Year	Total no. of flocks*		Total no. of animals		No. of flocks tested		No. of animals tested		No. of positive samples	
	Sheep	Goats	Sheep > 1 year	Goats	Sheep	Goats	Sheep	Goats	Sheep	Goats
2004	17,439		918,500		1,655		50,501		0	
2005	16,500		927,400		935		28,406		1**	
2006	15,800		894,100		911		27,812		0	
2007	15,400	1,300	854,000	71,000	1,004	183	29,633	5,734	0	0
2008	15,059	1,308	891,427	69,637	783	80	23,235	2,399	0	0
2009	14,800	1,300	877,400	67,800	816	104	26,681	3,124	0	0

\*Based on data from the register of production subsidies as of July 31 the respective year.

\*\*Probably unspecific reaction.

Blood samples were examined for antibodies against *Brucella melitensis* using the rose bengal plate agglutination test (RBT) for the initial screening. A competitive ELISA (C-ELISA, Svanova Biotech AB, Uppsala, Sweden) would be used to follow up unclear or positive reactions due to cross reactions.

The surveillance programme for *Brucella melitensis* in sheep was evaluated in 2006. When taking into account results accumulated from 2004 to 2006, it was estimated that there is a 99 % probability that the prevalence of sheep flocks being positive for *Brucella melitensis* is lower than 0.2 % (5). The results of the programme during the years 2007 to 2009 have further strengthened this conclusion.

## Results

A total of 26,681 samples from 816 sheep flocks and 3,124 samples from 104 goat flocks were analysed in 2009. This is approximately 5.5 % of the total Norwegian sheep flocks and 8.0 % of Norwegian goat flocks.

All samples tested for antibodies against *Brucella melitensis* in 2009 were negative. The results from the surveillance and control programme for *Brucella melitensis* in small ruminants in 2004 to 2009 are shown in Table 1.

## Discussion

Approximately 90 % of the Norwegian sheep flocks in ram circles were screened for antibodies against *Brucella melitensis* during 2004 and 2005. Most flocks participating in the ram circles were retested in the programme during 2006 to 2008 (4). Breeding flocks of other sheep breeds than those regulated by The Norwegian Sheep and Goat Breeders Association were selected for sampling in 2009. Hence flocks selling live animals outside the established breeding system were tested to a larger extent than earlier years.

## References

1. Martin WB, Aitken ID. Diseases of Sheep. 3rd ed. Oxford: Blackwell Scientific Publications; 2000.
2. Timoney JF, Gillespie JH, Scott FW, Barlough JE. Hagan and Bruner's Microbiology and Infectious Diseases of Domestic Animals. 8th ed. Ithaca: Comstock Publishing Associates; 1988.
3. Ødegaard Ø. Brucellosis - Nordic perspective. In: Proceedings from the Course in Serious Contagious Diseases in Animals. Oslo, Norway; 2000.
4. Grøneng GM, Tharaldsen J, Mork J, Er C. The surveillance and control programme for *Brucella melitensis* in small ruminants in Norway. Annual report 2008. In: Brun E, Hellberg H, Mørk T (editors). Surveillance and control programmes for terrestrial and aquatic animals in Norway. Oslo: National Veterinary Institute; 2009.
5. Hopp P, Grøneng G, Nyberg O, Tharaldsen J, Bratberg B, Djønne B, Viljugrein, H. Evaluering av overvåkingsprogrammet for *Brucella melitensis* hos sau [Evaluation of the surveillance programme for *Brucella melitensis* in sheep, No]. Oslo: National Veterinary Institute; 2007.

The National Veterinary Institute (NVI) is a nation-wide 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 National Veterinary Institute has its main laboratory in Oslo, with regional laboratories in Sandnes, Bergen, Trondheim, Harstad og Tromsø, with about 360 employees in total.

[www.vetinst.no](http://www.vetinst.no)



**Veterinærinstituttet**  
*National Veterinary Institute*

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.

[www.mattilsynet.no](http://www.mattilsynet.no)

