

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

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Introduction

Brucella melitensis was not detected in any sheep or goat flock sampled in 2008.

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.

Material and methods

Flocks belonging to ram circles registered by the Norwegian Sheep and Goat Breeders Association and their associated flocks constituted the main test population in sheep. Approximately 1,744 flocks were part of this breeding system in 2008, of a total of 15,059 sheep flocks. A total of 563 flocks in the breeding system were selected for sampling. In addition, sheep from 300 randomly selected flocks not belonging to any ram circle were included in the programme.

In goats, 80 of a total of 1,308 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 2008 is given in Table 1.

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) was used to follow up unclear or positive reactions due to cross reactions.

Results

A total of 23,235 samples from 783 sheep flocks and 2,399 samples from 80 goat flocks were analysed in 2008. This is approximately 5.2 % of the total Norwegian sheep flocks and 6.1 % of Norwegian goat flocks. Five hundred and one sheep flocks were members of ram circles, corresponding to approximately 29 % of the total number of flocks in ram circles in Norway.

All samples tested for antibodies against *Brucella melitensis* in 2008 were negative. The results from the surveillance and control programme for *Brucella melitensis* in small ruminants in 2004 to 2008 are shown in Table 1.

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 2004-2008

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	71,500	1004	183	29,633	5,734	0	0
2008	15,059	1,308	891,427	69,637	783	80	23,235	2399	0	0

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

**Probably unspecific reaction

Discussion

Approximately 90 % of the Norwegian sheep flocks in ram circles were screened for antibodies against *Brucella melitensis* during 2004 and 2005. In 2006, a new round of testing started, aiming at testing all flocks in ram circles within a three-year period (4).

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).

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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.

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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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