

The surveillance and control programme for *Brucella melitensis* in small ruminants in Norway 2012

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Brucella melitensis was not detected in any sheep flock or goat herd sampled in 2012.

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.

Material and methods

In 2012, 500 sheep flocks and 115 goat herds were randomly selected for sampling. In addition, 5 flocks which had imported sheep or goats during the period 2007 to 2009 were included in the programme.

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. Rams and a selection of ewes, all more than one year old, were sampled in each flock. The number of flocks in the surveillance and control programme for *Brucella melitensis* in small ruminants in 2012 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) would be used to follow up unclear or positive reactions due to cross reactions.

Results

A total of 14,088 samples from sheep and 2,562 samples from goats were received in the programme in 2012. Ninety-nine sheep samples were rejected or not tested, leaving 13,989 samples from 479 sheep flocks and 2,562 samples from 86 goat flocks for analysis. This is approximately 3.3 % of the total Norwegian sheep flocks and 6.6 % of Norwegian goat herds.

All samples tested for antibodies against *Brucella melitensis* in 2012 were negative. The results from the surveillance and control programme for *Brucella melitensis* in small ruminants in 2004 to 2012 are shown in Table 1.

Table 1. Results and total number of flocks within the frame of the Norwegian surveillance and control program for *Brucella melitensis* in small ruminants in 2004-2012

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	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
2010	14,800	1,300	887,600	67,600	269	25	8,160	779	0	0
2011	14,500	1,300	882,000	66,900	467	93	13,629	2,698	0	0
2012	14,300	1,300	868,500	65,400	479	86	13,989	2,562	0	0

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

**Probably unspecific reaction

Discussion

During the years 2004-2008, ram circles and their member flocks registered by The Norwegian Sheep and Goat Breeders Association constituted the target population for the programme. 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, and breeding flocks of other sheep breeds than those regulated by The Norwegian Sheep and Goat Breeders Association were selected for sampling in 2009. In 2010, 2011 (4) and 2012 a random selection of the Norwegian sheep and goat population was made. In addition, flocks which had imported sheep or goats during the period 2007 to 2009 were considered to have higher probability of having the infection if introduced to the country and hence were included in the programme.

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 2012 have further strengthened this conclusion.

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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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