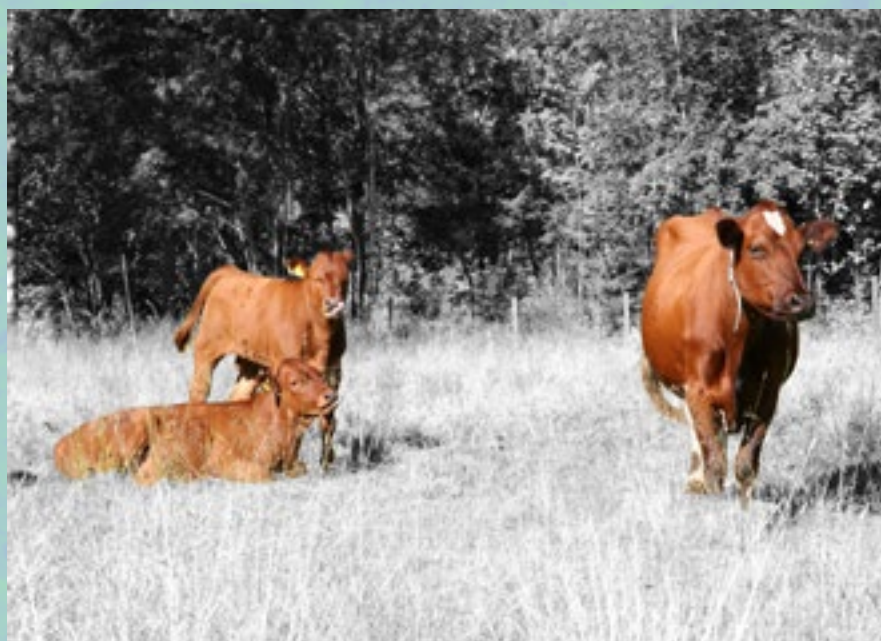


The surveillance and control programmes for paratuberculosis in Norway

Annette H. Kampen

Berit Djønne

Petter Hopp



Surveillance and control programmes for terrestrial and aquatic animals in Norway

Annual report 2011

Project managers at the Norwegian Veterinary Institute:

Ståle Sviland and Hege Hellberg

Publisher

Norwegian Veterinary Institute

PO Box 750 Sentrum

N-0106 Oslo

Norway

Fax: + 47 23 21 60 01

Tel: + 47 23 21 60 00

E-mail: postmottak@vetinst.no

www.vetinst.no

ISSN 1890-9973

Title:

The surveillance and control programme for paratuberculosis in Norway 2011

Authors:

Annette H. Kampen, Berit Djønne, Petter Hopp

Date: 18 February 2013

Front page photo: Colourbox

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

Example of citation:

Kampen AH, Djønne B, Hopp P. The surveillance and control programme for paratuberculosis in Norway 2011. *Surveillance and control programmes for terrestrial and aquatic animals in Norway. Annual report 2011*. Oslo: Norwegian Veterinary Institute 2013.

© Norwegian Veterinary Institute 2013

The surveillance and control programme for paratuberculosis in Norway 2011

Annette H. Kampen, Berit Djønne, Petter Hopp

*In 2011 *Mycobacterium avium* subsp. *paratuberculosis* was recorded in one goat herd in which paratuberculosis previously had been detected in 2008.*

Introduction

Paratuberculosis was first diagnosed in cattle and goats in Norway in 1907 and 1934, respectively (1, 2). *Mycobacterium avium* subsp. *paratuberculosis* infection in ruminants is a notifiable disease (List B) in Norway. The control of this disease is enforced by government legislation and restrictions on animal movement. In goat herds, government restrictions combined with vaccination have been used to control paratuberculosis, however, the last years a large proportion of the Norwegian goat herds have followed a disease eradication programme to get rid of the infection (3).

A national surveillance and control programme for paratuberculosis in cattle was established in 1996 (4, 5). The programme was extended to llamas, goats and sheep in 2000, 2001 and 2002, respectively (6).

Descriptions of occurrence of the disease in Norway, control measures taken up to 1995, and results from the surveillance and control programmes from 1996 to 2001, can be found in the annual report for 2001 (5). The number of new infected herds detected since the programme started is given in Figure 1.

Aim

The aim of the surveillance programme for paratuberculosis is to detect and control the infection in the Norwegian ruminant population.

Materials and methods

Cattle, goats, sheep, llamas and alpaca were examined in the programme in 2011. Faecal samples were collected on the farms by the Norwegian Food Safety Authority, while organ samples were collected at slaughterhouses.

Active surveillance

Cattle

The target population consisted of all cattle herds delivering milk to dairies in the sampling period and all beef cattle herds receiving state support according to records of July 2010. Fifty herds were randomly selected for sampling from areas where paratuberculosis is registered in goat herds. Faecal samples were collected from the five oldest cows in each herd.

Goats

Ninety herds were randomly selected for sampling from areas where paratuberculosis is registered in goat herds and thirty herds were randomly selected from areas where paratuberculosis have not been registered in goat herds. Faecal samples were collected from the ten oldest goats.

Sheep

Thirty flocks from areas where paratuberculosis is registered in goat herds were randomly selected for sampling. Faecal samples from the ten oldest sheep were collected.

Llamas and alpacas

Llama and alpaca were introduced as new species to Norway in 1997-98. A few animals have been imported over the last years. Faecal samples from five animals over four years of age are collected in each herd each year. In addition, organ samples are collected at slaughter and from animals that die when older than four years.

Passive clinical surveillance

Clinical surveillance has been included in the programme since 2000. For cattle, special emphasis is placed on the collection of samples from animals with reduced milk production, loss of weight, diarrhoea lasting more than 14 days, and animals that are over three years of age.

Samples

Number and type of samples collected in the programme is given in Table 1.

Histopathological examination

Samples from jejunum, ileum, ileocecal valve, and mesenteric lymph nodes were examined histopathologically. The tissue was fixed in 10% neutral-buffered formalin, processed by routine methods and stained with haematoxylin and eosin (HE) and the Ziehl-Neelsen (ZN) method for acid-fast bacteria.

Samples showing granulomatous lesions with acid-fast bacteria were considered to be positive for paratuberculosis.

Table 1. Number of samples collected for examination for *Mycobacterium avium* subsp. *paratuberculosis* in 2011

		Faecal samples No. of animals	Intestinal samples No. of animals	Total no. of animals	Total no. of herds / flocks
Cattle	Random sample	210	-	210	42
	Suspected cases	1	-	1	1
Goat	Random sample	1036	-	1036	107
	Suspected cases	-	-	-	-
Sheep	Random sample	361	-	361	38
	Suspected cases	-	-	-	-
Llama and alpaca		275	5	280	64

Bacteriological examination

The samples were decontaminated with 4% sodium hydroxide and 5% oxalic acid with 0.1% malachite green (7), and inoculated onto selective and non-selective Dubos medium with mycobactin (2 µg/ml) and pyruvate (4 mg/ml) (8). Incubation time was 16 weeks.

Mycobactin dependency, acid-fastness by Ziehl-Neelsen staining, and presence of the insertion segment IS900 by a PCR technique (9) were used to identify the isolates.

Results

All results from bacteriological and histopathological examinations are given in Table 2. In 2011, *M. avium* subsp. *paratuberculosis* was isolated from 1 sample in 1 randomly selected goat herd in which *M. avium* subsp. *paratuberculosis* had been detected in 2008.

Since the surveillance programme for paratuberculosis started in 1996, infection with *M. avium* subsp. *paratuberculosis* has been found in altogether 10 cattle herds, 6 sheep flocks and in 34 different goat herds of which the bacteria were detected for the first time in 27 of these (Figure 1).

Table 2. Results of histopathological and bacteriological examination of cattle, goats, sheep and llamas in the surveillance programme for paratuberculosis in 2011

Species	Type of samples	Bacteriology			Histopathology			Total	
		Examined		Positive	Examined		Positive	Positive	
		Animals	Herds	Animals	Animals	Herds	Animals	Animals	Herds
Cattle	Faecal	211	43	0				0	0
	Intestinal	-	-	-	-	-	-	-	-
Goat	Faecal	1036	107	1				1	1
	Intestinal	-	-	-	-	-	-	-	-
Sheep	Faecal	361	38	0				0	0
	Intestinal	-	-	-	-	-	-	-	-
Llama and	Faecal	275	63	0				0	0
	Intestinal	-	-	-	5	1	0	0	0
Total	Faecal	1883	251	1				1	1
	Intestinal	-	-	-	5	1	0	0	0

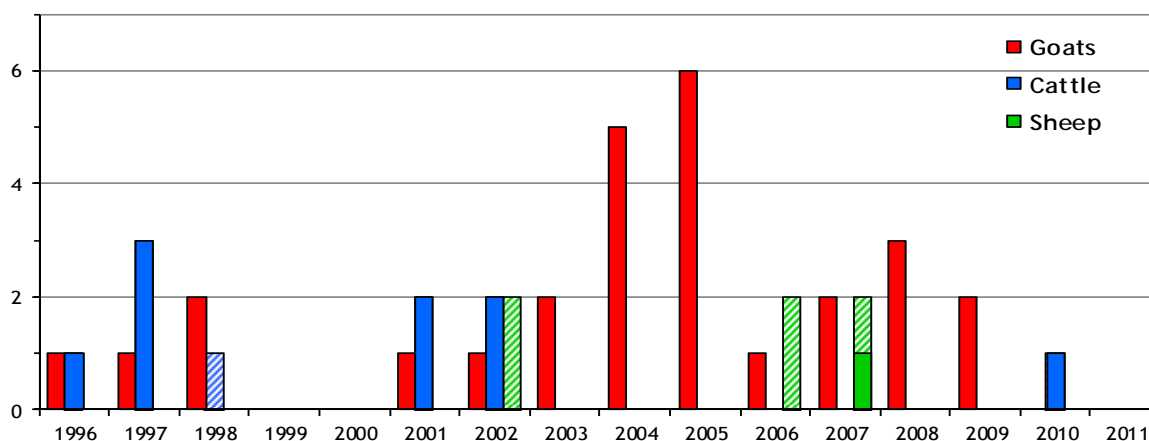


Figure 1. The number of new detected goat, sheep and cattle herds since 1996 that have been reported positive for *Mycobacterium avium* subsp. *paratuberculosis* irrespective whether the sample was collected as part of the surveillance programme or not. Cattle herds and sheep flocks where another species at the same holding previously has been reported positive are presented with striped bars.

Discussion

Paratuberculosis is considered to occur among goats in 6 out of the 19 counties in Norway. The dairy organisation (TINE) and the Norwegian Goat Health Services have started an eradication programme for three widespread infectious diseases in goats. The programme started in 2001 and concentrated on caprine arthritis encephalitis and caseous lymphadenitis the first years. From 2004, herds in areas where paratuberculosis had been detected were included. From 2001 to 2011 a total of 379 goat herds had been included in the eradication programme (3).

All the cases among cattle and sheep can be attributed to one of two reasons; either brought into the country with imported cattle (seven cattle herds, one sheep flock) or contact with infected goats (three cattle herds, five sheep flocks). Importation of live cattle almost ceased by 1996 and has since been replaced by importation of semen and embryos.

Although the eradication programme for paratuberculosis in goats is expected to reduce the indigenous source of *M. avium* subsp. *paratuberculosis*, goat herds still represent a risk for spread of the infection to other ruminants. Furthermore, the import of sheep, goats, llamas and alpacas might present a risk for introduction of infected animals into the ruminant population.

References

1. Horne H. Kronisk pseudotuberkuløs tarmbetændelse hos kvæg konstatert i Norge [Chronic pseudo-tuberculous intestinal inflammation demonstrated in Norway, No]. *Nor Vet Tidsskr.* 1908; 20: 70-7.
2. Holmboe FV, Slagsvold L. Paratuberkulose hos sau og geit [Paratuberculosis in sheep and goats, No]. *Skand Vet Tidsskr.* 1934; 24: 573-85.
3. Lindheim, D. Friskere geiter. Årsrapport 2011 [Healthier goats. Annual report 2011, No]. Ås: Helsetjenesten for Geit; 2012.
4. Djønne B, Fredriksen B, Nyberg O, Sigurðardóttir ÓG, Tharaldsen J. National bovine paratuberculosis program in Norway. *Bull Int Dairy Fed.* 2001; 364: 75-80.
5. Djønne B, Nyberg O, Fredriksen B, Sigurðardóttir ÓG, Tharaldsen J. The surveillance and control programme for paratuberculosis in Norway. In: Fredriksen B, Mørk T (editors). Surveillance and control programmes for terrestrial and aquatic animals in Norway. Annual report 2001. Oslo: National Veterinary Institute; 2002. p. 45-54.
6. Kampen AH, Djønne B, Hopp P. The surveillance and control programme for paratuberculosis in Norway. In: Sviland S, Hellberg H (editors). Surveillance and control programmes for terrestrial and aquatic animals in Norway. Annual report 2010. Oslo: National Veterinary Institute; 2011. ISSN 1503_1454
7. Berg Jørgensen J. An improved medium for culture of *Mycobacterium paratuberculosis* from bovine faeces. *Acta Vet Scand.* 1982; 23: 325-35.
8. Saxegaard F. Isolation of *Mycobacterium paratuberculosis* from intestinal mucosa and mesenteric lymph nodes of goats by use of selective Dubos medium. *J Clin Microbiol.* 1985; 22: 312-3.
9. Sigurðardóttir OG, Press CM, Saxegaard F, Evensen O. Bacterial isolation, immunological response and histopathological lesions during the early subclinical phase of experimental infection of goat kids with *Mycobacterium avium* subsp. *paratuberculosis*. *Vet Pathol.* 1999; 36: 542-50.

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.

www.vetinst.no



Veterinærinstituttet
Norwegian 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

