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The surveillance programme for footrot in Norway 2020

The surveillance programme for footrot in Norway 2020

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Summary

In 2020, approximately 96,200 sheep were inspected for footrot. A total of 134 animals originating from 78 different flocks were examined by PCR. Virulent strains of the bacterium *Dichelobacter nodosus* were not detected in any sheep flock.

Introduction

Ovine footrot is an infectious disease of sheep caused by the *bacterium Dichelobacter nodosus*. The severity of disease varies and is dependent on the breed of sheep, environmental factors and bacterial strain. *Dichelobacter nodosus* strains are divided into so-called benign and virulent strains. In Norway, disease caused by virulent strains (severe footrot) is a notifiable disease (List B). The control of this disease is enforced by government legislation and restrictions on animal movement.

Since 1948, footrot had not been detected in Norway until the bacterium was detected in a single herd with lameness in 2008. Clinical footrot was detected in other flocks later the same year. All sheep flocks in the counties of Rogaland and Agder, more than 250,000 animals, were then included in the project "Turn the sheep" launched by the sheep industry. *Dichelobacter nodosus* was detected by PCR in more than 500 flocks, but at that time no laboratory methods were available in Norway to differentiate between benign and virulent strains.

In 2009, the project "Healthy feet" was launched as a collaborative project between the industry, the Norwegian Food Safety Authority and the Norwegian Veterinary Institute. The goal was to eradicate severe ovine footrot in Norway. The project terminated end 2014. In this project, more than 400,000 examinations of sheep originating from approximately 4,500 flocks were performed in the field, and approximately 190,000 animals were inspected at slaughterhouses (1).

A national surveillance programme for footrot in sheep was established in 2014 (based on methods already used in the "Healthy feet" project). In addition to the surveillance programme (2), footrot is also sometimes detected via clinical investigations. Any positive finding is followed up, and contacts are traced.

Aim

The aim of the surveillance programme for ovine footrot is to detect sheep with virulent strains of *D. nodosus*, to identify infected flocks for disease eradication.

Materials and methods

The feet of approximately 96,200 sheep were inspected by specially trained staff at six slaughterhouses in Southern Norway. There were 147 inspection days at five slaughterhouses in areas where footrot had occurred, i.e. the counties of Rogaland and Agder. In addition, three inspection days were spent at one abattoir situated in the county of Viken.

Samples were collected from sheep feet showing clinical signs in agreement with footrot score 2-5 (3). Normally three samples were collected from the same flock to secure the diagnosis, normally by sampling two feet of the first animal with clinical signs and one foot from another animal from the same flock. In addition, two samples should be collected each inspection day at the slaughterhouses situated outside the county of Rogaland if no sheep with clinical signs were found that day.

Samples were analysed using a multiplex real-time PCR for detection of 16S rRNA of *D. nodosus* and differentiation between benign and virulent strains of *D. nodosus*.

Results

A total of 150 different samples from 134 animals originating from 78 different flocks were examined by PCR. Virulent strains of *D. nodosus* were not detected in any sheep flock.

Table 1: Number of inspection days at abattoirs and number of samples examined with PCR and the corresponding result for the Norwegian surveillance programme for virulent footrot in sheep.

Year	Inspection days at abattoirs	Estimated number of inspected carcasses	Examined by PCR		Positive	
			Animals	Samples	Animals	Flocks
2014	150	121,000	150	172	0	0
2015	150	92,500	221	310	6	3
2016	150	120,000	186	253	0	0
2017	150	122,200	95	125	1	1
2018	151	124,000	152	168	3	1
2019	146	118,000	176	178	2	1
2020	147	96,200	134	150	0	0

Discussion

There were no detections of virulent footrot in sheep in the surveillance programme in 2020. In addition, no cases were detected at clinical suspicion or during follow-up of contact herds from the case in 2019. Thus, 2020 is the first year since the detection in 2008 with no known cases of footrot in Norway. In Agder there has been no detected cases since 2014. The result from 2020 combined with the results from previous years indicate that the occurrence of severe footrot in Norway is low, and that the probability of the disease being spread outside Rogaland and Agder is very low (4).

It is challenging to detect infectious agents with the ability to both cause subclinical infections as well as severe disease outbreaks, and difficult to discover the infection prior to disease outbreaks and further spread if severe clinical signs are absent. Under such conditions samples from animals with score 1 is included in the surveillance.

The findings in the programme the previous years underline the importance of continued awareness of footrot as well as continued active surveillance in order to reach the goal of eradicating virulent footrot from Norway.

Reference

1. Anonymous. Sluttrapport Friske føtter http://www.fotrate.no/media/Sluttrapport_Friskefotter_mai_2015_lavvoppl.pdf (accessed 07.04.2021).
2. Kampen AK, Moldal T, Vatn S, Tarpai A. The surveillance programme for footrot in Norway 2019. Surveillance programmes for terrestrial and aquatic animals in Norway. Annual Report 2019. Oslo: Norwegian Veterinary Institute 2020.
3. Winter A. Fotråte [Footrot] In: Halthet hos sau [Lameness in sheep]. Norwegian edition. Oslo: Tun forlag; 2010. p. 52-64.
4. Grøneng GM, Vatn S, Kristoffersen AB, Nafstad O, Hopp P: The potential spread of severe footrot in Norway if no elimination programme had been initiated: a simulation model. Vet Res 2015, 46:10.
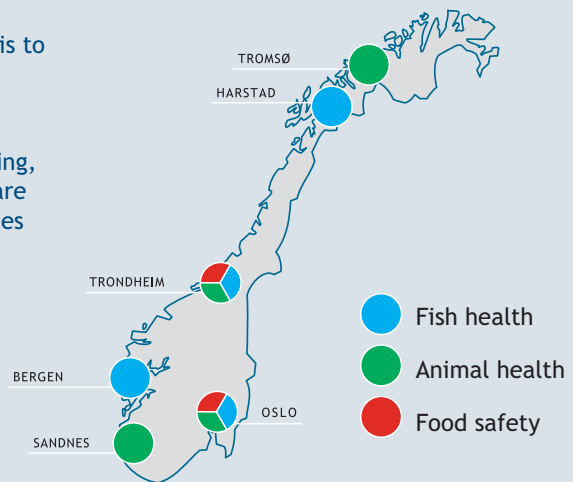
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