



## The surveillance programme for *enzootic bovine leukosis* (EBL) in Norway 2020



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## Summary

All milk and blood samples tested in 2020 were negative for antibodies against bovine leukemia virus (BLV).

## Introduction

*Enzootic bovine leukosis* (EBL) is caused by bovine leukemia virus (BLV), in the genus retrovirus. Most infections are subclinical. Approximately one third of infected cattle older than three years of age develop persistent lymphocytosis. A smaller proportion of animals develop lymphosarcomas in various internal organs. EBL is classified as a list B disease in Norway and is notifiable to the Office International des Epizooties. The disease had never been reported in Norway until antibodies against BLV were detected in eight dairy herds in samples collected through the surveillance programme in 1995 (1). No new herds have tested positive since 1997 (2), except a single positive bulk milk sample in one herd in 2002, and one blood sample from one of the cows in that herd. After extensive follow up, it was concluded that the positive antibody results were due to false positive reactions (3). Free status from EBL was granted to Norway by the EFTA Surveillance Authority in 2007.

The Norwegian Food Safety Authority is responsible for implementing the surveillance programme for EBL. The Norwegian Veterinary Institute is in charge of planning the programme, collecting the bulk milk samples from the dairies, and performing the tests. Official inspectors from the Norwegian Food Safety Authority collected the blood samples from beef cattle at slaughterhouses.

## Aim

The aim of the surveillance programme for EBL is to document freedom from the infection in Norway according to Council Directive 64/432/EEC as amended and to contribute to the maintenance of this favourable situation.

## Materials and methods

The surveillance programme included both dairy and beef herds. The target population of dairy herds consisted of all cattle herds delivering milk to dairies during the sampling period. The target population of beef herds was all herds delivering cattle to slaughter in 2020.

Eighteen per cent of the dairy herds were randomly selected for sampling. Bulk milk samples were provided by the dairies. From the beef herds, individual blood samples from animals older than 24 months were collected at 21 slaughterhouses, with a maximum of five animals per herd and day of sampling.

Bulk milk samples from 1,169 dairy herds were collected and tested. A total of 3,709 individual blood samples from 1,258 beef herds were received for analyses in pools (n =1,621). The sampled herds represented approximately 18.4% of the Norwegian cattle herds (Table 1).

**Table 1:** Numbers of dairy herds and beef herds and herds sampled within the frame of the Norwegian surveillance programme for EBL in 2020

Herd category	Cattle herds (total no. <sup>1</sup> )	Sampled herds (no. <sup>2</sup> )	Sampled herds (%)
Dairy herds <sup>3</sup>	7 211	1 169	16.2
Beef herds <sup>4</sup>	5 730	1 258	22.0
Total	13 073	2 404	18.4

<sup>1</sup>Based on data from the Register of production subsidies as of 1 March 2020.

<sup>2</sup>Combined beef cattle and dairy farms could be sampled under both herd categories. Number of unique farms is given as total number of sampled herds.

<sup>3</sup>Cattle herds delivering milk to dairies.

<sup>4</sup>Sampling performed at slaughterhouses

Blood samples (pooled or individual samples) were analysed using a competitive ELISA kit for Enzootic Bovine Leukosis Virus ID Screen® BLV Competition (ID.Vet, Grabels, France). In case of positive or inconclusive results in pooled blood samples, individual samples are re-tested. Individual samples with inconclusive or positive results are re-tested in duplicates using the same method.

Bulk milk samples were analysed using an indirect ELISA, IDEXX Leukosis Milk Screening Ab test (IDEXX Laboratories, Maine, USA). Inconclusive and positive reactors are retested in duplicates using the same method. In case of doubtful reactors, new blood samples/bulk milk samples from the suspected animals or herd, are requested and tested.

## Results

All blood samples tested in 2020 were negative for antibodies against BLV. Five bulk milk samples were either inconclusive or positive, while the remaining bulk milk samples were negative. New bulk milk samples collected from the suspected herds were negative for antibodies against EBL. Thus, all herds were concluded negative. Table 2 shows the results of the testing during the period from 1995 to 2020.

*Table 2: Numbers of samples and positive results of antibody testing in the surveillance programme for EBL in the Norwegian cattle population during the period 1995-2020.*

Year	Dairy herds	Beef herds		No. of positive samples
	No. of herds sampled	No. of herds sampled <sup>1</sup>	No. of individuals tested <sup>2</sup>	
1995	25 131	1 532	9 354	8 (bulk milk)
1996	2 278	303	1 523	1 (bulk milk)
1997	26 903	2 214	16 741	0
1998	23 581	2 191	17 095	0
1999	19 933	2 382	18 274	0
2000	1 590	340	2 892	0
2001	2 564	434	3 453	0
2002	2 308	462	3 693	1 (bulk milk)
2003	1 845	449	3 901	0
2004	1 573	402	3 364	0
2005	1 919	484	4 766	0
2006	1 673	479	4 624	0
2007	1 575	412	4 241	0
2008	1 422	444	4 616	0
2009	1 315	435	5 038	0
2010	1 265	507	4 020	0
2011	1 226	1 278	4 758	0
2012	1 189	1 178	4 306	0
2013	1 042	1 167	4 079	0
2014	1 489	935	4 132	0
2015	1 176	1 206	3 704	0
2016	1 180	1 337	4 241	0
2017	1 107	1 448	4 285	0
2018	1 131	1 341	4 153	0
2019	1 071	1 328	4 124	0
2020	1 169	1 258	3 709	0

## Discussion

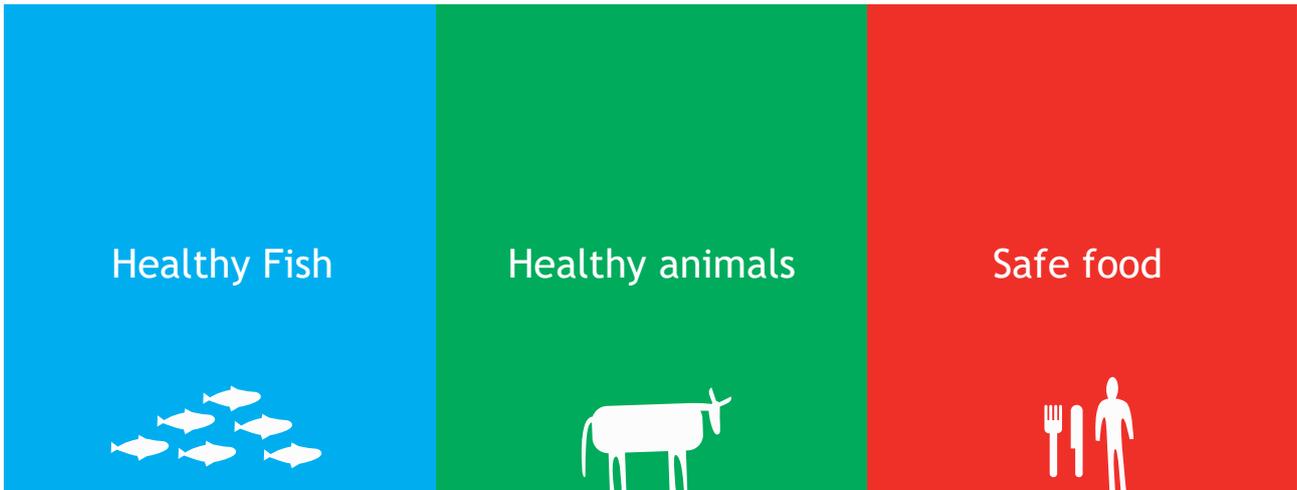
The requirement from the EU for granting an EBL-free status is that the herd prevalence must be lower than 0.2%, which represents a maximum of 26 herds out of the total number of 13 352 herds.

No new cases have been reported after 1997, and the continuous surveillance since 1995 shows that the Norwegian cattle population is free from EBL according to the requirements (2, 3). Initially, all cattle herds were tested annually. Since 2000, a minimum of 10% of dairy and beef cattle herds have been tested each year. Using scenario tree modelling, the probability of freedom from EBL in Norway at the end of 2014 was calculated to 99.0% (5). The results of the surveillance programme from 2020 support that the Norwegian cattle population is free of EBL.

Together with the possible isolation period of six months and the testing protocol for imported animals, the surveillance programme for EBL should be an effective means to detect introduction of new infection.

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