

REPORT 31/2024

The surveillance programme for *enzootic bovine leukosis* (EBL) in Norway 2023

Authors

Marie Myklatun Krosness, Johan Åkerstedt, Jørgen Dalaker and Siv Klevar

Suggested citation

Krosness Marie M, Åkerstedt, Johan, Dalaker, Jørgen, Klevar, Siv. The surveillance programme for *enzootic bovine leukosis* (EBL) in Norway 2023. Surveillance programme report. Veterinærinstituttet 2024. © Norwegian Veterinary Institute, copy permitted with citation

Quality controlled by

Merete Hofshagen, Director of Animal Health, Animal Welfare and Food Safety, Norwegian Veterinary Institute

Published

2024 on www.vetinst.no

ISSN 1890-3290 (electronic edition)

© Norwegian Veterinary Institute 2024

Commissioned by / In collaboration with

Norwegian Food Safety Authority



Colophon

Cover design: Reine Linjer

Cover photo: Colourbox

www.vetinst.no

Content

Summary.....	3
Introduction.....	3
Aim	3
Materials and methods.....	4
Results	5
Discussion	6
Acknowledgments	6
References	7

Summary

All milk and blood samples tested in 2023 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 2 disease in Norway and is listed by the World Organisation for Animal Health (WOAH). EBL is a category C, D and E disease in the EU.

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 serological results were due to false positive reactions (3). Free status from EBL was granted Norway by the EFTA Surveillance Authority in 2007 as described in ESA Decision 032/21/COL.

The Norwegian Food Safety Authority (NFSA) 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 NFSA 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 demands in Regulation (EU) 2020/689 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 were all herds delivering cattle to slaughter in 2023.

Of the Norwegian dairy herds, 21.6% herds were randomly selected for sampling. From the beef herds, individual blood samples from animals older than 24 months were collected at 19 slaughterhouses, with a maximum of five animals per herd and day of sampling.

The dairies provided 1,445 bulk milk samples from 1,337 dairy herds. One bulk milk sample was not approved, leaving 1,444 samples from 1,336 dairy herds for analysis. A total of 4,219 individual blood samples from 1,393 beef herds were received for analyses in pools (n=1,757). The sampled herds represented approximately 21.9% of all 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 2023.

Herd category	Cattle herds (total no. ¹)	Sampled herds (no. ²)	Sampled herds (%)
Dairy herds ³	6,485	1 337	20.6
Beef herds ⁴	5,968	1 393	23.3
Total	12 453	2 730	21.9

¹Based on data from the Register of production subsidies as of 1 March 2023.

²Combined beef- and dairy farms could be sampled under both herd categories. Number of unique farms is given as a total number of sampled herds.

³Cattle herds delivering milk to dairies.

⁴Sampling performed at slaughterhouses.

Bulk milk samples were analysed using an indirect ELISA, IDEXX Leukosis Milk Screening Ab test (IDEXX Laboratories, Maine, USA). Samples with inconclusive and positive reactions were retested in duplicates using the same method and/or SVANOVIR® BLV gp51-Ab Confirmation (Indical Bioscience GmbH, Leipzig, Germany). In case of positive or doubtful serological results, new blood samples/bulk milk samples from the suspected herd were collected and tested.

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 reactions in pooled blood samples, individual samples were retested. Individual samples with inconclusive or positive results were retested in duplicates. In case of positive or doubtful results, new blood samples from the suspected herd were collected and tested.

Results

When screening the 1,444 bulk milk samples, one sample (0.1%) had positive and another sample had doubtful reactions, while the remaining 1,442 samples were negative. The positive or doubtful samples were retested with negative results.

Out of 1,757 pooled blood samples from 1,393 beef herds, three were doubtful, while the remaining 1,754 samples were negative. The doubtful samples were retested with negative results.

In conclusion, all tested herds were negative for antibodies against EBL in 2023.

Table 2 shows the results of the testing during the period from 1995 to 2023.

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 1995-2023.

Year	Dairy herds	Beef herds		No. of positive samples
	No. of herds sampled	No. of herds sampled ¹	No. of individuals tested ²	
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
2021	1 212	1 413	3 952	0
2022	1 093	1 432	4 200	0
2023	1 337	1 393	4 219	0

Discussion

The EU requirement for granting an EBL-free status is that the herd prevalence must be lower than 0.2%, which represents a maximum of 24 herds out of the total number of 12.453 herds.

No new cases have been reported after 1997, and the continuous surveillance since 1997 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 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 2023 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 measure to detect introduction of a new infection.

Acknowledgments

The authors would like to thank the technical staff at the Norwegian Veterinary Institute for performing the analyses with excellence. Moreover, the authors would like to thank all personnel from the Norwegian Food Safety Authority for collection and submission of samples.

References

1. Tharaldsen J, Ødegaard Ø, Krogsrud J. Smittsom storfeleukose diagnostisert i Norge [Contagious bovine leukosis diagnosed in Norway, No]. *Nor Vet Tidsskr* 1996; 108: 550.
2. Ånestad LM, Åkerstedt J, Dalaker J, Klevar S. The surveillance programme for enzootic bovine leucosis (EBL) in Norway 2022. *Surveillance Programmes for terrestrial and aquatic animals in Norway. Annual report 2022*. Oslo: Norwegian Veterinary Institute 2023.
3. Nyberg O, Tharaldsen J, Heier BT. The surveillance and control programme for enzootic bovine leukosis (EBL) in Norway. In: Mørk T, Hellberg H (editors). *Surveillance and control programmes for terrestrial and aquatic animals in Norway. Annual report 2003*. Oslo: National Veterinary Institute; 2004. p. 57-62.
4. Klintevall K, Näslund K, Svedlund G, Hajdu L, Linde N, Klingeborn B. Evaluation of an indirect ELISA for the detection of antibodies to bovine leukemia virus in milk and serum. *J Virol Methods* 1991; 33: 319-33.
5. Jonsson ME, Kristoffersen AB, Åkerstedt J, Hopp P, Mørk T, Sjurseth SK, Norström M. Evaluation of the surveillance sensitivity of the official Enzootic bovine leukosis programme in Norway. *Annual Meeting of the Society for Veterinary Epidemiology and Preventive Medicine, Elsinore, Denmark, 16-18 March 2016*. Poster.