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The surveillance programme for enzootic bovine leukosis (EBL) in Norway 2024

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Content

Summary

All bulk milk and blood samples tested in 2024 were negative for antibodies against bovine leukemia virus (BLV).

Introduction

Enzootic bovine leukosis (EBL) is caused by bovine leukemia virus (BLV), a member of the family *Retroviridae*. Most infections are subclinical. However, 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. In Norway, EBL is classified as a List 2 disease and is also listed by the World Organisation for Animal Health (WOAH). Within the EU, EBL is categorised under disease categories C, D, and E.

In Norway, enzootic bovine leukosis had never been reported 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 cow 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 responsible for planning the programme, collecting the bulk milk samples from the dairies, performing the analyses, and reporting the results. Blood samples from beef herds are collected at slaughterhouses by NFSA inspectors.

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

Herds and sampling

The surveillance programme included both dairy and beef herds. The target population of dairy herds were all Norwegian cattle herds delivering milk to dairies during the sampling period. The target population of beef herds were all Norwegian herds delivering cattle to slaughter in 2024.

Of the dairy herds, 24.9% were randomly selected for sampling. From the beef herds, individual blood samples from animals older than 24 months were collected at 16 slaughterhouses, with a maximum of five animals per herd per sampling day.

The dairies provided 1,747 bulk milk samples from 1,525 dairy herds. One bulk milk sample was not approved, leaving 1,746 samples from 1,524 dairy herds for analysis. A total of 4,213 individual blood samples from 1,372 beef herds were collected. The blood samples were analysed in pools of 1-5 animals (n= 1,725). The sampled herds represented approximately 24.3% of all Norwegian cattle herds (Table 1).

Table 1. Numbers of dairy herds and beef herds sampled in the Norwegian surveillance programme for EBL in 2024.

Herd category	Cattle herds (total no.[1])	Sampled herds (no.[2])	Sampled herds (%)
Dairy herds[3]	6 226	1 525	24.5
Beef herds[4]	5 708	1 372	24.0
Total	11 934	2 897	24.3

[1]Based on data from the Register of production subsidies as of 1 March 2024.
[2]Combined beef- and dairy farms could be sampled under both herd categories. The number of unique farms is given as a total number of sampled herds.
[3]Cattle herds delivering milk to dairies.
[4]Sampling performed at slaughterhouses.

Laboratory analyses

Bulk milk samples were analysed using a commercial indirect enzyme-linked immunosorbent assay (ELISA), IDEXX Leukosis Milk Screening Ab test (IDEXX Laboratories, Maine, USA), following the manufacturer's instructions. Samples with positive or inconclusive reactions were retested in duplicate using the same method, and/or the indirect ELISA, SVANOVIR® BLV gp51-Ab Confirmation (Indical Bioscience GmbH, Leipzig, Germany). In cases of positive or doubtful serological results, new bulk milk or individual blood samples from the suspected herd were collected and tested.

Blood samples (pooled or individual samples) were analysed using a competitive ELISA kit for BLV, ID Screen® BLV Competition (IDvet, Grabels, France). In cases of positive or inconclusive reactions in pooled blood samples, individual samples were retested. Individual samples with positive or inconclusive results were retested in duplicate using the same method and/or the SVANOVIR® BLV gp51-Ab Confirmation kit. If results remained positive or doubtful upon retesting, new blood samples from the suspected herd were collected and tested.

Results

Among the 1,746 bulk milk samples from dairy herds screened for BLV antibodies, 1,700 tested negative, 36 samples (2.1%) showed positive reactions, and 10 samples produced doubtful reactions. All positive and doubtful samples were negative upon retesting.

Of 1,724 pooled blood samples from beef herds, 1,722 were seronegative, while two pools produced doubtful reactions. Upon retesting, one of the initially doubtful samples tested negative, while the other remained doubtful. The individual blood samples contributing to the doubtful pool were retested in duplicate, all yielding negative results.

In conclusion, all 1,524 dairy herds and 1,372 beef herds in the surveillance program for EBL were negative for antibodies against BLV in 2024. Table 2 shows the results of the surveillance programme from 1995 to 2024.

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 1995-2024.

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
2024	1 524	1 372	4 213	0

Discussion

The EU requirement for granting EBL-free status is that herd prevalence must be below 0.2%, which corresponds to a maximum of 23 herds out of the total number of 11,934 herds.

No new cases of EBL have been reported since 1997, and continuous surveillance since then has shown that the Norwegian cattle population remains free from the disease in accordance with official requirements (2, 3). Initially, all cattle herds were tested annually. Since 2000, however, surveillance has been based on testing a minimum of 10% of both dairy and beef herds each year. Using scenario tree modelling, the probability of freedom from EBL in Norway by the end of 2014 was calculated to 99.0% (4). The results of the 2024 surveillance programme continue to support the conclusion that the Norwegian cattle population is free from 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 new infections.

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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. Krosness MM, Åkerstedt J, Dalaker J, Klevar S. The surveillance programme for enzootic bovine leucosis (EBL) in Norway 2023. Surveillance Programmes for terrestrial and aquatic animals in Norway. Annual report 2023. Oslo: Norwegian Veterinary Institute 2024.
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. 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.

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