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The surveillance programme for bovine spongiform encephalopathy (BSE) in Norway 2025

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Content

Summary

Brain samples from 6,560 bovine animals from 2,865 dairy herds and 874 beef cattle herds were submitted for examination in the surveillance and control programme for BSE in Norway 2025. A total of 428 samples were rejected because they contained unsuitable material. All the 6,132 tested brain samples were negative for BSE. In autumn 2025 the Norwegian Veterinary Institute and the Norwegian Food Safety Agency held a webinar for relevant stakeholders to increase the awareness and understanding of BSE.

Introduction

Norway is categorized as a country with negligible risk of BSE (1). The BSE surveillance programme was initially based on passive surveillance (1998-2000), with active surveillance introduced in May 2000. In the period 1998 - 2000 the samples were investigated by histopathological examination. From 2001 and onwards, the samples were examined by an Enzyme-Linked ImmunoSorbent Assay (ELISA) method for detection of resistant prion protein (PrP^{Sc}).

The number of samples collected in each category in the period 1998 - 2025 is presented in Table 1. Except for one positive atypical H-BSE case in 2015, BSE has never been detected in any of the examined animals.

The Norwegian Food Safety Authority (NFSA) is responsible for implementing and carrying out the surveillance programme for BSE. The Norwegian Veterinary Institute is in charge of the programme planning, the laboratory analyses and the reporting.

Aim

The aim of the surveillance program is the detection and eradication of the infectious agent (classical BSE), if present, documentation of the absence of disease in the cattle population, and fulfillment of obligations in accordance with international regulations.

Table 1. Number of collected samples for BSE examination by the Norwegian surveillance programme according to categories from 1998 - 2025.

Year	Clinically suspected animals	Fallen stock	Emergency slaughtered animals	Ante-mortem animals	Imported slaughtered animals	Healthy slaughtered animals*	Total
1998 - 2000	78	0	0	0	19	0	97
2001	14	1,352	7,073	2,612	88	2,400	13,539
2002	2	1,482	7,246	3,562	39	9,907	22,238
2003	2	1,936	7,334	4,107	39	10,727	24,145
2004	3	2,145	9,217	1,355	24	10,443	23,187
2005	1	2,318	8,462	102	10	10,486	21,379
2006	0	2,364	8,177	36	4	10,455	21,036
2007	0	2,213	7,304	48	9	10,000	19,574
2008	0	2,391	8,358	16	5	9,373	20,143
2009	1	2,435	8,320	27	3	9,451	20,237
2010	0	2,788	7,438	11	1	127	10,365
2011	1	3,078	7,241	23	1	7,878	18,222
2012	1	2,936	6,841	7	0	8,744	18,529
2013	1	3,239	7,887	9	4	9,421	20,561
2014	1	1,946	4,270	12	1	264	6,494
2015	0	1,793	5,088	48	1	0	6,930
2016	1	1,918	5,108	74	1	0	7,102
2017	2	1,640	5,227	89	1	0	6,959
2018	1	1,333	5,073	88	1	0	6,496**
2019	0	1,977	5,168	154	1	1	7,301**
2020	0	1,914	4,950	115	1	123	7,103**
2021	0	2,171	5,309	66	2	40	7,588**
2022	0	2,058	5,201	31	0	66	7,356**
2023	0	1,770	4,356	20	0	44	6,190**
2024	0	2,145	4,082	27	0	0	6,254**
2025	0	2,383	4,130	22	0	25	6,560**
Total	**109**	**53,725**	**158,860**	**12,661**	**255**	**109,975**	**335,585**

* Healthy slaughtered animals were excluded from the surveillance programme in 2010 and from 2014 and onwards.

** Includes samples unsuitable for examination.

Materials and methods

Programme outline

For 2025, the surveillance programme included examination of the following categories:

- Clinically suspected cattle irrespective of age.
- All cattle older than 48 months of age, which have died or been culled, but not slaughtered for human consumption (fallen stock).
- All emergency slaughtered cattle older than 48 months.
- All cattle older than 48 months, with abnormal findings at ante-mortem examination, rejected for human consumption, (referred to as ante-mortem animals).
- All slaughtered imported cattle from any country irrespective of age.

Implementation

The farmers were requested to report all cases of clinically suspected cattle irrespective of age, fallen stock older than 48 months and when delivering imported cattle to slaughter, to the Norwegian Food Safety Authority (NFSA). Since 2019, the company Biosirk, a nationwide company collecting and rendering fallen stock, performs most of the sampling of brains from fallen stock on behalf of the NFSA. The employees involved, mainly truck drivers, have been trained in the sampling by attending courses arranged by the NFSA.

The brain or head from clinically suspected cattle, or a spoon sample from the medulla oblongata from the other categories, were collected by the inspectors from the NFSA at the abattoirs and sent within 24 hours in a cool insulated container to the Norwegian Veterinary Institute (NVI). The NVI performs the laboratory examinations and the reporting of the results.

Clinically suspected animals

No clinically suspected animals were submitted in 2025. The standard protocol to process the clinically suspected animals is that the whole brain is divided mid-sagittally into equal halves. From the non-fixed half, tissue from the obex area is analysed for detection of PrP^{Sc} by ELISA (HerdChek BSE-Scrapie AG Test, IDEXX) and subsequently by Western blot (TeSeE® WESTERN BLOT, Bio-Rad) as described by the manufacturer.

In case of positive or inconclusive results, the other half of the brain is formalin-fixed and processed according to a standard routine protocol, embedded in paraffin, sectioned at 2 to 4 µm and stained with haematoxylin and eosin. Immunohistochemical staining for detection of PrP^{Sc} is performed on selected sections using a monoclonal anti-PrP antibody (SAF 84, courtesy of J. Grassi, CEA, France).

Risk population

Non-fixed brain tissue from the obex area was analysed for detection of PrP^{Sc} by ELISA (HerdChek BSE-Scrapie Ag test) as described by the manufacturer. In cases with positive or inconclusive test results, the sample was tested by Western blot (TeSeE® WESTERN BLOT, Bio-Rad)

Brain samples were evaluated as unsuitable for examination when they were severely autolysed, the obex area was totally or partially missing, or the anatomy of the sample was not recognisable.

Results and discussion

In 2025, the NVI received 6,560 cattle samples. Of these, 428 (6,5%) samples were unsuitable for examination (418 from fallen stock and 10 from emergency slaughter). All examined samples were negative for BSE.

For 35 samples (0.5%) the herd of origin was not reported. However, it is important to note that in case of a positive test result, the identity of the herd can be traced via the carcass number. The remaining 6,525 samples originated from 2,865 of 6,105 dairy cattle herds (including combined herds) and 874 of 4,701 beef cattle herds. The mean number of examined animals per herd was 1.7.

Clinically suspected animals (passive surveillance)

In 2025, there were no animals investigated as clinical suspect due to abnormal behaviour and tremor. Improved methods for clinical examination to distinguish between real suspected BSE cases and cases with central nervous disease of other causes has probably resulted in few clinical suspected cases in later years. Animals with diseases related to the central nervous system are likely to be included in the sampling of other risk groups if not identified as a clinically suspect animal.

Surveillance of slaughtered animals and fallen stock (active surveillance)

In 2013, The EU-commission decided to stop BSE testing in healthy slaughtered cattle in 25 EU-member states (decision 2013/76/EU). Norway stopped the testing of healthy slaughtered animals from 2014.

At the same time, the age limit for including cattle in the categories “Fallen stock”, “Emergency slaughter” and “Ante mortem” was increased to 48 months. This amendment has resulted in a reduced number of sampled animals in the categories fallen stock and emergency slaughter in 2014 and onwards compared to 2013.

Table 2 illustrates the geographical distributions of the cattle population alongside the various categories of animals subjected to testing. A relatively good correlation exists between the collection of samples from fallen stock and emergency slaughtered animals across different regions, and the distribution of the cattle population within those regions. A corresponding comparison related to the age distribution of sampled animals is shown in Table 3.

Table 2. Regional distribution of the Norwegian cattle population and of the cattle sampled for PrP^{Sc} examination in 2025. The regions follow the administrative units defined by the Nomenclature of Territorial Units for Statistics level 2 (NUTS2).

Region	Total population (%)	Fallen stock (%)	Emergency slaughter (%)	Ante mortem animals (%)	Clinically suspected animals (%)	Total sampled (%)*
Oslo og Viken	8.2	4.3	6.6	0	0	5.8
Innlandet	20.7	14.7	22.2	0	0	19.5
Agder og Sør-Østlandet	7.8	3.8	7.0	5.0	0	5.8
Vestlandet	34.5	47.8	36.7	25.0	0	40.7
Trøndelag	19.9	23.7	21.0	70.0	0	22.1
Nord-Norge	9.0	5.8	6.5	0	0	6.2
Total number	**843,900**	**2,383**	**4,130**	**22**	**0**	**6,560**

* There were 35 samples (0.5%) from cattle with unknown herd of origin and therefore could not be placed into region. These samples are assumed to be distributed following the regional distribution of the cattle from known region within each target group.

Table 3. Age distribution of the Norwegian cattle population and of the cattle tested for PrP^{Sc} in 2025.

Age groups (months)	Total population (%)	Fallen stock (%)	Emergency slaughter (%)	Ante mortem animals (%)	Clinically suspected animals (%)	Total tested (%)*
< 24	44.4	0.1	0.1	11.8	-	0.1
24-35	10.7	-	0.3	11.8	-	0.2
36-47	8.6	0.7	2.5	11.8	-	1.9
48-59	6.6	26.3	26.3	17.6	-	26.0
60-71	8.7	25.4	25.5	11.8	-	25.2
72-83	5.5	20.2	18.2	-	-	18.5
84-95	3.8	12.1	12.3	23.5	-	12.1
96-107	2.8	6.4	6.4	5.9	-	6.3
108-119	2.2	3.5	3.3	-	-	3.3
120-131	1.6	1.5	2.1	5.9	-	1.9
132-143	1.3	1.2	1.1	-	-	1.1
144-155	1.2	0.9	0.8	-	-	0.8
≥ 156	2.8	1.7	1.1	-	-	1.3
Total number	**843,900**	**1,965**	**4,120**	**22**	**0**	**6,132****

* There were 72 examined samples (1.2%) from cattle with unknown age. The age of these cattle is assumed to follow the age distribution of the cattle with known age within each target group.
** Excluding 428 samples unsuitable for examination.

Conclusions

In 2015, the first and only case of BSE (atypical BSE H-BSE type) was detected in Norway. No case of classical BSE has ever been detected, including the 6,132 animals tested in 2025.

It is considered highly probable with increasing certainty that the Norwegian cattle population never has been infected with classical BSE-agent. This is mainly due to few imports to Norway of cattle and products potentially infected with the BSE-agent, limited use of meat and bone meal in concentrates intended for ruminants, and the use of high temperature and pressure in the domestic production of meat and bone meal (2). The main causes of no detected cases of classical BSE are supported by a risk assessment for BSE in Norway (3) and by the compiled results from the surveillance programme for BSE in the years 2001 to 2025.

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