The European Union summary report on surveillance for the presence of transmissible spongiform encephalopathies (TSE) in 2019

European Food Safety Authority (EFSA)

Abstract

This report presents the results of surveillance on transmissible spongiform encephalopathies (TSE) in cattle, sheep, goats, cervids and other species, and genotyping in sheep, carried out in 2019 by 28 Member States (MS), and by Iceland, Montenegro, North Macedonia, Norway, Serbia and Switzerland (non-MS). In total, 1,150,388 cattle were tested by MS, a 2.7% decrease from 2018 and 44,557 by the six non-MS. Six cases of H-BSE were reported by France (4) and Spain (2), and 1 L-BSE by Poland. The number of H- BSE cases was the largest reported per year including the youngest ever case (5.5 years of age). In total, 338,098 sheep and 143,529 goats were tested in the EU, an increase of 3.9% in both species compared with 2018. In sheep, 17 inconclusive cases by two MS and 997 cases of scrapie were reported: 911 classical (97 index cases (IC), one of ARR/ARR genotype and 98.7% with genotypes of susceptible groups) by seven MS, 86 atypical (AS) (80 IC) by 11 MS. Thirty-one ovine scrapie cases were reported by Iceland and Norway. Random genotyping was only reported by eight MS: Cyprus excluded, 15.7% of genotyped sheep carried genotypes of susceptible groups. In goats, three inconclusive cases by two MS and 390 cases of scrapie were reported: 379 classical (24 IC) by six MS, 11 atypical (10 IC) by six MS. The heterogeneous enforcement of a 3-year surveillance programme for chronic wasting disease (CWD) in six MS (Estonia, Finland, Latvia, Lithuania, Poland and Sweden) resulted in the testing of 7,980 cervids and confirmation of three CWD cases in wild moose in Sweden. Other seven MS tested 2,732 cervids with no positive results. Norway tested 30,147 cervids in 2019, with two new moose cases. In total, 122 animals from four other species reported by three MS TSE tested negative.

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The EFSA Journal is a publication of the European Food Safety Authority, an agency of the European Union.
Summary

This report of the European Food Safety Authority (EFSA) presents the detailed results of surveillance activities on animal transmissible spongiform encephalopathies (TSE) carried out during 2019 in the European Union (EU) and in six non-Member States (non-MS), i.e. Iceland, Montenegro, North Macedonia, Norway, Serbia and Switzerland, as well as genotyping data in sheep. TSE monitoring data for cattle, sheep, goats, cervids and species other than domestic ruminants are reported by country according to Regulation (EC) 999/2001 (the TSE Regulation) and consist of testing data as well as case data.

Surveillance data were mainly submitted through the EFSA TSE data reporting tool. Six MS submitted data directly as eXtensible Markup Language (XML) files by using their own system for the automatic upload of data into the EFSA Data Collection Framework (DCF) whereas the rest of the reporting countries submitted XML files via the EFSA TSE data collection tool. The electronically submitted data were extracted from the EFSA database and further processed and validated by EFSA to summarise the information and to elaborate the summary tables presented in the current EU summary report (EUSR).

A descriptive summary of the reported data is provided at reporting country level or aggregated at EU level for all reporting countries. When possible, descriptions and calculations were stratified according to the available variables, such as surveillance target group (healthy slaughtered animals, animals culled under bovine spongiform encephalopathy (BSE)/TSE control and eradication measures, etc.) or surveillance type (passive vs. active), country, sampling year (since 2001 for bovine animals and 2002 for small ruminants), case type (i.e. classical BSE (C-BSE), atypical BSE (H-BSE or L-BSE), classical scrapie (CS) or atypical scrapie (AS)), flock/herd status (infected/non-infected), index case and age class.

In total, 1,150,388 cattle were tested in 2019 in the EU. BSE testing was concentrated in the group of risk animals (emergency slaughtered animals (ES), animals with clinical signs at ante mortem inspection (AM) and fallen stock (FS)) with over 83% of all cattle tested in the EU, with FS being the largest contributor with 918,182 cattle tested in 2019 (92.4% of all cattle in the risk group). An additional 44,557 cattle were tested by four of the six non-MS, with no cases reported. Serbia (the main contributor with 20,110 cattle tested) and Montenegro and reported mostly cattle from the HS target group.

Seven atypical cases of BSE were confirmed in 2019 by: Spain (2 H-BSE), France (4 H-BSE) and Poland (1 L-BSE), all born between 2001 and 2008 except one H-type case of 5.5 years in Spain. From an epidemiological point of view, the highlights in the BSE caseload of the reporting year are: the number of H-type BSE cases was the largest reported in a single year, equal to that of 2009 (6), (six cases per million tested) and the report by Spain of a H-type case of 5.5 years, the youngest atypical BSE ever reported since the TSE data are collected and published. An additional H-BSE case was reported by Brazil.

In total, 481,627 small ruminants were tested in 2019 in the EU: 338,098 sheep (3.9% increase from 2018) and 143,529 goats (3.9% increase). In addition, 23,473 sheep and 217 goats were tested by four and three of the six non-MS, respectively.

In sheep, 997 scrapie cases were reported in the EU in 2019, 641 more case than in 2018. A total 31 cases of scrapie in sheep were reported by two (Iceland and Norway) of the four non-MS that tested in total 23,473 sheep, namely, Iceland, North Macedonia, Norway and Serbia. Classical scrapie (CS) was reported by seven MS and one non-MS: Cyprus, Greece, Italy, Portugal, Romania, Spain, the United Kingdom and Iceland, whereas atypical scrapie (AS) was reported by 11 MS and one non-MS: Finland, France, Germany, Hungary, Ireland, Italy, Poland, Portugal, Slovakia, Spain, the United Kingdom and Norway. An additional total of 17 cases in sheep were reported as inconclusive by Spain (5) and Italy (12) (See Table 31), which are not included in the total scrapie caseloads for these two countries.

Most of the ovine cases (91.7%) were reported by four countries, namely Greece, Italy, Romania and Spain, as it was the case in the previous year. In total, 911 ovine cases in the EU were CS (91.4%) and 86 were AS (8.6%). Among the non-MS, 21 CS cases were reported by Iceland and 10 AS cases by Norway. In sheep, 17.8% (177) of all cases in the EU reported in 2019 were index cases, with a much higher proportion in AS cases (80/86: 93%) compared to CS cases (97/911: 10.6%). In total, 98.7% of the CS cases in sheep reported in 2019 with known genotypes belonged to

1 Following the correction of the number of cases in EL in 2018 (178), the total number of scrapie cases in sheep in the EU in 2018 was 933: 820 classical and 113 atypical.
animals holding genotypes of the susceptible groups (NSP3, NSP3O, NSP4 or NSP5). One CS case was reported by Spain in a sheep carrying the ARR/ARR genotype, a very rare occurrence.

In goats, 390 scrapie cases were reported in the EU in 2019, which is a reduction of 25.4% (–133) compared with 2018 when 523 cases were reported. Out of 390 caprine scrapie cases, 379 were CS (97.2%, with Cyprus accounting for 81.3% of these) and 11 were AS. This reduction is mainly due to the decrease in the number of cases in goats in two reporting countries: Cyprus (from 382 to 309), Spain (from 91 to 37). CS was reported by six MS, namely Cyprus, Greece, Italy, Spain and the United Kingdom. AS was also reported by six MS: Cyprus, France, Italy, Poland, Portugal and Spain. The 217 goats tested by three non-MS (Iceland, North Macedonia and Norway) were all negative. An additional total of three cases in goats were reported as inconclusive by Spain (1) and Italy (2) (See Table 33), which are not included in the total scrapie caseloads for these two countries.

In goats, only 8.7% of all cases reported in the EU in 2019 were index cases, lower than in 2018 (9.6%), with a higher proportion in AS (10/11: 90.9%) than in CS (24/379: 6.3%). Currently, CS is still the most frequently reported type of scrapie in the EU in both species. Focusing on the last 10 years (2010–2019), in sheep, there has been a significant average decrease of, respectively, 5% per year in CS and 4% per year in AS. In goats, there was no detectable trend for both CS and AS.

The long-term trends of CS in terms of cases per 10,000 tests in both species, the situation in 2019 confirmed the 10-year statistically significant decreasing trend in sheep and no detectable trend in goats, respectively. With regard to the long-term trends of AS, there was also a 10-year statistically significant decreasing trend in sheep and no detectable trend in goats.

In 2019, the genotyping activity from random samples of the national EU sheep populations was carried out by eight MS: Belgium, Cyprus (where genotyping is conducted systematically in the breeding sheep population), France, Greece, Italy, Latvia, the Netherlands and Poland. After excluding Cyprus, 15.7% of the randomly genotyped sheep still carried genotypes of the susceptible groups, lower than the 19.2% in 2018. The percentage of susceptible sheep rose to 45.5% in Greece and 29.9% in Italy, two of the countries with the highest caseload in 2019, whereas the percentage was 10.3% in the other five MS.

The enforcement of a 3-year surveillance programme for CWD in six MS – Estonia, Finland, Latvia, Lithuania, Poland and Sweden – resulted in the testing of 7,980 cervids and the confirmation of three cases of CWD in wild moose by Sweden. The implementation of the mandatory surveillance in the six MS is quite heterogeneous in terms of design (number and characteristics of the declared primary sampling units, PSU), number of cervids tested in general and per PSU and distribution of testing by species and target groups. The targeting of mostly hunted/slaughtered fit for human consumption (HSHC) animals observed in the first year of implementation was increased in 2019 up to 60.5% of all tested cervids, consolidating a situation in which the sensitivity of the surveillance system is lower than expected. Other seven MS – Austria, Hungary, Italy, Romania, Slovenia, Spain and the United Kingdom – tested 2,732 cervids, all with negative results and with Romania accounting for 77.7% of all cervids tested by them. Norway continued its intensified testing programme in wild and captive cervids and tested 30,147 animals in 2019, mostly semi-domesticated reindeer (42.9%), followed by wild moose (19.7%) and red deer (17.2%), leading to the detection of two moose cases. Additionally, Iceland reported testing of 114 cervids, with no cases.

A total of 122 animals of other species were TSE tested by Finland (114), Estonia (6) and Spain (2): 12 raccoon dogs (Nyctereutes procyonoides), 66 American minks (Neovison vison), 42 foxes (genus Vulpes) and 2 chamois (Rupicapra rupicapra). None of them tested positive.
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1. Introduction

1.1. Background and Terms of Reference

According to Part I.A, Chapter B, Annex III of Regulation (EC) 999/2001² (here referred to as the transmissible spongiform encephalopathy (TSE) Regulation), the information to be presented by MS in their annual report, as provided for in Article 6(4), includes:

1) The number of suspected cases placed under official movement restrictions in accordance with Article 12(1), per animal species.

2) The number of suspected cases subject to laboratory examination in accordance with Article 12(2), per animal species, including the results of the rapid and confirmatory tests (number of positives and negatives) and, with regard to bovine animals, the age distribution of all tested animals. The age distribution should be grouped as follows: ‘below 24 months’, distribution per 12 months between 24 and 155 months, and ‘above 155 months’ of age.

3) The number of flocks where suspected cases in ovine and caprine animals have been reported and investigated pursuant to Article 12(1) and (2).

4) The number of bovine animals tested within each subpopulation referred to in Chapter A, Part I, points 2.1, 2.2, 3.1 and 5. The method of the sample selection, the results of the rapid and confirmatory tests and the age distribution of the tested animals grouped as set out in point 2 should be provided.

5) The number of ovine and caprine animals and flocks tested within each subpopulation referred to in Chapter A, Part II, points 2, 3, 5 and 6 together with the method for sample selection and the results of the rapid and confirmatory tests.

6) The geographical distribution, including the country of origin if not the same as the reporting country, of positive cases of BSE and scrapie. The year, and where possible the month of birth should be given for each TSE case in bovine, ovine and caprine animals. TSE cases that have been considered atypical shall be indicated. For scrapie cases, the results of the primary and secondary molecular testing, referred to in Annex X, Chapter C, point 3.2 (c), shall be reported, when appropriate.

7) In animals other than bovine, ovine and caprine animals, as well as in cervids other than those covered by the 3-year CWD monitoring programme referred to in Part III.A of Chapter A of this Annex, the number of samples and confirmed TSE cases per species.

8) The genotype, and, where possible, the breed, of each ovine animal found positive to TSE and sampled in accordance with Chapter A, Part II, point 8.

9) For Member States covered by the 3-year CWD monitoring programme referred to in Part III.A of Chapter A of this Annex, the annual report for the years 2018, 2019 and 2020 shall include:

a) The number of cervid samples submitted for testing, by target group according to the following criteria:
   - primary Sampling Unit (PSU) identifier,
   - species,
   - management system (farmed, captive, wild or semi-domesticated),
   - target group,
   - sex.

b) The results of the rapid and confirmatory tests (number of positives and negatives) and, where applicable, of further isolate characterisation investigations, the tissue sampled and the rapid test and confirmatory technique used.

c) The geographical location, including the country of origin if not the same as the reporting Member State, of positive cases of TSE.

d) The genotype and species of each cervid found positive for TSE.

e) Where tested, the genotype of cervids tested and found negative for TSE.

² Regulation (EC) No 999/2001 of the European Parliament and of the Council of 22 May 2001 laying down rules for the prevention, control and eradication of certain transmissible spongiform encephalopathies. OJ L 147, 31.5.2001, p. 1-40.
Changes in points 7 and 9 are the result of the amendment following Commission Regulation (EU) 2017/1972 amending Annexes I and III of the TSE Regulation (see Section 1.2.4).

According to Part I.B, Chapter B of the same Annex III ‘The compilation of reports containing the information referred to in Section A and submitted to the Commission (which shall send it to the European Food Safety Authority) on a monthly basis in the electronic format agreed between the Member States, the Commission and the European Food Safety Authority or, with regard to the information referred to in point 8 on a quarterly basis, may constitute the annual report as required by Article 6(4), provided that the information is updated whenever additional information becomes available.’

According to Part II of Chapter B, the Union summary shall be presented in a tabled format covering at least the information referred to in Part I.A for each Member State.

1.2. Surveillance of TSE in the European Union

1.2.1. Legal basis

Animals suspected of a TSE should be examined in accordance with Article 12.2 of the TSE regulation. The legal framework for the active surveillance (i.e. the testing of animals not reported as suspected of being infected by a TSE) of ruminants for the presence of TSE is laid down in Article 6 of the TSE regulation, and specified in its Annex III, Chapter A.

Of the 27 MS at that time, Commission Decision 2009/719/EC, allowed 25 MS (all except Bulgaria and Romania) to apply a revised BSE monitoring programme. Commission Implementing Decision 2013/76/EU of 4 February 2013, amending Commission Decision 2009/719/EC, authorised these 25 MS to decide to stop testing slaughtered bovine animals for human consumption. Within EU28, this monitoring programme is also applicable for Croatia.

The legal basis for the sample collection and for the test methods is laid down in Chapter C of Annex X of the TSE regulation. From 2005, Annex X (as amended by Commission Regulation (EC) No 36/2005) also provides for mandatory discriminatory testing for BSE of TSE cases detected in small ruminants.

There were not amendments of the TSE Regulation affecting 2019 TSE surveillance. For previous amendments, see 2018 EFSA EUSR (EFSA, 2019).

1.2.1.1. The EU reference laboratory for TSE

Commission Regulation (EU) 2018/221 of 15 February 2018 amending Regulation (EC) No 999/2001 of the European Parliament and of the Council and Regulation (EC) No 882/2004 of the European Parliament and of the Council established that from 1 January 2019, the EU reference laboratory for TSE will be a consortium between the Istituto Zooprofilattico Sperimentale del Piemonte, Liguria e Valle d’Aosta (IZSPLVA) and the Istituto Superiore di Sanità (ISS), led by IZSPLVA.

1.2.2. BSE surveillance of bovine animals

As described in the 2016 European Union summary report (EUSR) (EFSA, 2017) on TSE, the BSE surveillance of bovine animals is based on the testing of samples from the following target groups: emergency slaughtered (ES); animals with clinical signs at ante-mortem (AM); fallen stock (FS); healthy slaughtered animals (HS); animals clinically suspected of being infected by BSE (SU); and animals culled under BSE eradication measures (EM).

The categories of bovine animals to be submitted for BSE testing are defined in the TSE Regulation and are based on a combination of age (age limits have been changed over time) and surveillance target groups. The general rules for BSE surveillance, applied in 2019, are summarised in Table 1.

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3 Commission Regulation (EU) 2017/1972 of 30 October 2017 amending Annexes I and III to Regulation (EC) No 999/2001 of the European Parliament and of the Council as regards a surveillance programme for chronic wasting disease in cervids in Estonia, Finland, Latvia, Lithuania, Poland and Sweden and repealing Commission Decision 2007/182/EC.

4 Since 2018, TSE data are submitted by reporting countries directly to the European Food Safety Authority (EFSA) with different frequency and periodicity.

5 Commission Implementing Decision of 4 February 2013 amending Decision 2009/719/EC authorising certain Member States to revise their annual BSE monitoring programmes.

6 Commission Regulation (EU) 2018/221 of 15 February 2018 amending Regulation (EC) No 999/2001 of the European Parliament and of the Council and Regulation (EC) No 882/2004 of the European Parliament and of the Council as regards the European Union reference laboratory for transmissible spongiform encephalopathies. OJ L 43, 16.2.2018, p. 6–7.
A table summarising the evolution of the changes (age limits for different target groups) was published in the 2015 EU Summary Report (EFSA, 2016).

However, there are still some differences in the application of these general rules owing to specific national rules that provide some residual testing of HS or the testing of at-risk animals (ante-mortem, emergency slaughtered and fallen stock) at younger age. The age limits (in months) of bovine animals tested for BSE surveillance applied in 2019 by Member State (MS) or non-MS (Iceland, Montenegro, North Macedonia, Norway, Serbia and Switzerland) are shown in Table 2.

**Table 1:** Criteria for BSE surveillance in bovine animals as applied in 2019 by country, age limit and surveillance target group, based on the TSE Regulation, as last amended, Commission Implementing Decision 2013/76/EU of 4 February 2013 and Commission Implementing Decision (EU) 2016/851 of 26 May 2016

| Surveillance target group | EU 26 | Romania, Bulgaria (a) |
|---------------------------|-------|-----------------------|
| Emergency slaughtered animals (ES) | > 48 months | > 24 months |
| Animals with clinical signs at ante mortem (AM) | | |
| Fallen stock (FS) | | |
| Healthy slaughtered animals (HS) | No mandatory testing required | > 30 months |
| Animals clinically suspected of being infected by BSE (BSE suspects) (SU) | All | All |
| Animals culled under BSE eradication measures (EM) | | |

(a): Different criteria were applied in 2019 because Bulgaria and Romania were not in the list of the 26 Member States authorised to revise their BSE annual surveillance programmes.

**Table 2:** Age limits (in months) of bovine animals tested for BSE surveillance applied in 2019 by reporting country and surveillance target group

| Country | Surveillance target group |
|---------|---------------------------|
| | ES | AM | FS (a) | HS | SU | EM |
| AT | > 24 | > 24 | > 48 | No testing | No age limit | No age limit |
| BE | > 48 | > 48 | > 48 | No testing | No age limit | > 24 |
| BG | > 24 | > 24 | > 24 | > 30 | No age limit | No age limit |
| CY | > 48 | > 48 | > 48 | No testing | No age limit | > 48 |
| CZ | > 24 | > 24 | > 24 | No testing | No age limit | No age limit |
| DE | > 48 | > 48 | > 48 | No testing | No age limit | > 48 |
| DK | > 48 | > 48 | > 48 | No testing | No age limit | No age limit |
| EE | > 48 | > 48 | > 48 | No testing | No age limit | No age limit |
| EL | > 48 | > 48 | > 48 | > 72 | No age limit | No age limit |
| ES | > 48 | > 48 | > 48 | Born before 2001 and coming from herds with BSE positive cases | No age limit | No age limit |
| FI | > 48 | > 48 | > 48 | No testing | No age limit | No age limit |
| FR | > 48 | > 48 | > 48 | Born before 01/01/2002 | No age limit | 48 |
| HR | > 48 | > 48 | > 48 | No testing | No age limit | No age limit |
| HU | > 24 | > 24 | > 24 | No testing | No age limit | No age limit |
| IE | > 48 | > 48 | > 48 | No testing | No age limit | > 48 |
| IT | > 48 | > 48 | > 48 | No testing | No age limit | No age limit |
| LT | > 48 | > 48 | > 48 | No testing | No age limit | No age limit |
| LU | > 48 | > 48 | > 48 | No testing | No age limit | > 48 |
| LV | > 24 | > 24 | > 24 | No testing | No age limit | No age limit |
| MT | > 48 | > 48 | > 48 | No testing | No age limit | No age limit |
| NL | > 48 | > 48 | > 48 | No testing | No age limit | No age limit |
| PL | > 48 | > 48 | > 48 | No testing | No age limit | No age limit |
| PT | > 48 | > 48 | > 48 | No testing | No age limit | No age limit |
1.2.3 TSE surveillance of small ruminants

As described in the 2016 EUSR on TSE (EFSA, 2017), the surveillance of ovine and caprine animals for the presence of TSE is performed based on testing samples obtained from the following surveillance target groups: animals culled under TSE eradication measures (EM); animals not slaughtered for human consumption (NSHC); healthy animals slaughtered for human consumption (SHC) and animals clinically suspected of being infected by TSE (SU).

Target surveillance groups in small ruminants to be reported for surveillance for TSE based on the infection status of flock/herd/holding, the case type detected and the control measures taken according to the TSE Regulation have been summarised in Table 3.

The minimal sample sizes for NSHC and SHC are set in Tables A and B of Annex III, chapter A, Section II, point 3 and point 2(a), respectively, of the TSE Regulation. The application of the quotas according to sheep and goat populations in each MS is displayed in Table 4. MS may choose to replace up to a maximum of 50% of their SHC ovine and caprine animals by animals obtained from NSHC, e.g. dead ovine and caprine animals over the age of 18 months and up to a maximum of 10% of their ovine and caprine animals tested in SHC and NSHC by animals (> 18 months of age) killed as part of disease eradication campaign(s) at a ratio of 1:1.

1.2.3.1 Genotyping in sheep

The prion protein genotype for the codons 136, 154 and 171 should be determined for each positive TSE case in sheep.

As described in Section 1.2.1, in 2017, the Regulation (EC) 894/2017 amended the TSE Regulation with regards to representative genotyping activities in the ovine populations. However, as it has come into force on 1 January 2018, the changes in the TSE regulation do not require to genotype a minimum sample of at least 600 animals for MS with an adult sheep population of > 750,000 animals, and for other MS, to genotype a minimum sample of at least 100 animals. The new requirements establish to genotype once every 3 years with a minimum sample of at least 1,560 ovine animals; or at a frequency and with a sample size determined by the Member State based on compliance with a set of criteria.

| Country | ES | AM | FS(a) | HS | SU | EM |
|---------|----|----|------|----|----|----|
| RO      | > 24 | > 24 | > 24 | > 30 | No age limit | No age limit |
| SE      | > 48 | > 48 | > 48 | No testing | No age limit | No age limit |
| SI      | > 48 | > 48 | > 48 | No testing | No age limit | No age limit |
| SK      | > 24 | > 24 | > 24 | No testing | No age limit | No age limit |
| UK      | > 48 | > 48 | > 48 | No testing | No age limit | No age limit |
| CH      | > 48 | > 48 | > 48 | > 48 | No age limit | > 48 |
| IS      | > 48 | > 48 | > 48 | No testing | No age limit | No age limit |
| ME      | > 24 | > 24 | > 24 | > 30 | No age limit | No age limit |
| MK      | > 24 | > 24 | > 24 | No testing | No age limit | No age limit |
| NO      | > 48 | > 48 | > 48 | No testing | No age limit | No age limit |
| RS      | > 24 | > 24 | > 24 | > 30 | No age limit | No age limit |

ES: emergency slaughtered; AM: animals with clinical signs ante-mortem; FS: fallen stock; HS: healthy slaughtered; SU: animals clinically suspected of being infected with BSE; EM: animals culled under BSE eradication measures.

(a): If surveillance target group is FS and animals are born in Romania, Bulgaria or Switzerland, then the age limit is > 24 months.

7 The term TSE surveillance is used in small ruminants as both scrapie and BSE have been detected naturally in small ruminants. When reporting TSE cases in small ruminants, the TSE type assigned is scrapie, unless stated otherwise.
**Table 3:** Target surveillance groups in small ruminants to be reported for surveillance for TSE based on the infection status of flock/herd/holding, the case type detected and the control measures taken according to the TSE Regulation

| Reported flock/herd status | Index case | Case type | Control measures taken | Sampled population | Surveillance target group to be reported |
|----------------------------|------------|-----------|------------------------|--------------------|----------------------------------------|
| Non-infected flock/herd<sup>(b)</sup> | Yes | CS or AS | n/a | Slaughtered for human consumption. Annex III, Chapter A, Part II, point 2 | SHC |
| | | | | Not slaughtered for human consumption. Annex III, Chapter A, Part II, point 3 | NSHC |
| TSE infected flock/herd under official control at sampling<sup>(c)</sup> | No | CS | Killing and complete destruction of all animals (option 1), TSE Regulation, Annex VII, Chapter B, point 2.2.2<sup>(b)</sup> or killing and complete destruction of the susceptible animals only (option 2<sup>(a)</sup>) Annex VII, Chapter B, point 2.2.2<sup>(c)</sup> | Culled and destroyed under options 1 or 2 | EM |
| | | | | Slaughtered for human consumption after application of option 1 or option 2<sup>(a)</sup> | SHC |
| | | | | TSE clinical suspects Chapter 4, Article 12, points 1–2 | SU |
| TSE infected flock/herd under official control at sampling<sup>(c)</sup> | No | CS | Follow-up after implementation of control measures according to Annex VII, point 2. Intensified TSE monitoring protocol (Annex VII, point 3) after option 1 or option 2, or if derogation of option 2 was established, after complete destruction or slaughtering for human consumption of identified animals. | Slaughtered for human consumption point 3.1<sup>(a)</sup> | SHC |
| | | | | Not slaughtered for human consumption point 3.1<sup>(b)</sup> | NSHC |
| | | | | TSE clinical suspects Chapter 4, Article 12, points 1–2 | SU |
| TSE infected flock/herd under official control at sampling<sup>(c)</sup> | No | CS | Follow-up after implementation of control measures according to Annex VII, point 2. Intensified TSE monitoring protocol (Annex VII, point 4) after option 3. | Slaughtered for human consumption point 4.1<sup>(a)</sup> | SHC |
| | | | | Not slaughtered for human consumption point 4.1<sup>(b)</sup> | NSHC |
| | | | | TSE clinical suspects Chapter 4, Article 12, points 1–2 | SU |
| TSE infected flock/herd under official control at sampling<sup>(c)</sup> | No | CS | Intensified TSE monitoring protocol pending the implementation of control measures according to the derogation in point 2.2.2.<sup>(c)</sup>(iii) and after the implementation of the control measures | Slaughtered for human consumption. Points 4.1<sup>(a)</sup> and 3.1<sup>(a)</sup> | SHC |
| | | | | Not Slaughtered for human consumption. Points 4.1<sup>(b)</sup> and 3.1<sup>(b)</sup> | NSHC |
| | | | | TSE clinical suspects Chapter 4, Article 12, points 1–2 | SU |
| Reported flock/herd status | Index case | Case type | Control measures taken | Sampled population | Surveillance target group to be reported |
|---------------------------|------------|-----------|------------------------|--------------------|----------------------------------------|
| TSE infected flock/herd under official control at sampling\(^{(c)}\) | No         | AS        | Intensified TSE monitoring protocol after the detection of an Atypical Scrapie case (Annex VII point 2.2.3) | Slaughtered for human consumption point 2.2.3 | SHC                                    |
|                           |            |           |                        | Not slaughtered for human consumption point 2.2.3 | NSHC                    |
|                           |            |           |                        | TSE clinical suspects Chapter 4, Article 12, points 1-2 | SU                      |

TSE: transmissible spongiform encephalopathy; CS: classical scrapie; AS: atypical scrapie; EM: animals culled under TSE eradication measures; NSHC: animals not slaughtered for human consumption; SHC: animals slaughtered for human consumption; SU: animals clinically suspected of being infected by TSE.

(a): Option 2 can only be applied to sheep (genotyping and culling).

(b): Sheep flocks or goat herds that are not under control measures or intensified TSE protocols or a sheep flock or goat herd that has never been infected with scrapie and for which every new detected case will be an index case.

(c): Sheep flocks or goat herds that are under control measures or intensified TSE protocols or a sheep flock or goat herd that has been infected during reporting year.
Table 4: Minimum sample size for the TSE surveillance in small ruminants by reporting country in 2019

| Country | Sheep Population size (a) | Surveillance target group | Goats Population size (a) | Surveillance target group |
|---------|---------------------------|---------------------------|---------------------------|---------------------------|
|         | SHC | NSHC | SHC | NSHC | SHC | NSHC | SHC | NSHC |
| AT      | 100–750 | 0 | 1,500 | 40–250 | 0 | 100% up to 500 |
| BE      | 100–750 | 0 | 1,500 | 40–250 | 0 | 100% up to 500 |
| BG      | > 750 | 10,000 | 10,000 | > 750 | 10,000 | 10,000 |
| CY      | 100–750 | 0 | 1,500 | 40–250 | 0 | 100% up to 500 |
| CZ      | 100–750 | 0 | 1,500 | < 40 | 0 | 100% up to 100 |
| DE      | > 750 | 10,000 | 10,000 | 40–250 | 0 | 100% up to 500 |
| DK      | 100–750 | 0 | 1,500 | < 40 | 0 | 100% up to 100 |
| EE      | 40–100 | 0 | 100% up to 500 | < 40 | 0 | 100% up to 100 |
| EL      | > 750 | 10,000 | 10,000 | > 750 | 10,000 | 10,000 |
| ES      | > 750 | 10,000 | 10,000 | > 750 | 10,000 | 10,000 |
| FI      | 100–750 | 0 | 1,500 | < 40 | 0 | 100% up to 100 |
| FR      | > 750 | 10,000 | 10,000 | > 750 | 10,000 | 10,000 |
| HR      | 100–750 | 0 | 1,500 | 40–250 | 0 | 100% up to 500 |
| HU      | > 750 | 10,000 | 10,000 | < 40 | 0 | 100% up to 100 |
| IE      | > 750 | 10,000 | 10,000 | 40–250 | 0 | 100% up to 500 |
| IT      | > 750 | 10,000 | 10,000 | > 750 | 10,000 | 10,000 |
| LT      | 40–100 | 0 | 100% up to 500 | < 40 | 0 | 100% up to 100 |
| LU      | < 40 | 0 | 100% up to 100 | < 40 | 0 | 100% up to 100 |
| LV      | 40–100 | 0 | 100% up to 500 | < 40 | 0 | 100% up to 100 |
| MT      | < 40 | 0 | 100% up to 100 | < 40 | 0 | 100% up to 100 |
| NL      | 100–750 | 0 | 1,500 | 250–750 | 0 | 1,500 |
| PL      | 100–750 | 0 | 1,500 | 40–250 | 0 | 100% up to 100 |
| PT      | > 750 | 10,000 | 10,000 | 250–750 | 0 | 1,500 |
| RO      | > 750 | 10,000 | 10,000 | > 750 | 10,000 | 10,000 |
| SE      | 100–750 | 0 | 1,500 | < 40 | 0 | 100% up to 100 |
| SI      | 100–750 | 0 | 1,500 | < 40 | 0 | 100% up to 100 |
| SK      | 100–750 | 0 | 1,500 | < 40 | 0 | 100% up to 100 |
| UK      | > 750 | 10,000 | 10,000 | 40–250 | 0 | 100% up to 500 |
| CH      | – | – | – | – | – | – |
| IS      | 100–750 | < 40 | – | – | – | – |
| ME      | 100–750 | < 40 | – | – | – | – |
| MK      | 100–750 | 40–250 | – | – | – | – |
| NO      | > 750 | 40–250 | – | – | – | – |
| RS      | > 750 | 40–250 | – | – | – | – |

TSE: transmissible spongiform encephalopathy; NSHC: animals not slaughtered for human consumption; SHC: animals slaughtered for human consumption.

The six non-MS reporting countries are included in the table for information. The TSE regulation does not apply to them.

(a): Thousand heads.

Live sheep population in 2019 (or latest available) extracted from: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=a
pro_mt_lssheep&lang=en.

Live goat population in 2019 (or latest available) extracted from: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=a
pro_mt_lsgoat&lang=en.

(–): No active surveillance system (in CH only suspect animals are tested).
1.2.4. TSE surveillance in cervids and other species

By Commission Regulation (EU) 2017/1972 requirements for a 3-year surveillance programme for chronic wasting disease (CWD) in cervids in Estonia, Finland, Latvia, Lithuania, Poland and Sweden were established. Annexes I and III of Regulation (EC) No 999/2001 are amended in accordance with the Annex to this Regulation, which describes the surveillance programme.

The Member States which have a wild and/or farmed and/or semi-domesticated population of moose and/or reindeer (Estonia, Finland, Latvia, Lithuania, Poland and Sweden) shall carry out a 3-year monitoring programme for CWD in cervids, from 1 January 2018 to 31 December 2020. The TSE tests performed for the purpose of this monitoring programme shall take place between 1 January 2018 and 31 December 2020; however, the collection of samples for the purpose of the monitoring programme may start in 2017. The 3-year monitoring programme for CWD in cervids is described in detail in Annex III, chapter A, Part III of the TSE Regulation. The other MS may carry out monitoring for CWD in cervids on a voluntary basis.

1.3. Testing protocols

The testing protocol for BSE surveillance in bovine animals is described in pages 8 and 9 of the 2016 EUSR on TSE (EFSA, 2017). The testing protocol for TSE surveillance in small ruminants is described in pages 13 and 14 of the 2016 EUSR on TSE (EFSA, 2017).

2. Data and methods

2.1. Origin of the data

The raw data are electronically submitted by MS and non-MS. The data to be submitted consist of testing data and case-based data for bovine animals, small ruminants, cervids and other species, according to the reporting periods (monthly basis) as described in Chapter B.I of Annex III of the TSE Regulation.

Surveillance data were mainly submitted through the EFSA TSE data reporting tool for the reporting of surveillance data on TSE as required by the TSE Regulation. The tool allows reporting countries to edit and automatically upload the data to the EFSA Data Collection Framework (DCF) for inclusion in the EFSA Scientific Data Warehouse (DWH). The tool has been applied for the first time during the 2018 TSE data collection period. A number of reporting countries (CZ, ES, FI, FR, IT and SE) transmitted data directly as eXtensible Markup Language (XML) files by using their own system for the automatic upload of data into the DCF, whereas the rest of the reporting countries transmitted XML files to the DCF via the EFSA TSE data collection tool. All data were then submitted to the EFSA DWH and confirmed by the reporting countries. The electronically submitted data were extracted from the EFSA DWH and further processed and validated by EFSA to summarise the information and to elaborate the summary tables presented in the current EUSR. A new validation dashboard has been made available to all reporting countries to visualise the 2018 and 2019 data.

Finally, information on the population of small ruminants in 2019 as presented in Table 4 were obtained from the 2019 or latest available Eurostat annual data (https://ec.europa.eu/eurostat/data/database). The number of BSE cases worldwide (Table 11) was obtained from the last available report on the monitoring and testing of ruminants for the presence of TSE in the EU (European Commission, 2016) and the OIE animal information system (http://www.oie.int/wahis).

During validation of the data with the reporting countries, additional information was asked with relation to the reporting according to i) Annex III, Chapter B, Section 1.A, point 1 of the TSE Regulation: the number of suspected cases placed under official movement restrictions in accordance with Article 12(1), per animal species; ii) Annex III, Chapter B, Section 1.A, point 3 of the TSE Regulation: the number of flocks for which suspected cases in ovine and caprine animals have been reported and investigated pursuant to Article 12(1) and (2); and iii) the number of ovine and caprine flocks tested within each subpopulation referred to in Annex III, Chapter A, Part II, points 2, 3, 5 and 6. The results of this questionnaire are summarised in Appendix D.

8 Commission Regulation (EU) 2017/1972 of 30 October 2017 amending Annexes I and III to Regulation (EC) No 999/2001 of the European Parliament and of the Council as regards a surveillance programme for chronic wasting disease in cervids in Estonia, Finland, Latvia, Lithuania, Poland and Sweden and repealing Commission Decision 2007/182/EC. OJ L 281, 31.10.2017, p. 14–20.
The data in this report refer only to the samples collected and confirmed cases reported between 1 January 2019 and 31 December 2019 in the EU and the six additional non-EU reporting countries: Iceland, Montenegro, North Macedonia, Norway, Serbia and Switzerland. Montenegro and Serbia (non-MS and non-EFTA countries) are the first-time submitting TSE data for the EU summary report.

EFSA validated the 2019 data by checking for inconsistencies in the electronically extracted data, and by comparing the reported data with previous years. Members of the TSE subgroup of the Scientific Network for Zoonoses Monitoring Data in the reporting countries were consulted during this validation. The data validation started on 1 April 2020 and was finalised on 16 July 2020. The results and tables presented in the current EUSR are based on the data retrieved from the EFSA Scientific Data Warehouse on 27 July 2020. An additional consultation with reporting countries was conducted between 25 September 2020 and 12 October 2020. If data were corrected by the reporting countries in the report but not updated in the EFSA Scientific Data Warehouse, the corrections will only be mentioned by means of footnotes in the current or future EUSR.

For some tables and figures, historical data (data between 2001 and 2019 with focus on the last 5 years in cattle and sheep) were extracted from the EU TSE database. As certain MS and non-MS may calculate their annual statistics using different reporting criteria (e.g. based on the date of sampling), the data summarised in this report may differ slightly from the national figures published by single MS for 2019. In addition, subsequent submissions of updated/amended data by MS may have resulted in differences in the figures included in this report when compared with the same data presented in previous EU summary reports.

2.2. Presentation of the data

The current report should be considered the EU summary report for 2019 in compliance with Section II, Chapter B, Annex III of the TSE Regulation.

The 28 EU MS or EU28, the three EFTA members, Iceland, Norway and Switzerland, and the non-EFTA IPA (Instrument for Pre-Accession Countries) countries, North Macedonia, Montenegro and Serbia, are the reporting countries included in this report. The data reported by Switzerland include those of Lichtenstein. The countries are quoted in this report by using the country codes from the Nomenclature of Units for Territorial Statistics (NUTS) or the English name according to Regulation (EC) No 1059/2003⁹. For some tables and figures, the surveillance target groups were combined: FS, ES and AM in bovine animals have been included in the group ‘risk animals’. The word ‘risk animals’ is used here to indicate those animals whose probability of being detected with the disease is higher than in the surveillance target group of HS animals. However, this does not imply that the risk animals experienced a higher level of exposure than normal (Doherr et al., 2001). The same holds for small ruminants from the NSHC target group (Bird, 2003) when tested from non-infected flocks/herds.

2.3. Methods

2.3.1. Descriptive methods

To describe the results of the TSE surveillance programme in the EU in 2019, a number of figures and tables have been produced along with a short narrative text to describe the main findings. The report is split into four sections: bovine animals (cattle), small ruminants (sheep and goats), cervids and species other than bovine, ovine and caprine animals and cervids. Both EU aggregated data and data at the national level are presented. Where it was considered relevant, multi-year and historical data are shown. Surveillance data were available for the period 2001–2019 for bovine animals, for 2002–2019 for small ruminants and for 2018 and 2019 for cervids and other species.

For bovine animals, summary statistics were obtained based on the total number of tests performed in 2019 by reporting country and surveillance target group. In addition, historical data relating to confirmed cases since 2015 are presented in detail whereas those on the 2001–2014 period have been summed up. This 5-year period has been selected as during the period 2015–2019 a harmonised EU-wide, active BSE surveillance was applied and restricted to at risk animals of ≥ 48 months of age, even though few exceptions are still in place in some countries as shown in Table 2.

Additional epidemiological parameters have been presented: number of cases by case type (e.g. C-BSE, H-BSE, L-BSE), target group and proportions (cases per million tests) by case type and year.

⁹ Regulation (EC) No 1059/2003 of the European Parliament and of the Council of 26 May 2003 on the establishment of a common classification of territorial units for statistics (NUTS). OJ L 154, 21.6.2003, p. 1–41.
These have been used to describe the development of the BSE epidemic and to put into context the findings of the reporting year.

To obtain relevant epidemiological information about the BSE cases detected in 2019, EFSA asked for additional information from the individual concerned reporting countries via a small questionnaire.

For small ruminants, summary statistics are presented in this report, and where possible, stratified according to the relevant variables in the database such as surveillance target group (SHC, NSHC, SU, EM), flock/herd status (infected, non-infected, unknown/not available), surveillance type (passive surveillance restricted to SU vs. active surveillance restricted to SHC and NSHC in non-infected flocks/herds), country, year (since 2002), case type (CS or AS), index case (yes/no). In particular, when historical data have been considered for trend analysis, the last 10-year period (2010–2019) has been included in the analysis.

Based on the minimum testing requirements for TSE surveillance in small ruminants (Table 4), a check has been carried out of the compliance of each MS. For assessing compliance, the following criteria have been applied:

- For testing in the NSHC surveillance target group: if the difference between observed testing and expected testing (minimum requirements) was positive, then the MS is compliant with the testing requirements.
- For testing in the SHC surveillance target group: if the difference between observed testing and expected testing (minimum requirements) was positive, the MS is compliant. When the difference was negative, a further calculation was performed to check if the MS compliance had been achieved by applying the derogation provided by the TSE Regulation (according to point II.2(c), Chapter A, Annex III of the TSE Regulation) i.e. replacing up to 50% of its minimum SHC sample size by testing dead ovine or caprine animals over the age of 18 months at the ratio of 1:1 and in addition to the minimum sample size for NSHC.
- If the MS is required to test 100% up to 500 of the NSHC in sheep, and the reported number of tested sheep was, e.g. 350 – the MS was categorised as compliant since it is not known the total subpopulation of NSHC in the country.

An MS has been considered to meet the minimum requirements when the above criteria have been met in both target groups.

The reporting system of TSE surveillance data does not allow the collation of the number of newly infected flocks and herds during the reporting year but only the number of index cases, considered to be a proxy for the number of incident scrapie cases.

Finally, the classification originally developed by the Great Britain’s National Scrapie Plan (NSP) was used to summarise and describe the data on genotyping.

In order to describe and plot the reported data, some assumptions were made for reporting the results in bovine animals and small ruminants (sheep and goats):

- To plot the temporal evolution of BSE cases (C-BSE, L-BSE and H-BSE), cases for which the type was reported as 'unknown' or was missing were considered for reporting purposes as C-BSE, since most of these were reported before 2005.
- To plot the reported scrapie cases according to the flock/herd status, it was assumed that flocks/herds with status reported as ‘unknown’, ‘other’ or blank were considered for reporting purposes as ‘non-infected flocks/herds’.
- To describe the evolution of the total number of scrapie index cases, it was assumed that all index cases (‘yes’) were confirmed in non-infected flocks/herds. If an index case was reported as ‘no’ or ‘unknown’, it was considered for reporting purposes as ‘infected flocks/herds’.
- To describe the results of the discriminatory TSE testing, it was assumed that all scrapie cases with ‘BSE-like’, ‘non-BSE-like’ or ‘inconclusive’ results in the primary or secondary molecular tests have been submitted for discriminatory testing.

For cervids, summary statistics were extracted and presented in tabular format as follows:

- for all reporting countries, number of tested cervids in 2019 by reporting country, species and management system (wild and semi-domesticated/farmed).
- for the six MS subject to mandatory surveillance, number of PSU declared, proportion tested and median, minimum and maximum number of tested cervids in 2019 per PSU by MS and management system.
- for all reporting countries, the number of tested cervids in 2019 by target group, species, management system and reporting country.
Number of tested animals in species other than cattle, sheep, goats and cervids tested for TSE in reporting countries in 2019 are presented in tabular format by species and reporting country.

### 2.3.2. Analytical methods

With regard to surveillance in cattle, the average number of cases detected per million tests at the EU level in both the risk animals and HS target groups (period 2010–2019) have been used to check if any significant temporal trend was detectable. For this purpose, a Poisson regression model has been fitted for each BSE type (C-BSE, H-BSE and L-BSE) separately, using the number of cases as dependent variable and the year as a continuous independent variable. The number of tests was taken into account in the model (offset).

The target group (risk animals vs. HS), potentially affecting the probability of detecting the disease, was added to the model as covariate to adjust for any confounding effect. A $p \leq 0.05$ was considered statistically significant. The relative risk (RR) obtained by exponentiating the beta coefficient associated with the ‘year’ variable was used as a measurement of the annual variation in the probability of detection, i.e. the temporal trend for the entire period. In the model, the RR indicates the average annual change in the proportion of cases per animals tested corresponding with the annual probability of detecting the disease: an RR $> 1$ indicates an average annual increase in the number of cases per million whereas an RR $< 1$ indicates an average annual decrease.

TSE data of small ruminants from the last 10 years (period 2010–2019) have been used to check if any significant temporal trend was detectable. As per BSE, a Poisson regression model has been fitted for ovine and caprine animals separately, using the number of cases as dependent variable and the year as a continuous independent variable. The number of tests was taken into account in the model (offset). The target group (NSHC vs SHC), potentially affecting the probability of detecting the disease, was added to the model as covariate to adjust for any confounding effect. A $p \leq 0.05$ was considered statistically significant for both the statistical analyses. The RR obtained by exponentiating the beta coefficient associated with the ‘year’ variable was used as a measurement of the annual variation in the probability of detection, i.e. the temporal trend for the entire period. In the model, the RR indicates the average annual change in the number of cases per animals tested corresponding with the annual probability of detecting the disease: an RR $> 1$ indicates an average annual increase in the number of cases per million whereas an RR $< 1$ indicates an average annual decrease.

The mean age of the AS cases has been compared with that of CS cases in sheep and goats by applying a two-sample t-test with unequal variances. A $p \leq 0.05$ was considered statistically significant.

### 3. Assessment

#### 3.1. BSE surveillance in bovine animals

About 118.8 million bovine animals have been tested for BSE in EU since 2001. In 2019, there was a 2.7% reduction in the number of tested bovine animals in the EU, from 1,181,934 in 2018 to 1,150,388 in 2019, due to a reduction in the HS target group: from 177,536 in 2018 to 156,229 in 2019 and the slight reduction in the number of tested animals in the FS from 932,049 in 2018 to 918,182 in 2019, despite a 7.3% increase of animals tested in the ES group (from 64,262 in 2018 to 68,969 in 2019). Romania and Bulgaria continue being the main contributors to the HS testing group with 137,463 (88%) tested cattle.

The six non-MS (Iceland, Montenegro, Norway, North Macedonia, Serbia and Switzerland) tested 44,557 cattle in 2019; Serbia, a new reporting country, was the main contributor with 20,110 cattle tested. The two new reporting countries, Montenegro and Serbia, reported mostly cattle tested in the HS target group and Serbia 30 extra cattle as clinical suspects.

There was a decrease of 1% in the number of animals tested in the risk group (ES+AM+FS), from 1,003,707 in 2018 to 993,332 in 2019. Similar to the previous year, cattle in the risk group accounted for over 86.4% of all tested cattle in the EU and cattle tested in the FS target group accounted for 92.4% of all risk cattle tested.

The number of cattle tested for BSE per reporting country for each target group in 2019 is shown in Table 5.
Table 5: Number of bovine animals tested for BSE by reporting country and surveillance target group in 2019 in the EU and other reporting countries

| Country | Surveillance target group | Risk animals | Other target groups | Total |
|---------|---------------------------|--------------|---------------------|-------|
|         |                           | ES          | AM | FS | Subtotal risk animals | HS | SU | EM | Subtotal other target groups |       |
| AT      |                           | 3,659       | 29 | 15,326 | 19,014 | 64 | 19 | 83 | 19,097 |
| BE      |                           | 785         | 3  | 25,335 | 26,123 | 2  | 8  | 10 | 26,133 |
| BG      |                           | 844         | 2,144 | 2,988 | 24,781 | 6  | 24,787 | 27,775 |
| CY      |                           | 53          | 1,686 | 1,739 | 22    | 22 |     | 1,761 |
| CZ      |                           | 2,848       | 3  | 21,497 | 24,348 | 78 | 2  | 80 | 24,428 |
| DE      |                           | 10,240      | 162,896 | 173,136 | 339 | 584 | 923 | 174,059 |
| DK      |                           | 1,705       | 22,872 | 24,577 | 18 |     | 1 | 24,578 |
| EE      |                           | 140         | 44 | 3,578 | 3,762 |     |     | 0 | 3,762 |
| EL      |                           | 107         | 10 | 1,190 | 1,307 | 10,366 | 5 | 10,371 | 11,678 |
| ES      |                           | 556         | 16 | 60,609 | 61,181 | 185 | 21 | 206 | 61,387 |
| FI      |                           | 14          | 11,272 | 11,286 | 3 |     | 3 | 11,289 |
| FR      |                           | 3,410       | 203,849 | 207,259 | 7,100 | 13 | 7,114 | 214,373 |
| HR      |                           | 22          | 4,992 | 5,014 | 118 |     | 118 | 5,132 |
| HU      |                           | 81          | 76 | 10,927 | 11,084 | 170 | 12 | 182 | 11,266 |
| IE      |                           | 427         | 56,426 | 56,853 | 8 |     | 8 | 56,861 |
| IT      |                           | 19,048      | 381 | 34,356 | 53,785 | 242 |     | 242 | 54,027 |
| LT      |                           | 15          | 37 | 2,823 | 2,875 |     |     | 0 | 2,875 |
| LU      |                           | 2,593       |     | 2,593 | 3 |     | 3 | 2,596 |
| LV      |                           | 279         | 258 | 2,831 | 3,368 | 1 |     | 1 | 3,369 |
| MT      |                           | 60          |     | 232 | 292 |     |     | 0 | 292 |
| NL      |                           | 5,037       | 46,964 | 52,001 | 27 |     | 27 | 52,028 |
| PL      |                           | 10,692      | 714 | 48,753 | 60,159 | 2 | 14 | 37 | 60,196 |
| PT      |                           | 1,440       | 1,224 | 14,246 | 16,910 | 3 | 6 | 9 | 16,919 |
| RO      |                           | 2,855       | 2,714 | 3,278 | 8,847 | 112,682 | 70 | 112,752 | 121,599 |
| SE      |                           | 152         | 26 | 8,227 | 8,405 | 19 |     | 19 | 8,424 |
| SI      |                           | 409         | 78 | 5,822 | 6,309 | 30 | 8 | 38 | 6,347 |
| SK      |                           | 60          |     | 9,656 | 9,716 | 2 |     | 2 | 9,718 |
| UK      |                           | 4,185       | 414 | 133,802 | 138,401 | 13 | 5 | 18 | 138,419 |
| Total EU |                       | 68,696      | 6,454 | 918,182 | 993,332 | 156,229 | 767 | 157,056 | 1,150,388 |
| CH      |                           | 4,159       |     | 7,016 | 11,175 | 26 |     | 26 | 11,201 |
| IS      |                           | 3           | 9 |     | 12 |     |     | 0 | 12 |
| ME      |                           | 0           |     | 4,227 |     | 4,227 | 4,227 | 4,227 |
| MK      |                           | 0           |     | 2,123 |     | 2,123 | 2,123 | 2,123 |
| NO      |                           | 5,147       | 153 | 1,584 | 6,884 |     |     | 0 | 6,884 |
| RS      |                           | 57          | 2,779 | 2,836 | 17,244 | 30 | 17,274 | 20,110 |
| Total Non-EU |                   | 9,366       | 153 | 11,388 | 20,907 | 23,594 | 56 | 0 | 23,650 | 44,557 |
| Total   |                           | 78,062      | 6,607 | 929,570 | 1,014,239 | 179,823 | 823 | 60 | 180,706 | 1,194,945 |

BSE: bovine spongiform encephalopathy, ES: emergency slaughtered; AM: animals with clinical signs at ante-mortem; FS: fallen stock; HS: healthy slaughtered; SU: animals clinically suspected of being infected with BSE; EM: animals culled under BSE eradication measures.
The distribution of the number of bovine animals tested for BSE by age group, surveillance target group and reporting country in 2019 can be found in the following link: https://doi.org/10.5281/zenodo.4087794 distributed as follows:

- **Table 6**: Number of bovine animals tested by age group in the EU MS and non-MS reporting countries in 2019.
- **Table 7**: Number of bovine animals in the risk group (animals with clinical signs at ante-mortem, emergency slaughtered and fallen stock), by age group, tested in EU MS and non-MS reporting countries in 2019.
- **Table 8**: Number of tested healthy slaughtered bovine animals by age group in EU MS and in non-MS reporting countries in 2019.
- **Table 9**: Number of BSE suspected bovine animals, by age group, tested in EU MS and in non-MS-reporting countries in 2019.
- **Table 10**: Number of bovine animals culled under BSE eradication measures, by age group, tested in EU MS and in non-MS-reporting countries in 2019.

In the EU, seven BSE cases were reported in 2019, all atypical BSE submitted to the FS testing group: six H-type (two by Spain and four by France) and one L-type by Poland. Table 11 reports the main clinical and epidemiological data of the positive cases. One additional H-type case was reported outside Europe, by Brazil in a 17-year-old beef cow found dead during ante-mortem inspection at abattoir. The animal was born and raised on a full-cycle beef farm on extensive grazing.\(^{10}\)

The number of H-type BSE cases in the EU was the largest reported in a single year (6), equal to the number reported in 2009. As a result, the proportion of cases per million tests raised to 6 for H-type BSE in 2019 (Figure 1). The number of L-type BSE was in line with the number of cases reported in the last few years. Most of the atypical cases reported in 2019 were detected in beef cattle older than 11 years, except one of the two H-type BSE cases reported by Spain, an unusually young dairy animal (5.5 years). In fact, it is the youngest atypical BSE case ever reported since the TSE data are collected and published.

Based on 115 atypical BSE cases with known age of, the average age at detection was 11.85 years (range: 5.5–18.5 years) and tested in the FS target group that accounts, as mentioned above, for most of the tested animals.

The number of BSE cases by reporting country, type and year (up to 2019, with a focus on the last 5 years) is shown in Tables 12–14.

Time series analysis carried out over the last 10-year period (period 2010–2019) shows a significant decreasing trend in the occurrence of C-BSE (annual RR = 0.59 i.e. an annual decrease of 41% in the proportion of cases per tested animals; \( p < 0.0001 \)), whereas no significant trend for the two atypical BSE forms was found (H-BSE:1.05 \( p = 0.43 \); L-BSE: 1.05 \( p = 0.47 \)).

Maps showing the geographical distribution of the cumulative number of cases and the cumulative proportion of cases per million tests of C-BSE cases born after the total (reinforced) feed ban (BARB), H-BSE and L-BSE for the period 2001–2019 are shown in Appendix B.

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\(^{10}\) https://www.oie.int/wahis_2/temp/reports/en_imm_0000030678_20190603_110419.pdf
Table 11: Clinical and epidemiological description of the seven BSE cases detected in 2019

| Country | ES - atypical 1 | ES - atypical 2 | FR - atypical 3 | FR - atypical 4 | FR - atypical 5 | FR - atypical 6 | PL - atypical 7 |
|---------|----------------|----------------|----------------|----------------|----------------|----------------|---------------|
| **Surveillance target group** | Fallen Stock | Fallen Stock | Fallen Stock | Fallen Stock | Fallen Stock | Fallen Stock | Fallen Stock |
| **Case type** | H-BSE | H-BSE | H-BSE | H-BSE | H-BSE | H-BSE | L-BSE |
| **Month and year of birth** | July 2013 | January 2001 | January 2003 | March 2008 | November 2003 | April 2003 | July 2007 |
| **Age at detection (in months)** | 66 | 222 | 193 | 132 | 192 | 200 | 138 |
| **BARB status** | No | No | No | No | No | No | No |
| **Clinical signs** | No | Not specific: Limp, ataxia, and weight loss | None | None | Weight loss during previous months | None | No |
| **Cattle type** | Dairy | Beef | Beef cattle | Beef cattle | Beef cattle | Beef cattle | Beef cattle |
| **Breed** | Holstein-Friesian | Mixed | Limousine | Aubrac | Charolais | Mixed breed (Blond d'Aquitaine x mixed) | Limousine |
| **Was the case confirmed at herd/holding where the animal was born?** | Yes | No | No | No | Yes | Yes | No |
| **Location (NUTS3) of natal herd or herd where case found** | El Piñero-Zmora-Castilla y León | Manoñ- A Coruña- Galicia | 81190 Montauriol Tarn | 43800 Chamalières sur Loire (Haute-Loire) | 23700 Donteix (Creuse). | 11230 Corbieres (Aude) | PL 515, (Mirs, Mirsk, Lwowek Slaski, Dolnoslaskie) |
| **Herd size** | 465 | 67 | 157 | 157 | 174 | 87 | 50 |
| **Herd type** | Dairy | Beef | Beef | Beef | Beef | Beef | Beef |
| **Feeding system during first year of life** | Mixed | Unknown | Milk + forage | Unknown | Milk + granulated | Not born on farm. Feeding system unknown |
| **Feed cohorts? Tested? If Yes: Results (number tested; number positives)** | No | 19. Not tested. No BSE case in natal herd | 13 tested negative | 3 tested negative | Ongoing (1) | 8 tested negative |
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| Country | ES - atypical 1 | ES - atypical 2 | FR- atypical 3 | FR- atypical 4 | FR- atypical 5 | FR- atypical 6 | PL- atypical 7 |
|---------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Birth cohorts? Tested? If Yes: Results (number tested; number positives) | 50 | 16. Not tested. | 13 tested negative | 2 tested negative | 2 tested negative | 2 tested negative | 21 tested negative |
| Offspring? Tested? If Yes: Results (number tested; number positives) | Not tested | Not tested | 0 | 0 | No | Yes, not tested (dead) |
| Sire? Tested? (Yes/No). If Yes: Results (positive? Negative?) | Unknown | Unknown | 0 | 0 | No | No |
| Dam? Tested (Yes/No). If Yes: Results (positive? Negative?) | Not tested | Not tested | 0 | 0 | No | No |

BSE: bovine spongiform encephalopathy; H-BSE: H-type BSE; L-BSE: L-type BSE.
Table 12:
Total number of reported BSE cases (classical-BSE + atypical H-BSE + atypical L-BSE) in reporting countries and worldwide by year (up to 2019) and country

| Country | Year | Total |
|---------|------|-------|
|         | Up to 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| AT      | 8    | 0    | 0    | 0    | 0    | 0    | 8 |
| BE      | 133  | 0    | 0    | 0    | 0    | 0    | 133 |
| CZ      | 30   | 0    | 0    | 0    | 0    | 0    | 30 |
| DE      | 421  | 0    | 0    | 0    | 0    | 0    | 421 |
| DK      | 16   | 0    | 0    | 0    | 0    | 0    | 16 |
| EL      | 1    | 0    | 0    | 0    | 0    | 0    | 1 |
| ES      | 812  | 1    | 1    | 3    | 0    | 2    | 819 |
| FI      | 1    | 0    | 0    | 0    | 0    | 0    | 1 |
| FR      | 1,000| 0    | 4    | 2    | 3    | 4    | 1,013 |
| IE      | 1,659| 1    | 0    | 1    | 0    | 0    | 1,661 |
| IT      | 147  | 0    | 0    | 0    | 0    | 0    | 147 |
| LU      | 3    | 0    | 0    | 0    | 0    | 0    | 3 |
| NL      | 88   | 0    | 0    | 0    | 0    | 0    | 88 |
| PL      | 74   | 0    | 0    | 0    | 0    | 1    | 75 |
| PT      | 1,086| 0    | 0    | 0    | 0    | 0    | 1,086 |
| RO      | 2    | 0    | 0    | 0    | 0    | 0    | 2 |
| SE      | 1    | 0    | 0    | 0    | 0    | 0    | 1 |
| SI      | 8    | 1    | 0    | 0    | 0    | 0    | 9 |
| SK      | 27   | 0    | 0    | 0    | 0    | 0    | 27 |
| UK      | 184,592| 2 | 0    | 0    | 1    | 0    | 184,595 |

**Total EU-28** | **190,109** | **5** | **5** | **6** | **4** | **7** | **190,136** |

| Country | Year | Total |
|---------|------|-------|
| BRA     | 2    | 0    | 0    | 0    | 0    | 1    | 3 |
| CAN     | 19   | 1    | 0    | 0    | 0    | 0    | 20 |
| ISR     | 1    | 0    | 0    | 0    | 0    | 0    | 1 |
| JPN     | 36   | 0    | 0    | 0    | 0    | 0    | 36 |
| LI      | 2    | 0    | 0    | 0    | 0    | 0    | 2 |
| NO      | 0    | 1    | 0    | 0    | 0    | 0    | 1 |
| CH      | 465  | 0    | 0    | 0    | 0    | 0    | 465 |
| USA     | 4    | 0    | 0    | 0    | 1    | 1    | 6 |

**Total non-EU** | **529** | **2** | **0** | **1** | **1** | **1** | **534** |

**Total** | **190,638** | **7** | **5** | **7** | **5** | **8** | **190,670** |

BRA: Brazil; CAN: Canada; ISR: Israel; JPN: Japan; LI: Liechtenstein; NO: Norway; CH: Switzerland; USA: The United States of America. BSE: bovine spongiform encephalopathy; H-BSE: H-type BSE; L-BSE: L-type BSE.

(a): Included imported cases: CAN one case in 1993; Denmark one case in 1992; France one case in 1999; Germany one case in 1992, three cases in 1994, two cases in 1997; Ireland five cases in 1989, one case in 1990, two cases in 1991 and 1992, one case in 1994 and one case in 1995; Italy two cases in 1994, 2001 and 2002; Portugal one case in 1990, 1991, 1992, 2000 and 2004 and three cases in 1993; Slovenia one case in 2004; Switzerland one case in 2012; USA one case in 2003.

(b): NL: The number of classical scrapie for NL should be updated in the database for 2001 from 18 cases to 19 cases.

Therefore, the total of the Netherlands for the column up to 2013 is 88 instead of 87.

(c): Gavier-Widen et al. (2008).

Each cell reports the total number of BSE cases (C-BSE + H-BSE + L-BSE). Grey-shaded cells indicate the year(s) and Member State(s) where at least one BARB case was detected (EFSA, 2017). EU countries without BSE cases are not included.

Source: data regarding non-EU cases and cases in EU Member States for the period 1987-2002 were made available by the European Commission (European Commission, 2016). Data were retrieved from the EU TSE Database and the OIE website (http://www.oie.int/wahis).
### Table 13: Number of reported classical BSE cases in the EU and non-EU reporting countries by year (up to 2019) and country

| Country code | Year       | Total |
|--------------|------------|-------|
|              | Up to 2014 | 2015  | 2016  | 2017  | 2018  | 2019  |
| AT           | 5          | 0     | 0     | 0     | 0     | 0     | 5     |
| BE           | 133        | 0     | 0     | 0     | 0     | 0     | 133   |
| CZ           | 29         | 0     | 0     | 0     | 0     | 0     | 29    |
| DE           | 416        | 0     | 0     | 0     | 0     | 0     | 416   |
| DK           | 15         | 0     | 0     | 0     | 0     | 0     | 15    |
| EL           | 1          | 0     | 0     | 0     | 0     | 0     | 1     |
| ES           | 798        | 0     | 0     | 0     | 0     | 0     | 798   |
| FI           | 1          | 0     | 0     | 0     | 0     | 0     | 1     |
| FR           | 968        | 0     | 1     | 0     | 0     | 0     | 969   |
| IE           | 1,655      | 1     | 0     | 0     | 0     | 0     | 1,656 |
| IT           | 142        | 0     | 0     | 0     | 0     | 0     | 142   |
| LU           | 3          | 0     | 0     | 0     | 0     | 0     | 3     |
| NL           | 84         | 0     | 0     | 0     | 0     | 0     | 84    |
| PL           | 60         | 0     | 0     | 0     | 0     | 0     | 60    |
| PT           | 1,079      | 0     | 0     | 0     | 0     | 0     | 1,079 |
| SI           | 8          | 0     | 0     | 0     | 0     | 0     | 8     |
| SK           | 27         | 0     | 0     | 0     | 0     | 0     | 27    |
| UK           | 184,577    | 1     | 0     | 0     | 1     | 0     | 184,579 |
| **Total EU** | 190,001    | 2     | 1     | 0     | 1     | 0     | 190,005 |
| CH           | 464        | 0     | 0     | 0     | 0     | 0     | 464   |
| **Total non-EU** | 464 | 0     | 0     | 0     | 0     | 0     | 464   |
| **Total**    | 190,465    | 2     | 1     | 0     | 1     | 0     | 190,469 |

BSE: bovine spongiform encephalopathy.
Each cell reports the total number of C-BSE cases.
Reporting countries that have never reported classical cases are not included in the table.
Grey-shaded cells indicate the year and Member State where at least one BARB case was detected (EFSA BIOHAZ Panel, 2017a).
Source: Data were retrieved from the EU TSE Database and from the OIE website for CH.

### Table 14: Number of reported BSE atypical cases in EU and non-EU reporting countries by year (period 2001–2019), type and country

| Country code | Year       | TOTAL |
|--------------|------------|-------|
|              | 2001–2014  | 2015  | 2016  | 2017  | 2018  | 2019  |
| H            | L          | H     | L     | H     | L     | H     | L     |
| AT           | 1          | 2     | 1     | 2     | 1     | 2     | 1     |
| CZ           | 1          | 0     | 1     | 0     | 1     | 0     | 1     |
| DE           | 2          | 3     | 2     | 3     | 2     | 3     | 2     |
| DK           | 0          | 1     | 0     | 1     | 0     | 1     | 0     |
| ES           | 7          | 7     | 1     | 1     | 1     | 2     | 2     |
| FR           | 15         | 17    | 3     | 1     | 1     | 2     | 4     | 24  |
| IE           | 4          | 0     | 1     | 4     | 1     | 4     | 1     |
| IT           | 0          | 5     | 0     | 5     | 0     | 5     | 0     |
| NL           | 1          | 3     | 1     | 3     | 1     | 3     | 1     |
| PL (a)       | 2          | 12    | 1     | 2     | 1     | 2     | 1     |
| PT           | 7          | 0     | 7     | 0     | 7     | 0     | 7     |
| RO           | 0          | 2     | 0     | 2     | 0     | 2     | 0     |
| SE           | 1          | 0     | 1     | 0     | 1     | 0     | 1     |

Notes:
- BSE: bovine spongiform encephalopathy.
- Grey-shaded cells indicate the year and Member State where at least one BARB case was detected (EFSA BIOHAZ Panel, 2017a).
- Source: Data were retrieved from the EU TSE Database and from the OIE website for CH.

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(a) Data for 2001 and 2002 were not available.
The number of historical reported BSE cases can be found in the following link https://doi.org/10.5281/zenodo.4252322, as follows:

| Country code | Year | TOTAL |
|--------------|------|-------|
|              | 2001–2014 | 2015 | 2016 | 2017 | 2018 | 2019 | H | L | H | L | H | L | H | L | H | L | H | L |
| SI           | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| UK           | 6 | 9 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total EU     | 47 | 61 | 2 | 1 | 4 | 0 | 2 | 4 | 1 | 2 | 6 | 1 | 62 | 69 | 7 | 9 |
| NO           | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CH           | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total non-EU | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total        | 48 | 61 | 3 | 1 | 4 | 0 | 2 | 4 | 1 | 2 | 6 | 1 | 64 | 69 | 7 | 9 |

BSE: bovine spongiform encephalopathy.
Each cell reports the total number of H-type BSE (H) and L-type BSE (L) cases.
Reporting countries that have never reported atypical cases are not included in the table.
(a): In 2012, PL reported an atypical BSE case without specifying the type.
Source: Data were retrieved from the EU TSE Database and from the OIE website for CH.

The number of historical reported BSE cases can be found in the following link https://doi.org/10.5281/zenodo.4252322, as follows:

- **Table 15**: Number of BSE cases per country and year until 2000 (included) in the EU and non-EU countries.
- **Table 16**: Number of classical BSE cases per country and year from 2001 in the EU and non-EU reporting countries.
- **Table 17**: Number of atypical H-BSE cases per country and year from 2001 in the EU and non-EU reporting countries.
- **Table 18**: Number of atypical L-BSE cases per country and year from 2001 in the EU and non-EU reporting countries.
3.2. TSE surveillance in small ruminants

Since 2002, nearly 10 million small ruminants have been tested as part of the official EU TSE surveillance in the EU. In 2019, 481,627 small ruminants were tested by the 28 MS: 338,098 sheep (70.2%) and 143,529 goats (29.8%), which represents a 3.9% increase (18,113) in the number of tested small ruminants in the EU, compared with that of 2018.

In four of the six non-MS reporting countries (Iceland, North Macedonia, Norway, Serbia), a total of 23,690 small ruminants were tested: 23,473 sheep (99.1%) and 217 goats (0.9%), an increase of 1,740 from 2018, mostly due to the increase in testing by Norway and Iceland, and not by the addition of the two new reporting countries (only Serbia tested 165 sheep slaughtered for human consumption). Montenegro and Switzerland did not report data on small ruminants.

In sheep, the increase in the total tested in the EU was 3.9% (338,098 tested in 2019 compared with 325,386 in 2018), due to the increase in testing in both TSE-infected flocks with a 9.4% increase in 2019 (from 37,662 in 2018 to 41,197 in 2019), and non TSE-infected flocks with a 3% increase in 2019 (from 285,897 in 2018 to 294,527 in 2019).

Figure 1: Cases per million tested bovine animals by surveillance target group and case type for the period 2014–2019 in the EU (black numbers in white background: number of cases). BSE: bovine spongiform encephalopathy; H-BSE: H-type BSE; L-BSE: L-type BSE
In goats, there was also a 3.9% increase in the tested animals in the EU (143,529 in 2019 compared with 138,128 in 2018), due to the increase of testing in both TSE-infected herds with a 5.2% increase in 2019 (from to 12,375 in 2018 to 13,013 in 2019) and non-TSE-infected herds with a 3.3% increase in 2019 (from 125,658 in 2018 to 129,810 in 2019).

The numbers of sheep and goats tested for TSE by reporting country, surveillance target group and flock/herd status in 2019 are summarised in Tables 19 and 20, respectively. Taking into account the number of samples tested in the SHC and NSHC target groups and those required according to the TSE Regulation (Table 4), 22 MS fulfilled the requirements for sheep testing. In goat surveillance, 23 MS fulfilled the requirements for goat testing.

The pattern of testing in 2019 in sheep by country and flock status was very similar to that of 2018. In 2019, for each sheep tested in a TSE-infected flock in the EU, there were 7.1 sheep tested in non-TSE-infected flocks, similar to 2018 and lower than in 2017 with nearly 11 tested in non-TSE-infected flocks. The increase in the overall testing of sheep in 2019 is mostly due to the higher level of testing in three reporting countries: Spain, Italy and Poland, with an overall increase of 4,776, 4,161 and 2,711 sheep tested, respectively.

The pattern of testing in 2019 in goats by country and flock status was very similar to that of 2018. In 2019, for each goat tested in a TSE-infected herd in the EU, there were 10 goats tested in non-TSE-infected herds, similar to 2018 and much lower than in 2017 with nearly 31 goats tested in non-TSE-infected herds in 2017. The increase in the overall testing of goats in 2019 is mostly due to the higher level of testing in Italy, with an overall increase of 4,796 goats tested.
Table 19: Number of sheep tested for TSE by reporting country, surveillance target group and flock status in 2019 in the EU and other reporting countries

| Flock status | TSE-infected flocks | Non-infected flocks | Unknown/not available |
|--------------|---------------------|---------------------|-----------------------|
|              | EM | NSHC | SHC | SU | EM | NSHC | SHC | SU | EM | NSHC | SHC | SU | Subtotal TSE infected flocks | Subtotal non-infected flocks | Subtotal unknown/not available | Total |
| Surveillance target group | | | | | | | | | | | | | | | | | |
| AT | 11 | 6 | 17 | | 2,922 | 166 | 3,088 | | | | | | | | | | | 3,105 |
| BE | | | | | 1,574 | 4 | 1,578 | | | | | | | | | | | 1,578 |
| BG | | | | | 2,678 | 18,028 | 5 | 20,711 | | | | | | | | | | 20,711 |
| CY | 910 | 761 | 1,671 | 1,652 | 82 | 1,734 | | | | | | | | | | | 3,405 |
| CZ | | | | | | | | | | | | | | | | | | 2,374 |
| DE | 19 | 19 | 10,865 | 9,837 | 50 | 20,752 | | | | | | | | | | | 20,771 |
| DK | | | | | 517 | | 517 | | | | | | | | | | | 517 |
| EE | | | | | 326 | | 326 | | | | | | | | | | | 326 |
| EL | 1,865 | 2,110 | 1,239 | 3 | 5,217 | 113 | 1,036 | 21 | 1,170 | | | | | | | | | | 6,387 |
| ES | 12,156 | 12,156 | | | 13,554 | 8,987 | 5 | 22,546 | | | | | | | | | | 34,702 |
| FI | 19 | 5 | 24 | | 1,636 | 5 | 1,641 | | | | | | | | | | | 1,665 |
| FR | 41 | 41 | 19,682 | 8,371 | 5 | 25,026 | | | | | | | | | | | 25,067 |
| HR | | | | | 1,350 | | 1,350 | | | | | | | | | | | 1,350 |
| HU | 4,128 | 397 | 4,525 | | 7,996 | 8,760 | 16,756 | | | | | | | | | | | 21,281 |
| IE | 41 | 279 | 320 | | 10,781 | 10,834 | 1 | 21,616 | | | | | | | | | | 21,936 |
| IT | 5,422 | 459 | 802 | | 13,656 | 12,362 | 10 | 26,028 | | | | | | | | | | 32,711 |
| LT | | | | | 666 | | 666 | | | | | | | | | | | | 666 |
| LU | | | | | 100 | | 100 | | | | | | | | | | | | 100 |
| LV | | | | | 254 | | 254 | | | | | | | | | | | | 254 |
| MT | | | | | 302 | 139 | 441 | | | | | | | | | | | 441 |
| NL | | | | | 1,520 | | 1,520 | | | | | | | | | | | 1,520 |
| PL | 424 | 83 | 507 | | 10,843 | 21,360 | 73 | 32,276 | | | | | | | | | | 32,276 |
| PT | 424 | 83 | 507 | 15,046 | 5,143 | 20,189 | | | | | | | | | | | 20,696 |
| RO | 180 | 6,999 | 7,191 | | 19,141 | 17,231 | 11 | 36,383 | | | | | | | | | | 43,574 |
| SE | 56 | 16 | 72 | | 1,229 | 16 | 1 | 1,246 | | | | | | | | | | 1,318 |
| SI | | | | | 2,500 | 203 | 11 | 2,714 | | | | | | | | | | 2,714 |
### Table 20: Number of goats tested for TSE by reporting country, surveillance target group and herd status in 2019 in the EU and other reporting countries

| Herd status     | TSE-Infected Herds | Non-infected Herds | Unknown/Not Available |
|-----------------|--------------------|--------------------|-----------------------|
|                 | EM | NSHC | SHC | SU | Subtotal infected flocks | EM | NSHC | SHC | SU | Subtotal non-infected flocks | EM | NSHC | SHC | SU | Subtotal unknown/not available | Total |
| AT              |    |      |     |    |                     |     |      |     |    |                          |     |      |     |    |                                      |      |
| BE              |    |      |     |    |                     |     |      |     |    |                          |     |      |     |    |                                      |      |
| BG              |    |      |     |    |                     |     |      |     |    |                          |     |      |     |    |                                      |      |
| CY              |    |      |     |    |                     |     |      |     |    |                          |     |      |     |    |                                      |      |
| CZ              |    |      |     |    |                     |     |      |     |    |                          |     |      |     |    |                                      |      |
|                 | 1,027 | 709 | 2,108 | 7,450 | 706 | 706 | 3,909 | 240 | 3,556 | 19,159 | 1,027 | 709 | 2,108 | 7,450 | 706 | 706 | 361,571 |      |
| Herd status                  | TSE-Infected herds | Non-infected herds | Unknown/Not available |
|-----------------------------|--------------------|--------------------|-----------------------|
| Surveillance target group   | EM | NSHC | SHC | SU | Subtotal infected herds | EM | NSHC | SHC | SU(a) | Subtotal non-infected herds | EM | NSHC | SHC | SU | Subtotal unknown/not available | Total |
| DE                          | 1742 | 274 | 4 | 2,020 | 2,020 | | | | | | | |
| DK                          | 110 | 1 | 111 | 111 | | | | | | | | |
| EE                          | 35 | | 35 | 35 | | | | | | | | |
| EL                          | 377 | 273 | 96 | 746 | 314 | 465 | 1 | 780 | 1,526 | | | | |
| ES                          | 3059 | 3,059 | 10,728 | 8,395 | 19,123 | 22,182 | | | | | | | |
| FI                          | 270 | | 270 | | | | | | | | | |
| FR                          | 18,292 | 4,232 | 22,524 | | | | | | | | | |
| HR                          | 327 | | 327 | | | | | | | | | |
| HU                          | 32 | | 248 | | | | | | | | | |
| IE                          | 153 | | 153 | | | | | | | | | |
| IT                          | 836 | 52 | 964 | 1,852 | 6,939 | 27,406 | 6 | 34,351 | 36,203 | | | | |
| LT                          | 13 | | 13 | | | | | | | | | |
| LU                          | 103 | | 103 | | | | | | | | | |
| LV                          | 31 | | 31 | | | | | | | | | |
| MT                          | 164 | 126 | 290 | | | | | | | | | |
| NL                          | 1528 | | 1,528 | | | | | | | | | |
| PL                          | 3,554 | 855 | 12 | 4,421 | | | | | | | | | |
| PT                          | 11 | 11 | 1529 | 1 | 1,530 | 1,541 | | | | | | | |
| RO                          | 12 | 220 | 232 | 7,593 | 28,314 | 1 | 35,908 | 36,140 | | | | |
| SE                          | 84 | | 84 | | | | | | | | | |
| SI                          | 476 | 45 | 10 | 531 | 531 | | | | | | | | |
| SK                          | 15 | 11 | 26 | 184 | 184 | | | | | | | | |
| UK                          | 219 | 288 | 507 | 499 | 499 | | | | | | | | |
| Total EU                    | 4,711 | 4,253 | 4,049 | 13,013 | 57,695 | 72,080 | 35 | 129,810 | 705 | 1 | 706 | 143,529 |
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| Herd status       | TSE-Infected herds | Non-infected herds | Unknown/Not available | Total   |
|-------------------|--------------------|--------------------|-----------------------|---------|
|                    | EM     | NSHC | SHC | SU | Subtotal infected herds | EM     | NSHC | SHC | SU<sup>(a)</sup> | Subtotal non-infected herds | EM | NSHC | SHC | SU | Subtotal unknown/not available | Total |
| NO                |        |      |     |    | 159 | 47 | 1 | 207 |               |               |                 |        |      |     |    |                          | 207 |
| RS                |        |      |     |    | 159 | 57 | 1 | 217 |               |               |                 |        |      |     |    |                          | 217 |
| Total non-EU      | 4,711  | 4,253 | 4,049 |   | 13,013 | 57,854 | 72,137 | 36 | 130,027 |                 |                 | 705 | 1 |                 | 706 | 143,746 |
| Total             | 4,711  | 4,253 | 4,049 |   | 13,013 | 57,854 | 72,137 | 36 | 130,027 |                 |                 | 705 | 1 |                 | 706 | 143,746 |

EM: animals culled under TSE eradication measures; NSHC: animals not slaughtered for human consumption; SHC: animals slaughtered for human consumption; SU: animals clinically suspected of being infected by TSE (transmissible spongiform encephalopathies).

<sup>(a)</sup>: Goats reported with clinical signs at ante-mortem (AM) have been included in this table as SU: 1 from EL and 11 from PL.
In total, 997 scrapie cases in sheep were reported in the EU in 2019, 64 (6.9%) more than in 2018. They were reported by 14 MS, four less than in 2018. Austria, Denmark and Sweden, that reported AS in 2018, and Bulgaria, that reported CS in 2018, did not report scrapie cases in 2019. In addition, 31 scrapie cases in sheep were reported by two (Iceland and Norway) of the six non-MS reporting countries.

CS was reported by seven different MS and one non-MS: Cyprus, Greece, Spain, Italy, Portugal, Romania, the United Kingdom and Iceland, whereas AS was reported by 11 MS and one non-MS: Finland, France, Germany, Hungary, Ireland, Italy, Poland, Portugal, Slovakia, Spain, the United Kingdom and Norway. Most of the ovine cases in the EU (91.7%) were reported by four countries, namely Greece, Italy, Romania and Spain, as it was the case in the previous years.

In total, 911 sheep scrapie cases in the EU in 2019 were CS cases (91.4%) and 86 were AS cases (8.6%). Among the non-EU reporting countries, 21 CS cases were reported by Iceland and 10 AS cases by Norway. Table 21 shows the number of scrapie cases in sheep by reporting country, case type, index case status and surveillance target group in 2019. The geographical distribution of AS and CS in 2019 in sheep is shown in Appendix C. An additional total of 17 cases in sheep were reported as inconclusive by Spain (5) and Italy (12) (See Table 31), which are not included in the total scrapie caseloads for these two countries.

In sheep, 17.8% (177) of all cases in the EU reported in 2019 were index cases, a reduction of 12.8% from the previous year (203 cases), with a much higher proportion in AS cases (80/86: 93%) than in CS cases (97/911: 10.6%), reflecting the within-flock spread of CS. Using the absolute number of index cases as a proxy for the flock-level incidence in sheep and comparing 2018 with 2019, there was nearly no difference in the number of CS index cases (from 98 in 2018 to 97 in 2019, –1%) and a decrease in the number of AS index cases (from 105 to 80, –25.2%).

In total, 390 scrapie cases in goats were reported in the EU in 2019 by nine MS (two more than in 2018), with a 25.4% reduction (–133) compared with 2018 when 523 cases were reported. This change is due mainly to the decrease in the number of cases in goats in two reporting countries: Cyprus (from 382 to 309), Spain (from 91 to 37). Cyprus, Italy and Spain reported both CS and AS. Greece, Hungary and the United Kingdom reported only CS cases whereas France, Poland and Portugal reported only AS cases. As mentioned previously, most of the CS cases were reported by Cyprus with a slight increase in the contribution of this country to the CS caseload in 2019 (from 73.7% in 2018 to 81.3% in 2019). The three non-MS that reported tested goats did not report any scrapie cases.

In total, 379 caprine cases in the EU in 2019 were CS cases (97.2%) and 11 were AS (7.8%). Table 22 shows the number of scrapie cases in goats by reporting country, case type, index case status and surveillance target group in 2019. The geographical distribution of AS and CS in 2019 in goats is shown in Appendix C. An additional total of three cases in goats were reported as inconclusive by Spain (1) and Italy (2) (See Table 33), which are not included in the total scrapie caseloads for these two countries.

In goats, 8.7% (34) of all cases reported in the EU in 2019 were index cases, lower than the 9.6% (50) in 2018, with a higher proportion in AS (10/11: 90.9%) than in CS (24/379: 6.3%). Cyprus and Italy accounted for 61.8% of all index cases in goats. Using the absolute number of index cases in goats as a proxy for the herd-level incidence in goats and comparing 2019 with 2018, there was a decrease in the number of CS index cases (from 44 to 24, –45.5%) and an increase in the number of AS index cases (from 6 to 10).

In general, considering the total number of cases by type and without restricting the calculation to index cases only, CS is still the most frequently reported type of scrapie in the EU in both the species. In 2019, the CS/AS ratio was 10.6:1 in sheep (higher than in 2018: 7.3:1) and 34.4:1 in goats (lower than in 2018: 86.1:1). If, for goats, Cyprus is excluded, the CS/AS ratio in goats was 7.1:1 in 2019, higher than in 2018 (27.2:1).
Table 21: Number of scrapie cases in sheep by country, case type, index case status, surveillance target group in 2019 in the EU and other reporting countries

| Case type | Atypical scrapie (AS) | Classical scrapie (CS) |
|-----------|----------------------|------------------------|
|           | Total AS             |                        |
|           | No                   | Yes                    |
| Surveillance target group | NSHC | SHC | Subtotal | NSHC | SHC | Subtotal | EM  | NSHC | SHC | SU | Subtotal | NSHC | SHC | SU(a) | Subtotal |
| CY        | 11 | 1 | 1 | 1 | 1 | 1 | 1 | 4 |
| DE        | 31 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| EL        | 112 | 122 | 6 | 240 | 15 | 9 | 12 | 36 | 276 | 276 |
| ES        | 1 | 1 | 2 | 4 | 6 | 7 | 302 | 302 | 9 | 1 | 10 | 312 | 312 | 319(c) |
| FI        | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| FR        | 1 | 1 | 2 | 4 | 6 | 7 | 302 | 302 | 9 | 1 | 10 | 312 | 312 | 319(c) |
| HU        | 33 | 6 | 6 | 6 | 6 | 6 | 6 |
| IE        | 3 | 3 | 6 | 6 | 6 | 6 | 6 |
| IT        | 7 | 7 | 7 | 139 | 9 | 1 | 149 | 10 | 12 | 22 | 171 | 171 | 178(d) |
| PL        | 3 | 1 | 4 | 4 | 4 | 4 | 4 |
| PT        | 19(b) | 1 | 20 | 20 | 20 | 20 | 20 |
| RO        | 26 | 81 | 8 | 115 | 19 | 5 | 2 | 26 | 141 | 141 |
| SK        | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| UK        | 3 | 3 | 6 | 6 | 4 | 4 | 8 | 1 | 1 | 9 | 15 |
| Total EU  | 2 | 2 | 2 | 6 | 59 | 21 | 80 | 86 | 557 | 161 | 88 | 8 | 814 | 56 | 27 | 14 | 97 | 911 | 997 |
| IS        | 19 | 19 | 2 | 2 | 2 | 2 | 2 | 21 | 21 |
| NO        | 3 | 7 | 10 | 10 | 10 | 10 | 10 |
| Total non-EU | 3 | 7 | 10 | 10 | 19 | 19 | 2 | 2 | 21 | 31 |
| Total     | 2 | 2 | 2 | 6 | 62 | 28 | 90 | 96 | 576 | 161 | 88 | 8 | 833 | 56 | 27 | 16 | 99 | 932 | 1028 |

EM: animals culled under TSE eradication measures; NSHC: animals not slaughtered for human consumption; SHC: animals slaughtered for human consumption; SU: animals clinically suspected of being infected by TSE (transmissible spongiform encephalopathies).

Only the reporting countries in which scrapie cases in sheep were detected in 2019 are mentioned in the table.

(a): Sheep cases reported with clinical signs at ante-mortem (AM) have been included in this table as SU: 1 from EL.
(b): It includes one imported case: an animal imported for slaughter from Spain which died at lairage/resting area of the slaughterhouse and was tested as NSHC.
(c): An additional total of five cases were reported as inconclusive by Spain (See Table 31).
(d): An additional total of 12 cases were reported as inconclusive by Italy (See Table 31).
Table 22: Number of scrapie cases in goats by country, case type, index case status, surveillance target group in 2019 in the EU and other reporting countries

| Case type       | Atypical scrapie (AS) | Classical scrapie (CS) | Total CS |
|-----------------|-----------------------|------------------------|----------|
|                 | No        | Yes | Total AS | No | Yes | SU | Subtotal | No | Yes | SHC | SU | Subtotal | Total |
| Surveillanc target group | EM | NSHC | SHC | Subtotal | EM | NSHC | SHC | SU | Subtotal | EM | NSHC | SHC | SU | Subtotal |
| CY              | 1 | 1 | 1 | 147 | 97 | 56 | 300 | 6 | 2 | 8 | 308 | 309 |
| EL              | 2 | 2 | 2 | 33 | 3 | 3 | 33 | 2 | 2 | 3 | 35 | 37(a) |
| ES              | 3 | 3 | 3 | 13 | 3 | 3 | 16 | 1 | 9 | 10 | 26 | 29(b) |
| FR              | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| HU              | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| IT              | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Total EU        | 1 | 1 | 5 | 5 | 10 | 11 | 195 | 104 | 56 | 355 | 11 | 13 | 24 | 379 | 390 |
| Total non-EU    | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total           | 1 | 1 | 5 | 5 | 10 | 11 | 195 | 104 | 56 | 355 | 11 | 13 | 24 | 379 | 390 |

EM: animals culled under TSE eradication measures; NSHC: animals not slaughtered for human consumption; SHC: animals slaughtered for human consumption; SU: animals clinically suspected of being infected by TSE (transmissible spongiform encephalopathies).

Only the reporting countries in which scrapie cases in goats were detected in 2019 are mentioned in the table.

(a): An additional total of one case were reported as inconclusive by Spain (See Table 33).
(b): An additional total of two cases were reported as inconclusive by Italy (see Table 33).
Focusing on the last 10 years, the evolution in the number of scrapie cases detected at EU level is shown for each species and by case type in Figure 2. After the 2006 peak in the number of reported scrapie cases in sheep with 2,596 CS cases (when the number of tests also peaked), CS cases have decreased from 1,444 in 2011 to 554 in 2016. An increase was observed in 2017 (839 CS and unknown cases), and a similar order of magnitude was observed in 2018 (820 cases). A new increase to 911 is evident in 2019, mainly due to CS cases from TSE-infected flocks reported by Greece, Italy and Spain.

Greece, Spain and Italy increased the overall number of CS scrapie cases by nearly 55.1%, 11.8% and 14%, respectively, compared to the previous year. This trend was likely associated with the increase in the testing of TSE-infected flocks. In Romania, despite testing in both years around seven thousand sheep in TSE-infected flocks, the total number of CS cases decreased from 203 in 2018 to 141 in 2019 (~30.5%). The number of index cases of CS in the four most affected reporting countries was 94, very similar to that in 2018, 92.

In goats, the decreasing trend in the absolute number of CS cases is clear. The evolution is mainly affected by one single MS (Cyprus), where the number of detected cases has consistently declined since the peak in 2013 when 1,678 cases were reported by Cyprus and 1,799 in total including all other MS. Since then, the total number of CS cases has decreased consistently to 308 in 2019. Spain has also observed a substantial reduction in the number of CS in goats from 89 in 2018 to 35 in 2019, with only two index CS cases. Greece also reported fewer CS cases whereas the total number in Italy increased from 15 to 26, although the number of index cases remained stable.

Based on the 20,364 cases of scrapie with known type, species and age between 2009 and 2019, in sheep, the average age of AS cases (85.2 months) is significantly higher ($p < 0.001$) than that of CS cases (51.1 months). Similarly, in goats, the average age of AS cases (87.6 months) is significantly higher ($p < 0.001$) than that of CS cases (52.4 months). When comparing sheep with goats, there is no significant difference in the average age for AS (87.6 months in goats and 85.2 months in sheep) ($p = 0.54$), with the average age of CS cases in sheep (51.1 months) being very similar to that of goats (52.4 months) although statistically different ($p < 0.05$).

Tables 23 and 24 show the cases of CS and AS, respectively, in sheep for the period 2002–2019, with a focus on the last 5 years. Tables 25 and 26 show the cases of CS and AS, respectively, in goats for the period 2002–2019, with a focus on the last 5 years.

In sheep, in 2019, the number of index cases of CS and AS per 10,000 tests carried out by target group at EU level was: 1) for CS: 3.3 in NSHC, 2.2 in SHC and 714.3 in SU; 2) for AS: 3.4 in NSHC and 1.7 in SHC.

In goats, in 2019, the number of index cases of CS and AS per 10,000 tests carried out by target group at EU level was: (1) for CS: 1.9 in NSHC and 1.8 in SHC; (2) for AS: 0.9 in NSHC and 0.7 in SHC.

**Figure 2:** Number of reported scrapie cases in the EU by case type in the period 2010–2019 in (A) sheep and (B) goats
| Country code | Up to 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total CS |
|--------------|-----------|------|------|------|------|------|----------|
| BE           | 38        |      |      |      |      |      | 38       |
| BG           | 11        |      |      |      |      |      | 17       |
| CY           | 3,184     | 13   | 7    | 2    | 4    | 1    | 3,211    |
| CZ           | 56        |      |      |      |      |      | 56       |
| DE           | 115       |      |      |      |      |      | 116      |
| EL           | 5,265     | 252  | 227  | 247  | 178(a) | 276 | 6,445    |
| ES           | 979       | 69   | 91   | 247  | 279  | 312  | 1,977    |
| FR           | 1,531     | 1    | 2    |      |      |      | 1,534    |
| HU           | 10        |      |      |      |      |      | 10       |
| IE           | 573       | 1    | 11   | 1    |      |      | 587      |
| IT           | 2,375     | 141  | 143  | 240  | 150  | 171  | 3,220    |
| NL           | 401       |      |      |      |      |      | 401      |
| PT           | 26        | 7    |      |      |      |      | 34       |
| RO           | 560       | 98   | 75   | 76   | 203  | 141  | 1,153    |
| SI           | 174(b)    |      |      |      |      |      | 174      |
| SK           | 104       | 3    | 10   | 15   |      |      | 132      |
| UK           | 1,993     | 2    |      |      |      |      | 2,004    |
| Total EU     | 17,395    | 581  | 563  | 839  | 820  | 911  | 21,109   |
| IS           | 166       | 29   | 11   | 1    | 21   | 21   | 249      |
| NO           | 12        |      |      |      |      |      | 12       |
| Total non-EU | 178       | 29   | 11   | 1    | 21   | 21   | 261      |
| Total        | 17,573    | 610  | 574  | 840  | 841  | 932  | 21,370   |

EU and reporting countries without classical scrapie cases in sheep are not included in the table. The table with all historical cases can be found on [https://doi.org/10.5281/zenodo.4252322](https://doi.org/10.5281/zenodo.4252322).

(a): The number of total cases in Greece in 2018 has been amended following the footnote in the republished 2018 TSE EUSR.
(b): The number of total cases up to 2014 in Slovenia has been amended following notification by the Slovenian competent authority. Subtotal and totals have been amended accordingly.

| Country | Up to 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total AS |
|---------|-----------|------|------|------|------|------|----------|
| AT      | 11        | 1    | 1    | 1    | 1    | 1    | 15       |
| BE      | 8         |      |      |      |      |      | 8        |
| BG      | 4         | 2    |      |      |      |      | 6        |
| CY      | 2         | 3    | 2    | 1    |      |      | 8        |
| DE      | 105       | 10   | 5    | 4    | 4    | 4    | 132      |
| DK      | 12        | 1    |      |      |      |      | 14       |
| EE      | 2         |      |      |      |      |      | 2        |
| EL      | 28        | 2    | 2    |      |      |      | 32       |
| ES      | 186       | 12   | 13   | 12   | 9    | 7    | 239      |
| FI      | 11        | 2    |      |      | 2    | 3    | 18       |
| FR      | 545       | 5    | 4    | 3    | 6    | 8    | 571      |
| HR      | 1         |      |      |      |      |      | 2        |
| HU      | 92        | 14   | 23   | 14   | 13   | 17   | 173      |
| IE      | 27        | 7    | 1    | 1    | 8    | 6    | 50       |
| IT      | 80        | 6    | 5    | 3    | 8    | 7    | 109      |
| NL      | 18        |      |      |      |      |      | 18       |
| PL      | 30        | 9    | 8    | 7    | 6    | 4    | 64       |
| PT      | 561       | 30   | 26   | 29   | 30(a) | 20   | 696      |
### Table 25: Number of classical scrapie cases in goats by year and reporting country up to 2019

| Country | Up to 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total CS |
|---------|------------|------|------|------|------|------|----------|
| BG      | 4          | 1    | 2    | 2    | 5    |      | 14       |
| CY      | 8,793      | 923  | 570  | 484  | 381  | 308  | 11,459   |
| EL      | 517        | 22   | 11   | 25   | 19   | 7    | 601      |
| ES      | 71         | 16   | 19   | 34   | 89   | 35   | 264      |
| FI      | 8          |      |      |      |      |      | 8        |
| FR      | 128        | 40   |      |      | 5    |      | 173      |
| HU      |            |      |      |      | 1    | 1    |          |
| IT      | 72         | 21   | 8    | 8    | 15   | 26   | 150      |
| RO      | 7          | 1    | 3    | 2    | 3    |      | 16       |
| SI      | 4          |      |      |      |      |      | 4        |
| UK      | 202        | 16   | 8    | 3    | 2    |      | 231      |
| Total EU| 9,806      | 1,040| 621  | 558  | 517  | 379  | 12,921   |
| Total non-EU| 0     |      |      |      |      |      | 0        |
| Total   | 9,806      | 1,040| 621  | 558  | 517  | 379  | 12,921   |

EU and reporting countries without classical scrapie cases in goats are not included in the table.

### Table 26: Number of atypical scrapie cases in goats by year and reporting country up to 2019

| Country | Up to 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total AS |
|---------|------------|------|------|------|------|------|----------|
| AT      | 1          |      |      |      |      |      | 1        |
| CY      | 0          | 1    | 1    | 1    | 1    |      | 4        |
| DE      | 1          |      |      |      |      |      | 2        |
| EL      | 2          | 1    | 1    | 1    |      |      | 5        |
| ES      | 39         | 5    | 5    | 2    | 2    |      | 55       |
| FI      | 1          |      |      |      |      |      | 1        |
| FR      | 48         | 5    | 3    | 2    |      |      | 61       |
| IT      | 17         | 1    | 3    | 3    | 2    | 3    | 29       |
| PL      |            |      |      |      | 1    | 1    | 1        |
| PT      | 12         |      |      |      |      |      | 14       |
| SI      | 0          |      |      |      |      |      | 1        |
| Total EU| 121        | 14   | 13   | 9    | 6    | 11   | 174      |
| Total non-EU| 1    |      |      |      |      |      | 1        |
| Total   | 122        | 14   | 13   | 9    | 6    | 11   | 175      |

EU and reporting countries without atypical scrapie cases in goats are not included in the table.
The number of historical reported scrapie cases can be found in the following link https://doi.org/10.5281/zenodo.4252322, as follows:

- **Table 27**: Number of classical scrapie cases in sheep per country and year from 2002 in the EU and non-EU reporting countries
- **Table 28**: Number of atypical scrapie cases in sheep per country and year from 2002 in the EU and non-EU reporting countries
- **Table 29**: Number of classical scrapie cases in goats per country and year from 2002 in the EU and non-EU reporting countries
- **Table 30**: Number of atypical scrapie cases in goats per country and year from 2002 in the EU and non-EU reporting countries

Over the last 10 years (2010–2019), the number of cases per 10,000 tested animals considering both the case types and the species ranged between 0.5 and 5.4. Figure 3 shows the 10-year evolution by target group of the number of scrapie cases per 10,000 tests of sheep and goats in TSE non-infected flocks/herds and separately per case type. Based on those data, in sheep, there is a statistically significant decreasing trend for both CS and AS (respectively, for CS an annual RR = 0.95, i.e. an average 5% annual decrease in the probability of detecting CS: p < 0.0001. For AS, an annual RR = 0.96, i.e. an average 4% annual decrease in the probability of detecting AS: p < 0.0001). In goats, the outputs of the Poisson regression model did not show any statistically significant trend for both CS and AS (p = 0.383 and 0.247, respectively).

Based on the same model, the probability of detecting CS in the NSHC surveillance target group was higher than in the SHC one in both sheep and goats (RR: 1.4, p < 0.001 in sheep and RR: 1.7, p < 0.0001 in goats). In AS, a statistically significant higher probability was only observed in sheep (RR = 1.6, p < 0.0001).

**Figure 3**: Number of scrapie (index) cases per 10,000 tests in the EU in (a) sheep and (b) goats in non-TSE-infected flocks/herds, reported by case type and target group in the period 2010–2019.
Tables 31 and 32 summarise the number of discriminatory tests performed by country in 2019 for CS and AS in sheep. Tables 33 and 34 summarise the number of discriminatory tests performed by country in 2019 for CS and AS in goats. In sheep, 677 (72.9%) of the CS and inconclusive cases reported in the EU were submitted for discriminatory testing and so were 37 of the AS cases (43%). The 21 cases of CS reported by Iceland and the 10 cases of AS reported by Norway were also submitted to discriminatory testing. All sheep scrapie cases submitted for discriminatory testing were confirmed as 'BSE excluded', except 5 cases and 12 cases reported by Spain and Italy, respectively, that were declared 'inconclusive'. In goats, 77 (20.2%) of the CS and inconclusive cases reported in the EU were submitted for discriminatory testing and 5 of the AS cases (45.4%). All goat cases subjected to discriminatory testing were confirmed as 'BSE excluded', except three inconclusive cases reported by Spain (1) and Italy (2).

Table 31: Number of discriminatory tests and results in classical scrapie cases in sheep in 2019 by reporting country

| Country | No. of classical scrapie and inconclusive cases | Cases submitted for discriminatory testing | % of total classical TSE and inconclusive cases(a) |
|---------|-----------------------------------------------|-------------------------------------------|-------------------------------------------------|
|         | BSE-not-excluded | BSE-excluded | Inconclusive | Total |                                 |
| CY      | 1 | 1 | 1 | 1 | 100% |
| EL      | 276 | 35 | 35 | 12.7% |
| ES      | 317 | 312 | 5 | 317 | 100% |
| IT      | 183 | 171 | 12 | 183 | 100% |
| PT      | 1 | 1 | 1 | 1 | 100% |
| RO      | 141 | 131 | 131 | 100% |
| UK      | 9 | 9 | 9 | 9 | 100% |
| Total EU | 928 | 660 | 17 | 677 | 72.9% |
| IS      | 21 | 21 | 21 | 100% |
| Total non-EU | 21 | 21 | 0 | 21 | 100% |
| Total | 949 | 681 | 17(b) | 698 | 73.5% |

(a): Indicates the proportion of classical TSE and inconclusive cases that are submitted to discriminatory testing by each reporting country.

(b): The 17 inconclusive cases have not been included in the total number of sheep scrapie cases of 2019. EU and reporting countries without classical scrapie cases in sheep are not included in the table.

Table 32: Number of discriminatory tests and results in atypical scrapie cases in sheep in 2019 by reporting country

| Country | No. of atypical scrapie cases | Cases submitted for discriminatory testing | % of total atypical TSE cases(a) |
|---------|--------------------------------|-------------------------------------------|---------------------------------|
|         | BSE-not-excluded | BSE-excluded | Total |                                 |
| DE      | 4 | 0 | 0 | 0% |
| ES      | 7 | 7 | 7 | 100% |
| FI      | 3 | 0 | 0 | 0% |
| FR      | 8 | 0 | 0 | 0% |
| HU      | 17 | 17 | 17 | 100% |
| IE      | 6 | 0 | 0 | 0% |
| IT      | 7 | 7 | 7 | 100% |
| PL      | 4 | 0 | 0 | 0% |
| PT      | 20 | 0 | 0 | 0% |
| SK      | 4 | 0 | 0 | 0% |
| UK      | 6 | 6 | 6 | 100% |
| Total EU | 86 | 37 | 37 | 43.0% |
| NO      | 10 | 10 | 10 | 100% |
Table 33: Number of discriminatory tests and results in classical scrapie cases in goats in 2019 by reporting country

| Country | No. of classical scrapie and inconclusive cases | Cases submitted for discriminatory testing | % of total classical TSE and inconclusive cases<sup>(a)</sup> |
|---------|-----------------------------------------------|------------------------------------------|----------------------------------------------------------|
| CY      | 308                                           | 8                                        | 2.6%                                                     |
| EL      | 7                                             | 2                                        | 28.6%                                                    |
| ES      | 36                                            | 35                                       | 100%                                                     |
| HU      | 1                                             | 1                                        | 100%                                                     |
| IT      | 28                                            | 26                                       | 28                                                       |
| UK      | 2                                             | 2                                        | 100%                                                     |
| Total EU| 382                                           | 74                                       | 20.2%                                                    |
| Total non-EU | 0                                        | 0                                        | 0%                                                       |

BSE: bovine spongiform encephalopathy, TSE: transmissible spongiform encephalopathies.
<sup>(a)</sup>: Indicates the proportion of classical TSE and inconclusive cases that are submitted to discriminatory testing by each reporting country.

EU and reporting countries without classical scrapie cases in sheep are not included in the table.

Table 34: Number of discriminatory tests and results in atypical scrapie cases in goats in 2019 by reporting country

| Country | No. of atypical scrapie cases | Cases submitted for discriminatory testing | % of total atypical TSE cases<sup>(a)</sup> |
|---------|-------------------------------|--------------------------------------------|-------------------------------------------|
| CY      | 1                             | 0                                         | 0%                                        |
| ES      | 2                             | 2                                         | 100%                                      |
| FR      | 3                             | 3                                         | 0%                                        |
| IT      | 3                             | 3                                         | 100%                                      |
| PL      | 1                             | 1                                         | 0%                                        |
| PT      | 1                             | 1                                         | 0%                                        |
| Total EU| 11                            | 0                                         | 45.4%                                     |
| Total non-EU | 0                        | 0                                         | 0%                                        |
| Total   | 11                            | 0                                         | 45.4%                                     |

BSE: bovine spongiform encephalopathy, TSE: transmissible spongiform encephalopathies.
<sup>(a)</sup>: Indicates the proportion of atypical TSE cases that are submitted to discriminatory testing by each reporting country.

EU and reporting countries without atypical scrapie cases in goats are not included in the table.
3.2.1. Genotyping in sheep

The classification of genotypes of the sheep prion protein PRNP gene used in this report and based on the Great Britain's National Scrapie Plan (NSP) is summarised in Table 35.

**Table 35:** Classification of the genotypes of the sheep prion protein PRNP gene according to Great Britain's National Scrapie Plan (NSP) and the three tiers of report groups

| NSP group         | Genotype                        | Comment                                      | Report group |
|-------------------|---------------------------------|----------------------------------------------|--------------|
| NSP1              | ARR/ARR                         | Genetically most resistant                   | Resistant    |
| NSP2              | ARR/ARQ; ARR/ARH; ARR/AHQ       | Genetically resistant                        | Semi-resistant|
| NSP3 Other (NSP3O)| ARQ/ARQ                         | Genetically little resistant (ARQ/ARQ may be scientifically reviewed) | Susceptible  |
| NSP3              | AHQ/AHQ; ARH/ARH; AHQ/ARQ; AHQ/ARQ |                                              | Susceptible  |
| NSP4              | ARR/VRQ                         | Genetically susceptible                      | Susceptible  |
| NSP5              | ARQ/VRQ; ARH/VRQ; AHQ/VRQ; VRQ/VRQ | Genetically highly susceptible               | Susceptible  |

Table 36 shows the genotypes of sheep scrapie cases in 2019 in the EU and other reporting countries.

In total, 855 (98.7%) of the 866 cases of CS in sheep with known genotype reported in the EU in 2019 (93.8% of the total CS caseload) were from the susceptible genotype groups (NSP3, NSP3O, NSP4 and NSP5). This is very similar to previous years in which over 93% of all CS cases with known genotypes were of the susceptible groups. In non-MS reporting countries, all CS cases reported by Iceland were of the susceptible genotype groups. It is important to highlight the reporting of a CS case by Spain in a sheep holding the ARR/ARR genotype (NSP1), a very rare occurrence.

For AS, the same genotype groups (NSP3, NSP3O, NSP4 and NSP5) accounted for 45.2% of all cases with known genotype (38.4% of the total AS caseload), very similar to 2018. Figure 4 shows the frequency distribution of genotypes of sheep scrapie cases by case type, year and NSP group in the period 2010-2019 in the reporting countries.

Table 37 shows the genotypes obtained in 2019 from the random samples of tested sheep in the reporting countries. The number of MS that did not report any random genotypes is 20, as in 2018, following the changes in the legislation that entered into force in 2018. The eight MS that conducted the genotype to a random sample of sheep were Belgium, Cyprus (where genotyping is conducted systematically in the breeding sheep population), France, Greece, Italy, Latvia, the Netherlands and Poland. One of the six non-MS reporting country, Iceland, also reported random genotype results. In the subset of EU MS that carried out the activity in 2019, excluding data from Cyprus, 15.7% of the sheep population (with known genotype) is susceptible to CS (NSP3, NSP3O, NSP4 and NSP5), lower than the 19.2% in 2018 and the 26.5% in 2017. This percentage rose to 45.5% in Greece and 29.9% in Italy, two of the countries with the highest caseload in 2019, whereas it was 10.3% in the other five MS.

Considering the past 10 years of random sampling and excluding Cyprus, the proportion of sheep in the resistant genotype group (NSP1; black colour in the bars of Figure 5) shifted from 25.5% of the total number of genotyped sheep in 2010 (in which 24 MS contributed) to 55.7% in 2019 (on which seven MS contributed).
Table 36: Distribution of genotypes of confirmed scrapie cases in sheep in 2019 by reporting country and National Scrapie Plan (NSP) group

| Type NSP group/Country | Atypical scrapie (AS) | Classical scrapie (CS) |
|------------------------|-----------------------|------------------------|
|                        | NSP1 | NSP2 | NSP3 | NSP3O | NSP4 | NSP5 | Unknown | Total AS | NSP1 | NSP2 | NSP3 | NSP3O | NSP4 | NSP5 | Unknown | Total CS |
| CY                     | 1    |      |      |       |      |      |         | 1        |      |      |      |       |      |      |         |          |
| DE                     | 1    | 1    | 2    |      |      |      |         | 4        |      |      |      |       |      |      |         |          |
| EL                     | 2    | 3    | 1    | 1    | 7    |      |         | 4        | 179   | 61   | 1    | 8     | 23   | 276  |         |          |
| ES                     | 2    | 3    | 1    | 1    | 7    |      |         | 3        | 292   | 3    | 1    | 12    | 312  |      |         |          |
| FI                     | 2    |      |      |      |      |      |         | 1        | 3     |      |      |       |      |      |         |          |
| FR                     | 8    |      |      |      |      |      |         |          |      |      |      |       |      |      |         |          |
| HU                     | 2    | 8    | 5    | 2    |      |      |         | 17       |      |      |      |       |      |      |         |          |
| IE                     | 4    | 1    | 1    |      |      |      |         | 6        |      |      |      |       |      |      |         |          |
| IT                     | 4    | 3    |      |      |      |      |         | 7        | 134   | 17   | 10   | 10    | 171  |      |         |          |
| PL                     | 1    | 3    |      |      |      |      |         | 4        |      |      |      |       |      |      |         |          |
| PT                     | 5    | 6    | 4    | 2    |      |      |         | 20       |      |      |      |       |      |      |         |          |
| RO                     | 2    | 8    | 5    | 1    |      |      |         | 45       |      |      |      |       |      |      |         |          |
| SK                     | 2    | 1    | 1    |      |      |      |         | 4        |      |      |      |       |      |      |         |          |
| UK                     | 2    | 2    | 2    |      |      |      |         | 6        |      |      |      |       |      |      |         |          |
| Total EU               | 13   | 27   | 20   | 13   | 0    | 0    |         | 13       | 86    | 86   | 2    | 73    | 45   | 911  |         |          |
| IS                     |      |      |      |      |      |      |         |          | 19    | 2    |      |       |      |      |         |          |
| NO                     | 1    | 2    | 2    | 5    |      |      |         | 10       |      |      |      |       |      |      |         |          |
| Total non-EU           | 1    | 2    | 2    | 5    | 0    | 0    |         | 10       | 0     | 19   | 0    | 0     | 2    | 0    | 21       |          |
| Total                  | 14   | 29   | 22   | 18   | 0    | 0    |         | 13       | 96    | 86   | 2    | 75    | 45   | 932  |         |          |
Figure 4: Frequency distribution of genotypes of sheep scrapie cases by case type, year and National Scrapie Plan (NSP) group in the period 2010–2019 in the reporting countries

Table 37: Number of genotyped animals (% of sample within country) in randomly selected sheep in the EU and other reporting countries in 2019 by reporting country and National Scrapie Plan (NSP) group, in accordance with Regulation (EC) 999/2001 Annex VII, in Chapter C, in Part 1, point 8

| Country | NSP1 | NSP2 | NSP3 | NSP3O | NSP4 | NSP5 | Other/Unknown | Total |
|---------|------|------|------|-------|------|------|--------------|-------|
| AT      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| BE      | 434 (68.8%) | 140 (22.2%) | 26 (4.1%) | 13 (2.1%) | 11 (1.7%) | 7 (1.1%) | 0 (0%) | 631 |
| BU      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| CY(a)   | 53,240 (90.7%) | 4,641 (7.9%) | 179 (0.3%) | 95 (0.2%) | 234 (0.4%) | 24 (0%) | 277 (0.5%) | 58,690 |
| CZ      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| DE      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| DK      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| EE      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| EL      | 18 (15%) | 43 (35.8%) | 33 (27.5%) | 10 (8.3%) | 5 (4.2%) | 3 (2.5%) | 8 (6.7%) | 120 |
### Number of genotyped animals (% of sample within country)

| Country | NSP1 | NSP2 | NSP3 | NSP3O | NSP4 | NSP5 | Other/Unknown | Total |
|---------|------|------|------|-------|------|------|---------------|-------|
| ES      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| FI      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| FR      | 284 (63.8%) | 119 (26.7%) | 24 (5.4%) | 1 (0.2%) | 13 (2.9%) | 4 (0.9%) | 0 (0%) | 445 |
| HR      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| HU      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| IE      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| IT      | 173 (25.8%) | 296 (44.2%) | 143 (21.3%) | 39 (5.8%) | 6 (0.9%) | 12 (1.8%) | 1 (0.1%) | 670 |
| LT      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| LU      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| LV      | 55 (55.6%) | 24 (24.2%) | 11 (11.1%) | 9 (9.1%) | 0 (0%) | 0 (0%) | 0 (0%) | 99 |
| MT      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| NL      | 757 (67.9%) | 240 (21.5%) | 32 (2.9%) | 30 (2.7%) | 19 (1.7%) | 9 (0.8%) | 28 (2.5%) | 1,115 |
| PL      | 29 (29%) | 36 (36%) | 16 (16%) | 3 (3%) | 8 (8%) | 8 (8%) | 0 (0%) | 100 |
| PT      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| RO      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| SE      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| SI      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| SK      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| UK      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| Total EU | 54,990 (88.9%) | 5,539 (9%) | 464 (0.7%) | 200 (0.3%) | 296 (0.5%) | 67 (0.1%) | 314 (0.5%) | 61,870 |
| CH      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| IS      | 0 (0%) | 0 (0%) | 255 (68.9%) | 62 (16.8%) | 0 (0%) | 53 (14.3%) | 0 (0%) | 370 |
| ME      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| MK      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| NO      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| RS      | Not done | Not done | Not done | Not done | Not done | Not done | Not done | 0 |
| Total non-EU | 0 (0%) | 0 (0%) | 255 (68.9%) | 62 (16.8%) | 0 (0%) | 53 (14.3%) | 0 (0%) | 370 |
| Total   | 54,990 (88.4%) | 5,539 (8.9%) | 719 (1.2%) | 262 (0.4%) | 296 (0.5%) | 120 (0.2%) | 314 (0.5%) | 62,240 |

(a): Data of Cyprus are different from those of other reporting countries since Cyprus systematically genotypes the breeding sheep population.
3.3. TSE surveillance in cervids

In 2019, 10,712 cervids were tested for TSE in the EU by 13 MS. Six of them were subject to mandatory surveillance (hereinafter referred to as the MS6) (Section 1.2.4): Estonia, Finland, Latvia, Lithuania, Poland and Sweden increased over 50% the number of cervids tested compared to the previous year from 5,110 to 7,980 (74.5% of the total). The seven MS not subject to mandatory surveillance that contribute to the monitoring were Austria, Hungary, Italy, Romania, Slovenia, Spain and the United Kingdom, reporting 2,732 tested cervids (25.5% of the total). However, Austria, Slovenia and the United Kingdom only reported one, one and two tested cervids, respectively.

Out of the 7,980 tested cervids by the MS6, 5,142 (64.4%) were wild animals, mostly roe deer (2,684), followed by moose (1,502) and red deer (807). Among the 2,838 (35.6%) captive, farmed or semi-domesticated cervids tested by the MS6, 2,565 (90.4%) were semi-domesticated reindeer reported by Sweden and Finland.

During the second year of mandatory surveillance in MS6, three cases of CWD in wild moose were reported by Sweden. The number of cervids tested and positive in 2019 by species, management system and reporting country are displayed in Table 38. The description of the CWD cases in 2019 is shown in Table 41.

In terms of testing at PSU level, the number and proportion of PSU for wild/semi-domesticated and farmed/captive cervids declared and tested by the MS6 is shown in Table 39. There is also large variability in the proportion of PSU from which samples have been collected, which is determined by the number of PSU included in the sampling programme. E.g. Estonia sampled 9 (60%) of the ‘PSU (wild)’ and 1 ‘PSU (captive/semi-domesticated)’ (6.7%). Poland sampled cervids from 100% and 18.8% of the 16 (wild) and 16 (captive/farmed), respectively. Sweden tested cervids from 49 out of the 50 PSU for wild (98%) and 34 of the 160 for farmed and semidomesticated cervids (21.3%). Finland sampled from 42% of the wild PSU and 90.7% of the semi-domesticated PSU. Latvia declared overall 100 PSU but submitted samples from 180 different PSU codes. Lithuania did not submit PSU codes for the tested cervids. Median, minimum and maximum number of cervids tested in the different types of PSU and countries of the MS6 are also displayed in Table 39.

The most common target group tested by the MS6 was the ‘Hunted/slaughtered fit for human consumption’ (HSHC) that accounted for 4,832 (60.5% of all tested cervids). Within this category,
Sweden reported 1,833 semi-domesticated reindeer tested. All the rest were risk animals in the different target groups: road/predator killed (RK): 1,988 (24.9%); fallen/culled (FC): 973 (12.2%); clinical suspect animals (SUS): 60 (0.75%); hunted/slaughtered not fit for human consumption (HSNHC): 127 (1.6%). There is a large variability between MS6 countries in the proportion of cervids tested in the HSHC, ranging from 3% tested by Finland to 93% by Latvia or 85.9% by Sweden. The numbers of tested cervids by reporting country, management system and target group in 2019 are displayed in Table 40.

Among the non-MS6, Romania accounted for 77.7% of all tested cervids (2,124), followed by Italy with 551. The majority of the tested cervids were roe deer (79.9%), followed by red deer (16.2%). All tested cervids by the non-MS6 resulted negative.

Norway continued its intensified testing programme in wild and captive cervids and tested 30,147 animals in 2019, mostly semi-domesticated reindeer (42.9%), followed by wild moose (19.7%) and red deer (19%) mostly from the hunted/slaughtered fit for human consumption target group, leading to the detection of two cases in moose (Table 41). Iceland also reported 114 reindeer tested in 2019, all negative.
Table 38: Number of cervids tested in the reporting countries in 2019 by management system, species and country (a)

| Management system country/species (c),(d) | Wild deer species (b) | Semi-domesticated/farmed deer species (b) | Total |
|------------------------------------------|-----------------------|-------------------------------------------|-------|
|                                          | Eurasian tundra reindeer | Finnish (Eurasian) forest reindeer | Moose | Roe deer | White-tailed deer | Red deer | Fallow deer | Other or unknown | Subtotal | Eurasian tundra reindeer | Finnish (Eurasian) forest reindeer | Roe deer | White-tailed deer | Red deer | Fallow deer | Other or unknown | Sub-total |
|                                          |                       |                                          |       |           |                |         |              |                  |         |                           |                             |         |                  |          |            |              |          |
| AT                                       |                        |                                          |       |           |                |         |              |                  |         |                           |                             |         |                  |          |            |              |          |
| ES                                       |                        |                                          |       |           |                |         |              |                  |         |                           |                             |         |                  |          |            |              |          |
| HU                                       |                        |                                          |       |           |                |         |              |                  |         |                           |                             |         |                  |          |            |              |          |
| IT                                       |                        |                                          |       |           |                |         |              |                  |         |                           |                             |         |                  |          |            |              |          |
| RO                                       |                        |                                          |       |           |                |         |              |                  |         |                           |                             |         |                  |          |            |              |          |
| SI                                       |                        |                                          |       |           |                |         |              |                  |         |                           |                             |         |                  |          |            |              |          |
| UK                                       |                        |                                          |       |           |                |         |              |                  |         |                           |                             |         |                  |          |            |              |          |
| Subtotal non-MS6                         | 0                      | 0                                        | 0     | 1,482     | 0             | 277     | 58          | 2             | 1,819     | 1                  | 0                           | 702     | 167         | 29       | 913     | 2,732        |
| EE                                       |                        |                                          |       |           |                |         |              |                  |         |                           |                             |         |                  |          |            |              |          |
| FI                                       |                        |                                          |       |           |                |         |              |                  |         |                           |                             |         |                  |          |            |              |          |
| LT                                       |                        |                                          |       |           |                |         |              |                  |         |                           |                             |         |                  |          |            |              |          |
| LV                                       |                        |                                          |       |           |                |         |              |                  |         |                           |                             |         |                  |          |            |              |          |
| PL                                       |                        |                                          |       |           |                |         |              |                  |         |                           |                             |         |                  |          |            |              |          |
| SE                                       |                        |                                          |       |           |                |         |              |                  |         |                           |                             |         |                  |          |            |              |          |
| Subtotal MS6                             | 0                      | 14                                       | 1,502 | 3 (3)     | 2,684         | 130     | 807         | 5             | 0          | 5,142 (3)       | 1,965                     | 600     | 3           | 1         | 604     | 1,115        |
| TOTAL EU                                 | 0                      | 14                                       | 1,502 | 3 (3)     | 4,166         | 130     | 1,084       | 63            | 2          | 6,961 (3)       | 1,966                     | 600     | 707         | 1         | 434     | 13,712 (3)   |
| IS                                       |                        |                                          |       |           |                |         |              |                  |         |                           |                             |         |                  |          |            |              |          |
| NO                                       |                        |                                          |       |           |                |         |              |                  |         |                           |                             |         |                  |          |            |              |          |
| TOTAL non-EU                             | 3,454                  | 5,934 (2)                                | 1,692 | 5,186     | 434           | 16,700 (2) | 12,937      | 560           | 37         | 27                | 13,561                     | 37      | 507         | 1         | 994     | 14,903 (5)   |
| TOTAL                                    | 3,454                  | 14                                       | 7,436 (5) | 5,858 | 130 | 6,270       | 63 | 436 | 23,661 (5) | 14,903 | 600 | 707 | 1 | 994 | 51 | 56 | 17,312 | 40,973 (5) |

(a): Number of positives for chronic wasting disease (CWD) are given in brackets.
(b): Eurasian tundra reindeer (Rangifer tarandus tarandus); Finnish (Eurasian) forest reindeer (Rangifer tarandus fennicus); Moose (or Eurasian/European elk) (Alces alces alces); Roe deer (Capreolus capreolus); White-tailed deer (Odocoileus virginianus); Red deer (Cervus elaphus); Fallow deer (Dama dama); Other or Unknown.
(c): Only countries that reported tested cervids are included in the table.
(d): Shaded in grey: MS conducting mandatory surveillance from 2018 (MS6).
Table 39: Number of PSU by management type in the MS6 with mandatory CWD surveillance in 2019

| Management system | PSU (WILD) | PSU (CAPTIVE/FARMED DEER) | Total PSU |
|-------------------|------------|---------------------------|-----------|
|                   | Number PSU declared | Number of PSU tested (%) | Median number of cervids tested (min–max) | Number PSU declared | Number of PSU tested (%) | Median number of cervids tested (min–max) | Number PSU declared | Number of PSU tested (%) | Median number of cervids tested (min–max) |
| EE                | 15         | 9 (60%)                   | 31 (1–135) | 15         | 1 (6.7%)                  | 1 (1–1)                               | 15         | 9 (60%)                  | 28 (1–135)                               |
| FI (a)            | 295        | 124 (42%)                 | 1 (1–69)   | 54 (b)     | 49 (90.7%)                | 10 (1–40)                             | 349        | 171 (49%)                | 3 (1–69)                                 |
| LT                | 51         | Not available             | 655 (c)    | Not available |                          |                                      | Not available |                          |                                        |
| LV (d)            | 180        | 5 (1–22)                  | 100        | 180 (180%) | 5 (1–22)                  |                                        |
| PL (e)            | 16         | 16 (100%)                 | 65 (6–160) | 16         | 3 (18.8%)                 | 10 (8–98)                             | 16         | 16 (100%)                 | 63 (1–160)                               |
| SE (f)            | 50         | 49 (98%)                  | 5 (1–424)  | 160 (109 farmed + 51 semi-domesticated) | 34 (21.3%)                | 10 (1–595)                             | 210        | 82 (39%)                  | 6 (1–595)                                |

CWD: chronic wasting disease, PSU: primary sampling units.
(a): One wild deer reported with unknown PSU ID excluded.
(b): Semi-domesticated PSU.
(c): Each farm and each facility in which cervids are kept in an enclosed territory shall be considered as a PSU. There are approximately 655 permissions issued by the Ministry of the Environment for keeping wild animals, including cervids, but the active number (with cervids) is unknown.
(d): 87 semi-domesticated/farmed and 46 wild cervids reported with unknown PSU ID excluded.
(e): The PSU are not split by management systems.
(f): Two semi-domesticated/farmed and five wild cervids reported with unknown PSU ID excluded.
Table 40: Number of tested cervids in the EU and reporting countries by management system, species, country and target group in 2019

| Management system | Wild deer species\(^{(a)}\) | Semi-domesticated/farmed deer species\(^{(a)}\) | Total |
|-------------------|-----------------------------|---------------------------------------------|-------|
|                   | Eurasian tundra reindeer     | Finnish (Eurasian) forest reindeer           |       |
| Country/species   | Moose                       | Roe deer                                   |       |
|                   |                             | White-tailed deer                           |   1   |
|                   |                             | Red deer                                   |   1   |
|                   |                             | Fallow deer                                |   1   |
|                   |                             | Other or unknown                            |   1   |
|                   |                             | Subtotal                                   |     1 |
| AT                |                             |                                             |       |
| RK                | 1                          |                                             |       |
| Total             | 1                          |                                             |       |
| ES                |                             |                                             |       |
| HSHC              | 4                          |                                             | 45    |
| Total             | 4                          |                                             | 45    |
| HU                |                             |                                             |       |
| SUS               | 4                          |                                             |     6 |
| FC                | 1                          |                                             |     2 |
| Total             | 5                          |                                             |     8 |
| IT                |                             |                                             |       |
| SUS               | 30                         |                                             | 38    |
| RK                | 329                        |                                             | 384   |
| FC                | 99                         |                                             | 129   |
| Total             | 458                        |                                             | 551   |
| RO                |                             |                                             |       |
| SUS               | 7                          |                                             |     3 |
| RK                | 4                          |                                             |     2 |
| FC                | 77                         |                                             | 101   |
| HSHC              | 931                        |                                             | 2,004 |
| Total             | 1,015                      |                                             | 2,124 |
| SI                |                             |                                             |       |
| SUS               | 1                          |                                             |       |
| Total             | 1                          |                                             |       |
| UK                |                             |                                             |       |
| SUS               | 2                          |                                             |       |
| Total             | 2                          |                                             |       |
| Subtotal non-MS6  | 0                          |                                             |       |
|                   | 1,482                       |                                             |       |
|                   | 0                           |                                             |       |
|                   | 277                         |                                             |       |
|                   | 58                          |                                             |       |
|                   | 2                           |                                             |       |
|                   | 1,819                       |                                             |       |
|                   | 1                           |                                             |       |
|                   | 702                         |                                             |       |
|                   | 0                           |                                             |       |
|                   | 167                         |                                             |       |
|                   | 14                          |                                             |       |
|                   | 29                          |                                             |       |
|                   | 913                         |                                             |       |
|                   | 2,732                       |                                             |       |
### The European Union summary report on surveillance for the presence of transmissible spongiform encephalopathies (TSE) in 2019

The table below provides a summary of surveillance data for the presence of transmissible spongiform encephalopathies (TSE) in different regions of the European Union for the year 2019. The data includes information on wild deer species and semi-domesticated/farmed deer species.

#### Management system country/species(b),(c)

| Management system | Wild deer species(a) | Semi-domesticated/farmed deer species(a) | Total |
|-------------------|----------------------|-------------------------------------------|-------|
|                   | Eurasian tundra reindeer | Finnish (Eurasian) forest reindeer | White-tailed deer | Red deer | Fallow deer | Other or unknown | Subtotal | Eurasian tundra reindeer | Finnish (Eurasian) forest reindeer | White-tailed deer | Red deer | Fallow deer | Other or unknown | Subtotal |
| EE                |                      |                                           |                      |         |          |            |       |                      |                     |                  |      |          |            |            |         |
| SUS               | 3                    | 7                                         | 11                   | 21      |         |            |       |                      |                     |                  |      |          |            |            |         |
| RK                | 3                    | 99                                        | 2                    | 104     | 1        |            |       |                      |                     |                  |      |          |            |            |         |
| FC                | 12                   | 46                                        | 1                    | 59      |         |            |       |                      |                     |                  |      |          |            |            |         |
| HSNHC             | 9                    |                                           | 9                    |         |         |            |       |                      |                     |                  |      |          |            |            |         |
| HSHC              | 116                  | 137                                       | 63                   | 316     |         |            |       |                      |                     |                  |      |          |            |            |         |
| Total             | 134                  | 298                                       | 77                   | 509     | 1        |            |       |                      |                     |                  |      |          |            |            |         |
| FI                |                      |                                           |                      |         |          |            |       |                      |                     |                  |      |          |            |            |         |
| RK                | 5                    | 72                                        | 91                   | 344     | 409      | 1          | 105    |                      |                     |                  |      |          |            |            |         |
| FC                | 8                    | 71                                        | 35                   | 141     | 120      | 2          | 122    |                      |                     |                  |      |          |            |            |         |
| HSNHC             | 5                    |                                           | 5                    | 59      |          |            |       |                      |                     |                  |      |          |            |            |         |
| HSHC              | 1                    | 14                                        | 4                    | 21      | 12       | 1          | 13     |                      |                     |                  |      |          |            |            |         |
| Total             | 14                   | 162                                       | 205                  | 511     | 600      | 3          | 1      | 604                 | 1,115               |                  |      |          |            |            |         |
| LT                |                      |                                           |                      |         |          |            |       |                      |                     |                  |      |          |            |            |         |
| RK                | 12                   | 152                                       | 28                   | 192     |         |            |       |                      |                     |                  |      |          |            |            |         |
| FC                | 7                    | 69                                        | 15                   | 91      | 9        |            |       |                      |                     |                  |      |          |            |            |         |
| HSNHC             | 1                    | 19                                        | 20                   |         |          |            |       |                      |                     |                  |      |          |            |            |         |
| HSHC              | 29                   | 464                                       | 290                  | 783     | 9        |            |       |                      |                     |                  |      |          |            |            |         |
| Total             | 49                   | 704                                       | 333                  | 1086    |         | 19         |       |                      |                     |                  |      |          |            |            |         |
| LV                |                      |                                           |                      |         |          |            |       |                      |                     |                  |      |          |            |            |         |
| SUS               | 4                    |                                           | 1                    | 5       |         |            |       |                      |                     |                  |      |          |            |            |         |
| RK                | 4                    | 35                                        | 9                    | 48      |          |            |       |                      |                     |                  |      |          |            |            |         |
| FC                | 2                    | 13                                        | 7                    | 22      |          |            |       |                      |                     |                  |      |          |            |            |         |
| HSNHC             | 213                  | 456                                       | 228                  | 897     |          | 104       |       |                      |                     |                  |      |          |            |            |         |
| HSHC              |                      |                                           |                      |         |          |            |       |                      |                     |                  |      |          |            |            |         |
| Total             | 219                  | 508                                       | 245                  | 972     |          | 104       |       |                      |                     |                  |      |          |            |            |         |

**Notes:**
- (a) Wild deer species and semi-domesticated/farmed deer species.
- (b) Management system: EE (Estonia, Finland, Latvia), FI (Finland, Sweden), LT (Latvia), LV (Latvia, Estonia).
- (c) Country/species: Sus, Red.

The table above provides a summary of surveillance data for the presence of transmissible spongiform encephalopathies (TSE) in different regions of the European Union for the year 2019. The data includes information on wild deer species and semi-domesticated/farmed deer species.
### Management system country/species<sup>(b),(c)</sup>

| Wild deer species<sup>(a)</sup> | Semi-domesticated/farmed deer species<sup>(a)</sup> |
|---------------------------------|---------------------------------|
| Eurasian tundra reindeer | Eurasian tundra reindeer |
| Finnish (Eurasian) forest reindeer | Finnish (Eurasian) forest reindeer |
| Moose | Moose |
| Roe deer | Roe deer |
| White-tailed deer | White-tailed deer |
| Red deer | Red deer |
| Fallow deer | Fallow deer |
| Other or unknown | Other or unknown |
| Subtotal | Subtotal |

#### PL

| SUS | RK | FC | HSNHC | HSHC | Total |
|-----|----|----|-------|------|-------|
| 13  | 13 | 13 | 13    | 13   | 13    |
| 3   | 3  | 3  | 3     | 3    | 3     |
| 785 | 785| 785| 785   | 785  | 785   |
| 35  | 35 | 35 | 35    | 35   | 35    |
| 269 | 269| 269| 269   | 269  | 269   |

#### SE

| SUS | RK | FC | HSNHC | HSHC | Total |
|-----|----|----|-------|------|-------|
| 3   | 3  | 3  | 3     | 3    | 3     |
| 31  | 31 | 31 | 31    | 31   | 31    |
| 116 | 116| 116| 116   | 116  | 116   |
| 1,246| 1,246| 1,246| 1,246| 1,246| 1,246|

#### Total MS6

| SUS | RK | FC | HSNHC | HSHC | Total |
|-----|----|----|-------|------|-------|
| 3   | 3  | 3  | 3     | 3    | 3     |
| 31  | 31 | 31 | 31    | 31   | 31    |
| 1,246| 1,246| 1,246| 1,246| 1,246| 1,246|

#### Total EU

| SUS | RK | FC | HSNHC | HSHC | Total |
|-----|----|----|-------|------|-------|
| 3   | 3  | 3  | 3     | 3    | 3     |
| 31  | 31 | 31 | 31    | 31   | 31    |
| 1,246| 1,246| 1,246| 1,246| 1,246| 1,246|

#### Total non-EU

| SUS | RK | FC | HSNHC | HSHC | Total |
|-----|----|----|-------|------|-------|
| 3   | 3  | 3  | 3     | 3    | 3     |
| 31  | 31 | 31 | 31    | 31   | 31    |
| 1,246| 1,246| 1,246| 1,246| 1,246| 1,246|

#### Total

| SUS | RK | FC | HSNHC | HSHC | Total |
|-----|----|----|-------|------|-------|
| 3   | 3  | 3  | 3     | 3    | 3     |
| 31  | 31 | 31 | 31    | 31   | 31    |
| 1,246| 1,246| 1,246| 1,246| 1,246| 1,246|

<sup>(a):</sup> Eurasian tundra reindeer (*Rangifer tarandus tarandus*); Finnish (Eurasian) forest reindeer (*Rangifer tarandus fennicus*); Moose (or Eurasian/European elk) (*Alces alces alces*); Roe deer (*Capreolus capreolus*); White-tailed deer (*Odocoileus virginianus*); Red deer (*Cervus elaphus*); Fallow deer (*Dama dama*); Other or unknown.

<sup>(b):</sup> Only countries that reported tested cervids are included in the table.

<sup>(c):</sup> SUS: clinical suspect animals; RK: Road/predator killed; FC: Fallen/culled; HSNHC: Hunted/slaughtered not fit for human consumption; HSHC: Hunted/slaughtered fit for human consumption.

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| Country | National case ID | Management system | Species         | Sex   | Age group | Target group | Part sampled                          | Result |
|---------|------------------|-------------------|-----------------|-------|-----------|-------------|---------------------------------------|--------|
| EU      |                  |                   |                 |       |           |             |                                       |        |
| SE      | 6.3.17-13874/2019| Wild              | European moose  | Female| ≥ 12 months| HSHC        | Obex Retropharyngeal lymph node        | POS    |
|         | 6.3.17-14115/2019| Wild              | European moose  | Female| ≥ 12 months| FC          | Obex Retropharyngeal lymph node        | POS    |
|         | 6.3.17-14116/2019| Wild              | European moose  | Female| ≥ 12 months| SUS         | Brain Obex Retropharyngeal lymph node  | POS NEG|
| Non-EU  |                  |                   |                 |       |           |             |                                       |        |
| NO      | 10               | Wild              | European moose  | Female| ≥ 12 months| HSHC        | Obex                                  | POS    |
|         | 6                | Wild              | European moose  | Female| ≥ 12 months| HSHC        | Obex                                  | POS    |

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3.4. Other species

Three MS, Estonia, Finland and Spain reported results on samples tested for TSE in species other than cattle, domestic sheep and goats, and cervids. In total, 122 samples were collected and tested from the following species: raccoon dog (*Nyctereutes procyonoides*), American mink (*Neovison vison*), fox (genus *Vulpes*) and chamois (*Rupicapra rupicapra*). None of them tested positive (Table 42).

### Table 42: Numbers of animals in species other than cattle, sheep, goats and cervids tested for TSE in reporting countries in 2019

| Country | Raccoon dog (*Nyctereutes procyonoides*) | Fox (genus *Vulpes*) | American mink (*Neovison vison*) | Chamois (*Rupicapra rupicapra*) | Total |
|---------|----------------------------------------|----------------------|---------------------------------|---------------------------------|-------|
| EE      | 6                                      |                      |                                 |                                 | 6     |
| ES      |                                        |                      |                                 |                                 | 2     |
| FI      | 12                                     | 42                   | 60                              |                                 | 114   |
| Total   | 12                                     | 42                   | 66                              | 2                               | 122   |

TSE: Transmissible spongiform encephalopathies.

4. Conclusions

As part of the BSE surveillance system in cattle in the EU, over 1.1 million cattle were tested in 2019, 2.7% less than in the previous year. The testing throughput combined with a risk-based strategy (86.4% of all tests were targeting risk animals) contributed to maximise the sensitivity of the BSE surveillance system considering the EU as a single epidemiological unit. Seven atypical cases of BSE (one L-BSE and six H-BSE cases) were confirmed in 2019 by three reporting countries: France (four H-BSE), Spain (two H-BSE) and Poland (one L-BSE). A total 44,557 cattle were tested by four of the six non-MS reporting countries, with no cases reported. In particular, in the two new reporting countries, Montenegro only tested cattle in the target group slaughter for human consumption and in Serbia, 85.7% cattle were tested in the same target group.

From an epidemiological point of view, the highlights in the BSE caseload of the reporting year are the number of H-type BSE cases was the largest reported in a single year, equal to that of 2009 (6) (six cases per million tested) and the report by Spain of a H-type case of 5.5 years, the youngest atypical BSE ever reported since the TSE data are collected and published. An additional H-BSE case was reported by Brazil.

A total of 481,627 small ruminants were tested in 2019 in the EU, as part of the TSE surveillance system, leading to an overall testing of about 10 million tests since 2002. Twenty-two MS complied with the EU monitoring requirements in sheep and 23 MS in goats. Compared with 2018, there was a decrease in the detection of the scrapie cases (CS and AS) in non-infected sheep flocks (from 203 to 177) despite the 3% increase in the level of testing in non-infected flocks. This may be consistent with a decrease in the overall incidence of the disease. In the same period, there was a similar decrease in the detection of the scrapie cases (CS and AS) in non-infected goat herds (from 50 to 34), despite the 3.3% increase in the testing in non TSE-infected herds, due to the low number of index cases reported by Cyprus (8). Out of the two new reporting countries, only Serbia tested small ruminants: 165 sheep slaughtered for human consumption without any case detected.

For CS in sheep, compared with 2018, the increase in the testing activity has resulted in an increase in the EU caseload but not in the proportion of cases per 10,000 tested animals or in the number of index cases, which were reduced again in 2019. Overall, the three countries with the largest number of CS cases, namely Greece, Italy and Spain, have reported more CS cases compared to 2018 but similar number of index cases and increased testing in TSE-infected flocks, where most of the CS cases are detected. Romania reported 30% fewer number of cases with the same level of testing than in 2018. From a geographical point of view, the disease is reported by a minority of the MS: seven in 2019, same number as in 2018 although some countries differ. As in 2018, only a very small proportion (1.2%) of the CS caseload is from MS other than Greece, Spain, Italy and Romania.

In goats, in total, 390 scrapie cases in goats were reported in the EU in 2019 by nine MS (two more than in 2018), with a 25.4% reduction (–133) compared with 2018 when 523 cases were reported, mainly due to the improved situation in Cyprus and Spain.
When looking at the long-term trends of CS in terms of cases per 10,000 tests in both species, the situation in 2019 confirmed the 10-year statistically significant decreasing trend in sheep and no detectable trend in goats, respectively, as estimated through modelling of the available epidemiological data. The disadvantage of the control of the disease in goat herds, due to the lack of both breeding for resistance programmes and genetic-based culling and restocking of infected herds, may explain to a certain extent this long-term trend. However, forthcoming amendments in the TSE regulation per Regulation (EU) 772/2020 will allow the management of outbreaks in goat herds with caprine animals carrying at least one of the following alleles: K222, D146 and S146.

For AS in sheep, compared with 2018, the above-described testing activity resulted in a decrease in the caseload and in the proportion of cases per 10,000 tested animals, a decrease in the number of index cases and the number of MS reporting cases, despite the overall increase in testing. The opposite occurred in goats where the increase in the testing activity compared with 2018 resulted in the increase of the AS caseload, in the proportion of cases per 10,000 tested animals and in the number of index cases. These changes could be due to the annual variability.

With regard to the long-term trends of AS, there was also a 10-year statistically significant decreasing trend in sheep and no detectable trend in goats.

The genotyping data collected in 2019 from ovine CS cases consistently confirm the association between the occurrence of the disease and the susceptible genotypes (NSP3, NSP3O, NSP4 or NSP5), with 98.7% of the cases with known genotypes carrying them. The 2019 genotyping data from random samples of the EU sheep population (after excluding Cyprus) did show an improvement compared with the previous years with an average 15.7% of the genotyped sheep carrying genotypes of the susceptible group, from 19.2% in 2018. Some caution is needed in interpreting this result as it could reflect the implementation of the amendment of the TSE Regulation with the subsequent reduction in the number of contributing MS. A CS case in a sheep holding the ARR/ARR genotype (NSP1) was reported by Spain.

The enforcement of the 3-year surveillance programme for CWD in six MS – Estonia, Finland, Latvia, Lithuania, Poland and Sweden – resulted in 2019 in an increase of over 50% the number of cervids tested compared to the previous year: from 5,110 to the testing of 7,980 cervids and the confirmation of three cases of CWD by Sweden.

The surveillance was complemented by the additional 2,732 cervids tested by other six MS (77.7% of them tested by Romania) with no additional cases detected. The implementation of the mandatory surveillance in the six MS is quite heterogeneous in terms of the design (number and characteristics of the declared PSU), the number of cervids tested in general and per PSU in particular and the distribution of testing by species and target groups. The targeting of mostly hunted/slaughtered fit for human consumption (HSHC) animals observed in the first year of implementation was further increased in 2019 up to 60.5% of all tested cervids, consolidating a situation in which the sensitivity of the surveillance system is lower than expected, following the proposed surveillance system by EFSA in 2017 (EFSA BIOHAZ Panel, 2017b). No conclusions can be drawn about the presence of the disease in other MS and about the prevalence in the affected MS.

Norway continued its intensified testing programme in wild and captive cervids and tested 30,147 cervids in 2019, leading to the detection of two moose cases. At the end of the reporting year and since 2016, Norway had confirmed in total 19 cases in reindeer, 6 in moose and 1 in red deer. Iceland also reported 114 tested cervids in 2019, all negative.

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**Abbreviations**

| AM   | Ante-mortem |
| AS   | Atypical scrapie |
| BARB | Born After the Revised feed Ban |
| BSE  | Bovine spongiform encephalopathy |
| C-BSE | Classical bovine spongiform encephalopathy |
| CS   | Classical scrapie |
| DCF  | Data Collection Framework |
| DWH  | Data Warehouse |
| EFTA | European Free Trade Association |
| EM   | Eradication measures |
| ES   | Emergency slaughtered |
| EUSR | European Union summary report |
| FS   | Fallen stock |
| H-BSE | H-type bovine spongiform encephalopathy |
| HS   | Healthy slaughtered |
| HSHC | Hunted/slaughtered fit for human consumption |
| HSNHC | Hunted/slaughtered not fit for human consumption |
| L-BSE | L-type bovine spongiform encephalopathy |
| MS   | Member State/s |
| MS6  | Estonia, Finland, Latvia, Lithuania, Poland and Sweden |
| NSHC | Not slaughtered for human consumption |
| NSP  | National Scrapie Plan |
| PSU  | Primary sampling units |
| RK   | Road/predator killed |
| RR   | Relative risk |
| SHC  | Slaughtered for human consumption |
| SU   | clinical suspect |
| SUS  | clinical suspect ( cervids ) |
| TSE  | Transmissible spongiform encephalopathies |
| WB   | Western blot |
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## Country codes

| Country   | Code | Country       | Code | Country       | Code | Country       | Code | Country       | Code | Country       | Code |
|-----------|------|---------------|------|---------------|------|---------------|------|---------------|------|---------------|------|
| Austria   | AT   | France        | FR   | Luxembourg    | LU   | Serbia        | RS   |
| Belgium   | BE   | Germany       | DE   | Malta         | MT   | Slovakia      | SK   |
| Bulgaria  | BG   | Greece        | EL   | Montenegro    | ME   | Slovenia      | SI   |
| Croatia   | HR   | Switzerland   | NL   | Spain         | ES   |
| Cyprus    | CY   | Iceland       | IS   | North Macedonia | MK | Sweden        | SE   |
| Czechia   | CZ   | Ireland       | IE   | Norway        | NO   | Switzerland   | CH   |
| Denmark   | DK   | Italy         | IT   | Poland        | PL   | The United Kingdom | UK  |
| Estonia   | EE   | Latvia        | LV   | Portugal      | PT   |
| Finland   | FI   | Lithuania     | LT   | Romania       | RO   |

**MS countries:** AT; BE; BG; HR; CY; CZ; DK; EE; FI; FR; DE; EL; HU; IE; IT; LV; LT; LU; MT; NL; PL; PT; RO; SK; SI; ES; SE; UK.

**Non-MS countries:** CH (including Lichtenstein); IS; ME; MK; NO; RS.
Table A.1: BSE active monitoring in relation to the adult bovine population (age > 2 years) in 2019

| EU/non-EU groups(a) | Country code | Adult cattle (> 2 years)(a) | Number of tested bovine animals at risk(b) | Proportion (%) of tested bovine animals at risk(b) |
|---------------------|--------------|------------------------------|-------------------------------------------|-----------------------------------------------|
| EU                  | AT           | 847,770                      | 19,014                                    | 2.2%                                          |
|                     | BE           | 1,187,580                    | 26,123                                    | 2.2%                                          |
|                     | BG           | 369,000                      | 2,988                                     | 0.8%                                          |
|                     | CY           | 37,910                       | 1,739                                     | 4.6%                                          |
|                     | CZ           | 657,250                      | 24,348                                    | 3.7%                                          |
|                     | DE           | 5,402,850                    | 173,136                                   | 3.2%                                          |
|                     | DK           | 698,000                      | 24,577                                    | 3.5%                                          |
|                     | EE           | 133,200                      | 3,762                                     | 2.8%                                          |
|                     | EL           | 283,000                      | 1,307                                     | 0.5%                                          |
|                     | ES           | 3,214,460                    | 61,181                                    | 1.9%                                          |
|                     | FI           | 348,810                      | 11,286                                    | 3.2%                                          |
|                     | FR           | 9,883,010                    | 207,259                                   | 2.1%                                          |
|                     | HR           | 162,000                      | 5,014                                     | 3.1%                                          |
|                     | HU           | 458,000                      | 11,084                                    | 2.4%                                          |
|                     | IE           | 2,855,890                    | 56,853                                    | 2.0%                                          |
|                     | IT           | 3,029,900                    | 53,785                                    | 1.8%                                          |
|                     | LT           | 336,200                      | 2,875                                     | 0.9%                                          |
|                     | LU           | 101,170                      | 2,593                                     | 2.6%                                          |
|                     | LV           | 222,430                      | 3,368                                     | 1.5%                                          |
|                     | MT           | 6,880                        | 292                                       | 4.2%                                          |
|                     | NL           | 1,752,000                    | 52,001                                    | 3.0%                                          |
|                     | PL           | 2,757,500                    | 60,159                                    | 2.2%                                          |
|                     | PT           | 903,460                      | 16,910                                    | 1.9%                                          |
|                     | RO           | 1,299,200                    | 8,847                                     | 0.7%                                          |
|                     | SE           | 612,710                      | 8,405                                     | 1.4%                                          |
|                     | SI           | 196,520                      | 6,309                                     | 3.2%                                          |
|                     | SK           | 226,680                      | 9,716                                     | 4.3%                                          |
|                     | UK           | 4,264,000                    | 138,401                                   | 3.2%                                          |
| Total EU            |              | 42,247,380                   | 993,332                                   | 2.4%                                          |
| Non-EU              | CH           | 787,310                      | 11,175                                    | 1.4%                                          |
|                     | IS           | 38,500                       | 12                                        | 0.0%                                          |
|                     | ME           | 64,500                       | 0                                         | 0.0%                                          |
|                     | MK           | 141,000                      | 0                                         | 0.0%                                          |
|                     | NO           | 353,700                      | 6,884                                     | 1.9%                                          |
|                     | RS           | 492,000                      | 2,836                                     | 0.6%                                          |
| Total non-EU        |              | 1,877,010                    | 20,907                                    | 1.1%                                          |
| TOTAL               |              | 44,124,390                   | 1,014,239                                 | 2.3%                                          |

(a): Taken from https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=apro_mt_lscatl&lang=en [Bovine animals, 2 years or over].
Norway’s cattle population taken from the TSE EUSR report 2018 (EFSA, 2019).
(b): At risk animals is the sum of animals with clinical signs at ante-mortem, emergency slaughtered and fallen stock.
Appendix B – Geographical distribution of BSE in the period 2001–2019

The size of the circles is proportional to the measurements and are only comparable within the map but not between maps.

**Figure B.1**: Geographical distribution of cumulative number of cases of C-BSE (A); BARB cases (B); H-BSE (C); and L-BSE (D) in the period 2001–2019
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**Figure B.2:** Country-specific BSE cases per million tests by case type in the period 2001-2019 in the EU

The size of the circles is proportional to the measurements and are only comparable within the map but not between maps.
Appendix C – Geographical distribution of scrapie in 2019

A  Classical cases in sheep

B  Classical cases in goats

C  Atypical cases in sheep

D  Atypical cases in goats

The size of the circles is proportional to the measurements and are only comparable within the map but not between maps.

Figure C.1: Geographical distribution of numbers of cases of ovine CS (A); caprine CS (B); ovine AS (C); and caprine AS (D) in 2019 in the reporting countries
Figure C.2: Geographical distribution of proportion of cases per 10,000 tests of ovine CS (A); caprine CS (B); ovine AS (C); and caprine AS (D) in 2019.
Appendix D – Additional information asked by EFSA in relation to reporting, according to Annex III of Regulation 999/2001

Table D.1: The number of suspected cases placed under official movement restrictions in accordance with Article 12(1), in 2019

| Country | Cattle | Sheep | Goats |
|---------|--------|-------|-------|
| AT      | 21     | 0     | 0     |
| BE      | 142    | 0     | 0     |
| BG      | 0      | 0     | 0     |
| CY      | 0      | 7,124 | 17,410|
| CZ      | 2      | 0     | 0     |
| DE      | 0      | 0     | 0     |
| DK      | 1      | 0     | 1     |
| EE      | 0      | 0     | 0     |
| EL      | 790    | 4,420 | 690   |
| ES      | 0      | 967   | 0     |
| FI      | 0      | 0     | 0     |
| FR      | 2      | 3     | 0     |
| HR      | 0      | 0     | 0     |
| HU      | 12     | 0     | 0     |
| IE      | 1,235  | 0     | 0     |
| IT      | 0      | 34    | 17    |
| LV      | 1      | 2     | 1     |
| LU      | 0      | 0     | 0     |
| LT      | 0      | 0     | 0     |
| MT      | 0      | 0     | 0     |
| NL      | 0      | 0     | 0     |
| PL      | 22     | 2     | 0     |
| PT      | 6      | 0     | 0     |
| RO      | 5,177  | 8,969 | 9     |
| SI      | 0      | 0     | 0     |
| SE      | 0      | 0     | 0     |
| SK      | 0      | 0     | 0     |
| UK      | 0      | 1     | 0     |
| Total EU| 7,409  | 21,519| 18,128|
| CH      | 0      | 0     | 0     |
| IS      | 0      | 0     | 0     |
| ME      | 0      | /     | /     |
| MK      | 0      | 0     | 0     |
| NO      | 0      | 0     | 0     |
| RS      | 30     | /     | /     |
| Total non-EU | 30 | 0 | 0 |
| Total   | 7,439  | 21,519| 18,128|
Table D.2: Number of flocks where suspected cases in ovine and caprine animals have been reported and investigated pursuant to Article 12(1) and (2), in 2019

| Country | Sheep | Goats |
|---------|-------|-------|
| AT      | 0     | 0     |
| BE      | 0     | 0     |
| BG      | 0     | 0     |
| CY      | 28    | 28    |
| CZ      | 0     | 0     |
| DE      | 4     | 4     |
| DK      | 1     | 1     |
| EE      | 0     | 0     |
| EL      | 4     | 4     |
| ES      | 0     | 0     |
| FI      | 0     | 0     |
| FR      | 0     | 0     |
| HR      | 0     | 0     |
| HU      | 0     | 0     |
| IE      | 0     | 0     |
| IT      | 6     | 6     |
| LV      | 1     | 1     |
| LU      | 0     | 0     |
| LT      | 0     | 0     |
| MT      | 0     | 0     |
| NL      | 0     | 0     |
| PL      | 0     | 0     |
| PT      | 0     | 0     |
| RO      | 1     | 1     |
| SI      | 0     | 0     |
| SE      | 0     | 0     |
| SK      | 0     | 0     |
| UK      | 0     | 0     |
| **Total EU** | **45** | **45** |
| CH      | 0     | 0     |
| IS      | 0     | 0     |
| ME      | /     | /     |
| MK      | 0     | 0     |
| NO      | 1     | 1     |
| RS      | /     | /     |
| **Total non-EU** | **1** | **1** |
| **Total** | **46** | **46** |

(a): In addition, 6 mixed flocks (sheep and goats).
Table D.3: Number of ovine and caprine flocks tested within each subpopulation referred to in Chapter A, Part II, points 2, 3, 5 and 6 together with the method for sample selection and the results of the rapid and confirmatory tests in 2019

| Country | Sheep SHC | Sheep NSHC | Sheep EM | Goats SHC | Goats NSHC | Goats EM | Other<sup>a</sup> |
|---------|-----------|------------|----------|-----------|------------|----------|-----------------|
| AT      | 110       | 1,814      | 2        | 22        | 590        | 0        | 0               |
| BE      | 0         | *          | 0        | 0         | *          | 0        | 0               |
| BG      | N/a       | N/a        | N/a      | N/a       | N/a        | N/a      | N/a             |
| CY<sup>b</sup> | 29     | 118        | 686      | 1         | 241        | 329      | 6               |
| CZ      | 0         | 908        | 0        | 1         | 239        | 0        | No              |
| DE      | 4,377     | 4,793      | 2        | 161       | 698        | 0        | 1,135           |
| DK      |           |            |          |           |            |          |                 |
| EE      | 0         | 70         | 0        | 0         | 5          | 0        | 0               |
| EL      | 34        | 62         | 36       | 19        | 27         | 15       | Non applicable  |
| ES      | 963       | 4,996      | 80       | 751       | 2,092      | 23       |                 |
| FI      | 3         | 464        | 0        | 0         | 43         | 0        | Mink 60, fox 42, raccoon dog 12<sup>c</sup> |
| FR      | 5529      | 20,355     | 0        | 4,240     | 18,678     | 0        | 0               |
| HR      | 0         | 792        | 0        | 0         | 219        | 0        | 0               |
| HU      | 1,521     | 1,140      | 0        | 47        | 59         | 1        | 0               |
| IE      | 5,257     | 6,959      | 0        | 0         | 127        | 0        |                 |
| IT      | 4,306     | 5,847      | 52       | 4,479     | 3,944      | 32       |                 |
| LV      | 0         | 91         | 0        | 0         | 18         | 0        |                 |
| LU      | 0         | Not available | 0  | Not available | 0 | 0               |
| LT      | 0         | N/A        | 0        | 0         | 13         | 0        |                 |
| MT      | 75        | 167        | 0        | 60        | 100        | 0        | 0               |
| NL      | 0         | 1,520      | 0        | 0         | 1,528      | 0        | 0               |
| PL      | 1,464     | 2,482      | 0        | 140       | 1,138      | 0        |                 |
| PT      | 1,024     | 5,899      | 53       | 1         | 814        | 4        | 0               |
| RO      | 12,267    | 9,684      | 22       | 5,495     | 3,798      | 0        | 0               |
| SI      | 68        | 1,224      | 0        | 17        | 353        | 0        | 0               |
| SE      | 5         | 699        | 0        | 0         | 48         | 0        | 0               |
| SK      | 6         | 507        | 0        | 1         | 58         | 0        | 0               |
| UK      | > 4       | > 5,470    | 1        | 0         | > 167      | 1        | 0               |
| CH      | 0         | 0          | 0        | 0         | 0          | 0        | 0               |
| IS      | 283       | 30         | 1        | 5         | 0          | 0        | 0               |
| ME      | /         | /          | /        | /         | /          | /        | /               |
| MK      | 240       | 0          | 3        | 0         | 0          | 0        | 0               |
| NO      | 3,454     | 4,256      | 12       | 14        | 69         | 0        | No other animals |
| RS      | 9         | /          | /        | /         | /          | /        | /               |

SHC: slaughtered for human consumption; NSHC: not slaughtered for human consumption; EM: emergency slaughter. n/a: Not available.

*: The Belgian competent authority informed that in the central database for sheep and goat identification, there is no direct link between the official eartag number and the last holding where the sheep or goat was kept. Only the herd of birth is registered in the central database. For this reason, it is impossible to answer question 3. At the rendering plant sheep and goats are randomly sampled during the year.

<sup>a</sup>: Monitoring in other animals (= for dairy production, OR from countries with indigenous TSE, OR animals that have consumed potentially contaminated feeding stuffs, OR animals born or derived from TSE infected dams).

<sup>b</sup>: In addition, 6 mixed flocks (sheep and goats).

<sup>c</sup>: Included in Table 41.
Appendix E – Country Data sets

All country data sets containing the tables on the occurrence of TSE per country are available on the EFSA Knowledge Junction community on ZENODO – please see below the list and corresponding link to the data sets. The countries that submitted data sets on the 2019 monitoring data year are: the 28 EU Member States and 6 non-EU Member.

Table E.1:  Links to the TSE data sets for 2019 by reporting country

| Country  | Link to the data set |
|----------|----------------------|
| **EU Member States** | |
| AT | https://doi.org/10.5281/zenodo.4091586 |
| BE | https://doi.org/10.5281/zenodo.4091592 |
| BG | https://doi.org/10.5281/zenodo.4091603 |
| CY | https://doi.org/10.5281/zenodo.4091605 |
| CZ | https://doi.org/10.5281/zenodo.4091617 |
| DE | https://doi.org/10.5281/zenodo.4091622 |
| DK | https://doi.org/10.5281/zenodo.4091628 |
| EE | https://doi.org/10.5281/zenodo.4091636 |
| EL | https://doi.org/10.5281/zenodo.4091642 |
| ES | https://doi.org/10.5281/zenodo.4091644 |
| FI | https://doi.org/10.5281/zenodo.4091648 |
| FR | https://doi.org/10.5281/zenodo.4091650 |
| HR | https://doi.org/10.5281/zenodo.4091654 |
| HU | https://doi.org/10.5281/zenodo.4091656 |
| IE | https://doi.org/10.5281/zenodo.4091660 |
| IT | https://doi.org/10.5281/zenodo.4091664 |
| LV | https://doi.org/10.5281/zenodo.4091666 |
| LU | https://doi.org/10.5281/zenodo.4091672 |
| LT | https://doi.org/10.5281/zenodo.4091674 |
| MT | https://doi.org/10.5281/zenodo.4091679 |
| NL | https://doi.org/10.5281/zenodo.4091685 |
| PL | https://doi.org/10.5281/zenodo.4091687 |
| PT | https://doi.org/10.5281/zenodo.4091689 |
| RO | https://doi.org/10.5281/zenodo.4091692 |
| SI | https://doi.org/10.5281/zenodo.4091694 |
| SE | https://doi.org/10.5281/zenodo.4091704 |
| SK | https://doi.org/10.5281/zenodo.4091710 |
| UK | https://doi.org/10.5281/zenodo.4091712 |
| **Non-EU Member States** | |
| CH | https://doi.org/10.5281/zenodo.4091717 |
| IS | https://doi.org/10.5281/zenodo.4091720 |
| ME | https://doi.org/10.5281/zenodo.4091724 |
| MK | https://doi.org/10.5281/zenodo.4091726 |
| NO | https://doi.org/10.5281/zenodo.4091728 |
| RS | https://doi.org/10.5281/zenodo.4091730 |