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SCIENTIFIC OPINION

The European Union summary report on surveillance for the presence of transmissible spongiform encephalopathies (TSE) in 2023

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The declarations of interest of all scientific experts active in EFSA's work are available at https://open.efsa.europa.eu/experts

Abstract

This report presents the results of surveillance on transmissible spongiform encephalopathies in cattle, sheep, goats, cervids and other species, and genotyping in sheep and goats, carried out in 2023 by 27 Member States (MS, EU27), the United Kingdom (in respect of Northern Ireland, (XI)) and other eight non-EU reporting countries: Bosnia and Herzegovina, Iceland, Montenegro, North Macedonia, Norway, Serbia, Switzerland (the data reported by Switzerland include those of Liechtenstein) and Türkiye. In total, 948,165 cattle were tested by EU27 and XI (−3%, compared with 2022), with five atypical BSE cases reported (four H-type: two in Spain, one in France and one in Ireland; one L-type in the Netherlands); and 46,096 cattle by eight non-EU reporting countries with two atypical BSE cases reported by Switzerland. Three additional atypical BSE cases were reported by UK (1), USA (1) and Brazil (1). In total, 284,686 sheep and 102,646 goats were tested in the EU27 and XI (−3.5% and −5.9%, respectively, compared to 2022). In the other non-EU reporting countries 26,047 sheep and 589 goats were tested. In sheep, 538 cases of scrapie were reported by 14 MS and XI: 462 classical scrapie (CS) by 4 MS (104 index cases (IC) with genotypes of susceptible groups in 93.4% of the cases), 76 atypical scrapie (AS) (76 IC) by 12 MS. In the other non-EU reporting countries, Iceland reported 70 cases of CS while Norway reported 7 cases of ovine AS. Ovine random genotyping was reported by six MS and genotypes of susceptible groups accounted for 6.9%. In goats, 183 cases of scrapie were reported, all from EU MS: 176 CS (47 IC) by seven MS and 7 AS (7 IC) by five MS. Three cases in Cyprus and one in Spain were reported in goats carrying heterozygous alleles at codon 146 and 222, respectively. In total, 2096 cervids were tested for chronic wasting disease by ten MS, none tested positive. Norway tested 14,224 cervids with one European moose positive.

KEYWORDS

atypical, BSE, classical, CWD, scrapie, surveillance, TSE

CONTENTS

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 2023 in the European Union (EU) Member States (MS), in the United Kingdom (in respect of Northern Ireland) (hereafter: 'XI') and in other eight non-EU reporting countries: Bosnia and Herzegovina,[1] Iceland, Montenegro, North Macedonia,[2] Norway, Serbia, Switzerland (the data reported by Switzerland include those of Liechtenstein) and Türkiye, as well as genotyping data in sheep and goats. Albania and Kosovo[3] confirmed no TSE surveillance was conducted in 2023.

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 and case data. Surveillance data were submitted through the EFSA TSE data reporting tool by 29 reporting countries. Seven 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). The electronically submitted data from the EFSA database were further processed, validated and extracted to draft the summary tables presented in the current EU summary report (EUSR).

As in 2022, the 2023 data of EU and XI have been compared with those of the previous years for the EU and the United Kingdom. That might introduce some bias, mainly in the 10-year trend analysis. In this report the 2023 EU27 data (i.e. data from the current 27 EU MS, referred to in the report as 'EU27') have been summed up with those provided by XI. However, all tables present separately the EU27 totals and those including EU27 data plus XI. Totals obtained from the three European Free Trade Association (EFTA) countries (Iceland, Norway and Switzerland (the data reported by Switzerland include those of Liechtenstein)) and the five non-EFTA IPA (Instrument for Pre-Accession Countries) (Bosnia and Herzegovina, Montenegro, North Macedonia, Serbia and Türkiye) were referred to as 'non-EU reporting countries' in the text and shortened in the Tables to 'other non-EU', for brevity of expression.

In total, 948,165 cattle were tested in 2023 in the EU27 and XI, with a decrease of 3% on the previous year. The 87.3% of all cattle tested in the EU27 and XI was reported to the group of risk animals (emergency slaughtered animals (ES), animals with clinical signs at *ante-mortem* inspection (AM) and fallen stock (FS)), with FS being the largest contributor with 761,696 cattle tested in 2023 (92% of all cattle in the risk group). An additional 46,096 cattle were tested by the eight other non-EU reporting countries. Serbia (the main contributor with 14,031 cattle tested) reported mostly cattle from the healthy slaughtered (HS) target group while Switzerland with 11,376, including the data of Liechtenstein reported mostly cattle from animals in the risk group.

In the EU27 and XI, five atypical BSE cases in the FS testing group were reported in 2023. Four cases were H-type (two in Spain, one in France and one in Ireland) and one was L-type (in the Netherlands). Two atypical BSE cases (L-type) were reported by Switzerland. Three additional atypical cases were reported in the rest of the world in 2023: one L-type (one in the USA) and two H-type (one in the UK and one in Brazil).

In total, 387,332 small ruminants were tested in 2023 in the EU27 and XI: 284,686 sheep (a 3.5% decrease compared to 2022) and 102,646 goats (a 5.9% decrease). In addition, 26,047 sheep were tested by five of the eight other non-EU reporting countries: Iceland, North Macedonia, Norway, Serbia and Türkiye, and 589 goats were tested by Iceland, Norway, Serbia and Türkiye.

In sheep, 538 scrapie cases were reported in the EU27 (14 MS) and XI in 2023, 19 less cases than in 2022. In total, 462 ovine cases in the EU27 and XI were CS (85.9%), 76 cases were AS (14.1%). Among the five other non-EU reporting countries that tested sheep, Iceland reported 70 cases of classical scrapie (CS) while Norway reported 7 cases of atypical scrapie (AS). CS was reported only by four MS (Greece, Italy, Romania and Spain) and one non-EU country (Iceland). AS was reported by 12 EU reporting countries (Austria, Belgium, Finland, France, Germany, Hungary, Italy, Poland, Portugal, Slovenia, Spain and Sweden). Among non-EU reporting countries, only Norway reported the presence of AS.

In sheep, 180 (33.5%) of all cases in the EU27 and XI reported in 2023 were index cases (IC), with a much higher proportion in AS cases (100%) compared with CS cases (22.5%). In total, 93.4% of the CS cases in sheep reported in 2023 with known genotypes belonged to animals holding genotypes of the susceptible groups (NSP3, NSP3O, NSP4 or NSP5).

In 2023, the random genotyping of the national EU sheep populations was carried out by six MS: Belgium, France, Germany, Italy, the Netherlands and Poland. After excluding Cyprus, 6.9% of the randomly genotyped sheep with known genotypes still carried those of the susceptible groups, lower than the 7.3% in 2022. This percentage stands at 18.3% in Italy, one of the countries with high case load in 2023.

In goats, in total 183 scrapie cases were reported in the EU27 and XI: 176 CS (96.2%, with Cyprus accounting for 35% of these) and 7 were AS cases (3.8%). Seven MS (Bulgaria, Cyprus, Greece, Italy, Portugal, Romania and Spain) reported CS, whereas five MS (France, Germany, Italy, Portugal and Spain) reported AS. The four other non-EU reporting countries (Iceland, Norway, Serbia and Türkiye) that reported tested goats did not report any scrapie cases. In goats, 29.5% (54) of all cases reported in the EU27 and XI in 2023 were IC, representing an increase from 2022 (22.3%). The proportion of IC cases in AS (100%) was higher than in CS (26.7%).

[1]In accordance with the Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community, and in particular Article 5(4) of the Windsor Framework in conjunction with Annex 2 to that Framework, for the purposes of this scientific report, references to the United Kingdom do not include Northern Ireland.

[2]In accordance with the Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community, and in particular Article 5(4) of the Windsor Framework in conjunction with Annex to that Framework, for the purposes of this scientific report, references to Member States include the United Kingdom in respect of Northern Ireland.

[3]This designation is without prejudice to positions on status and is in line with United Nations Security Council Resolution 1244 and the International Court of Justice Opinion on the Kosovo Declaration of Independence.

Genotype of goat cases at either codon 146 or 222 were reported in 135 cases (4 AS, 131 CS), mostly by Cyprus (64), Greece (58), Italy (10) and Spain (31). Three cases of CS reported by Cyprus were heterozygous goats at codon 146: one DN and two NS, respectively. In Spain, one case was heterozygous at codon 222 (KQ).

With regard to long-term trends (cases per 10,000 tests), the analysis up to 2023 confirmed the 10-year statistically significant decrease in sheep for AS (4% annually) while a trend was not significant for CS. No detectable trend was found in goats for AS while a statistically significant increasing trend was shown for caprine CS.

In 2023 2096 cervids where tested for chronic wasting disease (CWD) by 10 MS (54.4% of them tested by Romania). No cases have been detected. The hunted/slaughtered fit for human consumption (HSHC) target group was the most tested group with 67.5% of all tested cervids. Norway tested 14,224 animals, leading to the detection of one case in a wild European moose. Additionally, Iceland and Serbia reported testing of 46 and 180 cervids respectively, which were all negative. In total, 142 animals of other species were TSE tested by Finland: 47 domestic cats, 49 American minks, 35 foxes and 11 raccoon dogs. None of them tested positive.

Two interactive communication tools on TSE – a story map (click_this_link), providing general information on TSEs, and a dashboard (click_this_link) to search and visualise the surveillance data from EU Member States and other reporting countries, have been updated with the data of the reporting year.

1 | INTRODUCTION

1.1 | Background and Terms of Reference

According to Part I.A, Chapter B, Annex III of Regulation (EC) 999/2001[4] (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, the number of samples and confirmed TSE cases per species.
8. The genotype, and, where possible, the breed, of each ovine and caprine animal found positive to TSE and sampled in accordance with Chapter A, Part II, point 8.

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.'[5]

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. From 1 January 2016, the European Food Safety Authority shall analyse the information referred to in Part I and publish by the end of November a summary report on the trends and sources of TSE in the Union".

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.

Commission Decision 2009/719/EC[6] allowed MS to apply a revised BSE monitoring programme. Commission Implementing Decision 2013/76/EU[7] of 4 February 2013, amending Commission Decision 2009/719/EC, authorised 25 MS to decide to stop testing slaughtered bovine animals for human consumption. Following the EFSA scientific report on the evaluation of the revision of the BSE monitoring regime in Croatia (EFSA, 2016a) and the Commission Implementing

[4]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.

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

[6]Commission Decision 2009/719/EC of 28 September 2009 authorising certain Member States to revise their annual BSE monitoring programmes. OJ L 256, 29.9.2009, p. 35–37.

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

Decision (EU) 2016/851,[8] Croatia was allowed to discontinue the testing of slaughtered bovine animals for human consumption that is still required for Bulgaria and Romania.

With regards to the United Kingdom[9], the transition period agreed as part of the Agreement on the Withdrawal of the United Kingdom from the EU ended on 31 December 2020 and the United Kingdom is considered a third country. However, the Article 5(4) and Section 24 of Annex 2 of the Protocol on Ireland/Northern Ireland[10] contemplates the EU requirements on data sampling are also applicable to Northern Ireland; so, for the purpose of this report, references to Member States are read as including the United Kingdom in respect of Northern Ireland.

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[11]] also provides for mandatory discriminatory testing for BSE of TSE cases detected in small ruminants.

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 animals (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 in EU, applied in 2023, are summarised in Table 1. A table summarising the evolution of the changes (age limits for different target groups) was published in the 2015 EU summary report on TSE (EFSA, 2016b).

However, there are still some differences in the application of these general rules due to specific national provisions that provide some residual testing of HS or the testing of at-risk animals (AM, ES and FS) at younger age. The age limits (in months) of bovine animals tested for BSE surveillance applied in 2023 by Member States (MS), and United Kingdom (in respect of Northern Ireland) or the other non-EU reporting countries (Bosnia and Herzegovina, Iceland, Montenegro, North Macedonia, Norway, Serbia, Switzerland (the data reported by Switzerland include those of Liechtenstein) and Türkiye) are shown in Table 2.

TABLE 1 Criteria for BSE surveillance in bovine animals as applied in 2023 by country, age limit and surveillance target group, based on the TSE Regulation (EC) 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 25 + XI	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
BSE suspects (SU)	All	All
Animals culled under BSE eradication measures (EM)		

[a]Different criteria were applied in 2023 because Bulgaria and Romania were not in the list of the 25 MS and XI authorised to revise their BSE annual surveillance programmes.

TABLE 2 Age limits (in months) of bovine animals tested for BSE surveillance applied in 2023 by reporting country and surveillance target group.

	Surveillance target group					
Country	**ES**	**AM**	**FS**	**HS**	**SU**	**EM**
AT	> 24	> 24	> 48[a]	No testing[b]	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	> 24	> 48	No testing	No age limit	No age limit

[8]Commission Implementing Decision (EU) 2016/851 of 26 May 2016 amending the Annex to Decision 2009/719/EC as regards the authorisation for Croatia to revise its BSE annual monitoring programme. OJ L 141, 28.5.2016, p. 131–132.

[9]In accordance with the Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community, and in particular Article 5(4) of the Windsor Framework in conjunction with Annex 2 to that Framework, for the purposes of this [scientific report], references to the United Kingdom do not include Northern Ireland.

[10]In accordance with the Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community, and in particular Article 5(4) of the Windsor Framework in conjunction with Annex 2 to that Framework, for the purposes of this [scientific report], references to Member States include the United Kingdom in respect of Northern Ireland.

[11]Commission Regulation (EC) No 36/2005 of 12 January 2005 amending Annexes III and X to Regulation (EC) No 999/2001 of the European Parliament and of the Council as regards epidemio-surveillance for transmissible spongiform encephalopathies in bovine, ovine and caprine animals. OJ L 10, 13.1.2005, p. 9–17.

TABLE 2 (Continued)

Country	Surveillance target group					
	ES	AM	FS	HS	SU	EM
DK	> 48	> 48	> 48	No testing	No age limit	> 48
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	> 48	> 48	> 48	No testing	No age limit	> 48
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	> 48	> 48	> 48	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
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
XI[c]	> 48	> 48	> 48	No testing	No age limit	No age limit
BA	n/a	n/a	n/a	n/a	n/a	n/a
CH[d]	> 48	> 48	> 48	No testing	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	> 30	No age limit	No age limit
NO	> 48	> 48	> 48	No testing	No age limit	No age limit
RS	> 24	> 24	> 24	> 72 for domestic animals > 30 for imported animals	No age limit	No age limit
TR	> 30	> 30	> 30	> 36	> 30	No age limit

Note: The TSE Regulation does not apply to the eight non-EU reporting countries.

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

[a]If surveillance target group is FS and animals are born in Romania, Bulgaria or Switzerland, or the United Kingdom (with the exception of Northern Ireland and if the movement to the European Union took place since 1.1.2021) then the age limit is > 24 months.

[b]If surveillance target group is HS and animals are born in Romania, Bulgaria, Switzerland or the United Kingdom (with the exception of Northern Ireland and if the movement to the European Union took place since 1.1.2021), then the age limit is > 30 months.

[c]Data from XI, i.e. the United Kingdom (in respect of Northern Ireland), are available from 2021 onwards.

[d]The data reported by Switzerland include those of Liechtenstein.

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[12] 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 in 2023 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.

[12]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.

The minimal sample sizes for NSHC and SHC are set out in Tables A and B of Annex III, Chapter A, Section II, point 3 and point 2(a) and (b), 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.

According to Commission Regulation (EU) 2021/1176,[13] point 4.6, Chapter B, Annex VII is replaced by the following: 'the restrictions set out in points 4.1 to 4.5 shall apply for a period of two years following the detection of the last TSE case, other than atypical scrapie, on the holdings where option 3 laid down in point 2.2.2(d) has been implemented'. This means, among other things, intensive surveillance no longer needs to be conducted for a period of 2 years on holdings where an atypical scrapie case has been confirmed.

As a result of the changes made by the implementing regulation (EU) 2024/877 to the Annex VIII of the Regulation (EC) No 999/2001, Chapter A, Section A, point 2.3, the Member States or zone of the Member State with a negligible risk for classical scrapie are now as follows: Austria, Czech Republic, Finland and Sweden.

The Commission Regulation (EU) 2024/887 aligned the conditions applicable to genetically resistant goats with the ones applicable to genetically resistant sheep, particularly as regards the provisions for a holding to be recognised as having a negligible risk or a controlled risk of classical scrapie and the requirements for intra-Union trade of caprine semen and embryos set out in Annex VIII to Regulation (EC) No 999/2001, and the requirements for importation into the Union of milk and milk products of caprine animals, caprine animals intended for breeding, as well as of caprine semen and embryos set out in Annex IX to that Regulation.

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. Where the positive TSE case is an atypical scrapie case, the prion protein genotype for the codon 141 shall also be determined.

As described in the 2018 EUSR on TSE (EFSA, 2019), the Commission Regulation (EC) 2017/894[14] amended the TSE Regulation with regards to representative genotyping activities in the ovine populations. The changes in the TSE Regulation no longer require genotyping a minimum sample of at least 600 animals per 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 that MS, where a breeding programme is in place, could genotype a minimum sample of at least 1560 ovine animals once every 3 years; or at a frequency and with a sample size determined by the MS based on compliance with a set of criteria.

According to the Commission Regulation (EU) 2024/918, Member States implementing national breeding programmes to select for resistance to TSE in their ovine populations shall notify to the Commission the requirements for such programmes and submit a report only in case of changes to the same.

1.2.3.2 | *Genotyping in goats*

Point 8.2 Part II Chapter A of Annex III of Commission Regulation (EU) 2021/1176, amending the TSE Regulation, established that 'the prion protein genotype for the codons 146 and 222 shall be determined for each positive TSE case in goats. TSE cases found in goats of genotypes which encode serine (S) or aspartic acid (D) on at least one allele at codon 146 and/or lysine (K) on at least one allele at codon 222, shall immediately be reported to the Commission'.

[13]Commission regulation (EU) 2021/1176 of 16 July 2021 amending Annexes III, V, VII and IX to Regulation (EC) No 999/2001 of the European Parliament and of the Council as regards genotyping of positive TSE cases in goats, the determination of age in ovine and caprine animals, the measures applicable in a herd or flock with atypical scrapie and the conditions for imports of products of bovine, ovine and caprine origin.

[14]Commission Regulation (EU) 2017/894 of 24 May 2017 amending Annexes III and VII to Regulation (EC) No 999/2001 of the European Parliament and of the Council as regards the genotyping of ovine animals. OJ L 138, 25.5.2017, p. 117–119.

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[b]	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 suspects	**SU**
TSE-infected flock/herd under official control at sampling[c]	No	CS	Killing and complete destruction of all animals (option 1), TSE Regulation, Annex VII, Chapter B, point 2.2.2 (b) or killing and complete destruction of the susceptible animals only (option 2[a]) Annex VII, Chapter B, point 2.2.2 (c)	Culled and destroyed under options 1 or 2	**EM**
				Slaughtered for human consumption after application of option 1 or option 2[a]	**SHC**
				TSE clinical suspects Chapter 4, Article 12, points 1 and 2	**SU**
TSE-infected flock/herd under official control at sampling[c]	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. (a)	**SHC**
				Not slaughtered for human consumption point 3.1. (b)	**NSHC**
				TSE clinical suspects Chapter 4, Article 12, points 1 and 2	**SU**
TSE-infected flock/herd under official control at sampling[c]	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. (a)	**SHC**
				Not slaughtered for human consumption point 4.1. (b)	**NSHC**
				TSE clinical suspects Chapter 4, Article 12, points 1 and 2	**SU**
TSE-infected flock/herd under official control sampling[c]	No	CS	Intensified TSE monitoring protocol pending the implementation of control measures according to the derogation in point 2.2.2. (c)(iii) and after the implementation of the control measures	Slaughtered for human consumption. Points 4.1. (a) and 3.1. (a)	**SHC**
				Not Slaughtered for human consumption. Points 4.1. (b) and 3.1. (b)	**NSHC**
				TSE clinical suspects Chapter 4, Article 12, points 1 and 2	**SU**
TSE-infected flock/herd under official control sampling[c]	No	AS	Until July 2021, intensified TSE monitoring protocol after the detection of an Atypical Scrapie case (Annex VII point 2.2.3); the active monitoring (i.e. targeting SHC and NSHC) has been lifted on the basis of Commission Regulation (EU) 2021/1176)	Slaughtered for human consumption point 2.2.3 (discontinued from July 2021)	**SHC**
				Not slaughtered for human consumption point 2.2.3 (discontinued from July 2021)	**NSHC**
				TSE clinical suspects Chapter 4, Article 12, points 1 and 2	**SU**

Abbreviations: AS, atypical scrapie; CS, classical 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; TSE, transmissible spongiform encephalopathy.

[a]Option 2 can be applied both to sheep and goats (genotyping and culling).

[b]Sheep flocks or goat herds that are not under control measures or intensified TSE monitoring or a sheep flock or goat herd that has never had a scrapie case or 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 monitoring or a sheep flock or goat herd that has had a scrapie case confirmed during the reporting year.

TABLE 4 Minimum sample size for the TSE surveillance in small ruminants by reporting country in 2023.

	Sheep			Goats		
		Surveillance target group			Surveillance target group	
Country	Population size[a]	SHC	NSHC	Population size[a]	SHC	NSHC
AT	100–750	0	1500	40–250	0	100% up to 500
BE	100–750	0	1500	40–250	0	100% up to 500
BG	> 750	10,000	10,000	40–250	0	100% up to 500
CY	100–750	0	1500	40–250	0	100% up to 500
CZ	100–750	0	1500	< 40	0	100% up to 100
DE	> 750	10,000	10,000	40–250	0	100% up to 500
DK	40–100	0	100% up to 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	40–100	0	100% up to 500	< 40	0	100% up to 100
FR	> 750	10,000	10,000	> 750	10,000	10,000
HR	100–750	0	1500	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	0	100% up to 100
IT	> 750	10,000	10,000	> 750	10,000	10,000
LT	100–750	0	1500	< 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	1500	250–750	0	1500
PL	100–750	0	1500	40–250	0	100% up to 500
PT	> 750	10,000	10,000	250–750	0	1500
RO	> 750	10,000	10,000	> 750	10,000	10,000
SE	100–750	0	1500	< 40	0	100% up to 100
SI	40–100	0	100% up to 500	< 40	0	100% up to 100
SK	100–750	0	1500	< 40	0	100% up to 100
XI	> 750	10,000	10,000	40–250	0	100% up to 500
BA	> 750			40–250		
CH	–			–		
IS	100–750			< 40		
ME	100–750			< 40		
MK	100–750			40–250		
NO	> 750			40–250		
RS	> 750	1000[b]	1000[b]	40–250	1000[c]	1000[c]
TR	> 750			> 750		

Note: The TSE regulation does not apply to the eight non-MS countries. Live sheep population in 2023 (or latest available) extracted from: https://ec.europa.eu/eurostat/databrowser/view/APRO_MT_LSSHEEP/default/table?lang=en. Live goat population in 2023 (or latest available) extracted from: https://ec.europa.eu/eurostat/databrowser/view/APRO_MT_LSGOAT/default/table?lang=en.

Abbreviations: NSHC, animals not slaughtered for human consumption; SHC, animals slaughtered for human consumption; TSE, transmissible spongiform encephalopathy; –, No active surveillance system (in CH only suspect animals are tested).

[a]Thousand heads.

[b,c]The 1000 animals targeted are split between SHC and NSHC.

1.2.4 | TSE surveillance in cervids and other species

Since 2021 MS and non-EU reporting countries may carry out monitoring for CWD in cervids only on a voluntary basis.

1.3 | Testing protocols

The testing protocol for BSE surveillance in bovine animals is described on pages 8 and 9 of the 2016 EUSR on TSE (EFSA, 2017). The testing protocol for TSE surveillance in small ruminants is described on pages 13 and 14 of the 2016 EUSR on TSE (EFSA, 2017). The testing protocols were updated in 2020 and came into force in 2021. A reference to the updated protocols is included in the Guidance for reporting 2024 surveillance data on TSE (EFSA, 2024).

2 | DATA AND METHODS

2.1 | Origin of the data

Raw data are electronically submitted by EU MS and non-EU reporting countries. 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 on TSE were submitted to EFSA as required by the TSE Regulation. The EFSA data reporting 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). Seven reporting countries (CZ, ES, FI, FR, IT, NL and SE) transmitted data directly as extensible markup language (XML) files in 2023 by using their own system for the XML file generation and the upload of data into the DCF, whereas the rest of the reporting countries transmitted XML files to the DCF by the EFSA TSE data reporting 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 draft the summary tables presented in the current EUSR. The validation dashboard, available to all reporting countries to visualise the data since 2018, has been updated for 2023 data visualisation.

Finally, information on the population of bovine animals in 2023 was obtained from Eurostat annual data[15] (Bovine animals, 2 years or over), while information on the population of small ruminants in 2023 as presented in Table 4 was obtained from the 2023 or latest available Eurostat annual data.[16] The number of BSE cases worldwide (Table 12) 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 World Animal Health Information System (WOAH-WAHIS; https://wahis.woah.org/#/home). A final check regarding the number of BSE cases outside Europe was made by consulting WAHIS dataset.

During validation of the data, the following additional information was asked to the reporting countries:

- the number of suspected cases placed under official movement restrictions in accordance with Article 12(1), per animal species (according to (i) Annex III, Chapter B, Section 1.A, point 1 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) according to (ii) Annex III, Chapter B, Section 1.A, point 3 of the TSE Regulation; and
- 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.

In accordance with the Agreement on the Withdrawal of the United Kingdom from the EU, and in particular with the Protocol on Ireland/Northern Ireland, the EU requirements on data sampling are also applicable to Northern Ireland. Therefore, pursuant to Article 5(4) and Section 24 of Annex 2 of the Protocol on Ireland/Northern Ireland, which is an integral part of the Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community, for the purpose of this report, references to Member States are read as including the United Kingdom in respect of Northern Ireland.

The data in this report refer only to the samples collected and cases confirmed between 1 January 2023 and 31 December 2023 in the EU (27 Member States and United Kingdom in respect of Northern Ireland, referred to in the report as 'EU27 + XI') and other eight additional non-EU reporting countries: Bosnia and Herzegovina, Iceland, Montenegro, North Macedonia, Norway, Serbia, Switzerland (the data reported by Switzerland include those of Liechtenstein) and Türkiye. Upon request, Albania and Kosovo[17] informed that they did not conduct TSE surveillance data in 2023.

EFSA validated the 2023 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 May 2024 and was finalised on 28 June 2024. The results and tables presented in the current EUSR are based on the data retrieved from the EFSA Scientific Data Warehouse on 2 July 2024. An additional consultation with reporting countries was conducted between 19 September 2024 and 25 October 2024. Data submitted from 2018 onwards can be corrected in the EFSA DWH. However, if

[15]Live bovine animals 2 years or over in 2023 (or latest available) extracted from: https://ec.europa.eu/eurostat/databrowser/view/apro_mt_lscatl/default/table?lang=en.

[16]Live sheep population in 2023 (or latest available) extracted from: https://ec.europa.eu/eurostat/databrowser/view/APRO_MT_LSSHEEP/default/table?lang=en. Live goat population in 2023 (or latest available) extracted from: https://ec.europa.eu/eurostat/databrowser/view/APRO_MT_LSGOAT/default/table?lang=en.

[17]This designation is without prejudice to positions on status and is in line with United Nations Security Council Resolution 1244 and the International Court of Justice Opinion on the Kosovo Declaration of Independence.

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.

Data between 2001 and 2023 with focus on the last 5 years in cattle and sheep are presented in tables and figures. As certain MS and non-EU reporting countries may calculate their annual statistics using different reporting criteria (e.g. based on the date of final test results rather than the date of sampling), the data summarised in this report may differ slightly from the national figures published by single reporting countries for 2023. In addition, subsequent submissions of updated/amended historical data by reporting countries may have resulted in differences in the figures included in this report when compared with the same data presented in previous EUSR.

2.2 | Presentation of the data

The current report should be considered the EU summary report for 2023 in compliance with Section II, Chapter B, Annex III of the TSE Regulation.

Since 1 January 2021 complete the United Kingdom data are no longer submitted to EFSA. Instead, data from Northern Ireland (XI) (the United Kingdom in respect of Northern Ireland) are submitted and included in this report. In the tables of the report, EU27 data are shown individually and summed to those provided by the XI (EU27 + XI). Totals obtained from the three EFTA countries and the five non-EFTA IPA are referred as to 'Other non-EU'. Tables 12–18 and 23–30 include historical data in which full data from the United Kingdom are displayed until 2020 and XI for 2021–2023.

The reporting countries in this report are the 27 EU MS or EU27, the United Kingdom (in respect of Northern Ireland), three EFTA members (Iceland, Norway and Switzerland) and five non-EFTA IPA (Instrument for Pre-Accession Countries) countries (Bosnia and Herzegovina, Montenegro, North Macedonia, Serbia and Türkiye). The data reported by Switzerland include those of Liechtenstein. 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 1059/2003[18] (see section Country codes).

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 group 'risk animals' is used here to indicate those animals in which the probability of detecting the disease is higher than in the surveillance target group HS. 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.

Two interactive communication tools on TSE – a story map (https://storymaps.arcgis.com/stories/f3dc669cc2994fcfa35526ccdb696df2), providing general information on TSE, and a dashboard (https://www.efsa.europa.eu/en/microstrategy/tse), to search and visualise the surveillance data from EU Member States and other reporting countries, have been updated with the data of the reporting year.

2.3 | Methods

2.3.1 | Descriptive methods

To describe the results of the TSE surveillance programme in the EU in 2023, 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. When it was considered relevant, multi-year and historical data are shown. Surveillance data covered the period 2001–2023 for bovine animals and the period 2002–2023 for small ruminants.

For bovine animals, summary statistics were obtained based on the total number of tests performed in 2023 by reporting country and surveillance target group. In addition, historical data on confirmed cases between 2019 and 2023 (a 5-year period) are presented in detail whereas those on the 2001–2018 period have been summed up. Over this period data of reporting countries are comparable: as of 2017 in the EU as a whole, the surveillance system has been harmonised with active surveillance limiting monitoring to at-risk animals older than 48 months; 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. These have been used to describe the evolution 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 2023, EFSA asked for additional information from the individual concerned reporting countries by a small questionnaire.

For small ruminants, summary statistics are presented in this report, and when 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), surveillance type (passive surveillance restricted to SU vs. active surveillance restricted to SHC and NSHC in

[18]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.

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 (2014–2023) has been included in the analyses.

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 as the total subpopulation of NSHC in the country is not known.

A 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 (IC), 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 sheep genotyping while allele nomenclature was also used to summarise and describe the data on goats genotyping in this report.

To describe and plot the data, some assumptions were made to report the results of bovine animals and small ruminants (sheep and goats):

- To present the temporal change in evolution of BSE cases (C-BSE, L-BSE and H-BSE) in tables or graphs, 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 change in evolution of the total number of scrapie IC, it was assumed that all IC were confirmed in non-infected flocks/herds. If a case was reported as non-index or unknown index status, 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 2023 by target group, reporting country, species and management system (wild and semi-domesticated/farmed).
- For all reporting countries, the number of cases in cervids in 2023.

Number of tested animals in species other than cattle, sheep, goats and cervids tested for TSE in reporting countries in 2023 are presented in tabular format by species and reporting country.

2.3.2 | Data analysis 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 2014–2023) has 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.

TSE data of small ruminants from the last 10 years (period 2014–2023) have been used to check if any significant temporal trend was detectable. As per BSE, a Poisson regression model has been fitted for each case type (CS and AS) and for each species (ovine and caprine) 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.

For both species, 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.

Over the same 10-year period, and considering cases from all reporting countries, 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-value ≤ 0.05 was considered statistically significant for all the above-described statistical analyses.

3 | ASSESSMENT

3.1 | BSE surveillance in bovine animals

Since 2001 approximately 122.8 million bovine animals have been tested for BSE in the EU, including the United Kingdom until 2020 and XI instead since 2021. In 2023, there was a 3% reduction in the number of tested bovine animals in the EU27 and XI, from 977,008 in 2022 to 948,165 in 2023. This reduction is due to a sharp decrease of 28,843 animals in the total number of cattle tested by Bulgaria, Czech Republic, Greece and Romania, partially compensated by an increase in the number of cattle tested by France and the Netherlands. Romania and Bulgaria remain the main contributors to the HS testing group with 114,002 (95.3%) of all HS tested cattle in the EU27 and XI.

The other eight non-EU reporting countries (Bosnia and Herzegovina, Iceland, Montenegro, North Macedonia, Norway, Serbia, Switzerland (the data reported by Switzerland include those of Liechtenstein) and Türkiye) tested 46,096 cattle in 2023. Serbia and Switzerland were the main contributors with 14,031 and 11,376 cattle tested, respectively. All the non-EFTA IPA countries reported mostly cattle tested in the HS target group. Switzerland and Norway tested mainly FS and ES.

The number of animals tested in the risk group (ES + AM + FS) slightly increased from 820,561 in 2022 in the EU27 and XI to 828,030 in 2023 (0.9%). Similarly, to the previous year, cattle in the risk group accounted for 87.3% of all tested cattle in the EU27 and XI and cattle tested in the FS target group accounted for 92% of all risk cattle tested. The number of cattle tested for BSE per reporting country for each target group in 2023 is shown in Table 5.

TABLE 5 Number of bovine animals tested for BSE by reporting country and surveillance target group in 2023 in the EU and other reporting countries.

	Surveillance target group								
	Risk animals				Other target groups				
Country	FS	AM	ES	Subtotal risk animals	HS	EM	SU	Subtotal other target groups	Total
AT	15,333	13	3318	18,664	25		8	33	18,697
BE	23,392	2	1251	24,645	3	1	23	27	24,672
BG	38	3	15	56	19,363			19,363	19,419
CY	1655		120	1775	90			90	1865
CZ	13,836		4825	18,661	41		2	43	18,704
DE	157,905		11,735	169,640	120		407	527	170,167
DK	19,471		1889	21,360	1			1	21,361
EE	2664	31	100	2795					2795
EL	2749	1	2	2752	151		10	161	2913
ES	61,515	2	2003	63,520	496	3	1	500	64,020
FI	9088		3	9091					9091
FR	179,093		1543	180,636	4135		1	4136	184,772
HR	4751		38	4789	117		5	122	4911
HU	8239	108	43	8390	4		12	16	8406
IE	64,679	216		64,895	243		5	239	65,143
IT	30,143	48	9892	40,083	137		2	139	40,222
LT	4257	2	2	4261					4261
LU	2606			2606			3	3	2609
LV	3184	34	100	3318			4	4	3322
MT	150		161	311					311
NL	57,324		7524	64,848					64,848

TABLE 5 (Continued)

Country	Surveillance target group								
	Risk animals				Other target groups				
	FS	AM	ES	Subtotal risk animals	HS	EM	SU	Subtotal other target groups	Total
PL	37,616	949	7594	46,159			1	1	46,160
PT	14,329	552	1880	16,761			3	3	16,764
RO	4484	4202	4991	13,677	94,639		53	94,692	108,369
SE	7369	15	145	7529			2	2	7531
SI	5293	24	480	5797	10		14	24	5821
SK	6247			6247					6247
Total EU27	**737,410**	**6202**	**59,654**	**803,266**	**119,575**	**4**	**556**	**120,135**	**923,401**
XI[a]	24,286	380	98	24,764					24,764
Total EU27 + XI	**761,696**	**6589**	**59,752**	**828,030**	**119,575**	**4**	**556**	**120,135**	**948,165**
BA					4850			4850	4850
CH[b]	6789		4566	11,355			21	21	11,376
IS	6			6	342			342	348
ME					4150			4150	4150
MK	6			6	1461			1461	1467
NO	1492	20	4342	5854	44			44	5898
RS	3282		4	3286	10,741		4	10,745	14,031
TR	12			12	3964			3964	3976
Total other Non-EU	**11,587**	**20**	**8912**	**20,519**	**25,552**		**25**	**25,577**	**46,096**
Total	**773,283**	**6602**	**68,664**	**848,549**	**145,127**	**4**	**581**	**145,712**	**994,261**

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

[a]Data from XI, the United Kingdom (in respect of Northern Ireland) are available from 2021 onwards.

[b]The data reported by Switzerland include those of Liechtenstein.

The distribution of the number of bovine animals tested for BSE by age group, surveillance target group and reporting country in 2023 can be found in the following link https://doi.org/10.5281/zenodo.14006845 distributed as follows:

- **Table 6**: Number of bovine animals tested by age group in the EU27 and XI and non-EU reporting countries in 2023.
- **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 the EU27 and XI and non-EU reporting countries in 2023.
- **Table 8**: Number of tested healthy slaughtered bovine animals by age group in the EU27 and XI and non-EU reporting countries in 2023.
- **Table 9:** Number of BSE suspected bovine animals, by age group, tested in the EU27 and XI MS and non-EU-reporting countries in 2023.
- **Table 10:** Number of bovine animals culled under BSE eradication measures, by age group, tested in the EU27 and XI and non-EU reporting countries in 2023

In the EU27 and XI, five atypical BSE cases were reported in 2023. Four cases were H-type (two in Spain, one in France and one in Ireland) and one was L-type (in the Netherlands). All were found in the FS testing group; all the cases were older than 8 years of age of which three beef cattle and two dairy cattle. The reported cases did not show specific neurological clinical symptoms for BSE before death. In 2023, five additional cases of atypical BSE were reported in the rest of the world: two in Switzerland of L-type, one in the XU (the rest of the United Kingdom) of the H-type, one in Brazil of H-type and one in USA of the L-type. Table 11 reports the main clinical and epidemiological data of the cases in the EU27 and Northern Ireland plus Switzerland (the data of Switzerland include those of Liechtenstein).

In general, considering the low annual incidence of H-type and L-type BSE cases, these cases were in line with the number of cases reported in the last few years. Figure 1 shows the proportion of cases per million tests from 2018 to 2023.

Based on 136 atypical BSE cases with known age since 2001, the average age at detection was 12.2 years (range: 5.5–22.3 years). The FS target group accounts, as mentioned above, for most of the tested animals and hence the cases.

TABLE 11 Clinical and epidemiological description of the BSE cases detected in the reporting countries in 2023.

Country – BSE type	ES – atypical	ES - atypical	FR - atypical	IE - atypical	NL - atypical	CH - atypical	CH - atypical
Surveillance target group	Fallen stock	Fallen stock	Fallen stock	Fallen stock	Fallen stock	Fallen stock	Emergency slaughter
Case type	H-type	H-type	H-type	H-type	L-type	L-type	L-type
Month and year of birth	2000	2007	12/2008	03/2013	05/2014	02/2010	02/2011
Age at detection (in months)	267	193	180	128	99	160	145
BARB status	–	–	–	–	–	–	–
Clinical signs	Lateral decubitus position, semi-comatose, sunken eyes and hypothermia. The animal's condition significantly deteriorated within a 24-h period, as it had been standing upright the previous day. The animal was euthanised on the farm.	No clinical signs. Dead on farm.	No	Acute pelvic injury, hindlimb splits.	Dead on the farm.	Yes	Yes
Cattle type	Beef	Beef	Beef	Dairy	Dairy	Dairy	Beef
Breed	Mixed breed	Mixed breed	Charolaise	Holstein Friesian	Holstein Friesian	Brown	Aberdeen Angus
Was the case confirmed at herd/holding where the animal was born?	No, the case was confirmed in the farm where it was since 2017.	No, the case was confirmed in the main holding, linked to the pasture holding, where the animal was born; the animal belongs to the same owner.	Yes	No	Yes	No	No
Location (NUTS3) of natal herd or herd where case found	Herd of birth: Campo Lameiro (Pontevedra)	San Pedro del Valle (Salamanca).	Creuse (FRI2)	Natal herd in same county (Galway) as index herd.	NUTS 3 code: NL33C Hoekse Waard	Canton St. Gallen	Canton Graubünden
Herd size	2	64	239	248	91	37	19
Herd type	Meat (in semi-extensive production)	Meat	Fattening herd	Dairy	Dairy	n/a	n/a
Feeding system during first year of life	Unknown. The animal was 22 years old. The farm of birth is a free-range cattle farm in the bush, so it is assumed that the cohort animals did not consume feed.	Grass, raw materials such as oats and complementary compound feed.	Mother's milk and feed supplements.	Dam's milk followed by various calf/weanling rations purchased in 25 kg bags from approved retailers.	Ad libitum milk	Unknown	Unknown

TABLE 11 (Continued)

Country – BSE type	ES – atypical	ES - atypical	FR - atypical	IE - atypical	NL - atypical	CH - atypical	CH - atypical
Feed cohorts? Tested? If Yes: Results (number tested; number positives)	Feed cohorts: yes, six cattle from the cohort already dead or slaughtered between 2000 and 2010. Tested: no. There is no record of any BSE suspect or positive case in the holding of birth or in the holding of location at the date of death.	Feed cohorts: yes. Tested: no.	n/a	Feed cohorts: yes, one cohort alive in natal herd – Tested: yes. Results: negative.	Feed cohorts: yes, three animals feed cohort that are also a birth cohort. Not tested	Unknown	Unknown
Birth cohorts? Tested? If Yes: Results (number tested; number positives)	Birth cohorts: yes, five cattle from the cohort already dead or slaughtered between 2002 and 2017. Tested: no. There is no record of any BSE suspect or positive case in the holding of birth or in the holding of location at the date of death.	Birth cohorts: yes. Tested: no.	Birth cohorts: yes. Tested: Five animals of the cohort	Birth cohorts: no	Birth cohort: yes, four animals of birth cohort.	Unknown	Unknown
Offspring? Tested? If Yes: Results (number tested; number Positives)	Offspring: no direct offspring in the 2 years prior to the outbreak.	Offspring: yes. Tested: no.	Offspring: no	Offspring: yes. Tested: yes. Results: Three all negative.	Offspring	Unknown	Unknown
Sire? Tested? (Yes/No). If Yes: Results (positive? Negative?)	No	No	No	No	No	Unknown	Unknown
Dam? Tested (Yes/No). If Yes: Results (positive? Negative?)	No	No	No	No	No	Unknown	Unknown

Abbreviations: n/a, not available.

The number of BSE cases by reporting country, type and year (up to 2023, with a focus on the last 5 years) is shown in Tables 12–14 for total cases, classical BSE and atypical BSE, respectively.

Time series analysis carried out over the last 10-year period (period 2014–2023) shows a significant decreasing trend in the occurrence of C-BSE (annual RR = 0.53, i.e. an annual decrease of 47% in the proportion of cases per tested animals; $p = 0.01$), whereas no significant trend for the different BSE case types was found (H-BSE: RR = 1.04 $p = 0.55$; L-BSE: RR =1.02 $p = 0.83$). 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 2001–2023 are shown in Appendix B.

TABLE 12 Total number of reported BSE cases (classical BSE + atypical H-BSE + atypical L-BSE) in reporting countries and worldwide by year (period 1991–2023) and country.

	Year						
Country	**Up to 2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**Total**
AT	8						8
BE	133						133
CZ	30						30
DE[a]	421			1			422
DK[a]	16						16
EL	1						1
ES	817	2	1	2		2	824
FI	1						1
FR[a]	1009	4	2	3	1	1	1020
IE[a]	1661		1			1	1663
IT[a]	147						147
LU	3						3
NL	88					1	89
PL	74	1					75
PT[a]	1086						1086
RO	2						2
SE[b]	1						1
SI[a]	9						9
SK	27						27
Total EU27	**5534**	**7**	**4**	**6**	**1**	**5**	**5557**
BR	2	1		2		1	6
CAN[a]	20			1			21
CH[a]	465		1			2	468
ISR	1						1
JPN	36						36
LI	2						2
NO	1						1
USA[a]	6					1	7
United Kingdom[c]	184,595						184,595
XU[c]				1		1	2
Total other non-EU	**185,128**	**1**	**1**	**4**	**0**	**5**	**185,139**
Total	**190,662**	**8**	**5**	**10**	**1**	**10**	**190,696**

Notes: Each cell reports the total number of BSE cases (C-BSE + H-BSE + L-BSE). Grey shaded cells indicate the data availability due to the transition from UK to XI+XU due to Brexit. EU countries without BSE cases (Bulgaria, Cyprus, Estonia, Croatia, Hungary, Lithuania, Latvia and Malta) are not included in the table. *Source*: data regarding non-EU cases from 2003 collected from https://wahis.woah.org.

Abbreviations: BR, Brazil; BSE, bovine spongiform encephalopathy; CAN, Canada; H-BSE, H-type BSE; ISR, Israel; JPN, Japan; L-BSE, L-type BSE; LI, Liechtenstein; USA, The United States of America.

[a]Included imported cases: Canada 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]Gavier-Widén et al. (2008).

[c]United Kingdom was member of European Union until 1 February 2020. XI (the United Kingdom in respect of Northern Ireland) and XU (the rest of the United Kingdom) are presented from there on. 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 WOAH website (https://wahis.woah.org).

TABLE 13 Number of reported classical BSE cases in the EU and non-EU reporting countries by year (period 2001–2023) and country.

	Year						
Country code	**Up to 2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**Total**
AT	5						5
BE	133						133
CZ	29						29
DE	416						416
DK	15						15
EL	1						1
ES	798						798
FI	1						1
FR	969						969
IE	1656						1656
IT	142						142
LU	3						3
NL	84						84
PL	60						60
PT	1079						1079
SI	8						8
SK	27						27
Total EU27	**5426**	**0**	**0**	**0**	**0**	**0**	**5426**
CH	464						464
United Kingdom[a]	184,579						184,579
XU[a]				1			1
Total other non-EU	**185,043**	**0**	**0**	**1**	**0**	**0**	**185,044**
Total	**190,469**	**0**	**0**	**1**	**0**	**0**	**190,470**

Notes: 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, 2017). *Source*: data were retrieved from the EU TSE Database and from the WOAH website for CH.

Abbreviation: BSE, bovine spongiform encephalopathy.

[a]The United Kingdom was member of European Union until 2020. XI (the United Kingdom in respect of Northern Ireland) and XU (the rest of the United Kingdom) are presented from there on.

TABLE 14 Number of reported BSE atypical cases in EU and non-EU by year (period 2001–2023), type and country.

	Year													
	Up to 2018		**2019**		**2020**		**2021**		**2022**		**2023**		**TOTAL**	
Country code	**H**	**L**	**H**	**L**	**H**	**L**	**H**	**L**	**H**	**L**	**H**	**L**	**H**	**L**
AT	1	2											1	2
CZ	1	0											1	0
DE	2	3						1					2	4
DK	0	1											0	1
ES	9	10	2		1		1	1			2		15	11
FR	20	20	4		1	1	1	2	1		1		28	23
IE	4	1			1						1		6	1
IT	0	5											0	5
NL	1	3										1	1	4
PL[a]	2	12		1									2	13
PT	7	0											7	0
RO	0	2											0	2
SE	1	0											1	0
SI	1	0											1	0
Total EU27	**49**	**59**	**6**	**1**	**3**	**1**	**2**	**4**	**1**	**0**	**4**	**1**	**65**	**66**

(Continues)

TABLE 14 (Continued)

	Year													
	Up to 2018		2019		2020		2021		2022		2023		TOTAL	
Country code	H	L	H	L	H	L	H	L	H	L	H	L	H	L
BR	1		1				2				1		5	0
Canada	1	1					1						2	1
CH	1	0				1						2	1	3
NO	1	0											1	0
USA	1	1										1	1	2
United Kingdom[b]	7	9									1		8	9
Total other non-EU	**12**	**11**	**1**	**0**	**0**	**1**	**3**	**0**	**0**	**0**	**2**	**3**	**18**	**15**
Total	**61**	**70**	**7**	**1**	**3**	**2**	**5**	**4**	**1**	**0**	**6**	**4**	**83**	**81**

Notes: Each cell reports the total number of H-BSE and L-BSE cases. EU countries without atypical cases are not included in the table. *Source*: data were retrieved from the EU TSE Database and from the WOAH website for CH.

[a]In 2012, PL reported an atypical BSE case without specifying the type.

[b]The United Kingdom was member of European Union until 2020. XI (the United Kingdom in respect of Northern Ireland) and XU (the rest of the United Kingdom) are presented from there on.

The number of historical reported BSE cases can be found in the following link https://doi.org/10.5281/zenodo.14008073, as follows:

- **Table 15**: Number of BSE cases per country and year until 2000 (included) in the EU and non-EU reporting 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.

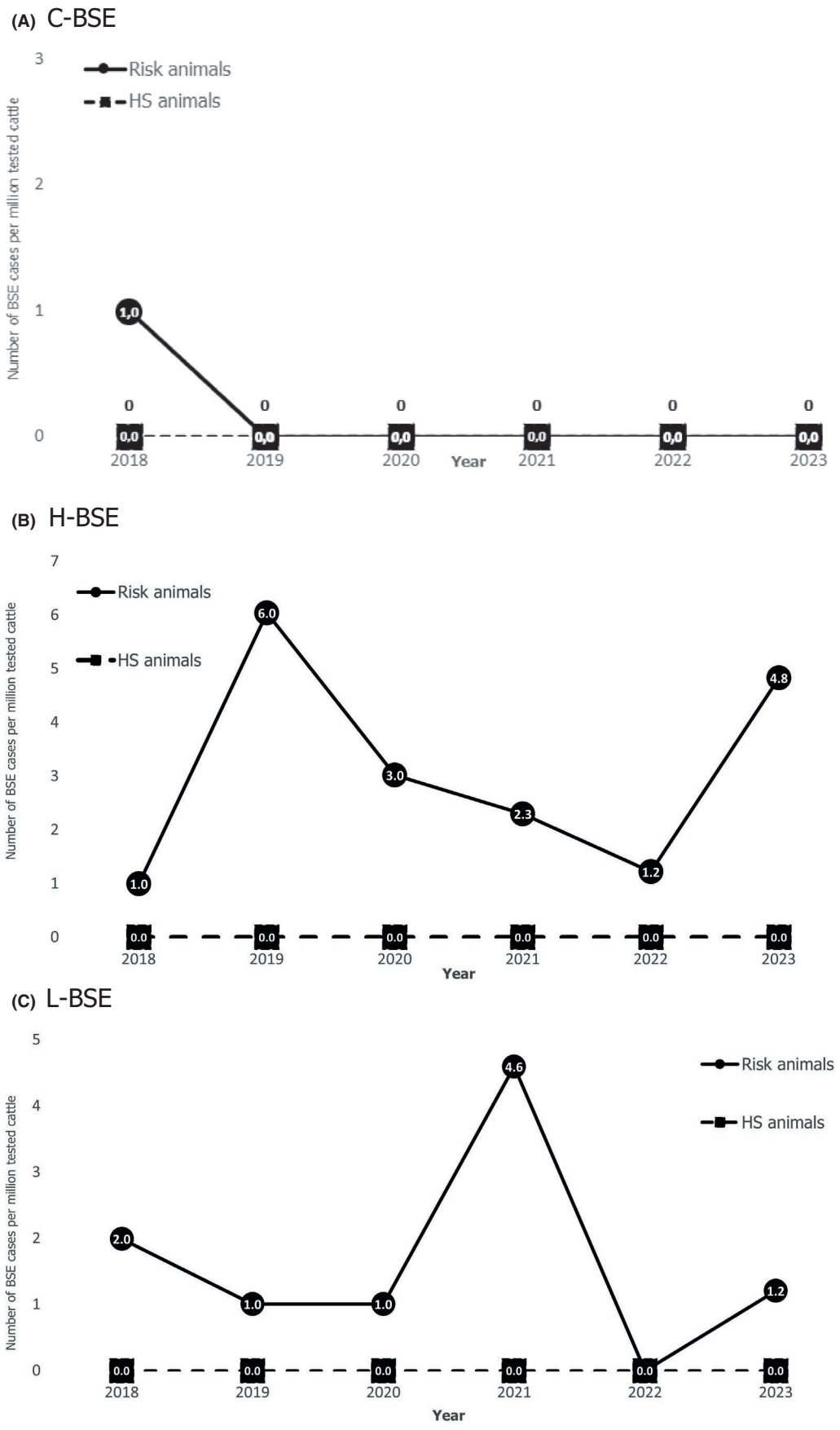


FIGURE 1 Cases per million tested bovine animals by surveillance target group and case type for the period 2018–2023 in the EU and the United Kingdom (until 2020) and in the EU and XI in 2021–2023. Black numbers in white background: number of cases. BSE, bovine spongiform encephalopathy; C-BSE, classical BSE; H-BSE, H-type BSE; L-BSE, L-type BSE.

3.2 | TSE surveillance in small ruminants

Since 2002, more than 11.2 million small ruminants have been tested as part of the official TSE surveillance in the EU, including the United Kingdom until 2020 and XI instead since 2021. In 2023, 387,332 small ruminants were tested by the EU27 and XI: 284,686 sheep (73.5%) and 102,646 goats (26.5%), which represents an overall 4.2% decrease (16,887) in the number of tested small ruminants, compared to 2022.

In five of the eight non-EU reporting countries (Iceland, North Macedonia, Norway, Serbia, Türkiye), a total of 26,636 small ruminants were tested: 26,047 sheep (97.8%) and 589 goats (2.2%), an increase of 468 (1.8%) compared with 2022, mostly due to an increase in testing by Iceland compared to the previous year. Türkiye only tested 10 small ruminants. Bosnia and Herzegovina, Montenegro and Switzerland (the data reported by Switzerland include those of Liechtenstein) did not report data on small ruminants.

The number of sheep tested in the EU27 and XI decreased by 3.5% (295,145 in 2022 compared with 284,686 in 2023). This was due to a reduction in testing mainly in the TSE-infected flocks, with a reduction of 22% (from 15,102 in 2022 to 11,786 in 2023) whereas in the non-infected flocks there was a minor reduction of 2.6% from 280,043 in 2022 to 272,900 in 2023.

In goats, there was a 5.9% decrease in the animals tested in the EU27 and XI (102,646 in 2023 compared with 109,074 in 2022). The testing showed a 15.8% decrease in TSE-infected herds (from 4141 in 2022 to 3487 in 2023) and a 5.5% decrease in non-TSE-infected herds (from 104,933 in 2022 to 99,159 in 2023).

The numbers of sheep and goats tested for TSE by reporting country, surveillance target group and flock/herd status in 2023 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) and the criteria described in Section 2.3.1, 20 countries in the group EU27 + XI fulfilled the requirements for sheep testing. In goat surveillance, 24 countries in the group EU27 and XI fulfilled the requirements for goat testing.

In 2023 the pattern of ovine testing by country and flock status was different from that of 2022. For each sheep tested in a TSE-infected flock in the EU27 and XI, there were about 23.1 sheep tested in non-TSE-infected flocks, higher than in 2022 (18.5). It means that the number of flocks under restriction is decreasing hence the number of animals tested during the 2-year enhanced monitoring. The decrease in the overall testing of sheep is due to the balance between the lower level of testing in Bulgaria of 12,978 (−81%), Spain 3241 (−10.7%), Germany 2023 (−9.6%) and France 1805 (−8.3%), compensated partially by a higher level of testing in Greece of 2928 (+57.3%), Romania 5519 (+12.4%) and Poland 2720 (8.2%).

Also, in goats, the 2023 pattern of testing by country and flock status was different from that of 2022. In 2023, for each goat tested in a TSE-infected herd in the EU27 and the XI, there were 28.4 goats tested in non-TSE-infected herds, higher than that in 2020, 2021 and 2022 (with a value of approximately 14, 18.3 and 25.3 respectively), but lower than in 2017 with nearly 31 goats tested in non-TSE-infected herds in 2017. The decrease in testing of 6428 goats is primarily attributable to Italy (−16.6%) and Spain (−11.9%). This decrease has not been offset by the increase in the number of goats tested by France (8.6%) and Greece (81%).

TABLE 19 Number of sheep tested for TSE by reporting country, surveillance target group and flock status in 2023 in the EU and other reporting countries.

Flock status	Infected flocks					Non-infected flocks				
Country/ surveillance target group	EM	NSHC	SHC	SU	Subtotal infected flocks	NSHC	SHC	SU	Subtotal non-infected flocks	Total
AT						2392	117	1	2510	2510
BE						1590			1590	1590
BG						9	3040		3049	3049
CY		320	222		542	1317	17		1334	1876
CZ						3118			3118	3118
DE						10,771	8178	29	18,978	18,978
DK						499			499	499
EE						105			105	105
EL	491	46	59		596	4344	3088	6	7438	8034
ES	7257	2			7259	10,633	9062		19,695	26,954
FI						1556	2		1558	1558
FR	2		50		52	15,194	4798	2	19,994	20,046
HR						1541		7	1548	1548
HU						10,643	10,981		21,624	21,624
IE						9557	11,878		21,435	21,435
IT	891	123			1014	11,964	10,192	1	22,157	23,171

TABLE 19 (Continued)

Flock status	Infected flocks					Non-infected flocks				
Country/ surveillance target group	EM	NSHC	SHC	SU	Subtotal infected flocks	NSHC	SHC	SU	Subtotal non-infected flocks	Total
LT						577			577	577
LU						100			100	100
LV						267		1	268	268
MT						111	5		116	116
NL						1525			1525	1525
PL						9634	26,301	31	35,966	35,966
PT						15,067	5351		20,418	20,418
RO		82	2198	6	2286	19,815	27,902	24	47,741	50,027
SE						1472			1472	1472
SI						2334	196	2	2532	2532
SK		37			37	12,996			12,996	13,033
Total EU27	**8641**	**610**	**2529**	**6**	**11,786**	**149,131**	**121,108**	**104**	**270,343**	**282,129**
XI[a]						2557			2557	**2557**
Total EU27 + XI	**8641**	**610**	**2529**	**6**	**11,786**	**151,688**	**121,108**	**104**	**272,900**	**284,686**
IS	1716				1716	59	4770	19	4848	6564
MK						5	204		209	209
NO						9825	9231	7	19,063	19,063
RS						173	35		208	208
TR						1	2		3	3
Total other non-EU	**1716**	**0**	**0**	**0**	**1716**	**10,063**	**14,242**	**26**	**24,331**	**26,047**
Total	**10,357**	**610**	**2529**	**6**	**13,502**	**161,751**	**135,350**	**130**	**297,231**	**310,733**

Abbreviations: 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).

[a]Data from XI, the United Kingdom (in respect of Northern Ireland) are available from 2021 onwards.

TABLE 20 Number of goats tested for TSE by reporting country, surveillance target group and herd status in 2023 in the EU and other reporting countries.

Herd status	Infected herds					Non-infected herds				Total
Country/ surveillance target group	EM	NSHC	SHC	SU	Subtotal infected herds	NSHC	SHC	SU	Subtotal non-infected herds	
AT						662	30		692	692
BE						585			585	585
BG							236	11	247	247
CY		914	833	68	1815	488	12		500	2315
CZ						881			881	881
DE						2049	175	6	2230	2230
DK						103			103	103
EE						5			5	5
EL	605	19	16		640	1774	449		2223	2863
ES	533	1			534	9890	8058		17,948	18,482
FI						255			255	255
FR						12,327	5297		17,624	17,624
HR						352			352	352

(Continues)

TABLE 20 (Continued)

Herd status	Infected herds					Non-infected herds				Total
Country/ surveillance target group	EM	NSHC	SHC	SU	Subtotal infected herds	NSHC	SHC	SU	Subtotal non-infected herds	
HU						125	81	1	207	207
IE						98	113		211	211
IT	275	43			318	6478	15,651	1	22,130	22,448
LT						18			18	18
LU						103			103	103
LV						25		1	26	26
MT						78			78	78
NL						1597			1597	1597
PL						3510	3447	9	6966	6966
PT						1556			1556	1556
RO		3	177		180	8972	12,234	5	21,211	21,391
SE						108			108	108
SI						849	93	2	944	944
SK						351			351	351
Total EU27	**1413**	**980**	**1026**	**68**	**3487**	**53,239**	**45,876**	**36**	**99,151**	**102,638**
XI[a]						8			8	8
Total EU27 + XI	**1413**	**980**	**1026**	**68**	**3487**	**53,247**	**45,876**	**36**	**99,159**	**102,646**
IS						4			4	4
MK						1	9		10	10
NO						555	13		568	568
RS						7			7	7
Total other non-EU	**0**	**0**	**0**	**0**	**0**	**567**	**22**	**0**	**589**	**589**
Total	**1413**	**980**	**1026**	**68**	**3487**	**53,814**	**45,898**	**36**	**99,748**	**103,235**

Abbreviations: 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).

[a]Data from XI, the United Kingdom (in respect of Northern Ireland) are available from 2021 onwards.

In total, 538 scrapie cases in sheep were reported in the EU27 and XI in 2023, 19 (3.4%) less than in 2022. They were reported by 14 MS and XI (three countries less than 2022). Except for Cyprus, Denmark, Croatia, Ireland and Slovakia, the other countries that had reported cases in 2022 did so again in 2023 with the addition of Belgium and Finland. In addition, 77 scrapie cases in sheep were reported by two non-EU reporting country: Iceland and Norway.

CS was reported by four MS: Greece, Italy, Romania, Spain and one non-EU country: Iceland. AS was reported by 12 EU reporting countries: Austria, Belgium, Finland, France, Germany, Hungary, Italy, Poland, Portugal, Slovenia, Spain and Sweden and in one non-EU reporting country: Norway.

Out of the 538 sheep scrapie cases reported in the EU27 and XI in 2023, 462 were CS cases (85.9%, 18 cases i.e. - 3.8%, less than in 2022) and 76 were AS cases (14.1%, one case less than in 2022). Among the non-EU reporting countries, 70 CS cases were reported by Iceland and 7 AS cases were reported by Norway. Table 21 shows the number of scrapie cases in sheep by reporting country, case type, index case status and surveillance target group. The geographical distribution of AS and CS in 2023 in sheep is shown in Appendix C.

In sheep, 180 (33.5%) of all cases in the EU27 and XI reported in 2023 were index cases (IC): 76 AS and 104 CS. This percentage is slightly higher than the previous year (30.3% in 2022) and so is the absolute number of all cases (169 in 2022) that increased by 6.5% in the reporting year. There was a much higher proportion of IC in AS cases (76/76: 100%) than in CS cases (104/462: 22.5%), reflecting the within-flock spread of CS. Using the absolute number of IC as a proxy for the flock-level incidence in sheep and comparing 2022 with 2023, there was an increase in the absolute number of CS IC (from 93 in 2022 (19.4%) to 104 in 2023 (11.8%)) and the same number of AS IC (76 in both years). All the seven AS cases reported by Norway were IC (100%) while in Iceland there were only CS cases, of which 65 not IC (92.9%) and 5 IC cases (7.1%).

In total, 183 scrapie cases in goats were reported in the EU27 and XI in 2023, 41 (–18.3%) less than 2022 due to the decrease in the number of cases in Cyprus from 134 to 64 (–52.2%). Only Italy, Portugal and Spain reported both CS and AS. Bulgaria, Cyprus, Greece and Romania reported only CS cases whereas France and Germany reported only AS cases (two and one case, respectively). Most of the CS cases were reported from Cyprus, Greece and Spain with Cyprus contribution

to the 2023 CS caseload much lower than that of the previous year (59.8% in 2022 and 35% in 2023). The four other non-EU reporting countries that tested goats did not report any scrapie cases.

In total, 176 caprine cases in the EU27 and XI in 2023 were CS cases (96.2%) and 7 cases were AS (3.8%). Table 22 shows the number of scrapie cases in goats by reporting country, case type, index case status and surveillance target group in 2023. The geographical distribution of AS and CS in 2023 in goats is shown in Appendix C.

In goats, 29.5% (54) of all cases reported in the EU27 and XI in 2023 were IC: 7 AS and 47 CS. This represents an increase on the 22.3% (50 observed in 2022), with a higher proportion in AS (7/7: 100%) than in CS (47/176: 26.7%). Greece accounted for 46% (23/54) of all IC in goats. Using the absolute number of IC in goats as a proxy for the herd-level incidence in goats and comparing 2023 with 2022, there was an increase in the number of CS IC (from 42 to 47, 11.9%) and there was a similar number of AS IC (from 8 to 7).

In general, considering the total number of cases by type and without restricting the calculation to IC only, CS is still the most frequently reported type of scrapie in the EU27 + XI in both species of small ruminants. In 2023 the CS/AS ratio was 6.1:1 in sheep (lower than in 2022: 6.2:1) and 25.1:1 in goats (lower than in 2022: 27:1). If, for goats, Cyprus is excluded, the CS/AS ratio was 16:1 in 2023 compared with 10.2:1 in 2022.

TABLE 21 Number of scrapie cases in sheep by country, case type, index case status, surveillance target group in 2023 in the EU and other reporting countries.

Case type	Atypical scrapie (AS)									Classical scrapie (CS)										
Index case	No				Yes					No					Yes					
Surveillance target group	EM	NSHC	SHC	Subtotal	NSHC	SHC	SU	Subtotal	Total AS	EM	NSHC	SHC	SU	Subtotal	NSHC	SHC	SU	Subtotal	Total CS	Total
AT					1			1	1											1
BE					1			1	1											1
DE					3	2		5	5											5
EL										9	46	59		114	64	6	4	74	188	188
ES					4	7		11	11	135	1			136	1	1		2	138	149
FI					5			5	5											5
FR					5	2		7	7											7
HU					7	5		12	12											12
IT					3	2		5	5	31	5			36	3	6		9	45	50
PL					2	1		3	3											3
PT					18	3		21	21											21
RO											19	50	3	72	7	12		19	91	91
SE					3			3	3											3
SI					1			1	1											1
Total EU27	**0**	**0**	**0**	**0**	**53**	**22**	**0**	**75**	**75**	**175**	**71**	**109**	**3**	**358**	**75**	**25**	**4**	**104**	**462**	**537**
XI[a]					1			1	1											1
Total EU27 + XI	**0**	**0**	**0**	**0**	**54**	**22**	**0**	**76**	**76**	**175**	**71**	**109**	**3**	**358**	**75**	**25**	**4**	**104**	**462**	**538**
IS										65				65		1	4	5	70	70
NO					6	1		7	7											7
Total other non-EU	**0**	**0**	**0**	**0**	**6**	**1**	**0**	**7**	**7**	**65**	**0**	**0**	**0**	**65**	**0**	**1**	**4**	**5**	**70**	**77**
Total	**0**	**0**	**0**	**0**	**60**	**23**	**0**	**83**	**83**	**240**	**71**	**109**	**3**	**423**	**75**	**26**	**8**	**109**	**532**	**615**

Note: Only the reporting countries in which scrapie cases in sheep were detected in 2023 are mentioned in the table.

Abbreviations: 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 a TSE.

[a]Data from the United Kingdom (in respect of Northern Ireland) (XI), are available from 2021 onwards.

TABLE 22 Number of scrapie cases in goats by country, case type, index case status, surveillance target group in 2023 in the EU and other reporting countries.

Case type	Atypical scrapie (AS)								Classical scrapie (CS)										
Index case	No				Yes				No					Yes					
Surveillance target group	EM	NSHC	SHC	Subtotal	NSHC	SHC	Subtotal	Total AS	EM	NSHC	SHC	SU	Subtotal	NSHC	SHC	SU	Subtotal	Total CS	Total
BG																8	8	8	8
CY										8	12	40	60	4			4	64	64
DE					1		1	1											1
EL									3	19	13		35	21	2		23	58	58
ES						2	2	2	27				27	2			2	29	31
FR					1	1	2	2											2
IT						1	1	1	1	5			6	2	1		3	9	10
PT					1		1	1						1			1	1	2
RO											1		1	1	5		6	7	7
Total EU27 + XI[a]	**0**	**0**	**0**	**0**	**3**	**4**	**7**	**7**	**31**	**32**	**26**	**40**	**129**	**31**	**8**	**8**	**47**	**176**	**183**
Total other non-EU					**0**		**0**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total	**0**	**0**	**0**	**0**	**3**	**4**	**7**	**7**	**31**	**32**	**26**	**40**	**129**	**31**	**8**	**8**	**47**	**176**	**183**

Note: Only the reporting countries in which scrapie cases in goats were detected in 2023 are included in the table.

Abbreviations: 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 a TSE (transmissible spongiform encephalopathies).

[a]Data from the United Kingdom (in respect of Northern Ireland) (XI), are available from 2021 onwards.

Focusing on the last 10 years (2014–2023), the evolution in the number of scrapie cases (detected at EU27 and the United Kingdom level for the period 2014–2020 and at EU27 and XI level for the period 2021–2023) is shown for each species and by case type in Figure 2. The 2014–2023 trends indicate a slight decrease in the annual caseload for both the species and scrapie type. However, as these trends do not account for the relevant denominators and potential confounding factors (e.g. the surveillance stream), an epidemiological interpretation should refer to the multivariate analysis applied to the prevalence data presented below.

In 2023, however, a decrease occurred with 462 CS cases due to the lower number of CS cases in Italy (–73.5%) despite the increase in cases in Greece (29.7%), Spain (17.9%) and Romania (97.8%).

In goats, although to a limited extent, the decreasing trend in the absolute number of CS cases (from 216 to 176) continued in 2023. The long-term evolution is mainly associated to one single MS (Cyprus), where the number of detected cases has consistently declined since the peak in 2013. In 2023, Cyprus saw a further decrease in the number of cases of 52.2% from 134 in 2022 to 64 in 2023, following a stable period in 2021 and 2022. In contrast, the number of CS cases in goats increased in Greece from 43 to 58 (34.9%), Spain from 20 to 29 (45%) and Romania from 2 to 7. Portugal reported a single case, while Italy saw a stable number of CS cases, from 8 to 9.

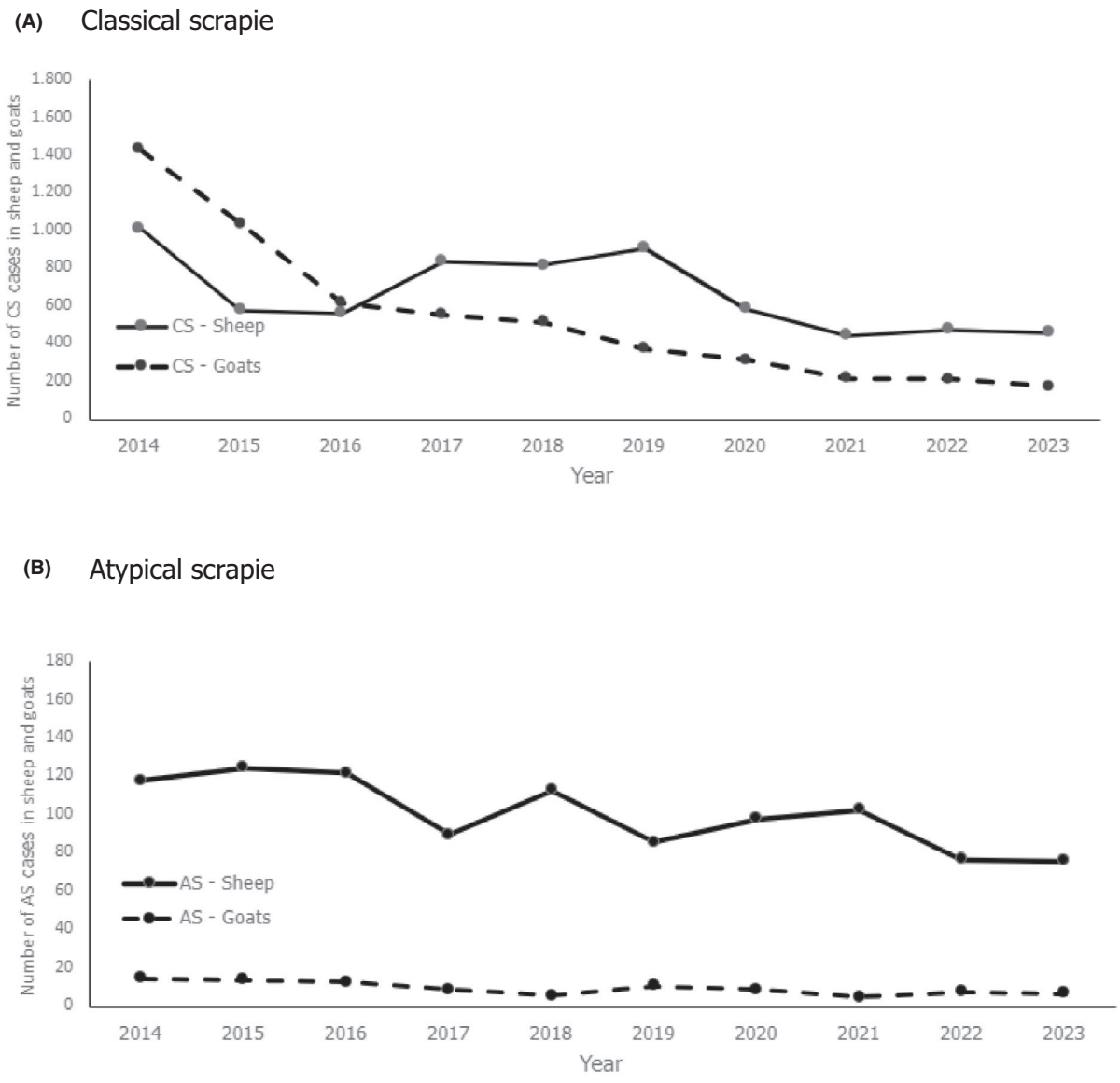


FIGURE 2 Number of reported scrapie cases in sheep and goats in the EU and the UK by case type in the period 2014–2023 in (A) CS and (B) AS.

Focusing on the last 10 years, based on the cases of scrapie with known type, species and age in sheep (8145 cases), the average age of AS cases (91.03 months) is significantly higher ($p < 0.001$) than that of CS cases (54.6 months). Similarly, in goats (5583 cases), the average age of AS cases (92.4 months) is significantly higher ($p < 0.001$) than that of CS cases (55.1 months). Comparing sheep and goats, no significant difference in mean age was found for either AS ($p = 0.79$) or CS ($p = 0.29$).

Tables 23 and 24 show the cases of CS and AS, respectively, in sheep for the period 2002–2023, 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 2002–2023, with a focus on the last 5 years.

TABLE 23 Number of classical scrapie cases in sheep by year and reporting country between 2002 and 2023.

Country	Up to 2018	2019	2020	2021	2022	2023	Total CS
BE	38						**38**
BG	17		8	6			**31**
CY	3210	1	2	2	2		**3217**
CZ	56						**56**
DE	116						**116**
EL	6169	276	176	74	145	188	**7028**
ES	1665	312	244	184	117	138	**2660**
FR	1534						**1534**
HU	10						**10**
IE	587						**587**
IT	3049	171	102	148	170	45	**3685**
NL	401						**401**
PT	33	1	5				**39**
RO	1012	141	52	34	46	91	**1376**
SI	174						**174**
SK	132						**132**
Total EU27	**18,203**	**902**	**589**	**448**	**480**	**462**	**21,084**
XI[a]							
Total EU27 + XI	**18,203**	**902**	**589**	**448**	**480**	**462**	**21,084**
IS	228	21	53	55		70	**427**
NO	16						**16**
United Kingdom	1995	9					**2004**
Total other non-EU	**2239**	**30**	**53**	**55**	**0**	**70**	**2447**
Total	**20,442**	**932**	**642**	**503**	**480**	**532**	**23,531**

Note: Only the reporting countries in which classical scrapie cases in sheep were detected are included in the table. The table with all historical cases can be found on https://doi.org/10.5281/zenodo.14008073.

[a]Data from United Kingdom (in respect of Northern Ireland) (XI), are available from 2021 onwards.

TABLE 24 Number of atypical scrapie cases in sheep by year and reporting country between 2002 and 2023.

Country	Up to 2018	2019	2020	2021	2022	2023	Total AS
AT	15				1	1	**17**
BE	8		2			1	**11**
BG	6						**6**
CZ	8						**8**
DE	128	4	14	5	1	5	**157**
DK	14				1		**15**
EE	2						**2**
EL	32		1				**33**
ES	232	7	12	6	10	11	**278**
FI	15	3	1	1		5	**25**
FR	563	8	3	7	7	7	**595**
HR	2			2	2		**6**
HU	156	17	14	16	19	12	**234**
IE	44	6	1	1	1		**53**
IT	102	7	6	6	3	5	**129**
NL	18						**18**
PL	60	4	5	11	4	3	**87**
PT[a]	676	20	18	32	23	21	**790**
RO			1				**1**
SE	49		1	1	2	3	**56**

TABLE 24 (Continued)

Country	Up to 2018	2019	2020	2021	2022	2023	Total AS
SI	10			2	1	1	**14**
SK	38	4	5	12	1		**60**
Total EU27	**2178**	**80**	**84**	**102**	**76**	75	**2595**
XI[b]	0			**1**	**1**	1	**3**
Total EU27+ XI	**2178**	**80**	**84**	**103**	**77**	**76**	**2598**
IS	8			1			**9**
NO	159	10	12	8	16	7	**212**
United Kingdom	362	6	14				**382**
Total other non-EU	**529**	**16**	**26**	**9**	**16**	**0**	**603**
Total	**2707**	**96**	**110**	**112**	**93**	**83**	**3201**

Note: EU and reporting countries without atypical scrapie cases in sheep are not included in the table.

[a]In 2018 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.

[b]Data from the United Kingdom (in respect of Northern Ireland) (XI), are available from 2021 onwards.

TABLE 25 Number of classical scrapie cases in goats by year and country between 2002 and 2023 in the reporting countries.

Country	Up to 2018	2019	2020	2021	2022	2023	Total CS
BG	**14**		7	4	9	8	**42**
CY	**11,151**	308	236	135	134	64	**12,028**
EL	**594**	7	27	11	43	58	**740**
ES	**229**	35	29	43	20	29	**385**
FI	**8**						**8**
FR	**173**						**173**
HU	**0**	1					**1**
IT	**124**	26	13	23	8	9	**203**
PT	**0**					1	**1**
RO	**16**		5	3	2	7	**33**
SI	**4**						**4**
Total EU27	**12,313**	**377**	**317**	**219**	**216**	**176**	**13,618**
XI[a]	0						**0**
Total EU27 + XI	**12,313**	**377**	**317**	**219**	**216**	**176**	**13,618**
United Kingdom	229	2	2				**233**
Total other non-EU	**229**	**2**	**2**	**0**	**0**	**0**	**233**
Total	**12,542**	**379**	**319**	**219**	**216**	**176**	**13,851**

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

[a]Data from the United Kingdom (in respect of Northern Ireland) (XI), are available from 2021 onwards.

TABLE 26 Number of atypical scrapie cases in goats by year and country between 2002 and 2023 in the EU and other reporting countries.

Country	Up to 2018	2019	2020	2021	2022	2023	Total AS
AT	**1**						**1**
CY	**3**	1					**4**
DE	**2**				1	1	**4**
DK	**0**		1				**1**
EL	**5**						**5**
ES	**53**	2	3	2	2	2	**64**
FI	**1**						**1**
FR	**58**	3	1	1	2	2	**67**
IT	**26**	3	3	2	3	1	**38**
PL	**0**	1					**1**
PT	**13**	1	1			1	**16**
SI	**1**						**1**

TABLE 26 (Continued)

Country	Up to 2018	2019	2020	2021	2022	2023	Total AS
Total EU27	**163**	**11**	**9**	**5**	**8**	**7**	**203**
XI[a]	0						**0**
Total EU27+ XI	**163**	**11**	**9**	**5**	**8**	**7**	**203**
NO	**1**						1
Total other non-EU	**1**						**1**
Total	**164**	**11**	**9**	**5**	**8**	**7**	**204**

Note: EU and reporting countries without atypical scrapie cases in goats are not included in the table.

[a]Data from the United Kingdom (in respect of Northern Ireland) (XI), are available from 2021 onwards.

The number of historical reported scrapie cases can be found in the following https://doi.org/10.5281/zenodo.14008073, as follows:

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

In sheep, in 2023, the number of IC of CS and AS per 10,000 tests carried out by target group at EU27 and XI level was: (1) for CS: 4.8 in NSHC and 2.1 in SHC; (2) for AS: 3.6 in NSHC and 1.8 in SHC.

In goats, in 2023, the number of IC of CS and AS per 10,000 tests carried out by target group at EU27 and XI level was: (1) for CS: 5.9 in NSHC and 1.7 in SHC; (2) for AS: 0.6 in NSHC and 0.9 in SHC.

Figure 3 illustrates the 10-year trend (2014–2023) for the number of scrapie cases per 10,000 tests of sheep and goats in TSE non-infected flocks/herds, disaggregated by target group and case type. The data set comprises figures for the EU 27 and the United Kingdom for the period 2014–2020, and for the EU 27 and XI for the period 2021–2023. The results of the Poisson regression model indicate a statistically significant downward trend for AS (annual RR = 0.96, $p < 0.01$) in sheep, with an average annual decline of approximately 4%. Conversely, the model did not show a statistically significant trend for CS ($p = 0.43$). In goats, the model did not show a statistically significant trend for AS ($p = 0.10$). However, a statistically significant increasing trend was evident for caprine CS (annual RR = 1.04, $p = 0.03$). Based on the same model, the probability of detecting CS in the NSHC surveillance target group was higher than that in SHC one in both sheep (RR: 1.56, $p < 0.0001$) and goats (RR: 1.74, $p < 0.0001$). The same was true for AS in sheep, where a statistically significant higher probability was observed (RR = 1.9, $p < 0.0001$). However, in the case of AS in goats, the increase (RR: 1.52) did not achieve statistical significance ($p = 0.06$).

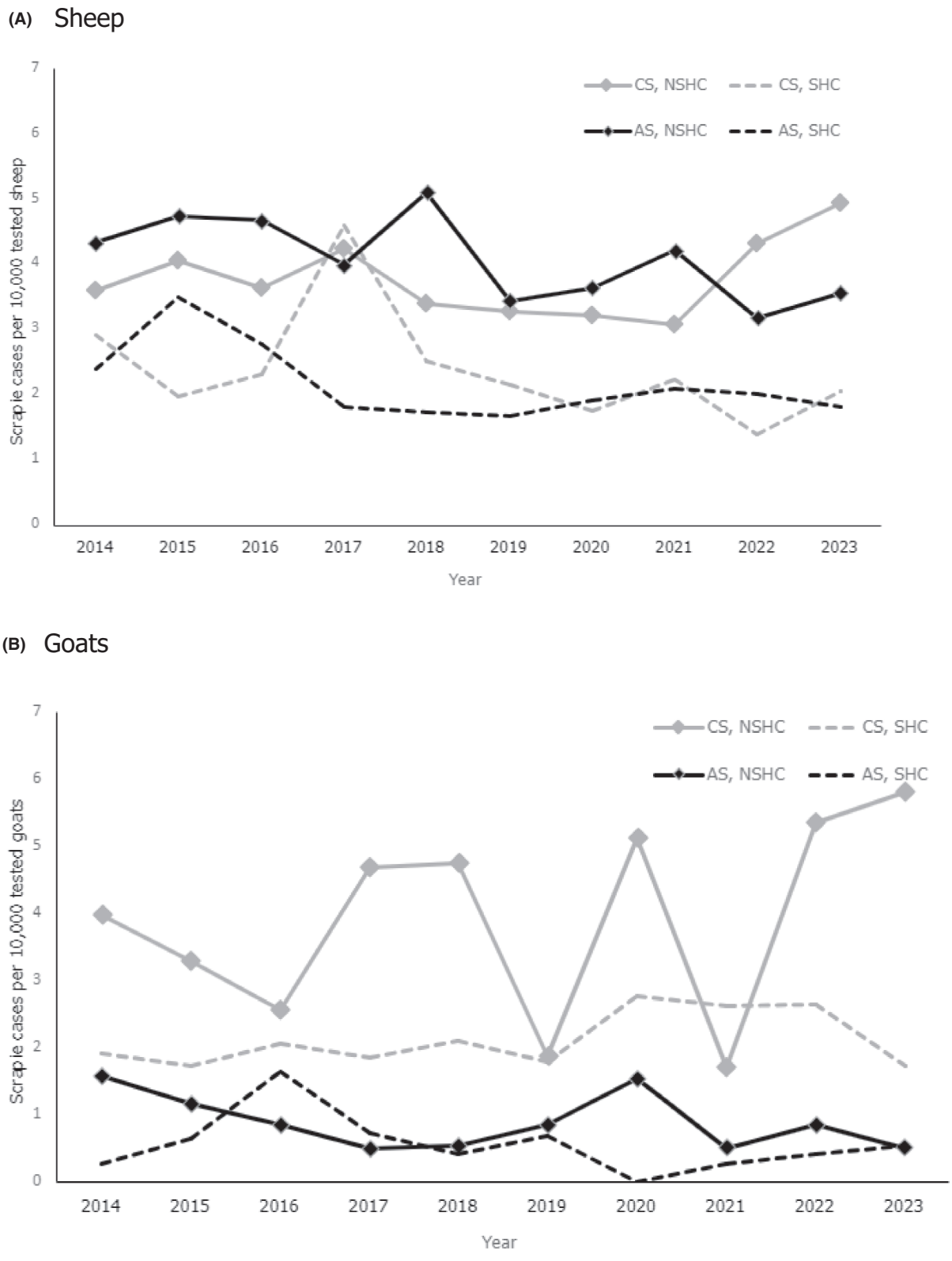


FIGURE 3 Number of scrapie (index) cases per 10.000 tests in the EU27 and the United Kingdom until 2020 and the EU27 and XI for the period 2021–2023 in (A) sheep and (B) goats in non-TSE-infected flocks/herds, reported by case type and target group in the period 2014–2023. This figure is restricted to active surveillance data, i.e. testing performed in NSHC and SHC target groups from non-infected flocks/herds or not previously known as infected. AS, atypical scrapie; CS, classical scrapie; NSHC, animals not slaughtered for human consumption; SHC, animals slaughtered for human consumption.

Tables 31 and 32 summarise the number of discriminatory tests performed by country in 2023 for CS and AS in sheep. Tables 33 and 34 summarise the number of discriminatory tests performed by country in 2023 for CS and AS in goats. In sheep, 462 (100%) of the CS reported in the EU27 and XI were submitted for discriminatory testing and so were 29 of the AS cases (38.2%). The 70 CS cases reported by Iceland were submitted to discriminatory testing. All sheep scrapie cases submitted for discriminatory testing were confirmed as 'BSE-excluded'. In goats, 176 (100%) of the CS reported in the EU and XI were submitted for discriminatory testing

as well as three of the AS cases (42.9%). All goat cases subjected to discriminatory testing were confirmed as 'BSE-excluded'.

TABLE 31 Number of discriminatory tests and results in classical scrapie cases in sheep in 2023 by reporting country.

Country	No. of classical scrapie, CH1641-like and inconclusive cases	Cases submitted for discriminatory testing			
		BSE-not- excluded	BSE-excluded	Total	% of total classical scrapie and inconclusive cases[a]
EL	188		188	188	100%
ES	138		138	138	100%
IT	45		45	45	100%
RO	91		91	91	100%
Total EU27	**462**	**0**	**462**	**462**	**100%**
IS	**70**		**70**	**70**	**100%**
Total other non-EU	**70**	**0**	**70**	**70**	**100%**
Total	**532**	**0**	**532**	**532**	**100%**

Note: Reporting countries without classical scrapie cases in sheep are not included in the table.

[a]Indicates the proportion of classical TSE cases that are submitted to discriminatory testing by each reporting country.

TABLE 32 Number of discriminatory tests and results in atypical scrapie cases in sheep in 2023 by reporting country.

Country	No. of atypical scrapie and inconclusive cases	Cases submitted for discriminatory testing			
		BSE-not-excluded	BSE-excluded	Total	% of total atypical scrapie cases[a]
AT	1		0	0	0%
BE	1		0	0	0%
DE	5		0	0	0%
ES	11		11	11	100%
FI	5		0	0	0%
FR	7		0	0	0%
HU	12		12	12	100%
IT	5		5	5	100%
PL	3		0	0	0%
PT	21		0	0	0%
SE	3		0	0	0%
SI	1		0	0	0%
Total EU27	**75**	**0**	**28**	**28**	**37.33%**
XI[b]	1	**0**	1	1	100%
Total EU27 + XI	**76**	**0**	**29**	**29**	**38.15%**
NO	7	**0**	0	0	0%
Total other non-EU	**7**	**0**	**0**	**0**	0%
Total	**83**	**0**	**29**	**29**	**34.94%**

Note: EU and reporting countries without atypical scrapie cases in sheep are not included in the table.

Abbreviations: BSE, bovine spongiform encephalopathy, TSE, transmissible spongiform encephalopathies.

[a]Indicates the proportion of atypical TSE cases that are submitted to discriminatory testing by each reporting country.

[b]Data from XI, the United Kingdom (in respect of Northern Ireland) (XI) are available from 2021 onwards.

TABLE 33 Number of discriminatory tests and results in classical scrapie cases in goats in 2023 by reporting country.

Country	No. of classical scrapie cases	Cases submitted for discriminatory testing			
		BSE-not- excluded	BSE-excluded	Total	% of total classical scrapie cases[a]
BG	8		8	8	100%
CY	64		64	64	100%
EL	58		58	58	100%
ES	29		29	29	100%
IT	9		9	9	100%
PT	1		1	1	100%
RO	7		7	7	100%
Total EU27 + XI[b]	**176**	**0**	**176**	**176**	**100%**
Total	**176**	**0**	**176**	**176**	**100%**

Abbreviations: BSE, bovine spongiform encephalopathy, TSE, transmissible spongiform encephalopathies. EU and reporting countries without atypical scrapie cases in goats not included in the table.

[a]Indicates the proportion of classical TSE cases that are submitted to discriminatory testing by each reporting country.

[b]Data from XI, the United Kingdom (in respect of Northern Ireland) (XI) are available from 2021 onwards.

TABLE 34 Number of discriminatory tests and results in atypical scrapie cases in goats in 2023 by reporting country.

Country	No. of atypical scrapie cases	Cases submitted for discriminatory testing			
		BSE-not- excluded	BSE-excluded	Total	% of total classical scrapie[a]
DE	1		0	0	0%
ES	2		2	2	100%
FR	2		0	0	0%
IT	1		1	1	100%
PT	1		0	0	0%
Total EU27 + XI[b]	**7**	**0**	**3**	**3**	**42.9%**
Total	**7**	**0**	**3**	**3**	**42.9%**

Note: EU and reporting countries without atypical scrapie cases in goats are not included in the table.

Abbreviations: BSE, bovine spongiform encephalopathy, TSE, transmissible spongiform encephalopathies.

[a]Indicates the proportion of atypical TSE cases that are submitted to discriminatory testing by each reporting country.

[b]Data from XI, the United Kingdom (in respect of Northern Ireland) (XI) are available from 2021 onwards.

3.2.1 | Genotyping

3.2.1.1 | *Sheep*

The classification of genotypes of the sheep prion protein *PRNP* gene used in this report, based on an adaptation from the Great Britain's NSP, is summarised in Table 35 (the risk is relative to classical scrapie only).

TABLE 35 Classification of the genotypes of the sheep prion protein *PRNP* gene according to Great Britain's National Scrapie Plan (NSP).

NSP group	Genotype	Risk of classical scrapie (Hunter, 2003)[a]
NSP1	ARR/ARR	Most resistant to scrapie
NSP2	ARR/ARQ; ARR/ARH; ARR/AHQ	Resistant to scrapie but offspring may be susceptible depending on genotype of the other parent
NSP3	ARQ/ARQ	Higher risk of scrapie in these sheep and in offspring
NSP3/Other (NSP3O)	AHQ/AHQ; ARH/ARH; ARH/ARQ; AHQ/ARH; AHQ/ARQ	Higher risk of scrapie in these sheep and in offspring
NSP4	ARR/VRQ	Susceptible to scrapie but could be used as a breeding source of the ARR allele associated with resistance
NSP5	ARQ/VRQ; ARH/VRQ; AHQ/VRQ; VRQ/VRQ	Sheep of highest susceptibility to scrapie in self and offspring

[a]Information extracted from the DEFRA National Scrapie Plan for Great Britain, Ram genotyping scheme.

Table 36 shows the genotypes of sheep scrapie cases in 2023 in the EU and other reporting countries.

Genotype data was available for 426 out of 462 CS sheep cases in the EU27 and XI in 2023. When known, 398 cases (93.4%) were from the susceptible genotype groups (NSP3, NSP3O, NSP4 or NSP5). This is lower than the previous years in which over 97.6% of all CS cases with known genotypes were from the susceptible groups. However, in the current year, no country has reported cases of CS in a sheep with the ARR/ARR genotype (NSP1), a very rare occurrence which has been reported in the past (e.g. by Spain in 2019 and by Romania in 2020).

Among ovine AS cases, 34 (53.1%) of the 64 cases of AS in sheep with NSP genotype reported in the EU27 and XI in 2023 were from the genotype groups NSP3, NSP3O or NSP5, similar to 2022. Additionally, 30 AS cases were classified in the NSP1 or NSP2 genotypes.

TABLE 36 Distribution of genotypes of confirmed scrapie cases in sheep by reporting country and National Scrapie Plan (NSP) group in 2023.

	Atypical scrapie								Classical scrapie								Total scrapie cases
Country /NSP types	NSP1	NSP2	NSP3	NSP3O	NSP4	NSP5	Unknown[a] N/G[b]	Total AS	NSP1	NSP2	NSP3	NSP3O	NSP4	NSP5	Unknown N/G	Total CS	
AT			1					1									1
BE	1							1									1
DE	1	2	1	1				5									5
EL										17	130	31		4	6	188	188
ES	1	1	2	4			3	11		7	90	3		8	30	138	149
FI		1	3				1	5									5
FR	1		1				5	7									7
HU	4	6	2					12									12
IT		1	1	3				5			35	10				45	50
PL		2		1				3									3
PT	2	7	6	5			1	21									21
RO										4	53	4	1	29		91	91
SE				1			2	3									3
SI				1				1									1
Total EU27	**10**	**20**	**17**	**16**			**12**	**75**		**28**	**308**	**48**	**1**	**41**	**36**	**462**	**537**
XI[c]				1				1									1
Total EU27 + XI	**10**	**20**	**17**	**17**			**12**	**76**		**28**	**308**	**48**	**1**	**41**	**36**	**462**	**538**
IS											69			1		70	70
NO		3	1	3				7									7
Total other non-EU	**0**	**3**	**1**	**3**	**0**	**0**	**0**	**7**	**0**	**0**	**69**	**0**	**0**	**1**	**0**	**70**	**77**
Total	**10**	**23**	**18**	**20**			**12**	**83**		**28**	**377**	**48**	**1**	**42**	**36**	**532**	**615**

[a]Unknown: genotype other than those included in the NSP list.

[b]N/G: not genotyped.

[c]Data from XI, the United Kingdom (in respect of Northern Ireland) are available from 2021 onwards.

Figure 4 shows the frequency distribution of genotypes of sheep scrapie cases by case type, year and NSP group in the period 2014–2023 in the reporting countries.

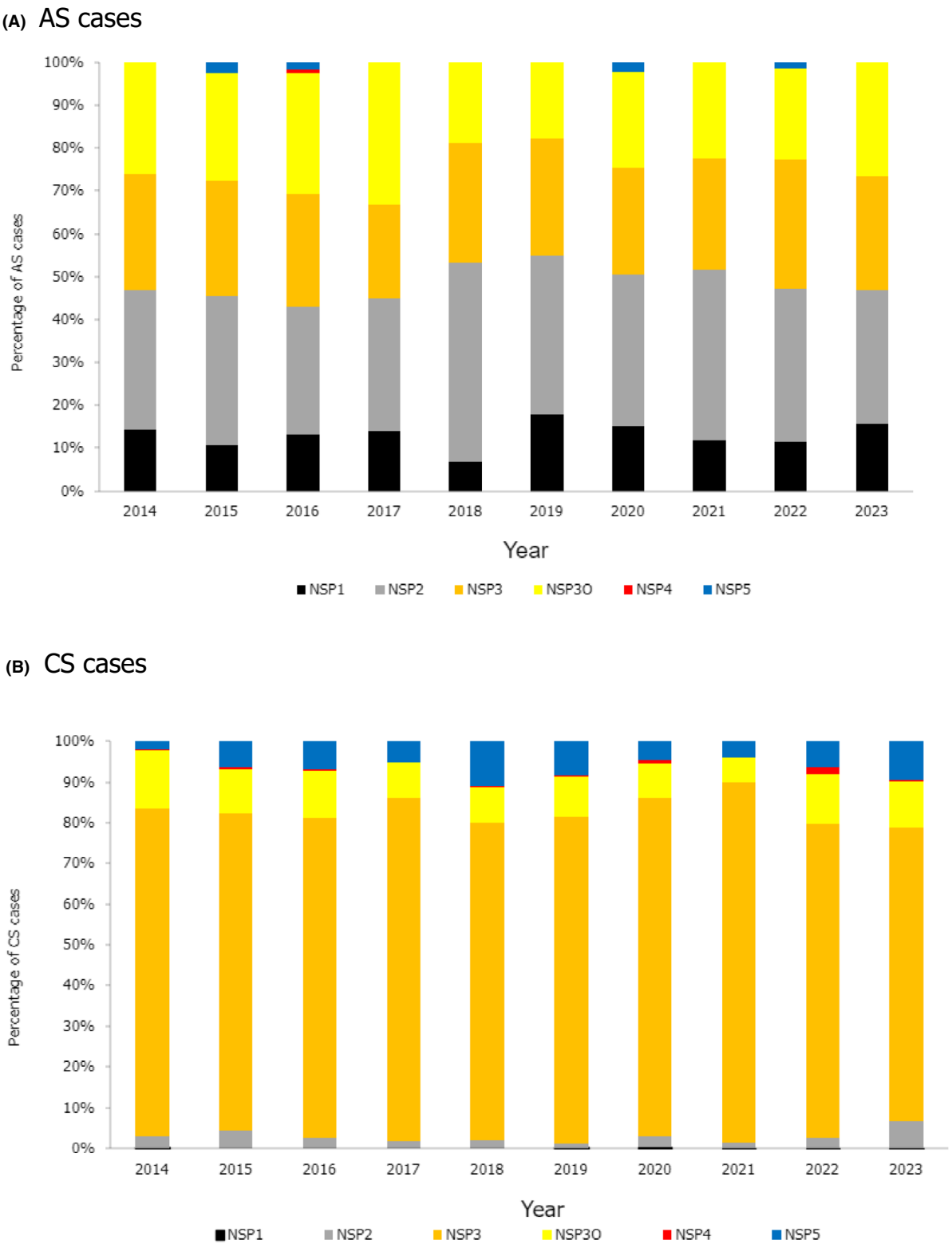


FIGURE 4 Frequency distribution of genotypes of sheep scrapie cases by case type (A) AS cases (B) CS cases, year and National Scrapie Plan (NSP) group in the period 2014–2023 in the reporting countries. (a) Atypical scrapie. (b) Classical scrapie. With regard to CS: NSP1: Resistant (black); NSP2: Semi-resistant (grey); NSP3 (orange) + NSP3O (yellow) + NSP4 (red) + NSP5 (blue): Susceptible as referred to in Table 35.

Table 37 shows the genotypes obtained in 2023 from the random samples of tested sheep in the reporting countries. In the EU27 and XI, following the changes in the legislation that entered into force in 2018, six MS conducted the genotyping of a random sample of sheep: Belgium, France, Germany, Italy, the Netherlands and Poland. The subset of EU27 and XI that carried out the activity in 2023 reported a total of 103,526 known genotypes: 0.9% (896) of the sheep population (with known genotype) were susceptible to CS (NSP3, NSP3O, NSP4 and NSP5), lower than the 7.3% in 2022 and the 7.9% in 2021. This percentage stands at 18.3% in Italy (it was 23.2% in 2022), one of the countries with high case load in 2023.

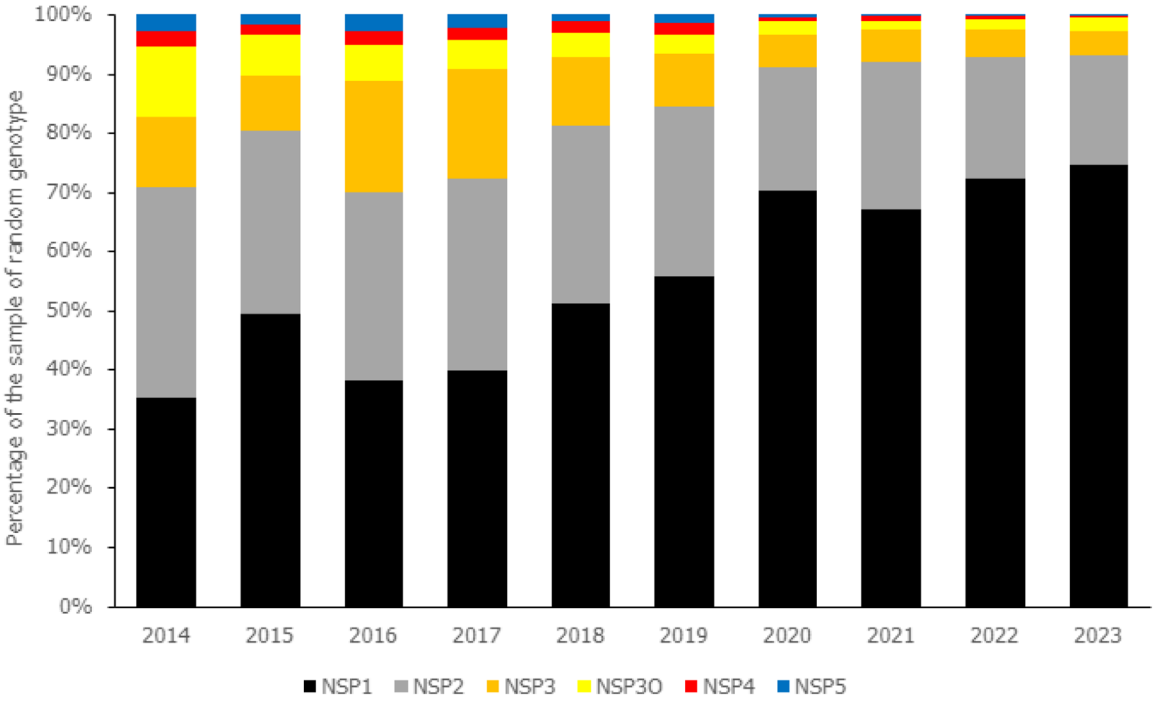
After excluding Cyprus, the proportion of sheep in the resistant genotype group (NSP1; black colour in the bars of Figure 5) shifted from 28.6% of the total number of genotyped sheep in 2011 (in which 23 MS contributed) to 73.7% in 2023 (to which six MS contributed), the highest ever recorded and 2.8% higher than the 71.8% of 2022, to which seven MS contributed.

TABLE 37 Number of genotyped animals (% of sample within country) in randomly selected sheep in the EU and other reporting countries in 2023 by reporting country and National Scrapie Plan (NSP) group, in accordance with Regulation (EC) 999/2001 Annex VII, Chapter C, Part I, point 8.

	Number of genotyped animals (% of sample within country)							
Country	**NSP1**	**NSP2**	**NSP3**	**NSP3O**	**NSP4**	**NSP5**	**Other**	**Total**
BE	5 (83.3%)		1 (16.7%)					6 (100%)
CY[a]	90,413 (94.0%)	5,002 (5.2%)	171 (0.2%)	82 (0.1%)	140 (0.1%)	5 (0.0%)	368 (0.4%)	96,181 (100.0%)
DE	4214 (79.9%)	757 (14.4%)	171 (3.2%)	109 (2.1%)	3 (0.1%)		21 (0.4%)	5275 (100%)
FR	201 (62.8%)	50 (15.6%)	13 (4.1%)	1 (0.3%)	7 (2.2%)	1 (0.3%)	47 (14.7%)	320 (100%)
IT	252 (35.4%)	325 (45.7%)	96 (13.5%)	22 (3.1%)	7 (1%)	5 (0.7%)	4 (0.6%)	711 (100%)
NL	676 (72.5%)	183 (19.6%)	19 (2%)	20 (2.1%)	12 (1.3%)	7 (0.8%)	16 (1.7%)	933 (100%)
PL	66 (66%)	30 (30%)		3 (3%)	1 (1%)			100 (100%)
Total EU27	**95,827 (92.6%)**	**6347 (6.1%)**	**471 (0.5%)**	**237 (0.2%)**	**170 (0.2%)**	**18 (0.0%)**	**456 (0.4%)**	**103,526 (100.0%)**
IS[b]	2 (0%)	1488 (4.4%)	24,630 (72.5%)	5926 (17.4%)	29 (0.1%)	1886 (5.6%)		33,961 (100%)
Total other non-EU	**2 (0%)**	**1488 (4.4%)**	**24,630 (72.5%)**	**5926 (17.4%)**	**29 (0.1%)**	**1886 (5.6%)**		**33,961 (100%)**
Total	**95,829 (69.7%)**	**7835 (5.7%)**	**25,101 (18.3%)**	**6163 (4.5%)**	**199 (0.1%)**	**1904 (1.4%)**	**456 (0.3%)**	**137,487 (100.0%)**

[a]Data from Cyprus are different from those of other reporting countries since Cyprus genotypes systematically the breeding sheep population.

[b]In previous years Iceland reported genotypes of culled flocks. Since the criteria to genotype is different from the requirements for the random genotyping, from 2021 this has been corrected and the genotypes presented in the table correspond only to the EU requirements. Note the differences in the relative prevalence of different NSPs by comparing Icelandic prevalences with those in the EU.



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Number of contributing MS	25	25	25	20	7	7	8	8	7	6
Total genotyped	9437	9823	9413	8871	2713	3180	7985	8068	7904	7345

FIGURE 5 Frequency distribution of the six genotype National Scrapie Plan (NSP) groups in sheep randomly sampled for genotyping in the EU in the period 2014–2023 according to Regulation (EC) 999/2001, Annex III, Chapter A, Part II, point 8 until end of 2017 and Annex VII, in Chapter C, in Part 1, point 8 from 2018. The table below the figure describes the number of contributing MS. Data from Cyprus were excluded. NSP1: Resistant (black); NSP2: Semi-resistant (grey); NSP3 (orange) + NSP3O (yellow) + NSP4 (red) + NSP5 (blue): Susceptible as referred to in Table 36.

3.2.1.2 | *Goats*

In 2023, at least one polymorphism at either codon 146 or 222 was reported in 135 cases (4 AS, 131 CS) by Cyprus, Germany, Greece, Italy, Portugal, Romania and Spain, seven of the nine countries in the EU27 and XI that reported cases. Three cases

of CS reported by Cyprus were heterozygous goats at codon 146: one DN and two NS. In Spain, one case was heterozygous at codon 222 (KQ). Table 38 shows the genotypes of goat scrapie cases in the EU in 2023. None of the non-EU reporting countries reported a case.

TABLE 38 Distribution of genotypes of confirmed scrapie cases in goats by reporting country in 2023.

Case type	Atypical scrapie			Classical scrapie						
Country	NQ/NQ	ZZ/ZZ	Total AS	DQ/NQ	NK/NQ	NQ/NQ	NQ/SQ	ZZ/ZZ	Total CS	Total
BG								8	8	8
CY				1		39	2	22	64	64
DE	1		1							1
EL						52		6	58	58
ES	1	1	2		1	19		9	29	31
FR		2	2							2
IT	1		1			9			9	10
PT	1		1			1			1	2
RO						7			7	7
Total	4	3	7	1	1	127	2	45	176	183

Notes: N = wild type codon 146; D = not wild type codon 146; S = not wild type codon 146; Q = wild type codon 222; K = not wild type codon 222; Possible combinations of alleles: NQ, NK, SQ, SK, DQ, DK. The combinations ZK, ZQ, NZ, SZ, DZ are used when one of the codons could not be determined; ZZ = used if the genotype could not be determined or was different from the available options.

3.3 | TSE surveillance in cervids

In 2023, 2096 cervids were tested for TSE in the EU27 and XI. The 10 MS that contributed to the monitoring were Austria, Estonia, Finland, Hungary, Italy, Latvia, Malta, Romania, Spain and Sweden. Romania, contributed to 54.4% of the total number of tested cervids in the EU and XI.

Out of the 2096 cervids tested by the MS, 1201 (57.3%) were captive, farmed or semi-domesticated cervids: 945 roe deer (75.3%), followed by 187 red deer (15.6%). Among the 895 (42.7%) wild cervids tested, 362 (40.5%) were roe deer and 285 (31.8%) red deer.

When considering the target groups, in the EU27 and XI the most commonly tested group by the MS was the 'Hunted/slaughtered fit for human consumption' (HSHC) with 1415 animals (67.5%); Romania and Spain contributed particularly to this group. A total of 681 cervids were tested in the risk groups: 244 (11.6% of the total tested) fallen/culled (FC); 246 (11.7%) road/predator killed (RK); 138 (6.6%) clinical suspect animals (SUS); 53 (2.5%) hunted/slaughtered not fit for human consumption (HSNHC). The numbers of tested cervids by reporting country, management system and target group in 2023 are displayed in Table 39. No cases were reported in the EU27 and XI in 2023.

In 2023 Norway tested 14,224 animals, mostly semi-domesticated reindeer (39.2%), followed by wild reindeer (15.3%) and roe deer (15%), European moose (14.2%) and red deer (13.7%). HSHC animals accounted for 74.7% of total. One case of CWD in a wild female European moose was reported by Norway as FC.

Iceland and Serbia also reported 46 and 180 cervids, respectively, tested in 2023 (54% wild roe deer and 86.7% from HSHC animals). They were all negative.

The description of the CWD case detected in 2023 is shown in Table 40.

TABLE 39 Number of tested cervids in the EU and reporting countries by management system, species, country and target group in 2023.

Management system species[a] country[b] and target group[c]		Semi-domesticated/farmed deer speciess[a]									Wild deer species[a]									
		Deer	European moose	Fallow deer	Reindeer	Roe deer	Red deer	Sika deer	White-tailed deer	Sub-Total	Deer	European moose	Fallow deer	Reindeer	Roe deer	Red deer	Sika deer	White-tailed deer	Sub-Total	Total
AT	FC			1			4			5										5
	Total			**1**			**4**			**5**										**5**
EE	FC	4								4						1			1	5
	Total	**4**								**4**						**1**			**1**	**5**
ES	HSNHC										51								51	51
	HSHC										53		8		29	189			279	279
	Total										**104**		**8**		**29**	**189**			**330**	**330**
FI	RK											4			2				6	6
	FC		1		11				6	18		32		5	16			11	64	82
	HSHC											13							13	13
	Total		**1**		**11**				**6**	**18**		**49**		**5**	**18**			**11**	**83**	**101**
HU	SUS														4	2			6	6
	FC												1		4	1			6	6
	Total												**1**		**8**	**3**			**12**	**12**
IT	SUS					1				1			11		60	16			87	88
	RK												15		176	46			237	237
	FC			1		1	2			4			3		68	30			101	105
	Total			**1**		**2**	**2**			**5**			**29**		**304**	**92**			**425**	**430**
LV	SUS														1				1	1
	Total														**1**				**1**	**1**
MT	HSHC			24						24										24
	Total			**24**						**24**										**24**
RO	RK					3				3										3
	FC	1		2		32	4			39										39
	HSHC			14		908	177			1099										1099
	Total	**1**		**16**		**943**	**181**			**1141**										**1141**
SE	SUS		1		1					2		38	1		2				41	43
	FC											2							2	2
	HSNHC				2					2										2
	Total		**1**		**3**					**4**		**40**	**1**		**2**				**43**	**47**

(Continues)

TABLE 39 (Continued)

Management system[a] country[b] and target group[c]		Semi-domesticated/farmed deer species[a]									Wild deer species[a]									
		Deer	European moose	Fallow deer	Reindeer	Roe deer	Red deer	Sika deer	White-tailed deer	Sub-Total	Deer	European moose	Fallow deer	Reindeer	Roe deer	Red deer	Sika deer	White-tailed deer	Sub-Total	Total
Total EU + XI		**5**	**2**	**42**	**14**	**945**	**187**		**6**	**1201**	**104**	**89**	**39**	**5**	**362**	**285**		**11**	**895**	**2096**
IS	RK													5					5	5
	HSHC													41					41	41
	Total													**46**					**46**	**46**
NO	RK				38		9			47	2	458		1	1553	219			2233	2280
	FC	4			71		5			80	28	415	2	56	528	206			1235	1315
	HSHC	22		3	5464		263			5752	42	1153		2114	49	1519			4877	10,629
	Total	**26**		**3**	**5573**		**277**			**5879**	**72**	**2026**	**2**	**2171**	**2130**	**1944**			**8345**	**14,224**
RS	RK														7	1			8	8
	FC														9	4			13	13
	HSNHC															4			4	4
	HSHC														**106**	**49**			155	155
	Total														**122**	**58**			**180**	**180**
Total non-EU		**26**		**3**	**5573**		**277**			**5879**	**72**	**2026**	**2**	**2217**	**2252**	**2002**			**8571**	**14,450**
Total		**31**	**2**	**45**	**5587**	**945**	**464**		**6**	**7080**	**176**	**2115**	**41**	**2222**	**2614**	**2287**		**11**	**9466**	**16,546**

[a]Deer: not specified. Moose (or Eurasian/European elk) (*Alces alces* alces). Fallow deer (*Dama dama*). Reindeer: Eurasian tundra reindeer (*Rangifer tarandus* tarandus) in Sweden; Finnish (Eurasian) forest reindeer (*Rangifer tarandus* fennicus) in Finland. Roe deer (*Capreolus capreolus*); Red deer (*Cervus elaphus*). White-tailed deer (*Odocoileus virginianus*). Sika deer (*Cervus nippon*).

[b]Only countries that reported tested cervids are included in the table.

[c]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.

TABLE 40 Description of the CWD cases in 2023.

Country	National case ID	Management system	Species	Sex	Age group	Target group	Part sampled	Analytical method type	Analytical method	Result
Non-EU										
NO	8	Wild deer	European moose (as animal)	Female	≥ 12 months	FC	Obex	Screening	IDEXX-HerdChek BSE-Scrapie Antigen Test Kit, EIA	POS
							Obex	Confirmation	Western blot	POS

3.4 | Other species

Only single MS (Finland) reported results of samples tested for TSE in species other than cattle, domestic sheep and goats, and cervids. In total, 142 samples were collected from 49 American minks (*Neovison vison*), 11 raccoon dogs (*Nyctereutes procyonoides*), 35 foxes (genus *Vulpes*) and 47 domestic cats (*Felis catus*). None of them tested positive.

4 | CONCLUSIONS

The reduction in the number of cattle tested in the EU27 and XI continued in 2023 with 948,165, 3% less than in the previous year. This drop in numbers largely resulted from the decrease in testing in Bulgaria, Czech Republic, Greece and Romania. Nevertheless, the overall testing throughput combined with a risk-based strategy (87.3% of all tests were targeting risk animals) contributed to maximise the sensitivity of the BSE surveillance system considering the EU27 and XI as a single epidemiological unit. In the EU27 and XI, five atypical BSE cases were reported, all in the FS testing group. Four cases were H-type (two in Spain, one in France and one in Ireland) and one was L-type (in the Netherlands). The situation of BSE was similar to the one of previous years in terms of tested animals and caseload. Considering the low annual incidence of H-type and L-type BSE cases, the cases found were in line with the expected variability of rare events. Two atypical BSE cases (L-type) were reported by Switzerland. Three additional atypical cases were reported in the rest of the world in 2023: one L-type (one in the USA) and two H-type (one in the UK and one in Brazil).

In total 387,332 small ruminants were tested in 2023 in the EU27 and XI, as part of the TSE surveillance system, leading to an overall testing of more than 11.2 million tests since 2002. Twenty countries in the group EU27 complied with the EU monitoring requirements for sheep and 24 countries for goats.

Compared with 2022, there was an increase in the detection of the ovine CS IC (from 93 to 104), while the AS IC (76) remained stable. The increase in CS IC occurred despite 2.5% decrease in the level of testing in non-infected flocks. However, as in 2022, the overall incidence of the disease (new infected herds) continued decreasing in this species. Yet again, this could be due to normal variability between years. Over the same period, the number of caprine IC (CS and AS combined) increased by 8%, from 50 to 54, despite the lower number of animals tested in non-infected herds.

For CS in sheep in 2023 in the EU27 and XI and compared with 2022, the caseload decreased by 3.8% - parallel to a decrease in testing in TSE-infected flocks by 22%. A comparison of the four MS that reported CS cases in 2023 with the previous year reveals a large decrease in Italy (73.5%), while Romania, Greece and Spain have seen increases of 97.8%, 29.7% and 17.9% respectively. Considering the index cases of 2021 and 2022, Italy reported 23 ICs in 2021, 14 ICs in 2022 and 9 ICs in 2023, showing a decrease in the disease over time. In Romania, which reported 34 ICs in 2021, 12 ICs in 2022 and 19 ICs in 2023, the evolution of the disease seems to be more uncertain and most of the 2023 cases (72) are not ICs: the significant increase observed could mainly be the result of intensified monitoring in infected herds.

In goats, the total number of cases (183) decreased by 18.3% in the EU-27 and XI compared to the previous year. Of the total number of cases, 176 were CS (96.2%), reported by seven MS. In three of them, there was an increase in the number of reported cases: Greece (34.9%), Spain (45%) and Romania from two to seven cases. In Cyprus, despite the large reduction in the caseload (by 52.2%), the incidence of CS appears to be stable, with four IC cases, similar to the figures reported in the previous 2 years.

The 10-year analysis of CS in the context of EU-27 and XI cases per 10,000 tests indicates a plateau in sheep, which contrasts with previous observations. In goats, despite the opportunity of implementation of risk management strategies based on breeding for resistance, a statistically significant increasing trend emerged in the proportion of cases per 10,000 tests, albeit marginal.

With regard to the presence of AS in sheep in the EU27 and XI, the testing activity conducted in 2023 yielded results that confirmed the situation observed in 2022, with 77 cases reported in both years. In goats, the AS situation was comparable to the previous year in terms of caseload (eight in 2022 and seven in 2023) and IC. The long-term trends of AS were consistent with those observed in the previous year, exhibiting a statistically significant 10-year decreasing trend in sheep and no statistically significant trend in goats.

The genotyping data collected in 2022 from ovine CS cases consistently confirmed the association between the occurrence of the disease in animals with susceptible genotypes (NSP3, NSP3O, NSP4 or NSP5): 97.6% of the cases with known NSP genotype. The 2023 genotyping of random samples of the EU sheep population (data from six MS after excluding Cyprus) showed a marginal improvement (6.9% of the genotyped sheep with known genotype carrying those of the susceptible groups) compared to the previous years (7.3%). The NSP1 group (i.e. ARR/ARR) accounted for 73.7% of all genotyped sheep. However, some caution is needed in interpreting this result as it could reflect the small number of MS contributing with data. Countries in which the caseload is large, like Italy, still showed a high proportion of susceptible sheep.

With regard to genotyping of goat cases, one polymorphism at codons 146 or 222 were reported in 135 out of 183 goat cases by seven reporting countries in the EU27 and XI. In Cyprus, three cases of CS were reported in goats heterozygous at codon 146: one DN and two SN; whereas in Spain, one case was heterozygous at codon 222 (KQ).

Some caution is needed when interpreting the CWD surveillance data. As observed in 2022, in 2023 there was a further substantial reduction of testing in both EU MS and XI and Norway. In the EU27 and XI 10 MS tested 2096 cervids, compared to 3202 tested by 10 MS in 2022 (−34.5%) with one main contributor: Romania with 54.4% of all cervids tested in the EU MS and XI. The monitoring was mainly carried out on the category 'hunted/killed animals fit for human consumption' (67.5%),

a target group with lower probability of disease, compared to the risk groups (FC, HSNHC, SUS) (EFSA BIOHAZ Panel, 2023). No cases have been detected. Norway continued its decreasing surveillance programme in wild and captive cervids and tested 14,224 cervids, 3359 fewer than in 2022 (–19.1%). One case of CWD in a wild European moose female was reported by Norway as FC.

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
CWD	chronic wasting disease
DCF	data collection framework
DWH	data warehouse
EFTA	European Free Trade Association
EM	eradication measures
ES	emergency slaughtered
EUSR	European Union summary report
FC	fallen/culled
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
IC	index case/s
IPA	Instrument for Pre-Accession Countries
L-BSE	L-type bovine spongiform encephalopathy
MS	Member State(s)
NSHC	not slaughtered for human consumption
NSP	National Scrapie Plan
NUTS	Nomenclature of Units for Territorial Statistics
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

COUNTRY CODES

AT	Austria
BA	Bosnia and Herzegovina
BE	Belgium
BG	Bulgaria
CH	Switzerland
CY	Cyprus
CZ	Czechia
DE	Germany
DK	Denmark
EE	Estonia
EL	Greece
ES	Spain
FI	Finland
FR	France
HR	Croatia
HU	Hungary
IE	Ireland
IS	Iceland
IT	Italy
LI	Liechtenstein

LT	Lithuania
LI	Liechtenstein
LU	Luxembourg
LV	Latvia
ME	Montenegro
MK	North Macedonia
MT	Malta
NL	The Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
RS	Serbia
SE	Sweden
SI	Slovenia
SK	Slovakia
TR	Türkiye
XI	United Kingdom (in respect of Northern Ireland)
XU	United Kingdom (excluding Northern Ireland)
EU27 MS countries and United Kingdom (in respect of Northern Ireland)	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, XI.
Non-EU reporting countries	BA, CH; IS; ME; MK; NO; RS; TR; XU.

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REQUESTOR

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AMENDMENT

A number of minor editorial corrections have been included in the republished version. Amendments have been made to Tables 5, 12, 14, 32, and 33; Figures 1 and 5; and in the body of the text in sections 3.2 and 3.2.1.1. These editorial corrections do not materially affect the outcome or the conclusions of this scientific output. To avoid confusion, the original version of the output has been removed from the EFSA Journal, but is available upon request.

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APPENDIX A

Additional surveillance data

TABLE A.1 BSE active monitoring in relation to the adult bovine population (age > 2 years) in 2023.

EU/non-EU groups	Country code	Adult cattle (> 2 years)[a]	Number of tested bovine animals at risk[b]	Proportion (%) of tested bovine animals at risk[b]
	AT	831.680	18.664	2.2%
	BE	1.115.540	24.645	2.2%
	BG	398.110	56	0.0%
	CY	43.230	1.775	4.1%
	CZ	657.910	18.661	2.8%
	DE	5.038.570	169.640	3.4%
	DK	660.530	21.360	3.2%
	EE	127.690	2.795	2.2%
	EL	318.400	2.752	0.9%
	ES	3.124.420	63.520	2.0%
	FI	327.060	9.091	2.8%
	FR	9.021.050	180.636	2.0%
	HR	155.000	4.789	3.1%
	HU	459.500	8.390	1.8%
	IE	2.747.590	64.902	2.4%
	IT	2.904.000	40.083	1.4%
	LT	328.400	4.261	1.3%
	LU	98.320	2.606	2.7%
	LV	207.800	3.318	1.6%
	MT	6.700	311	4.6%
	NL	1.704.000	64.848	3.8%
	PL	2.849.910	46.159	1.6%
	PT	827.560	16.761	2.0%
	RO	1.248.000	13.677	1.1%
	SE	585.000	7.529	1.3%
	SI	185.900	5.797	3.1%
	SK	225.030	6.247	2.8%
	Total EU27	**36.196.900**	**803.273**	2.2%
	XI[c]	n/d	24.764	n/d
	Total EU27 + XI	**36.196.900**	**828.037**	**2,29%**
Other non-EU	**BA**	n/d		n/d
	CH	770.650	11.355	1.5%
	IS	n/d	6	n/d
	ME	n/d		n/d
	MK	95.000	6	0.0%
	NO[d]	353.700	5.854	1.7%
	RS	393.700	3.286	0.8%
	TR	8.160.090	12	
	Total other non-EU	**9.773.140**	**20.519**	**0.21%**
	TOTAL	**45.970.040**	**848.556**	**2.50%**

[a]Population data obtained at: https://ec.europa.eu/eurostat/databrowser/view/APRO_MT_LSCATL__custom_6807810/default/table?lang=en.

[b]At-risk animals is the sum of animals with clinical signs at *ante-mortem*, emergency slaughtered and fallen stock.

[c]Data from XI, the United Kingdom (in respect of Northern Ireland) are available from 2021 onwards.

[d]Norway's cattle population taken from the TSE EUSR report 2020 (EFSA, 2021).

APPENDIX B

Geographical distribution of BSE in the period 2001–2023

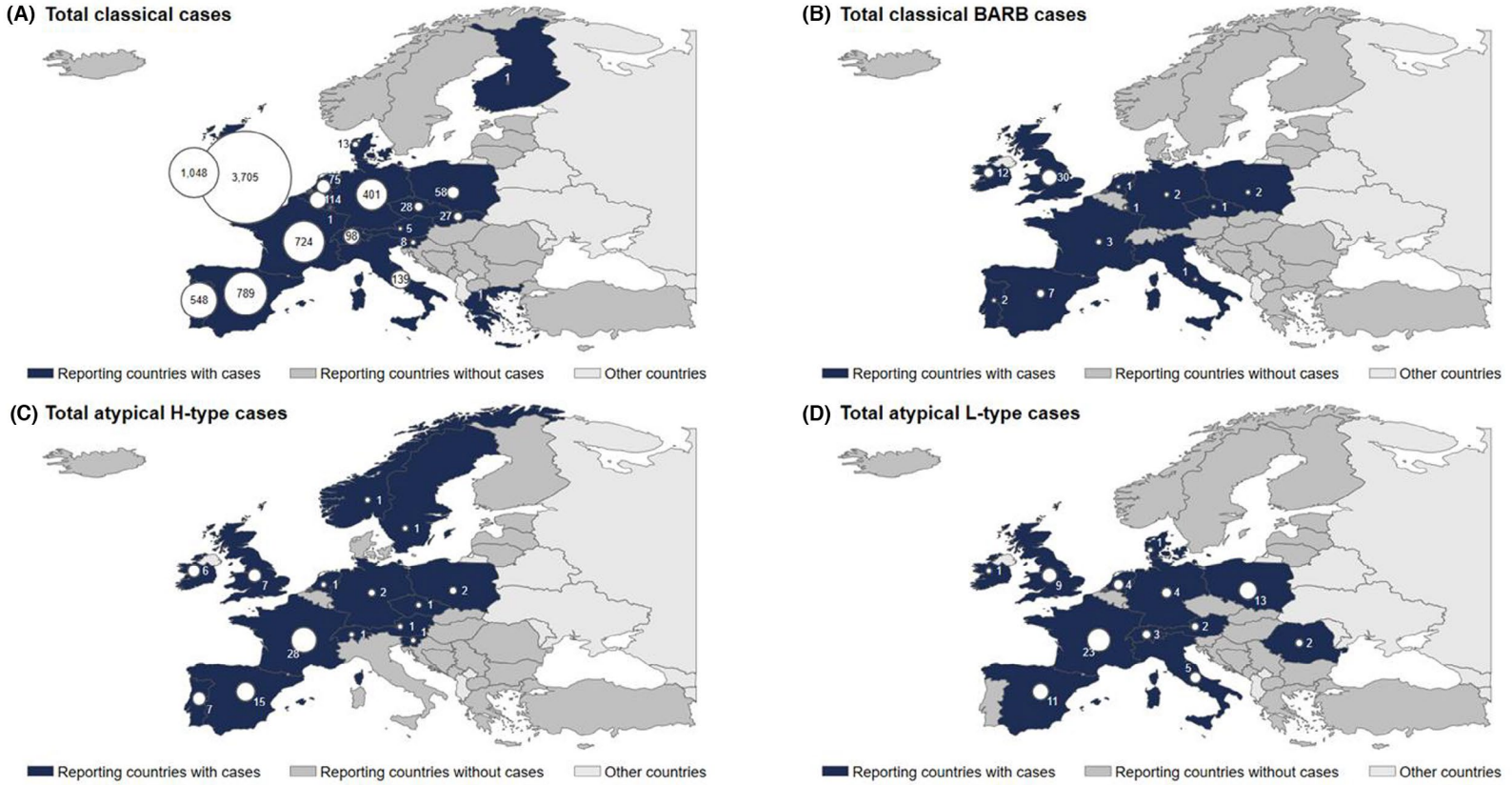

FIGURE B.1 Geographical distribution of cumulative number of cases of C-BSE in the period 2001–2023 in the reporting countries. (A) BARB cases not included. The size of the circles is proportional to the measurements and only comparable within the map but not between maps. With regards to the United Kingdom and 2023, only data from the United Kingdom (in respect of Northern Ireland) (XI) have been considered. Not all cases in the past has been possible to type for DK, compared to table 12, 1 case is missing here.

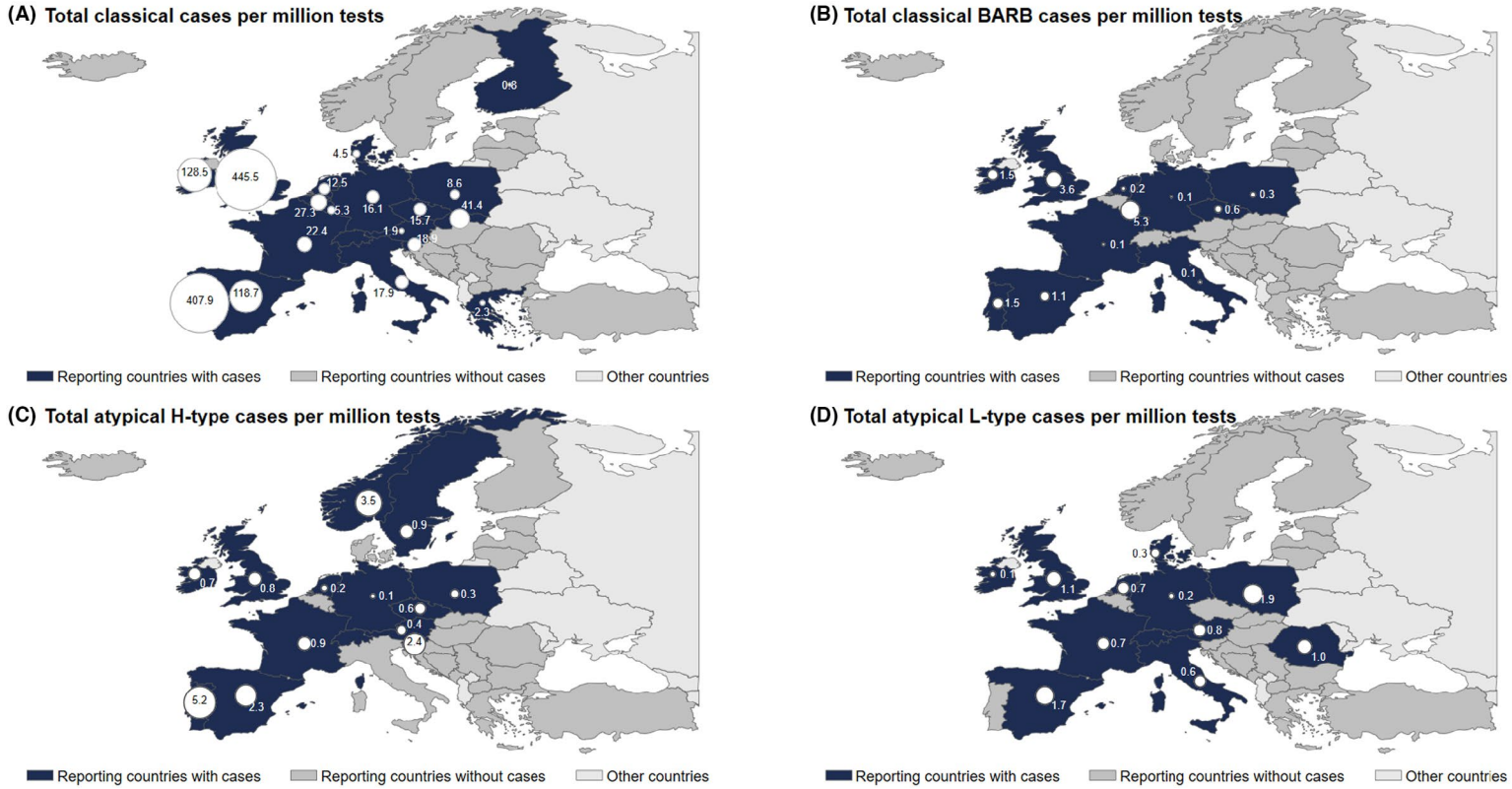

FIGURE B.2 Country-specific BSE cases per million tests by case type in the period 2001–2023 in the reporting countries. The size of the circles is proportional to the measurements and only comparable within the map but not between maps. With regards to the United Kingdom and 2023, only data from the United Kingdom (in respect of Northern Ireland) (XI) have been considered.

APPENDIX C

Geographical distribution of scrapie in 2023

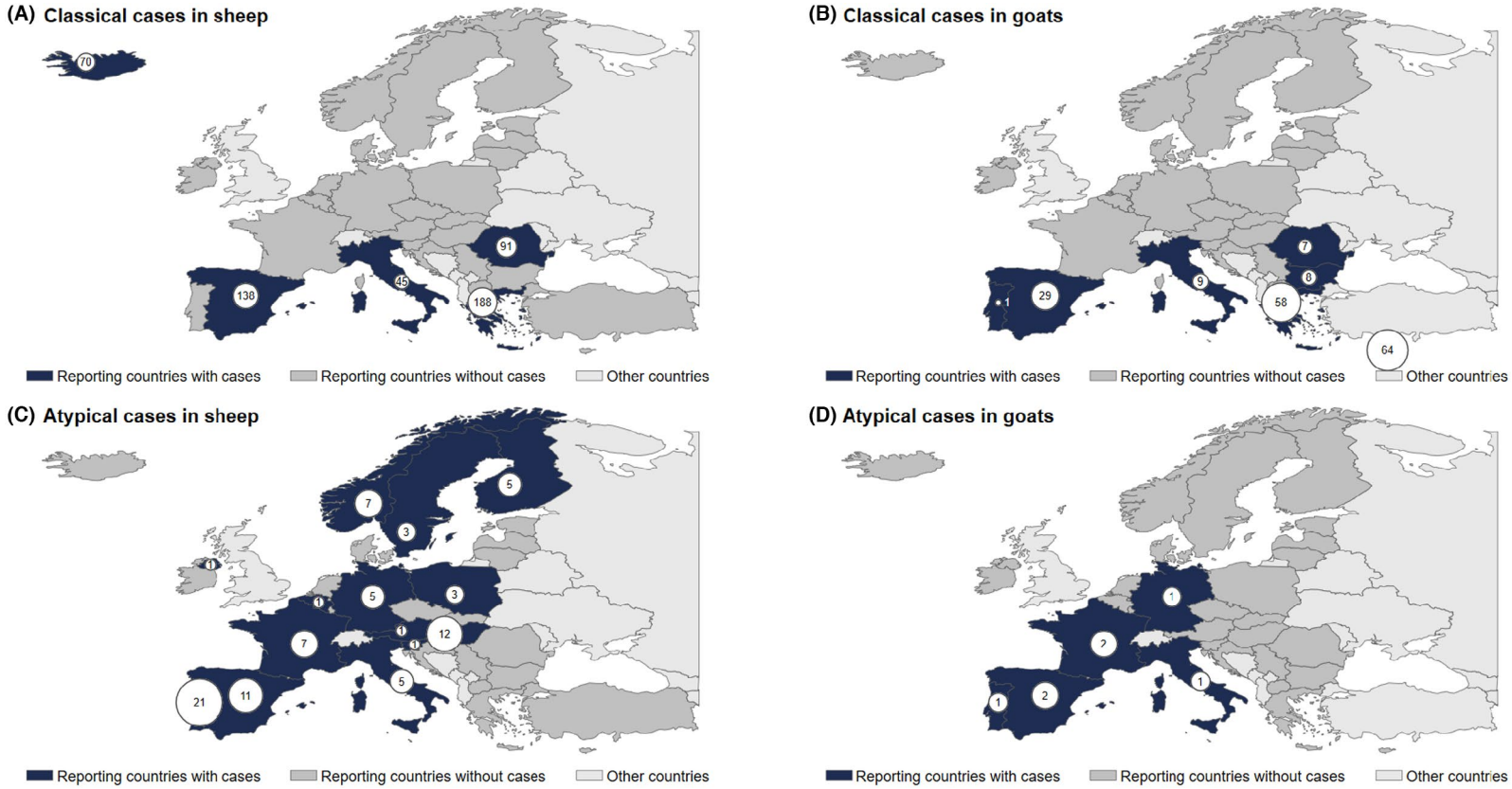

FIGURE C.1 Geographical distribution of numbers of cases of ovine CS (A), caprine CS (B), ovine AS (C) and caprine AS (D) in 2023 in the reporting countries. The size of the circles is proportional to the measurements and only comparable within the map but not between maps.

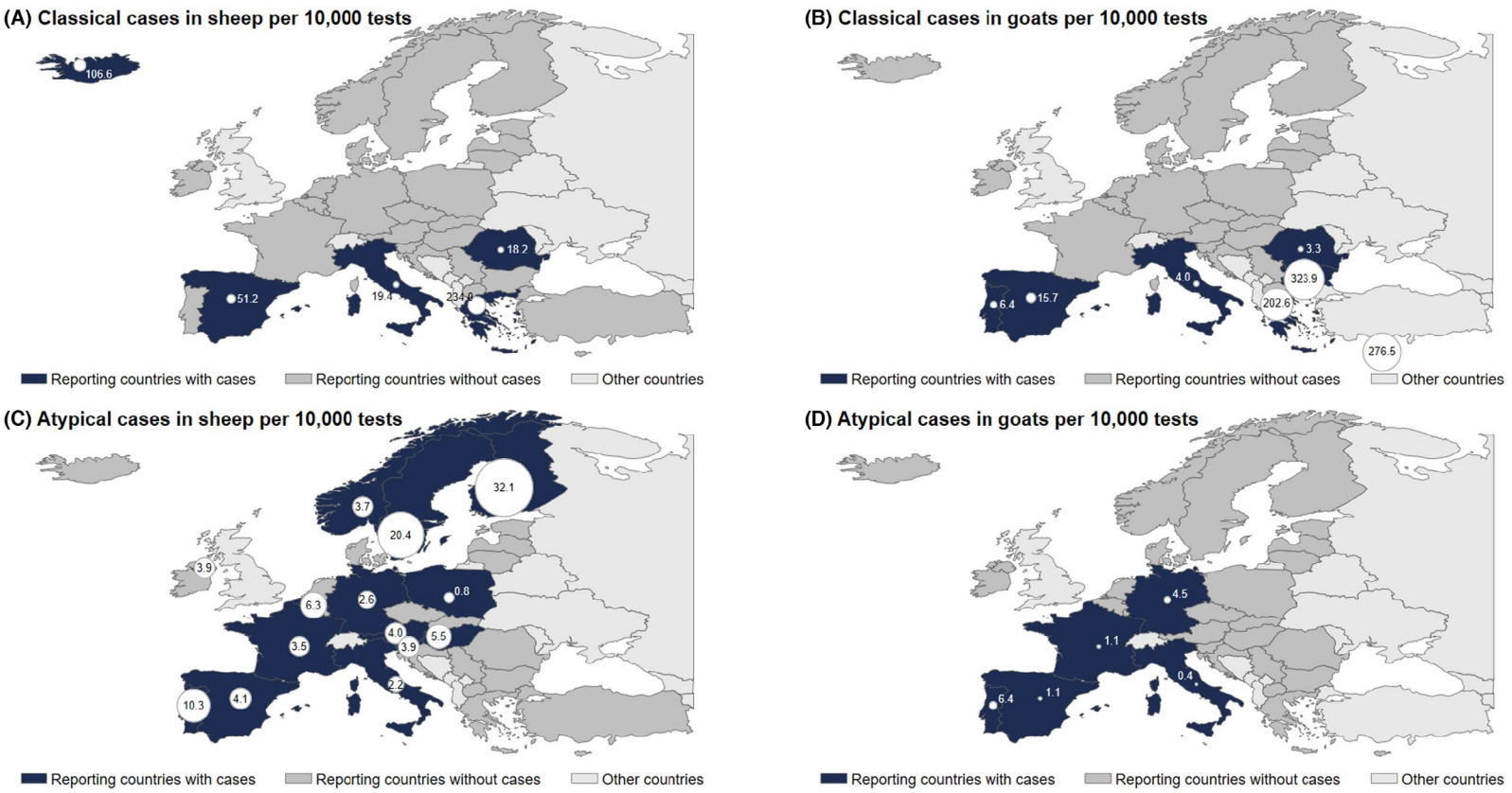

FIGURE C.2 Geographical distribution of proportion of cases per 10,000 tests of ovine CS (A), caprine CS (B), ovine AS (C) and caprine AS (D) in 2023 in the reporting countries. The size of the circles is proportional to the measurements and only comparable within the map but not between maps.

APPENDIX D

Additional information, 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 2023.

Country	Cattle	Sheep	Goats
AT	8	2	0
BE	0	0	0
BG	0	0	116
CY	0	0	4
CZ	2	0	0
DE	0	1	0
DK	1	0	0
EE	0	0	0
EL	11	6	0
ES	0	2	1
FI	0	0	0
FR	7	14	3
HR	0	0	0
HU	12	0	1
IE	6	0	0
IT	0	1	1
LT	0	0	0
LU	3	0	0
LV	4	1	1
MT	0	0	0
NL	1	0	0
PL	1	0	0
PT	0	0	0
RO	69	141	15
SE	0	0	0
SI	2	1	0
SK	0	0	0
Total EU27	**127**	**169**	**142**
XI[a]	0	0	0
Total EU27 + XI	**127**	**169**	**142**
BA	n/d	n/d	n/d
CH	21	0	0
IS	0	0	0
ME	0	0	0
MK	0	0	0
NO	0	0	0
RS	4	0	0
TR	0	0	0
Total other non-EU	**25**	**0**	**0**
Total	**152**	**169**	**142**

Abbreviation: n/d, not determined.

[a]Data from XI, the United Kingdom (in respect of Northern Ireland) are available from 2021 onwards.

TABLE D.2 Number of flocks/herds where suspected cases in ovine and caprine animals have been reported and investigated pursuant to Article 12(1) and (2) in 2023.

Country	Sheep	Goats
AT	2	0
BE	0	0
BG	0	1
CY[a]	6	25
CZ	0	0
DE	14	3
DK	0	0
EE	0	0
EL	4	0
ES	0	0
FI	0	0
FR	14	3
HR	0	0
HU	0	0
IE	0	0
IT	1	1
LT	0	0
LU	0	0
LV	1	1
MT	0	0
NL	0	0
PL	0	0
PT	0	0
RO	25	8
SE	0	0
SI	1	0
SK	0	0
Total EU27	**68**	**42**
XI[b]	0	0
Total EU27 + XI	**68**	**42**
BA	n/d	n/d
CH	0	0
IS	4	0
ME	0	0
MK	0	0
NO	0	0
RS	0	0
TR	0	0
Total other non-EU	**4**	**0**
Total	**72**	**42**

Abbreviation: n/d, not determined.

[a]In addition, 43 mixed flocks (sheep and goats).

[b]Data from XI, the United Kingdom (in respect of Northern Ireland) are available from 2021 onwards.

TABLE D.3 Number of ovine and caprine flocks/herds tested within each subpopulation referred to in Chapter A, Part II, points 2, 3, 5 and 6.

Country	Sheep SHC	Sheep NSHC	Sheep EM	Goats SHC	Goats NSHC	Goats EM	Other[a]
AT	99	1555	0	24	442	0	0
BE[b]	0		0	0		0	0
BG	0	0	n/a	0	0	1	n/a
CY	249	1638	0	845	1402	68	0
CZ	0	725	0	0	240	0	0
DE	2312	4509	0	70	599	0	59
DK	0	333	0	0	66	0	0
EE	0	42	5	0	5	0	0
EL	250	768	26	52	297	16	0
ES	1051	3528	241	824	1453	114	n/a
FI	2	531	0	0	78	0	0
FR	2024	7008	2	968	3549	0	0
HR	0	905	0	0	222	0	n/a
HU	917	1237	0	26	52	0	0
IE	3743	6466	0	0	51	0	0
IT	3836	5446	21	3200	4129	9	0
LT	0	96	0	0	9	0	n/a
LU[c]	0	n/a	0	0	n/a	0	0
LV	0	63	0	0	11	0	0
MT	5	111	0	0	74	0	0
NL	0	1521	0	0	1595	0	0
PL	1350	2430	0	148	1423	0	0
PT	904	5785	0	0	802	0	0
RO	2210	85	6	479	4	0	0
SE	0	1364	0	0	76	0	0
SI	59	1200	0	23	543	0	0
SK	0	505	0	0	104	0	0
XI[d]	0	0	0	0	0	0	0
BA	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CH	0	0	0	0	0	0	0
IS	316	20	3	0	4	0	0
ME	0	0	0	0	0	0	0
MK	204	5	0	9	1	0	0
NO	3381	4244	0	4	211	0	0
RS	10	85	1	0	5	0	0
TR	3	0	0	0	0	0	0

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

[a]Monitoring in other ovine and caprine categories (= 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).

[b]With regard to sheep and goats NSHC data, the Belgian competent authority informed that in the central database for sheep and goat identification, there is no direct link between the official ear tag number and the last holding where the sheep or goat was kept. Only the herd of birth is registered in the central database. At the rendering plant sheep and goats are randomly sampled during the year.

[c]The Luxembourg competent authority informed that for NSHC sheep and NSHC goats the number of flocks is unknown.

[d]Data from XI, the United Kingdom (in respect of Northern Ireland) are available from 2021 onwards.

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 links to the data sets. The countries that submitted data sets on the 2023 monitoring data year are the 27 EU Member States, XI and eight other non-EU reporting countries (Table E.1).

TABLE E.1 Links to the TSE data sets for 2023 by reporting country.

Country	Link to the data set
EU27 Member States	
AT	https://doi.org/10.5281/zenodo.14046771
BE	https://doi.org/10.5281/zenodo.14046733
BG	https://doi.org/10.5281/zenodo.14046667
CY	https://doi.org/10.5281/zenodo.14046778
CZ	https://doi.org/10.5281/zenodo.14046561
DE	https://doi.org/10.5281/zenodo.14046783
DK	https://doi.org/10.5281/zenodo.14046578
EE	https://doi.org/10.5281/zenodo.14046678
EL	https://doi.org/10.5281/zenodo.14046644
ES	https://doi.org/10.5281/zenodo.14046721
FI	https://doi.org/10.5281/zenodo.14044396
FR	https://doi.org/10.5281/zenodo.14046790
HR	https://doi.org/10.5281/zenodo.13981896
HU	https://doi.org/10.5281/zenodo.14046573
IE	https://doi.org/10.5281/zenodo.14046821
IT	https://doi.org/10.5281/zenodo.14046881
LV	https://doi.org/10.5281/zenodo.14046536
LU	https://doi.org/10.5281/zenodo.14044425
LT	https://doi.org/10.5281/zenodo.14046750
MT	https://doi.org/10.5281/zenodo.14046698
NL	https://doi.org/10.5281/zenodo.14046892
PL	https://doi.org/10.5281/zenodo.14046625
PT	https://doi.org/10.5281/zenodo.14046650
RO	https://doi.org/10.5281/zenodo.14046761
SI	https://doi.org/10.5281/zenodo.14046895
SE	https://doi.org/10.5281/zenodo.14046549
SK	https://doi.org/10.5281/zenodo.14046564
XI	https://doi.org/10.5281/zenodo.14046900
Other non-EU	
BA	https://doi.org/10.5281/zenodo.14046533
CH[a]	https://doi.org/10.5281/zenodo.14046910
IS	https://doi.org/10.5281/zenodo.14046620
ME	https://doi.org/10.5281/zenodo.14046636
MK	https://doi.org/10.5281/zenodo.14046916
NO	https://doi.org/10.5281/zenodo.14044449
RS	https://doi.org/10.5281/zenodo.14046730
TR	https://doi.org/10.5281/zenodo.14046543

[a]The data reported by Switzerland include those of Liechtenstein.