Bovine spongiform encephalopathy in 2014: continued highly favourable situation leads France to be classified as a country with "negligible BSE risk" in 2015

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Abstract

In 2014, for the third year in a row, no cases of classical BSE (C-BSE) have been identified. The number of cases of atypical BSE detected annually remains stable, with the identification of two cases of type-L BSE (BSE-L) at the slaughterhouse and one case of type H (H-BSE) at rendering. Due to a re-analysis in order to screen for all the atypical cases detected up to now, one atypical H-BSE case was reclassified as BSE-L, which brings the number cases of BSE-L detected in France to 17, and the number of BSE-H cases to 16. With this highly favourable situation regarding the disease, France was in a position to be internationally recognised as having "negligible BSE risk" , which was granted in early 2015.

Keywords

BSE, Epidemiological surveillance, Health control, Cattle, France

Résumé

Encéphalopathie spongiforme bovine en 2014 : une situation toujours très favorable permet l'acquisition du statut « à risque négligeable » en 2015

En 2014, pour la troisième année consécutive, aucun cas d'ESB classique (ESB-C) n'a été identifié. Le nombre de cas d'ESB atypique détectés annuellement se maintient avec l'identification de deux cas d'ESB de type L (ESB-L) à l'abattoir et un cas de type H (ESB-H) à l'équarrissage. A la faveur d'une ré-analyse à des fins de recherche de tous les cas atypiques détectés jusqu'alors, un cas atypique ESB-H a été reclassé ESB-L, ce qui porte à 17 le nombre de cas d'ESB-L et 16 celui des ESB-H détectés en France. Avec cette très bonne situation vis-à-vis de la maladie, la France était en position d'être internationalement reconnue « à risque négligeable », ce qui a été fait début 2015.

Mots-clés
ESB, épidémiosurveillance, police sanitaire, bovins, France

An overview of the BSE surveillance system and health control measures is presented in Box 1.

Trend in the number of cases

In 2014, samples were taken from 857,102 animals at the slaughterhouse (including 227 animals over the age of 48 months from emergency slaughter) and 186,370 animals at the rendering plant.

Of the seven non-negative samples, two samples from the slaughterhouse were confirmed as positive for L-BSE and one from rendering was confirmed as positive for H-BSE (Figure 1). The other four samples were found to be negative by the NRL. For the third year consecutively, no cases of classical BSE (C-BSE) were detected; no clinical suspicions were reported this year.

A total of 1,003 cases of C-BSE have been identified since surveillance was established in 1990. Regarding atypical forms, further to a re-analysis in 2014 in order to screen for all the atypical cases detected up to now, one atypical H-BSE case was reclassified as L-BSE, bringing the number cases of L-BSE detected in France to 17, and the number of H-BSE cases to 16 (Figure 1).

In 2014, 12 cattle were slaughtered as a result of health control measures taken to manage an outbreak of BSE.

Costs (amounts excluding VAT)

Sampling costs

Samples at the slaughterhouse are taken by State employees. This cost in human resources has not been estimated. For samples taken at the rendering plant, the State pays a fixed sum of €7.65 to the rendering plants for the cost of removing heads and placing them at the disposal of veterinarians, and a fixed sum corresponding to one veterinary act (AMV) per sample, which was €13.85 in 2014, to the veterinarians responsible for removing the obex. In total, the State spent approximately €1.4M for removing heads and making them available, and €2.6M for obex samples, for a total of €4M for sample preparation.

Laboratory costs

Analyses of samples taken at rendering plants are fully reimbursed by the State, within the limits of the ceilings determined by the volume of analyses carried out by the laboratories (ranging from €32 if the laboratory performs more than 25,000 analyses per quarter to €40 if the laboratory performs less than 6,500 analyses per quarter). The national average unit cost of the cattle screening test at the rendering plant was €30.40 in 2014. At the slaughterhouse, the State pays a flat-rate contribution of €8 per analysis. In total, the State spent approximately €12.4M for transmissible spongiform encephalopathy (TSE) screening analyses on cattle in 2014: €5.6M for analyses on rendered cattle and €6.8M for analyses on healthy slaughtered cattle.

In total, in 2014 the State spent approximately €16.4M for samples and analyses as part of BSE surveillance at slaughterhouses and rendering plants. These sums do not take into account the costs of taking samples at the slaughterhouse by State officials, nor the costs of coordination or technical and financial management of the scheme, particularly in terms of the state employees involved.

The programme for monitoring and combating TSEs is co-financed by the EU, which in 2014 contributed €5.55 per analysis at the slaughterhouse, €7.40 per analysis at the rendering plant, and 50% of the amount of compensation per bovine animal slaughtered or destroyed, to a maximum of €500.

Box 1. Surveillance and health control measures for BSE in cattle

Objectives
- To determine the prevalence of BSE in cattle.
- To detect, when applicable, any re-emergence of the BSE epizootic.

The population monitored
Programmed surveillance: healthy cattle slaughtered from 72 months of age and at-risk cattle (rendered or culled) from 48 months of age.

Outbreak surveillance: the entire cattle population.

Surveillance procedures
Outbreak surveillance
Carried out through the national BSE epidemiological surveillance network. Based on clinical surveillance of animals on the farm and at the slaughterhouse (suspicious signs detected during ante-mortem inspection). Any suspected case detected on the farm by the attending veterinarian is confirmed or ruled out by the veterinarian coordinating the departmental network.

Programmed surveillance
Since 2001, there have been two surveillance programmes in place:
- Slaughterhouse programme: systematic screening of all cattle intended for human consumption; this screening concerns all cattle over 72 months (48 months between 1 January 2009 and 30 June 2011, 30 months before January 2009 and 24 months between July 2001 and July 2004), and at-risk cattle over the age of 48 months (24 months until 31 July 2013). As of 1 January 2015, only animals born before 1 January 2002 will be covered by slaughterhouse surveillance.
- Rendering programme: screening of all cattle over 48 months that died on the farm or were euthanised following disease or accidents (24 months from June 2001 to March 2013).

Definition of suspected animals and cases
Any animal with the following characteristics is considered suspect for BSE:
- Living, slaughtered or dead animal presenting or having presented progressive neurological and/or behavioural disorders and/or deterioration of the general state that cannot be attributed to a disease other than BSE,
- Animal with a non-negative or suspect result on a rapid specific BSE test (ELISA, Western Blot or immunochromatographic methods).

Any suspect animal with a positive result for a confirmation test recognised by the Ministry of Agriculture (immunohistochemistry, Western Blot) is considered to be infected with BSE.

Health control measures
In suspected cases of BSE, the farms that held the animal during its first two years of life, and where appropriate the site currently holding the suspect animal, are placed under Prefectural monitoring order (APMS). If the case involves clinical suspicion, the suspect animal is then euthanised and diagnostic samples are taken.

If the case is confirmed, the farm or farms concerned are placed under Prefectural declaration of infection (APDI), and all cattle belonging to the same birth cohort as the confirmed case are slaughtered (animals born up to 12 months before or after birth of the case animal) along with cattle reared with the case animal during the first year of its life, while the case animal was under 12 or 24 months at the site of birth or of rearing, respectively. On these farms, if the affected BSE animal is female, calves born to this case animal in the two years preceding death, or showing clinical signs, or born during the clinical phase, are slaughtered.

Regulatory References

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.

Ministerial Order of 3 December 1990 establishing control measures for bovine spongiform encephalopathy.
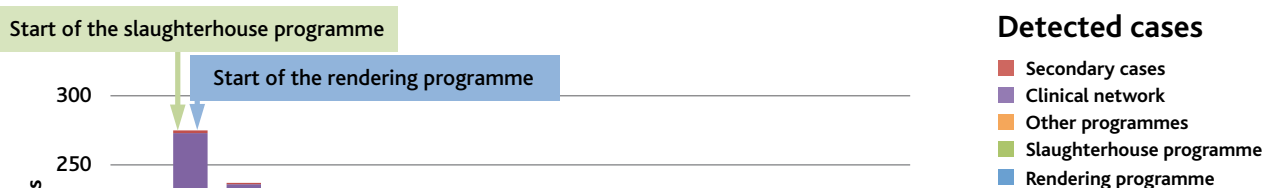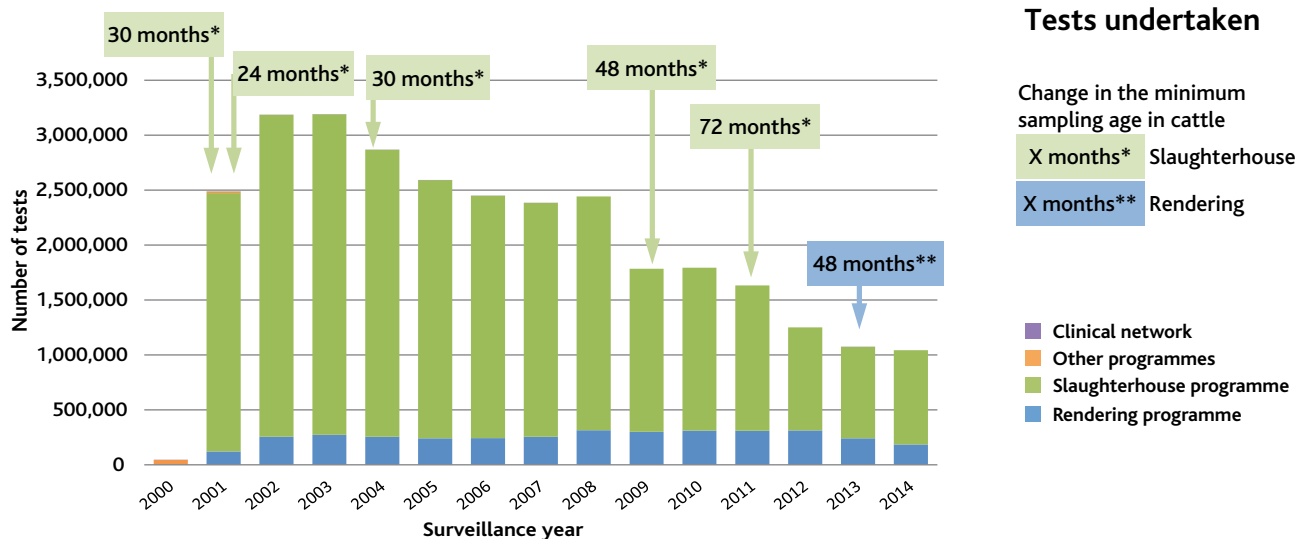

Box 2. BSE strains

Until 2003, there was only one known BSE strain. In 2003, two new BSE strains were identified. The atypical biochemical profile of these new strains compared to the 'classical' profile of the BSE strain gave rise to the names used for the three known BSE strains:
- Classical BSE (C-BSE) for the type of BSE responsible for the anazooty due to contamination of animals *via* feed,
- Atypical L-type BSE (L-BSE) for the strain characterised molecularly by a much lower level of the biglycosylated proteinase K-resistant prion protein (PrPres) form and an apparent molecular mass of PrPres that is slightly lower than in C-BSE on Western Blot,
- Atypical H-type BSE (H-BSE) characterised by an apparent molecular mass of PrPres that is higher than in C-BSE on Western Blot.

The two atypical BSE strains also differ from the classical strain in their epidemiological characteristics (Sala *et al.,* 2012):
- A low incidence (1 to 2 cases/million animals tested) that is relatively constant over time and consistent geographically with its presence in countries apparently free from C-BSE, suggesting that these forms are not contagious and not caused by simultaneous exposure of groups of animals, unlike the case of C-BSE,
- A mean age at diagnosis of 12.5 years, which is higher than that of animals with C-BSE (7 years) for the cases detected in France.
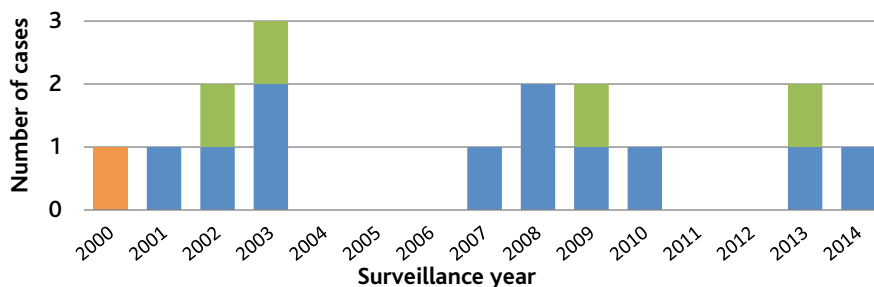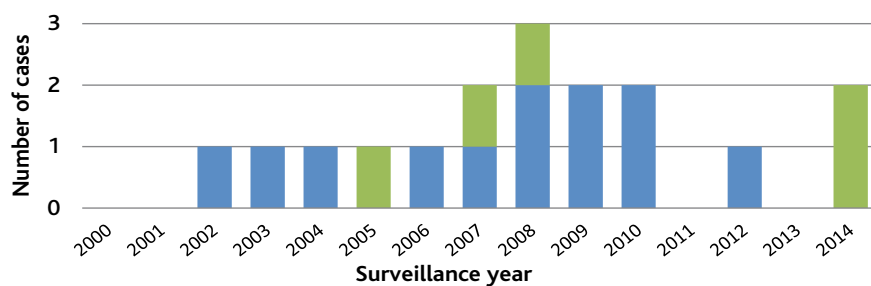
Figure 1. Change in BSE surveillance since 2000: number of tests performed per surveillance programme, and number of detected cases by BSE type and by surveillance programme. From 1991 (start of surveillance) to 1999, 80 cases of classical BSE were detected: 76 by the clinical network and three by 'other' programmes (pilot programmes and supplementary programmes), in addition to one secondary case (an animal found positive after the herd was slaughtered)
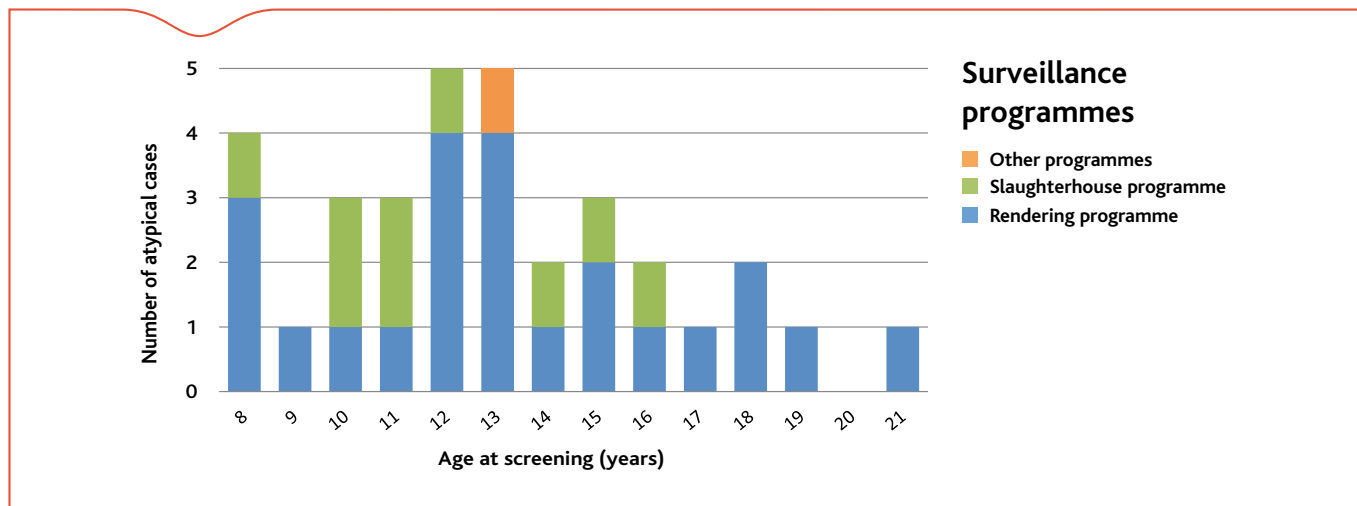
Figure 2. Breakdown of atypical BSE cases since 2000 by age and by surveillance programme. Between 1991 and 1999, no atypical BSE cases were identified

Discussion

The goal of BSE surveillance is to determine the prevalence of the disease and monitor its evolution; surveillance helps ensure that the measures put in place to safeguard human and animal health, including the withdrawal of specified risk materials, are still effective.

However, in order to reduce the cost of surveillance, following a favourable opinion from EFSA, the European Commission allowed Member States to cease tests on healthy animals at the slaughterhouse, considering that the disease is adequately monitored by tests at rendering plants and on at-risk animals at the slaughterhouse (Decision 2009/719/EC). Eighteen Member States stopped these optional tests in 2013. France decided not to stop tests at the slaughterhouse but to limit them to healthy animals born before 1 January 2002. This measure, which took effect on 1 January 2015, is expected to lead to an 80% decrease in the number of tests undertaken at the slaughterhouse (716,671 of 857,102 animals tested at the slaughterhouse in 2014 were born after 2002). On 31 December 2014, there were an estimated 200,000 cattle born before 1 January 2002 still held on French farms.

While relaxing slaughterhouse surveillance will not affect surveillance quality for the classical form of BSE, it is likely that the majority of cases of atypical BSE will no longer be detected through this system. Under this measure, only animals over the age of thirteen years will be tested in 2015, whereas six in nine atypical cases detected at the slaughterhouse up to now have been between the ages of eight and twelve years (Figure 2) and one of the two L-BSE cases detected in 2014 was born in 2004.

The anazooty seems to be under control, with no cases of C-BSE detected for three years now and atypical BSE cases presenting epidemiological characteristics, i.e. animals aged over eight years and mainly reared for meat production, consistent with current knowledge (Sala *et al,* 2012). Thus, with this stable situation in France regarding C-BSE, the application for recognition of the "negligible BSE risk" status from the OIE was favourably received in 2015. The most recent confirmed case of C-BSE concerned an animal born in 2004 and the OIE Terrestrial Code imposes an interval of 11 years between the year of birth of the last case and the recognition of "negligible risk" status (in addition to adequate surveillance, the implementation of risk prevention measures particularly relating to animal feed and imports, and strict health control measures during outbreaks).

No distinction is currently made between classical and atypical BSE in either EU regulations (Regulation (EC) No 999/2001) or international regulations (OIE Terrestrial Code). The same measures are applied in outbreaks of BSE, regardless of the strain identified. Similarly, the rules for obtaining (or losing) territory status as defined in the OIE Terrestrial Code (no status, controlled BSE risk, negligible BSE risk) do not take into account the strains involved in the outbreaks identified. Discussions are currently in progress at the international level to assess the relevance of taking into account the nature of the strains involved for the determination of territory status, and also regarding animal health measures during outbreaks.

References

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