FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

WORLD HEALTH ORGANIZATION

E

Agenda Item 4.1 a) **GF 01/7**

FAO/WHO GLOBAL FORUM OF FOOD SAFETY REGULATORS

Marrakesh, Morocco, 28-30 January 2002

BSE as a National and Trans-Boundary Food Safety Emergency

Paper submitted by the United Kingdom

Outline and Background

1. A new cattle disease, Bovine Spongiform Encephalopathy (BSE) was first identified in 1986. This belongs to a group of diseases known as a Transmissible Spongiform Encephalopathies (TSE). Although initially the infective agent for BSE was not thought to be capable of infecting humans, there is now evidence to suggest that BSE and a variant of the human TSE, Creutzfeldt-Jacob Disease (vCJD), are the same infective agent. These diseases are invariably fatal.

2. The agent that causes BSE is extremely resistant to the controls that would normally kill infectious agents such as bacteria and viruses, including cooking. Normal food hygiene measures are therefore ineffective against BSE. The only effective control in relation to human health is therefore to remove the infective agent from the food chain.

BSE as a prion disease

3. BSE is one of a group of diseases that affect a number of different mammals. These diseases, known as TSEs, or prion diseases, result from the build–up of abnormal prion proteins in the brain and nervous system and eventually cause death. BSE has a long incubation period. This means that it usually takes four to six years for cattle infected with BSE to show signs of the disease.

Case numbers of BSE

4. By 6 September 2001 there had been a total of 179,950 cases of BSE in cattle in the UK, with the peak number occurring in 1992. (See Figure 1.)

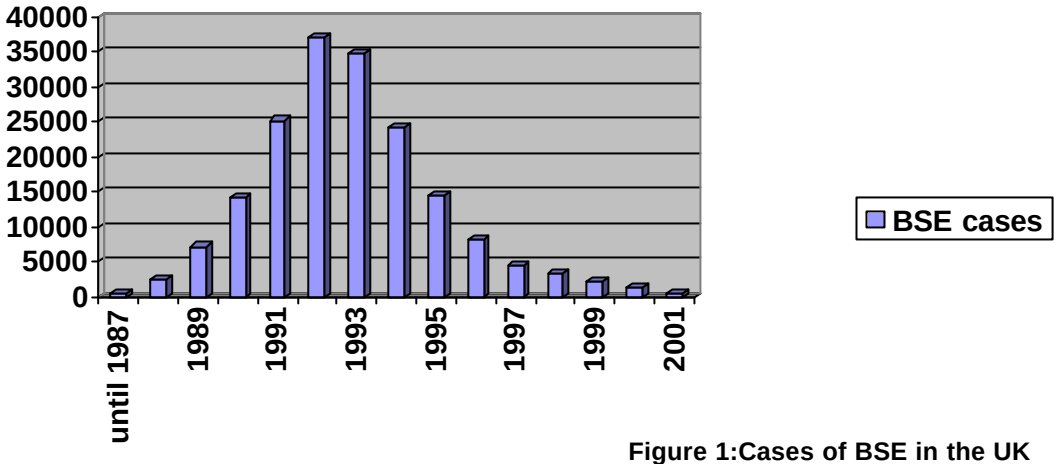

Figure 1:Cases of BSE in the UK

5. Although the vast majority of BSE cases world-wide have occurred in the UK, other countries have also been affected, mainly within Europe. Including:

Ireland	688 cases by 09/01	Spain	63 cases by 09/01
Portugal	581 cases by 07/01	Belgium	40 cases by 08/01
Switzerland	388 cases by 08/01	Italy	27 cases by 09/01
France	345 cases by 09/01	Netherlands	19 cases by 07/01
Germany	107 cases by 08/01		

Denmark, Greece, Luxembourg, Czech Republic and Liechtenstein have also had a few cases.

Associated Human Disease

6. The most commonly known human prion disease is Creutzfeldt-Jacob Disease (CJD). A new strain of CJD that occurs predominantly in younger people was discovered in 1996. More recent evidence has shown that the protein that accumulates in the brains of individuals with this new form of CJD is similar to the protein found in cattle infected with BSE, rather than that found in classical CJD. The new illness in humans is known as variant CJD, or vCJD.

7. The occurrence of a new form of CJD in the UK, where there is a high incidence of BSE, suggested that there might be a direct link between the two diseases. There is compelling evidence that the cause of vCJD is consumption of BSE contaminated meat. Researchers concluded that the most likely origin of this new disease was human exposure to the BSE agent.

8. Like BSE in cattle, vCJD is always fatal in people. As of August 2001 the total number of definite and probable cases of vCJD in the UK was 106. Figure 2 shows the breakdown of numbers by year. (Figures for 2001 up to and including August.)

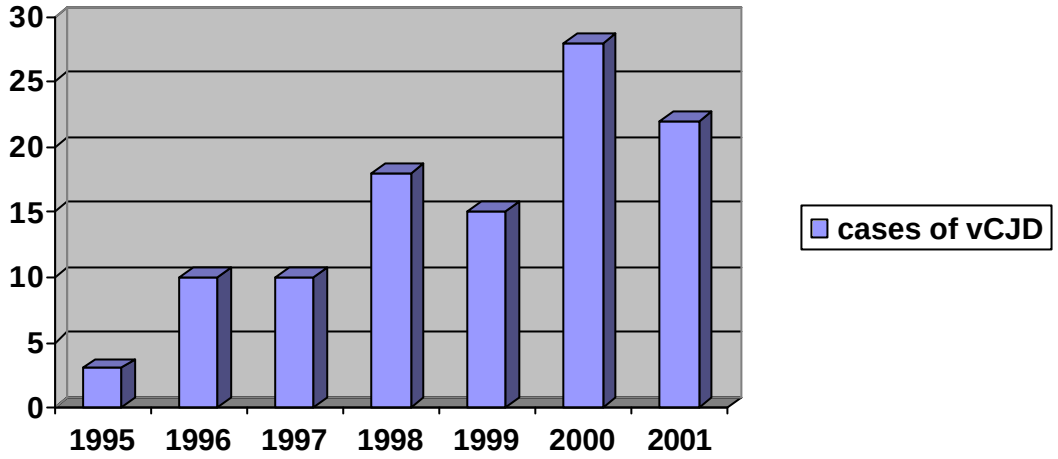

Figure 2: Cases of vCJD in the UK, definite and probable, by year.

Where does BSE come from?

9. BSE was first confirmed in cattle in 1986. Despite much research, however, no-one can say with certainty where BSE came from. It may have been the result of a spontaneous genetic mutation in a cow or other animal during the 1970s. The normal practice in the UK at the time was to recycle animal protein, including cattle offal, back into meat and bone meal incorporated into cattle feed. This could have led to the cycling of BSE within the cattle population and its spread. One of the early theories about why BSE spread within the cattle population was linked to a change in the rendering process to produce meat and bone meal. However, given that no rendering process will effectively destroy the BSE agent it is highly unlikely that this was a key factor.

Risk and uncertainty

10. Perhaps more than any other area of food safety, BSE is characterised by scientific uncertainty. Even now the precise nature of the causative agent and how it spreads in the host is not known for certain. The scientific uncertainty, which characterises BSE, means that throughout the BSE crisis the risk management options for protecting the health of the public have been precautionary in nature and aimed at risk reduction in the light of current knowledge. Risk can never be completely eliminated and the options have needed to be continually reassessed in light of emerging knowledge.

11. Throughout the Government has used expert scientific advisory committees to assess scientific evidence. This started with the Southwood Working Party in 1988, which developed into the Tyrrell Committee in 1989. The current committee is the Spongiform Encephalopathy Advisory Committee (SEAC) established in 1990.

Chronology of events in the UK and application of food safety control measures

November 1986 - BSE was identified in cattle.

December 1987 - Initial epidemiological studies in cattle were completed. These concluded that ruminant derived meat and bone meal was the only viable hypothesis for the cause of BSE. This conclusion was crucial in terms of control measures for both animal health and for protection of humans.

June 1988 -The use of ruminant derived meat and bone meal for feeding to ruminants was banned.

August 1988 - A slaughter policy was introduced, including compensation to farmers for slaughtered animals. An animal health measure but it indirectly impacted on human health by helping to reduce potential exposure.

December 1988 - BSE was designated a zoonoses, enabling legal powers to be used to reduce the risk to human health. This was a highly precautionary measure at the time as there was little indication that BSE would affect humans.

November 1989 - Specified bovine offal was banned from human food. The specified offal included those parts of the animal thought to have the highest likelihood of carrying the BSE agent. A crucial human health protection measure, even though it was highly precautionary at the time and exceeded even expert scientific advice.

September 1990 - Following reports that 5 antelopes and a cat had succumbed to a spongiform encephalopathy, and the experimental transmission of BSE to a pig, a ban was placed on specified bovine offal in all animal feed, including pet food. An animal health protection measure, but indirectly provided additional protection for humans.

March 1991 - The first case of BSE in offspring born after the ruminant feed ban (June 1988) was announced. This could have indicated that the feed ban was not being as effectively applied as it should have been. Subsequently many such cases occurred.(See Figure 3.) Of course, the case could also have indicated vertical transmission through cattle. Whilst some cases of vertical transmission are thought to have been possible, most cases in cattle born after the ruminant feed ban are now thought to have been because continued use of banned feed, or cross contamination with other animal feed. The 1990 ban on specified bovine offal in all animal feed was important to control cross contamination.

November 1994 - The ban on the use of specified bovine offal in animal feed was extended. All mammalian protein was banned in ruminant feed.

December 1995 - An additional measure to protect human health was enacted prohibiting the use of bovine vertebral column in the manufacture of all mechanically recovered meat. Spinal cord had already been included in the specified offal ban. However, it had proven difficult to remove the spinal cord completely from all carcasses. It was therefore decided to avoid the problem of fragments of spinal cord remaining by prohibiting the use of the vertebral column altogether.

March 1996 - The first cases of vCJD were announced.

March 1996 - The sale for human consumption of any meat from bovine animals over thirty months old was banned. Very few animals show signs of BSE onset by that age and infectivity is similarly only just emerging in infected animals. The over thirty months rule was therefore designed to prevent BSE infected cattle from entering the food chain.

April 1996 – The feeding of mammalian meat and bone meal to all farmed livestock was prohibited.

June 1996 - A feed recall scheme was launched (completed by October 1996) to collect and dispose of any meat and bone meal and feed containing it. This was to remove this possible source of infection entering the food chain.

January 1997 - Introduction of a selective cull of cattle most at risk of BSE.

December 1997 - Legislation came into force requiring the deboning of all beef derived from cattle, both home-produced and imported, aged over 6 months at slaughter before it is sold to customers. This was to control a very small risk of infectivity in bone marrow and dorsal root ganglia. (Later lifted once the risk was thought to have reduced.)

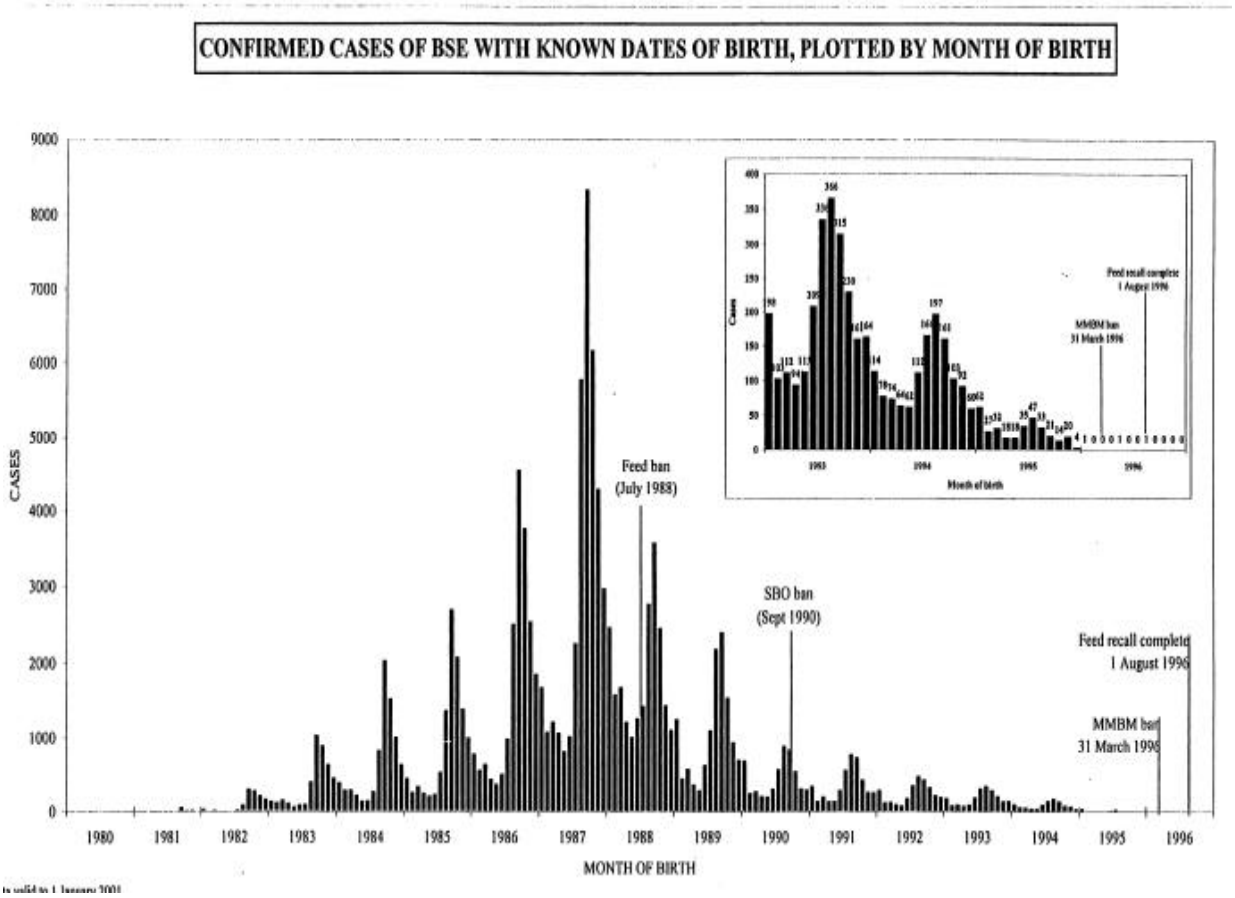

Figure 3: **Confirmed cases of BSE with known dates of birth, plotted by month of birth.**

12. The controls outlined above have been very successful in relation to reducing the number of cases of BSE in cattle. As mentioned previously the size and shape of the epidemic on vCJD in humans is impossible to predict at this time with any certainty. However, the control measures taken, especially :

- Removal of specified bovine offal (later Specified Risk Material) from the food chain;
- Banning of mechanically recovered meat from the spinal column, now extended under EU law to all ruminant bones;
- The over thirty months rule.

13. These measures are thought to mean that risk from consuming UK beef is at a very low level.

European and wider perspective

14. As noted in paragraph 5, the BSE emergency has not affected only the UK. It has also had significant impacts on our trading partners. This is particularly so within Europe. but there have also been wider ramifications throughout the world. About 0.5% of all cases of BSE have occurred outside the UK. Initial spread of the disease to other countries is thought to have been due to export of feed or live animals, but cases now appearing in other countries are probably due to the recycling of the disease in those countries.

15. Ireland, in 1989, was the first country outside of the UK to have cases of BSE. Cases then followed in Portugal and Switzerland (from 1990), France (1991), and Germany and Denmark (1992). Italy had its first 2 cases in 1994 and Belgium, Luxembourg and The Netherlands had their first cases in 1997. (See table 1.)

	Germany	Belgium	Denmark	Spain	France	Ireland	Italy	Luxembourg	The Netherlands	Portugal	Switzerland
1989	0	0	0	0	0	15	0	0	0	0	0
1990	0	0	0	0	0	14	0	0	0	1	2
1991	0	0	0	0	5	17	0	0	0	1	8
1992	1	0	1	0	0	18	0	0	0	1	15
1993	0	0	0	0	1	16	0	0	0	3	29
1994	3	0	0	0	4	19	2	0	0	12	64
1995	0	0	0	0	3	16	0	0	0	14	68
1996	0	0	0	0	12	74	0	0	0	29	45
1997	2	1	0	0	6	80	0	1	2	30	38
1998	0	6	0	0	18	83	0	0	2	106	14
1999	0	3	0	0	31	95	0	0	2	170	50
2000	7	9	1	2	162	152	0	0	2	136	33
2001 until Summer	94	21	3	58	103	108	25	0	11	72	22

Table 1: Cases of BSE by country. Note that the figures for 1999/ 2000 onwards include those detected through monitoring.

European response

16. At the time of the formal identification of BSE in the UK in late 1986 the disease was regarded as an animal health problem. Because of this the UK imposed controls in relation to removing meat and bone meal from ruminant feed in 1988. However, this was followed in the UK in 1989 by the requirement to remove specified bovine offal from human food, as a precautionary measure, despite the fact that there was no evidence for the disease being able to affect humans.

17. In May 1990 control measures were introduced in other European Community countries. At that time two European countries banned the import of beef from the UK. This ban was lifted in June 1990 following the intervention of the European Commission, which undertook to propose stricter animal health measures.

18. The next European wide measures were introduced in 1994 when the feeding of mammalian protein to ruminants was banned. They also introduced the first rendering standards to try to

minimise BSE in meat and bone meal. Further measures followed in 1996, immediately after the announcement of the first case of vCJD in the UK and the recognition of BSE as a food safety issue. The first action at this time was taken at a European level with a Europe-wide ban on exports of beef and beef products from the UK.

19. Some European Member States also took other precautionary measures to protect their consumers from all risks of contamination on an individual state basis between 1996 and 1998. These precautionary measures included the ban on specified risk material in human food and animal feed. These national measures were extended in October 2000 into a Europe-wide ban.

20. The banning of the export of beef from the UK was clearly a measure to protect consumers in other countries from possible food safety risks. However, the UK was also concerned to ensure that its consumers were protected from possible risks posed by imported beef. Introduction at a European level of the ban on the use of specified risk materials in human food was particularly important in this respect, although there has been, some concern over the effectiveness of its implementation (see paragraphs 28–29 below).

21. By the time of the European ban on UK beef significant measures had already been in place in the UK to protect human health for some time. These included the banning of specified risk material from human food and animal feed. Immediately following the March 1996 announcement of the first case of vCJD a further measure was introduced, the over thirty months rule.

22. June 1996 saw the first moves towards lifting the European export ban on UK beef – known as the Florence agreement. This set out 5 conditions for the gradual lifting of the ban. These were:

- Withdrawal of all meat and bone meal from farms or from establishments manufacturing animal feed;
- Stepping-up of checks in slaughterhouses;
- Introduction of a passport system for all cattle and setting-up of a computerised system for the identification and monitoring of animals;
- Removal of cattle aged more than 30 months from the human and animal food chains;
- Application of a selective culling programme.

23. Compliance with these conditions resulted in export of beef and beef products to Europe being allowed from Northern Ireland from June 1998 under the Export Certified Herd Scheme. This was followed in July 1999 by a decision to allow the export of UK beef produced under a Date Based Export Scheme applying to animals born after August 1996.

Actions taken by non-European Countries

24. BSE has also had implications for countries outside of Europe. One of the earliest controls applied by a third country was in 1989 when the USA banned the import of live cattle or beef and beef products from the UK. This was later extended to any country with confirmed cases of BSE. The stated aim of the USA controls related to protection of their herds from BSE infection. Many other countries followed with their own bans. By 1996 a great many non European countries had also banned UK beef, including Australia, New Zealand and South Africa all of whom were important markets for UK beef.

25. The European ban on specified risk materials used in human food also applies to third country imports except from countries classified as highly unlikely to present a BSE risk (see paragraph 26). When meat and meat products are imported from third countries they must be accompanied by a certificate to the effect that the specified risk materials have been removed and

that the animals have been slaughtered in accordance with required European Union standards. Similarly the UK ban on the sale of cattle over 30 months for human food (in place since 1996) applies to all imported beef except from 14 countries (Argentina, Australia, Botswana, Brazil, Mauritius, Namibia, New Zealand, Paraguay, Poland, South Africa, Swaziland, Uruguay, USA, Zimbabwe).

26. A further European initiative is the classification of countries into risk categories. In July 2000, the European Union Scientific Steering Committee adopted an opinion on the geographic risk of BSE in all Member States and certain third countries. It determined four categories of risk and allocated countries to one of the four categories as shown below:

- Category I (Highly unlikely to present a BSE risk)
- Category II (Risk of BSE is unlikely but cannot be excluded)
- Category III (Likely to present a BSE risk, even if not confirmed, or presenting a low level of confirmed BSE risk)
- Category IV (Confirmed, at a higher level)

27. There is provision for the categories to be reassessed. Factors other than confirmed cases that were also taken into account included:

- Imports of contaminated feed;
- Imports of infected animals;
- Possibility of cross contamination of cattle feed with other feeds that contain mammalian meat and bone meal.

Effectiveness of controls

28. Europe has clearly benefited from a European approach to tackling the problem of BSE. While control measures taken in the UK prior to 1996 were significant in reducing levels of BSE in the UK, it was clearly important also to implement controls throughout Europe because of the extent of international trade.

29. However, to be effective control measures must be rigorously applied and enforced through an effective inspection regime. This was certainly a lesson that the UK learnt in the early to mid 1990s when it was found that practices in slaughter houses had to be very closely monitored if the removal of all specified risk material was to be ensured. Action taken by the Meat Hygiene Service (set up in 1995) led to a great improvement in the UK. It is equally important to monitor imports for compliance. During 2001, up until August, 19 seizures of imported meat had been made because of the presence of prohibited spinal cord.

Conclusions and lessons to be learned

30. BSE was a new hazard. Not only had it not been encountered before but it belonged to a group of diseases, TSEs, that are still poorly understood. This led to unprecedented difficulties in risk assessment. Risk assessments must always be based on the best scientific data available. When key data (for example, the infective dose for animals and humans) are unavailable a great deal of uncertainty is introduced.

31. Uncertainty also has two important implications. The first is that it is quite likely that different groups of experts may deliver different assessments based on the same evidence, as actually happened between different expert committees in Europe. The second implication is that

decisions about areas of considerable uncertainty tend to lead to more precautionary policies, on occasions going further than current expert advice.

32. BSE has clearly caused considerable trans-national problems in both the trade of live animals and meat. These have been mainly, but not exclusively, in Europe. Within Europe we have had the advantage of a co-ordinated approach to control, underpinned by the advice of the European expert scientific committees. Co-ordination of action has been essential in bringing BSE under control.

33. Finally, consumer protection continues to depend on both continued efforts to eradicate the disease as well as the controls further down the food chain. Effective enforcement of required controls is obviously essential as well.