15. 'Mad cow disease' 1980s–2000: how reassurances undermined precaution

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15.1. Introduction

Many of the UK policy-makers who were directly responsible for taking policy decisions on bovine spongiform encephalopathy (BSE) prior to March 1996 claim that, at the time, their approach exemplified the application of an ultra precautionary approach and of rigorous science-based policy-making. ([11]) We argue that these claims are not convincing because government policies were not genuinely precautionary and did not properly take into account the implications of the available scientific evidence.

The BSE saga is enormously complex and this account is necessarily selective. It is, however, essential to appreciate that UK public policy-making was handicapped by a fundamental tension. The department responsible for dealing with BSE has been the Ministry of Agriculture, Fisheries and Food (MAFF), and it was expected simultaneously to promote the economic interests of farmers and the food industry whilst also protecting public health from food-borne hazards. The evidence cited here suggests that because MAFF was expected simultaneously to meet two contradictory objectives it failed to meet either.

15.2. A new cattle disease

The first cases of BSE were officially acknowledged in November 1986. The pathological characteristics of the new cattle disease closely resembled scrapie, a transmissible spongiform encephalopathy (TSE) that is endemic in the UK sheep population. TSEs are a group of very poorly understood, untreatable and invariably fatal brain diseases that afflict both animals and humans. Creutzfeldt-Jakob disease (CJD) is the best known human TSE.

MAFF scientists suspected that BSE had been caught from sheep infected with scrapie and was being transmitted through contaminated feed. The rendered remains of sheep, cattle and other animals were routinely incorporated into animal feedstuffs. Contaminated feed was quickly confirmed as the principal vector of the disease but whether BSE had in fact derived from scrapie, or from a spontaneous TSE in cattle, or from another source, remains unclear.

There was no evidence that eating sheep meat from scrapie-infected animals could cause CJD, but unfortunately policy-makers could not be sure that the agent which caused BSE had in fact derived from scrapie. Moreover, even if the scrapie pathogen had jumped species into cattle, policy-makers could not be sure that BSE would subsequently have the same transmission characteristics as scrapie. Experimental evidence indicated that it was then not possible to predict what the host range of a given strain of scrapie would be once it had jumped to another species (Kimberlin *et al.*, 1987). Even if policy-makers assumed that BSE was pathogenic to humans they could not quantify the risk. No one knew, for example, which cattle tissues, if any, would be free of the infectious agent, or what the levels of infectivity in the various tissues would be, or how this could vary over the period of incubation, and no one knew if there might be a threshold of human exposure below which the risk would be negligible. In the late 1980s there was no test that could reliably detect the pathogen in live animals before clinical symptoms appeared. Asymptomatic cattle could not be identified nor differentiated from cattle which were uninfected.

As soon as the first cases of BSE had been diagnosed senior officials realised that BSE posed a possible risk to human health (BSE Inquiry, 1999b, para. 22). As the Under Secretary in MAFF's Animal Health Group told his colleagues in early 1988: '... we do not know whether (BSE) can be passed to humans... There is no evidence that people can be infected, *but we cannot say there is no*

(11) Gillian Sheppard (BSE Inquiry transcript, 1998, 15 December, pp. 10–11); John Gummer (BSE Inquiry transcript, 1998, 8 December, p. 50).

risk… we have to face up to the possibility that the disease could cross another species gap' (emphasis added) (BSE Inquiry, 1999c, para. 59). Policy-makers had no choice but to take urgent decisions about a novel disease the implications of which were unknown.

15.3. Initial decisions

In the early stages of the BSE epidemic a wide spectrum of possible policy responses was available to policy-makers. The spectrum ranged from the most to the least precautionary. They could also be ranked in terms of their likely costs, but the order was then reversed. The total eradication of the disease and its pathogen from agriculture and foods would have required, *inter alia*, the slaughter and exclusion from the food chain of all the animals which had received feed known, or suspected, to have been contaminated with the pathogen. As there were no ways of knowing which batches of feed were contaminated, and because almost all dairy herds had received feed containing meat and bone meal, and because the majority of the beef herd were bred from dairy herds, that would have entailed slaughtering almost the entire British herd which might have cost in the order of GBP 12–15 billion ([12]). On the other hand, there were numerous other options which could have been selected, which would have substantially reduced the risks without spending a great deal of public money. These might have included, for example, a ban on the use of animals from affected herds as human food, or a ban on the use in the food chain of all bovine tissues that were suspected of harbouring the pathogenic agent, or even just a ban on the use of clinically affected animals as human food. In 1987, and the first half of 1988, approximately 1 200 clinical cases of BSE were recorded (though at that time the disease was not notifiable and the actual incidence must almost certainly have been higher) and most of those were sold as human food. The costs of compensation for removing those clinically diseased animals would have been no more than GBP 1 000 per animal, totalling approximately GBP 1.5 million. It is not yet possible to estimate the harm which eating those animals may have caused.

Box 15.1. Early warnings

Rendered animal slaughterhouse wastes have been recycled into animal feed since at least the beginning of the 20th century (Cooke, 1998). The known risks of that practice included the transmission, recycling and amplification of pathogens. Those concerns prompted the 1979 Royal Commission on Environmental Pollution to recommend minimum processing standards in the rendering industries (RCEP, 1979). Before the Labour government could follow that advice, they lost the 1979 election. It is not yet clear what effect such regulations might have had in diminishing the BSE epidemic because the incoming Conservative government decided to withdraw the proposed regulations, deeming them to be unnecessary and excessively restrictive. The Thatcher government indicated that the industry should be left to decide for itself how its equipment should be operated (Barclay, 1996, Section II B, p. 13). After 1996, minimum process standards were introduced in the rendering industry and deactivation experiments have been conducted and are in progress. We might eventually learn what the effect on the spread of TSE agents would have been if those standards had been introduced in 1979.

In the mid-1970s the US Department of Agriculture decided that carcasses of sheep and goats afflicted with, or exposed to, scrapie should not be used in human or animal foods, partly to prevent transmission of scrapie to other flocks but also because of their concern about a possible link between scrapie and CJD (Martin, 1998). No similar action was taken in the United Kingdom. If BSE was indeed caused initially by scrapie jumping from sheep to cattle then similar, relatively inexpensive, restrictions might have prevented the BSE epidemic.

The possibility that BSE might transmit to humans was recognised by veterinary officials in MAFF as soon as the disease was first diagnosed in 1986; however they thought that the probability that BSE might be pathogenic to humans was acceptably slight. The earliest documented official acknowledgement, of which we are aware, that the probability of transmission might be more than remote was made at a meeting at the National Institute for Biological Standards and Control in May 1988. The minutes of a meeting reported the conclusion that 'by analogy (with scrapie and CJD) BSE may be transmissible to humans' (BSE Inquiry, 1999c, para. 186). Senior government advisers participated in that meeting.

Between 1990 and 1995, evidence gradually emerged indicating that BSE exhibited distinct transmission characteristics from scrapie in sheep, thus indicating that BSE had an unknown and unpredictable host range. The most significant evidence was the discovery, from 1990 onwards, that BSE was transmissible, via food, to domestic cats, a species that is not susceptible to scrapie. Evidence that BSE could cause CJD did not emerge until 1995 when cases of an unusual form of CJD (later called variant CJD) in exceptionally young people began to be discovered. The temporal and geographical association between the two diseases was circumstantial evidence of causation.

In 1996 and 1997 direct evidence indicative of a causal relationship between BSE and variant CJD was produced. This included studies indicating that the pathological and clinical features of BSE and variant CJD were identical whilst both differed from the distinctive features of scrapie and sporadic CJD.

(12) Assuming a compensation rate of GBP 865 per slaughtered cow (the real rate of compensation paid to farmers in 1996), a herd of approximately 12 million cattle, the costs of slaughtering and incinerating cattle, and the knock-on effects on employment produces a maximum estimated figure of GBP 15 billion ('Cash for cows', 1996).

Even if the science had been massively less uncertain, scientific considerations would never by themselves have indicated where on the policy spectrum an appropriate response would have been. Policy-makers had to make political judgements about which actions to take, and how the costs should be distributed between public and private sources.

One problem with taking any regulatory measures, as then seen from the perspective of the UK government, was that any regulatory response — indeed any admission that consuming meat, milk or dairy products from British cattle might be harmful — would have undermined domestic and international confidence in the safety of British beef with adverse consequences for the meat industry. Even the virtually cost-free option of sharing information about the disease with those outside MAFF might have alerted domestic consumers and potential importers of UK cattle and meat to the presence of a new potentially fatal zoonotic disease. Fear of those consequences, and a reluctance to increase public expenditure, dominated policy-making in MAFF for the first 20 months of the epidemic. For example, when MAFF's Chief Veterinary Officer first told his minister about BSE he warned that '... the disorder could have potentially serious implications, not only domestically but for UK exports'. He advised that it was not appropriate to impose regulatory restrictions, noting that 'irresponsible or ill-informed publicity is likely to be unhelpful since it might lead to hysterical demands for immediate, draconian Government measures and might also lead other countries to reject UK exports of live cattle and bovine embryos and semen' (BSE Inquiry, 1999b, pp. 27–28). Even the option of making the disease notifiable, an essential tool for disease surveillance, was rejected in part, because, as one official put it, such action '... might imply to the general public we know something they don't, like the meat or milk is a source of danger for humans' (Phillips *et al.*, 2000, Vol. 3, para. 2.130).

As the epidemic rapidly began to escalate, UK policy-makers not only chose to avoid taking any regulatory action at all, but they also decided to try to keep information about BSE within the confines of the ministry. One of MAFF's scientists later recalled: '... in December 1986 when recognition of the disease began to crystallise, we were at the Central Veterinary Laboratory placed under strict confidentiality as to discussing it with outside people...' (BSE Inquiry, 1999b, p. 13). As the Phillips Inquiry into BSE concluded, during the first half of 1987 '... there was a policy of restricting, even within the State Veterinary Service, the dissemination of any information about the new disease' (Phillips *et al.*, 2000, Vol. 3, para. 2.137). Most of the scientific research community, the medical profession, and senior officials and ministers in other government departments did not learn about BSE until early 1988.

In February 1988, with the media beginning to devote attention to the new cattle disease and increasing numbers of affected cattle, senior MAFF officials changed their views and recommended that their ministers introduce a slaughter and compensation policy for clinically diseased cattle which, at the time, were being sold for human food. Officials argued, privately, that without a slaughter policy the government would be held responsible if it later transpired that BSE was transmissible to humans. The Agriculture Minister, John MacGregor, rejected that advice. The minister's private secretary explained why: 'He (the minister) does not see how we could *proceed without being clear where the offsetting savings are coming from*... More importantly... the argument that slaughter compensation policy would help to stem the spread of the disease (advocated in these papers) is precisely the one sugar beet growers have been making, and which we have strongly and publicly been rejecting. He also thinks that *action along the lines recommended now would make the export position much worse*, not better' (emphases added) (Minute, 1988).

The government's policy was not precautionary. Its primary objective was rather one of trying to diminish, as far as possible, the short-term adverse impact of BSE on the profitability of the food industry and the level of public expenditure.

15.4. Expert advice and regulatory controls

In mid-1988, and for the first time, a small expert advisory committee was set up to provide advice on BSE. This only occurred at the insistence of the Chief Medical Officer (CMO) at the Department of Health, who was first informed about the new disease only in March 1988 — 17 months after MAFF was first alerted (BSE Inquiry, 1999c, para. 115). That only occurred because agriculture

ministers were advised by their officials that they needed the support of the CMO for the ministers' decision not to remove clinically affected cattle from the human food chain (BSE Inquiry, 1999c, para. 76).

The advisory committee, under the chairmanship of Sir Richard Southwood, insisted on the day of their first meeting (20 June 1988) that clinically affected cattle should cease to go into the human and animal food chains and that farmers should be compensated. Another major change occurred when MAFF announced, on the very same day, that they would be introducing a ban on the use of potentially contaminated ruminant protein in ruminant feed. The feed ban only applied to ruminants. Animals such as pigs and poultry could still be fed with the contaminated protein even though no one knew whether or not they might also be susceptible to BSE. MAFF officials had in fact considered, and then rejected, a ban on feeding ruminant protein meal to all animals because that would have deprived the rendering industry of its principal market (the bulk of animal protein was fed to pigs and poultry) (BSE Inquiry transcript, 1998, 29June, p. 35). Senior veterinary officials were nevertheless aware that their decision was a gamble. In June 1988, the Chief Veterinary Officer, Keith Meldrum, admitted privately to a colleague that 'the most we could say is that any ruminant protein fed to (pigs) might contain the agent of BSE or scrapie. Whether or not infection would be established in the pig and whether it might replicate is unknown' (BSE Inquiry transcript, 1998, 16 June, p. 99). One unfortunate consequence of that decision was that for the next six or so years cross-contamination occurred between feed destined for cattle and feed destined for other animals, greatly prolonging the BSE epidemic.

Although Southwood's advisory committee had been quick to insist that clinically affected animals be removed from the human food chain it did not recommend controls on the use in food of sub-clinically infected animals, the tissues of which would also harbour the infectious agent. (In the absence of an ante-mortem diagnostic test any controls would have had to have been imposed on the entire British herd.) Southwood acknowledged in March 1996, after the acute BSE crisis erupted, that a ban on the use of all cattle brains might not have been a politically feasible option in 1988. He explained: 'We felt it was a no-goer. They (MAFF) already thought our proposals were pretty revolutionary' (*New Scientist*, 1996).

A ban on the use of cattle brains and other offal from all cattle in the human food supply was introduced by MAFF in November 1989, nine months after the Southwood Committee reported. That regulation was only introduced after it emerged that one of the government's own expert advisers had told officials, in confidence, that he had undertaken private consultancy work for the pet food industry and had subsequently recommended a bovine offal ban in pet food, and after ministers decided that they did not wish to be upstaged by the meat products industry and the pet food industry both of which had told MAFF that they would be unilaterally removing bovine offals from their products (BSE Inquiry, 1999e, paras 87–89 and 135).

The ruminant feed ban, the slaughter and destruction of affected cattle, and what became known as the specified bovine offal (SBO) ban were all in place by the end of 1989. The controls were not designed to eradicate the BSE agent, however, but only to diminish the risk. For example, the tissues selected for the SBO ban were chosen not because they alone harboured the infectious agent but because they could most easily be removed, and because they were of the lowest commercial value. There were no experimental data, at that time, indicating which cattle organs might be contaminated with the pathogen, although analogies with other species and their TSEs indicated that many other tissues would also have carried the agent. For example, lymph nodes and peripheral nerves would almost certainly be highly infectious but could not practicably be removed and organs such as the liver would, by analogy with other TSEs, also contain (lower) levels of the infectious agent but were commercially valuable (BSE Inquiry, 1999e, para. 85). Moreover, the SBO ban excluded cattle under six months old. The carcasses of calves were not normally split in abattoirs so the removal of their spinal cords would have raised abattoir costs. The exclusion of calves would only have been sensible if one could have assumed that vertical transmission of BSE from cow to calf could not occur. That assumption was implausible because it was already known that scrapie did transmit from ewes to their lambs and because MAFF did not start funding research into maternal transmission

of BSE until 1989 (Barclay, 1996, p. 16; *Nature*, 1990).

The delay in implementing the principal regulations also meant there had already been repeated human exposures to the pathogen. For example, from mid-1988, after Southwood recommended that all clinically affected cattle be destroyed, to the end of 1989, when the SBO ban was actually introduced, an estimated 30 000 infected cattle that were at least halfway through the average incubation period for BSE had been consumed (Dealler, 1996).

15.5. Constructing a house of cards

In 1987, UK policy-makers adopted the hypothesis that BSE was an innocuous version of scrapie and they struggled to remain wedded to it, in the face of accumulating evidence to the contrary, because that narrative enabled the UK government to offer a reassuring and optimistic message by suggesting that the presence of BSE in British dairy and beef herds posed no threat to human health. MAFF repeatedly asserted that their reassuring statements were fully supported by scientific evidence, expertise and advice. That was, however, a misrepresentation.

Policy-makers were repeatedly told, both by the scientific experts on whom they claimed to rely, and by the wider scientific community, that it was impossible to be certain that consuming meat, milk and dairy products from animals with BSE posed no risk. For example, in May 1990, the government's Spongiform Encephalopathy Advisory Committee (SEAC) told policy-makers that: 'in the present state of knowledge, it would not be justified to state categorically that there was no risk to humans, and it was not appropriate to insist on a zero risk' (BSE Inquiry transcript, 1998, 24 March, p. 71). Ministers and senior policy-makers insisted otherwise in public. On 7 June 1990, for example, the Agriculture Minister told the House of Commons that there was '... clear scientific evidence that British beef is perfectly safe' (*Hansard*, 1990, column 906). Policy-makers repeatedly claimed a certainty which was unavailable and which they knew to be unavailable. Occasionally policy-makers acknowledged that they could not be certain that BSE was an innocuous form of scrapie, but they always claimed that regulatory controls introduced in November 1989 prevented all potentially contaminated material from entering the food chain (*Radio Times*, 1992).

Regulatory controls were never intended, however, to eliminate exposure to the BSE agent, but only to diminish exposures, and MAFF scientists and expert advisers made sure that senior policy-makers knew that (see, for example, BSE Inquiry, 1999e, para. 275). For example, in 1990 SEAC produced a draft document about the safety of beef intended for the Chief Medical Officer, in which it made statements such as: 'some of the edible offal... that have on rare occasions demonstrated low titres of infectivity are not included in the offal ban' and 'there are some who insist on nothing less than an absolute guarantee of safety. No scientist is in a position to do that at present for British (or Irish) beef' (emphasis in original) (Phillips *et al.*, 2000, Vol. 11, para. 4.120). That document was circulated within the Department of Health and MAFF for suggested amendments. The MAFF official who subsequently forwarded the document to ministers told those ministers, and other MAFF officials, that: 'the most potentially inflammatory pieces of drafting in earlier versions (including the citations above) have now been edited out' (Phillips *et al.*, 2000, Vol. 11, para. 4.118). But then as Phillips concluded, in a memorable phrase, ministers and officials followed an approach to information provision 'whose object was sedation' (Phillips *et al.*, 2000, Vol. 1, para. 1179).

The assertion that beef was entirely safe was not only misleading but it also made it increasingly difficult for MAFF to take a range of other precautionary steps. Any new regulatory measure, no matter how useful or cheap, risked not only raising questions about the government's reassurances, but might also provoke serious doubts about the logic of not introducing further and more expensive controls (zero risk was always going to be unattainable without slaughtering and restocking the entire British herd and cleaning out the feed chain). In other words, partial reductions in risk were difficult from the point of view of presentation; the only credible options, given the rhetoric, were to draw a line, maintain that it provided total protection and stick to it, or alternatively to try to eradicate the agent entirely.

Numerous precautionary measures were not therefore introduced, not because of their immediate costs but because of their liability

to undermine the government's reassuring message. For example, mechanically recovered meat (MRM) was widely acknowledged to contain residual pieces of potentially highly infectious nervous tissue (BSE Inquiry transcript, 1998, 6 July, pp. 104–106 and 127). Banning MRM would have made explicit the risks associated with peripheral nervous tissue, most of which could not practicably be removed from the carcass. As the minutes of a meeting held at MAFF in September 1989 indicate: 'Mechanically recovered meat (MRM) — the possible danger raised by several of those consulted was recognised and during the discussion there was an expression of the illogicality of what was being done and in particular how easy it would be to have to concede the possible dangers of material other than those listed in the proposed ban. It was agreed not to raise it' (BSE Inquiry, 1999e, para. 263).

In February 1990 the Institute of Environmental Health Officers (IEHO), whose members were responsible for enforcing controls in slaughterhouses, raised concerns with MAFF about existing practices for removing cattle brains from heads, none of which, the IEHO argued, could be accomplished without contaminating the head meat. The IEHO sensibly recommended that all removal of head meat should take place prior to splitting the skull for the removal of the brain. Although agriculture ministers had 'qualms' about the practice of removing brains before removing head meat, and felt that the practice ought to be banned, civil servants argued, successfully, that no new controls should be introduced. As a senior official in MAFF's Meat Hygiene Division explained to the Minister for Food: 'Amendment regulations would fuel debate on BSE generally and, inevitably, lead to demands for similar action on spinal cords... A ban on splitting (spinal columns) would have grave consequences for the industry and for the export trade. Nor would it end with spinal cords. Concern would then be directed at nerve trunks and lymph nodes, which cannot be removed from carcasses' (BSE Inquiry, 1999f, p. 7).

Again, a cheap, simple and risk-reducing measure was avoided in order to maintain a reassuring and misrepresentative message about safety and to counteract political pressure for ever more precautionary controls. If MAFF had publicly acknowledged some of the uncertainties and risks, and admitted that some measures of control might be too impractical and/or too expensive, and therefore that a lower but acceptable level of risk might have to be tolerated, policy-makers might have found it easier to introduce precautionary control measures without threatening the ministry's credibility.

As events and evidence eventually prompted additional regulatory controls, it became increasingly hard to reconcile those responses with the government's reassuring narrative, particularly if those additional regulations made explicit further areas where controls ought to be introduced. Policy-makers therefore sometimes misrepresented their reasons for introducing regulations in an attempt to prevent their narrative from unravelling. For example, MAFF insisted that the SBO ban was not necessary on scientific grounds (see, for example, House of Commons Agriculture Committee, 1990, pp. 9 and 71), and it was therefore difficult to convince industry and other stakeholders that those regulatory measures were crucially important for public health. In 1995, during unannounced visits by enforcement officers to UK abattoirs, some 48 % were found to be failing to comply with the SBO regulations (House of Commons Agriculture and Health Select Committees, 1996, p. 10). As a representative of those responsible for enforcing slaughterhouse regulations put it: 'We were being given the message that really there probably wasn't a problem anyway so this was maybe a bit of window dressing as opposed to serious public health matters...' (*Panorama*, 1996).

It was not only new regulatory measures, however, that threatened the government's claims that risks were zero. Sustaining the government's reassuring message also entailed that unwelcome information and evidence could undermine the official narrative. Expert advisers were therefore carefully selected and those who did not share the ministry's policy framework, or who might refuse to acquiesce to restrictions on the dissemination of information, were excluded. As one MAFF official put it: '... you have to turn to external bodies to try to give some credibility to public pronouncements, you are very dependent therefore on what the Committees then find... Really the key to it is setting up the Committee, who is on it, and the nature of their investigations' (BSE Inquiry transcript, 1998, 29 June, pp. 79–81). Some experts were also excluded because

Box 15.2. The European dimension

Although BSE first emerged in the United Kingdom, it spread to other countries, especially in continental Europe, as a consequence of trade in animals and feedstuffs. Individual Member States and the European Commission have therefore had to grapple with many of the same difficulties and dilemmas as the United Kingdom. Countries such as Ireland, Portugal and France have had sufficiently high rates of BSE that, during the 1990s, their governments recognised the need to establish controls on their domestic production systems. Other countries, with lower incidences of BSE, such as Belgium, the Netherlands and Italy occasioned some concern and regulatory activities, but primarily in relation to traded animals and feedstuffs. The various jurisdictions have, nevertheless, responded in quite different ways, regardless of their levels of industrial development or the number of BSE cases in each country. A full account of how and why those responses differed is beyond the scope of this case study ([19]). Nevertheless, it is clear that the location of responsibilities for BSE policy-making was fundamental in framing the ways in which the BSE problem was defined, evaluated and responded to. In general, those jurisdictions in which industrial sponsorship and responsibility for consumer protection were located within the same institutions (e.g. Ireland) adopted less precautionary approaches to protecting public health than those where sponsorship and regulation were split or shared between more than one institution (e.g. Austria) (BASES, n.d.).

For example, within the European Commission, prior to 2000, responsibility for BSE policy was located primarily within DG III (with responsibility for the European Union's (EU) internal market and enterprise) and DG VI (with responsibility for agriculture and fisheries). Although the United Kingdom introduced domestic legislation banning the use of contaminated ruminant protein for use in ruminant feed in June 1988, at which point it informed the European Commission of its actions, EU-wide legislation to control the spread of BSE was not introduced for another six years. After June 1988, the United Kingdom continued to export contaminated feed to other Member States and some of that was subsequently fed to cattle. For example, exports of meat and bone meal to the EU had jumped from 12 553 tonnes in 1988 to 25 005 tonnes in 1989 (European Parliament, 1997, p. 8). In the summer of 1989, the Commission asked the United Kingdom to introduce an export ban on those feedstuffs but the United Kingdom refused to do so (BSE Inquiry, 1999d, para. 257). The Commission has since claimed that it did not have the legal basis itself, prior to the Single European Act, to ban exports of UK meat and bone meal (although the European Parliament has disputed that assertion); instead the Commission invited all Member States to introduce a national ban on the import from the United Kingdom of ruminant-derived meat and bone meal (European Parliament, 1996, p. 10). Some Member States then did so, or had already introduced such a ban (e.g. the Netherlands), whilst some did not ban imports of UK meat and bone meal until much later (e.g. Portugal). The European Commission did not insist on an EU-wide ban on the feeding of ruminants with meat and bone meal until 1994. Not until 1996 did the Commission ban the exports of UK produced meat and bone meal (and all other cattle products). The European Parliament has concluded that the Commission consistently subordinated the protection of animal and public health to maintenance of the internal market (European Parliament, 1997).

As a result of the 1996 BSE crisis, there has been an on-going reorganisation of scientific advice and food safety policy-making in both the European Commission and Member States. In the European Commission, the scientific advisory system has been reformed and management of scientific advice has moved to DG XXIV, now renamed DG SANCO or the Directorate General for Health and Consumer Protection. In 2000, the regulatory and sponsorship functions of DG III and DG VI were split and the regulatory functions were also transferred to DG SANCO. The European Commission's 2000 White Paper on food safety has now proposed a further institutional split by proposing the creation of a European Food Authority to provide independent science-based advice to DG SANCO (European Commission, 2000). Analogous reforms and proposals for reform have occurred in many of the Member States.

As of 2000, many individual Member States have discovered that they have rising cases of BSE (e.g. France and Ireland) and those countries that previously thought they might be free of the disease have discovered cases amongst their domestic cattle population (e.g. Germany and Spain). Substantial historical differences in the types of controls that have been imposed by different Member States, and the extent to which those controls have been enforced, will mean that some jurisdictions face considerable animal and public health challenges for many years.

their institutional location might provide the wrong impression. For example, the UK Public Health Laboratory Service (PHLS) — the established disease surveillance institution in the United Kingdom for new and emerging diseases — was always excluded from BSE policy. As the Welsh Chief Medical Officer has recalled: 'the basis of the consistent opposition to the involvement of the PHLS was the anxiety that their involvement would be tantamount to admitting the possibility of a human health risk (Phillips *et al.*, 2000, Vol. 11, para. 4.28).

Senior policy-makers also attempted to ensure that the commissioning, conduct and reporting of BSE research were tightly controlled. Many key experiments were never started or were seriously delayed, information and evidence were sometimes withheld, and data and materials were not always shared with other researchers. For example, a random post-mortem survey of animals in abattoirs would have helped to provide estimates of the numbers of infected but asymptomatic animals entering the human food chain. The laboratory resources

(13) National reports about the policy responses to BSE in 11 European countries, conducted as part of a European Commission sponsored research project, provide more information. These are available at: http://www.upmf-grenoble.fr/inra/serd/BASES/

were available and the costs would have been relatively low but only one such survey has been conducted in the United Kingdom and that was in 1999 and only in cattle that were not permitted to enter the human food chain. A crucially important experiment to see whether cattle fed on rations deliberately infected with scrapie would get BSE was not started until 1996 (BSE Inquiry transcript, 1998, 11 March, p. 132). Once BSE became notifiable, all infected cattle brains became the property of MAFF and the ministry showed extraordinary reluctance to provide some of the most senior scientists in the United States with pathogenic material (BSE Inquiry, 1999a, paras 493–505). A precautionary approach to policy-making, on the other hand, would have involved producing and disseminating far more information and evidence.

15.6. The failures and eventual collapse of the policy edifice

In the years following the Southwood Report, MAFF's reassuring narrative repeatedly and progressively unravelled. It did so partly because the scientific evidence, which was never entirely reassuring, became progressively less reassuring, because the ministry's control of the diffusion of information was imperfect, and because actors and agents outside the ministry's control took independent decisions. This occurred despite MAFF's vigorous attempts to sustain the policy in the face of its inherent weaknesses and accumulating counter-evidence.

By late 1995 a lengthy series of events and evidence had obliged MAFF progressively to tighten regulations, though in a reactive, rather than in an anticipatory, fashion. By then, a growing proportion of the national and global scientific and research community had become increasingly concerned about the risks from BSE. MAFF's policy eventually collapsed in March 1996 after a new variant of CJD (now, with the passage of time, labelled variant or vCJD) had emerged in the United Kingdom, and after SEAC had concluded that consuming food contaminated with BSE was the most probable cause.

Box 15.3. The costs of BSE

BSE has had substantial, and as yet incomplete, ramifications, some of which can be defined in monetary terms but others of which are incalculable.

In 1998, the cumulative expenditure by UK agricultural departments in response to the BSE crisis, from 1996 to 2001, was forecast to be GBP 4.2 billion (House of Commons, 1999). The bulk of that expenditure was, and will be, for compensating commercial enterprises, especially compensation to farmers for the removal of cattle over 30 months of age from the human food chain and support to the slaughtering and rendering industries. The figures also include expenditure on research programmes and administration. Other costs since 1996 that have been borne by public expenditure include the public inquiry into BSE, at an estimated GBP 25 million (Farmers Weekly Interactive Service, 1999).

The costs to the private sector of BSE have also been considerable. The ban on British beef exports in March 1996 led to the complete loss of a trade worth GBP 700 million per year (DTZ Pieda Consulting, 1998). In the first 12 months since March 1996, the total value of the market for UK produced beef fell by an estimated 36 % in real terms (a combination of loss of exports and the drop in domestic demand), amounting to an estimated loss of value added to the UK economy of GBP 1.15 billion (DTZ Pieda Consulting, 1998). It would be premature to try to provide precise estimates of the total costs of BSE, not least because we still cannot estimate how many people will eventually succumb to new variant CJD; there may be no more than another 100 cases, or there may eventually be up to a million (Collinge, 1999).

15.7. Conclusions

BSE was always going to be a difficult issue to apply a precautionary approach to once it had been discovered in the UK cattle herd. In November 1986, many infected cattle had already been consumed and even at that stage it would have been hugely expensive to eradicate.

Nevertheless, there was a great deal which the government could have done to diminish the risks to consumers, and in the long run to the meat industry and to the Exchequer, especially if they had openly acknowledged what the scientific evidence did, and did not, indicate. Instead the UK government claimed to be prudently protecting public health, while in practice it covertly subordinated the protection of public health to the support of agricultural sales, with a view also to minimising state intervention and public expenditure. The regulations which were set were, consequently, too little and too late, and even then they were not properly enforced. Moreover too little was invested in scientific research and the involvement of

independent scientists was actively discouraged.

If the UK government had adopted a genuinely precautionary approach, it would have necessitated, firstly and most fundamentally, reforming policy institutions so as to separate responsibilities for regulation from those of sponsorship. The BSE saga has provoked a reappraisal of the ways in which risks to public and environmental health are assessed and managed in the United Kingdom. Since May 1997, the UK government has acknowledged that there was a fundamental contradiction at the core of MAFF's remit, and that recognition informed the decision to create the Food Standards Agency.

A precautionary approach would also have necessitated acknowledging how little 'sound science' was available, and would have involved open and accountable discussions of the possible costs and benefits of taking, or failing to take, a wide range of different possible courses of action. A Freedom of Information Act might have the effect of initiating a cultural change in the way policy-making bodies represent scientific evidence. An institutional separation between those responsible for providing scientific advice, risk assessments and research and those responsible for regulatory policy-making might also have encouraged more open and robust discussion of possible risks. Furthermore, the more support there is for research, conducted by a wide range of disciplines and interdisciplinary groups and in a wide range of institutions with open access to evidence and data, the harder it would be to conceal uncertainties, and therefore the uncertainties might be more readily diminished.

One of the factors which, prior to March 1996, helped MAFF to sustain its optimistic narrative was the willingness of expert scientific advisers to acquiesce to an arrangement under which the scientists provided advice which was based on both scientific and non-scientific considerations but which was represented to the general public as if it was purely scientific. That suited ministers because it allowed them to argue that they were doing what, and only what, their scientific advisers recommended, and it flattered the scientists by representing them as authoritative and influential. A more precautionary approach could have been expected if the role of the scientific advisers had been more strictly delineated, and open to expert and public scrutiny. Since risk assessments are always framed by socio-economic considerations, the responsibility for articulating and justifying those framing assumptions should be the responsibility of democratically accountable ministers, and expert scientific advisers should be responsible for showing how they have gathered and interpreted all the appropriate evidence. Since March 1996, members of

Box 15.4. Conclusions from the Phillips Inquiry

In January 1998, an inquiry into BSE was set up by the Labour government to 'establish and review the history of the emergence and identification of BSE and variant CJD and of the action taken in response to it up to 20 March 1996' and 'to reach conclusions on the adequacy of that response, taking into account the state of knowledge at the time'. The inquiry committee, chaired by Lord Justice Phillips, reported in October 2000 after having taken oral and written evidence from over 600 witnesses.

The 16-volume report focused primarily on procedures rather than outcomes; indeed, the inquiry team was reluctant to comment on the extent to which policy was or was not proportionate, preferring instead to highlight issues of communication within and outside government, the use of expert advice and cooperation between government departments. Phillips' main criticism was that public policy was dominated by the political objective of reassuring the public. The inquiry team maintained, nevertheless, that appropriate policy decisions were taken although they were not always timely, properly designed, or adequately implemented or enforced.

Two of the conclusions reached by Phillips and his colleagues were that 'the government was anxious to act in the best interests of human health' and that 'it was not (the Ministry of Agriculture, Fisheries and Food's (MAFF)) policy to lean in favour of the agricultural producers to the detriment of the consumer'. It is, however, difficult to see how the evidence available to the inquiry, some of which is summarised in this case study, is consistent with those conclusions.

The Phillips Report contains 160 individual lessons. Many of these are specific to animal health policy and agricultural production practices but the main generic conclusions concern:

- the appropriate use and role of advisory committees;
- the maintenance of sufficient in-house expertise;
- greater cooperation between animal and human health professionals;
- the proper implementation, operation and enforcement of policy measures;
- coordination of research to diminish policy-relevant uncertainties;
- the principle that uncertainty can justify action;
- the importance of establishing credibility and trust;
- communication of uncertainty;
- openness and transparency.

Many of those conclusions are relevant to debates about precaution but none provided an explicit discussion of what precaution might imply in practice for the conduct of policy-making and research.

SEAC have become more independent than their predecessors. When advising on the possible risks from eating 'beef on the bone' SEAC set out the possible consequences of various courses of action, and explicitly indicated the decisions which ministers would have to take. Policy-making on BSE has become more precautionary, and in part that has been because it has become more open and accountable, especially following the creation of the United Kingdom's new Food Standards Agency.

Table 15.1. **BSE: early warnings and actions**

Source: EEA

Mid-1970s	United States bans scrapie-infected sheep and goat meats from cattle food chain
1979	UK Royal Commission on Environmental Pollution recognises risks of pathogens in animal feed and recommends minimum processing standards in rendering industries
1986	First cases of bovine spongiform encephalopathy (BSE) are officially acknowledged
1988	First documented official acknowledgement that BSE may be transmissible to humans
1988	Southwood Committee is set up and recommends that clinically affected cattle should not go into human and animal food
1989	Ruminant feed ban, slaughter and destruction of affected cattle and specified bovine offal (SBO) ban
1995	Almost 50 % of the abattoirs checked are found to be failing to comply with the SBO ban
1995	Evidence that BSE may cause Creutzfeldt-Jakob disease (CJD)
1996	At last, experiments start to see whether cattle fed on rations deliberately infected with scrapie would get BSE
1996	BSE crisis, after a new variant of CJD emerged in the United Kingdom and consuming BSE contaminated food was considered the most probable cause
1998–2000	The Phillips Inquiry takes place and its 16-volume report is published. Its conclusions do not seem sufficiently rigorous on judging government actions over time. These conclusions state that appropriate policy decisions had been taken, although not always timely, or adequately implemented or enforced.

15.8. References

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