
Monograph:
Beck, M., Kewell, B. and Asenova, D. (2007) BSE crisis and food safety regulation: a comparison of the UK and Germany. Working Paper. Department of Management Studies, University of York

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University of York
The York Management School
Working Paper No. 38
ISSN Number: 1743-4041

BSE Crisis and Food Safety Regulation: A Comparison of the UK and Germany

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Paper for the Risk and Rationalities Conference

"Coping with Disasters" Stream

Queen's College, Cambridge, United Kingdom, March 29 – 31, 2007

Abstract

The BSE crisis represents one of the worst policy disasters experienced by a UK government in recent years. In material terms, it led to the slaughter of 3.3 million cattle and an estimated economic loss of £3.7 billion. In administrative terms, the crisis led to the dissolution of the Ministry of Agriculture, Fisheries and Food (MAFF), an institution that was heavily criticised by the Phillips Inquiry for its lack of openness and transparency. Although far less severe in terms of its economic impact, with estimated losses of between Euro 0.8 and 1.05 billion, the German BSE crisis resulted in extensive political fallout, leading, inter alia, to the resignation of two government ministers.

This paper compares the handling of the crisis in the UK and Germany and the regulation put in place in its aftermath. It explores the reasons for the failure of both governments to manage this crisis in a credible, timely and proactive fashion. Examining the institutional contexts in which decisions about scientific evidence on BSE were made, the paper argues that, in both countries, a centralised system, in which government agencies controlled "science for government", was vulnerable to expert-interest group alliances which undermined the potential for a credible assessment of public health and safety risks. Looking at the policies adopted in the aftermath of these crises, the paper notes that, although being far less affected by BSE, Germany paradoxically adopted far more rigorous measures for the prevention of future incidents, which included the strict administrative separation of the risk assessment and management functions. Our paper concludes that the extent of administrative reforms which are initiated in response to crises is more likely to correspond to that general receptiveness of the political environment to these reforms, than the 'objective' impact of the crisis itself.

Key Words:

Accountability, BSE, Expert Judgement, Mismanagement, Phillips Inquiry, Risk Assessment, Risk Management, Risk Communication.

1. **Introduction**

The 'Risk Society' debate has long since established the notion that good governance of risk is fundamentally a matter of *good government* (Renn, 2007). In this paper, we argue that, if governments are to handle current and future animal to human health risks effectively, such as that which may be posed by 'Bird Flu', then their actions should be predicated upon 'open science', sound communications and appropriate regulatory and institutional frameworks. To illustrate our argument, we compare the handling of the 'BSE crisis' in the UK and Germany and the regulations put in place in its aftermath. Examining the institutional contexts in which decisions about scientific evidence on BSE were made, the paper argues that, in both countries, a centralised system, in which government agencies controlled' science for government' was vulnerable to expert-interest group alliances, which undermined the potential for a credible and open assessment of public health and safety risks. However, using print media indicators of scientific articles published in both countries, we find evidence of a more 'risk sensitive' culture in Germany as compared to Britain, which may have been responsible for the more pronounced political fallout associated with the German BSE crisis.

Our paper concludes that political receptiveness is a major factor in the good governance of crises such as BSE, but notes that this receptiveness can become skewed if the science underlining policy and strategy lacks 'risk sensitivity'. In doing so, the paper highlights some important weaknesses within the UK approach to the management of animal-health risks that appears to be following a path dependent legacy (Teece *et al.* 1997) established at the time of the BSE crisis, and which could lead key ministries and agencies to repeat similar mistakes in their management of the H5N1 outbreak in Suffolk. This path dependency centres, in our view, around the treatment of BSE, and H5N1, as, foremostly, animal health problems; and a tendency, therein, to see zoonoses and human health protection as a second stage issue. We conclude that the tendency of UK research to view BSE as an animal health problem, as

compared to the German tendency to view it as a human health problem, may explain both the shorter duration of the crises in Germany and the more radical reforms, including the strict institutional separation of risk assessment and management, which were adopted in Germany. However, it remains to be seen whether these radical institutional reforms present a sufficient barrier to the manipulation of government risk management activities, especially in instances where the interests of powerful producer groups are at stake (Bourdieu, 1998).

The paper is divided into seven further sections. The opening section positions the BSE crisis within contemporary debates about the nature of risk. Next, the paper reviews the government history of the BSE crisis as it ensued in the UK and Germany. Section three of the paper then considers how a science of BSE emerged in the UK and Germany, using an analysis of print media indicators. In conclusion, we consider how this science has framed the treatment of BSE, as a continuing, if somewhat shrouded, animal and human health risk in the UK. In doing so, the paper contends that the 'German Model', whilst far from perfect, represents a more effective institutional and regulatory framework for the curtailment of potential epidemics such as BSE, and possibly, Avian Flu.

2. Background

In a recent commons statement[i], the Secretary of State for the Environment, Food and Rural Affairs, David Miliband[ii], attempted to assuage renewed public and political concerns about the risks posed to human health by the arrival of the H5N1 strain of 'Avian Flu' or 'Bird Flu' in the United Kingdom. His statement to the House followed several days of heightened media interest in an outbreak of the deadly Asian strain of the H5N1 pathogen, on the 1st February, at Bernard Matthew's poultry farm in Holton, Suffolk[iii]. Whilst only a few days elapsed between the notification of the Suffolk outbreak and Miliband's statement, it did not take long for the spectre of 'BSE' to feature prominently within newspaper editorials[iv], and Radio phone-ins on

the subject[v]. There is a strong sense, therefore, of history repeating itself at the present time; and of hollow government assurances. Ironically, John Gummer, the former Conservative Secretary for Agriculture, and key political casualty of the BSE debacle, is also the local MP for the Suffolk Coastal Region. He has recently raised concerns in Parliament about government handling of the avian flu crisis, and the potential for contamination beyond the borders of Suffolk[vi].

There are further links between the two crises beyond the 'sixth degree of separation' between John Gummer and David Miliband. Over different time periods, the UK and Germany both faced a BSE 'crisis' in the sense that (1) there was a widely held public perception that government agencies had misinformed the public about the real dangers of the disease to humans, (2) the extent of its spread among animals, (3) the degree of its controllability as animal disease; and, perhaps most importantly, (4) the capacity for front-line institutions to manage and ultimately eliminate this food hazard.

Yet in terms of their extent the two crises differed significantly. The UK BSE (Bovine Spongiform Encephalopathy) crisis led to the slaughter of more than 3 million cattle and an estimated economic loss of £11 billion (Euro 16 billion) (Beck *et al*., 2005). The German BSE crisis was far less severe by comparison, leading to the slaughter of an estimated 85,000 cattle and estimated losses of between Euro 0.8 and 1.05 billion (Klett-Aktualitätendienst, 2001/2002). Despite its relatively limited economic impact and its overall shorter duration, the German BSE crisis set into motion a fundamental re-examination of what became known as a perceived 'iron triangle' between rural politicians, agricultural interests and government agencies responsible for agricultural issues.

In Britain, by contrast, the BSE crisis was largely perceived as a self-contained management failure, which, although undermining public confidence in government policies on food safety

did not lead to deep-seated questioning of the underlying relationship between, and legitimacy of, these interest groups. This outlook was very much confirmed in the Phillips inquiry, which, as post-crisis public inquiry, sought to identify the causes of mismanagement, poor communication with the public, and overarching patterns of decision making – without addressing the undue influence certain interest groups had played during the crisis (Phillips Inquiry, 2000).

As an animal disease, BSE can be defined as an incurable neurological disorder affecting primarily cattle. The practical concern with BSE can be largely attributed to the existence of a human version of BSE, known as 'new variant' Creutzfeldt Jakob Disease (nCJD), which mainly affects young people. It is generally assumed that BSE is transmitted through the food chain (Ebinger *et al*. 1998, pp.265-275) and that its root cause can be traced to processed meat and bone meal which was added as a protein supplement to cattle feed (DoH and MAFF 1989, p.36; Ford, 1996, p.20; Anon 1998, p.22). Researchers such as Wilesmith (Wilesmith *et al.* 1998) have hypothesised that the introduction of cost-saving rationalisations to meat and bone meal production in the 1970's lowered the processing temperature of this feed supplement, which increased the probability of the survival of BSE agents. Additionally, Kimberlin (1993) has suggested that these processes concentrated and caused genetic mutations which modified the disease and increased its infectivity.

Although some researchers suspect that BSE was present in European cattle herds from the 1940's onwards (Brown 1998, p.252), the first BSE case in the UK was diagnosed in 1985, and in Germany in 2000 (Imort, 2001, p.3). Following a spread of the BSE epidemic in the UK and a ban on high risk meat and milk from infected cattle by the UK government in 1988, Germany and France imposed a ban on British beef imports in 1989, which the EU Commission removed later on. Despite measures to remove contaminated feed, the number of BSE infected cattle continued to rise from 2,524 in 1988 to a peak of 37,280 in 1992 (Beck *et. al*., 2005). When the

UK government admitted in 1996 that a link between BSE and CJD could not be ruled out, the EU imposed a worldwide ban on UK beef and beef products which resulted in the slaughter of more than 4 million British cows (Anon, 2000). Restrictions on the export of British beef were only lifted in 2006, when measures regarding animal feed and BSE detection had been fully implemented in the UK. Between 1988 and 2001 a total of 180,802 cattle were identified as having BSE.

The discovery of a first born cow with BSE in Germany in November 2000 resulted in a ban on animal derived food supplement within the same month. When in January 2001 the 10^{th} case of BSE in Germany was detected, the Green party health minister (equivalent to the UK Secretary of Health) and the Minister of Agriculture were forced to resign, amidst public accusations of incompetence and mismanagement. Partly due to the withdrawal of contaminated feed infected cattle, the German BSE crisis peaked in 2001 with 125 cattle. However in 2002 a further 106 cattle were identified as infected, and even in 2006, seven cattle were slaughtered on account of BSE infection. Despite the far smaller extend of the BSE crisis, the German authorities appear to have had significant problems in handling and ending this crisis. Specifically there is evidence that protracted negotiations between federal and state governments about compensation and responsibilities for disease monitoring led to unnecessary delays which proved costly to farmers while undermining consumer confidence.

Despite differences in the extent of the crises and the institutional structures which attempted to manage them, the risk management failures in both countries followed broadly similar patterns. Specifically, both government scientists in both countries attempted to convince the public that there BSE represented no significant risk to humans and that the crisis could be managed speedily through relatively simple and easily enforceable regulatory measures. Only when the statements were proven demonstrably wrong by the further detection of BSE infected cattle were additional measures introduced and the initially optimistic statements about a speedy

resolution of the crises withdrawn. As a consequence of these overly optimistic statements and the unwillingness to communicate fully the risks and uncertainties associated with this new cattle disease, the government sponsored science of BSE was gradually discredited together with the public trust in the respective governments' ability to police and maintain food safety.

3. The UK BSE Crisis

The UK BSE crisis has been analysed in detail by a public inquiry chaired by Phillips which published its extensive report in 2000 (Phillips Inquiry, 2000). The Phillips report suggests that the main body responsible for conducting scientific research and for advising the government on BSE, the Ministry of Agriculture, Fisheries and Food (MAFF) established a pattern of restricting information to relevant professional groups, the media and the public early on during the crisis. Apparently, BSE infected cattle were detected in the UK throughout the years 1985 and 1986. Yet up until mid 1987, MAFF communicated no BSE relevant information to UK veterinarians. In the latter half of 1987 a circular letter by MAFF instructed veterinarians not to pass nay BSE relevant information to universities or other researchers.

By the end of 1987, the number of BSE infected cattle had reached 137 and report of a national epidemic surfaced in the UK press. In response, MAFF established its first expert advisory group in May 1988. This group, the Southwood Working Party, was tasked with identifying the potential risks which BSE could pose to humans. The Southwood group published its report in February 1989 (DoH and MAFF 1989), which suggested that there was a potential link between meat and bone meal and BSE. By stating that cattle were the dead end host for BSE, the report failed to address the possibility of a threat to humans. Additionally, the report failed to address how infected cattle without clinical signs could be prevented from entering the food chain.

Ultimately, despite the resistance of some Cabinet ministers, it was decided that the recommendation to exclude high-risk material from baby food would be published with the explanation that it was a measure of "extreme caution". Perhaps predictably, subsequent discussions in the media focused on the implications of the baby food recommendation, this defeating MAFF's attempt to stem a future BSE panic (Phillips Inquiry, 2000). Apart from the exclusion of high-risk material from baby foods, the report included a number of less controversial recommendations, such as the urgent introduction of a ban on infected animals entering the human food chain, and the creation of an expert body with the remit of directing future BSE research (DoH and MAFF, 1989).

Recent analyses have suggested that the Southwood Working Party's identification of BSE as an animal disease had far reaching implications for future investigations, in that is "effectively closed the door on further research into the human health risks of infected beef" (Crace, 2001: 13). The Southwood Working Party had produced a contradictory report, which, while giving an evidence-based assessment of animal related threats, categorically ruled out the possibility of the disease posing a threat to humans (DoH and MAFF, 1989). Despite the growing amount of unorthodox scientific opinion (Lacey, 1994; 1998; Almond *et al.* 1995; Ford 1996) the Southwood Working Party and the subsequent committees largely adhered to an 'approved' view (Kewell and Beck, 2006). Among its most important conclusions, it had determined that cattle were a 'dead-end host' for BSE. This, however, stood in clear contrast to its own recommendation to exclude high-risk material from baby food.

The publication of the Southwood Report in February 1989, nonetheless, caused a media storm. Following continuing public pressure, the government introduced a ban on the use of ruminant-derived protein in the form of meat and bone meal in cattle feed, in June 1988. This rule still allowed the use of meat and bone meal as feed for other animals like cats, sheep and poultry (HMSO, 1988; Maxwell, 1999). At that time, there was no test for identifying the infective

agent in animal feed, and it must be assumed that a certain amount of it continued to be fed to cattle, especially as farmers had stockpiled contaminated feed. Until 1994, MAFF representatives sought to quell public fears surrounding contaminated animal feed through claims that only large amounts of infected material could transmit the disease. These statements were based on virtually no scientific evidence and were eventually proven wrong on the basis of experimental research.

In line with the earlier recommendations by the Southwood Working Party, the Tyrrell Committee was created in June 1988, with the objective of providing further advice on BSE to MAFF and the Department of Health. The Tyrrell Committee was tasked with analysing leading research and, with identifying what future research may be required. The Committee published its report within a couple of months of being formed. The report emphasised the need to develop scientific knowledge in a number of areas and cautiously noted that no reliable conclusions could be drawn on the spread of BSE to humans since the incubation period of Kuru[vii] could exceed 30 years (HMSO, 1994).

During 1989, opposition leaders accused the government of complacency in the face of a potentially fatal disease. However, in June 1989, in response to escalating public concerns, the government initiated a ban on the high risk material – specified bovine offal – from entering the human food chain. This measure again contradicted the official scientific advice given by MAFF which had categorically stated that bovine offal posed no relevant risk to human health (HMSO, 1989). Following fears that the use of specified bovine offal could result in a complete ban on meat and bone meal, the UK Agricultural Supply Trading Association eventually introduced a voluntary ban on the substance in 1989. Much later, in November 1995, the government announced its own ban on specified bovine offal from mechanically recovered meat. Both bans were not officially monitored and it is not clear to what extent the rule were followed.

In April 1990, a new committee, the Spongiform Encephalopathy Advisory Committee (Advisory Committee) was established in an attempt to provide scientific underpinning for future government policies. During the following years the government largely adhered to the instructions given by the Advisory Committee (Kewell and Beck, 2006). The Advisory Committee itself produced two reports. The first one was an "Interim Report on Research" (1992), which endorsed further measures for handling BSE. The second report "Transmissible Spongiform Encephalopathies: A summary of Present Knowledge and Research" (1994) was aimed at providing a complete account of knowledge on BSE. In addition, in order to ensure a closer monitoring of the spread of the disease, the government established a CJD surveillance unit in May 1990.

Having accepted a range of measures, government officials felt confident that BSE risks were now under control. Accordingly, the first Advisory Committee Report (1992) concluded that all necessary steps had been taken to ensure the protection of human and animal welfare[viii]. This confidence was consecutively undermined by three developments. Firstly, the rate of infection proved to be higher than initially estimated[ix]. Secondly, credible scientific confirmation emerged of the possibility of a transfer of BSE to other species. Thirdly, and most importantly, a series of cases of the human variant of BSE were recorded from 1992 onwards.

Public fears that BSE could affect humans gradually found confirmation by the early 1990's. The first publicised case of CJD occurred in mid – 1992, when the CJD Surveillance Unit reported a 60-year old farmer as being infected to the Department of Health. Following the death of the farmer, the CJD Surveillance Unit's spokesman stated that the case was an outlier and that there was no evidence for a causal link between BSE and CJD (Sawcer *et al.* 1993). This view was maintained during a consecutive publicity campaign in which government officials reiterated the view that the two diseases were unrelated. More recently, the Phillips Inquiry (2000) has suggested there had been earlier cases of CJD in 1989, which had remained

concealed from the public on account of MAFF's denial of a link between the two diseases. Following the death of a second farmer in 1993, official sources continued to emphasise that there was "insufficient evidence to draw definite conclusions" (Davies *et al.* 1993). When several farmers, whose herds were infected with BSE, died from CJD, evidence mounted that these farmers had contracted the disease from the contaminated environment (Smith *et al*. 1995). This was followed by the deaths of younger victims from the mid-1990's onwards, which the press took as evidence of an escalation of the disease[x].

In light of these events, government officials continued to emphasise the safety of British beef. Similarly, the Advisory Committee meeting in September 1995 concluded that there was insufficient evidence to link the BSE outbreak to the occurrence of CJD. During the subsequent public debate, government officials maintained their position about the "absolute" safety of beef and proved unwilling to discuss the possibility of a threat to humans. According to the Phillips Inquiry, MAFF officials, actively encouraged government scientists to maintain the party-line in answering public questions (Phillips Inquiry, 2000).

By March 1996, with about 30,000 suspected cases of infected cattle and ten reported CJD cases in young people, the existing government view had become impossible to sustain. During March, an Advisory Committee meeting finally concluded that there might be evidence of a threat to humans. On the 20th March, the Advisory Committee was forced to speed up its proceedings in order to pre-empt press announcements. When the Committee issued a statement recognising that CJD was most likely caused by BSE, the government immediately announced that cattle of over 30 months (which was assumed to carry the highest risk of BSE) had to be de-boned and that meat and bone meal could no longer be used in animal feed. Contrary to government expectations, these measures did not quell public concerns and, following protests and plummeting beef sales, a complete ban on cattle of over 30 months was introduced

(Hornsby, 1998). As a result between 1996 and 1999, 3.3. million cattle were destroyed, while EU legislation prohibited all British cattle and beef exports[6].

The New Labour Government's announcement that if would conduct a public inquiry into the BSE crisis which would start as early as December 1997 marked the end of the BSE crisis as a political event. This was primarily the case because agricultural policy at this stage had become largely reactive with regard to European demands; with no further steps to uphold the original UK position denying the dangers of BSE being undertaken.

4. The German BSE Crisis

The events surrounding the German BSE crisis were initially connected to concerns about the safety of British beef. Thus, following the lifting of the three year embargo on the export of British beef in August 1999, Germany imposed a ban on the high risk material from any country from the human food chain. This raised issues about monitoring which led the German Consumer Association to demand that the Ministry of Agriculture and Food take responsibility for the monitoring and labelling of beef products[xi]. These regulations were passed in early October 2000. Due to fears about beef from unknown countries entering Germany, this law was further strengthened in later October, with a requirement being imposed that labels for German beef products include information on the birthplace and feeding place of cattle, in addition to existing requirements for information on the place of slaughter. In early November 2000, the expansion of the BSE crisis in the UK and France led several state governments to request that further measures be taken by the federal government. These approaches were initially rejected as 'blind actionism'[xii]. However, by the 7th of November, the Green Party Health Minister stated that Germany might impose additional restrictions on beef imports against other EU countries who traded in 'insufficiently labelled' British beef. Following the identification of two further BSE cases in France, the German Health Minister Fischer announced two new

measures. Firstly, state government were to initiate BSE 'quick tests'. Secondly, EU countries were given six weeks to comply with German beef labelling rules or face sanctions[xiii]. A further media uproar was caused in mid November 2000 when the German Red Cross announced that it rejected potential blood donors who lived for more than six months in the UK for fear of CJD contamination (Wiener, 2002).

By late November 2000, it had become clear that a planned nationwide programme of BSE tests could not be fully implemented due to capacity constraints. In this context, further concerns arose from the fact that these tests would not cover cattle under two years of age (where the disease could not be diagnosed) which constituted about 60% of the German cattle population. Additionally, some state agricultural authorities criticised the testing regime as it did not cover potential dangerous British sheep imports[xiv].

General fears about the spread of BSE into Germany worsened when, on November 24th a cow which had been imported from Portugal tested positive for BSE in the state of Saxony Anhalt. This was followed in early December by an announcement by Health Minister Fischer of new emergency measure which required that all cattle older than 30 months that had been slaughtered had to be tested for BSE. As part of this measure Fischer extended the ban on meat and bone meal to the feeding of all agricultural animals[xv].

In late December 2000, the German BSE crisis took on temporarily chaotic proportions, when experts from the Federal Office of Meat Research warned that German sausage products presented a particular risk due to the use of mechanically separated meat products. This led to a brief suspension of the sale of German beef products in Belgium which lasted from December 23rd, 2000 to January 5th, 2001, as well as calls, by the opposition Liberal party for the resignation of Health Minister Fischer. Following heavy criticism from within their respective parties, Health Minister Fischer of the Green Party and Agriculture Minister Funke, a Social

Democrat, announced a package of new measures aimed at increasing consumer protection and strengthening ecologically friendly approaches to agricultural production. Despite these announcements, Fischer and Funke were forced to resign only four days later, on January 10th, 2001.

The media attributed Fischer and Funke's resignation primarily to delays in coordinating action with state governments as well as their earlier misleading statements that Germany was BSE free. Typical for the mood of the time, the leftist newspaper Tagesspiegel commented somewhat polemically on Funke's resignation:

> *Funk was a lobbyist for the conventional agriculture. He encouraged cheap production and was not concerned about where animal feed came from. He attempted to protect 'his' farmers rather than his consumers. But in the end he did not help the farms, which had become discredited, partially ruined, and above all demoralised. This [Social Democratic] minister costs us years of progress, his motives were narrow and the only reason that he did not do more harm, was that he was unable to overrule the [Green Party] health minister Fischer*[xvi].

Some political and commentators and academic researchers, meanwhile, conceded that both resignations had less to do with actual failures of policy and communication, than with the fact that the Social Democratic and Green coalition government had become increasingly factionalised and unstable (Barloesius and Bruse, 2005).

Following the collapse of consumer demand for beef, comparable to the UK experienced some years earlier, the German Government announced in mid January 2001 that it would slaughter 400,000 cattle over the next six months in order to stabilise the market. These slaughters were

ultimately reduced to a much smaller number, with much of the meat being exported as food-aid to North Korea.

During January the demand for beef, meanwhile, suffered further when the State Government of Hesse banned the use of cattle derived products in surgery and the new Health Minister Schmidt announced a ban on the use of high risk materials in pharmaceuticals (Loy and Steiner, 2003). This situation was further aggravated, when the first 'German' BSE case was detected in the state of Brandenburg. Meanwhile attempts to implement the planned cull of 400,000 cattle were hindered by court proceedings alleging violations of animal welfare regulations and 'government-sponsored vandalism'[xvii].

On February 9th the German government's BSE expert Von Wedel announced that a ninth expert committee would be formed which would be tasked with identifying weaknesses in the existing policies and systems for the protection of consumers against BSE. The expert committee met in March 2001 and published its report in October of the same year (Barloesius and Bruse, 2005).

Despite continuing concerns over the safety of German beef, the German cattle market recovered to about 60% to 80% of previous activity by the end of February 2001. This was due, primarily, to cattle exports to Russia. In March, however, the cattle exports were put to a temporary halt, when the Russian government objected to an export deal which had been struck between the Bavarian governor Stoiber and Moscow's Major Lushkov[xviii].

These concerns about the safety of German beef were aggravated when an August 2001 Government report noted that since December 2000, 98 cases of BSE had been registered in Germany, of which 47 had been detected in Bavaria. Within the next months, the detection of further BSE cases in Bavaria and Thuringia led the German Association of Veterinary Medics to

demand the creation of a nationwide animal certification system. This, and similar suggestions for radical changes in food-safety regulation were rejected by some state government officials, including the Bavarian Minister Sinner (Conservative), who argued the exposure to BSE risks had been drastically reduced due to the existing testing regime and the removal of high risk material[xix].

Despite the detection of further isolated BSE cases in Thuringia, German beef consumption largely recovered by November 2001. This, together with the publication of the Expert report in October 2001, and the implementation of a host of related administrative measures, marked the end of the BSE crisis in Germany.

According to government minister measures were now in place to ensure "… the end of old-type agricultural policy. In the future, consumer protection was to take priority over economic interest" (Imort 2001: 4). Symbolically, this change was reflected in the renaming of the Ministry of Agriculture into the Ministry of Consumer Protection Food and Agriculture, which was now headed by Kuenast a lawyer from the Green Party whose appointment was to emphasise a break with previous farm lobby supported agricultural policies.

A key practical vehicle of this changed policy approach was, as had been advocated in the expert Report, the administrative separation of risk assessment and risk management in the form of the new Federal Office of Risk Assessment, which was to carry out its activities independent of the risk management activities of the Federal Office for Consumer Protection and Food Safety (Henning, 2003).

5. Analysis

Previous comparisons of the UK and German BSE crises have suggested that there are fundamental differences in the governance of science in the two countries particularly as concerns the use of expert committees (Dressel, 2000). Specifically Dressel notes that expert committees play a less formal role in policy-making as compared to the UK. According to Dressel, both German ministries involved in the BSE crisis saw it as necessary to invite experts only when they felt that they could no longer handle the urgent questions raised by the crisis. Dressel notes that the normal German way of handling a crisis such as BSE was for the Federal and State Ministers to invite scientific advisers on an adhoc basis.

It could be argued that the greater autonomy of German policy makers may have had a limiting effect on the level of technocracy with which the crisis was handled, if only because civil servants maintained a more direct level of responsibility. In doing so, BSE decision making in Germany continued to be closely located within the political arena, and did not shift, as it did in the UK, towards a model in which policy-makers and scientists shared close proximity (Kewell and Beck, 2006). This process, however, was eroded over time, as conflicting statements about the human risk associated with BSE created a more urgent need for the issue to be addressed on the basis of scientific evidence. Ultimately, as in Britain, the evidendentiary gap regarding the risks associated with BSE were not credibly bridged, and ultimately, as in Britain, the expert panels which were meant to provide independent advice, were increasingly seen as part of 'science for government' (Lowi, 1992).

The developments which occurred in the later stages of the German BSE crisis were not dissimilar from those characterising most of the UK BSE crisis. In Britain, MAFF, as the key government agency, gradually lost its credibility as a responsible risk manager, primarily on account of its failure to conduct an open and transparent debate. This situation was mirrored closely by the German ministries involved in the management of the BSE crisis (Beck, Asenova, Dickson, 2005). Here, misleading statements about a BSE-free Germany, undermined the

credibility of government policy much it did in the UK, following MAFF's claim that BSE represented no risk to humans. Both in the UK and Germany, the experts who were drafted in by the Government, were effectively as a political means to an end, whose role was to reinforce the 'party line' and limit the commercial damage of BSE. In Britain, this network of 'friendly scientists' probably did more to undermine than to strengthen the position of MAFF, both because of their contradictory recommendations, and because of the proximity of their views to MAFFs original stance (Beck *et al.* 2005; Kewell and Beck, 2006).

In Germany, government experts did not become a principal target of media and public blame, primarily because the expert advice given included proposals for genuine administrative restructuring. However, in as far as advice concerning the elimination of relevant risks was concerned, German advisors too were seen as offering too little too late. In this sense, both counties were characterised by processes within which a crisis that was manageable in theory, became unmanagable because of the actions of government officials as well as, to no small degree, the experts they consulted (Kewell and Beck, 2006).

The reason why German government experts and government officials acted in ways that were similar and divergent from their UK counterparts are probably difficult to answer. Some of the reasons for a more pronounced and more speedy reaction to the BSE crisis in Germany are obvious. At the time of the crisis Germany was ruled by a coalition government including the Social Democrats and the Greens. This government was supported by political constituencies that valued risk averse policy making in as far as human health hazards were concerned, and took an adverse view of commercial interests which sought to minimise these concerns in the political arena. None of this, however, explains the differing roles taken-up by the UK and German scientific communities and / or experts in relation to the BSE crises.

It is difficult to see why, for instance, much of the scientific community in Germany focus as their efforts upon highlighting the potential human health hazards associated with BSE, while UK scientists appeared to have adopted far more conservative positions. For lack of a better word, we describe this phenomenon as 'risk sensitivity' or 'risk culture'. This risk sensitivity appears to have been far more pronounced in Germany, and what we can say, with some certainty, is that cultural context drove the production of a science of BSE in different directions.

6. The Emergence of a 'Science' and 'Administration' of BSE in Germany and the UK

Management research in recent years has placed renewed emphasis on the use of print media indicators in identifying developing research agendas and divergent approaches to research questions (Benders, 2007; Braam *et al*. forthcoming). In order to identify scientific interest in BSE we have analysed a major database including more than 2000 abstracts of BSE related articles published between 1995 and 2003 in international and national scientific journals in a wide range of disciplines. This database was collected by the National Agricultural Library of the United States Department of Agriculture (Larson, 2004). For the purpose of this analysis these abstracts have first been classified by scientific disciplines and by country of publication. This analysis has been further refined by classifying articles as focusing on BSE as either an animal or human health issue and by extracting only those articles which were published in UK and German journals. In this context, a UK or German journal was defined as a scientific publication that is either orientated towards an exclusively national audience or which primarily includes articles by authors from the two countries.

Figure 1 depicts the total number of BSE related articles published between 1995 and 2003 in UK and German journals. This figure corresponds to Figure 2 where these articles are disaggregated as being of UK and German origin. As can be seen from both graphs, the number

of articles peaked in 1996 with a total of 56 articles, of which 45 originated from the UK, and 11 from Germany. A second, but less pronounced peak occurred in 1999, when 40 articles were published, of which 30 originated from the UK and 10 from Germany. This pattern corresponds to an intensification of BSE focused scientific research in the UK, when the disease was primarily viewed as a British phenomenon. The second peak in 1999, corresponds to a period of time in which BSE was reclassified as an international phenomenon. Looking at German publications alone, there was a notable increase in BSE related work in the early 2000s, which reached a peak in 2002, when it is became evident that BSE had become a German problem as well. Both Germany and the UK showed a decrease in BSE related publications by 2003 which is closely related to the near eradication of the disease following the implementation of national culling programmes and bans on high risk material and dangerous animal feed.

Figure 1)

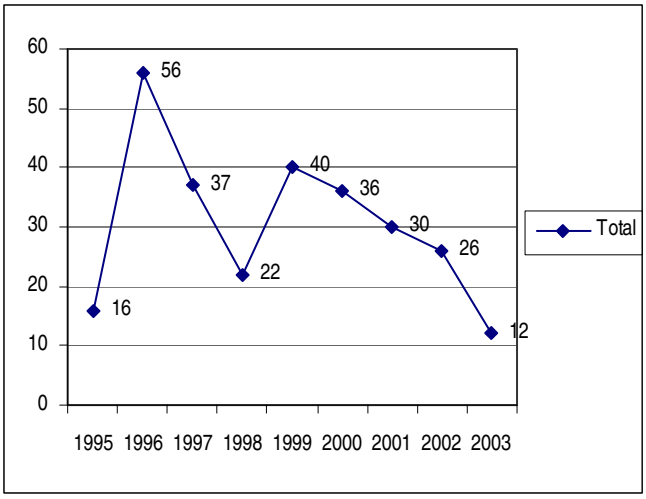

Figure 2)

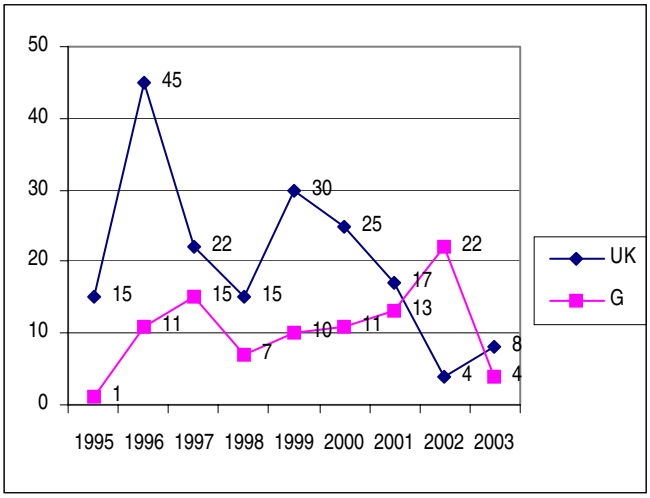

Table 1 show the articles which can be classified list as describing BSE as a human health problem as parentage of all articles published in each countries. As can be seen in the first (all Years), there was a significantly greater tendency among articles of German origin to address BSE as a human health problem (79.6%, as compared to 54.2% in the UK). This pattern applies to the percentage calculated for all years taken together, as well as all individual years with the exception of 1995, when German BSE research was apparently still in its infancy. The disaggregation of these articles by subject group (Veterinary and related Journals; Food Science and related Journals; Others, including Medical Journals) shows that the greater propensity to frame BSE as a human health problem applies in most of the disciplinary categories we investigated; but was particularly pronounced in the case of 'Veterinary and related Journals' where 64.7% of German articles made reference to BSE as a human health problem, whereas only 15.3% of UK articles did so.

While it is obvious that print media indicator research has its weaknesses, such as being affected by the vagaries of editorial policies, there is a strong indication that Germany's BSE research was indeed characterised by a different risk-culture with a more pronounced risk-sensitivity as concerns the human hazards associated with BSE. It stands to reason that these differences in the nature and orientation of 'scientific' research on BSE, will have affected expert and public perceptions of the crisis in a manner similar to the actual policies adopted by the respective

governments. This probably is nowhere more obvious than in connection with the reforms adopted by both countries in the wake of the crises. Although an in-depth analysis of these reforms would go beyond the theme of this paper, it is worth noting the differences in the policies adopted by the two countries. In as far as the UK's creation of its new Food Standards Agency (FSA) in 2000 is concerned, the approach which has been adopted with its implicit merger of risk assessment and management functions can be considered at best to represent a conservative, consensualist solution.

Table 1)

	UK	Germany
Percentage of Articles framing BSE as a Human Health Issue		
All Articles		
All Years (1995-2003)	54.2% (90/166)	79.6% (74/93)
1995	60.0% (9/15)	0.0% (0/1)
1996	57.7% (26/45)	90.9% (10/11)
1997	50.0% (11/22)	66.7% (10/15)
1998	73.3% (11/15)	85.7% (6/7)
1999	43.3% (13/30)	80.0% (8/10)
2000	56.0% (14/25)	100.0% (11/11)
2001	58.8% (10/17)	76.9% (10/13)
2002	25.0% (1/4)	68.2% (15/22)
2003	50.0% (4/8)	100.0% (4/4)
Veterinary and related Journals		
All Years (1995-2003)	15.3% (13/85)	64.7% (33/51)

Food Science and related Journals		
All Years (1995-2003)	25.0% (3/12)	90.9% (10/11)
Others, including Medical Journals		
All Years (1995-2003)	98.7% (81/82)	100.0% (28/28)

Although the mission statement of the FSA highlights the agency's intent of 'putting consumers first'[xx], the agency has failed to provide a critical analysis of the potential conflicts between the interests of food producers and the public. Indeed, academic research has criticised the FSA model as replication of the 'old productionist model' of food regulation, which fails to address relevant environmental, social and public health considerations (Lang *et al*. 2001).

In Germany, meanwhile, the separation of risk assessment and risk management, respectively, in the form of the new Federal Office of Risk Assessment, and the Federal Office for Consumer Protection and Food Safety, has led to a critical reflection about the advantages and disadvantages of separation of the two functions (see, e.g., Boeschen, Dressel, Schneider and Viehoever, 2002). These analyses have highlighted the vulnerability of the new system, particularly as regards its limited ability to perform as an early warning function. This has led to calls for the creation an additional national risk forum, which would be tasked with identifying emerging risks.

7. Conclusions

In this paper, we have considered the 'path dependent' nature of the BSE crisis in the UK and Germany, and the contrasting development of risk aversion measures, and a policy framework for the development of a *science of BSE,* in each country. We would argue that the current

handling of the 'Avian Flu' epidemic can be seen partly as a path dependent outcome of the British experience of BSE; and of the institutionalization of an approach to ruminant disease control that puts animal, rather than human health, at centre stage in government plans to control the epidemic (Teece *et al.* 1997). This path dependency centres, in our view, around the treatment of BSE, and H5N1, as, foremostly, animal health problems; and a tendency, therein, to see zoonoses and human health protection as a second stage issues. Research into the UK BSE problem has tended to be undertaken along this pathway, therefore, whereas is Germany it has been seen, first and foremost, as a human health problem. In our view this has lead to the development of a more robust scientific pathway for evaluating animal viral risks to human health; and, ergo, the policy implications of those risks.

In analysing the BSE crises in the two countries this paper has focused on two issues. Firstly it has sought to identify the causes of these crisis, and more specifically the reasons why the governments of both countries failed to respond to these in a timely and effective manner. In this context, it was argued that the failure of both the UK and German governments to manage these crisis effectively can be attributed to broadly similar causes, namely the prevalence of powerful entrenched interest groups clustered around agriculture and centralised or, semi-centralised, decision making systems in which government agencies and these interest groups jointly create and control 'science for government' (Lowi, 1992). Secondly, the paper focused on the question of why the two countries responded to similar events in radically different ways. There are a number of possible explanations for this. Firstly, we have noted that, apart from obvious political differences, such as the presence of a Social Democratic and Green Party coalition government in Germany which were likely to have impacted on the severity of post-crisis institutional reforms, there also existed more subtle differences in the 'risk-cultures' of both countries which predisposed Germany to implement more robust reforms. Although these differences in 'risk-cultures' are inherently difficult assess, we find significant disparities between the two countries in the thematic focus of print media, notably professional journals in

areas such as public health veterinary, studies and food sciences in the two countries. We suggest that these disparities are illustrative of deeper seated perceptual differences among professional communities which, themselves, mirror broader social preferences with regard to the management of potential human health risks.

8. Wider Implications

Veterinary medicine and comparative medicine play an increasingly important role in the management of public health issues, such as the BSE epidemic and the recent Avian Flu outbreak in Suffolk; and the problems they raise for managing such risks internationally (Lupton 1999). They also exemplify the challenges to government and science raised by animal borne health epidemics such BSE and Bird Flu in a global context (Ibid.); whilst shedding light upon the weaknesses and shortfalls of government regulation and agri-food industry business models that, it can be argued, help to perpetuate the spread of animal borne health hazards over great distances very rapidly. This has partly been facilitated by the globalization of the supply chain; and the 'traffic' this has created. Our ability to control animal borne epidemics is therefore a measure of our sophistication as societies, and, as Lupton (1999:14) notes, is a symbol of our progression as a science based civilization (see also: Lash *et al.* 1996; Burgess 2006).

While it appears that the UK is following a path dependent legacy set by BSE, there has, nevertheless, been a shift in government attitudes towards planning for such outbreaks. Thus in two recent commons statements, the Secretary of State for Environment, Food and Rural Affairs, David Miliband has described detailed emergency plans for the management of an

HN51 outbreak, should the virus jump the species gap. Thus, while government has acknowledge some of the mistakes made over the handling of BSE, particularly in terms of communication (Kewell and Beck, 2006), and the dismantling of MAFF and its replacement with the independent FSA, the central concern of government remains one of curtailing damage to the poultry industry, key agribusinesses such as Bernard Matthews, and the monopoly market positions enjoyed by such firms; and to do as much as possible to prevent the imposition of the kinds of export bans than followed BSE. Other past behaviours remain, such as the government's reluctance to introduce an ban on meat imports from Hungary, when it has done so for other infected countries, and of being unable to explain holes in the evidence chain between the appearance of the H5N1 strain in Hungary, and its transportation to Suffolk. Defra has been criticised for giving inconsistent advice to poultry keepers, and of increasing the risks to human health by choosing to transport birds for incineration in Staffordshire (200 miles from the containment zone). While there is no evidence of supply chain contamination beyond Suffolk, the FSA has nevertheless been subject to criticism for declaring that turkey products are safe to eat, if cooked appropriately, whilst at the same time acknowledging that the virus can be kept alive in frozen meat. At the root of the government's approach is a belief that at the present time, HN51 does not pose an immediate threat to human health, although it has developed elaborate contingency plans for dealing with a human epidemic, should current patterns of zoonoses (from animal to human through respiratory transmission) adapt at some point in the near future to a more virulent pathology involving either human to human transmission or food chain transmission. In doing so, current government strategy has stayed close to, but moved away from, the policies MAFF initiated in response to BSE, basing their actions on the findings of government scientists but communicating this more readily to the public; and by treating

Avian Flu as an animal health problem, but creating contingencies for a human epidemic; which is nevertheless substantially downplayed in most government communications.

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[i] A full transcript of David Miliband's statement, given to the House of Commons on the 5th February 2007 can be found at: http://www.defra.gov.uk/corporate/ministers/statements/dm070205.htm.

[2]David Miliband's 'ministerial blog' can be accessed via http://www.davidmiliband.defra.gov.uk/blgs/ministerial_blog/default.aspx

[iii] See: Anon. 'Timeline: Bird flu in the UK'. BBC News Online, posted Friday, 16th February, 13.23 GMT. Http://news/bbc/co.uk/1/hi/uk/4882824.stm.

[iv] For example: the Observer, Sunday 4th February; Sunday Times 11th February.

[v] See for example, Matthew Bannister's – Radio '5 Live' phone-in, Monday 5th February 2007. See: http://www.bbc.co.uk/fivelive/programmes/morning.shtml.

[vi] See, for example:http://www.bbc.co.uk/suffolk/content/articles/2007/02/05/bird_flu_holton_reaction_feature.shtml

[vii] A disease similar to BSE that occurred among a cannibal tribe in Papua New Guinea.

[viii] The Advisory Committee, however, lacked reliable information about the pace and scale of the spread of BSE prior to the ruminant feed ban, and therefore it was unable to evidence the effectiveness of its measures.

[ix] It has been estimated that about 710,000 infected cattle were eaten before 1996 (*Economist* 1998). Consecutive scientific analyses suggested that a small portion of BSE cases born, after the ban were attributable to varying incubation periods, whereas the majority of them were caused by contaminated animal feed that had remained in the supply chain. This view was supported by two observations: first, there was evidence for breaches of the animal specified bovine offal ban (Phillips Inquiry 2000), and, second, research findings indicated that very small quantities (about 1 gram) of infective material are sufficient to transmit the disease to cattle (Collee and Bradley 1997).

[x] Government officials, nonetheless, categorized the first case of vCJD in a 16-year-old (1994) and two further deaths of teenagers (1995) as a sporadic CJD. This contradicted the mainstream medical view that sporadic CJD appeared only in older persons at the extremely low rate of one person per million population per year.

[xi] See: Anon. 'BSE-Chronik des Wahnsinns', which can be accessed under www.netdoktor.de/feature/bse/creutzfeldt_jakob_chronik.htm.

[xii] Anon. Comment of 29th November 2000 in the Tagesspeigel, 'BSE: Blinder Aktionismus einer kopflosen Regierung', www.tagesspiegel.de/politik/archiv/29.11.2000/ak-po-10912.html.

[xiii] See: Food Law News, School of Food Biosciences, The University of Reading, UK22nd December 2000, www.foodlaw.rdg.ac.uk/**eu**/00.htm

[xiv] Bund fuer Lebensmittelrecht und Lebensmittelkunde, Fachthema BSE, http://www.bll.de/themen/bse/

[xv] Anon. Comment of 21th December 2000 in the Tagesspeigel, 'BSE: Fischer räumt Panne in BSE-Krise ein', www.tagesspiegel.de/politik/archiv/21.12.2000/ak-po-2.html

[xvi] Anon. Comment of 22th December 2000 in the Tagesspeigel, 'Erst Rueckrufe dann Ruscktritte', www.**tagesspiegel**.de/politik/archiv/22.12.2000/ak-po-11628.html

[xvii] See: Anon. 'BSE-Chronik des Wahnsinns', which can be accessed under www.netdoktor.de/feature/bse/creutzfeldt_jakob_chronik.htm.

[xviii] See: Anon. Comment of 23rd February in Welt-Online, 'Moskauer wollen kein bayerisches Rindfleisch', http://www.welt.de/print-welt/article435677/Moskauer_wollen_kein_bayerisches_Rindfleisch.html

[xix] See: Anon. 'BSE-Chronik des Wahnsinns', which can be accessed under www.netdoktor.de/feature/bse/creutzfeldt_jakob_chronik.htm

[xx] See: http://66.102.9.104/search?q=cache:ElN_MqPBtNUJ:www.ges.gov.uk/depts/FSA.doc+food+standards+agency+UK+history&hl=en&ct=clnk&cd=8&gl=uk