

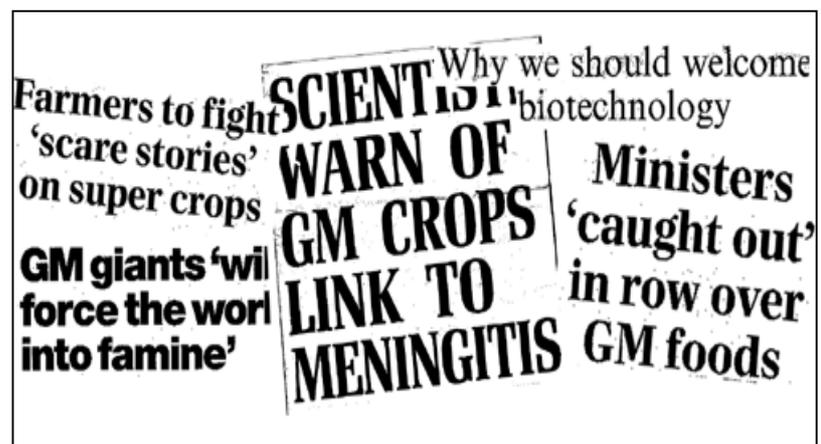


Parliamentary Office of
Science and Technology



THE 'GREAT GM FOOD DEBATE'

- a survey of media coverage in the first half of 1999



Report 138
May 2000

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The Parliamentary Office of Science and Technology is an office of Parliament which serves both Houses by providing objective and independent information and analyses on science and technology-related issues of concern to Parliament.

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Bottom: Various press headlines during the 'media debate'

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1 INTRODUCTION

In February 1999, modern biotechnology became the subject of more intense and acrimonious debate in the British media than at any time in its previous 25-year history. For a period of several weeks, the nation became preoccupied with the issue of genetically modified or “GM” food; indeed, for 8-10 days this was the lead story in both the national press and broadcast media. Triggered by continuing controversy over the (then unpublished) work of Dr Arpad Pusztai on the health effects on rats of GM potatoes, the “Great GM Food Debate” (the term used to describe this period in this report) expanded very rapidly to embrace more general questions concerning the safety of previously approved GM foods, the labelling of GM consumer products, the environmental impacts of GM crops, the relative merits of intensive versus organic farming, the role of large multi-national corporations in the global agricultural economy, the (im)partiality of government ministers responsible for biotechnology policy, and indeed the uncertainties inherent in the scientific process itself.

Almost immediately, it was clear that the Great GM Food Debate had considerable economic and political, as well as scientific significance. For UK industry, the debate emphasised the necessity to work in a situation where consumers were sceptical or actively hostile; while for UK Government, it indicated the need for a radical reappraisal of biotechnology policy. Internationally (not least, in other parts of the European Union) the Great GM Food Debate signalled the possibility of further difficulties in the path of the continuing development of agricultural and food biotechnology. At the same time, however, the debate had effects outside the biotechnology sector itself. Within the UK scientific community, for example, it came to be seen as a classic example of the alleged “mishandling” of science by the media. For many scientists, the apparent dearth of mainstream scientific opinion within the debate, combined with the apparent *animus* of many journalists against GM food, served to reinforce the stereotypical image of a mass media not merely ignorant about, but positively hostile towards, science.

It was in this context that the House of Lords Select Committee on Science and Technology decided to commission this study of the Great GM Food Debate as part of its wider investigation into the place of science in society. To conduct the research, media coverage of the GM food issue in the UK during the first half of 1999 was collected and analysed. Attention was focussed on daily and weekly national newspapers, together with selected radio and TV news and current affairs programmes. The interpretation of the nature and significance of this media coverage is based partly on content analysis of the media coverage itself and partly on the results of a larger investigation of changing public perceptions of biotechnology in Europe. This embraces longitudinal studies of media coverage and public policy in 12 different EU member states (including the UK), as well as a cross-sectional study of public perceptions of biotechnology in all EU member states in 1996. It thus provides useful background data on the trajectory of public opinion about biotechnology in the UK in the period immediately prior to the Great GM Food Debate.¹

The research reported here attempts to understand as clearly as possible the part played by the mass media in the Great GM Food Debate. It does not adjudicate on the “rights”

¹ For details of this study, see J Durant, M Bauer & G Gaskell (Eds), *Biotechnology in the Public Sphere: A European Sourcebook*, Science Museum, London, 1998.

and “wrongs” of the issues raised in the debate but rather, seeks to characterise and (so far as is practicably possible) to explain the principal features of the debate itself. Following a brief consideration of materials and methods, it examines some general considerations concerning the inter-relationships between science and the media, particularly in the context of public policy-making; describes the principal features of the Great GM Food Debate; and continues by analysing these features quantitatively and qualitatively. Finally, it offers an interpretation of the debate in terms of the wider scientific, economic, social and political context in which it took place. In a separate conclusion, we offer some (necessarily tentative) thoughts concerning the practical lessons that may be learned from the Great GM Food Debate by those who are interested in improving the relationship between science and society in Europe today.

2 METHOD OF STUDY

2.1 Period of the Debate

In this report, the term 'Great GM Food Debate' refers principally to the intense public debate about GM food that took place in the UK in February 1999. It takes as the start point of this period the publication in the *Guardian* on 12 February of a letter from 22 scientists concerning the work of the food scientist Arpad Pusztai², and that (in its most intense form, at least) it ended around 20 February, when the issue dropped out of the front pages of the newspapers on a daily basis (see **Figure 2**). For data gathering, however, the period of study in this report is rather more extensive - from 8 January to 8 June 1999. This permits the incorporation of both the immediate run-up to, and the aftermath of, the debate.

2.2 Selection of Media

The media analysis investigates coverage of the GM Food Debate in print and broadcast news media. The following newspapers have been selected for inclusion in the study:

TABLE 1 NEWSPAPERS AND BROADCAST MEDIA PROGRAMMES INCLUDED IN THE SURVEY³

<i>Newspaper Name</i>	<i>Newspaper Type</i>	<i>Readership (000)⁴</i>	Programme	Channel
<i>Daily Telegraph</i>	<i>Daily broadsheet</i>	<i>2736</i>	Today	Radio 4
<i>Guardian</i>	<i>Daily broadsheet</i>	<i>1270</i>	9 O'Clock News	BBC 1
<i>Independent</i>	<i>Daily broadsheet</i>	<i>840</i>	Newsnight	BBC 2
<i>Times</i>	<i>Daily broadsheet</i>	<i>1954</i>	Question Time	BBC 1
<i>Independent on Sunday</i>	<i>Weekly broadsheet</i>	<i>920</i>		
<i>Observer</i>	<i>Weekly broadsheet</i>	<i>1224</i>		
<i>Sunday Times</i>	<i>Weekly broadsheet</i>	<i>3784</i>		
<i>Daily Mail</i>	<i>Daily tabloid</i>	<i>5309</i>		
<i>Mirror</i>	<i>Daily tabloid</i>	<i>6153</i>		
<i>Mail on Sunday</i>	<i>Weekly tabloid</i>	<i>6167</i>		
<i>Sunday Mirror</i>	<i>Weekly tabloid</i>	<i>6953</i>		

2.3 Data Collection and Analysis

For the period of the study, all reports appearing in the chosen media referring to biotechnology or genetics were collected. Newspaper articles and radio/TV news items were then analysed quantitatively by coding specific features with the help of a pre-established coding frame. (A coding frame consists of a set of comparative core variables, designed to deliver a characterisation of coverage in terms of basic information about the article/programme, its attention structure, journalistic features and defined aspects of its content.) For the print media, the coded information was condensed into a series of 'media profiles', which then formed the basis of comparative analysis. However, with the broadcast media, the sample size was insufficient to permit significant results from quantitative analysis. Therefore, the final analysis of broadcast media is explicitly qualitative in nature. Further details of the methodology used are set out in **Annex A**.

² Arpad Pusztai had previously claimed in a television documentary in August 1998, that genetically modified potatoes had had a damaging effect on the immune system of rats. As a consequence of releasing his results to the general public before they had been substantiated by peer-review, Dr Pusztai was suspended from the Rowett Institute where he had carried out the experiments.

³ Note that the original printed forms of newspapers were not always used; in some cases, web-based versions of the newspapers were accessed (see Annex A).

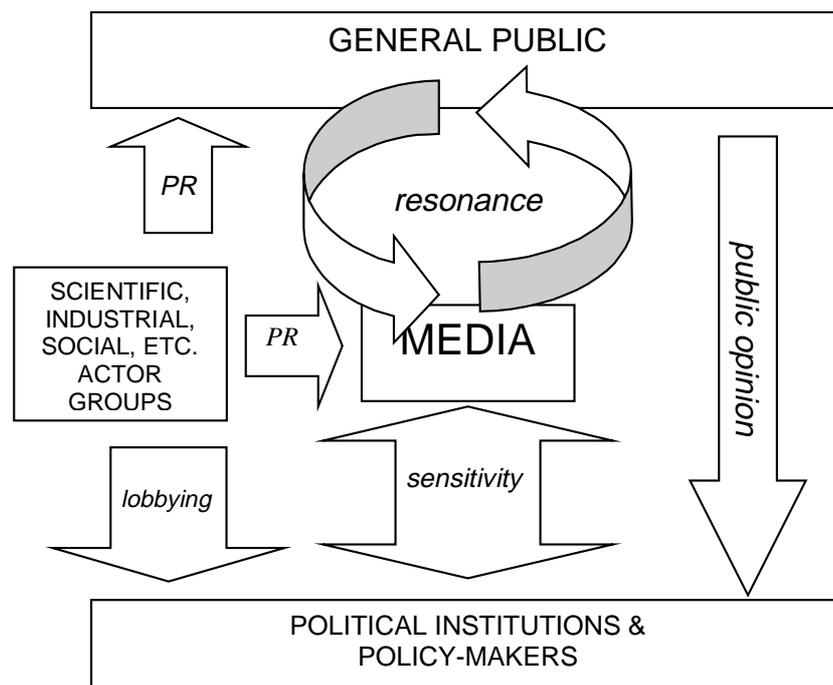
⁴ National Readership Survey, 1997, Average Issue Readership for all Adults aged 15+.

3 SCIENCE AND THE MEDIA

The mass media constitute an enormously important part of the public sphere in modern societies. There is general agreement in the literature that they are enormously influential, but much less agreement about the exact nature of this influence. It is widely recognised, for example, that the mass media facilitate communication among different actor groups (government, science, industry, non-governmental organisations (NGOs), etc.), and between all of these different actor groups and the general public. Beyond this, the mass media are commonly regarded as performing a vital democratic role as a source of independent criticism of any and all forms of vested economic, social and political interests. In addition, it is variously argued that the mass media serve to 'frame' issues in the public sphere, that they perform an 'agenda-setting' role, and even that they actively lead or shape public opinion.⁵

Confining our attention for the moment to the core concept of communication, it is useful to consider the ways in which the media facilitate communication between policy-makers, scientific, industrial and other relevant actor groups, and the general public. We may represent the relationships among these different entities by means of a model shown in **Figure 1**.

FIGURE 1 THE RELATIONSHIP BETWEEN THE PUBLIC AND THE MEDIA



The media are in the centre of the model shown in Figure 1 to indicate their primary role as facilitators of communication between all other social actors. Each actor group observes and at the same time is observed by the mass media. (Simultaneously, the media observe everyone else – and each other!) Similarly, each actor group seeks to influence, and at the same time is open to influence by, the mass media. This is as true of the scientific community as it is of industry, or of particular NGOs that may be concerned with a particular issue. All are keen to influence public opinion through public relations,

⁵ See J Durant, M Bauer & G Gaskell (Eds), *Biotechnology in the Public Sphere: A European Sourcebook*, Science Museum, London, 1998.

either directly or through the mass media. At the same time, all are extremely sensitive to what is said about them in the mass media.

For present purposes, three key relationships in the model deserve special mention, namely those between the media and the policy process, between the media and the general public, and between the general public and the policy process. As far as the media and the policy process are concerned, in any particular situation politicians and policy-makers may be more or less sensitive to what the media are saying about particular issues. Media coverage may be taken to represent the opinions of particular actors and interest groups (including, of course, journalists themselves) and/or wider public opinion. In this context, sensitivity may be thought of as a “gating” mechanism, controlling the extent to which the policy process is responsive to media influence.

So far as the media and public opinion are concerned, the model views the two as closely interdependent. In any particular situation, attempts by the media to raise issues or to set the agenda for public debate about those issues may resonate more or less effectively with wider public concerns (“public opinion”). Where there is little or no resonance, media coverage may remain low-key and media influence may be slight. Where there is great resonance, however, media coverage may escalate rapidly and media influence may be considerable. In this context, resonance may be thought of as a “feed forward” mechanism between the media and public opinion, influencing both the overall level and tone of media coverage and the nature and strength of public opinion.

Finally, the model recognises that public opinion exerts a direct influence on the policy process – most obviously, of course, through parliamentary elections, but also (and more importantly, so far as single issues such as GM food are concerned) through the traditional mechanisms of MPs’ surgeries and postbags and the more recent mechanisms such as opinion polling, focus group research, and so forth. When public opinion resonates with media coverage on a particular issue, public opinion may exert pressure on the political process both directly (via the media, for example through political opinion polling), and indirectly through the opinions of other actors and interest groups (as these are reflected through the media, or brought to bear directly, for example through lobbying).

4 CHARACTERISING THE DEBATE

4.1 Setting the Scene

Over the entire period of its history from 1973 to 1996, modern biotechnology enjoyed a relatively high level of (generally fairly positive) media coverage in the UK, and at the same time it attracted relatively high levels of support from the general public.⁶ Indeed, the UK was one of the first European countries to introduce food products of modern biotechnology into the consumer market: so-called vegetarian cheese (made using chymosin derived from genetically modified yeasts) was introduced in the early-1990s and GM tomato paste was introduced by two supermarket chains in 1995-6. Although these products attracted opposition from some NGOs, in general they were relatively well received by consumers. Significantly, neither of these food products attracted high and sustained levels of critical media coverage in the UK.

In 1996, however, two unrelated events occurred which together appear to have started a new chapter in the relationship between agricultural and plant biotechnology and the British public. The first event was the announcement by the then health minister Stephen Dorrell in March 1996 that a new form of Creutzfeld-Jacob Disease had been identified in humans, and that the most likely source of this disease was BSE-infected beef⁷. This announcement sparked a major public debate about the way in which the BSE crisis had been handled over the previous decade, together with a series of significant changes in public policy with respect to beef production and consumption. This announcement was widely interpreted as having undermined public confidence in policy-making for food safety.

The second important event in 1996 was the start of imports of North American commodity crops (soya and maize) into the European Union containing unsegregated mixtures of conventional and GM material. In the autumn of 1996, the UK media reported on this issue at reasonable length and there was a certain amount of public debate involving both special interest groups (e.g., farmers, and consumer and environmental organisations) and policy-makers and politicians. While this debate remained relatively low-key at the time, in retrospect it is clear that it had longer-term significance. The import into Europe of unsegregated GM soya, in particular, created serious difficulties for the European food industry (e.g., in the area of food labelling), and these served to keep the issue of GM food in the public eye over the next two years.

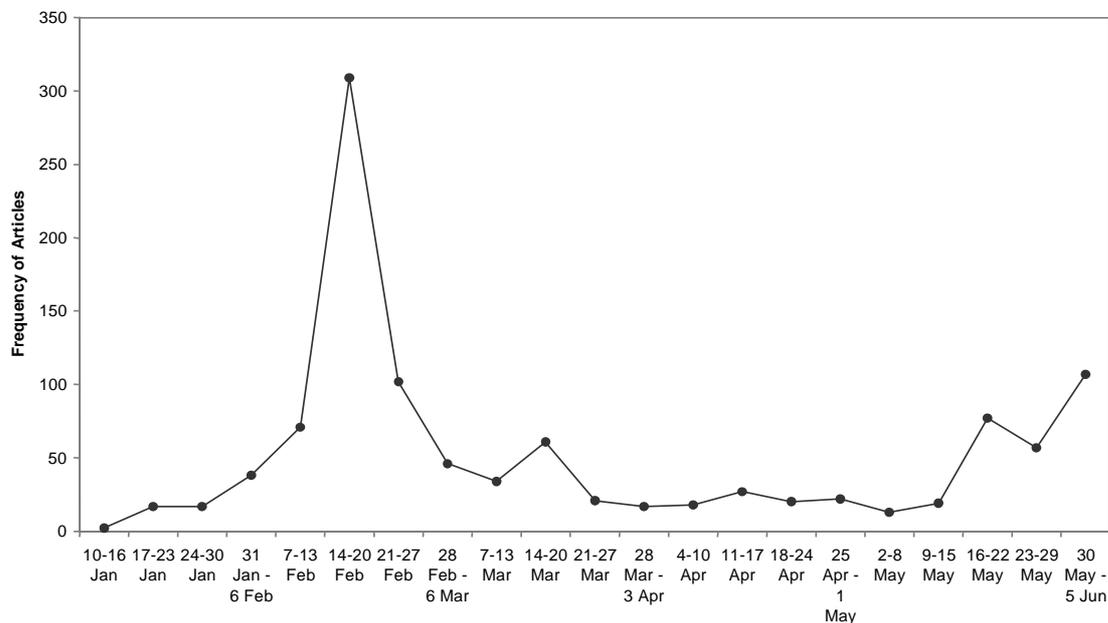
By the end of 1998, the issue of GM food was firmly on the public agenda in the UK. Significant events in that year included: the decision in April by the frozen food retailer *Iceland* to remove GM ingredients from all its own-label produce; the decision in June by the Prince of Wales to call for public debate on the merits of allowing GM crops to be grown in Britain; the call in July by *English Nature* for a three year moratorium on the commercial planting of GM crops in Britain; the decision in August to ban GM foods from the House of Commons restaurants; and the screening, also in August, of a TV documentary featuring the work of Dr Arpad Pusztai on the health effects on rats of GM potatoes. Finally, in September 1998 (after several years of difficult negotiation) EU

⁶ J Durant, M Bauer & G Gaskell (Eds), *Biotechnology in the Public Sphere: A European Sourcebook*, Science Museum, London, 1998.

⁷ BSE & CJD – Science, Uncertainty and Risk, POST 1996, Report 78, BSE and CJD Update, POST 1997.

regulations took effect regarding the labelling of foods containing GM ingredients. By this time, the scene was set for conflict between supporters and opponents of food biotechnology in the UK.

FIGURE 2 TOTAL NUMBER OF NEWSPAPER ARTICLES ON GM FOOD AND CROPS BY WEEK, JANUARY-JUNE, 1999



4.2 Characterising a Media Storm

The Great GM Food Debate was a “media storm”. Following a relatively calm prelude (up to around the end of January 1999), “storm clouds” began to gather as the issue of GM food rose up the news agenda. Over 11-12 February, the storm broke as GM food became the lead story in virtually all media. For the next 7-10 days, it raged on the front pages of all newspapers. After that, the storm eased somewhat as the issue of GM food gradually slipped down the news agenda and eventually subsided further, although media coverage remained substantially above that of previous (1998) levels. This overall pattern is reflected in the intensity of all print media coverage of the GM food issue during the entire period of this study (see **Figure 2**). The remainder of this section summarises the key features of the Great GM Food Debate through six stages in the progress of the media storm.

4.2.1 Prelude (before 31 January 1999)

In January 1999 the Government’s Advisory Committee on Releases to the Environment (ACRE) published a report claiming that there was no evidence to suggest that GM crops could endanger British wildlife;⁸ the House of Lords European Communities Committee published a report declaring that the benefits of GM foods greatly outweighed the risks;⁹ and the Government launched the “Bio-Wise” initiative, involving public investment of £13 million in Britain’s biotechnology industry over the next four years.¹⁰ These policy initiatives were publicly criticised by a number of consumer, environmental and other

8 Advisory Committee on Releases to the Environment (1999) *The Environmental risks of herbicide-tolerant oilseed rape: a review of the PGS hybrid oilseed rape*.

9 House of Lords European Communities Committee (1999) *Second Report: EC Regulation of Genetic Modification in Agriculture*

10 Department of Trade and Industry Bio-Wise Initiative, 1999.

interest groups, including a group of 100 chefs and food writers who launched a campaign to ban GM foods towards the end of January. The Government and most of the food industry were therefore continuing in one direction, and an emerging coalition of GM critics moving in another, although, on 31 January, agriculture minister Nick Brown announced that all restaurants would be obliged to label meals containing genetically modified produce.

4.2.2 The Gathering Storm (1-10 February)

During the first ten days of February 1999, media coverage of the GM food issue steadily increased in intensity. Much of this coverage reported debate in the House of Commons, where for the first time GM food became a party political issue¹¹. Indeed, on several occasions the Prime Minister rebuffed calls from the Leader of the Opposition for a moratorium on GM crops and foods. At the same time, back-bench Labour MPs questioned the Government's support for GM foods, and agriculture minister Jeff Rooker conceded in an interview with Channel 4 News that the failure to segregate GM commodity crops was posing serious problems both for the food industry and for consumers. At around this time, a MORI poll revealed that most people did not trust ministers to make the right decisions for them on food safety issues.

The politicisation of the GM food issue at this time was a crucially important new element in the debate. This was reflected in the increasingly strident tone of much media coverage of the issue at this time. For example, the *Daily Mail* carried a series of critical reports on the political links of major companies with the Government, claiming for example that some biotechnology companies had sponsored Labour Party Conferences; and on 6 February, they finally launched an explicit campaign under the editorial headline, "An issue of concern to every reader". The editorial called for an immediate moratorium on GM foods. The following day, the *Independent on Sunday* launched its campaign for a three year moratorium on the development of GM crops. Its front page headline read, "Stop GM Foods: Modified Crops 'Out of Control'", whilst its editorial urged readers to "Act now on GM".

4.2.3 The Storm Breaks (11-12 February)

During these two days, the GM story "broke" in the media. On 11th February, BBC2's *Newsnight* opened with the revelation that the following day the *Guardian* newspaper would publish a letter from 20 international scientists supporting the (still unpublished) work of Dr Arpad Pusztai. This letter duly appeared, together with an editorial calling for a moratorium on GM foods. The same day, the GM story was on the front pages of most newspapers. The *Independent* announced boldly that, "GM food critic is vindicated", while the *Times* stated more soberly that, "Scientists back critic of gene modified potatoes". In the first of two major items on that morning's Radio 4 *Today Programme*, presenter John Humphrys announced that, "A group of the world's most respected scientists has said that there must be a moratorium on the development of genetically modified food". Humphrys went on to interview the BBC's science correspondent Palub Ghosh in what some commentators felt were very sceptical terms (see section 5, below).

4.2.4 The Storm (13 – 20 February)

Throughout this period, the GM food issue remained front page news. There was an enormous amount of coverage in the media, and events moved very fast from day to day. Highlights of the debate at this stage included: the Government's continuing support for

11 See for example, 'Hague calls for halt on 'Frankenstein foods'', *The Daily Telegraph*, 4th February 1999

GM foods; the Opposition's continuing call for a moratorium; the attack on Lord Sainsbury, the Science Minister, over alleged conflicts of interest in connection with biotechnology; the Government's announcement that the remit and composition of ACRE were to be reviewed; explicit disagreement between Dr Pusztai and a number of other scientists, who staged a press conference in Westminster to call for independent evaluation of Pusztai's results; and Greenpeace's dumping of 4 tonnes of GM soya outside 10 Downing Street.

During the storm itself, the *Mirror* launched its campaign for the labelling of all food containing GM ingredients; the *Guardian* reported that Lord Sainsbury controlled the world-wide patent rights over a key gene currently used in the genetic modification process, and (inaccurately) that this gene was the promoter gene used by Dr Pusztai in his potato experiments; and in the *Daily Telegraph*, the Prime Minister warned that banning GM food would jeopardise Britain's biotechnology industries. Interestingly, during this period the *Independent* carried an extremely critical peer review of Dr Pusztai's work on GM potatoes by Tom Sanders, Professor of Nutrition at King's College London.

4.2.5 Heavy Rain (20 February – 8 June)

During the weeks that followed the height of the storm, the issue of GM food continued to receive prominent attention in the media. This focused on a wide variety of topics -- from the continuing efforts of the scientific community to evaluate Pusztai's (still unpublished) work, through the efforts of the Government to reorganise the regulatory apparatus for biotechnology and the rapid retreat of food manufacturers and retailers from the use of GM ingredients, to the continuing protests of environmentalists and organic farmers against the experimental planting of GM crops. A particularly interesting feature of this stage of the debate is the emergence of criticisms of the media themselves for the way in which they were handling the issue. In April, Cabinet Minister Jack Cunningham accused the media of 'mass hysteria' and warned that the GM food issue should not be compared with the BSE catastrophe. In May, Downing Street accused the BBC of failing to take a measured view of GM foods, attacking specifically one of John Humphrys' interviews with Jack Cunningham on Radio 4's *Today* programme. It was reported that at one of the Cabinet's weekly meetings the Prime Minister had complained that while positive scientific reports on GM food were barely reported, the media gave huge space to "anything which fed the hysteria".¹²

4.2.6 Aftermath (8 June – present)

In the aftermath of the Great GM Food Debate, agricultural and plant biotechnology are now situated in a wholly different public environment in the UK. The regulatory system for release of GM crops into the environment (along with the rest of the biotechnology policy apparatus) has been reformed and, in many areas, tightened; experimental planting of GM crops has become highly problematic (not least because of the threat of vandalism) and the prospect of commercial planting of GM crops has receded. The greater part of the food industry has made a tactical withdrawal from the use of GM ingredients; and the organic farming lobby, ably represented by The Soil Association (an organisation of which the Prince of Wales is Patron and media personality Jonathan Dimbleby is President) has experienced a considerable boom in popularity. Overall, the tenor of public opinion in the UK about GM food appears to have shifted from cautious approval in 1996 to sceptical disapproval in late-1999.

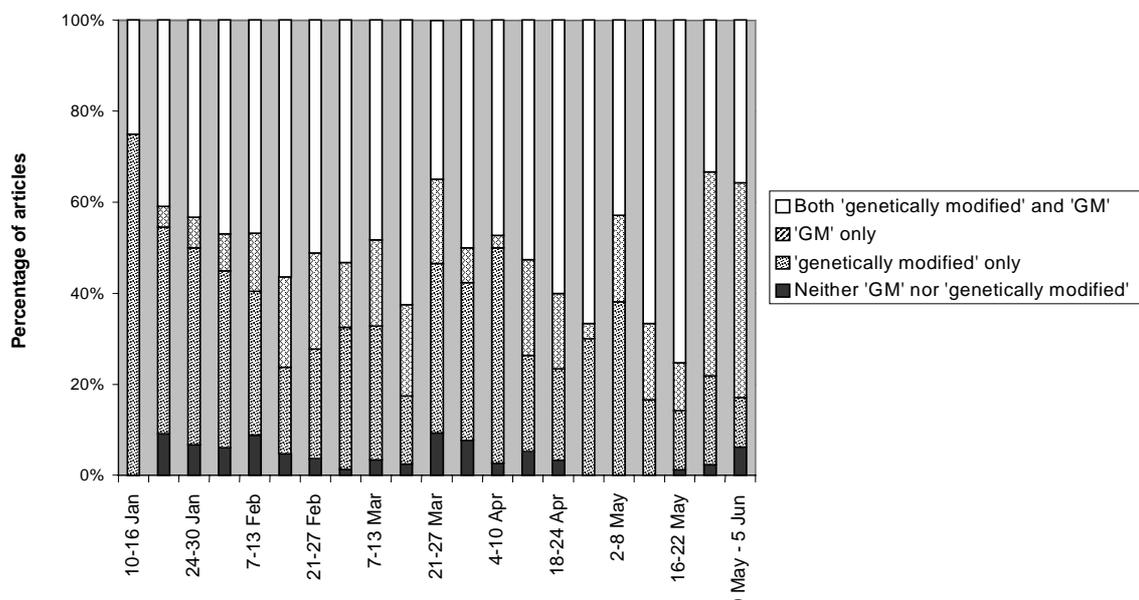
¹² The *Independent*, 28 May 1999.

5 ANALYSING THE DEBATE

5.1 General Features of Newspaper Coverage

To understand more about the nature of the newspaper coverage through the various phases of the storm, the database of encoded newspaper articles can be subject to keyword analysis. This shows up overall patterns in the coverage that would not otherwise be obvious. Thus, **Figure 3** shows the frequency of use of the terms “genetically modified” and “GM” related to food in all newspapers under study throughout the entire period. At the start of January, most articles use the term “genetically modified”, only a minority use both terms, and no articles use the term “GM” only. By the end of May, however, the situation is very different. Now, a small minority of articles uses the term “genetically modified” only, while almost half use the term “GM” only. Clearly, the term GM has become established in popular parlance through the course of the Great GM Food Debate. This conclusion is confirmed by the fact that in June 1999 the term GM was included for the first time in the Oxford English Dictionary.

FIGURE 3 TERMINOLOGY USED IN DESCRIBING GENETICALLY MODIFIED SUBSTANCES

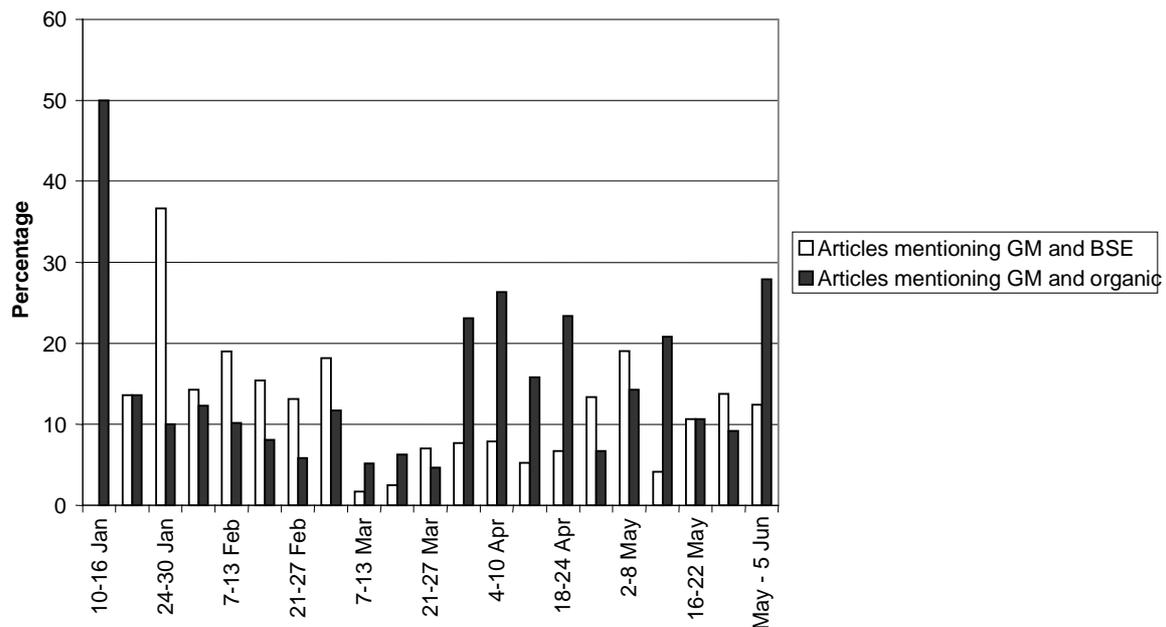


A second relatively straightforward analysis is shown in **Figure 4**. This provides overall data on the frequency with which articles on GM food also make reference (a) to BSE or related terms (CJD, mad cow disease, beef on the bone), and (b) to organic foods and/or organic farming. As far as BSE is concerned, it emerges that through the entire period of the study 13% of all articles mentioning GM foods also mention BSE or related terms. However, this figure disguises significant variations through the course of the debate. Thus, in the Prelude as many as 25% of articles on GM food also mention BSE; and in the Gathering Storm, the figure was 15%. The frequency of mentions of BSE drops off in later phases of the debate, as more specific issues, themes and actors come to dominate the media coverage. Overall, this result strongly confirms the hypothesis that the BSE crisis was an important precipitating factor in the Great GM Food Debate.

Turning next to the results on organic farming in Figure 4, it emerges that through the entire period of the study, the same percentage of articles on GM food (13%) also mention

organic foods and/or organic farming. Again, however, there are significant variations through the course of the debate, with the highest frequency of mentions of organic foods and/or farming before and after the “Storm” itself. This result strongly confirms the hypothesis that the organic food and farming “movement” (represented, as it was, by such prominent actors as the Prince of Wales, several media “personalities”, and the Soil Association) was an important precipitating factor in the Great GM Food Debate. It also lends support to the idea that the organic food and farming movement gained considerable momentum from the Great GM Food Debate.

FIGURE 4 MENTIONS OF BSE AND ORGANIC FOOD/FARMING IN ARTICLES DISCUSSING GENETIC MODIFICATION



A striking feature of the debate surrounding GM foods is that what had previously been a marginalised and specialised scientific issue became mainstream. Whilst other aspects of biotechnology had been covered mainly by science journalists, coverage of GM in the Great GM Foods Debate involved political, environmental and even lifestyle journalists. **Table 2** shows the percentage of news articles alone on GM foods written by different journalists (where the information is available) in all the newspapers analysed in this study, by phase:

TABLE 2 PERCENTAGE OF NEWS ARTICLES WRITTEN BY DIFFERENT TYPES OF JOURNALISTS

Rank	Journalist	Prelude	Gathering Storm	Storm Breaks	Storm	Heavy Rain	AVERAGE
1	Political	41	40	45	38	32	32
2	Environmental	18	13	9	17	19	17
3	News Reporter	0	7	18	21	15	14
4	Science/Technology	5	0	0	10	13	10
4	Consumer	5	7	0	14	12	10
5	Business	0	0	0	0	5	4
5	Agriculture	0	0	0	0	5	3

There appear to be five tiers of journalistic news coverage in the GM debate: the political editors and correspondents are the primary source of coverage; followed by environmental reporters; general news reporters; science/technology and consumer reporters; business and agriculture reporters. Throughout the debate, the political editors

and correspondents dominate news coverage. Indeed, as the storm breaks, coverage is entirely in the hands of political, environmental and news reporters. As the debate progresses, the proliferation of themes, issues and actors involved is reflected in a broadening of news coverage into different journalistic departments. However, specialist science and technology correspondents never contribute more than 15% of the total news coverage at any stage in the debate.

Feature articles (**Table 3**) attempt to explain the background of the debate and offer an opportunity for investigative journalism. As the issues involved are not purely scientific, a number of different types of journalist become involved (although with the political and environmental journalists, this is not until later in the debate). Therefore, for feature articles on GM, although science/technology journalists are the most important, they are followed closely by political, general news reporters, consumer affairs and environmental correspondents.

TABLE 3 PERCENTAGE OF FEATURE ARTICLES BY DIFFERENT TYPES OF JOURNALIST

Rank	Journalist	Prelude	Gathering Storm	Storm Breaks	Storm	Heavy Rain	AVERAGE
1	Science/ Technology	0	25	17	26	20	18
2	Political	0	0	0	30	17	16
3	News Reporter	14	13	50	26	9	15
4	Consumer	43	25	0	12	9	11
5	Environmental	0	0	0	0	20	10

Nearly half the published commentary (**Table 4**) comes from a public voice (i.e., “letters to the Editor”) with the percentage increasing as the debate progresses. Scientists, environmentalists and politicians are also commenting throughout the debate.

TABLE 4 PERCENTAGE OF COMMENTARY ARTICLES BY DIFFERENT TYPES OF JOURNALIST

Rank	Writer	Prelude	Gathering Storm	Storm Breaks	Storm	Heavy Rain	AVERAGE
1	Public Voice	33	37	0	47	58	46
2	Columnist/ Editor	17	26	33	24	18	18
3	Scientist	8	5	0	15	9	9
4	Environmentalist	0	11	0	9	4	6
5	Politician	17	0	0	0	4	4

The data strongly support the thesis that in the Great GM Food Debate the press did not view GM food as principally a scientific or technological issue. Rather, it was seen as a political, environmental and (especially in the tabloid newspapers) consumer matter. Only in feature articles (especially in the broadsheet newspapers) did science journalists dominate the press coverage. This fact probably accounts for a great deal of the discomfort that appears to have been experienced by many members of the scientific and science policy communities at what they took to be the “unscientific” or even “anti-scientific” character of much of the press coverage.

Finally in this category of general features of the newspaper coverage, the overall tone of the coverage requires analysis. From very early in the Great GM Food Debate, the nature of the press coverage itself was referred to by a number of actors involved in the debate. Generally, those commenting on the media coverage did so to criticise what they took to be sensationalism, misleading reporting and media bias. Thus, in a BBC2 *Question Time* debate on 18 February, three out of four panellists made critical references to the press

coverage of GM foods. The Director of the Royal Institution, Professor Susan Greenfield, suggested that it was hard to look at the issues properly because the press had “whipped up such hysteria”; the Labour minister Tony Banks suggested that “This is not the sort of issue that...our tabloid press are good at handling”; and the comedian Jo Brand referred to “the tabloids with these ridiculous kind of cartoon-ish pictures and words like ‘Frankenstein’”. Two days later, the Prime Minister authored an article in the *Daily Telegraph* in which he referred to “two weeks of misinformation” about the issue of GM food.

Some, at least, of the newspaper coverage appears to merit these pejorative descriptions. Take, for example, the following illustrative newspaper headlines: “Stop GM Foods: Modified crops ‘out of control’”¹³; “The Prime Monster: Fury as Blair says: I eat Frankenstein Food and It’s Safe”¹⁴; “Mutant crops could kill you”¹⁵; and “Gene crops could spell extinction for birds”¹⁶. What is interesting about these headlines is not merely that they are all either explicitly or implicitly anti-GM but rather that they come from a mix of broadsheet (2) and tabloid (2) newspapers. In other words, Brand’s characterisation of newspaper coverage as conventionally divided into “low-brow”, sensationalist tabloid and “high-brow”, specialist broadsheet material is not obviously applicable with the Great GM Food Debate.

Instead, the key distinction appears to be between those newspapers that adopted a stridently anti-GM campaigning stance and those that did not. The contrast between these two editorial stances is most easily made by matching headlines about the same issues from different newspapers in the sample. For example, on the same day that the *Daily Mirror* led with “The Prime Monster: Fury as Blair Says: I eat Frankenstein Food and It’s Safe”, The *Daily Telegraph* (a newspaper not famous for its support of the Labour Party) ran the headline, “Blair gives his blessing to GM foods”.¹⁷ Similarly, on the same day that the *Guardian* announced to its readers that, “Gene crops could spell extinction for birds”, The *Times* informed its readers in altogether more sober terms that, “Wildlife risks to be investigated”.¹⁸ In order to understand the sensationalist and even scare-mongering tone of much newspaper coverage of GM foods, there is a need to investigate not the culture of *tabloid* journalism but rather the culture of *campaigning* journalism.

5.2 Campaigning versus Non-campaigning Newspapers

From qualitative analysis, individual newspapers included in the study appear to be ranked according to the intensity of their campaigns as follows:

Daily Mail, Mail on Sunday, Express and Express on Sunday

Independent on Sunday

Guardian and Observer

Mirror and Sunday Mirror

Independent

Times, Sunday Times, Telegraph and Sunday Telegraph

¹³ *Independent on Sunday*, 7 February 1999

¹⁴ *Daily Mirror*, 16 February 1999

¹⁵ *Express*, 18 February 1999

¹⁶ *Guardian*, 19 February 1999

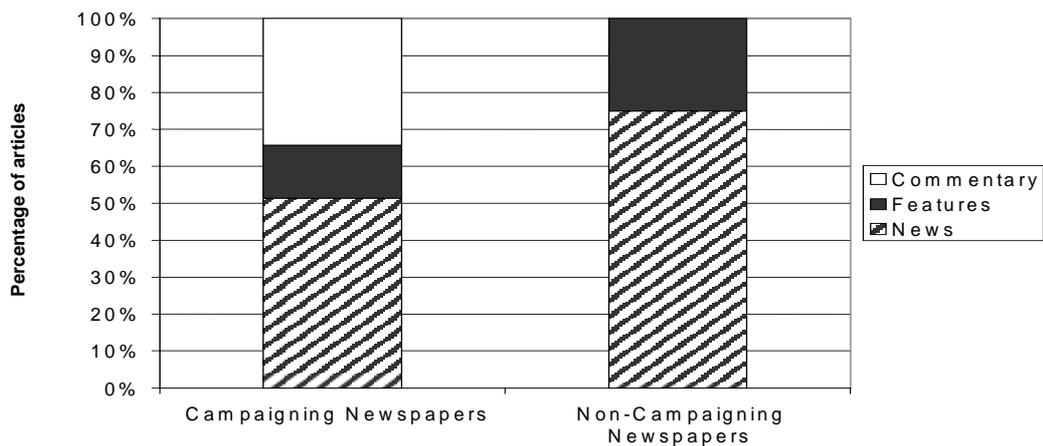
¹⁷ *Daily Telegraph*, 16 February 1999

¹⁸ *Times*, 18 February 1999

Both the *Daily Mail* and the *Express* appeared to be running implicit anti-GM campaigns before the Gathering Storm in early February. The *Daily Mail* launched its campaign ‘officially’ on 6 February (although it appears to have taken a negative stance on GM foods months before this date), whilst the *Mail on Sunday* continued to campaign ‘unofficially’. (See **Annex B** for the definitions used in this study of ‘explicit’ or ‘official’ campaigning, ‘implicit’ or ‘unofficial’ campaigning and non-campaigning in specific newspapers). The *Independent on Sunday* launched its campaign during the Gathering Storm, on 7 February, whilst the *Independent’s* style of campaigning journalism throughout the Great GM Foods Debate remained implicit. Similarly, the *Guardian* and the *Observer* ran implicit rather than explicit anti-GM campaigns, from well before the Gathering Storm. The *Mirror* launched a GM food labelling campaign during the Storm itself, on 15 February, although its Sunday equivalent remained implicit. The remaining newspapers in the study (the *Times*, the *Sunday Times*, the *Telegraph* and the *Sunday Telegraph*) did not adopt a campaigning mode on GM food at all. Rather, they maintained a more conventional reporting style throughout.

Subjecting the encoded newspaper data to analysis, quickly reveals some fundamental differences in the media coverage of the campaigning and non-campaigning newspapers. Throughout the debate, the former devoted a smaller proportion of their total coverage to news items and a correspondingly larger proportion of their total coverage to commentary. As **Figure 5** reveals, this difference was particularly marked in the Prelude to the Great GM Food Debate, where roughly a third of the articles in the campaigning newspapers but none of the articles in the non-campaigning newspapers were devoted to commentary. These results suggest that the campaigning newspapers helped to drive the Great GM Food Debate, working to “set the agenda”, while the non-campaigning newspapers simply followed that agenda by reporting the latest twists and turns in the debate.

FIGURE 5 NEWSPAPER OUTPUT ON GM FOODS BEFORE 1 FEBRUARY



Qualitative analysis confirms this hypothesis. Throughout the Great GM Food Debate, it is the campaigning rather than the non-campaigning newspapers that consistently take the lead in raising and pursuing key issues – the work of Dr Pusztai, the independence and credibility of the science minister Lord Sainsbury, the leaking of allegedly suppressed reports, the role of Monsanto, etc. Similarly, it is the campaigning newspapers that consistently employ what may be regarded as sensational and even on occasion scare-mongering headlines. Time and again, references to the supposedly harmful effects of “Frankenfoods” on human health, and of GM crops on the environment, are found in

campaigning newspapers only. So large, in fact, are the differences between the campaigning and the non-campaigning newspapers on these dimensions that they mask the generally dominant distinctions in British journalism between tabloid and broadsheet newspapers. (For further details of the analyses on which these conclusions are based, together with many more examples of the two styles of reporting, see **Annexes B and C**).

5.3 The Relationship between Print and Broadcast Media

In the UK news agendas are more often driven by newspapers than by broadcast media.¹⁹ Certainly, this appears to have been the case in the Great GM Food Debate. For several weeks before the storm broke, the storm clouds were gathering in the pages of the press (particularly in the campaigning press). It was a letter published in the *Guardian* newspaper (again, one of the newspapers that adopted an implicitly campaigning style throughout) which marked the beginning of the storm. Time and again through the course of the next few weeks, new issues were first introduced into the debate by campaigning newspapers. The broadcast media played a distinct role of their own in the debate - after being interviewed initially by BBC's *Newsnight* in February 1998, Pusztai spoke out about his controversial work on GM potatoes in ITV's *World In Action*, in August 1998. During the key phases of the Great GM Food Debate in 1999, however, the broadcast media appear to have taken many of their cues from the press.

A fundamental difference between the press and broadcast media in the UK is that the former are free to take a strong editorial stance on key issues, whereas the latter frequently work under the requirement to remain impartial. This distinction held to a degree in the Great GM Food Debate. Certainly, no national radio or TV channel adopted an explicitly campaigning stance. However, the question of the impartiality of the broadcast media was raised in the debate - not least, by the Prime Minister's office in respect of certain key interviews conducted at the height of the media storm by the *Radio 4 Today Programme*. Two key interviews were conducted by John Humphrys on the morning of 12 February. The first, conducted before 7.00am, involved Humphrys in conversation with the BBC science correspondent Palub Ghosh. Part of this interview proceeded as follows:

Humphrys: "The real worry that the scientists have, and indeed many other people - most people in Britain I think it's fair to say isn't it, if we're to believe the surveys that have been carried out - is that we simply do not know, so why are we rushing at it if not to fatten the profits of the big chemical companies, the big biotech companies?"

Ghosh: "Well, advocates of the technology suggest that we do know. It's not like BSE, the fact that we do know a lot about food essentially what you look at is..."

Humphrys: "Well, they told us that about BSE..."

Ghosh: Exactly, I'm just putting their argument to you. Essentially, we do know what food contains. Whatever you do to it genetically at the end of the day you look to see if it's poisonous or not. And that's a field that's well established. But the new concerns are that perhaps the genetic modification isn't stable, that there are some initial results in test tubes which might suggest that. There's also concern that, because of the techniques used, we

¹⁹ Bauer M; Science in the media as cultural indicator - complementing survey with media analysis; in press.

might become resistant to antibiotics, and of course this latest finding that some of the chemicals produced might actually stunt growth or depress the immune system. Now these are very very initial findings but they're worrying enough for this group of 20 international scientists to call for more research to be done."

Humphrys: "And when people call, as indeed English Nature has called, for a moratorium, what do they mean? A moratorium on what?"

Ghosh: "They don't want any more genetically modified or genetically engineered foods to be introduced to supermarket shelves until the issue is settled one way or another for sure. But quite apart from what the science is telling us, in some ways it's about politics now, It's about the PR battle, and because of what's happened with BSE, because a number of high profile people have come forward to voice their concerns about genetically engineered food, it is an argument that the biotechnology industry for the moment seems to be losing."

Humphrys: "Mmm. Nor are they very keen to talk to us it must be said. Palub Ghosh, thanks very much indeed."

The tone of this interview is extremely sceptical towards governmental, scientific and industrial support for agricultural and plant biotechnology. Adopting a stance that he claims is the majority position of the British public, Humphrys clearly leans to the side of the critics of GM food. A little later in the same programme, the same presenter was to adopt an even more hostile posture towards GM food in an interview with Cabinet Minister Jack Cunningham. The full text of the Jack Cunningham interview – which was later the subject of a specific complaint from 10 Downing Street, and which has now been the subject of an internal BBC Inquiry – is reprinted as **Annex D** of this report.

Juxtaposing these two interviews with those carried out *before* the story broke, suggests that, even when allowing for the combative conventions of political journalism, these interviews mark a significant shift in the tone of broadcast media coverage of GM food in the UK. In many ways, this shift - from neutral and relatively low-key reporting, to energetic and at times highly opinionated interrogation - is analogous to the shift into campaigning mode of many of the national newspapers. Remaining broadly within the conventions of the most robust forms of political interviewing in the UK (interestingly, Humphrys was vindicated on these grounds by the BBC Complaints Appeals Committee), Humphrys nevertheless succeeded in conveying very powerfully the sense that the writing was on the wall for GM food in the UK.

What is the significance of these features of the Great GM Food Debate? Why is it that, after years of generally low-key but positive media coverage, there should have been such intense and (in many cases) sceptical media reporting? While one cannot “explain” the media storm surrounding GM food in the same way that one might hope to explain a literal storm in the natural world, it is possible to attempt an account that renders it comprehensible. This is based on an interpretation of the results that have now been set out in terms of the communications model set out in Figure 1.

The interpretation used in this report starts and finishes with the concept of public opinion. Up to 1996, there is good reason to think that UK public opinion was cautiously supportive of agricultural and plant biotechnology. In the context of the long-running BSE crisis, food safety was a highly sensitive issue; but in spite of this, most people thought that on balance the benefits of GM foods slightly outweighed the risks.²⁰ In 1996, however, two events occurred to de-stabilise this situation: first, in the spring health minister Stephen Dorrell stood up in the House of Commons and suggested that the most likely source of new variant CJD in humans was BSE-infected beef; and second, in the autumn it became known that unsegregated mixtures of unmodified and modified soya were in the process of being imported into Europe from North America.

The escalation of the BSE crisis sensitised the British public still further to questions of food safety in general, but the importing of unsegregated soya transformed the terms of the GM food debate itself. No longer was it a question of whether consumers would choose to purchase a restricted number of clearly labelled GM food products; now, it was simply a matter of time before the vast majority of the public would find themselves eating an indeterminately large number of unlabelled GM food products, whether they liked it or not. This shift mobilised potentially powerful critics of GM food, including not only a number of extremely prominent public figures but also leading environmental organisations such as Friends of the Earth, leading consumer organisations such as the Consumer Association, and the (then relatively obscure) representative body for organic farmers, the Soil Association. Over the next two years, an informal but increasingly powerful coalition of lobbyists was created among these individuals and institutions.

It seems clear that by the end of 1998 several things had happened to make a high profile media debate more likely. First, food products containing GM ingredients had begun to proliferate in the UK market, with provisions for labelling that were still unclear. Second, the lobby against GM foods had begun to make its presence felt. Third, public concern about GM foods had risen significantly. Fourth, media interest in GM foods had also risen sharply. At this point, sensing that public policy and commercial practice had diverged considerably from public opinion, several newspaper editors saw a clear opportunity to champion what they took to be the popular cause of resistance to GM crops and GM foods. Key players here were the *Daily Mail* and the *Daily Express*. Locked in a fierce circulation battle, these two newspapers specialised in populist campaigning on carefully selected issues. By early 1999, the two titles were vying to out-do one another in their zeal to represent what they took to be their readers’ concerns about GM foods. At the same time, the *Guardian* was maintaining a generally critical stance, and other newspapers

²⁰ See Durant et al (1998) National Profiles: United Kingdom; in J Durant, M Bauer & G Gaskell (Eds), *Biotechnology in the Public Sphere: A European Sourcebook*, Science Museum, London,

(notably, the other tabloids and the *Independent* stable of newspapers) were moving in the same direction.

In the first few weeks of 1999, public concern about GM foods became sufficiently clear to make this an attractive issue for party politics. The decision of HM Opposition to break with what had up to this point been a long-standing political consensus on biotechnology policy in the UK further emboldened both the lobbyists and the campaigning newspapers. Now, all that was required for a full-scale media storm was a “trigger” event of some kind. This was provided by the decision of an environmental organisation to orchestrate a letter from a group of scientists to a (sympathetic) newspaper, supporting Pusztai’s critical claims. This letter did not *cause* the Great GM Food Debate; rather, it *occasioned* it. As a trigger event, it was particularly effective – reinforcing, as it did, long-standing public unease over the trustworthiness of expert reassurances about the safety of new technologies, especially in the area of food production; but equally, the conditions for a media storm were by now so favourable that some other trigger event might have worked just as well.

The communication model set out in Figure 1 shows how the key relationships between public opinion and media and between media and public policy contributed to the Great GM Food Debate. So far as the former relationship is concerned, for more than two years there had been increasing resonance between mounting public concern and mounting media interest in the issue of GM food. It is doubtful whether newspaper editors would have launched explicit campaigns against GM food unless they felt confident that such campaigns would resonate with readers’ concerns. In this sense, the campaigning newspapers almost certainly judged their readers’ and their own commercial interests rather accurately. This is not a claim either that public opinion drove media coverage or that media coverage drove public opinion. Rather, the two are interlocked in a “feed-forward” relationship that served greatly to accelerate the growth of public opposition to GM foods in the UK.

So far as the relationship between media and public policy is concerned, by 1999 UK political institutions and policy-makers were extremely sensitive to public opinion as represented in the mass media. From the outset, the new Labour Government elected in 1997 had been generally alert to public opinion. Particularly in areas such as BSE and food health and safety, it had been keen to do all it could to restore flagging public confidence in the policy process. Among the early initiatives taken with this end in view were the commitment to the creation of a new Food Standards Agency and the initiation of a review of the regulatory apparatus for biotechnology.²¹ However, with public concern – and even, in the case of new “beef on the bone” restrictions, public irritation – continuing unabated, by the end of 1998 the Government was acutely aware of the need to stay in touch with public opinion on new food sciences and technologies. At the point when the Great GM Food Debate took place, the UK’s political institutions and policy-makers could not have been more highly attuned to what was being said about food biotechnology in the public domain. These are the main reasons that the Great GM Food Debate had such a large impact on the political and policy arenas.

²¹ Office of Science and Technology (1999) *The Advisory and Regulatory Framework for Biotechnology: Report from the Government’s Review*

The answer to the question: *What lessons can be learnt from the Great GM Food Debate?* depends entirely upon whom is asking the question. This report is primarily concerned with those interested in the role of science in society. Of course, the GM food issue was not only or even primarily an issue to do with the role of science in society: it was also (and in many senses, more importantly) an agricultural, economic, environmental and political issue. However, GM foods are the result of science-based technology; and scientists and science correspondents played a significant part in the Great GM Food Debate.

It would appear to carry several obvious lessons for the scientific and science communication communities. First, even a single, unpublished (and therefore unauthenticated) scientific claim – given the “right” circumstances – can have an extraordinary impact on public debate and public opinion. Second, dealing with expert disagreement in socially sensitive areas of scientific research is extremely difficult. Third, when scientific or science-related issues become high profile news, events can move very quickly indeed – and not always in directions that scientists expect. Fourth, while low-profile science stories in the news are often handled by specialist science or technology correspondents, high-profile science stories are often the province of a wider range of journalists – up to and including newspaper editors. When this happens, the ways in which science is handled can also change significantly.

There is one further lesson to be drawn from the Great GM Food Debate which is not, perhaps, quite so obvious. For the most part, science and science-related issues are the subject of *reporting* in the media. Occasionally, however, such issues can become the target of *campaigning*. The rules of engagement of science and scientists with the media are completely different under conditions of reporting and campaigning. In the former case, scientists are viewed principally as expert sources of potentially interesting stories; in the latter they may be viewed as politically interested actors or even as bit-players in a drama whose real interest and significance lies elsewhere. Most of the discomfort experienced by scientists in the Great GM Food Debate was associated with the fact that a number of prominent newspapers chose to campaign on the issue of GM Food. The decision to campaign was a decision to politicise coverage of GM food; and it was this politicisation that gave the debate its characteristically confrontational and even raucous qualities.

The media do not campaign indiscriminately. As the *Sunday Times* discovered some years ago, when it conducted a lone campaign against the generally accepted scientific view of the nature and causes of AIDS, not every media campaign is successful; and an unsuccessful campaign can do considerable damage to a newspaper’s reputation. The media are in a close, interdependent relationship with the public, and that resonance between media coverage and public opinion is a key factor in shaping public debate. The opportunity for a media campaign on GM food was created by the steady divergence after 1996 between governmental and industrial policy on GM food, on the one hand, and public opinion on the other. Without such divergence, it is extremely doubtful whether any national newspaper would have felt able to launch an anti-GM campaign.

For those interested in the role of science in society, therefore, the implications are clear. If science policy relating to socially sensitive areas of scientific practice is allowed to diverge

too far from public opinion, the potential is created for populist media campaigning of a kind that scientists themselves are likely to find extremely uncomfortable. It is therefore in the interests of the scientific and science policy communities to ensure that policy and practice remain generally attentive to and respectful of the public. This is not, of course, to say that science policy should be overtly populist – on the contrary, it will sometimes be important for scientists and science policy-makers to argue publicly for things that are not inherently popular. The real lesson of the Great GM Food Debate, however, is that in a democracy, any significant interest – science included – ignores the public at its peril.

ANNEXES

ANNEX A METHODOLOGY

A1 Introduction

The method chosen for the quantitative analysis was a stripped-down version of classic content analysis. Classic content analysis was chosen over other methods of quantitative analysis by virtue of its ability firstly, to cope with large amounts of material and secondly, to allow for systematic (i.e. replicable and valid) comparisons on the basis of a common coding-frame. A coding frame constitutes a set of comparative core variables, designed to deliver a characterisation of coverage in terms of basic information about the article/programme, its attention structure, journalistic features and defined aspects of its content. In a fully comprehensive content analysis, information will also be coded for according to frames, thematic structures and evaluation; however, due in part to time restraints, this was incorporated qualitatively into the narrative account.

The unit of analysis is a single newspaper article, or radio/television news item, which is read/watched/listened to by the coders and interpreted in the light of the questions posed by the coding frame. Through the application of the coding frame, newspaper articles and radio/television news items are extensively 'indexed' so that they may be easily retrievable for further qualitative analysis. The results of the media content analysis are condensed into 'media profiles', which form the basis of the comparative analysis. In conjunction with measures of absolute intensity of articles on a week-by-week basis and the narrative account of events, the media profiles also provided a 'phase structure' for the debate.

All articles surrounding the GM foods debate were collected, as were all articles relating to other aspects of biotechnology. The only articles that were systematically omitted were those that referred to the use of 'DNA tests' in routine forensic inquiries; these were not considered relevant to biotechnology per se. Articles from *The Times* and *The Sunday Times* were retrieved from hard copy sources and their relevance was judged by eye. These articles were unique in their inclusion of all associated pictures and page numbers. Such information was not consistently available for any of the other newspapers. Articles from the *Guardian*, the *Observer* and the *Daily Telegraph* were collated from the web sites of the respective newspapers and were identified using the search commands 'gene', 'GM', 'biotech', 'DNA' and 'genetically modified'. Articles from the remaining newspapers (the *Daily Mail*, the *Mail on Sunday*, the *Independent*, the *Independent on Sunday*, the *Mirror* and the *Sunday Mirror*) were assembled from an on-line source – *FT Profile* – and were identified using the above search commands. Unfortunately, it was not possible to retrieve page/section details or pictures for many of those articles. The multiple methods of data collection outlined above were used for practical purposes and due to a restriction in the resources available. However, by comparing a sample of the hard copy and online data sets with a headline retrieval for the same newspapers on *FT Profile*, the data sets were found to be roughly equivalent.

Broadcast media were represented by the *Today Programme* (BBC Radio 4), *Newsnight* (BBC2), *Question Time* (BBC1), the *Nine O'Clock News* (BBC1) and select documentaries such as *Panorama* (BBC1). These news and current affairs programmes, were chosen because they have the largest audience ratings for programmes of their kind across Britain. Materials were collected by post from the *BBC Resources: Information and Archives* department in response to a search for the inclusion in the above programmes of any item

on 'genetics' or 'biotechnology'. Materials took the form of VHS videos (television material) and audiocassettes (radio material). All programmes were watched/listened to and coded where applicable according to the coding frame set out below with a brief summary of their content. However, the total sample size of broadcast material was considered to be too small for significance in a quantitative analysis, ruling out a comparison with the newspaper material. Thus, in the final analysis, our examination of the broadcast material is explicitly qualitative.

A2 The Coding Frame

Where the information was available/applicable, all newspaper, radio and television articles were coded for values under the following categories:

- *Basic information*: newspaper name, television/radio programme name, newspaper type (i.e. broadsheet or tabloid), month, day of month, year, weekday,
- *Attention structure*: page type/exposition, headline, size of article
- *Journalistic Features*: newspaper/programme section, news format, author
- *Content*: Focus, Definition of the term 'GM' within the article, Reference to 'BSE', 'CJD' and/or 'mad cow disease', Reference to 'organic farming/foods'

Some of the above values within the content category merit further explanation:

Focus

There are three distinct types of articles:

- those with a focus on GM foods or a related issue
- those with a focus on other areas of biotechnology or genetic issue
- those with solely passing references to GM foods.

This last set of articles are said to be 'spun-off' from the GM foods debate since their focus is not specifically on GM foods, which are mentioned as a frame of reference for other issues. A subcategory of spin-off articles are those where the reference to GM foods is metaphorical only, and the terms involved are 'recontextualised', so that they no longer reflect their original meaning. The inclusion of spin-off articles is important for the purposes of analysis, because they demonstrate the infiltration of the debate into broader departments of a newspaper and the emergence of the GM debate as a phenomenon in itself. Furthermore, to use 'GM' as a frame of reference in other, spin-off articles, assumes that the audience holds a certain level of familiarity with the subject.

Coverage of other areas of biotechnology was also recorded, to examine whether the GM debate had any knock-on effects on either the nature or intensity of output in this area.

Definition of the term 'GM'

During the course of the debate, 'GM' emerged as a shortening of the term 'genetically modified', and was widely used in all media. The occurrence of both the terms 'GM' and 'genetically modified' were documented for all articles, to assess their prevalence. Of particular interest, are the minority of articles in which the term 'GM' was used without further definition. Such occurrences provide further evidence of the assumed cognisance of the debate amongst the audience. Use of the term 'GM' without definition is a media shortcut, and represents an estimation of the level of public knowledge that is assumed to exist. It may also be an indirect measure of the media influence on public discourse, as supported by the addition in June 1999 of 'GM' to the *Oxford English Dictionary*.

Reference to 'BSE', 'CJD' and/or 'mad cow disease'

The BSE crisis was undeniably a major precursor to the GM debate of 1999 in the UK. It is likely that it was crucial in generating a mistrust of regulatory processes, and in alerting the public to some of the potential risks in food biotechnology. Mentions of 'BSE', 'CJD' and/or 'mad cow disease' in newspaper articles, TV and radio transmissions were therefore recorded to gain an empirical measure of their influence.

Reference to 'organic farming/foods'

During the course of the debate, the organic farming movement emerged as a leading opponent of GM foods. To gain some empirical measure of the influence of the movement on the course of the debate, mentions of 'organic farming/foods' were also documented.

A quality check on coder reliability was carried out on 5% of the sample by researchers at The Methodology Institute, London School of Economics and Political Science. Average reliability was calculated as 94%.

ANNEX B ANALYSIS

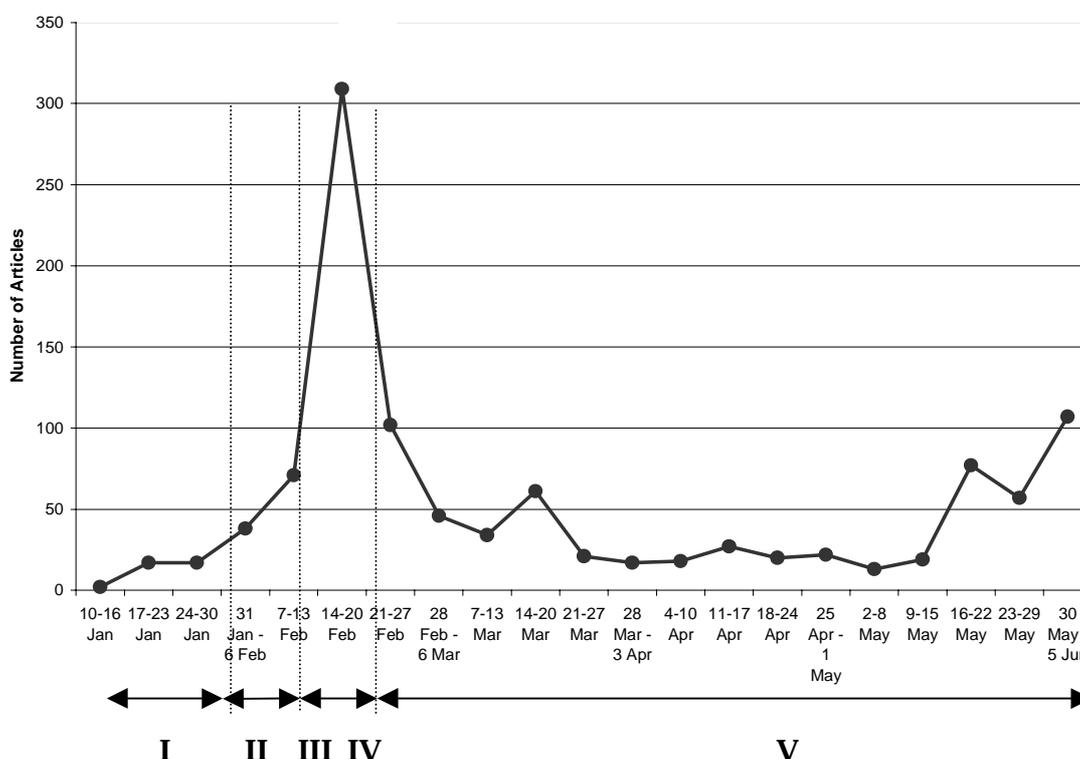
B1 Phase Structure Of The Debate

Through preliminary analysis of the intensity of news coverage over time and narrative accounts of events, we were able to divide the GM Foods Debate into 6 phases:

Phase I: <i>Prelude</i>	< 31 January '99	Background to the GM foods debate
Phase II: <i>Gathering Storm</i>	1 to 10 February '99	GM rises up the news agenda
Phase III: <i>Storm Breaks</i>	11-12 February '99	GM hits the headlines; the story breaks
Phase IV: <i>The Storm</i>	13-20 February '99	GM is a front-page story
Phase V: <i>Heavy Rain</i>	21 February to 8 June '99	GM remains a prominent story
Phase VI: <i>Isolated Showers</i>	8 June '99 onward	The current GM situation

These phases are clear from **Figure B1**, which shows the absolute intensity of newspaper coverage of GM foods over time:

FIGURE B1 TOTAL WEEKLY NEWSPAPER OUTPUT ABOUT GM , JANUARY-JUNE 1999



The phase structure of the debate also became evident through the quantitative analysis of media profiles of newspaper output.

B2 The Media Matrix

B2.1 Introduction

Newspaper articles were analysed quantitatively according to 'media profiles'. These classify newspaper output according to two criteria – the news *format* and the *focus* of the article. From qualitative analysis (see **Annex C**), it became clear that campaigning newspapers differed from non-campaigning newspapers in their style of coverage. Therefore, it seemed appropriate to use quantitative analysis to identify the role of

campaigning journalism in the debate. The preliminary analysis based on 'The Media Matrix' is not suitable for the television and radio data, since it relies on the *format* of the articles. This is not appropriate for television and radio news/current affairs items, because the programme in which they appear largely determines their format. Furthermore, due to the significantly smaller size of the broadcast media sample, it was not considered appropriate to carry out a quantitative analysis in the same way as for the newspaper sample.

B2.2 News Format

News

News articles report daily events, and are generally fairly straightforward in their journalistic style. Generally, the news reporter does not make any personal comment on the course of events.

Features

Feature articles focus less on events and more on the background of the issue. Although the writer of the feature has control over who is quoted or interviewed, in theory, such articles are supposed to be balanced, and the writers' own opinions should not be more than tacit.

Commentary

Commentaries are characterised by a direct statement of the opinion of the writer. They may take many forms, from editorials to regular columns, letters from the public and invited responses from non-journalists.

B2.3 News Focus

GM Foods

The article is directly about genetically modified foods, or some event that has taken place as a direct result of the debate surrounding GM foods. The issue may be framed by scientific, social, political and/or ethical arguments.

GM Spin-Off

Spin-off articles are not specifically about genetically modified foods, or the surrounding debate, but nonetheless make reference to it. Such articles are said to be 'spun-off' from the debate, or inspired by it. A subcategory of spin-off articles is those where the reference to GM is metaphorical only, and the terms involved are 'recontextualised', so that they no longer reflect their original meaning. The inclusion of spin-off articles is important for the purposes of analysis, because they represent the infiltration of the debate into broader departments of the newspaper and the emergence of the GM debate as a phenomenon in itself. Furthermore, for 'GM' to be used as a frame of reference in other, spin-off articles, it must be assumed that the audience holds a certain level of familiarity with the issues involved.

Other Biotechnology

It is likely that the GM debate has had an appreciable impact on the perception and portrayal of biotechnology as a whole, so it is of significance to record newspaper output in other areas during the same period. Articles on other aspects of biotechnology that make reference to the GM food debate are classified as 'spin-off' articles rather than 'other biotech' articles.

B2.4 The Resultant Matrix

Application of the criteria discussed above gives the following analytical matrix:

	News	Feature	Commentary
GM subject	x	x	x
Spin-off (<i>GM background</i>)	x	x	x
Other biotech (<i>non spin-off</i>)	x	x	x

B3 Newspaper Coverage: The Role of Campaigning Journalism

It may be hypothesised that the relationship between the style of newspaper coverage and the phase of the debate is symbiotic, both in the campaigning newspapers and the non-campaigning newspapers. Indeed, it may be possible to *define* the campaign status of a newspaper based on its Media Profile during the period.

Hypotheses:

- The media 'profile' of campaigning newspapers throughout the period will differ significantly from that of non-campaigning newspapers. Furthermore, the media profiles of newspapers will evolve as the debate progresses.
- The frequency of 'spin-off' articles will increase in all newspapers as the debate intensifies. This effect may be more pronounced in campaigning newspapers, reflecting how the issue permeates into all journalistic discourse, and the Editors' sensitivity to any article with a 'GM slant'. Similarly, the frequency of feature articles (both spin-off and GM focused) will increase as the debate intensifies.
- During the most intense phase of the debate, a campaigning newspaper reduces its coverage of non-GM biotechnology, whereas a non-campaigning newspaper sees an increase in non-GM coverage over the same period.
- A campaigning newspaper will devote a higher proportion of its output to commentary on the GM issue, than a non-campaigning newspaper. Furthermore, if the role of the campaigning newspaper is indeed crucial in driving the debate, such commentary will be noticeable before the story breaks.

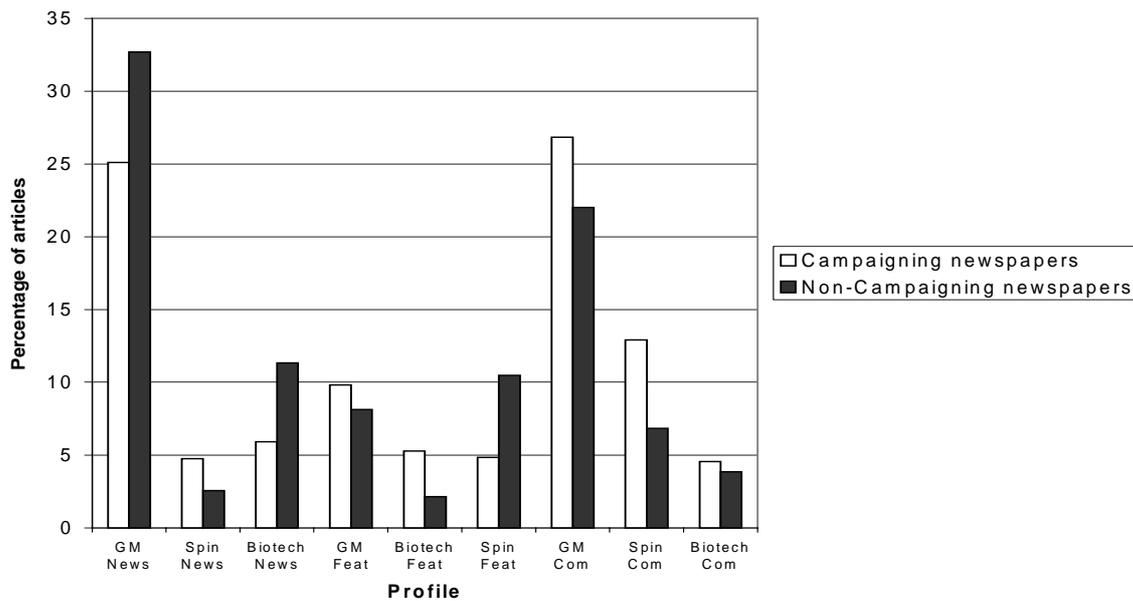
B4 Definition of 'Campaigning' versus 'Non-Campaigning' Newspapers

Campaign status was determined either because there was an explicit mention in a newspaper of a 'campaign' (the *Mirror*, the *Daily Mail* and the *Independent on Sunday*) or by an implicit style of campaigning journalism (the *Guardian*, the *Observer*, the *Mail on Sunday*, the *Sunday Mirror* and the *Independent*). This latter mode of campaigning was gauged both directly (by interviews with journalists involved in the reporting of the debate on the editorial stance of their newspaper) and by qualitative analysis of newspaper articles themselves (the frequent use of 'sensationalist' headlines, highly emotive language and calls for public involvement etc. – see **Annex C**). The remaining newspapers (the *Daily Telegraph*, the *Times* and the *Sunday Times*) appeared not to adopt a campaigning mode on GM food at all. These 'Non-Campaigning' newspapers, remained in a more conventional mode of reporting throughout the debate, and their use of emotive headlines and language was considerably less.

B5 Results

Newspaper articles were organised according to their campaign status and to the above Media Matrix. **Figure B2** below shows the media profiles for campaigning versus non-campaigning newspapers for the period 8 January to 8 June 1999.

FIGURE B2 CAMPAIGNING VS NON-CAMPAIGNING NEWSPAPERS: MEDIA PROFILES FOR 8TH JANUARY TO 8TH JUNE 1999



A Chi-Squared test was then performed to establish whether the Profiles of campaigning and non-campaigning newspapers were significantly different over the whole period (see **Table B1**). (Ho: The profile of campaigning newspapers is the same as that for non-campaigning newspapers, $v=8$, 5% confidence, $X_0 = 21.96$).

As $66.87 > 21.96$, Ho is rejected: the profile of campaigning newspapers is significantly different from that of non-campaigning newspapers.

TABLE B1 CHI-SQUARED TEST FOR CAMPAIGNING VS. NON-CAMPAIGNING NEWSPAPERS BY MEDIA PROFILE

Chi-squared test for campaigning vs. non-campaigning newspapers by media profile

			Campaign status		Total
			campaign	non	
Media Profile	GM News	Count	348	153	501
		Expected Count	374.5	126.5	501.0
	GM Features	Count	136	38	174
		Expected Count	130.1	43.9	174.0
	GM Commentary	Count	372	103	475
		Expected Count	355.1	119.9	475.0
	Spin-off News	Count	66	12	78
		Expected Count	58.3	19.7	78.0
	Spin-off Features	Count	73	10	83
		Expected Count	62.0	21.0	83.0
	Spin-off Commentary	Count	179	32	211
		Expected Count	157.7	53.3	211.0
	Other Biotech News	Count	82	53	135
		Expected Count	100.9	34.1	135.0
	Other Biotech Features	Count	67	49	116
		Expected Count	86.7	29.3	116.0
	Other Biotech Commentary	Count	63	18	81
		Expected Count	60.6	20.4	81.0
Total		Count	1386	468	1854
		Expected Count	1386.0	468.0	1854.0

A **chi-square test** is performed on a two-way frequency table to test whether two variables can be considered statistically independent. In calculating the chi-square test, the observed frequency in each cell is compared to the frequency which would be expected if the row and column classifications were independent. In this case, a chi-square test has been used to analyse the proportions of different types of newspaper article in two contrasting samples, that is, campaigning and non-campaigning newspapers.

Table continued overleaf

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	66.939 ^a	8	.000
Likelihood Ratio	66.660	8	.000
Linear-by-Linear Association	.167	1	.683
N of Valid Cases	1854		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 19.69.

Closer examination of newspaper profiles was then carried out by week and by phase in order to measure differences between campaigning and non-campaigning newspapers over time.

B6 Profiles by week

Line graphs were plotted in groupings according to campaign status and news format. Due to discrepancies in the sizes of the two groups, total frequencies for news, features and commentaries were standardised in relation to the frequencies of GM News in the week of 7-13 Feb for campaigning and non-campaigning newspapers respectively.

B6.1 The News Profile

As consistent with the defined phase structure of the debate, news output (as well as features and commentaries – see **Figures. B3 and B4** below) on GM foods steadily increases in both types of newspapers through the ‘Gathering Storm’ of the debate, rising sharply as the ‘Storm Breaks’, peaking during the ‘Storm’ and remaining high during the ‘Heavy Rain’. The subsidiary peaks in media attention on 14-20 March and 16-22 May coincide with:

- a mass retreat from the major supermarket chains (14-20 March)
- the simultaneous reports of the BMA and the Royal Society, together with a study published in *Nature* (claiming that pollen from genetically modified maize could kill a species of butterfly), a leaked letter from Sir Robert May to the RSPB, the announcement of two new genetics commissions and a joint report by the government’s chief medical adviser and chief scientific adviser (16-22 May).

FIGURE B3 CAMPAIGNING NEWSPAPERS - NEWS COVERAGE

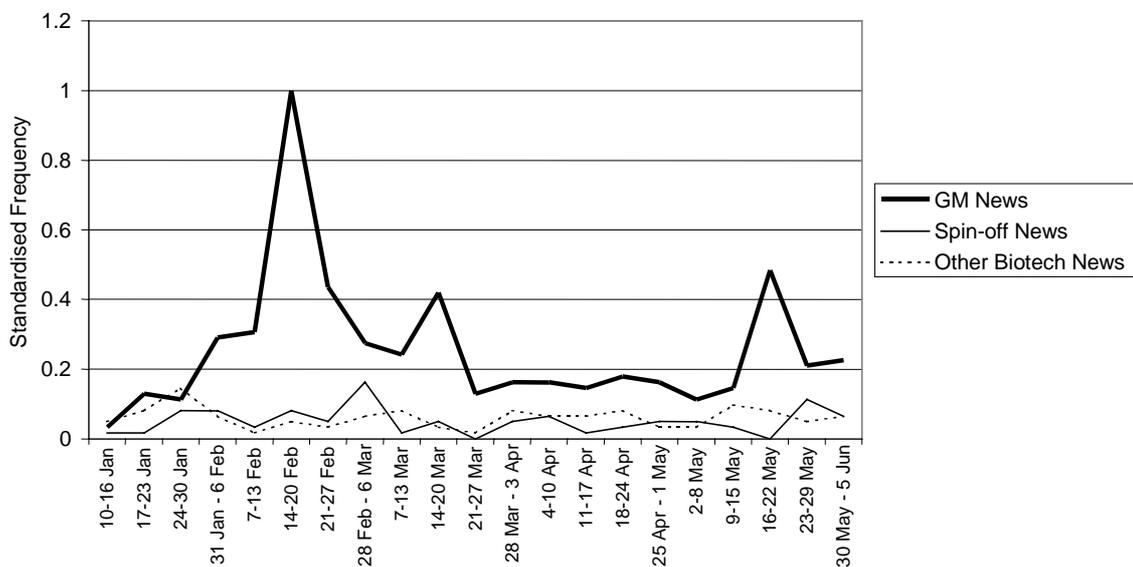
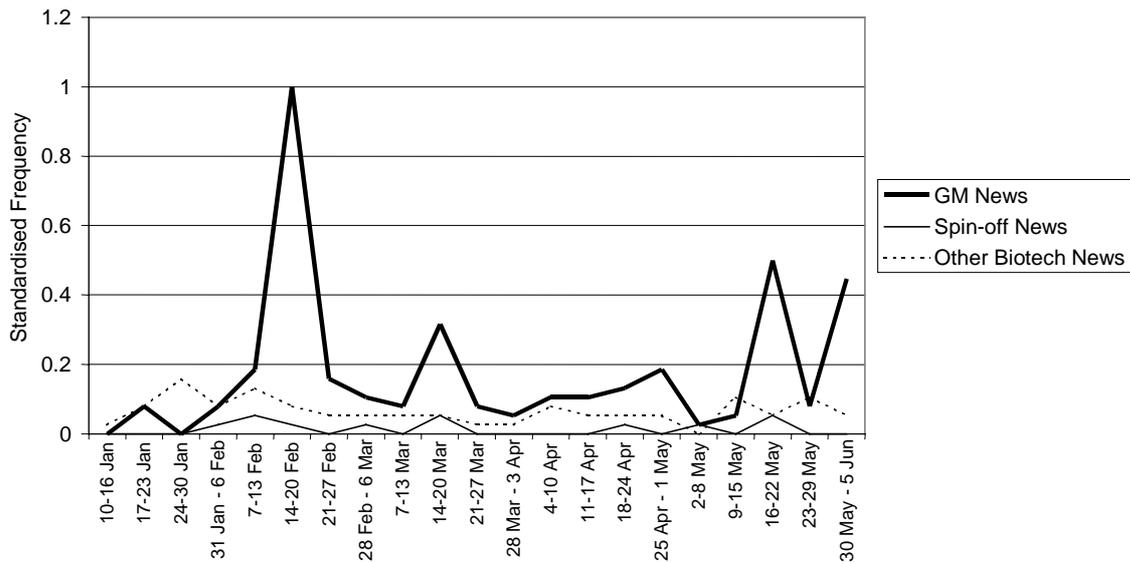


FIGURE B4 NON-CAMPAIGNING NEWSPAPERS - NEWS COVERAGE



The news coverage also shows that the debate surrounding GM Foods showed no signs of leaving the public arena in June, indeed it appeared to be re-emerging towards the end of the defined period. This coincided with the Prince of Wales' open commentary on GM foods (in an article in the *Daily Mail* on 1st June), together with the voluntary destruction of the first test field of GM crops by Captain Fred Barker, an acquaintance of the Prince.

Frequency of news articles before and after the storm breaks is higher in the campaigning newspapers relative to the non-campaigning newspapers. Frequency of spin-off articles is also slightly higher. Both these findings support the hypothesis that the campaigning newspapers were playing an active role in 'driving' the debate. Conversely, the relative frequency of other biotech news is higher in the non-campaigning newspapers than in the campaigning newspapers during the storm. This is further evidence to suggest that the campaigning newspapers were devoting most of their attention to the GM debate.

B6.2 The Features Profile

The frequency of feature articles on GM foods and on related issues (spin-off) is significantly higher in the campaigning newspapers than in the non-campaigning newspapers throughout the period. However, on average, frequency of other biotechnology features is greater for the non-campaigning newspapers relative to the campaigning newspapers. The only peak in the frequency of feature articles on other areas of biotechnology in the campaigning newspapers occurs when frequencies on GM foods are low. This may be assumed to be a period of 'low-newsworthiness' in the GM foods debate. The phase structure of the GM debate is reflected by the frequencies of features on GM foods in both types of newspaper. (See **Figures B5 and B6**)

FIGURE B5 CAMPAIGNING NEWSPAPERS - FEATURE ARTICLES

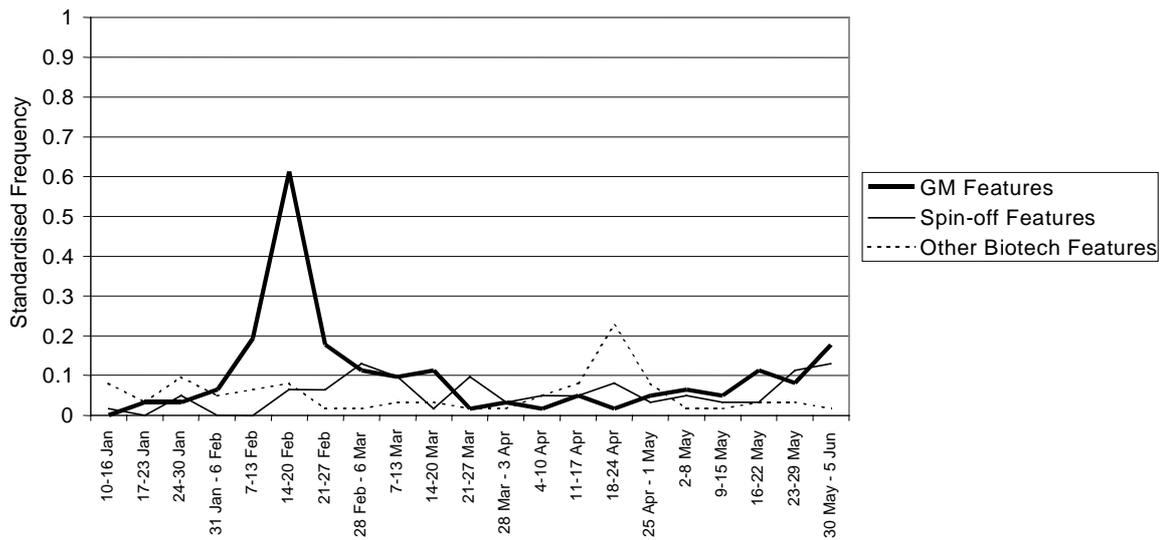
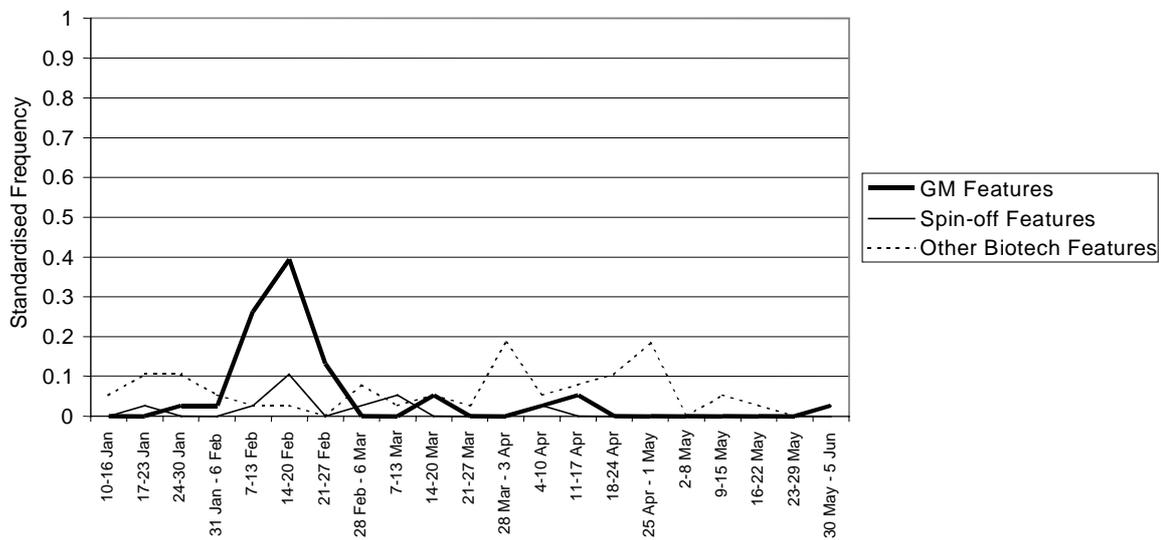


FIGURE B6 NON-CAMPAIGNING NEWSPAPERS - FEATURE ARTICLES



B6.3 The Commentary Profile

Commentary on GM Foods is dramatically higher in the campaigning newspapers than in the non-campaigning newspapers. Indeed, during the week of the “Storm”, commentary on GM foods in the campaigning newspapers is twice as frequent as their GM news output. Furthermore – and crucially if campaigning newspapers are indeed playing a role in driving the debate – commentary on GM in campaigning newspapers is intense in the weeks before the debate, but virtually non-existent in the non-campaigning newspapers in the same weeks. The issue also permeates the commentary in other areas in campaigning newspapers, as demonstrated by the relative frequencies of spin-off articles. (See **Figures B7 and B8.**)

FIGURE B7 CAMPAIGNING NEWSPAPERS - COMMENTARY OUTPUT

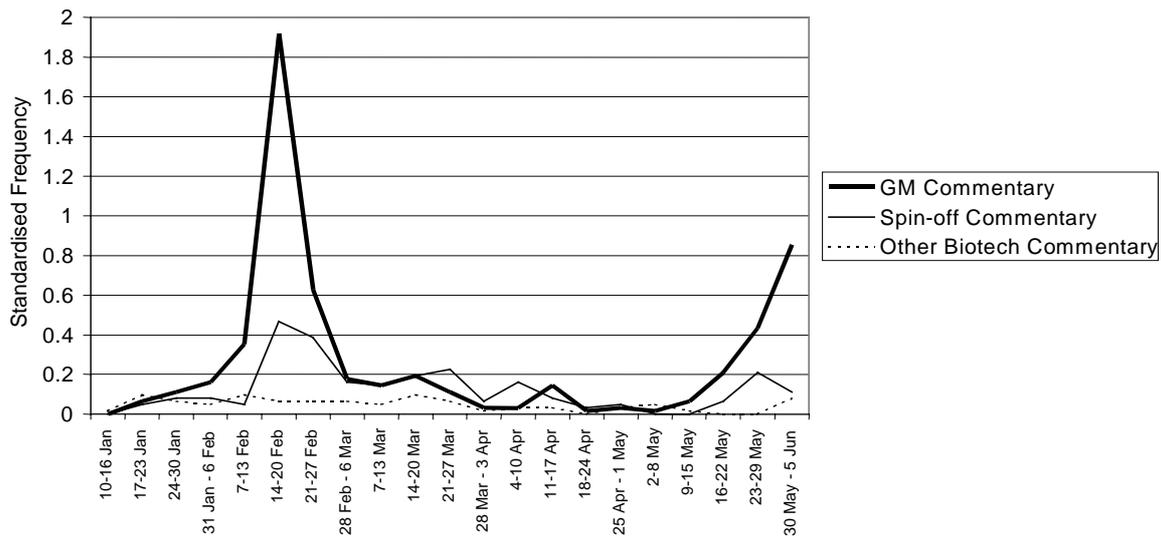
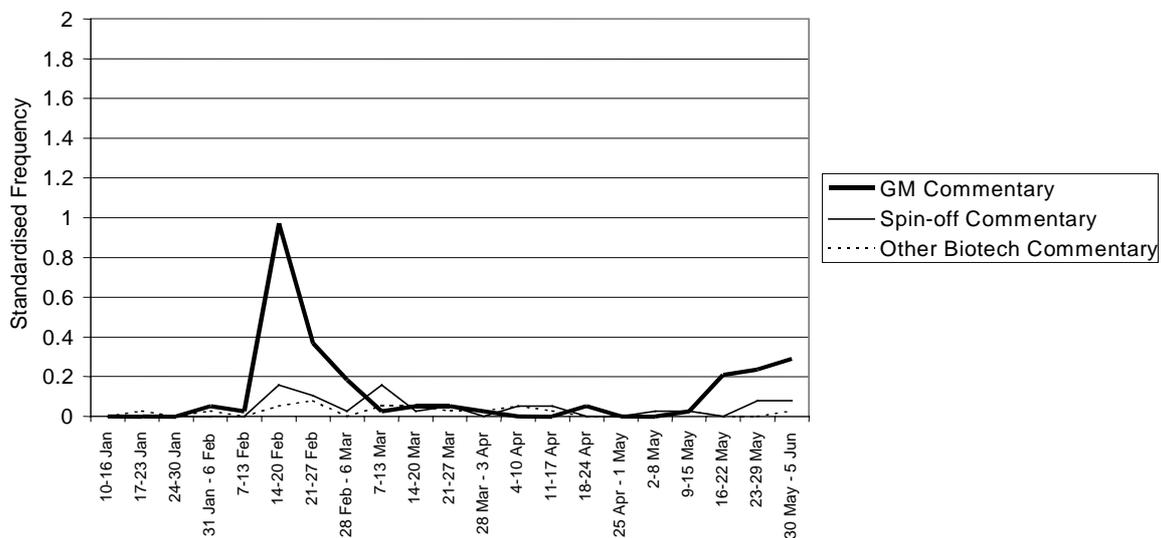


FIGURE B8 NON-CAMPAIGNING NEWSPAPERS - COMMENTARY OUTPUT



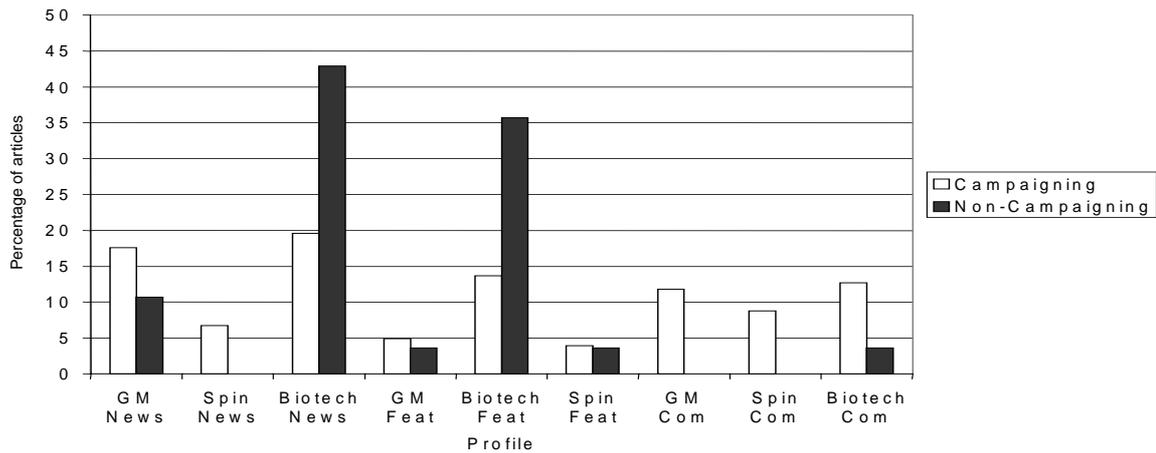
B7 Profiles by Phase

The following bar charts show *percentage* output of campaigning and non-campaigning newspapers for the media profiles by phase.

Phase I: Prelude

During the Prelude, the most notable difference between the campaigning and non-campaigning newspapers is that the campaigning newspapers are already beginning their commentary on GM foods whereas such commentary is absent in the non-campaigning newspapers. Mentions of GM foods are also slipping into the discourse of commentary in other areas (i.e. spin-off commentary) in the campaigning newspapers. Non-campaigning newspapers however, are marked by their high percentage output on other areas of biotechnology, and no commentary on GM foods. (See **Figure B9**).

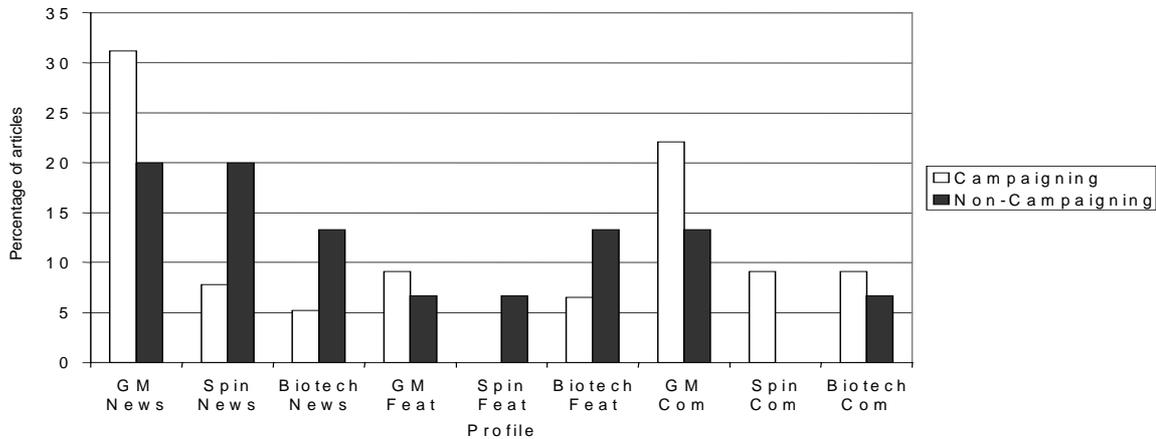
FIGURE B9 PHASE I:PRELUDE



Phase II: Gathering Storm

During the gathering storm, both newspaper types cover the news and begin (or continue) their commentary. News and commentary on GM foods increases from the previous phase, with 2/3rds of campaigning newspapers’ output devoted to GM foods. Non-campaigning newspapers continue to invest a sizeable proportion of their output to other areas of biotechnology, although less than during the previous phase. (See **Figure B10**).

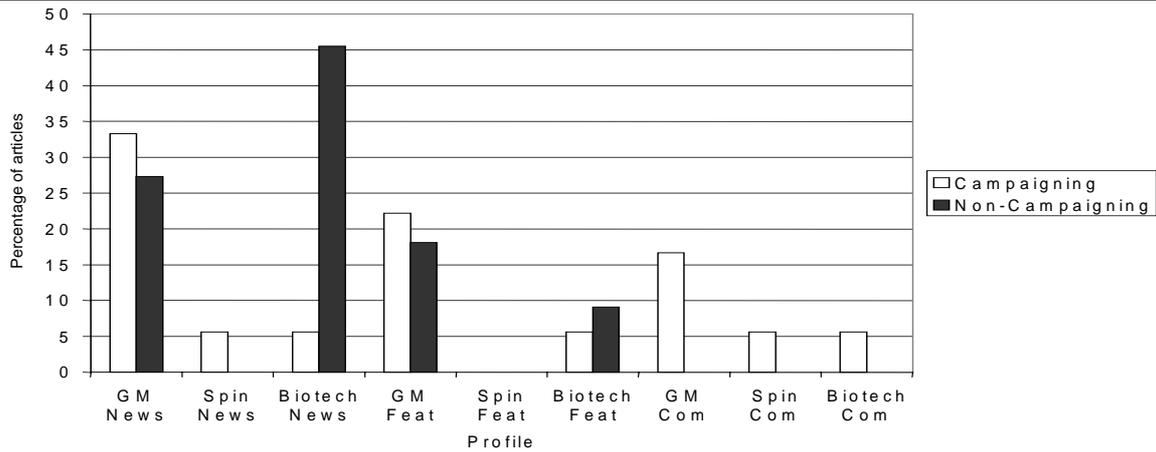
FIGURE B10 PHASE II: GATHERING STORM



Phase III: Storm Breaks

As the “Storm” breaks, more than 25% of output in both types of newspaper consists of news articles on GM foods. Feature articles also increase from previous phases. However, the most striking differences are (i.) non-campaigning newspapers print no commentary on GM foods, or related (i.e. spin-off) issues during these two days, and (ii.) non-campaigning newspapers devote 50% of their output to other areas of biotechnology (compared with only 10% in campaigning newspapers). Together with the profiles of the previous phases, there is growing evidence at this stage that the campaigning newspapers are playing a part in driving the campaign (i.e. by their higher levels of news coverage and commentary before and as the Storm breaks). (See **Figure B11**.)

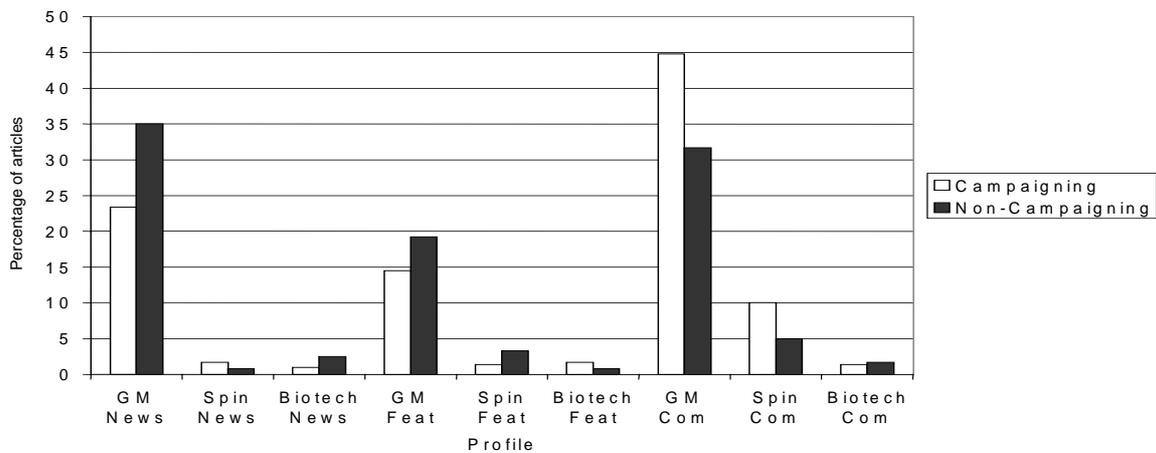
FIGURE B11 PHASE III: STORM BREAKS



Phase IV: The “Storm”

During the “Storm”, the profiles of the two types of newspaper are very similar. More than 75% of output in both newspapers is devoted to GM foods – news, features and commentary. However, the crucial difference between the two types of newspaper is that campaigning newspapers have significantly more commentary than news articles, whereas for non-campaigning newspapers the reverse is true (although the difference in format is less extreme). (See **Figure B12**.)

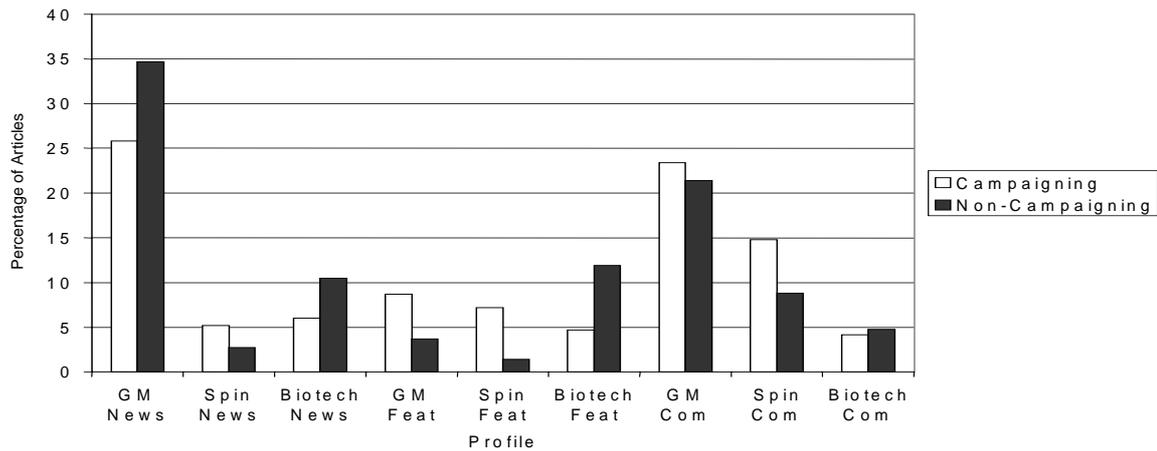
FIGURE B12 PHASE IV: STORM



Phase V: Heavy Rain

The above bias towards commentary vs. news articles on GM foods continues throughout this phase (except that overall, news articles are more frequent than commentaries). However, in both newspapers, spin-off news, feature and commentary articles emerge, albeit in greater proportions for campaigning newspapers than for non-campaigning newspapers. There is also twice as much news and feature coverage in non-campaigning newspapers than in campaigning newspapers. (See **Figure B13**.)

FIGURE B13 PHASE V: HEAVY RAIN



B8 Summary of Phases

Phase I: Prelude

Campaigning newspapers are already commenting on GM foods. Non-campaigning newspapers are marked by their devotion to other areas of biotechnology.

Phase II: Gathering Storm

News coverage, features and commentary on GM foods emerge in both types of newspaper, although in higher proportions in the campaigning newspapers. The proportion of output on other areas of biotechnology in non-campaigning newspapers is double that of campaigning newspapers, although markedly less than during the Prelude.

Phase III: Storm Breaks

GM news and feature output is high. However, non-campaigning newspapers devote more than 50% of their output to other areas of biotechnology, and produce no commentary on GM or related areas. Other areas of biotechnology receive significantly less coverage than the previous phases in campaigning newspapers.

Phase IV: Storm

GM news, features and commentary dominate; in campaigning newspapers the emphasis is on commentary, whereas non-campaigning newspapers concentrate on news. All attention to other areas of biotechnology is relaxed.

Phase V: Heavy Rain

Spin-off news, feature and commentary articles emerge in all newspapers, although to a greater extent in campaigning newspapers than in non-campaigning newspapers. The emphasis is on GM news and commentary. Over 30% of non-campaigning newspapers' output is devoted to other biotechnology issues, compared with less than 15% in campaigning newspapers. However, the proportions are markedly less than during the prelude and gathering storm.

B9 Conclusion

The contrasting media profiles of campaigning versus non-campaigning newspapers reflect their different agenda: The campaigning newspapers appear to be playing a critical

role in *driving* the debate while simultaneously being taken over by it, whereas the non-campaigning newspapers *follow* the debate while keeping abreast of other developments in biotechnology. This may be interpreted from the observation that commentary on GM foods begins in the campaigning newspapers long before the story breaks, and that they maintain coverage of GM foods during periods of low GM newsworthiness by increasing their proportional output of spin-off and feature articles. In the meantime, other areas of biotechnology receive less coverage once the storm has broken in all newspapers. However relative coverage in non-campaigning newspapers is significantly higher than in campaigning newspapers throughout the period.

B10 Further Analyses of Media Profiles

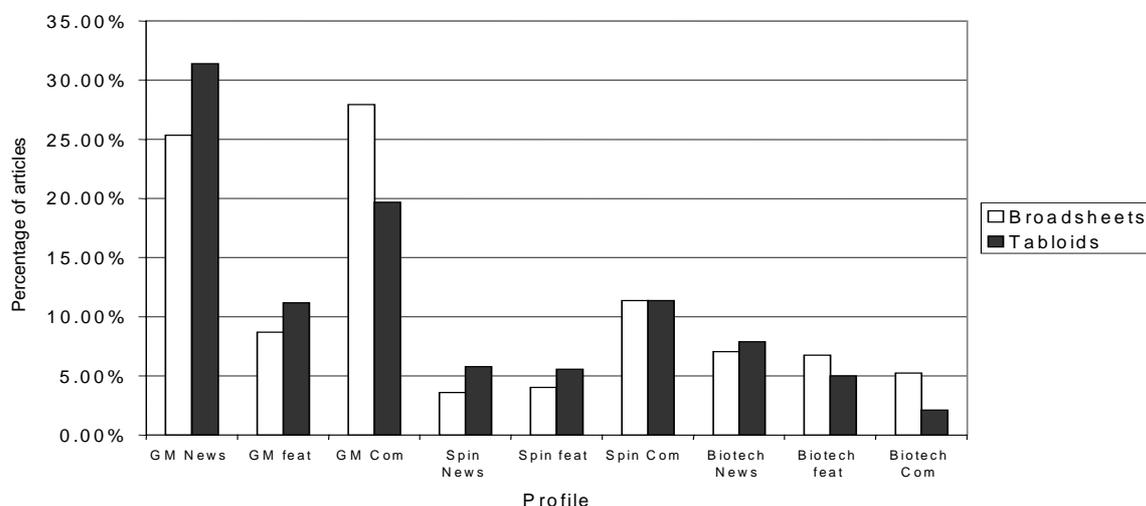
B10.1 Broadsheets vs. Tabloids

Both qualitative and quantitative analyses indicate that there is a considerable difference in the output of campaigning newspapers relative to non-campaigning newspapers during the Great GM Food Debate. However, further quantitative analysis was carried out to determine whether this difference could be accounted for by the different composition of the two groups. In this study, the campaigning group of newspapers consists of both broadsheets and tabloids, whereas the non-campaigning group of newspapers consists of broadsheets only. Therefore, it was necessary to carry out further quantitative analysis to determine whether the type of newspaper had an overriding effect on its output during the debate.

It was hypothesised that the differences between the media profiles of tabloid newspapers and broadsheet newspapers would be less marked than the differences between campaigning and non-campaigning newspapers. An additional hypothesis was that coverage of other areas of biotechnology would be less in tabloid than in broadsheet newspapers, because some of the tabloid newspapers do not have specialist science writers, unlike the broadsheets.

Figure B14 shows the media profiles of broadsheet and tabloid newspapers for the period 8 January to 8 June 1999.

FIGURE B14 BROADSHEETS VS TABLOIDS MEDIA PROFILES - 8TH JAN TO 8TH JUNE 1999



A Chi-Squared test was performed in the same way as previously described to establish whether the Profiles of broadsheets and tabloids newspapers were significantly different over the whole period. (Ho: The profile of broadsheet newspapers is the same as that for tabloid newspapers, $v=8$ degrees of freedom, 5% confidence, $X_0 = 21.96$). $X=34.35$, therefore as $34.35 > 21.96$. Ho is rejected: the profile of the broadsheet newspapers is significantly different to that of the tabloid newspapers. Furthermore, $34.35 < 66.87$, therefore it can be said that the differences between broadsheets and tabloids are not as marked as the differences between campaigning and non-campaigning newspapers.

On closer examination of the media profiles of the broadsheets and the tabloids in the different phases of the debate, the following points emerge:

- the differences between broadsheets and tabloids are less marked than the differences between campaigning and non-campaigning newspapers
- on average, the tabloids devote less attention to commentary on GM foods than do broadsheets, and more attention to GM news and features.

Therefore, it is likely that the high level of commentary in the campaigning newspapers derives from the broadsheets in the group rather than the tabloids. However, an exception to this general observation occurs in the first week of June, when commentary on the GM debate soars dramatically for both types of newspaper but more markedly in the tabloids. This is probably due to the publication of commentary on the debate by the Prince of Wales in the *Daily Mail*. Finally, as hypothesised, the tabloids devote less attention on average to other areas of biotechnology than do the broadsheets.

B10.2 The Times and The Sunday Times vs. The Independent and The Independent on Sunday

It was noted in the preliminary analysis that the campaigning newspapers were composed of a combination of broadsheet and tabloid newspapers, whereas the non-campaigning newspapers were composed of broadsheets only. Therefore, in order to establish whether the composition of the two groups was significant, two *broadsheet* newspapers (including their Sunday editions), whose roles in the opinion-leading press were considered to be mutually equivalent but whose campaign status differed, were compared. The *Times* and the *Sunday Times* were chosen for comparison with the *Independent* and the *Independent on Sunday*.

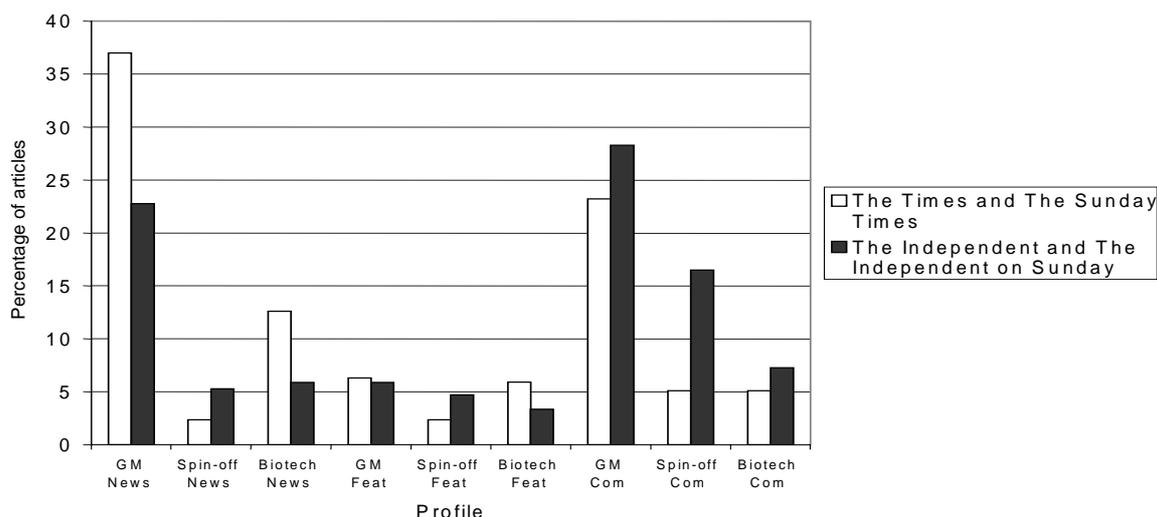
It was hypothesised that if the differences between campaigning and non-campaigning newspapers were more marked than the differences between broadsheets and tabloids - as the previous analyses suggest - then the differences between the *Times* newspapers and the *Independent* newspapers would be as marked as the differences between the campaigning and non-campaigning newspapers. An additional hypothesis was that the *Independent* newspapers would devote a greater proportion of their output to commentary on the GM issue than the *Times* newspapers, as is consistent with their difference in campaign status.

Figure B15 shows the media profiles of the *Times* and the *Sunday Times*, and the *Independent* and the *Independent on Sunday* for the period 8 January to 8 June 1999.

A Chi-Squared test was performed to establish whether the Profiles of the *Times* and the *Independent* newspapers were significantly different over the whole period. (Ho: The profile of the *Times* newspapers is the same as that for the *Independent* newspapers, $v=8$

degrees of freedom, 5% confidence, $X_0 = 21.96$). $X = 50.60$, therefore as $50.60 > 21.96$ H_0 is rejected: the profile of the *Times* newspapers is significantly different from that of the *Independent* newspapers. Furthermore, although the differences between the *Times* and the *Independent* newspapers are not as marked as the overall differences between campaigning and non-campaigning newspapers (because $50.60 < 66.87$), they are nevertheless more marked than the differences between broadsheets and tabloids (because $50.60 > 34.35$). This is consistent with the hypothesis that the *campaign* status of a newspaper has a greater effect on the media profile of a newspaper than its *type*.

FIGURE B15 THE TIMES VS THE INDEPENDENT MEDIA PROFILE FOR 8TH JANUARY TO 8TH JUNE 1999



After further examination of the media profiles, the following may be summarised: Total output over the period in the *Independent* newspapers was twice that observed in the *Times*, a finding that is consistent with the higher (standardised) frequencies of the campaigning newspapers than of the non-campaigning newspapers. However, total output during Phases III and IV (the Storm Breaks and the Storm) was approximately the same in the two stables of newspaper. On average, the proportion of commentary on GM food and related issues is greater in the *Independent* newspapers than in the *Times* newspapers. This is also consistent with their respective campaign statuses. Indeed, during the peak period (the Storm), the intensity of commentary in the *Independent* newspapers on both the GM issue, and on spin-off issues is more than twice that in the *Times* newspapers. Conversely, during the Storm, the frequency of GM news articles is much greater in the *Times* newspapers than in the *Independent* newspapers (24 versus 15 news articles respectively). This bias towards news in the *Times* newspapers and commentary in the *Independent* newspapers is consistent with the differences between non-campaigning and campaigning newspapers. Although total coverage of other biotechnology does not seem to be significantly different in the two newspapers; the attention paid to other areas of biotechnology compared with GM food is less in the *Independent* newspapers, even before the Storm breaks. This finding is consistent with the differences between campaigning and non-campaigning newspapers. Therefore, the proportion of tabloid newspapers in the group may account for lower relative frequency of articles on other areas of biotechnology in the campaigning newspapers during the debate.

ANNEX C QUALITATIVE ANALYSIS OF THE PRINT MEDIA FOR THE PERIOD 10TH TO 21ST FEBRUARY 1999

The following is a summary of qualitative analysis of the GM debate for the period 10th to 21st February 1999 (i.e. from when the story breaks to when the story hits the front pages). News and leader articles were analysed qualitatively using *Atlasti* computer software²² for all newspapers.

This breaking phase of the debate is dominated by controversy. The two characters on which the controversies are centred are Dr Arpad Pusztai (the dismissed geneticist from the Rowett Institute) and Lord Sainsbury (the Science Minister, a member of the supermarket-owning family). The main frame is that of health, although emerging themes are the relationship between government and industry, labelling and environmental issues.

Given these two main controversies, it becomes clear that several of the newspapers are 'fuelling' the debate and setting the agenda. Furthermore, the qualitative analysis has reinforced quantitative observations about the differences between campaigning and non-campaigning newspapers. Throughout the following summary the use of emotive language by the different newspapers is noted. The summary has three parts, although they are not mutually exclusive:

- Identification of campaigning newspapers
- Agenda setting in campaigning newspapers
- Scaremongering, misinformation and sensationalism

C1 Identification of Campaigning Newspapers

From qualitative analysis, individual newspapers (including those [marked * below] that were not included in the quantitative analysis) appear to be ranked according to the intensity of their campaigns as follows:

*Daily Mail, Mail on Sunday, Express** and *Express on Sunday**

Independent on Sunday

Guardian and *Observer*

Mirror and *Mirror on Sunday*

Independent

Times, Sunday Times and *Telegraph* and *Sunday Telegraph**

Daily Mail and Mail on Sunday

An active campaign against GM foods was launched by the *Daily Mail* on 6 February 1999, although the newspaper appeared to be campaigning implicitly for weeks before this date. The *Mail on Sunday* did not launch an official campaign, but continued to campaign implicitly throughout the debate. The *Daily Mail* has been an active player in the debate, characteristically campaigning 'on behalf of its readers'.

²² *Atlas.ti* is a software package for the visual qualitative analysis of large bodies of textual, graphical and audio data.

The Daily Mail, 6-February 1999

Leading Article: *An Issue Of Concern To Every Reader*

Today the Mail launches a campaign to alert the public to the dangers of genetically modified 'Frankenstein' foods. New Labour's handling of this most sensitive issue of food safety has so far been shambolic, naive and blithely indifferent to the genuine concerns of millions of British consumers... The time has come for a long, hard, independent assessment of the potential risks. Tony Blair should ignore the lobbyists and order a moratorium forthwith on GM foods.

The Daily Mail, 10-February 1999

News: *The Mail forces Sainsbury's to label Frankenstein food.*

Sainsbury's is to label hundreds of products containing 'Frankenstein food' derivatives in a major victory for Daily Mail readers. The country's second biggest supermarket chain revealed the U-turn yesterday amid allegations that it had been 'misleading' shoppers... Consumers are angry that the products were introduced without any proper consultation or any study on their long-term effect on human health.

The Independent on Sunday

The *Independent on Sunday* launched a campaign against GM foods on 7th February 1999, just days before the story broke:

The Independent on Sunday, 7-February 1999

Leader: *Act now on GM*

Today we urge the Government to take two important actions on genetically modified food: the first is to declare a three-year freeze on developing modified crops; the second is to insist that all products containing modified food are clearly labelled.

The Guardian and the Observer

The *Guardian* ran a series called 'The Food Revolution' on 16, 17 and 18 December 1997 that summed up the alarms (and promises) about GM food. In 1999, the newspaper did not launch an official or explicit campaign, but was responsible for a 'push' on 12th February, when it published a letter of protest from 22²³ international scientists against the dismissal of Arpad Pusztai. Both the *Guardian* and the *Observer* played an agenda-setting role during the week of 'the Storm' with extensive reportage of both the Pusztai affair and the controversy surrounding Lord Sainsbury.

The Guardian, 12-February 1999

Leader: *Flaws in the food chain: We need a moratorium*

The pressure for a moratorium on genetically modified food - at least until more rigorous testing has been done - is beginning to look like a tidal wave.... Tony Blair may feel that he is a victim of another media bandwagon - on to which Mr Hague was quick to jump. But that is not true. There is a growing consensus of people and experts of all persuasion deeply concerned about this leap into the unknown. Mr Blair should seize the initiative and declare a moratorium until further research can satisfy the burgeoning band of doubters.

²³ Sometimes the number is reported as 20.

The *Mirror* and the *Mirror on Sunday*

The *Mirror* launched a labelling campaign on 15th February 1999 during the week of the storm. However, its editorial stance appeared even stronger, calling for a suspension of sales of genetically modified food.

The *Mirror*, 13-February 1999

Leader: *Voice Of The Mirror: Thought For Food*

WHY is the Government so stubborn about genetically modified food? We don't know if it is dangerous - no one does. But no one knows if it is safe, either... Surely it is better to be safe than sorry? Which means suspending sales of all genetically modified food. Before the first disastrous case of its effect on humans is reported

The *Mirror*, 15-February 1999

News: *Label Frankenstein Food: Mirror's 'Label It All' Plea.*

The *Mirror* today launches a campaign to have all food products labelled if they contain genetically modified organisms.

The *Independent*

The *Independent* did not launch an explicit campaign against GM foods. However, as quantitative analysis has shown, its style of coverage – both the intensity and the amount of commentary – is debatably closer to campaigning newspapers than non-campaigning newspapers.

The *Times*, the *Sunday Times* and the *Daily Telegraph*

None of the above newspapers showed signs of campaigning either for or against GM foods during 'the storm'. Rather than playing an active role in driving the debate, they appeared to be simply reporting 'events' as they happened. The *Sunday Telegraph* probably also falls into this category, although it was not included in the analysis.

The *Times*, 19-February 1999

Leader: *Food Wars: The other risks from the GM fiasco*

Governments need stiff resolve when faced with any food or health scare. Impetuous action to satisfy public alarm can have disastrous, long-term consequences. The current furore over genetically modified (GM) crops and food is no different. Bending to public concern by placing a moratorium on their commercial growth or sale, as green activists wish, could have disastrous ramifications for prosperity and world trade. The letter published yesterday by five Cabinet Ministers displays an awareness of the potential benefits GM technology can bring, but its release into an environment already affected by hysteria does not bode well for progress.

C2 Agenda Setting and Controversy in Campaigning Newspapers: Pusztai, Lord Sainsbury, Leaked Reports and Monsanto

As mentioned, the breaking phase of the debate was dominated by controversy. As well as Dr Arpad Pusztai and Lord Sainsbury, Monsanto and the issue of Government secrecy were also attacked. Several newspapers appeared to be playing an active role in 'fuelling' controversies in these four areas:

Pusztai

The story broke on Friday 12th February as a group of 22 scientists (although varyingly reported as 21 or 20) from around the world publish a statement in the *Guardian*

supporting the work of Dr Arpad Pusztai. In the *Guardian* and in the tabloids, Pusztai is described as being 'vindicated' by these 'top' researchers. In the *Independent*, *Times* and *Telegraph*, the statement is presented less emphatically:

The *Guardian*, 12-February 1999

News: *Top researchers back suspended lab whistleblower*

Twenty-two prominent scientists have signed a public statement in support of suspended food scientist Dr Arpad Pusztai, who lost his job last year for warning the British public of possible risks associated with the way bio-technology companies were introducing genetically modified food without long-term feeding trials. The scientists from 13 countries state that their independent examination of all the published data shows that Dr Pusztai was right to be concerned and should never have been attacked or suspended.

The *Mirror*, 13-February 1999

News: *Put A Five-year Freeze On Frankenstein Food: Pressure Grows On Ministers*

THE campaign to ban genetically modified food for at least five years reached fever pitch last night. The clamour for the Government to take urgent action followed fresh fears that Frankenstein foods could harm our health. One expert warned of a possible 'Doomsday scenario' if production continues. And in a sensational twist, 20 scientists backed the man who was ridiculed for warning of health risks. Dr Arpad Pusztai's research showed modified potatoes fed to rats weakened their immune systems and shrunk their internal organs, including their brains. In humans, that could lead to more cancer cases and more deaths during epidemics like the recent flu outbreak.

The *Daily Mail*, 12-February 1999

News: *GM scientist 'proved right': Government urged to recheck discredited expert's findings*

The *Independent*, 13-February 1999

News: *GM food critic is vindicated*

The *Times*, 12-February 1999

News: *Scientists back critic of Gene modified potatoes*

The *Telegraph*, 12-February 1999

News: *Alarm over 'Frankenstein' foods*

Lord Sainsbury

As with the Pusztai affair, the controversy surrounding Lord Sainsbury, the Science Minister, begins before the story breaks, adding weight to the idea that a debate on GM foods was brewing and was perhaps inevitable. The *Guardian* and the *Mail* (and their respective Sunday equivalents) played crucial roles in driving the controversy and setting the agenda through investigation into Lord Sainsbury's affairs and speculation about a conflict of interest.

Mail on Sunday, 24-January 1999

News: *Store Cards To 'Spy' On Gene Food Shoppers*

The Government is secretly planning to use supermarket loyalty cards to snoop on whether shoppers are buying controversial genetically modified foods... according to Whitehall insiders. The disclosure will fuel a row over the Government's support for

genetically-modified foods... Science Minister Lord Sainsbury, former head of the supermarket chain, has been accused of having a conflict of interests because he runs a charitable foundation investing millions on research into the products.

The *Guardian*, 15-February 1999

News: *Call for Lord to go over GM food row*

Conservatives called yesterday for Lord Sainsbury of Turville, the billionaire scion of the supermarket dynasty, to be removed as Science Minister in the wake of the row over genetically modified food... The peer had a taste last month of the conflict between his business interests and his role as Science Minister when it was disclosed he was involved in the preparation of a special supermarket video which extols the wonders of GM food.

On 16th February 1999, the *Guardian* attempted to make a connection between the two controversies, by accusing Lord Sainsbury of owning the patent rights to the promoter gene that Pusztai feared may have been causing damage to his rats. The newspaper is forced to apologise the following day, as it emerges that their accusation is wrong; Monsanto in fact owns the patent.

The *Guardian*, 16-February 1999

Front page: *Revealed: Lord Sainsbury's interest in key gene patent*

(Lord Sainsbury) owned for 11 years the company which controls the worldwide patent rights over a key gene currently used in the genetic modification process... The same gene is at the centre of the food scandal revealed last week in the *Guardian* which has split the Government and has led to calls for a moratorium on the release of modified foods and provoked demands for an independent ethics commission to look at the whole issue...It is likely that today's revelations will increase opposition pressure on Lord Sainsbury to resign.

The *Daily Mail*, 16-February 1999

News: *Sainsbury's Link To 'Cauliflower Gene'*

Lord Sainsbury personally owns one of the most important ingredients used worldwide to create 'Frankenstein food', it emerged last night...

On 17th February 1999, the editor of the *Guardian*, Alan Rusbridger, was forced to apologise for the mistake over the ownership of a patent for a particular gene used in the genetic modification process. As his links with the biotech industry were examined further, the debate moved on to question whether Lord Sainsbury had stepped out of meetings where policies that potentially conflicted with his own interests were discussed. However, newspapers did not all agree whether the problem was that he had to leave the meetings, or whether he should have been present in the first place. Accusations continued throughout the week.

Leaked Reports

The most widely covered 'hidden' report during the week of the 'Storm' was in fact published by ACRE²⁴ on 18th February. It detailed the potential effects of genetically modified crops on wildlife, and it may have been responsible for bringing to closer attention the environmental issues surrounding GM crops.

²⁴ Advisory Committee on Releases to the Environment (1999) *The Commercial Use of Genetically Modified Crops in the United Kingdom: the Potential Wider Impact on Farmland Wildlife*

The Daily Mail, 17-February 1999

News: *Mutant Crops' Threat To Wildlife*

A leaked Government report confirms campaigners' worst fears that genetically-modified crops could wipe out some of Britain's favourite farmland birds and wildlife... The document, which deals a new blow to the Frankenstein food companies' ambitions and vindicates the warnings of green lobby groups, concludes there must be 'Greater understanding' of the potentially catastrophic effects on wildlife.

The Independent, 17-February 1999

News: *Threat to wildlife report suppressed*

A Government report warning that genetically modified crops posed a threat to British wildlife has been shelved indefinitely, it emerged last night...

The Mirror, 18-February

News: *Bird Threat 'Cover-up'*

Ministers yesterday denied stifling a damning report on the effects of Frankenstein foods on the countryside...

The Guardian, 19-February 1999

News: *Gene crops could spell extinction for birds*

The Times, 18-February 1999

News: *Wildlife risk to be investigated*

The Telegraph, 19-February 1999

News: *Report raises fear of faster decline in farm wildlife*

Monsanto

Monsanto is attacked continuously throughout the debate, and some newspapers were attempting to set the agenda by insinuating 'cosy' links between the government and the biotechnology company.

The Daily Mail, 13-February 1999

News: *They Couldn't Be Closer To Blair. So Why Are These Men Working For The World's Biggest Genetic Food Firm And Opening Doors To The Highest Level Of Government?*

A Daily Mail investigation of Parliamentary records... (revealed that) two men who played key roles in Labour's election triumph are helping the multimillion-pound campaign to persuade the public to eat 'Frankenstein food'. The party's former chief spokesman, David Hill, advises GM food giant Monsanto on media presentation while Tony Blair's American pollster and strategist Stan Greenberg has done in-depth consultancy work for the firm."

The Independent on Sunday, 14-February 1999

News: *Labour pays GM giants to expand in UK*

Genetic engineering giants, including Monsanto, have been offered millions of pounds in taxpayers' money to encourage them to expand their presence in the United Kingdom."

The *Independent on Sunday*, 21-February 1999

News: *Revealed: False data misled farmers*

Monsanto, the genetic engineering company, included false information about a genetically engineered crop it wants to sell in a safety assessment submitted to government advisers.

News: *Monsanto pleads guilty to flouting rules on crops*

Monsanto, the controversial biotech giant at the heart of the growing row over 'Frankenstein foods', will this week plead guilty to criminal charges of flouting rules over the planting of genetically modified (GM) crops... The development will be a huge embarrassment for the company, which has been aggressively promoting GM foods. It could not have come at a worse time for the US multinational with the country in an uproar over the issue, and the *Independent on Sunday's* campaign attracting massive political and public support.

C3 Scaremongering and Sensationalisation

In addition to some of the 'sensationalist' headlines and reporting found earlier in this summary, below are some further headlines from the Storm that may be construed as being sensationalist, scaremongering and/or misinformed.

The *Daily Mail*, 15-February 1999

News: *Safety fears at 70 sites testing GM Crops*

While many are technical breaches of the rules, others at the 340-plus GM sites are believed to involve failure to guard against cross-pollination. This, it is feared, could lead to the creation of indestructible super-weeds, strangling the countryside and wiping out wildlife.

The *Daily Mail*, 15-February 1999

Features: *This Crippled Mother Is A Victim Of The World's First Disease Triggered By Genetic Modification. She Has A Chilling Message For Worried British Consumers: The lesson from an American woman who took a 'natural' sleeping pill*

As she lay on her bed last night, coughing uncontrollably and racked with pain, she had a simple message for British consumers who are bewildered by the fast-moving claim and counterclaim of the GM debate. 'Nobody knows for certain what the long-term result of genetic modification will be,' she said. 'You allow this food to go on sale, and every trip to the supermarket will become a game of Russian roulette.'

The *Daily Mail*, 18-February 1999

News: *The soya judged fit for humans after being fed to fish*

The *Mail on Sunday*, 14-February 1999

News: *Hidden Perils Of GM Products We Eat*

The Pusztai case has raised fears that GM foods already on our supermarket shelves are a health time bomb... The danger is that they (*the modified genes*) could be taking something else with them. A prime suspect (although it has not yet been investigated) would be a 'Construct' which is used to kickstart the new genes in modified crops. It contains, among other things, fragments of cauliflower mosaic virus. This virus occurs naturally and we have probably all eaten it at some time. But the version used by the GM food makers has been altered to make it unlike anything in nature.

The *Sunday Mirror*, 21-February 1999

News: *Fears For Britain's Water Supply*

The water industry has admitted it has grave concerns over the safety of drinking water close to genetically modified crops. Water experts warned the Government of their fears 10 years ago, but these were ignored.

The *Mirror*, 16-February 1999

Front Page *The Prime Monster: Fury As Blair Says: I Eat Frankenstein Food And It's Safe*

The *Express*, 15-February 1999

Front Page: *Protests at move to 'cannibalism': Human genes found in GM food*

The *Express*, 17-February 1999

Front Page: *Is baby food safe?*

The *Express*, 18-February 1999

Front Page: *Mutant crops could kill you*

**ANNEX D EXCERPT FROM THE 'TODAY PROGRAMME', BBC
RADIO 4, 12 FEBRUARY 1999.**

John Humphrys Last year, a highly respected British scientist, Professor Arpad Pusztai, caused great concern when he made public research that he had carried out into genetically modified foods and confirmed the worst fears of many people about the risks involved. Within days he was sacked from his job at the Rowett Research Institute in Aberdeen, and ordered to keep quiet about it all. Now 20 leading scientists from around the world have said not only was he right all along, but the dangers are even worse than he'd thought at the time. The Labour MP Alan Simpson, says Pusztai has been totally vindicated.

(Pre-recorded excerpt from an interview with Alan Simpson).

JH Well on the line now is Dr Jack Cunningham who is the Cabinet Office Minister with responsibility for coordinating the Governments' genetically modified policy. And with me in the studio Dr Vyvyan Howard, who's Head of Research in Foetal Toxicology at Liverpool University. Dr Howard, is he right?

Vyvyan Howard Um, I think that Dr Pusztai who has done some direct hazard assessment on these genetically modified potatoes, has come up with some unexpected findings, they're not the ones he thought he would find, but having done that he has spoken out and said that these really need to be taken seriously. And I think he's right. What this tells is that we have to be rather cautious about how we proceed. Before this it's been thought that just to analyse the composition of these plants could be adequate to tell us that they are safe. But clearly these feeding experiments which have shown reduced organ weight in some cases and an alteration in the immune response or a measurement of the immune response, means that we're going to have to test these plants rather like pharmaceutical agents.

JH Which takes years?

VH It takes years and it costs about \$400 million to bring a new drug to the market. And that's mainly because of the level of testing. And we consume food in a lifetime in tonnes, with a drug we would expect to take it for a couple of days in milligrams or micrograms for a good reason, voluntarily, but with food we have to take it.

JH But the fact is we're eating this stuff pretty well everyday?

VH Well, that's right. It's becoming increasingly difficult to avoid...

JH And we're growing more of it?

VH Yes, and that's clearly been a policy of the biotech industry, to try and just flood the market so that there's no choice and then it's a *fait accompli*.

JH Dr Cunningham, why is the Government not saying there must be a moratorium?

Dr Cunningham John, the Government's primary duty is to protect people and the environment, and we take advice from a number of bodies: English Nature, the Advisory

Committee on Novel Foods and Processes, the Advisory Committee on Releases to the Environment...

JH And English Nature has told you there should be a moratorium. You've chosen to ignore their advice.

JC No, that is not true actually. What English Nature has said, and I quoted them accurately in the House of Commons, is this, 'English Nature is not against genetic modification, per se...

JH No, I didn't say they were.

JC Well, contrary to what has been reported we are not asking for a moratorium on commercial release of all genetically modified crops. That's a quotation from a letter from the chairman of English Nature to the Prime Minister and to me. We are not ignoring their advice. That's totally untrue...

JH Dr Howard

VH Well, I understood that they were asking for a moratorium, and certainly that's what a number of us are now asking for. It's time for us to actually think about how we want to perform hazard assessment on these crops. That's the basic message that comes through...

JH So why, Dr Cunningham, are you being so selective about the advice that you choose to obey?

JC We're not being selective. We act on the best available scientific advice. And just let me say in respect of the dispute which is now involving the Rowett Institute, that whatever happened there is a matter for the institute and not for the government...

JH No, but we have 20 international scientists all saying Dr Pusztai was right, and they are deeply worried as Dr Howard has just told us for reasons he has explained. He is worried that the government seems to be saying, 'Let's go ahead with it', and people are deeply puzzled by that.

JC No, we are not saying, 'Let's go ahead with it', you said earlier that we are growing more and more genetically modified food...

JH Yes

JC ...in this country. There is no commercial growing of genetically modified food...in this country

JH (speaking over Dr Cunningham) I didn't say it was commercial growing. We're experimenting in a large way with fields and fields and fields of genetically modified crops in this country.

JC We need to test these crops and experiment, exactly to find out whether they do have harmful effects on the environment. That is the whole purpose of the work that is

being proposed. And incidentally, since people seem to think that I'm misquoting English Nature, just let me give another quotation from the letter, from the Chairman of English Nature...

JH Well I'd sooner you dealt with the 20 scientists who are holding a news conference today from around the world to say why they are so worried.

JC Well I can't deal with the 20 scientists until they submit to us what it is they are saying, and since they have not yet submitted anything yet to the government, to me or any other minister in the government, how can we comment on it? When...

JH (interrupting) But Dr Cunningham, when an endless stream of people have been coming to the government over the last years and saying, 'We are deeply worried about this'. And what puzzles an awful lot of people is that you yourself are prepared to ban beef-on-the-bone, even though your scientists have told you the risks involved are passingly, vanishingly minute, and yet here is something that could – I emphasise could because of course we don't know – could cause the most horrendous diseases, could destroy the environment, and yet you are saying, 'Let it rip'.

JC No, I am not saying, 'Let it rip'. You're saying, 'Let it rip', I'm saying that is not an accurate reflection of what is happening...

JH (interrupting) Why not a moratorium then? Give us time.

JC A moratorium on the experimental work is neither necessary, nor sensible in the circumstances. If we stopped testing what is proposed, we would bring the whole thing grinding to a halt, and there's no evidence to support that proposal...

JH Stop the stuff entering the food chain.

JC What I am trying to say to you is the following. We, this government, is introducing labelling of food. The previous government opposed labelling. We are setting up...

JH It is ineffective labelling, as you well know. Even if it exists.

JC Well how do you know that? It hasn't been introduced yet.

JH Well, we've seen it introduced for all sorts of food, and we know exactly what happens; it is minuscule lettering invariably and you can not effectively label all foods. Every bit, pretty well nowadays, the scientists tell us pretty well every bit of processed food we eat has some genetically modified organism in it. You're gonna label *everything*? People can't cope with that; we're not *scientists*.

JC We haven't introduced the labelling yet, and I don't agree with what you're saying...

JH Why not then?

JC Well, is this a monologue John, or am I allowed to join in this conversation?

JH It's a question. Why haven't you introduced it yet?

JC We have been working in conjunction with the food industry and we are now consulting the catering industry, to agree how it should be introduced. We've got international obligations; we've got to work with our European colleagues. The fact is we are taking ahead the issue of labelling, where the previous government objected to labelling. We are establishing an advisory committee on animal foodstuffs, which the previous government was advised to do and declined to do. We have set in place an examination of all the advisory systems, and our other bodies who bring to the ministers attention evidence and scientific assessments of what is going on to make sure that that is robust and comprehensive. And we have for the first time a Cabinet committee looking comprehensively at these matters across government. The suggestion that we are not doing anything, or that we are allowing, in your ridiculously inaccurate words, to 'Let things rip', simply doesn't bear examination...

JH (interrupting) The fact is we're eating this stuff day in and day out. And can I tell you what it is – you'll have known this because you read the papers as well as I do – what concerns many people is that the government is under great pressure from the massive multinational companies, like Monsanto, and you are listening to them and you're not listening to a lot of other people to whom you should be listening.

JC Well, that is also wrong because just yesterday we voted *against* an application to introduce a genetically modified seed into agriculture in Europe. So your suggestion, which I absolutely reject, that somehow we are doing what industry wants us to do, and not taking careful assessments and noting the advice of people who are there to give us statutory and other advice, is simply not true.

JH (speaking over JC) So why not a moratorium?

JC We voted against this application yesterday, which demonstrates quite clearly that where we believe there is a problem, we will not allow these things to proceed.

JH Jack Cunningham, Dr Howard – thank you both very much.

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