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# **Public Perceptions of Genetically Modified Food and Crops, and the *GM Nation? Public Debate on the Commercialisation of Agricultural Biotechnology in the UK***

## **Main Findings of a British Survey**

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# Introduction

This report presents the initial descriptive findings of a comprehensive empirical study of public attitudes towards genetically modified (GM) food and crops, and of general public's levels of awareness, understanding and perceived value of a public debate on the commercialisation of agricultural biotechnology occurring during the summer of 2003.

The UK government-sponsored public debate on the commercialisation of genetically modified (GM) crops is a unique experiment in the governance of technological innovation and risk. The Agriculture and Environment Biotechnology Commission (AEBC), the independent body which provides strategic advice to government on biotechnology issues affecting agriculture and the environment, in itself a novel institutional innovation, signalled the need for such a debate in 2002. The public debate, which has been named *GM Nation? The Public Debate*, has been steered by an independent committee along the lines envisaged by the AEBC (DTI, 2003).

In November 2002 the *Understanding Risk* team, an interdisciplinary consortium of academics drawn from four institutions, were appointed as independent evaluators of this important experiment in participatory democracy concerning the possible commercialisation of GM crops in the UK.<sup>1</sup> The evaluation of the debate has been a multi-method one, combining qualitative and quantitative approaches, and drawing in particular on our strengths in observational fieldwork, survey work, and in-depth interviews. Most of the fieldwork has been focused upon those *directly* involved in the debate, including the observation of the debate planning process, observation of both public and closed meetings and issuing questionnaires to the participants of these meetings, interviewing representatives of engaged stakeholder organisations, and monitoring and analysing media coverage of the debate (for details see Horlick-Jones, Walls, Rowe, Pidgeon, Poortinga and O'Riordan, 2004). In order to examine the context in which the debate process has taken place, and in particular of lay views on that debate, we have also conducted a more general survey of impacts upon public attitudes towards the end of the debate process. This survey had two main objectives:

- To examine public perceptions of GM food and agricultural biotechnology in general, in particular possible shifts in public sensibilities, awareness and knowledge of risk issues in relation to GM food and crops. The latter may be examined by comparing the results with a UEA/MORI survey conducted in 2002 (see Poortinga and Pidgeon, 2003a).
- To investigate public awareness, perceptions and understanding of the GM debate process itself.

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<sup>1</sup> See <http://www.uea.ac.uk/env/pur/index.html> and <http://www.gmnation.org.uk>.

# The Survey

## Procedure and Respondents

Data for this study were collected between 19 July and 12 September 2003. A quantitative survey was administered in Britain (England, Scotland, and Wales) by the market research company MORI. A national representative quota sample of 1,363 people aged 15 years and older was interviewed face-to-face in their own homes. The interviews were carried out using fully trained and supervised market research interviewers and took on average about thirty minutes to complete. The overall sample was made up of a core British sample of 1,017 interviews, a booster survey in Scotland of 151 interviews and a booster survey in Wales of 195 interviews.<sup>2</sup> The survey sample was run in Enumeration Districts (EDs) that were randomly selected with a probability proportional to the size of the population.<sup>3</sup> Interviewers approached selected addresses within these EDs until they reached the quotas for gender, age and work status. The quotas reflected the actual profile of each ED. A maximum of one interview per address was conducted. The booster surveys were conducted in order to be able to compare public perceptions of GM food in England, Scotland and Wales.<sup>4</sup> All frequency data have been weighted to the known profile of the British population in terms of age, gender, social class and region, as presented in Table 1.

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<sup>2</sup> Fieldwork for main survey: 19 July – 26 August; fieldwork for Scottish booster: 11 August –26 August; fieldwork for Welsh booster 11 August –12 September.

<sup>3</sup> By way of information, EDs or enumeration districts are the smallest building blocks of the census (The census is a count of all people and households in the UK and is normally taken every ten years). EDs make up wards, which in turn make up constituencies. An ED averages about 150-200 households, with the range of households in an ED being 80-500.

<sup>4</sup> The comparative analyses between England, Scotland and Wales will be the subject of a separate report.

## The Questionnaire

The questionnaire consisted of three main sections. The first two sections were used to examine public perceptions of GM food and crops in general. More specifically, the first section presented respondents with a set of questions similar to those asked in a survey conducted in summer 2002 (this study is described in the following section). In addition to public perceptions of GM food in general, this section was aimed at capturing possible shifts in public sensibilities, awareness and knowledge of risk issues in relation to GM food. The second section contained questions that were adapted from the *GM Nation?* public debate questionnaire (DTI, 2003). These questions were designed to measure specific risks and benefits associated with GM food and crops. Note that, while the first section only contained questions on GM food, the additional set of questions in the second section refers more widely to attitudes to GM food *and* crops. The third section of the survey contained questions specifically developed to evaluate the *GM Nation?* public debate on the commercialisation of agricultural biotechnology. This section of the survey mainly focused on public awareness of the debate, as well as people's views and understandings of the value and impacts of the GM debate process itself. The specific questions are reported in Appendix G.

**Table 1. Characteristics of the 2003 survey sample.**

Characteristic		%	Characteristic		%
<b>Gender</b>	Male	49	<b>Level of Education</b>	No formal	24
	Female	51		GCSE	25
<b>Age</b>	15-24	13		Vocational/ NVQ	8
	25-34	21		A level	15
	35-44	18		Bachelor degree	16
	45-54	16		Postgraduate	4
	55-64	13		Other/ Don't know	12
	65 and older	19	<b>Marital Status</b>	Married	47
<b>Class</b>	AB	22		Cohabiting	11
	C1	30		Single	23
	C2	19		Widowed	8
	DE	28		Divorced	6
<b>Income</b> <sup>a)</sup>	Low	18	Separated	2	
	Average	27	<b>Employment Status</b>	Full-time	45
	High	21		Part-time	11
	Don't know/Refused	36		Unemployed	7
	<b>Ethnic Background</b>	White		93	Retired
Black		2		Student	5
Asian		3	Disabled	3	
Other		1	Looking after children	6	

Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363); Note: a) Low: <£11,500 gross per annum, Average: £11,500 to £30,000, High: ≥ £30,000.



## **The UEA/MORI Risk Survey 2002**

To measure change over time, a set of identical questions on GM food has been included in the current survey and compared to data from a major survey of public attitudes to science, governance and risk, prior to the commencement of the AEBC debate. Between 6 July and 31 July 2002 a national sample of 1,547 respondents aged 15 years and older was interviewed. The total sample of the 2002 survey comprised five separate quota samples of about 300 respondents, each covering one of five core risk cases of the *Understanding Risk* programme, i.e., Climate Change, Radiation from Mobile Phones, Radioactive Waste, GM food and Genetic Testing. The overall sample, as well as the five sub-samples, matched the demographic profile of the British population. Here we use the sub-sample of 296 respondents that were interviewed in 2002 about GM food as a baseline for the present follow-up survey associated with the GM debate.<sup>5</sup> For a more elaborate description of the results of the *UEA/MORI Risk Survey 2002* see Poortinga and Pidgeon (2003a).

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<sup>5</sup> Characteristics of the *unweighted* 2002 GM Food sub-sample (n=296): Gender: Male 45%, Female, 55%; Age: 15-24 15%, 25-34 19%, 35-44 17%, 45-54 17%, 55-64 12%, 65+ 22%; Class: AB 19%, C1 32%, C2 14%, DE 35%; Income: Low 18%, Average 25%, High 19%, Refused 37%; Ethnic Background: White 97%, Black 1%, Asian 1%, Other 1%; Level of Education: No formal 33%, GCSE 20%, Vocational 8%, A level 12%, Bachelor degree 14%, Postgraduate 3%, Other 9%; Marital Status: Married 47%, Cohabiting 9%, Single 24%, Widowed 10%, Divorced 8%, Separated 2%; Work Status: Full-time 45%, Part time 8%, Unemployed 6%, Retired 26%, Looking after house/children 6%, Student 6%, Other 2% (see Poortinga and Pidgeon, 2003a).

# Public Attitudes to GM Food and Crops

## GM Food in Context

### *GM Food in Context*

When studying risk issues, such as the GM controversy, it is important to consider that people may be interested in a range of other personal and social issues. Controversial issues surface in a society that already has to deal with numerous other questions, with which risk issues have to ‘compete’ for attention. To put the issue of GM food into context, respondents were first asked to indicate the importance value of twenty *Personal* (P) and *Social* (S) issues (see Table 2). In addition, people were asked to indicate the personal importance of the issue of GM food. These answers are reported in Table 2 on a 5-point scale, ranging from “not at all important”, to “very important”.<sup>6</sup>

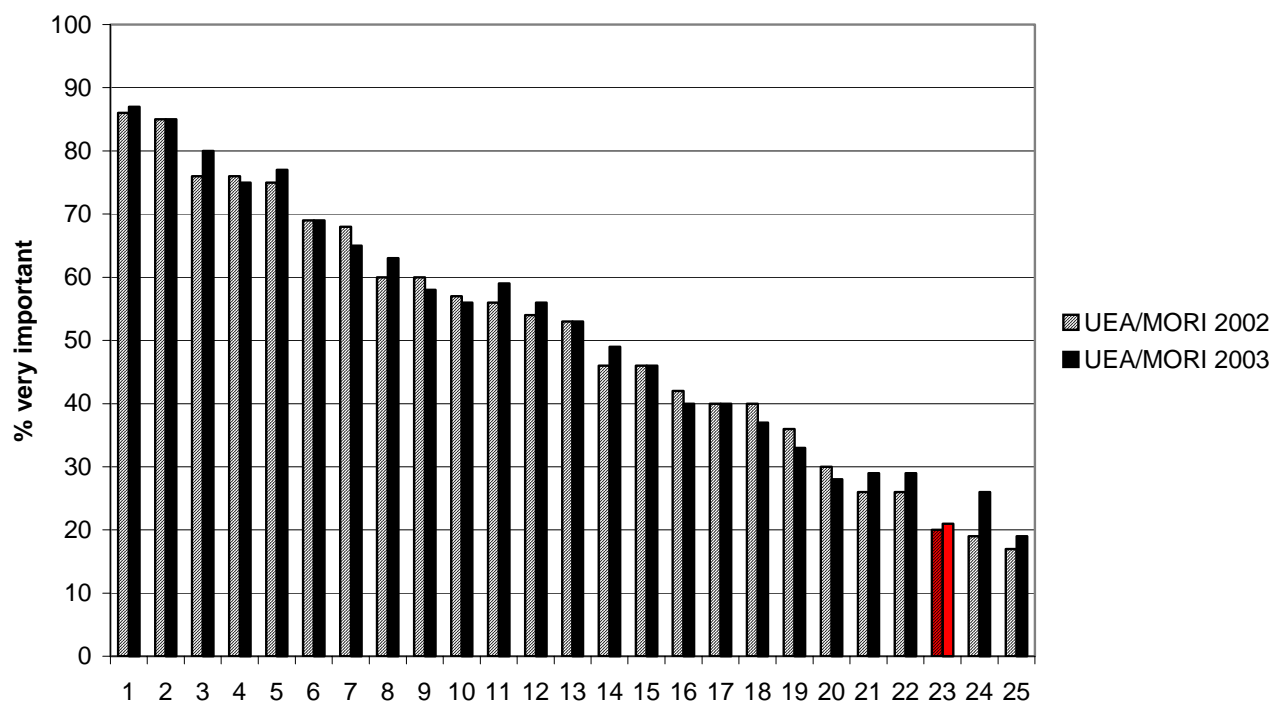
**Table 2. Risk in context: The importance of various personal (P) and social (S) issues (%)**

	Not at all important		Neither/ Nor		Very Important	Don't know
Your Health (P)	0*	0*	2	10	87	0*
Partner and Family (P)	1	1	4	10	85	0*
Law and Order (S)	0*	1	3	16	80	0*
Personal Safety (P)	0	0*	4	18	77	0*
Education (S)	1	2	4	17	75	0*
Being Independent (P)	0*	1	6	23	69	0*
Your Privacy (P)	1	1	6	26	65	0*
Terrorism (S)	1	2	9	24	63	1
Environmental Protection (S)	0*	2	7	31	59	0*
Having a Comfortable Life (P)	0*	1	7	33	58	0*
Personal Finance (P)	0*	1	7	36	56	0*
Social Relations/Friends (P)	0*	1	8	34	56	0*
RADIOACTIVE WASTE	3	3	14	26	53	1
Animal Welfare (S)	2	3	14	31	49	0*
The Economy (S)	1	2	12	37	46	1
Excitement/Fun (P)	2	2	18	36	40	0*
Work (P)	9	4	14	32	40	1
Tackling World Poverty (S)	3	3	20	36	37	0*
Tackling Human Rights (S)	2	3	20	42	33	1
Population Growth (S)	3	5	29	32	29	1
GENETIC TESTING	5	5	25	33	29	3
CLIMATE CHANGE	3	5	25	39	28	1
RADIATION FROM MOBILE PHONES	8	7	29	27	26	2
<b>GM FOOD</b>	<b>9</b>	<b>8</b>	<b>33</b>	<b>26</b>	<b>21</b>	<b>3</b>
Religion (P)	17	11	35	17	19	0*

**Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363); Note: \*) These non-empty cells (<0.5) were rounded to 0.**

<sup>6</sup> The full wording and original coding of this question (0,1,2,3,4) are given in Appendix G (Q1).

In Table 2 it can be seen that the most important issue was Health. Eighty-seven percent of the respondents said that Health is very important to them personally. Other issues that were very important to more than three-quarters of the general public were Partner and Family (85%), Law and Order (80%), Personal Safety (77%), and Education (75%). Eight issues were very important to more than half of the respondents: Being Independent (69%), Your Privacy (65%), Terrorism (63%), Environmental Protection (59%), Having a Comfortable Life (58%), Personal Finance (56%), Social Relationships/Friends (56%), and Radioactive Waste (53%). Slightly less important were Animal Welfare (49%), The Economy (46%), Excitement/Fun (40%), Work (40%), Tackling World Poverty (37%), and Tackling Human Rights (33%). These issues were important to less than half but more than a third of the respondents. Table 2 shows that the least important issues included Population Growth (29%), Genetic Testing (29%), Climate Change (28%), Radiation from Mobile Phones (26%), GM food (21%) and Religion (19%). Table 2 shows a clear pattern: most personal issues (P) can be found in the upper regions of the table, while social issues (S) are mainly found in the lower regions (including GM food), the same pattern as found in the 2002 survey. Indeed, only very minor differences in importance of the various personal and social issues were found between 2002 and 2003 (see Appendix A).



**Figure 1. Importance of various personal and social issues.<sup>7</sup>**

<sup>7</sup> 1=Your health, 2=Partner and family, 3=Law and order, 4=Education, 5=Personal safety, 6=Being independent, 7=Your privacy, 8=Terrorism, 9=Having a comfortable life, 10=Personal finance, 11=Environmental protection, 12=Social relations/Friends, 13=Radioactive waste, 14=Animal welfare, 15=The economy, 16=Work, 17=Excitement/Fun, 18=Tackling world poverty, 19=Tackling human rights, 20=Climate change, 21=Population growth, 22=Genetic testing, **23=GM food**, 24=Radiation from mobile phones, 25=Religion.

Figure 1 shows that Radiation from Mobile Phones (+7%) and Law and Order (+4%) saw the largest increase in importance between 2002 and 2003. Likewise, Terrorism, Environmental Protection, Animal Welfare, Population Growth and Genetic Testing were important to more people in 2003 than in 2002 (+3%). Interestingly, Privacy, World Poverty and Human Rights were important to fewer people in 2003 than in 2002 (-3%). The importance of the other social and personal issues, as well as the issue of GM food has remained fairly stable compared to 2002.

#### *Interest in GM Food*

Despite the *relative* unimportance of GM food, it appeared that people are fairly interested in this issue. Table 3 shows that, although thirty percent of the respondents were not very interested and ten percent was not at all interested, a majority (56%) said that they were fairly or very interested in the issue of GM food. Table 3 also shows that the level of interest in the issue of GM has only slightly changed between 2002 and 2003. Interest in the issue of GM food is somewhat lower in 2003 than in 2002, and the proportion of the public that has no opinion is slightly up.

**Table 3. What would you say is your level of interest in the issue of GM food? (%)**

	2002	2003
Very interested	22	15
Fairly interested	38	41
Not very interested	25	30
Not at all interested	14	10
No opinion	1	4

Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363); UEA/MORI Risk Survey 2002 (Weighted dataset, n=296).

## General Evaluation of GM Food

### *Affect*

There is growing evidence that people's initial affective response is an important part of the way in which lay perceptions of risk issues are constructed (see e.g. Finucane, Alhakami, Slovic, Johnson, 2000; Langford, 2002; Slovic, Finucane, Peters & MacGregor, 2002; Poortinga and Pidgeon, under review). That is, people's general orientation towards an issue (whether it is 'good' or 'bad') may function as a filter influencing the way subsequent information is processed. Two questions were asked to assess people's general affective evaluation of GM food.

**Table 4. On the whole, how would you describe your feeling about GM food? (%)**

	2002	2003
Very good thing	2	2
Fairly good thing	13	12
Neither good nor bad thing	35	40
Fairly bad thing	25	24
Very bad thing	19	16
No opinion	5	6

**Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363); UEA/MORI GM Food Survey 2002 (Weighted dataset, n=296).**

Although Table 4 shows that most people could be found in the middle (forty percent in 2003 said that GM food was neither a good nor a bad thing), the overall pattern of responses was clearly skewed towards the negative. That is, whereas 40% of those asked thought that GM food is a bad thing, only 14% thought that GM food is a good thing.

A similar pattern emerged when using a slightly different question (not used in 2002). When people were asked how they feel about GM food, 15% said that they feel positively, 50% said that they feel negatively, and 35% said that they feel neither positively nor negatively about GM food (see Table 5).

**Table 5. In general, how do you feel about GM food? (%)**

Very positively	3
Somewhat positively	12
Neither positively nor negatively	35
Somewhat negatively	26
Very negatively	24
Not stated	1

**Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363);**

There are no obvious differences in people's general affective feelings towards GM food between 2002 and 2003. Table 4 shows that also in 2002 a large proportion of adults could be found in the middle (35%). Moreover, a sizeable minority of 44% thought that GM food is a bad thing, while only 15% thought that GM food is a good thing.

### Concern

People were asked how concerned they are about GM food. People could answer this question on a 5-point scale, ranging from "not concerned at all" to "very concerned".<sup>8</sup> Table 6 shows that a majority of the general public (51%) are concerned about GM food, whilst only 17% is not. About one third of the general public (31%) could be found in the middle. Table 6 also shows that about one third (32%) agreed and almost half (48%) disagreed with the statement "I am not that bothered about GM food". Only 17% neither agreed nor disagreed with the statement. Similarly, 40% disagreed, 31% agreed and 23% neither agreed nor disagreed with the statement "The idea of GM food fills me with dread".

**Table 6. Concern about GM food. (%)**

	<b>Strongly Disagree</b>	<b>Tend to Disagree</b>	<b>Neither/ Nor</b>	<b>Tend to Agree</b>	<b>Strongly Agree</b>	<b>No opinion</b>
I am not that bothered about GM food	25	23	17	25	7	2
The idea of GM food fills me with dread	15	25	23	17	14	5
	<b>Not at all Concerned</b>	.	<b>Neither/ Nor</b>	.	<b>Very Concerned</b>	<b>No opinion</b>
Concern about GM food	11	6	31	27	24	2

**Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363).**

Comparing the results with the 2002 survey (see Appendix B) reveals that concern about GM food has noticeably increased.<sup>9</sup> Whereas in 2002 about one in three respondents (37%) were concerned about GM food, a majority (51%) was in 2003. At the same time, the proportion that disagreed with this item dropped from 27% to 17%. A similar shift was found using the other two measures. It appeared that, while in 2002 about two in five (38%) disagreed with the statement "I am not that bothered about GM food", in 2003 almost half of the general public (47%) disagreed. The proportion of people that agreed with this statement remained stable at about one-third of the population (33% in 2002 and 32% in 2003). Moreover, the number of people agreeing with the statement "the idea of GM food fills me with dread" was up from 24% in 2002 to 31% in 2003. However, the proportion of people disagreeing with the statement remained fairly stable at about 2 out of five (37% in 2002 and 40% in 2003).

<sup>8</sup> The full wording and original coding (0,1,2,3,4) of this question are given in Appendix G (Q2).

<sup>9</sup> Please note that, compared to the 2002 survey results, concern about 4 other risk issues (climate change, radioactive waste, radiation from mobile telephones and genetic testing not reported here) also increased, albeit to a lesser extent than GM food.

### *Perceived Risks and Benefits*

It is generally understood that perceptions of risks and benefits are a major driver of people's responses to a specific activity or technology, such as GM food (see e.g. Slovic, 2000). It is likely that people who consider this technology risky are less likely to accept GM food. In addition, the absence of specific benefits may lead to a further reluctance to embrace GM food. In the present study, respondents were asked to assess the risks of GM food to themselves, to the environment as well as to British society as a whole. Likewise, they were asked to assess the benefits of GM food for themselves, for the environment and for British society as a whole. People could respond using a 7-point scale, ranging from "none" to "very high", with "some" as the scale midpoint (see Table 7).<sup>10</sup>

**Table 7. Perceived risks and benefits of GM food. (%)**

	None	.	.	Some	.	.	Very high	No opinion/ Don't know
<b>Perceived Risks</b>								
Personal	9	4	10	34	7	7	13	15
Environment	5	3	6	35	10	10	15	15
British society as a whole	5	3	9	36	10	8	14	15
<b>Perceived Benefits</b>								
Personal	34	6	11	25	4	3	2	14
Environment	30	7	10	23	6	3	3	18
British society as a whole	22	6	10	35	6	5	2	14

Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363).

It appeared that the perceived personal risks of GM food were fairly equally distributed. About a quarter of the general public (27%) assessed the risks of GM food to themselves as high, whereas a comparable proportion (23%) assessed the personal risks as low. Thirty-four percent of the general public perceived 'some' risks to themselves. The risks to the environment were thought to be higher. About 35% of the general public assessed the risks to the environment as high, while only 14% considered these risks as low. Again, a sizeable proportion of the general public (35%) fell into the middle category. Probably comprising both personal and environment risks, it appeared that one-third of the general public (32%) assessed the "risks to British society as a whole" as high, 17% assessed these risks as low, while about 36% perceived 'some' risks to British society as a whole.

Table 7 also illustrates that only a small minority saw any personal benefits associated with GM food. A mere 9% saw high personal benefits. In contrast, more than half (51%) deemed the personal benefits as low. One in four saw 'some' personal benefits associated with GM food. Likewise, while only 12% thought that the benefits of GM food for the

<sup>10</sup> The full wording and original coding (0,1,2,3,4,5,6) of this question are given in Appendix G (Q10-Q13).

environment were high, a large proportion of the general public (47%) thought that the environmental benefits of GM food are low. About a quarter of the general public (23%) could see some benefits to the environment associated with GM food.

Conspicuously, a relatively large proportion of people had either no opinion or did not respond to the six risk and benefit questions (between 14% and 1\*%). This suggests that many people may find it difficult to assess the risks and benefits of GM food directly.

Comparing Table 7 with Appendix C shows that the perceptions of risks and benefits of GM food have hardly changed. Also in 2002 about a quarter (26%) assessed the personal risks as high, about one in five (18%) assessed them as low, while a third (37%) perceived ‘some’ risks to themselves. In 2002 two out of five (42%) thought that the environmental risks of GM food were high, only 7% thought they were low, and about one in three (35%) thought there were some risks to the environment. Moreover, the risks to British society as a whole were assessed as high by 31%, as low by 12%, and as ‘some’ by 40%. Similarly, the perceived benefits of GM food were comparable. In 2002 the personal benefits of GM food were assessed as high by only 10%, while they were considered high by two out of five (42%). About one in three (31%) thought there were some personal benefits associated with GM food. Similarly, 19% assessed the benefits of GM food for British society as a whole as high, 31% assessed them as low, and 36% thought there were some benefits for British society as a whole. Also in 2002, between 14% and 19% of the respondents had either no opinion or did not respond to the risk and benefit questions.

#### *Weighing the Risks and Benefits of GM Food*

After they were asked to assess the risks and benefits of GM food separately, respondents were asked to weigh the risks and benefits in one overall judgment. Table 8 shows that, in line with the perceived risks and benefits, most people felt that the risks of GM food outweigh the benefits (42%). In comparison, 20% felt that the benefits of GM food outweigh the risks.

**Table 8. Which of the following statements most closely describes your opinion? (%)**

	2002	2003
The benefits of GM food far outweigh the risks	5	6
The benefits of GM food slightly outweigh the risks	11	14
The benefits and risks of GM food are about the same	29	23
The risks of GM food slightly outweigh the benefits	18	19
The risks of GM food far outweigh the benefits	21	23
Don't know/None of these	16	15

**Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363); UEA/MORI Risk Survey 2002 (Weighted dataset, n=296).**



About one in four (23%) thought that the benefits and risks of GM food are about the same. As with the separate risk and benefit questions, about 15% of adults had either no opinion or did not respond to the latter question, again suggesting that people may find it difficult to answer these rather abstract questions. Table 8 also shows that the risks and benefits of GM food were weighed similarly in 2002 as in 2003. In 2002 only 16 percent felt that the benefits outweigh the risks, while 39 percent felt that the risks of GM food outweigh the benefits. Three in ten (29%) thought that the benefits and risks of GM food are about the same. A relatively large proportion of one in seven (16%) had no opinion or did not respond to this question.

#### *Acceptability of GM Food*

In Table 9 it can be seen that GM food was unacceptable to a large proportion of the general public. It appeared that 40% found GM food fairly or very unacceptable. In comparison, about one in four (27%) thought that GM food is fairly or very acceptable. A similar number (27%) said that GM food was neither acceptable nor unacceptable.

**Table 9. Acceptability of GM food. (%)**

	<b>2002</b>	<b>2003</b>
Very acceptable	3	4
Fairly acceptable	19	23
Neither acceptable nor unacceptable	34	27
Fairly unacceptable	16	20
Very unacceptable	20	20
No opinion	8	5

**Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363); UEA/MORI Risk Survey 2002 (Weighted dataset, n=296).**

Comparing the results of the 2002 and 2003 surveys shows that the acceptability of GM food has largely stayed the same. In 2002, 22% felt that GM food was fairly or very acceptable, 36% felt that GM food was fairly or very unacceptable, and 34% felt that GM food is neither acceptable nor unacceptable (see Table 9).

Table 10 shows responses to an item that was specifically designed to measure four distinct attitudinal positions on GM food (cf. Margolis, 1996). People were asked to indicate which of four statements most closely describes their opinion, each representing one of four distinct attitudinal positions towards GM food (see Figure 2). The results suggest that the general public is fairly ambivalent about GM food. That is, more than half of the general public are not sure whether GM food should be promoted or opposed. However, overall, public opinion about GM food seems to be skewed towards opposition. While about one third (29%) indicated that GM food should be opposed, a mere 9% indicated that GM food should be promoted. Moreover, 8% of the public said they did not care whether GM food should be promoted or opposed.

**Table 10. Four distinct attitudinal positions towards GM food. (%)**

GM food should be promoted ( <i>positive</i> )	9
GM food should be opposed ( <i>negative</i> )	29
I am not sure whether GM food should be promoted or opposed ( <i>ambivalent</i> )	53
I don't care whether GM food should be promoted or opposed ( <i>indifferent</i> )	8

**Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363). Note: The corresponding attitudinal positions are given in brackets (cf. Figure 2).**

Comparable results were found when people were asked: “How strongly would you say you support or oppose GM food” (see Table 11). Whereas only 14% appeared to support GM food, more than one-third opposed GM food (36%). The largest proportion of respondents, however, neither supported nor opposed GM food (39%).

**Table 11. Support for and opposition to GM food. (%)**

	1996 <sup>a)</sup>	1998 <sup>b)</sup>	Feb 2003 <sup>c)</sup>	Jun 2003 <sup>d)</sup>	Aug 2003 <sup>e)</sup>
Strongly Support	6	6	3	3	3
Tend to Support	25	16	11	11	11
Neither Support nor Oppose	16	15	25	33	39
Tend to Oppose	24	21	26	21	19
Strongly Oppose	26	37	30	25	17
Don't know	3	5	5	7	11
Support	31	22	14	14	13
Oppose	50	58	56	46	36
Net	-16	-36	-42	-32	-23

**Source: a) MORI/Greenpeace, n=1,003, 13-15 December 1996; b) MORI/GeneWatch, n=950 adults, 6-8 June 1998; c) MORI Environment Tracker, n=2,141, 6-10 February 2003; d) MORI Environment Tracker, n=1,958, 19-24 June 2003; e) UEA/MORI, n=1,363, 19 July - 12 September 2003; Please note the question wording was slightly different in 1996 and 1998 to 2003. In 96/98 the question wording was as follows: ‘Thinking of genetically modified food or food derived from genetic engineering, what is your opinion towards the development and introduction of such food? Would you say, support it to a great extent, support it slightly, neither support nor oppose it, oppose it slightly, oppose it to a great extent, don't know’.**

The 2003 survey contained an item used previously by MORI to track public support and opposition over time. Table 11 shows support for GM has fallen since the issue first emerged in the media spotlight in 1996. In 1996, close to one in three (31%) supported GM food. Support for GM food weakened to 22% in 1998, and fell even further, reaching 14% in 2003. At the same time, opposition towards GM food grew from 50% in 1996 to 58% in 1998. In 2003, however, opposition towards GM food dropped from 56% in

February 2003 to 46% in June 2003, and was found to be 36% in this study (July-September 2003). The decreased opposition to GM food does not necessarily mean that people have become more positive towards GM food. Rather, people have become more uncertain about GM food. Whereas in 1996 and 1998 about one in six (16% and 15% respectively) neither supported nor opposed GM food, in February 2003 one in four, and in June 2003 about one in three were neutral. In the present study it was found that after the *GM Nation?* public debate (July-September 2003) about two in five (39%) neither supported nor opposed GM food. This indicates that the public may have become more ambivalent towards the complex issue of GM food.

## Specific Attitudes towards GM Food and Crops

### *Specific Risks and Benefits of GM Food and Crops*

People were asked to indicate to what extent they agreed with seven statements about (potential) risks of GM food and crops (see Table 12) and to what extent they agreed with five statements about specific benefits of GM food and crops (see Table 12). Most of these questions were adapted from the *GM Nation?* questionnaire (see DTI, 2003).<sup>11</sup> Table 12 shows that an overwhelming majority (85%) thought that: “We don’t know enough about the long-term effects of GM food on our health”. In line with these findings, only 9% agreed with the statement: “GM crops are safer than traditional crops because they have been more thoroughly tested”, while almost half of the respondents (48%) disagreed. About one in three (32%) neither agreed nor disagreed that GM crops are safer than traditional crops because they have been more thoroughly tested. Next to uncertainties about the health impacts of GM food, it emerged that the greater part of the general public (63%) is concerned about the potential negative impact of GM crops on the environment, while only 10% were not concerned about the potential environmental impacts. Likewise, a majority (68%) agreed with the statement “I am worried that if GM crops are introduced it will be very difficult to ensure that other crops are GM free”. In comparison, only 7% disagreed with this statement. About one in five neither agreed nor disagreed with the statement “I am worried that if GM crops are introduced it will be very difficult to ensure that other crops are GM free”. It appeared that a majority (56%) agreed, while only 7% disagreed that GM food could make farmers dependent on big companies that have patents on GM crops. About a quarter of this representative sample (26%) neither agreed nor disagreed that this is a concern to them personally. Finally, Table 12 shows that three out of four is worried that “this new technology” is being driven more by profit than by the public interest. A mere 7% is not worried that this new technology is being driven more by profit than by the public interest. Similarly, 64% agrees that GM crops would mainly benefit the producers and not ordinary people, while only 9% of the respondents disagrees.

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<sup>11</sup> The *GM Nation?* public debate feedback form had the following response options: “Disagree strongly”, “Disagree”, “Agree”, “Agree strongly”, and “Don’t know/unsure”. Respondents in our survey could respond to the same statements using a 5-point scale, coded as follows: 1: “Strongly disagree”, 2: “Tend to disagree”; 3: “Neither agree nor disagree”, 4: “Tend to agree”, and “Strongly agree”). The latter scale also included a separate “No opinion” option.

**Table 12. Specific risks and specific benefits of GM food and crops. (%)**

	<b>Strongly Disagree</b>	<b>Tend to Disagree</b>	<b>Neither/ Nor</b>	<b>Tend to Agree</b>	<b>Strongly Agree</b>	<b>No opinion</b>
<b>Specific Risks</b>						
I don't think we know enough about the long-term effects of GM food on our health <sup>(GMN)</sup>	1	3	8	33	52	3
GM crops are safer than traditional crops because they have been more thoroughly tested	21	27	32	8	1	10
I am concerned about the potential negative impact of GM crops on the environment <sup>(GMN)</sup>	2	8	22	37	26	6
I am worried that if GM crops are introduced it will be very difficult to ensure that other crops are GM free <sup>(GMN)</sup>	2	5	18	35	33	7
GM food will make farmers dependent on big companies that have patents on GM crops	2	5	26	36	20	11
I am worried that this new technology is being driven more by profit than by the public interest <sup>(GMN)</sup>	1	6	13	38	37	5
I think GM crops would mainly benefit the producers and not ordinary people <sup>(GMN)</sup>	1	8	21	33	31	5
<b>Specific Benefits</b>						
I believe GM crops could help to provide cheaper food for consumers in the UK <sup>(GMN)</sup>	9	14	23	39	6	9
I think that some GM crops could benefit the environment by using less pesticides and chemical fertilisers than traditional crops <sup>(GMN)</sup>	9	11	26	37	7	10
I believe that GM crops could improve the prospects of British farmers by helping them to compete with farmers around the world <sup>(GMN)</sup>	10	16	32	26	5	12
I believe that GM crops could benefit people in developing countries <sup>(GMN)</sup>	7	10	19	38	18	7
I believe that some GM non-food crops could have useful medical benefits <sup>(GMN)</sup>	5	6	34	34	6	16

**Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363); Note: <sup>(GMN)</sup> indicates a statement taken from the GM Nation? public debate feedback form.**

**Table 13. Factor loadings after Varimax rotation**

Statement	Factor	
	1	2
I am concerned about the potential negative impact of GM food crops on the environment	<b>.66</b>	-.32
GM food will make farmers dependent on big companies that have patents on genetically modified crops	<b>.61</b>	.06
I am worried that if GM crops are introduced it will be very difficult to ensure that other crops are GM free	<b>.76</b>	-.08
I am worried that this new technology is being driven more by profit than by the public interest	<b>.78</b>	-.13
I don't think we know enough about the long-term effects of GM food on our health	<b>.76</b>	-.09
I think GM crops would mainly benefit the producers and not ordinary people	<b>.71</b>	-.34
I believe GM crops could help to provide cheaper food for consumers in the UK	-.12	<b>.74</b>
I believe that GM crops could benefit people in developing countries	-.17	<b>.77</b>
I think that some GM crops could benefit the environment by using less pesticides and chemical fertilisers than traditional crops	-.17	<b>.74</b>
I believe that GM crops could improve the prospects of British farmers by helping them to compete with farmers around the world	-.25	<b>.75</b>
I believe that some GM non-food crops could have useful medical benefits	.07	<b>.66</b>
Eigenvalue	3.21	2.95
Explained Variance	29.2	26.8
Average agreement	3.99	3.27
Cronbach's $\alpha$	0.82	0.81

**Note: The scales were coded to range from 1: "totally disagree" to 5: "totally agree"; Factor loadings higher than 0.50 are in bold; Factor interpretations: 1) Perceived risks, 2) Perceived benefits.**

Table 12 clearly shows that a substantial proportion of our sample appreciates the various (potential) benefits of GM food and crops, although the strength of that endorsement is generally lower (fewer people *strongly agree*) than with the risk questions. It appears that almost half the general population (45%) believes that GM crops could help to provide cheaper food for consumers in the UK. In comparison, 23% disagreed with this statement. People also acknowledged the potential benefits of GM food for the environment. About 44% agreed, while 20% disagreed that some GM crops could benefit the environment by using less pesticides and chemical fertilisers than traditional crops. People's responses to the statement "I believe that GM crops could improve the prospects of British farmers by helping them to compete with farmers around the world" were fairly equally distributed: 31% agreed, 26% disagreed, and 32% neither agreed nor disagreed with the statement. It appeared that a clear majority (56%) felt that GM food could benefit people in developing countries. In contrast, only 17% disagreed with the statement "I believe that GM crops

could benefit people in developing countries”. Finally, a sizeable minority (40%) believed that some GM non-food crops could have useful medical benefits, while a mere 11% doubted that assertion. It is worth noting that a (relatively) large number of people (34%) neither agreed nor disagreed with the statement, while 16% had no opinion or did not respond to the latter question. This suggests that a large proportion of the general public has no clear opinion about the potential medical benefits of GM crops.

A Principal Components Analysis (PCA) was conducted in order to examine whether people’s responses to the 12 specific attitude statements could be summarised into a limited number of underlying dimensions. Because the statement “GM crops are safer than traditional crops because they have been more thoroughly tested” loaded highly on multiple factors in an initial exploratory PCA, this item was omitted from further analyses. Two dimensions could best describe the eleven remaining statements, each accounting for about thirty percent of the original variance. The first dimension reflected the perceived risks of GM food and crops, while the second dimension reflected the perceived benefits of GM food and crops. Both dimensions were highly reliable (Cronbach’s  $\alpha$  of 0.82 and 0.81 for the *perceived risk* and the *perceived benefit* dimension respectively).

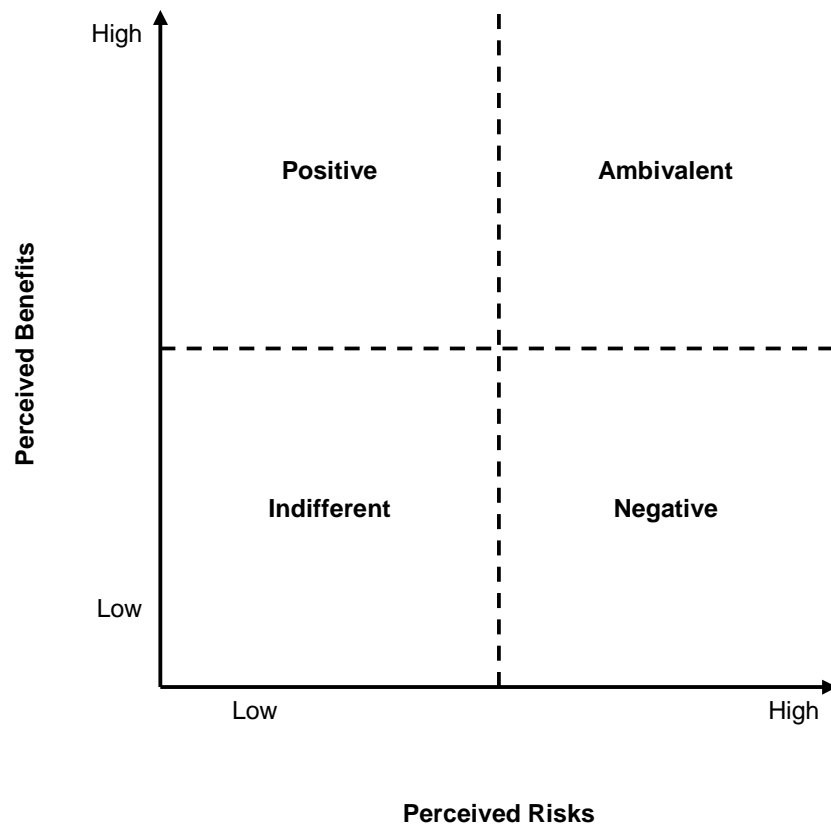


Figure 2. A proposed typology of attitudes.

The measures of perceived risks and benefits obtained from the principal components analysis can be used to explore the distribution across a (two dimensional) space with four distinct attitudinal positions (see Figure 2; cf. Margolis, 1996; Poortinga and Pidgeon, 2002). Firstly, a combination of high perceived risks and low perceived benefits can be assumed to reflect a *negative* attitudinal position towards a particular issue. Likewise, people who think that GM food and crops are beneficial and at the same time think that they are not risky most likely have a general *positive* attitude. For both these groups the positive and negative attitudes are consistent with one another. For the *ambivalent* group, however, the positive and negative attitudes are in conflict. That is, people belonging to this group feel that GM food and crops are beneficial but at the same time also feel that they may be risky. Ambivalence seems to be an important concept, as recent work suggests that, rather than simply supporting or rejecting agricultural biotechnology, the public overwhelmingly expresses *ambivalent* feelings about this application of technology (Marris, Wynne, Simmons and Weldon, 2001). Finally, people who feel that GM food and crops are neither beneficial nor risky can be said to be *indifferent*. That is, the absence of positive as well as negative attitudes most likely indicates that someone either has no (clear) opinion, or is simply not interested about this particular issue.

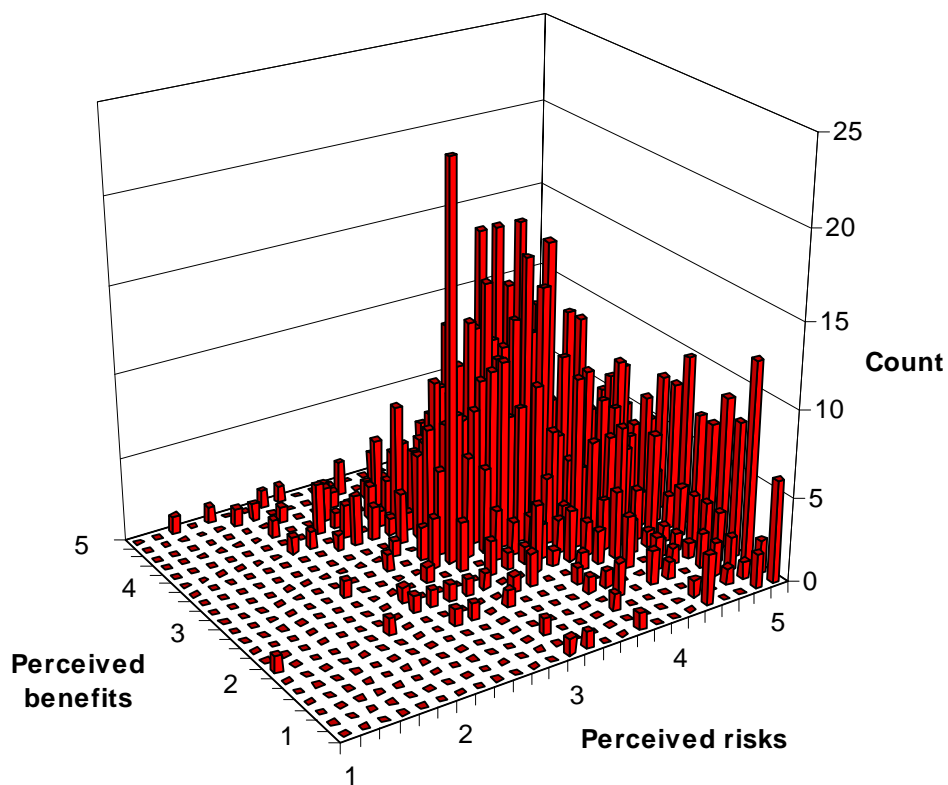


Figure 2. Distribution of perceived risks and benefits of GM food and crops (2003).



Each individual can be assigned a combined perceived risk score and a combined perceived benefits score, by averaging the responses to the six specific risk and five specific benefit items respectively. The two resulting variables were moderately negatively correlated ( $r=-0.38$ ). Figure 3 illustrates the frequency distribution of individual responses in terms of their joint risk and benefits scores. Taking the scale midpoints of 3 as the cut-off for each axis it is immediately apparent that there are very few indifferent individuals (about 4%), and only a small number who are positive (about 7%). The main distribution is essentially bimodal, with a significant proportion (about 32%) holding clearly negative attitudes towards GM food and crops and the remainder (about 56%) exhibiting ambivalence.

#### *Labelling and Liability*

Table 14 shows that labelling of GM products as well as liability of the biotechnology industry (for potential damage caused by GM products) are important issues to the general public. An overwhelming majority (94%) feels that all food containing GM material should be labelled. Similarly, almost four out of five (79%) agrees that biotechnology companies should be made liable for any damage caused by GM products.

**Table 14. Labelling and liability. (%)**

	<b>Strongly Disagree</b>	<b>Tend to Disagree</b>	<b>Neither/ Nor</b>	<b>Tend to Agree</b>	<b>Strongly Agree</b>	<b>No opinion</b>
<b>Labelling</b> All food containing GM material should be labelled	0*	1	3	29	65	2
<b>Liability</b> Biotechnology companies should be made liable for any damage caused by GM products	1	4	13	31	48	4

**Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363); Note: \*) This non-empty cell (<0.5) was rounded to 0.**

### *Risk Characteristics*

In Table 15 it can be seen that half of the respondents (50%) feels that genetic modification interferes with nature in an unacceptable way. In contrast, only 17% felt that this is not the case. About two out of seven (28%) neither agreed nor disagreed that genetic modification interferes with nature in an unacceptable way. It also appeared that, while a mere 6% disagree, more than three-quarter of the general public (74%) agree that GM food has unknown consequences. About one in seven (15%) neither agree nor disagree that GM food has unknown consequences. Uncertainty about the impacts of GM food is also reflected in responses to the statement “GM food poses risks to future generations”. More than half of the respondents (54%) agree, 10% disagree, and 27% neither agree nor disagree that GM food poses risks to future generations.

**Table 15. Risk characteristics. (%)**

	<b>Strongly Disagree</b>	<b>Tend to Disagree</b>	<b>Neither/ Nor</b>	<b>Tend to Agree</b>	<b>Strongly Agree</b>	<b>No opinion</b>
I feel that genetic modification interferes with nature in an unacceptable way <sup>(GMN)</sup>	4	13	28	25	25	6
GM food has unknown consequences	1	5	15	40	34	5
GM food poses risks to future generations	1	9	27	32	22	9
I feel able to control any risks to myself associated with GM food	20	25	19	23	6	7
The risks from GM food are unfair because they fall unevenly on particular groups in British society	5	14	33	25	8	16

**Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363); Note: <sup>(GMN)</sup> Statement taken from the GM Nation? public debate feedback form.**

It appeared that 45% of the general public feel unable to control any risks to themselves associated with GM food, while 29% did feel able. One in five (19%) neither agreed nor disagreed. One in three (33%) agreed, about one in five (19%) disagreed, and one in three neither agreed nor disagreed (33%) that the risks from GM food are unfair because they fall unevenly on particular groups in British society.

Comparing Table 15 with Appendix B demonstrates that people’s perceptions of GM food have hardly changed between 2002 and 2003. In 2002, 76% agreed, 12% neither agreed nor disagreed, and only 6% disagreed that GM food has unknown consequences. These results are comparable to those of 2003. Likewise, more than half of the people (52%) agreed, 29% neither agreed nor disagreed, and only 7% disagreed that GM food poses risks to future generations. There were also no differences between 2002 and 2003 for control over the risks associated with GM food. In 2002 one in four (25%) felt able to control any risks to themselves associated with GM food, while 44% did not. Twenty-one

percent of the sample neither agree nor disagree with the statement “I feel able to control any risks to myself associated with GM food”. Moreover, about one in four (26%) agreed, about one in seven (14%) disagreed, and about two out of five (39%) neither agreed nor disagreed with the statement “the risks from GM food are unfair because they fall unevenly on particular groups in British society”. These results can again be compared to the results of 2003. It has to be noted that in 2002 as well as in 2003 a large proportion (20% and 15%, respectively) did not have an opinion about the latter item, once more suggesting that some people may find it difficult to assess the fairness of the distribution of the risks associated with GM food.

#### *The Regulation of GM Food*

Two questions were used to determine people’s trust in the regulation of GM food (see Table 16). The responses to both questions are broadly comparable. That is, whereas about one in five (19% and 21% respectively) agreed with the statements “I feel confident that the British government adequately regulates GM food” and “I am confident that the development of GM crops is being carefully regulated”, about half of the respondents disagreed (55% and 45% respectively). In addition 19% neither agreed nor disagreed with the statement “I feel confident that the British government adequately regulates GM food”, while 27% neither agreed nor disagreed with the statement “I am confident that the development of GM crops is being carefully regulated”.

**Table 16. The regulation of GM food. (%)**

	<b>Strongly Disagree</b>	<b>Tend to Disagree</b>	<b>Neither/ Nor</b>	<b>Tend to Agree</b>	<b>Strongly Agree</b>	<b>No opinion</b>
<b>Trust in Risk Regulation</b>						
I feel confident that the British government adequately regulates GM food	28	27	19	16	3	6
I am confident that the development of GM crops is being carefully regulated <sup>(GMN)</sup>	18	27	27	19	3	6
<b>Independent regulatory organisations</b>						
Organisations separate from government are needed to regulate GM food	2	4	10	39	40	5
Organisations separate from industry are needed to regulate GM food	1	3	10	38	42	6

**Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363); Note: <sup>(GMN)</sup> Statement taken from the GM Nation? public debate feedback form.**

People were asked to what extent they agree or disagree that organisations separate from government are needed to regulate GM food and to what extent they agree or disagree that organisations separate from industry are needed to regulate GM food (see Table 16). The responses to these two statements were practically similar. Whereas a large majority of four out of five (79% and 80% respectively) agreed, only 6% and 4% disagreed that organisations were needed that are independent from government and industry respectively. One in ten (10%) neither agreed nor disagreed with each of these statements.

There were some discernible differences in people’s responses to the item “I feel confident that the British government adequately regulates GM food” between 2002 and 2003 (see Appendix B). Whereas agreement with the statement remained the same (20% in 2002 compared to 19% in 2003), disagreement increased from 41% in 2002 to 55% in 2003. At the same time, the proportion of people that neither agreed nor disagreed with the statement dropped from 29% in 2002 to 19% in 2003. This shows a considerable drop in confidence in the British Government to adequately regulate GM food between 2002 and 2003.

It appeared that the need for independent organisations to regulate GM food has increased from 2002 to 2003 (see Appendix B). That is, whereas in 2002 59% felt that organisations separate from government are needed, this number grew to 79% in 2003. Likewise, while in 2002 65% agreed with the statement that organisations separate from industry were needed to regulate GM food, fully 80% did in 2003.

**Table 17. Ambivalence, attitudinal certainty and need for information. (%)**

	<b>Strongly Disagree</b>	<b>Tend to Disagree</b>	<b>Neither/ Nor</b>	<b>Tend to Agree</b>	<b>Strongly Agree</b>	<b>No opinion</b>
<b>Ambivalence v. Certainty</b>						
I have mixed feelings about GM food	10	12	18	40	16	4
There are so many arguments for and against GM food. I could be persuaded by any of them	16	24	24	26	5	4
I have strong opinions about GM food	7	19	28	22	21	3
<b>Need for Information</b>						
I am well informed about GM food	28	32	16	15	4	5
I need more information to form a clear opinion about GM food	3	5	7	33	51	2

Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363).

### *Ambivalence, Attitudinal Certainty and Need for Information*

Table 17 shows that most of the general public feels ambivalent towards GM food. That is, 56% agreed with the statement “I have mixed feelings about GM food”, while only 22% disagreed. Eighteen percent neither agreed nor disagreed that they have mixed feelings about GM food. Perhaps not completely in line with these findings are the results that about one in three (31%) agreed, while 40% disagreed with the statement “There are so many arguments for and against GM food. I could be persuaded by any of them”. So, whereas most people had mixed feelings about GM food, they may not necessarily be persuaded easily to become more supportive or opposed. Likewise, it appeared that most people agreed with the statement “I have strong opinions about GM food” (43%), while about one in four (26%) disagreed.

It appeared that, on these measures, the British public are equally ambivalent about GM food in 2002 as in 2003.<sup>12</sup> Comparison of Table 16 with the results in Appendix B shows that the responses to the statement “I have mixed feelings about GM food” in 2002 and in 2003 are largely comparable. In 2002, 57% of the respondents agreed, 19% disagreed, and 14% neither agreed nor disagreed with the statement.

In the present study it was found that many people feel that they do not have enough information to form a clear opinion about GM food. Only 19% agreed that they are well informed about GM food, while a majority (60%) disagreed. Probably as a result, most people felt a high need for information. More than four out of five (84%) said that they need more information to form a clear opinion about GM food (see Table 17).

Comparing the current results with the findings of the 2002 survey suggests the need for information about GM food has barely changed. That is, Appendix B shows that, in 2002 18% felt well informed about GM food, while 55% did not. About one in five (21%) neither agreed nor disagreed with the statement “I am well informed about GM food” in 2002.

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<sup>12</sup> We did not ask the ‘support-oppose’ question (Table 11) in 2002, so can only base this interpretation on the single ‘mixed-feelings’ question shown here.

### *Behavioural Intentions*

Table 18 shows that, although a sizeable minority (28%) agree with the statement “I would be happy to eat GM food”, almost half of the respondents (46%) disagree. About one in five (23%) neither agreed nor disagreed with the statement. Additionally, 50% of the respondents said that they would try to avoid purchasing GM food products. In comparison, only 22% said that they would not try to avoid purchasing GM food products. One out of four neither agreed nor disagreed with the statement.

**Table 18. Behavioural intentions. (%)**

	<b>Strongly Disagree</b>	<b>Tend to Disagree</b>	<b>Neither/ Nor</b>	<b>Tend to Agree</b>	<b>Strongly Agree</b>	<b>No opinion</b>
I personally would be happy to eat GM food <sup>(GMN)</sup>	28	18	23	22	6	3
I would try to avoid purchasing GM food products	5	17	25	21	29	2

**Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363); Note: <sup>(GMN)</sup>**  
**Statement adapted from GM ‘Nation?’ feedback form.**

Appendix B shows that people’s intention to eat GM food has hardly changed between 2002 and 2003. The results in 2002 showed that a majority (56%) would not be happy to eat GM food, while about one in three (29%) would be happy to eat GM food. About one in ten (11%) neither agreed nor disagreed with the statement.

**Table 19. Evaluation of government. (%)**

	<b>Strongly Disagree</b>	<b>Tend to Disagree</b>	<b>Neither/ Nor</b>	<b>Tend to Agree</b>	<b>Strongly Agree</b>	<b>No Opinion</b>
<b>Competence</b>						
The government is doing a good job with regard to GM food	24	25	28	11	1	11
The government is competent enough to deal with GM food	27	27	19	19	2	6
<b>Credibility</b>						
The government distorts facts in its favour regarding GM food	3	9	23	34	22	9
<b>Reliability</b>						
The government changes policies regarding GM food without good reasons	3	9	30	30	17	11
<b>Integrity (Vested Interests)</b>						
The government is too influenced by the biotechnology industry regarding GM food	2	7	25	35	20	10
<b>Care</b>						
The government listens to concerns about GM food raised by the public	19	33	20	20	2	5
The government listens to what ordinary people think about GM food	31	35	15	11	2	6
<b>Fairness</b>						
I feel that the way the government makes decisions about GM food is fair	23	25	31	11	1	9
<b>Openness</b>						
The government provides all relevant information about GM food to the public	35	33	17	7	2	7
<b>Value Similarity</b>						
The government has the same opinion as me about GM food	24	27	26	7	1	14
The government has the same ideas as me about GM food	25	30	24	8	2	13
<b>Bias of Government</b>						
The government wants to promote GM food	2	6	23	39	21	9
The government is not in favour of GM food	24	33	26	4	2	11

Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363).

## Evaluation of Government

It is often argued that *trust* is a complex and multifaceted concept. Studies of trust in institutions have primarily focused on identifying the factors influencing trust-judgments. A range of factors appear to influence trust in risk managing institutions, which may be summarised under the rubrics of *competence*, *care* and *consensual values* (Johnson, 1999). In this study, respondents were asked to evaluate government policy on GM food. The items used were designed to measure *competence*, *credibility*, *reliability*, *integrity* (vested interests), *care*, *fairness*, and *openness* (see Table 19). The statements were selected from previous trust work (e.g. Renn and Levine, 1991; Frewer *et al.*, 1996; Peters, Covello and McCallum, 1997; Johnson, 1999; Metlay, 1999). In addition, two questions were included aimed at measuring the extent to which the government was seen as having the same values as respondents in the context of GM food (*Value Similarity*, see Earle and Cvetkovich, 1995). Moreover, two questions were used to ascertain whether people thought that the Government is biased towards a particular position regarding GM food.

Table 19 shows that people are fairly critical about the government and its GM policies. In general, about half of the respondents agreed with the negatively formulated statements, and half or more disagreed with the positively formulated statements. Comparing Table 19 with Appendix F demonstrates that there are only minor differences in the evaluation of government between 2002 and 2003.

A PCA was conducted in order to examine whether the evaluation of government could be described by a number of underlying dimensions. Table 20 shows that the nine statements (excluding the items on value similarity) could be described by two main factors. These two factors accounted for 68.3% of the variance of the original variables. Most items loaded high on the first factor, which accounted for 42.9% of the variance. This factor was concerned with the items aimed at measuring competence, care, fairness and openness, and can be interpreted as a *general trust* factor. That is, it represents a general evaluation of government policy on GM food. The second factor accounted for 25.4% of the original variance and was concerned with the items “the government distorts facts in its favour regarding GM food”, “the government changes policies regarding GM food without good reasons”, and “the government is too influenced by industry regarding GM food”. This factor reflects a *scepticism* of how government GM policies are brought about and can be labelled as *scepticism*. These results are comparable to similar analyses conducted on the five risk cases in the 2002 survey (see Poortinga and Pidgeon, 2003b).



**Table 20. Factor loadings after Varimax rotation.**

	Factor	
	1	2
The government is doing a good job	<b>0.77</b>	-0.33
The government is competent enough	<b>0.80</b>	-0.23
The government distorts facts in its favour	-0.27	<b>0.79</b>
The government changes policies without good reasons	-0.26	<b>0.81</b>
The government is too influenced by industry	-0.23	<b>0.78</b>
The government listens to concerns raised by the public	<b>0.74</b>	-0.23
The government listens to what ordinary people think	<b>0.80</b>	-0.20
I feel that the way the government makes decisions is fair	<b>0.82</b>	-0.28
The government provides all relevant information to the public	<b>0.76</b>	-0.25
<b>Eigenvalue</b>	3.86	2.29
<b>Explained Variance</b>	42.9	25.4
<b>Average agreement</b>	2.28	3.65
<b>Cronbach's <math>\alpha</math></b>	0.90	0.78

**Note:** The scales were coded to range from 1: "totally disagree" to 5: "totally agree"; Factor loadings higher than 0.50 are in bold; Factor interpretations: 1) General Trust; 2) Scepticism.

## Trust in Information Sources

Trust has become a popular research subject in the social sciences during the last two decades. It is thought to reduce social uncertainty and complexity, is seen as an important element of social capital and as a prerequisite for a healthy and flexible economy and democracy. In the field of risk research trust in risk management institutions may be an important factor in perception and acceptance of risks (see e.g., Renn and Levine, 1991; Kasperson, Golding and Tuler, 1992, Slovic, 1993 Cvetkovich and Löfstedt, 1999; Poortinga and Pidgeon, 2003b). It is also generally acknowledged that trust is a prerequisite for effective risk communication. In the present study, respondents were asked to indicate to what extent they trusted various sources to tell them the truth about GM food (see Table 21).

**Table 21. To what extent do you trust the following organisations and people to tell the truth about GM food (%)**

	Distrust a lot	Distrust a little	Neither/ Nor	Trust a little	Trust a lot	No opinion
Doctors	1	2	14	42	39	2
Consumer Rights Organisations (e.g. Consumers' Association)	2	5	13	43	33	4
Environmental Organisations	2	6	14	45	31	3
Scientists working for Universities	2	4	17	46	29	2
Scientists working for Environmental Groups	2	7	15	48	25	2
The Food Standards Agency (FSA)	3	6	14	45	26	5
Friends and Family	1	3	23	30	40	2
Department of Environment, Food and Rural Affairs (DEFRA)	5	7	18	44	20	6
People from your Local Community	2	5	33	42	14	4
Farmers	5	10	26	36	19	3
Scientists working for Government	15	21	19	34	8	3
Scientists working for the Biotech Industry	14	21	23	28	9	5
Local Authorities	10	17	33	31	5	3
Biotechnology Industry	15	20	25	27	8	5
Food Manufacturers	17	26	21	29	5	3
The European Union (EU)	20	19	25	25	7	4
The National Government	23	25	19	25	5	3
The Welsh Assembly (n=235)	15	12	27	29	11	6
The Scottish Parliament and its Executive (n=265)	14	23	31	24	5	3

Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363).

Consistent with previous work on trust (see e.g., Frewer *et al.*, 1996; Corrado, 2001; Worcester, 2001; Poortinga *et al.*, 2004), Table 21 shows that Doctors, Consumer Right Organisations, Environmental Organisations and Scientists working for Universities were the most trusted information sources. More than three-quarters of the general population indicated that they trusted these information sources (a little or a lot) to tell the truth about GM food. More than half of the respondents said that they trust Scientists working for Environmental Groups, FSA, Friends and Family, DEFRA, 'People from your local community', and Farmers to tell the truth about GM food. The least trusted sources were Scientists working for Government, Scientists working for the Biotechnology Industry, Local Authorities, the Biotechnology Industry, Food Manufacturers, the EU and the National Government. All these sources were trusted by fewer than half of the general public. In addition, in Wales and Scotland people were asked to what extent they trust the Welsh Assembly and The Scottish Parliament and its Executive respectively. Whereas the former was trusted by 40% of the Welsh sub sample (n=235), the latter was trusted by 29% of the Scottish sub-sample (n=265) to tell the truth about GM food.

A PCA with Varimax rotation was conducted in order to examine whether there is an underlying pattern in people's trust judgements.<sup>13</sup> Table 22 shows the factor loadings after Varimax rotation. The first factor comprised trust in scientists working for the government, local authorities, the national government and the European Union, and accounted for 17.9% of the original variance of trust in information sources. This factor can be interpreted as *trust in government institutions*. The sources that loaded highly on the second factor, and accounted for 16.8% of the original variance, were food manufacturers, the biotechnology industry, scientists working for the biotechnology industry, farmers, FSA, and DEFRA. This suggests that the latter three groups are also seen as being part of a wider system of governance and production of food biotechnology. The third factor accounted for 16.7% of the original variance and was concerned with trust in consumer organisations, environmental organisations, scientists working for environmental groups, and scientists working for universities. The latter set of trust judgements represents *trust in watchdogs*, i.e., independent organisations that keep a critical eye on developments in genetically modified food and those who are believed to inform the public about possible consequences of GM food. The fourth factor included trust in Friends and Family as well as trust in "people from your own community". The latter factor could be interpreted as *trust in personal sources*. The four-factor solution found in this study is largely comparable to the one found by Poortinga *et al.* (2004) regarding trust in information sources to tell the truth about Foot and Mouth Disease.

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<sup>13</sup> Excluding the Welsh Assembly and The Scottish Parliament and its Executive.

Table 22 shows that (the highest average trust ratings were for watchdogs and personal sources (3.95 and 3.87, respectively, on a 5-point scale, coded here to range from 1: “totally disagree” to 5: “totally agree”, with “neither agree nor disagree” as the scale midpoint). Government institutions were trusted the least to tell the truth about GM food (2.84). Although industry seems to be moderately trusted (3.28), a closer examination of this factor reveals that the FSA (3.88), DEFRA (3.71) as well as farmers (3.55) are more trusted than food manufacturers (2.79), the biotechnology industry (2.91) and scientists working for the biotechnology industry (2.96).

**Table 22. Factor loadings after Varimax rotation.**

	Factor			
	1	2	3	4
Doctors	-0.04	0.26	0.43	0.45
Consumer Rights Organisations (e.g. Consumers' Association)	0.09	0.06	<b>0.61</b>	0.27
Environmental Organisations	0.09	0.02	<b>0.65</b>	0.40
Scientists working for Universities	0.15	0.17	<b>0.79</b>	-0.05
Scientists working for Environmental Groups	0.12	0.08	<b>0.82</b>	0.06
The Food Standards Agency (FSA)	0.15	<b>0.58</b>	0.47	0.08
Friends and Family	-0.00	0.09	0.05	<b>0.81</b>
Department of Environment Food and Rural Affairs (DEFRA)	0.25	<b>0.56</b>	0.39	0.07
People from your Local Community	0.16	0.02	0.25	<b>0.74</b>
Farmers	-0.02	<b>0.59</b>	0.15	0.38
Scientists working for Government	<b>0.75</b>	0.35	0.12	-0.04
Scientists working for the Biotech Industry	0.41	<b>0.76</b>	0.06	-0.06
Local Authorities	<b>0.69</b>	0.26	0.14	0.30
Biotechnology Industry	0.40	<b>0.76</b>	0.04	-0.02
Food Manufacturers	0.41	<b>0.56</b>	-0.09	0.23
The European Union (EU)	<b>0.79</b>	0.09	0.22	-0.00
The National Government	<b>0.85</b>	0.25	0.08	0.02
<b>Eigenvalue</b>	3.05	2.86	2.84	1.95
<b>Explained Variance</b>	17.9	16.8	16.7	11.5
<b>Average agreement</b>	2.84	3.28	3.95	3.87
<b>Cronbach's <math>\alpha</math></b>	0.85	0.82	0.77	0.64

**Note: The scales were coded to range from 1: “totally disagree” to 5: “totally agree”; Factor loadings higher than 0.50 are in bold; Factor interpretations 1) Trust in Government Institutions; 2) Trust in Industry; 3) Trust in Watchdogs; 4) Trust in Personal Sources.**

It appeared that the patterns of trust associated with various information sources altered slightly between 2002 and 2003 (see Appendix D). Most of the sources that loaded highly on the *watchdogs* and *personal sources* dimensions were even more trusted in 2003 than in 2002. More people felt that people from your local community (+15%), consumer organisations (+10%), scientists working for environmental groups (+10%), environmental organisations (+9%), scientists working for universities (+9%), and doctors (+9%) could be trusted. Moreover, food manufacturers (+6%), local authorities (+5%) and scientists working for government (+5%) were slightly more trusted in 2003 than in 2002. Trust in the other sources remained largely unchanged.<sup>14</sup>

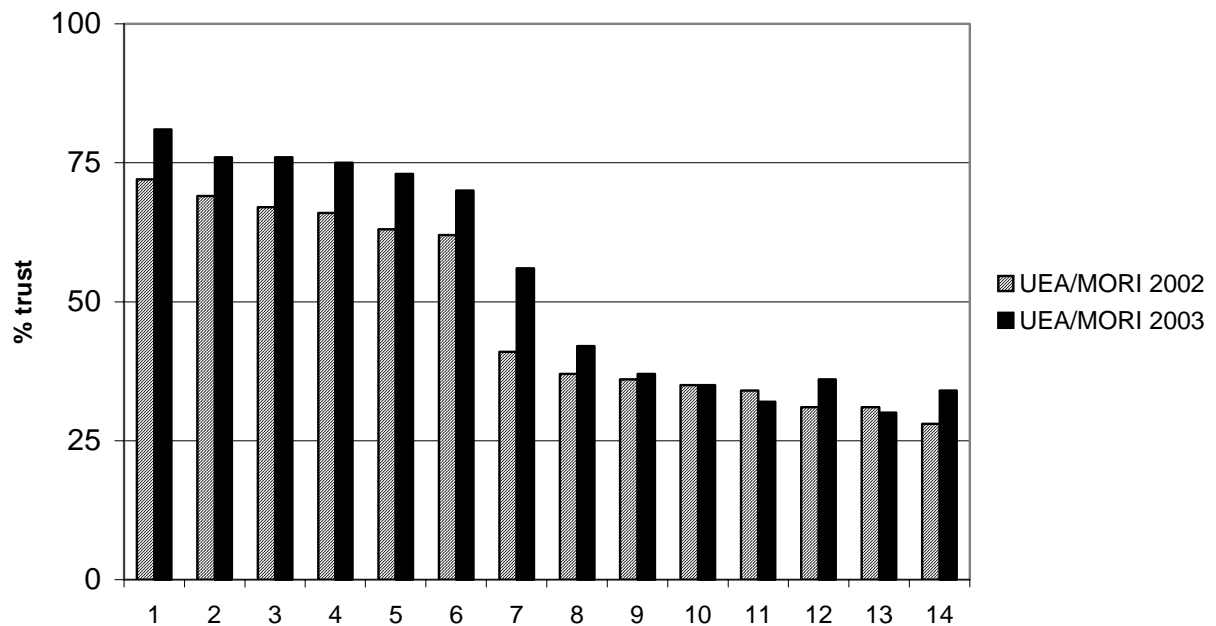


Figure 3. Trust in various information sources.<sup>15</sup>

<sup>14</sup> This comparison does not include the following sources: Farmers, the FSA, DEFRA, as well as the Welsh Assembly and The Scottish Parliament and its Executive, as they were not included in the 2002 survey.

<sup>15</sup> 1=Doctors, 2=Consumer organisations, 3=Environmental organisations, 4= Scientists working for universities, 5=Scientists working for environmental groups, 6=Friends and family, 7=People from your local community, 8=Scientists working for government, 9=Scientists working for the biotechnology industry, 10=The biotechnology industry, 11=The European Union, 12= Local authorities, 13=The national government, 14=Food manufacturers.

## Involvement in Decision Making

People were asked to what extent they agreed that various groups of people or organisations should be involved in making decisions about GM food (see Table 23). It appeared that a large majority (more than 80%) agreed that Environmental Organisations, the FSA, the General Public, Scientists working for Environmental Groups, Consumer Organisations and Doctors should be involved in making decisions about GM food. Slightly fewer people (more than 60%) felt that DEFRA, Scientists working for Universities, Farmers, Local Communities, Food Manufacturers, Scientists working for Government and the National Government should be involved in making decisions about GM food. The lowest agreement levels were found for Local Authorities, the Biotechnology Industry, Scientists working for the Biotechnology Industry and the EU. However, even here (with these relatively distrusted institutions) more than half of the sample feels that these groups should be involved in making decisions about GM food. This clearly shows that among the general public there is a strong desire for the widest possible stakeholder input into decision-making about GM food.

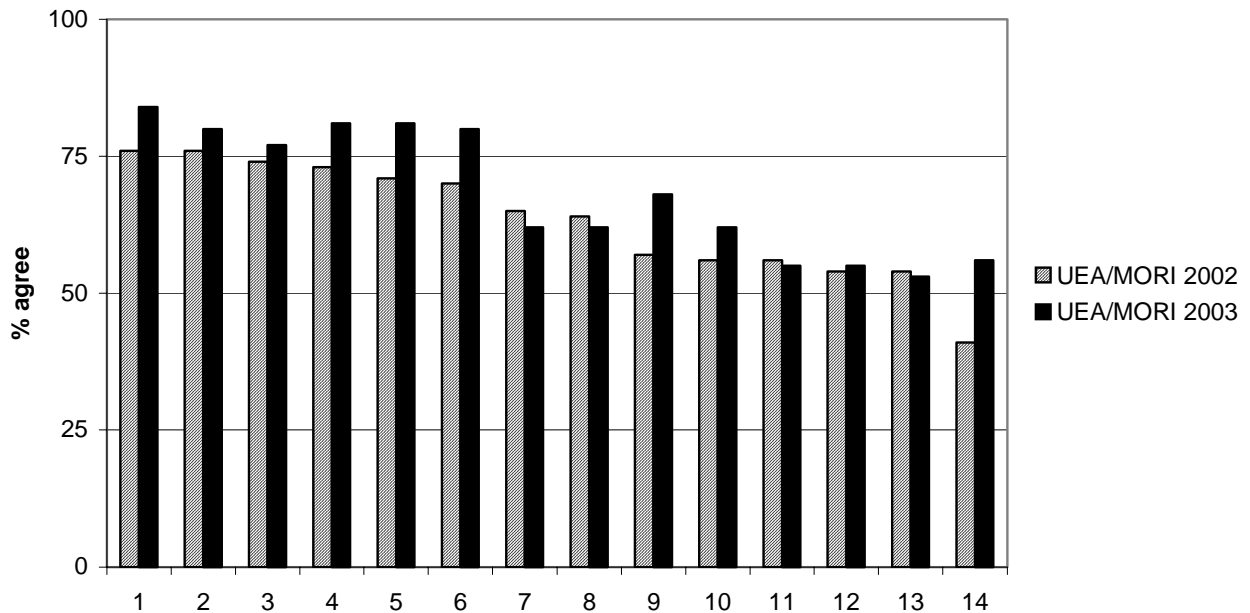


Figure 4. Agreement about involvement in decision making about GM food.<sup>16</sup>

<sup>16</sup> 1=Environmental organisation, 2= Consumer organisations, 3= Scientists working for universities, 4=Scientists working for environmental groups, 5=The general public, 6=Doctors, 7= Scientists working for government, 8=The national government, 9= Local communities, 10= Food manufacturers, 11= Scientists working for the biotechnology industry, 12=The biotechnology industry, 13=The European Union, 14=Local authorities.

**Table 23. How much do you agree or disagree that the following should be involved in making decisions about GM food? (%)**

	Strongly Disagree	Tend to Disagree	Neither/ Nor	Tend to Agree	Strongly Agree	No opinion
Environmental Organisations	1	3	8	43	41	4
The Food Standards Agency (FSA)	1	2	7	42	42	5
The General Public	1	4	11	41	40	3
Scientists working for Environmental Groups	1	3	10	45	36	3
Consumer Rights Organisations (e.g. Consumers' Association)	1	4	10	43	37	5
Doctors	1	4	11	43	37	3
Department of Environment Food and Rural Affairs (DEFRA)	2	3	9	42	37	6
Scientists working for Universities	1	3	13	46	31	4
Farmers	4	7	13	38	35	4
Local Community	2	8	17	42	26	5
Food Manufacturers	8	15	11	40	22	4
Scientists working for Government	7	11	15	40	22	4
The National Government	9	10	15	41	21	4
Local Authorities	6	14	20	40	16	5
Biotechnology Industry	8	12	18	39	16	7
Scientists working for the Biotechnology Industry	8	13	18	37	18	7
The European Union (EU)	13	12	16	34	19	6
The Scottish Parliament and its Executive (n=265)	8	13	16	35	23	5
The Welsh Assembly (n=235)	10	7	20	29	26	8
The government should consult the public about how to regulate GM food	2	8	10	43	33	3
I would like to be personally consulted in policy making decisions about GM food	11	20	21	26	19	3
I would be prepared to take part in a public discussion or hearing about GM food	14	20	20	29	14	3

**Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363).**

In addition, 58% of the Scottish sub-sample (n=265) felt that the Scottish Parliament and its Executive should be involved and 55% of the Welsh sub-sample (n=235) felt that the Welsh Assembly should be involved in making decisions about GM food

The second half of Table 23 clearly confirms that people feel that the general public should be involved in such a complex and controversial issue as GM food. More than three-quarters (76%) thinks that the government should consult the public about how to regulate GM food. Only 10% disagreed and 10% neither agreed nor disagreed with that the statement “the government should consult the public about how to regulate GM food”. Although it is often found that, despite high support for public involvement, the willingness to get personally involved is low, this study suggests that the willingness to get personally engaged in the issue of GM food was fairly high. Whereas 31% disagreed and 21% neither agreed nor disagreed, almost half of the respondents (45%) agreed with the statement “I would like to be personally consulted in policy making decisions about GM food”. Likewise, while about one in three (34%) would not be prepared to take part in a public discussion or hearing about GM food, almost half of those questioned (43%) would be prepared to take part. One in five neither agreed nor disagreed with the statement.

Some differences were found between 2002 and 2003 in the proportion agreeing that the various organisations and groups of people should be involved in making decisions about GM food (see Figure 4; see also Appendix E). It appeared that in 2003, compared to 2002, more people felt that local authorities (+15%), local communities (+11%), the general public (+10%), doctors (+10%), environmental organisations (+8%), scientists working for environmental groups (+8%) and consumer organisations (+4%) should be involved in making decisions about GM food. Again, this seems to suggest that there is a growing need for organisations separate from government and industry to make decisions about developments in GM food. Having said that, people’s agreement that food manufacturers should be involved in making decisions about GM food also grew from 56% in 2002 to 62% in 2003.



# Awareness and Evaluation of the Public Debate

## Awareness of The Debate

One of the objectives of the *GM Nation?* debate was to create widespread awareness among the population of the programme of debate. This study shows that a great majority (71%) of those interviewed had not heard of the *GM Nation?* debate. In addition, 13% had heard of the debate *but* knew nothing about it. In contrast, 15% of the general public were to some extent aware of the debate. To be specific, about one in eight indicated that they knew a little about the debate, while only 3% said they knew a fair amount or a lot about the debate (see Table 24). These figures can be interpreted in a number of ways. On the one hand, the bulk of the population (seven in ten) had not heard of the debate at all. On the other hand, this finding does suggest that a sizeable minority of the British adult population had been made aware of its existence. Given the relative lack of advertising, tabloid and television coverage of the debate, this figure might be regarded as representing a modest success, and indeed this performance could usefully be compared to data on awareness of other Government initiatives in comparable areas of science and technology. As generally interest in the issue of GM food is high, the results of the survey suggest that the debate only partially met its objective to create widespread awareness among the population, as only a minority of the general public seems to have heard of the programme of debate. It should also be noted that on a question of this kind one could get ‘false positives’: That is, people claiming to have heard or read about something they have not.

**Table 24. How much do you know about ‘GM Nation? The Public Debate’, the National Debate on Genetic Modification of Foods and Crops that has been Going on Recently? (%)**

Know a lot about	1
Know a fair amount about	2
Know a little about	11
Heard of but know nothing about	13
Never heard of	71
Don't know	3

Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363).

## Evaluation of the Debate

Because awareness of the Debate among at least a significant proportion of the respondents was expected to be low, respondents were provided in the final section of the questionnaire with some information about the background and the process of *GM Nation?* (see Box A below or Appendix G), following which they were asked to evaluate the debate on a range of measures.

### **BOX A: Information Provided to Respondents on GM Nation?**

As you may know, "*GM Nation? The Public Debate*" is a nationwide discussion of issues related to genetic modification (GM) of food and crops. It is sponsored by the government, and managed by an independent board of people representing diverse views on GM. During June and July 2003 a series of regional and local meetings have been organised to allow people to have their say about the role of GM in the UK. "*GM Nation? The Public Debate*" is organised to involve the public in the important decision as to whether or not GM foods and crops should be grown commercially in Britain. The findings from the meetings will be fed back to the Government to help inform their policy-making on GM foods and crops.

Public views on the value of the debate itself appeared to be mixed (see Table 25). On the one hand, a majority (66%) feels that the debate is a good way for the public to get more involved in making decisions about GM foods and crops. In contrast, only 12% disagreed that the debate is a good way for the public to get more involved in making decisions about GM foods and crops. Of the respondents, 45% agreed, 31% disagreed and 19% neither agreed nor disagreed with the statement "It is unclear to me what the debate is about". Although almost half of the respondents (45%) disagreed, about one in four (23%) agreed that the debate shows that the government listens to what normal people think about GM foods and crops. A sizeable minority (26%) neither agreed nor disagreed that the government listens to what normal people think about GM foods and crops.

It appeared that people's responses to the statement "Organising the debate is a waste of taxpayers' money" were fairly equally distributed. That is, about 37% disagreed, 35% agreed and 20% of the general public neither agreed nor disagreed that organising the debate is a waste of taxpayers' money. It appeared that the great majority (42%) neither agreed nor disagreed with the statement "the debate has been run fairly, without promoting any specific views on GM foods and crops". In addition 30% had no opinion or did not respond to this question. These latter findings are hardly surprising given that a majority had never heard of debate.

**Table 25. GM Nation evaluation statements. (%)**

	<b>Strongly Disagree</b>	<b>Tend to Disagree</b>	<b>Neither/ Nor</b>	<b>Tend to Agree</b>	<b>Strongly Agree</b>	<b>No opinion</b>
<b>Evaluation of the Debate</b>						
The debate is a good way for the public to get more involved in making decisions about GM foods and crops	3	9	16	53	13	7
It is unclear to me what the debate is about	8	23	19	31	14	6
The debate shows that the government listens to what normal people think about GM foods and crops	16	29	26	20	3	7
Organising the debate is a waste of taxpayers' money	7	30	20	25	10	8
The debate has been run fairly, without promoting any specific views on GM foods and crops	5	9	42	13	1	30
<b>Impact of the Debate</b>						
The debate will have an influence on government's policies on GM foods and crops	11	25	27	25	3	10
Because of the debate I trust the government more to make the right decisions about GM foods and crops	18	27	25	18	3	9
The debate will make no difference, because the government has already made its mind up on GM foods and crops	2	13	19	38	21	7
It does not matter whether there is a debate on GM or not. In the end European and International laws will determine what will happen	3	8	15	43	25	5

Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363).

Despite clear support for a debate on GM foods and crops as such, there is a high level of scepticism about the impact of the debate (see Table 25). More than half the general public agrees with the statement: “The debate will make no difference, because the government has already made its mind up on GM foods and crops”, while only 15% disagrees with this statement. Again, about one in three is undecided (i.e., “neither acceptable nor unacceptable”, including “No opinion”). Likewise, the greater part of the public thinks that European and international laws will determine what will happen with GM food. While 68% agree, just 11% of the general public disagree with the statement: “It does not matter whether there is a debate on GM food or not. In the end European and International laws will determine what will happen”. Twenty-one percent neither agree nor disagree with the statement or has no opinion.

**Table 26. How useful, if at all, do you think it would be to have public debates on other important new developments in science and technology? (%)**

Very useful	34
Fairly useful	43
Not very useful	12
Not at all useful	3
Don't Know	7

**Source: UEA/MORI GM Food Survey 2003 (Weighted dataset, n=1,363).**

The public generally feels positively about public involvement exercises such as *GM Nation?* More than three-quarters of the respondents (77%) felt that it is important to have public debates on other important new developments in science and technology (see Table 26). Only a minority of the general public thought that such debates are not very (12%) or not at all (3%) useful.

## Summary of Findings

This report presents the initial descriptive findings of a large-scale British survey of public attitudes towards GM food and crops, and of the general public's levels of awareness, understanding and perceived value of the *GM Nation?* debate process that was held during the summer of 2003 (see DTI, 2003). The main aim of this survey was to gauge current public opinion about GM food and crops as well as possible shifts in public sensibilities, awareness and knowledge of the GM food issue across the period that the public debate took place. The latter objective was examined by comparing the findings of the present study (conducted in the summer of 2003) with a study conducted on GM food in the summer of 2002. A second main aim of this survey was to investigate public awareness, perceptions and understanding of the GM debate process itself. This section summarises the main (descriptive) findings of this study.

### GM Food in Context

First, GM food was put into context by comparing it to various personal and social issues, including four other contemporary risk cases. The findings in the current study were similar to those found in 2002 (Poortinga and Pidgeon, 2003a).

- Personal issues are generally considered more important than social issues, including the case of GM food.
- In relative terms, GM food was amongst the least important of issues.
- Despite the relative unimportance of GM food, people are fairly interested in this issue. More than half of those questioned were at least 'fairly interested' in the issue of GM food.

### Attitudes towards GM Food

In this survey the issue of GM food was evaluated on a large number of items. To take just three examples:

- While 40% of those asked thought that GM food is a bad thing, a further 40% said that GM food is neither a good nor a bad thing, while 14% thought that GM food is a good thing.
- More than half of the public indicated that they are not sure whether GM food should be promoted or opposed. In contrast just under one third (29%) indicated that GM food should be opposed while 9% indicated that GM food should be promoted and 8% did not care whether it is promoted or opposed.
- 42% of the sample thought the risks of GM food outweigh the benefits, 23% that they are about the same and 20% that the benefits outweigh the risks.

Although it is often thought that there is widespread opposition to GM food in the UK, the results suggest that, rather than simply for or against, attitudes are more nuanced and complex with many individuals holding essentially *ambivalent* beliefs about this application of biotechnology. Nevertheless, although precise frequencies of support etc. depend upon the particular question asked (e.g. the examples listed immediately above), responses also suggest that attitudes to GM food in aggregate are clearly skewed towards the negative. In addition:

- In comparison to our results of 2002 there was very little change in most of the measures of general attitudes to GM food.
- However *concern* about GM food does appear to have increased somewhat in the 2003 survey (conducted immediately after *GM Nation?*) compared to levels surveyed in 2002.
- The 2003 survey contained an item used previously by MORI to track public support and opposition to GM food over time. Support for GM has fallen since the issue first emerged in the media spotlight in 1996, although opposition in the current survey is also lower than in earlier periods. The data also indicates that the public may have become more ambivalent over time towards the complex issue of GM food.

### **Specific Attitudes towards GM Food and Crops**

The survey results indicate people hold a complex set of beliefs about a range of specific health, environmental, social and economic risks and benefits of GM food and crops.

- The results indicate a range of specific concerns about the risks of GM food and crops.
- In particular, a large majority (85%) of the sample thought that we don't know enough about the potential long-term effects of GM food on our health.
- Next to uncertainties about health impacts, people were most concerned about the potential negative impact of GM crops on the environment.
- However, a substantial proportion of our sample agreed that GM food and crops could hold a range of future benefits, in particular for the environment, consumers, and those in developing countries (although the benefit items were less strongly endorsed than the risk items).
- A principal components analysis showed that public attitudes towards GM food and crops could best be described with a separate *perceived risks* and *perceived benefits* dimension. Exploring the distribution across the two dimensions confirms

that most people are *ambivalent* about GM food and crops, as a majority appreciated some (potential future) benefits while at the same time expressing significant concerns about the possible risks of GM food and crops.

Taken in aggregate, the responses to the various items on the survey suggest a highly consistent pattern of attitudes towards GM food and crops. Up to 50% of people, again depending upon the question asked, can be categorised in the middle; that is they typically hold *ambivalent* attitudes. In addition, and as noted at various points above, aggregate public opinion is also clearly weighted towards the negative. That is, a further sizeable proportion of the UK population, which can vary between about one third and one half, depending upon the question asked, holds predominantly *negative* beliefs about GM food and crops. In contrast, about one in ten only have clearly *positive* views on this issue.

### **Governance and Trust in Relation to GM Food**

The survey contained a number of items on the governance of GM food, in relation to labelling, liability, beliefs about and trust in government regulation, and trust in various sources of information.

- On the issue of labelling there was extremely high agreement (94%) that food containing GM ingredients should be labelled.
- Our respondents also felt strongly that biotechnology companies should be made liable for any damage caused by GM products.

In addition there was a lack of general endorsement of government regulation with regard to GM food (consistent with the findings of our 2002 survey). For example.

- Very few respondents believed the British Government adequately regulated GM food.
- There were very strong levels of agreement that organisations separate from government and industry are needed to regulate GM food. These items also saw very large percentage increases in agreement compared to 2002.

The survey contained a number of items designed to evaluate different dimensions of trust in government handling of GM food issues (competence, care, consensual values). Consistent with the findings of the 2002 survey, the evaluation of government and its policies could best be described by two underlying and independent trust dimensions: namely a *general trust* and a *scepticism* dimension. The two trust components that were found in this study show that different degrees of general trust can coexist with different degrees of scepticism. This suggests that even where expressed trust in an institution appears high, critical sentiments almost always coexist regarding such things as organisational motives or available resources (see Walls, Pidgeon, Weyman, and Horlick-

Jones, 2004). Conversely, critical sentiments about risk regulation may not always signal complete rejection of an institution or its policies (Walls *et al* label this a state of ‘critical trust’; also Poortinga and Pidgeon, 2003b).

The study also asked about trust in various actors to tell the truth about GM food. A pattern consistent with other research (as well as the 2002 survey) was found, as follows.

- Doctors, consumer right organisations, environmental organisations, scientists working for universities, scientists working for environmental groups, as well as the Food Standards Agency (and to a slightly lesser extent DEFRA) are the most trusted sources to tell the truth about GM food.
- The least trusted sources were other government institutions (such as the national government, the EU, local authorities and scientists working for government) as well as industry sources (such as the food manufacturers, the biotechnology industry and scientists working for the biotechnology industry).

A principal components analysis demonstrated that trust in information sources can best be described by four factors, which, respectively, represent trust in *government institutions*, *trust in industry*, *trust in watchdogs*, and *trust in personal sources*. Interestingly, the FSA, farmers and the DEFRA all loaded highly on the factor representing ‘Trust in Industry’, suggesting that these organisations or groups of people may be seen as being part of a wider system of governance and production of food biotechnology.

- The major differences *between* actors, found in relation to trust, were less pronounced when people were asked to indicate how much they agreed that they should be involved in making decisions about GM food. In fact, more than half of the respondents agreed that *all* organisations and groups of people included on the survey should be involved in decision making. This result suggests that people feel that all views should be heard in order to have a successful process about this still controversial technology.
- The results also clearly indicate that people feel that the general public should be involved in decisions about a complex and controversial issue such as GM food.

Overall, an interesting shift in public views on the *governance* of GM food seems to have taken place between 2002 and 2003. As noted above, people expressed a stronger need in 2003 for organisations separate from government and industry to adequately regulate developments in GM food. This shift is reinforced by the finding that independent organisations and groups of people (mainly so-called ‘watchdogs’) were more highly trusted in 2003 compared to 2002. At the same time the (generally low) trust ratings of industry and government sources remained practically unchanged over both surveys. Likewise, agreement that watchdog organisations should be involved in making decisions



about GM food increased substantially from 2002 to 2003, while agreement that government and industry should be involved remained fairly stable. Given that many of the other items measuring more general attitudes to GM food itself remained relatively stable over the two surveys, one conclusion might be that intervening external events (i.e. the involvement of the UK government in the Iraq War during the spring of 2003, and its aftermath) have changed general attitudes towards the UK government and its regulatory activities over the period of the two surveys rather than attitudes to the governance of GM food *per se*.

### **Awareness and Evaluation of the GM Nation? Public Debate**

The final section of the survey contained questions specifically designed to evaluate the *GM Nation?* public debate on the commercialisation of agricultural biotechnology. This section of the survey mainly focused on public awareness of the debate as well as people's views and understandings of the value and impacts of the GM debate process itself. One of the main aims of *GM Nation?* was to create widespread awareness among the general population (see DTI, 2003) of the debate itself. Regarding this issue:

- A moderate proportion of adults (15%) reported they had heard about the debate and knew at least something about it, while slightly less had heard about the debate but knew nothing of it.
- On the other hand, this means that the bulk of the population (seven in ten) had not heard of the debate at all.

In general, our respondents held rather mixed views on the value of the debate itself. As noted above people have a desire to be involved in decision making about GM. Accordingly:

- In particular, people feel that the debate was a good way for the public to get more involved in making decisions about the complex issue of commercialisation of agricultural biotechnology.
- Respondents did not have clear views either way on process issues such as the fairness of the conduct of the debate, what it was about or its value for money. These findings are hardly surprising given that many had never heard of debate in the first place.
- Despite clear support for the debate itself, people were fairly sceptical about its impact. Many people felt that what will happen to agricultural biotechnology is a foregone conclusion, because the government has already made its mind up on GM foods and crops, and also because "in the end European and International Laws will determine what will happen".

- As a concluding positive note, an overwhelming majority (77%) of those surveyed felt that public debates, such as the *GM Nation?*, would be useful in the context of other new developments in science and technology.

## **In Conclusion**

This report presents the main descriptive findings of a detailed empirical study of public sensibilities, awareness and knowledge of issues in relation to GM food and crops and the nationwide *GM Nation?* public debate on the commercialisation of agricultural biotechnology. The survey was conducted in the summer of 2003 immediately after the conclusion of the debate process, and has produced a rich dataset that allows for a detailed exploration of public attitudes to this controversial issue. The current report is primarily descriptive, and, therefore, has only highlighted a number of the overall findings of the study. Nor has the report attempted to present a detailed evaluative analysis of the implications of our findings for the conduct of the *GM Nation?* public debate itself. More detailed statistical and evaluative analyses will be published by the authors at a later stage.

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## Appendices

**Appendix A. Results of UEA/MORI Risk Survey 2002: The importance of various personal (P) and social (S) issues. (%)**

	Not at all important		Neither/ Nor		Very Important	Don't know
Your Health (P)	0*	0*	2	10	86	1
Partner and Family (P)	1	1	4	10	85	0*
Law and Order (S)	0*	1	4	19	76	0*
Education (S)	1	1	5	16	76	1
Personal Safety (P)	0*	0*	4	21	75	0*
Being Independent (P)	0*	0*	6	23	69	1
Your Privacy (P)	0*	1	8	24	68	0*
Terrorism (S)	1	2	11	24	60	1
Having a Comfortable Life (P)	0*	1	7	31	60	1
Personal Finance (P)	1	1	8	33	57	0
Environmental Protection (S)	0*	1	10	32	56	1
Social Relations/Friends (P)	0*	1	8	38	54	1
RADIOACTIVE WASTE	2	5	17	23	53	1
Animal Welfare (S)	3	4	17	30	46	1
The Economy (S)	2	3	14	34	46	1
Work (P)	8	3	14	31	42	2
Excitement/Fun (P)	2	4	18	35	40	1
Tackling World Poverty (S)	3	4	19	35	40	1
Tackling Human Rights (S)	2	4	19	37	36	1
CLIMATE CHANGE	5	6	22	36	30	2
Population Growth (S)	4	6	32	32	26	2
GENETIC TESTING	5	9	29	27	26	4
<b>GM FOOD</b>	<b>10</b>	<b>12</b>	<b>34</b>	<b>21</b>	<b>20</b>	<b>4</b>
RADIATION FROM MOBILE PHONES	9	8	37	25	19	3
Religion (P)	18	11	33	20	17	0*

**Source: UEA/MORI Risk Survey 2002; Person Weighed Data Set (N= 1547) for social and personal values (entries in lower case); sample sizes for the individual risk cases (entries in upper case) were: climate change (321), radiation from mobile phones (319), radioactive waste (306), GM food (296), and genetic testing (305). Note: \*) These non-empty cells (<0.5) were rounded to 0.**

**Appendix B. Results of UEA/MORI Risk Survey 2002: Attitudes towards GM food. (%)**

	<b>Strongly Disagree</b>	<b>Tend to Disagree</b>	<b>Neither/ Nor</b>	<b>Tend to Agree</b>	<b>Strongly Agree</b>	<b>Don't Know/ No opinion</b>
<b>Importance</b>						
Importance of GM food <sup>a</sup>	10	12	34	21	20	4
<b>Concern</b>						
I am not that bothered about GM food	19	19	19	26	7	10
The idea of GM food fills me with dread	15	22	30	11	13	8
Concern about GM food <sup>b</sup>	16	11	31	20	17	4
<b>Risk Characteristics</b>						
GM food has unknown consequences	1	5	12	49	27	7
GM food poses risks to future generations	1	6	29	34	18	11
I feel able to control any risks to myself associated with GM food	15	29	21	20	5	10
The risks from GM food are unfair because they fall unevenly on particular groups in British society	4	10	39	22	4	20
<b>Trust in Risk Regulation</b>						
I feel confident that the British government adequately regulates GM food	14	27	29	18	2	10
<b>Independent regulatory organisations</b>						
Organisations separate from government are needed to regulate GM food	2	5	23	38	21	12
Organisations separate from industry are needed to regulate GM food	1	5	14	40	25	16
<b>Ambivalence</b>						
I have mixed feelings about GM food	8	11	14	43	14	10
<b>Need for Information</b>						
I am well informed about GM food	21	34	21	15	3	7
<b>Behavioural Intention</b>						
I personally would be happy to eat GM food	25	21	20	21	8	5

**Source: UEA/MORI Risk Survey 2002 (Weighted dataset, n=296); Note: a) The scale ranged from "Not at all important" to "Very important"; b) The scale ranged from "Not at all concerned" to "Very concerned".**

**Appendix C. Results of UEA/MORI Risk Survey 2002: Perceived risks and benefits of GM food. (%)**

	None	.	.	Some	.	.	Very high	No opinion
<b>Perceived Risks</b>								
Personal	5	3	10	37	9	5	12	19
Environment	2	2	3	35	17	10	15	17
British society as a whole	3	3	6	40	11	8	12	17
<b>Perceived Benefits</b>								
Personal	28	5	9	31	7	3	0	17
Environment	---	---	---	---	---	---	---	---
British society as a whole	17	5	9	36	10	7	2	14

Source: UEA/MORI Risk Survey 2002 (Weighted dataset, n=296).



**Appendix D. Results of UEA/MORI Risk Survey 2002: Trust in information sources to tell the truth about GM food. (%)**

	<b>Distrust a lot</b>	<b>Distrust a little</b>	<b>Neither/ Nor</b>	<b>Trust a little</b>	<b>Trust a lot</b>	<b>Don't Know</b>
1. Doctors	3	4	16	51	21	4
2. Consumer Right Organisations (e.g., Consumers' Association)	4	7	15	48	21	5
3. Environmental Organisations	4	7	17	48	19	5
4. Scientists working for Universities	2	4	22	50	16	6
5. Scientists working for Environmental Groups	3	6	22	47	16	7
6. Friends and Family	3	3	24	35	27	8
7. People from your Local Community	3	6	40	35	6	9
8. Scientists working for Government	13	24	22	32	5	5
9. Scientists working for the Biotechnology Industry	14	22	20	32	4	8
10. The Biotechnology Industry	16	22	18	33	2	9
11. The EU	19	17	23	29	5	8
12. Local Authorities	9	23	30	29	2	8
13. The National Government	17	27	20	27	4	5
14. Food Manufacturers	18	35	15	24	4	4

**Source: UEA/MORI Risk Survey 2002 (Weighted dataset, n=296).**

**Appendix E. Results of UEA/MORI Risk Survey 2002: Involvement in decision making about GM food. (%)**

	<b>Strongly Disagree</b>	<b>Tend to Disagree</b>	<b>Neither/ Nor</b>	<b>Tend to Agree</b>	<b>Strongly Agree</b>	<b>No opinion</b>
1. Environmental Organisations	1	4	15	46	30	5
2. Consumer Right Organisations (e.g., Consumers' Association)	2	3	13	49	27	6
3. Scientists working for Universities	2	3	14	53	21	8
4. Scientists working for Environmental Groups	0	5	15	51	22	7
5. The General Public	2	5	17	42	29	6
6. Doctors	1	4	17	49	21	
7. Scientists working for the Government	5	9	17	50	15	5
8. The National Government	3	11	17	47	17	6
9. Local Communities	2	10	24	40	17	8
10. Food Manufacturers	6	17	17	38	18	4
11. Scientists working for the Biotechnology Industry	7	10	19	44	12	9
12. The biotechnology Industry	8	11	18	45	9	9
13. The EU	8	12	19	38	16	7
14. Local Authorities	2	10	30	31	10	7
I would like to be personally consulted in policy making decisions about GM food	10	25	26	19	8	11

**Source: UEA/MORI Risk Survey 2002 (Weighted dataset, n=296).**

**Appendix F. Results of UEA/MORI Risk Survey 2002: Evaluation of government with regard to GM food. (%)**

	<b>Strongly Disagree</b>	<b>Tend to Disagree</b>	<b>Neither/ Nor</b>	<b>Tend to Agree</b>	<b>Strongly Agree</b>	<b>No opinion</b>
<b>Competence</b>						
The government is doing a good job with regard to GM food	17	22	37	11	1	12
The government is competent enough to deal with GM food	20	22	25	22	1	11
<b>Credibility</b>						
The government distorts facts in its favour regarding GM food	1	6	32	34	17	10
<b>Reliability</b>						
The government changes policies regarding GM food without good reasons	1	6	35	31	15	12
<b>Integrity (Vested Interests)</b>						
The government is too influenced by the biotechnology industry regarding GM food	1	7	36	29	15	12
<b>Care</b>						
The government listens to concerns about GM food raised by the public	14	32	23	20	2	11
The government listens to what ordinary people think about GM food	24	33	19	16	1	8
<b>Fairness</b>						
I feel that the way the government makes decisions about GM food is fair	16	27	33	12	1	12
<b>Openness</b>						
The government provides all relevant information about GM food to the public	27	33	21	9	1	10
<b>Value Similarity</b>						
The government has the same opinion as me about GM food	23	27	25	10	2	13
The government has the same ideas as me about GM food	21	27	29	9	1	14

Source: UEA/MORI Risk Survey 2002 (Weighted dataset, n=296).