

Genetically Modified foods: What is the Mass Media's role in Shaping Consumer Perception's and Knowledge?

Kelly Fishman

Abstract Advances in recombinant DNA technology during the 1990's have modified crops to produce traits not possible with traditional breeding techniques. These genetically modified (GM) foods can be modified to generate higher nutrient and yield levels, and to produce their own pesticides, fertilizers, and vaccines. This technology has caused considerable consumer debate, with opponents stressing health, environmental, economic, and moral consequences. Consumers are ultimately in control of the GM issue, and are in turn highly influenced by the mass media (Cracknell 1993). This study aimed to determine if different mass media sources give distinct perception and knowledge of GM foods. A self-administered survey of 105 Berkeley supermarket consumers was employed to acquire this information. This survey concluded that most consumers (58%) do consult the mass media, specifically newspapers (44%), for information on genetically modified foods. Respondents were given composite scores to their answers of knowledge and perception questions, and from these pair-wise comparisons between mass media sources were made. In terms of perception, comparison between television and radio was found to be significant, with TV producing a more positive perception of GM foods. Significance was additionally found between newspapers and radio, with radio giving a more negative perception. No significance existed between television and newspapers. In terms of knowledge, significance was displayed again between television and radio, with radio providing a higher mean knowledge score. No significance was found between newspaper and radio. Finally, significance was discovered to exist between television and newspaper, with newspapers giving a higher mean knowledge score.

Introduction

Farmers have been modifying crops with cross and selective breeding for the past ten thousand years. However, recent advances in recombinant DNA technology have modified crops to produce traits not possible with traditional breeding techniques. These genetically modified organisms (GMO's) are created with direct DNA transfer, involving small metal particles propelled at high speed into the target tissue, which is then developed into transgenic plants (Dunwell 1998). In the early 1990's, biotechnology was seen as a solution to agricultural problems such as low food productivity, pesticide use, and health complications (Jordan 2000, Barton and Dracup 2000). However, the application of biotechnology in agriculture has generated considerable debate, with concerns over inadvertently introduced toxins, introduced allergens, changes in essential nutrient levels, and globalization and ethical consequences (Kaepler 2000, Jordan 2000). Under a 1992 policy, the Federal Drug Administration (FDA), considers genetically modified (GM) foods to be subject to the same standards as conventional varieties. (FDA 1992) The FDA places legal duty on the developers of GM foods to assure their safety, and does not require GM products to be labeled. (FDA 1992, Kaepler 2000) The success of transgenic crops in the field, coupled with the FDA's approval, stimulated the interest of multinational corporations and by 1996 massive amounts of GM grain, wheat and soy were produced and shipped into the American marketplace (PBS 2000 elect. comm, Jordan 2000).

An understanding of consumer opinion and how it is influenced is extremely important, as American consumers are ultimately in control of the GM issue. Scientific researchers, the food industry, legislation, and agricultural producers rely on consumer acceptance of GM foods. In an interview with the Public Broadcasting System, Agricultural Secretary Dan Glickman stated that, "The FDA had the power to require labeling if there is enough pressure to convince them to do it. It doesn't have to even be for safety" (PBS 2000). This statement illustrates the power consumers have over legislation, power that translates into an influence on the biotech industry, agricultural institutions and food producers.

Several studies theoretically explored the role of the mass media in influencing environmental issues (Cracknell 1993, Hansen 1993, Neuzil and Kovarik 1996). It has been found that the mass media plays a seminal role in influencing social issues, and environmental topics are certainly not an exception. (Hansen 1993, Neuzil and Kovarik 1996). The mass media helps to shape consumer views by bringing attention to and legitimizing environmental causes.

(Cracknell 1993, Neuzil and Kovarik 1996) As Jon Cracknell states, “By alerting governmental institutions to public interest in environmental issues, the mass media undoubtedly helps to push environmental concerns up the political agenda” (Cracknell 1993). However, the capability of the mass media to produce meaningful social change is debated, as many critics believe this medium does not present alternative ideas or challenging points of view (Neuzil and Kovarik 1996). This skepticism translates to an inability to fundamentally influence knowledge and perceptions of environmental issues (Shanahan 1993)..

With a survey of college students James Shanahan (1993), of Boston University, determined the role of television in influencing awareness of environmental issues (Shanahan 1993). Shanahan found that “...television’s role, if not directly causal, is as a systemic factor which can work against environmental improvement in a cyclical fashion” and those who watched less television had a greater chance for exposure to environmentally concerned messages (Shanahan 1993).

The majority of studies on GM foods focused on determined consumer confidence on the issue (Hallman and Metcalfe 1995; Costa et al. 2001). These surveys gauged consumer opinion, and did not show how a consumer obtains information and shapes his or her perceptions. For example, the Office of Technology Assessment (1986) surveyed 1,273 randomly selected adults (OTA 1986). Research revealed an increasing public awareness and understanding of GM foods (OTA 1986). However, this study did not reveal how participants’ awareness and understanding was shaped.

An understanding of the influences on consumer power is extremely important as they influence the ultimate rejection or acceptance of GM foods in the marketplace. Theoretical studies debated the influence of the mass media in changing fundamental environmental views (Neuzil and Kovarik 1996). Only one study was found to link a mass media source to environmental awareness (Shanahan 1993). Adding to this need for research on the effects of the mass media is the inability of most studies to determine how consumers’ views of GM foods are shaped (OTA 1986).

This study specifically focuses on the controversial environmental issue of genetically modified foods. Additionally, the mass media was specifically examined since it is one of the most used sources for scientific and environmental information (Cracknell 1993, Neuzil and Kovarik 1996). Gaps in the previous research in terms of traditional mass media sources

presenting information and shaping perception and knowledge in comparison to one another were filled. Thus, this study primarily examined the role of particular traditional mass media sources--the newspaper, television and radio-- in influencing consumer perception and knowledge of GM foods, relative to one another. Specific questions addressed are if television gave a more positive perception and low knowledge level of GM foods, as compared to newspapers and radio. Based on previous studies, the hypothesis advanced is that respondents who use television as a major source for information would have a lower level of knowledge and a more positive perception of GM foods (Shanahan 1993). The concern over television as a primary source of information was addressed by Shanahan (1993) who noted that television has coverage limited to environmental catastrophes, and with an emphasis on simplistic, diametrical manner. Additionally, questions posed are if newspapers and radio give a more positive perception and higher knowledge level than television. The hypothesis is that respondents who use the newspaper or the radio as a primary source have a higher knowledge level and more negative perceptions of GM foods. This hypothesis is based on research that the newspaper produces more widespread coverage of environmental organizations and their issues (Anderson 1993). Newspapers have been shown to contain limited information on key factors in environmental issues (Singer 1987), but source is hypothesized to present more information than television. Similarly radio is thought to be similar to newspaper in the role of informing and influencing consumer perceptions of GM foods

Additional questions asked if participants have confidence in their understanding of GM foods in order to make an informed purchasing decision. Based on previous findings most consumers do not know that they are consuming GM foods (OTA 1986). This leads to the hypothesis that participants do not believe they have enough confidence in the history, use and technology of GM foods to make an informed purchase decisions. Further tests included determining if participants believe their primary mass media source provides accurate and unbiased information. A claim put forth by many non-governmental opponents of GM foods is that the mass media is heavily biased towards the pro-GM foods side (Greenpeace 2000 elect. comm). The hypothesis is that consumers do trust the mass media source for accurate, unbiased information.

To accomplish primary and secondary objectives, a survey of Berkeley residents was employed. As a vital metropolitan area which includes a major university the city of Berkeley

offers a diverse population. Participation in this study was limited to supermarket consumers, age eighteen and over.

Methods

No convenient list of food consumers was available, so cluster sampling of supermarket consumers was employed to select adults making food choice decisions. This population was desired since they were assumed to have opinions and knowledge of GM foods. The sample was drawn from three Berkeley supermarkets: Safeway Food and Drug at 1444 Shattuck Blvd., Andronicos Market at 1414 University Ave., and Berkeley Bowl at 2020 Oregon. These specific markets, opposed to other chains, locations and smaller stores were chosen since they offer varying price and food content. This enabled the incorporation of various socioeconomic classes and of consumers with different food preferences.

A self-administered survey was distributed at a table outside the main entrance of each supermarket location. A poster advertised the objective of the survey, affiliation, and the amount of time required to participate. The survey was administered as consumers exited the store, and participation was completely voluntary. In order to avoid bias, no questions were answered during, or before, participation. Respondents were only informed that they were being asked to answer questions about their opinions and knowledge of GM foods. After completing the survey, participants were given a sheet with contact information and further information describing the objectives. Surveys were distributed for an hour at 8 a.m., noon, and 8 p.m.. Varying times were chosen to incorporate most types of shoppers. The survey was administered on Monday, Wednesday, and Sunday at these times for one week at each store. Data was collected at Berkeley Bowl during the week of April 1, at Safeway during the week of April 8, and at Andronicos during the week of April 15, 2002. Additional surveys were distributed at Berkeley Bowl and Safeway on Tuesday, Thursday and Saturday during the week of April 15 for one hour at each store, in order to increase sample size. The author was the only person to distribute surveys, in order to decrease survey bias (Bernard 2002).

The survey instrument was twenty-two questions long and was composed of several parts. First, respondents were asked if they had previously heard of GM foods. Participants who selected answer choice B (I have not heard of this issue before), were asked not to continue with the survey. These potential participants were not included since they were assumed to not have

opinions and knowledge of GM foods. This qualification may decrease sample size, but may also increase the quality of the responses. Participants then answered questions on their use of the mass media for scientific issues, specifically GM foods. The four items asked about respondent's information source, traditional mass media source, Internet use, and their experience with their primary source news coverage. Information source was defined as the mass media, governmental documents, non-governmental organizations, family and friends or the Internet. Mass media sources included TV news programs, local/national TV news, radio news programs, and local/national newspapers. Of those who did consult the Internet, respondents were asked to qualitatively note which non-mass media websites they had visited for information on GM foods. Although the Internet was out of the scope for this study, it was included in order to aid future studies in determining the increasing role that the Internet plays in influencing environmental issues (Council of Europe 1997). The Internet was not included in this study since it is still developing as a source. Additionally, not all participants may have access to this particular mass media source, unlike most who have access to the traditional mass media.

The next set of questions gauged consumer perception of GM foods. The three items included in this section questioned participant's views on the safety, consumption, and labeling of GM foods. The third set of questions focused on participant knowledge, encompassed was the history, use, and technology behind GM foods.

The next item included asked participants to note their confidence in their understanding of the technology behind GM foods enough to make informed purchasing decisions. Respondents were then asked three items comprising 'other factors'. These items were included to determine if other influences were acting on participants' perceptions and knowledge, as has been suggested by prior literature (Shanahan 1993). Included are questions on participant's consumption of organic foods, price and food content influences on food choice decisions, and the morality of GM foods. Demographic data was then questioned, specifically sex, age and education level. A copy of the questionnaire is located in the Appendix.

The data obtained was non-normal and non-parametric, and all statistical tests were computed using StatView-5 computer program. To test the primary objective a total of three questions were used in each knowledge and perception section. Instead of arbitrarily choosing one knowledge and one perception question to test against mass media source, each respondent was given a composite knowledge and a composite perception score. A respondent's perception

score could range from -3 (a disapproving view of GM foods) to +3 (an accepting view of GM foods). A respondent’s knowledge score could range from zero (very low level of knowledge on GM foods) to 3 (very high level of knowledge on GM foods). The composite scores were then analyzed against pair-wise comparisons between television and radio, newspapers and radio, and television and newspapers. Data was analyzed with Mann-Whitney U statistical tests.

To test for associations between the questions comprising the secondary objective, Chi-squared tests of Independence were employed. Responses to questions 2A (TV news programs) and 2B (local/national TV news) were combined to a general 2T or “Television” category for all statistical analysis, except to determine the most used traditional mass media source. The categories were combined due to the low sample size, and to increase the power of statistical tests.

Results

A total of 105 surveys were collected. Chart 1 summarizes age, Chart 2 education, and Chart 3 gender distribution of the sample population and the city of Berkeley. No major differences were noted, however the sample population slightly over represented younger and more educated people.

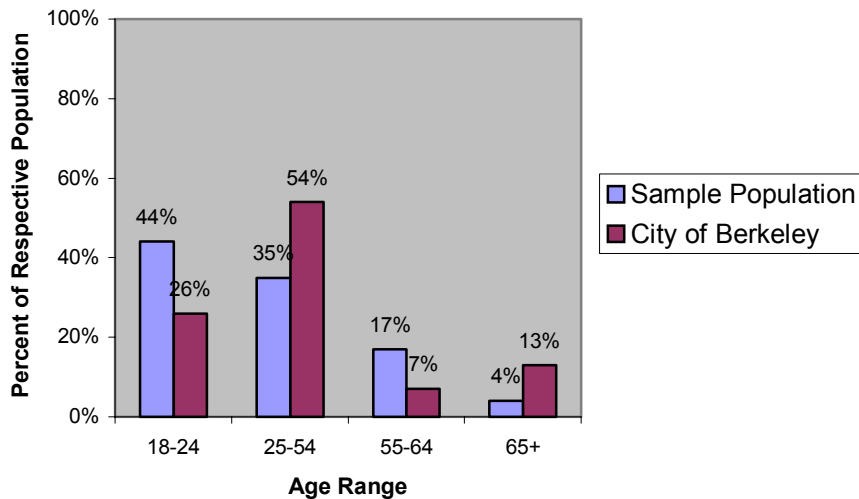


Chart 1: Age comparison between the sample population (N=105) and the city of Berkeley (N= 88,044)

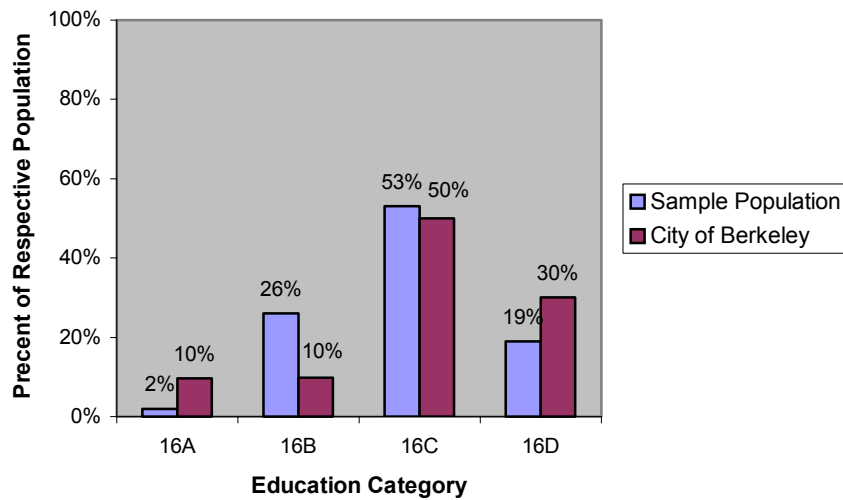


Chart 2: Education comparison between the sample population (N=105) and the city of Berkeley (N=65,410)

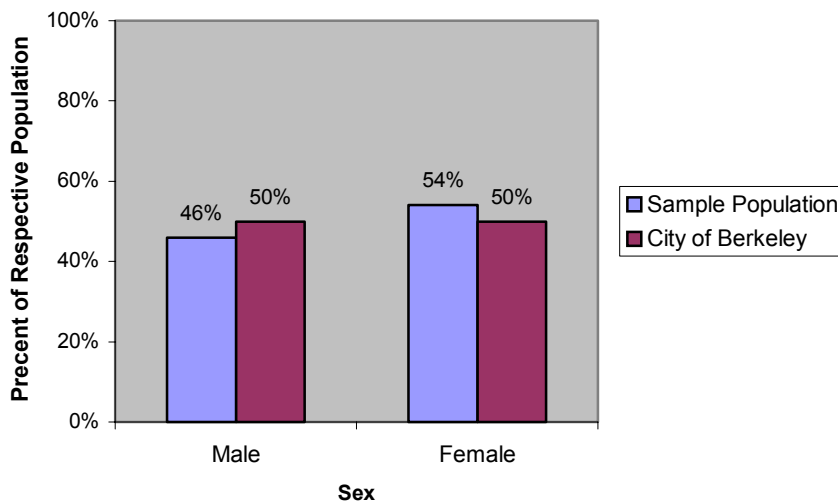


Chart 3: Gender comparison between the sample population (N=105) and the city of Berkeley (N= 102,724)

The majority (58%) of participants used the mass media as their information source (1A). The second most used (15%) source was non-governmental organizations (1C). Slightly less (13%) used family and friends as a source for information on GM foods (1D). Equal amounts (4%) used governmental organizations (1B) and the Internet (1E). Within the mass media, the

majority (44%) of participants used newspapers, followed by television news programs (22%), local and national television news (21%) and radio (18%).

In addition to pair-wise tests between different traditional mass media sources and knowledge and perception, the mean knowledge and perception score was calculated. This was done to facilitate an understanding of the general perception and knowledge relayed by each source. These tests were analyzed using Mann Whitney-U statistical methods, and since there was three pair-wise comparisons, the individual P-values for each was multiplied by three. Table 1 summarizes the results for the primary objective. In terms of perception, the comparison between television and radio was found to be significant, with TV producing a more positive perception of GM foods. Significance was additionally found between newspapers and radio, with radio giving a more negative perception. No significance existed between television and newspapers. In terms of knowledge, significance was displayed again between television and radio, with radio providing a higher mean knowledge score. No significance was found between newspaper and radio. Finally, significance was discovered to exist between television and newspaper, with newspapers giving a higher mean knowledge score.

	TV	Radio	Newspaper	Radio	TV	Newspaper
Perception	+1.8	-1.2	-.07	-1.2	+1.8	-.07
	Significant (P-value = .0171)		Significant (P-value = .0612)		Not Significant (P-value = 1)	
Knowledge	1.2	1.7	1.8	1.7	1.2	1.8
	Significant (P-value = .0726)		Not Significant (P-value = 1)		Significant (P-value = .0183)	

Table 1: The role of the mass media on respondent’s knowledge and perceptions

Most (38%) of respondents’ noted they had heard more negative comments on GM foods from their mass media source (4B). Slightly less (34%) had heard both sides equally (4C). Almost one-quarter (20%) said they did not know what they had heard from their mass media source (4D), and few (13%) had heard more positive comments for GM foods (4A).

In response to question 9, asking respondents to note their confidence in their understanding of GM foods, the majority of respondents (56%) noted that they feel confident enough in the

technology behind GM foods to make an informed purchase decision. A slight minority of respondents (31%) did not feel confident in their understanding, and 18 percent were unsure of their understanding of the technology behind GM foods. No association was found to exist (Chi Squared P-value = .4530) between specific mass media source (question 2) and respondents self-rated confidence in GM foods (question 9).

Results showed that a majority (44%) of respondents did not consult the Internet for information on scientific issues, including genetically modified foods. Of those who visited the Internet, most (32%) used traditional mass media type websites, and 24 percent used other types. Only those who selected “other types” had to qualitatively express their experiences, however some respondents’ did not fill in the websites they visit. Qualitative results are displayed below in Chart 2.

School/University/UC Berkeley (N=7)	Media File (N=1)
Environmental Organizations (Greenpeace) (N=3)	Scientific Magazine sites (N=1)
Science Journals (Nature/Science) (N=2)	Surfrider.com (N=1)
1C, 1B/ Types Above (N=2)	National Geographic (N=1)

Chart 2: Qualitative responses to question 4B

Responses revealed that price (38%) was the most important factor in food choice decisions. The majority of respondents (58%) sometimes buy organic items and a high majority (66%) does not believe that it is unethical to create crops with genetic engineering. Responses to questions 12 through 14 are displayed in Appendix A-Table A, B, and C.

Discussion

A limitation of this study was the limited sample size. Contributing to this size was a sizable amount of supermarket consumers whom had not previously heard of genetically modified foods. Due to this lack of information, they were asked them not to continue with the survey, therefore decreasing the sample tremendously. The sample population was further limited to customers of three area supermarkets, shopping at the precise days and times of distribution. Certain socioeconomic levels, minority groups, and those living at a distance from the market

locations may not have been represented. However, these demographics were not included in the study. Consequently, future studies should include demographic questions in these areas.

Further limitation of this study included potential biases within the survey instrument due to phrasing, question order and word choice. Attempts were made to minimize this, however it is possible that some bias occurred.

The sample was generally representative of the Berkeley population. However participants in the 18-24 year old range were slightly favored. During sampling I noted that many respondents who checked that they have not previously heard of genetically modified foods-- and therefore did not to continue with the survey-- were older customers. This qualification may have had the unintended effect of favoring younger consumers. Additionally, a higher percentage of high school graduates and those who have completed/some/current Bachelors degree were found in the sample population. These groups may have found me more approachable, or been more sympathetic with my cause as a student. Further, the days, times and locations of my sampling may have favored these groups.

As expected the most used source was the mass media. Environmental organizations traditionally have solicited the mass media to present stories and findings, and the mass media responds with environmental coverage (Cracknell 1993). Further, in 10 newspaper studies conducted by American Opinion Research (1992) readers identified environmental news as the fastest growing topic of interest (Neuzil and Kovarik 1996). It is therefore not surprising that respondents would seek the mass media for information and as coverage increases.

The primary hypothesis of the study was to determine if the different traditional mass media sources gave different perceptions and knowledge levels of GM foods. The hypothesis that television would give a more positive mean perception and a lower mean knowledge source than radio was verified. The tendency to a more positive perception and lower knowledge was expected to exist due to the manner of television to present environmental themes in a simplistic manner (Shanahan 1993). Shanahan (1993) found that students who watched more television had a greater lack of concern for the environment. This was conferred by this study, which showed that television viewers tend to view GM foods more positively. However, no significance was found to exist between television and newspapers in terms of perception. This study hypothesized that television would give a more positive perception of GM foods in comparison to newspapers. This finding may be due to the types of newspapers used by participants,

however specific newspaper types were not recorded. A significance was discovered to exist between television and newspapers in terms of knowledge. This was hypothesized, and newspapers gave a higher mean knowledge score than television.

In comparison between newspapers and radio, no significance was discovered to exist in terms of knowledge. However, significance was found in terms of perception, with radio giving a more negative mean perception score. It was hypothesized that the two would give the same mean perception and knowledge score. This result could be experienced with a future study that specifically examines the types of radio a station and newspapers used. Perhaps, as with the result between television and newspaper in terms of perception, some stations and papers express different themes and information. Future studies should specifically examine if there is a difference in the environmental coverage between these sources.

The most used mass media source was the newspaper. This finding went against the hypothesis that categories 2A (TV news programs) and 2B (local and national news) would make up the majority of responses. However the combined totals for both categories (43%) was slightly below that for newspapers. This hypothesis was based on a study by James Shanahan which concluded that television was the primary source for information about environmental health issues (Shanahan 1993). This was supported by the fact that television is easily accessible (Shanahan 1993). The fact that the majority of respondents consulted newspapers for as a primary source may be linked to a higher education level. Indeed, my sample population did favor those who were more educated, with the majority (72%) of respondents having completed/current/some higher education.

A secondary objectives for this study was to determine if participants have confidence in their understanding of the technology of GM foods in order to make informed purchasing decisions. The majority of respondents did feel confident in their understanding, agreeing with the hypothesis. This high percentage is also reflected in the overall high knowledge level that participants showed. No association was found to exist between confidence level and mass media source employed. An association was hypothesized to exist due to the tendency of newspaper and radio to give more information, therefore leading to a higher self-rated confidence. However, perhaps this hypothesis was false since those who primarily employ a certain source do not employ other sources. Concluding that these participants would not know what information they are missing.

Secondary objectives also included deciphering if participants believe the mass media source they consult presents accurate and unbiased information. A slight majority of respondents noted they believe their mass media source presents slightly more negative arguments of GM foods. This is surprising, since it was hypothesized that a majority of respondents would note their primary mass media source as presenting the issue equally. This was based on the intuition that most consumers would consult the source they believe gives the most accurate and unbiased information. If participants feel their mass media source was not doing this, they would not employ that source. Perhaps, instead of a flaw in this hypothesis, but the sizable amount of younger, more educated participants. This particular group has been found to be more concerned with the environment, and thus perhaps more skeptical of their mass media source (Shanahan 1993). Only around one-third (34%) of respondents believed their information source on GM foods presents the topic equally. Further, the finding most participants believe their source presents more of an argument against GM foods goes against the claim put forth by some non-governmental organizations. Some organizations, such as Greenpeace, maintained that the mass media presents more stories favoring GM foods (Greenpeace 2000 elect. comm). The fact that these were mostly environmental organizations making this claim might have lead them to expect more environmentally friendly views in the mass media.

Most respondents did not consult the Internet for information on genetically modified organisms. However, as this media develops and grows, future studies should investigate this medium as it has the potential to offer the most information, and highest level of awareness, as compared to the traditional mass media (Council of Europe 1997). Of those respondents who consulted the Internet, most visit traditional mass media sites. This could be due to the fact that the credibility of the mass media carries over to the Internet, resulting in a high amount of use.

Future studies should investigate if different supermarkets have customers who display ideologies of GM foods. This study observed that many who shopped at the primarily organic market, Berkeley Bowl, tended to be more disapproving of GM foods. This however was not able to be tested, due no recordings on which respondents shopped at which store.

Acknowledgements

I would like to thank Manish Desai, Matt Orr, Justin Remais and John Latto for all their help.

References

- Akre, J. 2001. Media Serve Genetically Modified Food Industry. *Media Alliance* 20: 1-6.
- Anderson, A. 1993. Source-media relations: the production of the environmental agenda. Pp 51-68 *In The Mass Media and Environmental Issues*. A. Hansen, ed. Leicester University Press, New York.
- Bernard, R. 2002. *Research Methods in Anthropology: Qualitative and quantitative approaches*, 3rd edition. Alta Mira Press, Walnut Creek, CA. 100 pp.
- Cottle, S. 1993. Mediating the environment: modalities of TV news. Pp 107-133 *In The Mass Media and Environmental Issues*. A. Hansen, ed. Leicester University Press, New York.
- Compaine, B. (1979). *Who Owns the Media?*. Knowledge Industry Publications, Inc., White Plains, N.Y.. 338 pp.
- Cracknell, J. 1993. Issue arenas, pressure group and environmental agendas. Pp 3-21 *In The Mass Media and Environmental Issues*. A. Hansen, ed. Leicester University Press, New York.
- Croteau, D. 2001. *The Business of the Media: Corporate Media and the Public Interest*. Pine Forge Press, Thousand Oaks, California. 243 pp.
- Dunwell, J. M.. 1998. Genetically Modified Food Products. *International Journal of Food science and Technology* 33: 205-209.
- Dunwoody, S. Griffin, R. 1993. Journalistic strategies for reporting long-term environmental issues: a case study of three Superfund sites Pp 22-50 *In The Mass Media and Environmental Issues*. A. Hansen, ed. Leicester University Press, New York.
- Dracup, M. 2000. Genetically Modified Crops and the Environment. *Agronomy Journal* 92: 797-801.
- Food and Drug Administration. 1992. *Foods derived form New Plant Varieties*. Department of Health and Human services, Docket No. 92N-0139. New York.
- Gaskell et al. 1999. Worlds Apart: The reception of GM foods in Europe and the US. *Science* 18: 935-938.
- Hansen, A. 1993. Greenpeace and press coverage of environmental issues. *In The Mass Media and Environmental Issues*. A. Hansen, ed. Leicester University Press, New York.
- Hoban, T. Consumer attitudes of agricultural biotechnology. *The Forum for Family and Consumer Issues* 6.1 2001: 12 pars. February, 2001

- Jordan, M.C. 2000. The Privatization of Food: Corporate Control of Biotechnology. *Agronomy Journal* 92: 803-806.
- Kaeppler, H. F. 2000. Food Safety Assessment of Genetically Modified Crops. *Agronomy Journal* 92: 793-796.
- Lewis, R. 1999. GM Crops face heat of debate. *The Scientist* 13:1-5.
- Neuzil, M. Kovarik, W. 1996. *Mass Media and Environmental Conflict*. SAGE Publications, London. 243 pp.
- Palfreman, J. 2001. Harvest of Fear. Frontline and Nova co-production, WGBH edu Foundation. Public Broadcasting System video distributor.
- Proceeding. 1997. Environment conservation and the media. Council of Europe Publishing, Strasbourg. 59 pp.
- Selvin, S. Fall 2001. Public Health 142 Course Reader. Pp 7.16-7.25. UC Berkeley Press, Berkeley, CA.
- Shanahan, J. 1993. Television and the cultivation of environmental concern: 1988-92 *In The Mass Media and Environmental Issues*. A. Hansen, ed. Leicester University Press, New York.
- Singer, E. Endreny, P. 1987. Reporting hazards: their benefits and costs. *Journal of Communication* 37: 10-26
- US Congress. 1986. Office of Technology Assessment national survey. Washington D.C. available at www.wws.Princeton.edu/~ota
- Whipple, D. 1999. Seeds of Controversy. *The Futurist* 33: 10-12.

Appendix A

Item	Percent of Respondents
12A: Price	36%
12B: Ingredient Content	24%
12C: Both equally	39%
12D: Neither	1%

Table A: Responses to question 12: Is price or ingredient content more important in your food choice decisions?

Item	Percent of Respondents
13A: Always	17%
13B: Sometimes	55%
13C: Never	28%

Table B: Responses to question 13: when available, how often do you buy organic food items?

Item	Percent of Respondents
14A: GM crops are morally wrong	13%
14B: GM crops are not morally wrong	63%
14C: I am unsure of the morality of GM crops	24%

Table C: Responses to question 14: Do you believe that creating crops with genetic engineering is morally wrong or not?

Sample survey

*** Please note that the actual font used in survey distribution was size 14**

I am a UC Berkeley student conducting research on consumer opinions of genetically modified foods, or GM foods. Please check only one of the responses to each of the following questions. Thank you in advance for your time.

-Kelly Fishman

<p>Are you a Berkeley resident, over the age of 18?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>

IF YOU ANSWERED NO, YOU ARE FINISHED WITH THE SURVEY, THANK YOU.

IF YOU ANSWERED YES, PLEASE CONTINUE WITH THE SURVEY.

Have you heard of genetically modified (GM) foods before taking this survey?

A. YES

B. NO

IF YOU ANSWERED NO, YOU ARE FINISHED WITH THE SURVEY, THANK YOU.

IF YOU ANSWERED YES, PLEASE CONTINUE WITH THE SURVEY

1. Of the following, which INFORMATION SOURCE do you use most for information on scientific issues, including GM foods?

- 1A. Mass media (*TV, radio, newspapers and magazines*)
- 1B. Governmental documents (*FDA, EPA and other agency reports*)
- 1C. Environmental/agricultural/non-governmental organization
- 1D. Family and friends
- 1E. Internet websites (*They may contain any of the areas above*)

2. Of the following, which MASS MEDIA SOURCE do you turn to most for information on scientific issues, including GM foods?

- 2A. TV news programs (*for example Nightline or 60 minutes*)
- 2B. Local/national TV news (*for example morning or nightly TV news programs*)
- 2C. Radio news programs (*for example NPR, BBC or local radio shows*)
- 2D. Local/national newspapers (*for example the SF Chronicle, NY Times or LA Times*)

3. Of the following, which INTERNET WEBSITES do you consult most for information on scientific issues?

- 3A. Traditional mass media-type organizations (*for example 60 minutes, SF Chronicle online, or NPR online*)
- 3B. Other types of websites: (*please list*) _____
- 3C. I do not consult the Internet for information on scientific issues

4. Which statement best describes your experience?

- 4A. I have heard more of the argument for GM foods
- 4B. I have heard more of the argument against GM foods
- 4C. I have heard both sides equally
- 4D. I do not know

5. Which statement best describes your opinion?

- 5A. GM foods are as safe as conventional foods
- 5B. GM foods are less safe than conventional foods
- 5C. Do not know enough about GM foods to decide
- 5D. I am undecided on the safety of GM foods

6. Which statement best describes your attitude?

- 6A. I generally will eat GM foods
- 6B. I will not eat GM foods
- 6C. I do not know or can not decide

7. Do you think GM foods should have special labels on them?

- 7A. Yes
- 7B. No
- 7C. I do not know or am not sure

8. How long do you believe GM soy, corn and wheat products have been in the marketplace?

- 8A. They have always been in the marketplace
- 8B. Since 1986
- 8C. Since 1996
- 8D. They are not yet in the marketplace

9. Do you feel confident enough in your understanding of the science behind GM foods enough to make an informed purchasing decision?

- 9A. I feel confident in my understanding of GM technology
- 9B. I do not feel confident in my understanding of GM technology
- 9C. I am unsure of my understanding of GM foods.

10. Most scientists have concluded that GM foods are:

- 10A. Unsafe
- 10B. Safe
- 10C. Scientists are undecided

11. How are genetically modified foods created?

- 11A. By transferring genes from one crop species into another
- 11B. By cloning certain crop genes
- 11C. By cross pollinating between crop species

12. Is price or ingredient content more important in your food choice decisions?

- 12A. Price
- 12B. Ingredient content
- 12C. Both equally
- 12D. Neither

13. When available, how often do you buy organic food items?

- 13A. Always
- 13B. Sometimes
- 13C. Never

14. Do you believe that creating crops with genetic engineering is morally wrong or not?

- 14A. GM crops are morally wrong
- 14B. GM crops are not morally wrong
- 14C. I am unsure of the morality of GM crops

15. Education level:

- 15A. Did not complete high school
- 15B. High school graduate
- 15C. Current/some/completed Bachelors degree
- 15D. Current/some/completed Professional or Graduate degree

16. Age:

- 16A. 18-35
- 16B. 36-50
- 16C. 51-64
- 16D. 65+

17. Gender:

- 17A. Male
- 17B. Female

THANK YOU FOR YOUR HELP!!!

Your participation in this study has helped me to better understand your level of knowledge and perceptions of GM foods. Additionally, your responses will be analyzed to determine how you form these opinions, and specifically the role that the mass media plays in influencing those opinions.