

Evaluating Genetically Modified Food Labels: A Focus Group Study

Research Paper Submission

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Abstract

Genetically modified (GM) organisms are commonplace in modern agricultural practice. However, consumer polls and surveys have indicated a lack of acceptance of GM ingredients in food and a desire to see such products identified through the use of labels. In this study, three focus groups, comprised of consumers in two northwest Arkansas counties, evaluated and discussed four genetically modified food labels developed using the Elaboration Likelihood Model. Findings revealed that participants want labels on food containing GM ingredients. Participants agreed on two features a label on GM foods should have: contact information and an identifying symbol. This label should appear on the front of the package or near the nutrition label. Participants also expressed a strong desire for consumer education about GM foods and any label adopted in the future to identify them. Further research on consumer preference for GM food labels is needed using both qualitative and quantitative methods.

Key words: genetically modified organisms, biotechnology, labeling, Elaboration Likelihood Model, focus groups

Introduction

In 2000, only 1% of the U.S. population was employed on a farm (National Agricultural Statistics Service, n.d.). As more and more Americans move away from rural settings, the consumer's understanding of agriculture practices quickly decreases. Food production techniques and practices are abstract concepts to citizens who have never been exposed to the lifestyle. This lack of knowledge fosters questions and concerns about food safety practices, including crops derived through genetic engineering (Brom, 2000).

Biotechnology includes any technique that uses living organisms to improve plants or animals, to make or modify products, or to develop microorganisms for specific uses (Office of Technology Assessment, 1984). Therefore, genetic engineering or genetically modifying an organism is one aspect of biotechnology. A genetically modified organism (GMO) is developed by taking a desired gene from one organism and transplanting it into the DNA of another organism (Maynard, 2004).

The United States is the world's leading producer of genetically modified (GM) crops. The most commonly planted genetically modified U.S. crop varieties are corn (45% GM), cotton (76% GM), and soybeans (85% GM). Production of GM canola, squash, and papaya varieties is also increasing (Pew Initiative on Food and Biotechnology, n.d.).

Consumer support for labeling products containing GM ingredients has increased in recent years. A 2000 study showed that 86% of U.S. citizens support mandatory labeling on all genetically altered foods, up from 84% in 1999 (Shanahan, Scheufele, & Lee, 2001). Labeling "includes any written, printed, or graphic matter that is present on the label, accompanies the food or is displayed near the food, including that for the purpose of promoting its sale or disposal" (Einsiedel, 2000, p. 231). Consumer advocacy groups argue for labels insisting the

consumer's "right to know" what they are eating. Vegetarians, for example, would want to know if the GM food contained a gene or protein from an animal. Other consumers want to avoid GM food for religious reasons or concerns about the safety of GM foods (Hart, 2004).

Labeling GM foods in the United States would be a complex and potentially expensive process. The common argument of consumer awareness and choice is one factor supporting mandatory labeling. However, labels can be misleading, ignored, misunderstood or useless. To make an informed decision, consumers must be better educated and aware of the options available (McHughen, 2000). The purpose of this study was to evaluate GM food label designs developed through the Elaboration Likelihood Model. Specifically, three research questions guided the project:

- **RQ1:** Did the selected Arkansas consumers want to see labels on foods that contain GM ingredients?
- **RQ2:** What types of information did the selected Arkansas consumers want on a food product that contains genetically modified ingredients?
- **RQ3:** Where on the food package should information about genetically modified ingredients be displayed?

Literature Review and Theoretical Framework

Public Opinion and Labeling

Two-thirds of Americans say it is important to know if a product contains genetically modified ingredients (Pew Initiative on Food and Biotechnology, 2001). In one focus group study (Teisl, Halverson, et al., 2002), almost all participants said they wanted a mandatory labeling program because "consumers have a right to know what goes into their bodies" (p. 8). A

study of New Jersey residents (Hallman & Metcalfe, 1995) found 84% of residents thought foods developed through biotechnology should be labeled as such.

Despite the prevalence of GM foods in the marketplace, surveys of U.S. consumers have shown a rather low understanding of food biotechnology (Heffernan & Hillers, 2002; Shanahan et al., 2001; Teisl, Halverson, et al., 2002). The consumer awareness level of biotechnology remains under 50%, but it is increasing over time (Hoban, 1999). A low level of awareness is demonstrated when a majority (62%) of consumers say they have never eaten GM foods (Falk et al., 2002). This is highly unlikely because 70% of manufactured foods contain GM ingredients (Brown & Ping, 2003).

Recent labeling studies (Teisl, Halverson, et al., 2002; Teisl, Peavey, Newman, Buono, & Hermann, 2002) have illustrated how focus group participants react to certain label designs and helped create the methodology for this research project. Teisl, Halverson, et al. (2002) used six focus groups to discover how consumers responded to different labeling messages. Participants were shown one actual “GMO-free” label and three label props on frozen corn, chicken tenders, and a pasta-with-vegetables meal. The GM labels differed on the type and amount of information given and indicated whether the product did or did not contain GM ingredients.

The majority of participants in the study agreed that the label should clearly indicate if the food product contains any GM ingredients. They also wanted to know why the genetic modification was done (Teisl, Halverson, et al., 2002). These findings indicated the consumers’ desire to see a label indicating the presence of GM ingredients, and an additional explanation of why the modification was done. This is important because a popular communications theory known as the Elaboration Likelihood Model (ELM) shows that with repeated exposure to a

message, consumers begin to use the central route (understanding based on message content and quality) to persuasion (Petty & Cacioppo, 1981).

The Elaboration Likelihood Model

The Elaboration Likelihood Model (Petty & Cacioppo, 1981) is used to evaluate how the public reacts to persuasive messages in advertising (Lien, 2001). The theory states that people process persuasive messages with different levels of elaboration. Elaboration involves the level of attention paid to message content (Littlejohn, 1992). Although many studies employing the ELM have focused on advertising, the principles can be applied to other forms of marketing such as food labeling, logos, and branding (Davies & Wright, 1994). Previous focus group studies have shown that the wording on GM food labels has an important effect on consumer understanding and acceptance of biotechnology (Hoban, 1999).

Within the ELM, there are two distinct routes to persuasion – the central route and the peripheral route. The central route is highly dependant on the persuasive message content and quality. “The message recipient attends to the message arguments, attempts to understand them, and then evaluates them” (Petty & Cacioppo, 1981, p. 256). Attitudes developed through the second approach, the peripheral route, are based less on thoughtful evaluation and more on inferred perceptions. Some factors include perceived rewards or punishments related to the message, judgmental distortions when perceiving the message, or opinions why a speaker is advocating a certain point of view (Petty & Cacioppo, 1981).

Studies using the ELM (Andrews & Shimp, 1990; Lord, Lee, & Sauer, 1995) laid a foundation for the use of specific content, sources, and designs of the proposed GM food labels. Andrews and Shimp (1990) conducted an experiment to test the Elaboration Likelihood Model in

a consumer behavior context. This study used the three basic variables of the ELM – message processing involvement (elaboration likelihood), message argument strength, and peripheral cues – to test cognitive responses and attitude changes. The results of the study showed that high-involvement subjects concentrated more on the claims in the advertisement (versus the picture) than low-involvement subjects. High-involvement subjects also remembered a significantly higher number of message arguments than low-involvement subjects. This finding supports the ELM theory that individuals with higher elaboration likelihood will focus more on the central route to persuasion.

Methods

Three consumer focus group sessions were held in northwest Arkansas on three Saturdays in February 2005 (only one session per day). A random telephone sample was used to recruit participants for the sessions from a two-county area (Benton and Washington counties). A screening questionnaire purposively identified candidates who regularly shopped for groceries and were, therefore, familiar with current package labels. Subject selection efforts focused on minimizing sample bias (Morgan, 1997). When a list of 30 suitable candidates was reached (10 for each session), sampling stopped. Final groups had four to eight participants. Participants received a gift certificate and lunch for attending the two-hour session.

Review of past studies (Pew Initiative on Food and Biotechnology, 2001; Hoban, 1996) led to the development of the questioning route. Researchers familiar with qualitative methodology evaluated the questioning route and made suggestions. Following these corrections, representatives of the target population, who were not in the recruited focus groups, participated in a pilot test of the focus group session. This process improved the clarity and effectiveness of

the questioning route and label designs. The moderator’s use of a structured questioning route provided more consistency between each session because it lists the same questions and question order for all groups (Morgan, 1997).

The moderator began each focus group session by explaining the purpose of the research, clarifying the participants’ roles, and asking introductory questions (Krueger, 1994). Following this, the moderator asked about general attitudes of biotechnology and genetically modification and if foods developed through this process should be labeled. The question of labeling was asked three times, each time after receiving additional information that may have influenced participants’ responses. After these responses, four label examples developed using the Elaboration Likelihood Model as a theoretical foundation were shown (see Figure 1). These labels were categorized as: 1) central route weak; 2) central route strong; 3) peripheral route weak; and 4) peripheral route strong. The labels were shown to the participants in respective order. Each label was displayed on a box of generic brand corn flakes, and participants received a printed copy of each label for closer evaluation.


<p>Label 1</p> <p>This product contains corn derived through biotechnology to reduce pesticide use and exposure to the toxin fumonisin, which may cause esophageal cancer in humans.</p>	<p>Label 2</p> <p>In accordance with U.S. Food and Drug Administration regulations, this product contains corn derived through biotechnology to reduce pesticide use and exposure to the toxin fumonisin, which may cause esophageal cancer in humans.</p> <p>For more information about foods produced through biotechnology, visit the FDA website www.fda.gov or call (888)-BIO-INFO.</p>
<p>Label 3</p> <p>READY TO EAT!</p>  <p>This product contains corn derived through biotechnology.</p> 	<p>Label 4</p>  <p>This product contains biotech corn proven to:</p> <ul style="list-style-type: none"> - reduce ground and surface water contamination - reduce harmful impact on wildlife - reduce exposure to cancer-causing toxin  <p>U.S. Food and Drug Administration</p>

Figure 1. Labels developed through the Elaboration Likelihood Model.

Central elements on Labels 1 and 2 included the actual printed messages pertaining to the product contents and contact information to learn more about the product. The message was fact-based, containing informational and objective descriptions of the product. Peripheral elements on Label 3 and 4 included both relevant and irrelevant graphics and two certifying sources. The label text was very concise on Label 3, and a bulleted list of items on Label 4 allowed for easy reading and counting of the printed messages.

This study followed Guba and Lincoln's (1989) recommendations for credibility, dependability, and confirmability to assure research rigor. This study gained credibility through persistent observation (pilot study and three 90-minute focus group sessions), peer debriefing (committee review), and member checks (final question asked during each session). Dependability was addressed by audio recording focus group discussions and keeping a typed transcript to provide a traceable and documented data. Confirmability is related to objectivity was met by keeping the data in raw form, demonstrating a clear data trail on the printed transcripts, and discussing the conclusions with the research committee to assure that the data, interpretations, and outcomes were actual and not manufactured by the researcher (Guba & Lincoln, 1989).

Analysis of the data was systematic, yet flexible and emergent. Transcript-based analysis was used for all three sessions. Although a great deal of information was collected, only that essential to the research questions was thoroughly analyzed. Categorization and coding were used to aid in the analysis process (Lindlof & Taylor, 2002).

Results

Participants were united in their discussions on several issues, including their desire for GM labeling; their opinions on design, content, and placement of the labels; and their perceived need for public education about genetically modified foods.

Need for GM Labels

To address RQ 1, the question “Should foods containing genetically modified (GM) ingredients be labeled?” was asked three times during each discussion. The question was first asked after an explanation of the term “genetically modified.” Participants said that these products should be labeled.

Even though it's expensive and even though it's a nightmare deciding how much genetic material does there need [to be] to make it genetically modified, I think we need the information.

It should be an informed choice.

I'd like it to say “Whole-grain oats, genetically modified” or whatever the proper term is then go on. It doesn't mean I will stop buying, I just want to know.

Participants shared strong opinions after learning of Brown and Ping's (2003) study that estimated 70% of processed foods currently in the marketplace may contain genetically modified ingredients.

I don't think we should forget about labeling just because they snuck something in on us. It's still so early in the game, we don't know what the long term effects will be.

I would say that I feel more strongly because that's a high percentage and I would have never known about it if you didn't tell me. It's like, wow, how did we not know that?

Just because they snuck 70% into our products doesn't mean we can't go back and retrofit the system. It's not going to be an overnight thing to change it from 70% to whatever, but it doesn't mean that we can't start to rectify the situation.

The current FDA regulation requires labels on GM food products if the product is significantly different from its conventional counterpart in terms of its nutritional value or because it contains a known allergen (USDA, n.d.). Reaction to this statement focused on the terminology of “significant difference.”

It said known allergens have to be identified, that’s a good thing. The percentage, or as you stated, the significant difference, I’d want to know that information.

Significant in my opinion is not an absolute term. I just think instead of making labels a mile long, I’d rather just see genetically modified or are they not.

The word significant – that’s a really subjective kind of word. What’s significant to you and what’s significant to me are two different things possibly.

Participants noted that consumers have not been told if foods contain GM ingredients and that it should be an informed choice. The concept of being informed and educated was a common theme throughout the focus group discussions.

The consumers have a big responsibility to help police the thing [GM foods] if they feel it’s important to them. The only way to do that is to get more educated consumers.

I think that if I know more about it, I don’t care if it’s labeled or not. Before they start labeling and all that, I think more information should be on TV or radio or whatever about what this really is.

Although I agree that in general, the public needs to be better educated about this issue, I really think people should be allowed to make choices based on the label and information.

First of all, I think there should be more education of the public on what this means. I think all of us are a little nervous just about that term. It would be nice to be educated. If they’re wanting us to be more accepting, they need to give us the pros and the cons.

Some discussion focused on the amount of GM ingredients in a product, and if that factor changed their opinion of wanting a label. Most participants indicated that the percentage of GM ingredients in a product was not relevant; it was the fact that it contained GM ingredients at all

that concerned them. Several participants qualified their statements about wanting a label by expressing their uncertainty about the long-term effects of GM products. Again, this issue led to more discussion about the need for consumer education.

Other comments involved the dislike of terms such as “may contain” and indicated they wanted a more concrete statement from the government regarding whether or not the product contains GM ingredients.

There should be more direct labeling. Take words like “maybe.” *Maybe* some genetically modified corn. Well, is it or isn’t it? You all created it. I think the vagueness to me is worrisome.

Provide facts that no one is trying to benefit from or ram down your throat; they are just there for you to check out.

Despite learning more from the focus group moderator about the current abundance of GM ingredients in foods and about the current labeling regulations, all the participants strongly agreed throughout the focus group discussions that they want to see foods containing genetically modified ingredients labeled.

I’m still with labeling. My feeling is there’s not enough oversight concerning the foods and drugs that are marketed to the public.

I still prefer the label if it’s been modified.

The important thing about labeling is that you’ll know they’re [GM ingredients] there. Otherwise you don’t know.

Design, Content, and Placement of GM Labels

Responses to RQ 2 and RQ 3 emerged throughout the focus group sessions as participants shared their expectations regarding the design, content, and placement of the labels, which they clearly desired. The two most popular and desired features of the labels were the contact information and the use of a biotechnology symbol.

The contact information, such as toll-free number or internet address, an element associated with central-route (strong) processing, was viewed as a proactive way for consumers to learn more about biotechnology and its use in food products.

I just feel that if they add something that is very different from the natural product it needs to be stated: "This product contains" whatever it is that it contains. Then go to the website if you want to do research on whatever that is. You would have that option.

I love it. I have a way to find out more. I can go there and hopefully find out the processes and the effects of it.

I do like the contact information. That provides the consumer with a source of information if they are interested.

Participants also wanted to know in what way the product was modified; some said this information could be on the web site and not the label itself.

It's like anything else, if you really want to find information, you can find ways to do it. This is helpful because you don't have to go look it up.

It's almost like it's an honest step.

That participants wanted to base their decisions on this type of information clearly represents central-route processing in the ELM.

In all three focus groups, participants proposed the creation of a biotechnology symbol comparable to common food symbols such as the Real seal on dairy products or the organic symbol that identifies organic produce.

If they could come up with a logo, a little picture of some kind, that would represent genetically modified and use that for the labeling so people could look at that and see "Oh that's genetically modified."

Similar to the organic symbol.

During the first focus group, a participant noticed the use of a “K” on the generic cereal box to indicate the contents were kosher and wondered aloud whether a similar symbol would work to represent the presence of genetically modified ingredients. The “K” was clearly visible on the front of the box near the label examples.

Maybe something as simple as something like the K could indicate something is GMO.

I pointed out earlier the K for kosher. It’s plainly visible right there on the box for anyone who needs to know that.

Such a symbol would be associated with peripheral-route processing, which demonstrates that participants may employ both routes in the decision-making process related to accepting GM foods.

Although all the participants agreed that developing a common symbol to represent products containing biotechnology ingredients, more than half did not know the meaning of “K” symbol. This underscored the importance of consumer education if a biotechnology symbol were to be introduced.

Is that a real logo? Is that a national thing?

I’m not Jewish so I didn’t know.

To answer RQ 3, participants shared opinions on where a GM food label should appear on a package. Several wanted the label to be on the front of the package to be easily identified while browsing store aisles. Others said it should appear near the nutrition label or ingredients because many consumers look at this information.

I’d like it located in the same place on every product so you don’t have to turn the box to every side.

On the front so I would know whether I want to even take this product off the shelf or not.

Yeah, maybe right under the ingredients.

The organic label is right on the front.

That's where all the other labels that they use are, like for poisons and chemicals and organic. All of those are always on the front so this one should be on the front also.

You definitely need to have the symbol on the front of the box somewhere it is easy to see. Then I had the side of the box, underneath the nutritional content and ingredients... "contains genetically modified corn," benefits of the corn and "for more information."

Based on the fact that 70% of all processed foods already have it, if it was on the label on the side it would be just fine because almost any product you pick up is going to have it in there.

Maybe it does need to be on the front so that we can go in the grocery store and stand there and see how much food is... it might be overwhelming.

Consumer Education

To insure a systematic analysis of the findings, the moderator provided a short summary of key findings at the end of each discussion and asked them if they had any other comments.

Consumer education, a theme that had permeated many aspects of the discussion, but that had never been the primary topic, was reinforced invariably during the summary phase of the discussion.

They [regulatory agencies] should do an advertising campaign to acquaint people with the label and educate them what the wording means.

They [regulatory agencies] could do TV spots and pick up ads in newspapers. Something other than just slapping the label on there and saying "we've got a label"

Conclusions and Recommendations

These findings led to some clear conclusions and recommendations about the Arkansas consumers who participated in this study.

The consumers were adamant in their desire for GM food labeling. This supports several other public opinion studies (Pew Initiative on Food and Biotechnology, 2001; Teisl, Halverson, et al., 2002) and sends a message to regulators, food companies, and retailers. The overwhelming support for genetically modified food labels indicates that this issue is not going to disappear. Previous studies show consumer support for such labels and the percentage appears to be increasing over time. In fact, it would not be surprising for consumers to become much more demanding about the need to have such products identified through the use of a label.

The consumers also had obvious preferences for the design, content, and location of the label. Suggestions regarding specific label elements included a consistent biotechnology symbol and contact information where consumers can learn more about this type of product. Participants also suggested placing the biotechnology symbol on the front of a package, and any additional information about genetic modification on the front or near the nutrition label. These desires indicate that consumers want to be persuaded through both routes – central and peripheral – about the safety of genetically modified food. The most likely explanation for this is that the consumers want to use a peripheral route (a symbol as required by a certifying regulatory organization) but want access to a central route (a telephone number or web address where detailed information may be found) to use if they so choose.

Additionally, the concept of consumer education was a dominant theme throughout the focus group discussion, and participants indicated their level of education would affect how they viewed any developed GM food label. This conclusion supports McHughen's (2000) recommendation that consumers must be better educated and aware of the options available to be able to make more informed decisions. The availability of this information is important because the ELM shows that with repeated exposure to a message, recipients begin to use the central

route to persuasion (Teisl, Halverson, et al.). Opinions formed through the central route are more permanent than those formed as a temporary attitude change through the peripheral route (Petty & Cacioppo, 1981).

The amount of emphasis participants placed on the concept of consumer education begged the question, who should be responsible for educational efforts – the U.S. government, food companies, or some other group? Participants placed a high level of trust in the U.S. government and said it was the government's responsibility (not food companies') to provide objective information to consumers. Other studies agree with this finding (Baker & Mazzocco, 2002; Hoban, 1996). However, food companies should also evaluate how they can address consumer concerns and should examine how a potential GM food label could be used as a marketing tool.

The most obvious recommendation for practice is to give consumers what they want. Based on previous research, they seem to desire labeling. The Arkansas consumers in this study certainly did. However, ultimately, consumers themselves will determine if labeling ever becomes mandatory by their purchasing behaviors. As long as they continue to buy GM foods without labels, the need for labels will never be practical. Still, regulatory agencies and the food industry alike should be prepared with a plan for labeling in case consumers to take a stand on this issue.

Because the research does not exactly reflect practice on this issue (overwhelming majorities of consumers report wanting labels, yet the same consumers seem to be showing little concern for this issue when they purchase their food), further research on this topic is needed in other locations, using both qualitative and quantitative studies. The use of the Elaboration

Likelihood Model should also continue to be employed and evaluated in future studies to test its effectiveness in developing potential GM food labels.

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