

Natural High-Tech: Engineering Natural Fibers

Abstract

This project aimed to study consumer attitudes towards GM cotton used in their apparel. This study was conducted in three parts. The first part consisted of literary research. The second was based on data collection and research from consumers through various internet platforms. The third part of our research consisted of a survey meant to determine consumer attitudes towards GM cotton and possibly determine reasoning for these attitudes. We found that consumers tend to have a negative view on GM cotton when they consider the politics surrounding it. People are also quite concerned with the safety of GMOs in general. The survey results were interesting because it showed an overwhelmingly neutral attitude towards GM cotton and a general lack of knowledge which somewhat contradicted the comments we found which were more so negative. There were several differences between the survey and comments. However, we were still able to make a few connections to hypothesize the majority of people's attitudes towards GM cotton. We found that the majority of consumers knew very little about GM cotton. We believe that the knowledge of the consumer must be changed in order to create an overall more positive attitude towards GM cotton.

Objectives

The objectives of this research project are as follows:

1. Determine the consumer's overall attitude towards GM cotton used in their apparel.
2. Identify consumer awareness and knowledge of GM cotton.

We aimed to determine the consumers overall attitude towards GM cotton used in their apparel. In order to better market GM cotton to the consumer, we must know their opinion of it so that we can tailor the marketing plan to appeal to the customer. We also wanted to identify the consumer's knowledge of GM cotton as well as a possible reason for seemingly negative attitudes towards it.

Background/Literature

The problem we researched is the controversy involving Genetically Engineered Cotton and the customers' knowledge and perception of it. Cotton is widely used and is a natural fiber and therefore cannot be manipulated in the same way as manufactured fibers. However, genetic engineering has been made possible, so much so that 80% of all cotton that is made for apparel is genetically engineered (Gilbert, 2013; Gruère & Sengupta, 2011; Nicolia, Manzo, Veronesi, & Rosellini, 2014; Wolfenbarger & Phifer, 2000). Many articles that we've researched, including Genetically Modified Crops to Help Reduce Losses: Experts and A Synopsis of US Consumer Perception of Genetically Modified (Biotech) Crops conclude that genetically modified crops, like cotton, are safe and helpful, increasing agricultural productivity and thereby also improving the economic and environmental sustainability in farming. Even with this research, consumers still have a concern about the physical and environmental effects of genetically modifying cotton for a few reasons. Many believe that GM cotton has driven farmers to suicide. However, according to Natasha Gilbert, "Although financial hardship is a driving factor in suicide among Indian farmers, there has been essentially no change in the suicide rate for farmers since the introduction of Bt cotton" (Gilbert, 2013). The success of this cotton in some countries, like India, is also an issue. This is because the technologies that are currently available to produce cotton only work well in countries with a cold-temperate climate- such as the United States (Chakravarthy, V., Reddy, T., Reddy, V., & Rao, K, 2012). Consumers also believe that GM Cotton is not safe for themselves and the environment. The fact is, however, that this technology is safe and very helpful. Consumers will benefit by having cheap and available products (Evans, E. A., & Ballen, F. H., 2016). Based on our exploratory research, it is evident that more accurate knowledge on the consumer end is needed. One area of further study should focus on the potential of this technology. People want to know, and should know, how this GE technology works and what the positive and negative consequences are (Genetically modified, 2018). Another area of further investigation should be the development of new varieties of this genetically engineered fiber (Fernandez-Cornejo, J., Wechsler, S., & Livingston, M., 2014). A final area of further investigation could include the standardization and efficiency of measuring the effects of GM crops (Hillbeck, A., Meier, M., Römcke, J., Jänsch, S., Teichmann, H., & Tappeser, B., 2011).

Methods

The primary goal of our research is to evaluate and analyze consumers' awareness and attitudes toward genetically engineered cotton used within their apparel. To achieve this goal, we researched and gathered 200 consumer comments from various sources. These sources included blog posts, YouTube videos, and LinkedIn posts about GMOs.

Our approach is based on the analysis of the consumer comments and whether they are positive, negative, or neutral regarding not only GM cotton, but GMOs in general. We also categorized each comment based on one of eight categories. The population of interest for this research is based on consumer comments made on posts or videos about GMOs which were found using a Google social search engine.

These consumer comments were collected from several social media platforms, the majority of comments coming from LinkedIn and YouTube. We were able to collect a total of 200 comments to aid our research. We did our best to find as many sources and posts on each social media platform as possible in order to get a fair and accurate depiction of consumer attitudes. As depicted below, the majority of comments came from various YouTube videos discussing GMOs. This is not very surprising as YouTube is one of the largest platforms and allows for free viewing and commenting of any content, regardless of whether a person is subscribed to that channel or not. Each video we collected comments from had thousands of views and hundreds of comments.

Through our survey, we were trying to measure the overall attitudes towards GMO's and particularly GMO cotton amongst the consumer. The survey was broken into five main parts that were each meant to measure a different facet of the consumer's perception of GMO cotton as well as identify the particular consumer this information was coming from. The categories were: Knowledge, Perception, Preferences, Priorities, and Demographics.

Results

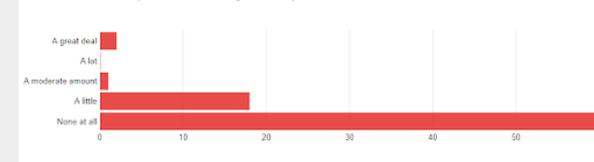
We collected a total of 200 comments on various social media platforms about the perception of GMOs. The pie chart below shows the proportions of comments per each social media platform. As depicted below, the majority of comments came from various YouTube videos discussing GMOs. Through our consumer research, we were able to narrow down the general attitudes of the consumer towards GMOs. The biggest and most prominent take away from the research was how people felt about the business and political involvement in GMO production. The consumer's attitudes towards Monsanto and the politics surrounding GMO production was overwhelmingly negative. As shown in the table below, 35 out of 44 of those comments were negative, 8 neutral, and only 1 positive. The majority of negative attitudes were pertaining to Monsanto's monopoly on GMOs and the fact that it helps these companies get richer and richer. Because of this general opinion, people are untrusting of GMOs because of the company they come from. Another topic consumers were concerned about was pertaining to the safety of GMOs. Again, most of the consumer's attitudes toward the safety of GMOs was overwhelmingly negative as you can see from the table below.

We also collected a total of 83 responses to a survey we created about knowledge, perception and preferences regarding GM cotton. These survey results seemed to prove our original hypothesis that more accurate knowledge for consumers is needed. As you can see from the bar chart below, in response to the question "How much do you know about genetically modified cotton?" is overwhelmingly "None at all." Out of 82 respondents, 61 selected "None at all," which is 74%. This lack of knowledge was a pattern that carried throughout the rest of the survey. When asked "How likely is it that genetically modified cotton will create problems for the environment?" and "How likely is it that genetically modified cotton will lead to health problems for the population as a whole?" the majority of both responses was "unsure." Additionally, when asked "What is your overall view about GMO and GM cotton?" 69% of respondents selected "Neutral," whereas 20% said "Negative" and 9% said "Positive."

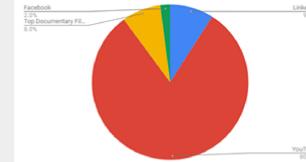
It is interesting to see that there is such a drastic difference in viewpoints between the social media comments and the survey results. It is worth noting that comments found on social media posts were not solely about GM cotton but also about GMOs in general, whereas the survey was entirely about GM cotton. Even still, these results are a good indication that consumer knowledge on the topic needs to be expanded in order to gain an intelligent perspective about genetically modified cotton.

Category	Unit of analysis (word/themes)	Count negative	Count positive	Count neutral	Total Count
Cost	high prices, costing more, expensive		3	3	8
Agriculture (Farmer)	outside, agriculture system is not sustainable, spreading pesticides	17	2	7	26
Business/Political Involvement (Monsanto)	companies who will screw you through monopoly, people can be brought off, corrupted companies	35	1	8	44
Safety	least harm possible, safety testing, poison, less risky	21	4	8	33
Social Impact	help save humans, help rapidly growing human population, half the world would starve w/o GMO	12	15	5	32
Environmental Impact	how GMO influence the ecosystem, serious negative effect on ecosystem	12	7	5	24
Production	creating crops, consumers can't produce for themselves	2	2	4	8
Regulation	fighting the labeling of GMOs, government should draft laws and regulations	4	1	11	16
Other	knowledge, do your research,	14		15	29

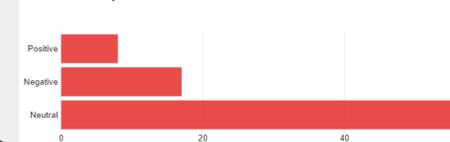
Q4 - How much do you know about genetically modified cotton?



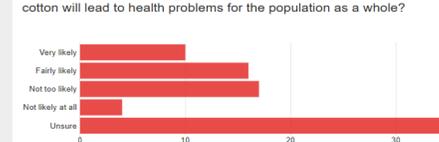
Comments by Social Media Platform



Q10 - What is your overall view about GMO and GM cotton?



Q14 - Based on your knowledge, how likely is it that genetically modified cotton will lead to health problems for the population as a whole?



Discussion

The results from both the comment collection and the survey showed an overall trend towards consumer attitudes of GM cotton.

The comments collected showed an overwhelmingly negative view towards the politics surrounding GM crops. These attitudes were mainly directed towards Monsanto (the company that has a monopoly over GMO's). People were also quite untrusting of the long term effects of GMOs on one's health due to a lack of long term studies. Because of this, people were much more concerned with GM foods as opposed to GM cotton. Through the comments, we also identified a lack of knowledge of GMOs and how they work throughout the comments we used.

Through the survey we also found an overwhelming lack of knowledge of GM cotton amongst those that were surveyed. Out of over 100 respondents, 47 of those respondents claimed to only know "a little" about GM cotton. Only 1 respondent claimed to know "a great deal" about the topic. This showed a correlation between a lack of knowledge of GM cotton and a neutral of it. The majority of those surveyed who said they only knew "a little" had a neutral view on GM cotton thus leading us to believe the consumer could be swayed either way on the topic if presented new information. Those who said they knew more seemed to have a more polar view of GM cotton either negative or positive.

What does it all mean?

Based on the results from both the survey and comment collection, we were able to develop a hypothesis on overall consumer attitudes towards GM cotton.

- The majority of consumers have a negative view of GM cotton but also a lack of knowledge.
- College aged students are more likely to have a neutral opinion on GMO's.
- Politics surrounding GMOs tend to sway the consumer towards a negative viewpoint.

Summary/Conclusions

The results that we've obtained from our research supports the original hypothesis that this research was based on, i.e. more accurate knowledge from consumers regarding genetically modified cotton is needed in order to gain an accurate, and perhaps positive, perspective. We came to this conclusion through research of literature on the topic, consumer comments on posts about the topic, and responses to a survey about the topic. When reading our literature sources, it was evident that, through various studies and research, genetically modified cotton was found to be safe for and will help the environment. However, when collecting and reading comments consumers made on social media posts about this same topic, the viewpoints here were overwhelmingly negative. Most comments did not have facts to back up their negative viewpoint, however a few made some good arguments. We found that the biggest issue that consumers have with this topic was not the safety or health risks of it, but rather the business and political side of the issue, i.e. Monsanto. Lastly, when looking through the survey responses, it was very evident that most consumers know very little to nothing at all about GM cotton and did not seem to have strong viewpoints one way or the other. This was a departure from the comments that we collected from social media, as those seemed to suggest that consumers knew quite a bit about GM cotton, or at the very least had strong viewpoints about it. When putting all of this research together, it is clear that the knowledge of the consumer regarding this topic must increase to gain an accurate gauge of the consumers' perception. More transparency from products and companies is needed, as well as strict labeling of products as being GM, in order for consumers to gain more accurate and well rounded knowledge, which will translate into a more accurate and well rounded consumer perception regarding genetically modified cotton.

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