Course: Biology Grade Level: 11/12
Type: Argumentation Structure: Analysis
Teaching Task 2: Should industry continue to produce genetically modified crops for human use by utilizing genetic engineering? After reading several popular and scientific sources, write an essay that addresses the question and support your position with evidence from the text. Be sure to acknowledge competing views. Give examples from past or current events or issues to illustrate or clarify your position.
Performance Level: Approaches Expectations

Help Us Grow GMO's!

In recent years, biotechnology has made significant strides toward improving the yield of crops by making them safer for consumers, and by improving the quality of the product itself Some farmers have both discredited and others have utilized the use of many of theses biotechnological farming practices within their own farms. The farmers who apply these practices are risking their entire livelihood by using a technique, such as DNA engineering, a fairly new strategy, that has proved useful in many agricultural communities around the United States. The use of biotechnology in agricultural practices will enhance the quantity and quality of produce around the world. (Pusztai 2001)

Current research shows that genetically modified tomatoes that have the spliced kanr genes incorporated into their own DNA show increased size in the genetically modified tomatoes compared to the organic tomatoes. This study also focused on the level of toxicity that the GM tomatoes would contain. The GM and organic tomatoes were fed to test rats and the toxic affects that were anticipated in the GM tomatoes were inherently, absent. Therefore, it would be appropriate to conclude that genetically modified tomatoes would benefit society more so than organic tomatoes. (Kilman 2011)

Furthermore, genetically modified organisms will also prove insurmountably important in sustaining the amount of food for developed and undeveloped countries. For example, due to the shortages of sugar in both prosperous nation such as the United States and underdeveloped countries . such as Kenya, the Department of Agriculture has deemed it necessary for the production of genetically modified beet plants in order to replenish the diminishing amount of sugar. Genetically modified beet plants will be necessary because beet plant processors determine that there aren't enough organic beet plant seeds to grow sufficient amount of beet plants that would normally be turned into sugar. Because the amount of organic sugar is low in the U.S., it directly impacts the increase in price of this necessity for all American workers who desire sugar in their coffee to jump start them into their day. (Kilman 2011)

In retrospect, genetically modified produce can have adverse affects on the wildlife in the environment surrounding their location. For example, bacteria may become antibiotic resistant due to the antibiotics in the produce or meat that increases the preservation of the organism. Also, in some rare cases, some genetically modified organisms have been known to cause allergies due to mutations in their recombinant DNA expressing adverse traits that impact humans. (Arntzen 2011)

The people who discourage the consumption of genetically modified organisms have merely fell victim to mass hysteria caused by organic extremists. An alarming 60% to 70% of produce in grocery stores in the United States contain genetically modified ingredients. This just shows that the prevalence of GMO's are outrageously high without many people even knowing that they are consuming these products. This then leads to the people who would rather consume organic produce as compared to genetically modified produce. Most people who say they would rather eat organic food and don't shop exclusively for expensive produce at specific organic

grocery stores don't even realize that 70% of produce at normal grocery stores contain genetically altered ingredients! The point is that average consumers aren't even aware that their consuming GMO's when they are so against the idea of genetically altered produce. (Schneider 2010).

Lastly, biotechnology is making significant strides to not only improve the nutrient quality in genetically modified produce, but also to improve the environmental growing conditions the produce can withstand. An example of this strategy would be taking the gene of the an artic fish that allows it to withstand freezing temperatures and splicing it into the DNA of a strawberry. This will allow the strawberries to survive in early morning and night frosts. Frost resistance will be expressed in the recombinant DNA of the strawberry. This breakthrough in biotechnology will broaden the growing ranges of strawberries allowing them to grow more efficiently in many adverse regions of the world. This is just one of the many examples that biotechnology has improved the standard of people's food. (Arntzen 2011)

In conclusion, it is apparent that there are both positives and negatives of utilizing genetically modified organisms. However, **it** is apparent that the positives far out weigh the negatives mainly because people everywhere will have to start depending on these GM crops to feed the world in the future. GMO's have the potential to supply the human body with ample vitamins and minerals that organic produce would never be able to provide, thus relieving the human race of vitamin deficiencies that will be cured with something as simple as consuming a diet full of genetically modified foods. Starvation is currently one of the biggest problems that under privileged countries face. With the advancement in biotechnology and genetically modified organisms, this problem will be solved in the near future.

Works Cited

Pusztai, Arpad. Genetically modified Foods: "Are they a Risk to Human/ Animal Health'? ActionBioscience.org. June 2001.

Kilman, Scott. "Modified Beets Gets New Life." The Wall Street Journal. 5 February 2011.

Schneider, Keith. Schneider, Renee. "Genetically Modified Food" The University of Florida IFAS Entension. No Date given.

Arntzen, Charles. Harvest of Fear. Interview 2001 Film. 23 May 2011

Annotation		
Focus	2	The writer attempts to establish a position that biotechnology will benefit the world, but this position is not consistently carried throughout the paper. The introductory paragraph confuses the position by stating*, "Farmers who apply these practices are risking their entire livelihood…"* and then contradicting this statement with the final sentence in the introduction.
Reading/Research	2	The writer presents information from the research but relies heavily on two sources. The writer's example of strawberry modification is relevant; however, the research presented is not always directly related to the claim. The writer needs a more thorough understanding of organic produce: "*GMO's have the potential to supply the human body with ample vitamins and minerals that organic produce would never be able to provide…"*
Controlling Idea	2	The writer establishes a claim but introduces ideas (e.g., wildlife and allergies) without directly and accurately relating them to the thesis, which relates to produce. The counter claims distract from, rather than enhance, the argument.
Development	2	Most of the details are appropriate but there are lapses in reasoning: • *Therefore, it would be appropriate to conclude that genetically modified tomatoes would benefit society more so than organic tomatoes. (Kilman 2011)* • In the third paragraph, the writer uses information about shortages in sugar to argue for sustaining food for developed and undeveloped countries. The writer is unclear in developing the idea of how wildlife and allergies are connected to GMO produce.
Organization	2	The writer uses an appropriate structure for the writing, but the fourth paragraph about wildlife and allergies does not fit with the overall argument. Introducing the new idea of vitamins and minerals in the closing paragraph interferes with the coherence and the reasoning.
Conventions	2.5	The writer's command of standard English conventions is uneven : • "to grow sufficient amount" • "have merely fell victim to mass hysteria" There is redundancy within sentences: *Genetically modified beet plants will be necessary because beet plant processors determine that there aren't enough organic beet plant seeds to grow sufficient amount of beet plants that would normally be turned into sugar.* Although citations are present, the writer places them at the ends of paragraphs.
Content Understanding	2	The writer demonstrates an uneven understanding of biotechnology. The writer appears to pull topics from reading sources that support both sides of the argument but is unsure of how to juxtapose them logically in a way that enhances rather than detracts from the content.

This student would benefit from feedback, discussion, and/or instruction in the following areas:

- Selecting information from reading materials relevant to the prompt (See " Controlling Idea")
- Developing ideas logically and with more purposeful elaboration

  > "Furthermore, genetically modified organisms will also prove insurmountably important in sustaining the amount of food for developed and undeveloped countries." (paragraph 3)

- Diction

  > "Some farmers have both discredited and others have utilized the use of many of theses biotechnological farming practices within their own farms."

- Parenthetical citations and their effective use