

GMO Food Labeling



Introduction

Lesson Introduction

As with many scientific breakthroughs, the use of genetically modified organisms (GMOs) to create human food and food labeling comes with both societal debate and judgment.

In this lesson, students will form opinions on the use of GMOs in human food production and how it should be labeled.



Grade Level: 9 - 12

Time Needed: 120 - 180 minutes

Learning Objectives

After completing this lesson, students will be able to:

1. Explain the arguments given for and against GMO foods and mandatory food labeling
2. List the regulatory agencies that monitor the development and use of GMOs
3. Describe the current safeguards used to monitor the use of GMO's in human food
4. Describe the current GMO labeling policies

Next Generation Science Standards (NGSS)

As a result of activities for grades 9-12, all students will learn content in these areas:

Topics

- **LS4:** Interdependent relationships in ecosystems
- **ESS5:** Human impacts

Performance Expectation

- **HS-ESS3-4:** Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
- **HS-LS4-6:** Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.

Dimension

Practices:

- Asking questions
- Constructing explanations
- Engaging in argument from evidence
- Obtaining, evaluating & communicating information

Disciplinary Core Ideas:

- **ESS3:** Earth & human activity
- **LS2.A:** Interdependent relationships in ecosystems

Cross-Cutting Concepts:

- Cause & effect



Materials

- Computers with Internet access
- Note cards
- Access to the following websites:

How to complete a debate

- http://www.ehow.com/how_2107323_hold-k12-class-debate.html

Debate Rubric

- <http://712educators.about.com/cs/rubrics/l/blrubricdebate.htm>

Labeling of Genetically Engineered Foods-Quick Facts

- <http://www.ext.colostate.edu/pubs/foodnut/09371.html>

Debate and Policies on Labeling GM Foods

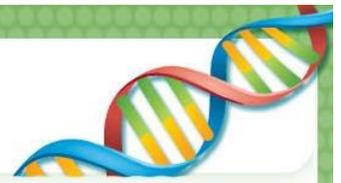
- <http://debatepedia.idebate.org/en/index.php/Debate: Mandatory labeling of genetically modified foods>
- <http://www.bio.davidson.edu/people/kabernd/seminar/2004/GMevents/NH/nh.html>

Organic Valley

- <http://www.organicvalley.coop/why-organic/gmos/>

Labeling Policy

- <http://pbs.ifpri.info/2014/05/22/gmo-food-labeling-policies-review/>
- <http://agribiotech.info/more-details-on-specific-issues/files/McHugen-Labeling%20sent%20to%20web%2002.pdf/view>



Instructional Process



1. Introduce the concept of a GMO and the current food labeling policy in the United States (refer to the Colorado State University Extension website for the core content for this discussion). Facilitate a discussion with the students, allowing them to discuss their opinions of GMO foods and mandatory food labeling.
2. Based on their opinions either for or against GMO foods and mandatory labeling, divide the class into groups of 3-4 people and assign them a “position” to defend. Explain that they will be researching the topic of GMO foods and mandatory food labeling and then debating the pros and cons of the issue.
3. Hand out copies of the Student Worksheet to each group.
4. Review the debate process with the class. Explain to each group that they will need to prepare an opening statement, rebuttal, and closing statement for their point of view. The common order is as follows: "Pro" side introduces and argues, "Con" side follows. Next, each team, "Pro" then "Con" will have time for rebuttal. Finally, each team offers their closing arguments. Ask students to complete their Student Worksheets as they prepare for their debate.
5. Allow students to do research (at least 1-2 class periods) and prepare their statements, arguments, and counter-arguments on note cards. (Refer to the supplemental web content listed in the Materials section for debate points).
6. Next, pair up groups of opposing positions to debate against each other.
7. Conduct the debate.
8. After the groups have had a chance to debate their sides, debrief and have the students answer the follow-up questions independently. Discuss as a class.

Supplemental Content

Additional discussion and research points:

- Issues surrounding mandatory labeling of GMO foods
- What specific technologies would require a label?
- What percent of genetically engineered ingredient must be present to require food label?
- Should meat, eggs, and dairy products from livestock fed transgenic crops require a label?
- How should regulators verify claims that food is or isn't genetically modified?
- What is the economic impact of labeling?
- Concerns of allergenicity
- Environmental impacts of GMO foods
- Is there enough testing on GMOs to consider them safe?
- Agencies responsible for food labeling



Follow-Up Questions

1. Identify the primary U.S. government agencies that are responsible for overseeing the testing and marketing of GMO foods.
2. Explain the three major components of the current GMO food labeling policy.
3. Discuss why some people are concerned about food allergens being introduced through genetic engineering. Do you think this is a founded concern? Why or why not?
4. Based upon the evidence presented in class, is the production of GMOs limiting or increasing the impact of humans on the environment? Explain using information from the debates presented.

GMO Food Labeling– Student Sheet



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As with many scientific breakthroughs, the use of genetically modified organisms (GMOs) to create human food and food labeling comes with both societal judgment and debate.

In this lesson, you will be able form your own opinion and take a stand on the use of GMOs in human food production and how it should be labeled.

Internet Resources

Labeling of Genetically Engineered Foods-Quick Facts

- <http://www.ext.colostate.edu/pubs/foodnut/09371.html>

Debate and Policies on Labeling GM Foods

- http://debatepedia.idebate.org/en/index.php/Debate:_Mandatory_labeling_of_genetically_modified_foods
- <http://www.bio.davidson.edu/people/kabernd/seminar/2004/GMevents/NH/nh.html>

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