Genetically Modified Organisms (GMOs): Good, Bad, or ???

How do we engage in discussion with others who disagree with us? How do we engage in discussion with the scientifically illiterate? The discussion of GMOs seems especially challenging. Why?

> To some extent, it is a product of our political culture. There is often little critical scrutiny of the issues within a particular "tribe." For example, just as many on the political right discount the broad scientific consensus that human activities contribute to global warming, many on the left disregard the decades of scientific studies demonstrating the safety and wide-reaching benefits of GE crops.
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> Both the left and the right (and the center) discard reason when it doesn't suit their politics. (Ronald, *FES* 451)

How might we undertake constructive discussion with those who disagree with us, or when we are uncertain of the right conclusion?

1. Why are GMOs an issue? (Clarify the issue)

- Is the question a matter of individual choice (what should I eat?), or education (should GMOs be labeled?), or broad policy (should GMOs be banned, or regulated, or ??)?
- Is the question about the existing GMO system, or about *any* GMO system, even under more ideal conditions?

2. What are GMOs? (Agree on definitions)

- Are there multiple definitions? Why? (Do different stakeholders give different definitions?)
- Are there terms within the definition that need to be defined?
- How do we decide between the different definitions?
- What is at stake in giving a definition?

For example: Definitions from, e.g., Wikipedia:

A genetically modified organism (GMO) is an organism whose genetic material has been altered using genetic engineering techniques. Genetic engineering, also called genetic modification, is the direct manipulation of an organism's genome using biotechnology.

Biotechnology is generally accepted as the use of living systems and organisms to develop or make useful products. For thousands of years, humankind has used biotechnology in agriculture, food production and medicine.[1] The term itself is largely believed to have been coined in 1919 by Hungarian engineer Karl Ereky. In the late 20th and early 21st century, biotechnology has expanded to include new and diverse sciences such as genomics, recombinant gene technologies, applied immunology, and development of pharmaceutical therapies and diagnostic tests.[2].

3. Who are the stakeholders in the development, consumption and critique of GMOs? (Identify the community of stakeholders)

4. What is at issue between these stakeholders? What are their different claims? (Identify conjectures and disagreements)

- Are there errors and misunderstandings that might be corrected?
- Are some stakeholders better positioned to have the relevant knowledge?

Some considerations against (but remember…these must be evaluated in relation to the issues defined in (1)):

a) GMOs may not be *safe*.

b) GMOs are not adequately *tested*.

c) GMOs may be *environmentally risky*.

d) The companies and university scientists developing GMOs are not to be *trusted*.

e) GMOs are not *sustainable*.

f) Resistance to GMOs is politically important way to protest rampant capitalism, globalization, corporate greed, the decline of rural communities, etc.

g) Other??

Some considerations for:

a-b) Many GMOs have been tested extensively; although they are not a "testable class," we can test them individually.

c) There are ways to regulate the use of GMOs to address risks of environmental impact; not using GMOs in many cases causes other environmental hazards.

d) This is too broad a claim – many companies and scientists are trustworthy. But it is true that many are just out to "make a buck," including apparently benign companies like Whole Foods.

e) This needs to be elaborated, but there is a risk of "super bugs" and "super weeds" that are herbicide and pesticide resistant. This is a risk for any farmer that relies on a single herbicide/pesticide, and might be managed by deploying a "refuge strategy" (*FES,* 450) in crop management (not relying on monocultures and creating spaces where insects can find refuge from the insecticide).

f) It will be difficult to feed the hungry around the globe, especially given expected climate change, unless we invest in GMOs. Also, some GMOs can make a huge difference to the health of a population, e.g., golden rice.

g) Other??

5. On what points (if any) do the stakeholders agree and disagree? (Find common ground)

- Can we use points of agreement to settle disagreements?
- Are there some disagreements that will be intractable? Why?
- Should we focus on debates between only a subset of the stakeholders? Which ones? Why?

6. How should we determine the value of GMOs? (Identify what matters, any competing values)

- What values should guide our evaluation of the positions?
- Are there shared values to rely on?
- If there aren't shared values, how might we defend the values we will employ against our opponents' values?

7. What policy should be endorsed? (Policy)

- Based on our evaluation of GMOs, what policies should be put in place?
- How does individual preference based on individual values relate to public policy?

24.03 Good Food: The Ethics and Politics of Food Choices
Spring 2017