In the following essay, Jacob Olitsky points out that different genetically modified organisms (GMOs) present us with extremely different risks and benefits. He recommends a case-by-case analysis rather than the blanket support or condemnation of all GMOs.

Discussing Genetically Modified Organisms

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The debate on the morality of creating and using genetically modified organisms (GMOs) should be made on a case-by-case basis. Consequentialist discussions about GMOs often provide examples of specific GMOs that can have a net benefit or detriment, but it is not always made clear that these examples do not apply to all GMOs. If some organism is a GMO, and that organism causes harm, then some GMOs cause harm -- not all GMOs. Different GMOs can potentially cause harm in different ways. Farm animals, crops, bacteria, *et cetera* all pose different risks, and one GMO should not be discredited for the failings of another. For example, there are more ecological risks associated with GMOs that can reproduce in the wild than GMOs that cannot. In comparison, a GMO such as the Enviropig may be good for the environment, but there are ethical concerns regarding the treatment of the Enviropig that do not arise with non-sentient farm crops. Different GMOs need to be addressed differently.

Possibly the most dangerous GMOs are those which have the potential to become invasive species. There are several known cases where introducing completely natural species into new ecosystems has caused harm to those ecosystems, such as the Japanese beetle in North America (Japanese Beetle). GMOs can upset ecosystems because they can introduce new, highly improbable phenotypes into the wild. Some GM farm crops such as Bt-corn are designed to have

better protection against pests than their selectively bred counterparts. Corn, having been domesticated over millennia, is not the most natural of crops, but some farmed plants- such as citrus fruit trees- are similar to those in the wild. Farmers may dislike it, but there are many species of organisms that eat species of plants that humans farm, and there are many organisms that depend on those organisms for food, and so on and so forth. The important difference between crops that are sprayed for pesticide and crops that produce their own pesticide is that the sprayed-on pesticide cannot as easily venture off the farm and into the wild. GM plants can spread off of farms and into the wild, disrupting natural food chains. If spayed pesticides do cause harm, then at least the damage can be managed by ceasing the use of the pesticide as happened with DDT. Once loose in the wild, invasive species are notoriously difficult to control, and ceasing to add new GMOs to the environment will not make the already-escaped GMOs and their descendants go away.

The Enviropig is another farm GMO, but there are different issues to consider when discussing the Enviropig than plants. If the researchers' claims are accurate, the Enviropig could be quite good for the environment by reducing the phosphorous pollution around pig farms (Guelph). Since Enviropigs have "health status, growth rates and reproductive characteristics similar to that of pigs," they are not any more likely to cause harm if they escape then normal pigs (Guelph). However, crops cannot suffer: pigs can. The Enviropig may have a net benefit on the environment, but this benefit must also outweigh the suffering created by the experimentation process. Research on sentient GMOs must be carefully considered to determine if it will result in enough good to justify the suffering of the experimental subjects.

It is true that generalizations must be made in order to make effective laws, but there is a difference between generalizations about GMOs and generalizations about pest-resistant GM

farm crops. Generalizations cannot be applied to all GMOs unless it is the act of genetic modification itself that is in question, in which case the argument becomes one of consequentialism vs. formalism. One GMO can be harmful to the environment while another is beneficial. Debaters should be clear as to what GMOs they are talking about so that flaws or benefits of one GMO are not implied to apply to all GMOs. Genetic modification to organisms has the potential for a plethora of benefits and detriments, but all of these do not apply to all organisms.

Works Cited

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