



The Science Source for Food,
Agricultural, and Environmental Issues

Food Biofortification—Reaping the Benefits of Science to Overcome Hidden Hunger

(Issue Paper) Chair: Howarth Bouis, International Food Policy Institute

Overview:

Biofortification is a process of increasing the density of minerals and vitamins in a food crop through conventional plant breeding, transgenic techniques, or agronomic practices. This new paper covers the wide range of inter-disciplinary topics encompassed by biofortification including the economic justification for biofortification, bioavailability and efficacy of biofortified crops, crop development, catalyzing the scale up of biofortification, and the potential of transgenic approaches in biofortification.

Learning Outcomes

- *Compare the nutritional efficacy of biofortified crops to non-biofortified crops.*
 - *Describe how biofortified crops are developed with both conventional breeding and genetic engineering.*
 - *Explore the future of biofortified crops.*
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Resources

Access the Issue Paper, Ag quickCAST, and webinar here: <https://www.cast-science.org/publication/the-need-and-challenge-for-effective-stewardship-of-new-pest-management-technologies-in-agriculture/>

“Pink Bollworm Versus Bt Cotton: Three Countries, Three Results”:

<https://entomologytoday.org/2019/07/22/pink-bollworm-versus-bt-cotton-three-countries-three-results/>

“Biofortification: The Nutrition Revolution Is Now”: <https://www.harvestplus.org/biofortification-nutrition-revolution-now>

“New study shows CRISPR can be applied to produce biofortified rice”:

<https://allianceforscience.cornell.edu/blog/2020/03/new-study-shows-crispr-can-be-applied-to-produce-biofortified-rice/>



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Assessment Questions

1. Write a summary of this article highlighting 3-5 important facts you learned.
2. Compare the nutritional values of biofortified crops to their non-biofortified counterparts. What added nutrients do biofortified crops provide? Why are those nutrients important for health?
3. How does consumer preferences for foods made with biofortified crops compare to foods made with non-biofortified crops?
4. Explain how biofortified crops are bred using (a) conventional breeding and (b) genetic engineering. What are the opportunities and challenges associated with each technology?
5. What are some of the opportunities and challenges in the future of biofortified crops?

Student Reflection

1. How would you market biofortified crops to the public to further increase acceptance and usage? What ways do think would be most cost-effective?
2. Many common foods, such as flour, rice, and breakfast cereal, are enriched with added vitamins and minerals. Should food companies make products from biofortified crops rather than using enriched flours or rice? Consider costs and public acceptance in supporting your position.