Flagship 2: Biofortification

Highlight 1: Research to Inform Action

It is critical to demonstrate the nutritional, health, and agronomic benefits of biofortified crops in order to convince policymakers, program implementers, farmers, and consumers that biofortified crops are valuable and beneficial. Numerous peer-reviewed studies published over the past 16 years have shown that biofortification of crops through conventional breeding can increase nutrient levels without compromising yield, resilience to climate conditions, or other traits desired by farmers; that consumption of biofortified crops can measurably improve micronutrient status, health outcomes, and cognitive and physical functions; and that farmers are willing to grow these crops, and consumers are willing to eat them. In 2019, two studies reinforced the evidence base for the nutrition and health benefits of biofortified crops, providing further support for policy and programmatic action. One study, published in the *British Journal of Nutrition* in 2019, followed up on a seminal project led by HarvestPlus during 2006–2009 in Mozambique and Uganda, the Reaching End Users project, which introduced vitamin A orange sweet potato (OSP) vines in selected communities of smallholder farmers, with the aim of reducing vitamin A deficiency among children under five years old and women of reproductive age. In addition to distributing vines, the project included training for mothers on OSP preparation and nutritional information, as well as assistance in marketing surplus OSP. For the study published in 2019, researchers went back to the communities three years after the project had been completed to conduct socioeconomic and dietary intake surveys. The study showed that the project had sustained impact on vitamin A intakes among participating families beyond the project end date. Notably, the researchers found lasting impacts on vitamin A intakes among young children and their mothers. “The study demonstrates that lasting impact from biofortification interventions is possible,” said Alan de Brauw, the lead author on the study and senior research fellow in the Markets, Trade, and Institutions Division at IFPRI.

Another paper published in 2019 was based on a study in Rwanda, which showed that iron-deficient women who consumed iron beans twice a day for 18 weeks experienced not only improved iron status but also improved ability to conduct everyday physical tasks such as walking, cleaning, and other household chores. This was the first study to show that a solely food-based nutrition intervention (as opposed to taking supplements) produced improvement in subjects’ “work efficiency”—the amount of energy needed to perform light tasks. Iron deficiency is the most common type of micronutrient deficiency; it is one of the leading causes of anemia and is known to cause fatigue and impair physical performance—such as a person’s degree of physical endurance and work efficiency. In Africa south of the Sahara, 37 percent of women are anemic and nearly one in three cases are caused by iron deficiency. Previous research with Rwandan women showed that consumption of iron-biofortified beans resulting in improved iron status also improved cognitive function in the same adult women.

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