

## Letter to the Editor

### RESPONSE TO COMMENTARY

Response to **Commentary** on the Guest Editorial “Hidden Hunger: Is there a weak link” published in AJFAND Volume 12, No. 7, December 2012.

Dear Editor-in-Chief,

I write in response to the Commentary by “Ekin Birol and Yassir Islam, HarvestPlus” published in AJFAND Volume 13, No. 1, January 2013.

The commentary mainly focuses on the editorial paragraph on biofortification which, the authors claim, contains “a few ***misperceptions*** related to biofortification” which they attempt to clarify, stressing that “*This is especially important as HarvestPlus and its partners prepare to deliver four biofortified crops in four African countries in 2013: iron beans in Rwanda and Uganda; pro-vitamin A orange sweet potato in Uganda, pro-vitamin A orange maize in Zambia, and pro-vitamin A yellow cassava in Nigeria.*”

I thank the authors for their critical assessment of the editorial. The significant role of HarvestPlus and its partners in combating hidden hunger and malnutrition in general, and their several community based projects in support of maternal and child health and community health in the low and lower-middle income countries are well documented [1]. Biofortification is an emerging agricultural technique in the cultivation of micronutrient-rich varieties of staple crops that can improve the diets of the poor in the fight against hidden hunger [2 – 4]. HarvestPlus is using conventional breeding techniques for the development of biofortified crops [1 – 3]. Biofortification is indeed an exciting and creative technology; however, it also is complex, and presents many challenges. Thus, it continues to generate large volumes of basic and applied research data, as well as diverse opinions from scientists, researchers, consumers and stakeholders [1, 4 – 7].

Although the focus of the Guest Editorial was on the concept of “Hidden Hunger,” with no specific reference to HarvestPlus, I welcome their comments, and recognize their desire to justify and promote the delivery of biofortified crops to the four African countries. However, after careful consideration, I seriously doubt that their comments actually serve their stated purpose of clarifying the editorial “misperceptions related to biofortification.” Below are my detailed responses to their comments:

**Comment 1:** “*All biofortified crops that are currently being delivered, as well as those in the pipeline for delivery by HarvestPlus and its partners are conventionally bred*”. “*Moreover, biofortified varieties of crops are not only bred to have higher micronutrient levels (iron, zinc and vitamin A) but also to have various production and consumption traits farmers and consumers prefer, such as high yield; virus, disease and pest resistance; drought tolerance, and cooking and eating quality, to name a few*”.

**Response:** The editorial correctly defined the concept of biofortification, with no specific reference to HarvestPlus [4–8]. Its focus was on “Hidden Hunger”, which prompted the reference to the higher micronutrient levels (iron, zinc and vitamin A) in biofortified crops. Their comment about “*biofortified varieties of crops...*”, while providing additional information, is not a proof of any “misperception related to biofortification.” The additional information the authors provide is acceptable; however, all of the mentioned “traits” are not necessarily shared by all biofortified crops. It would have been appreciated, if the authors had also included traits that are more relevant to the issue of hidden hunger, such as the levels of anti-nutritional factors in some of the biofortified crops, and the relative bioavailability of micronutrients in them.

**Comment 2:** *Biofortified crops are not just for cultivation in family or community gardens for household consumption. Many, if not all, of these crops can also be grown in smallholders' fields and on larger farms both for subsistence and as cash crops. While the author correctly notes that remote communities may especially benefit from biofortification as they often have limited access to fortified foods or supplements, biofortified varieties of crops are bred to be suitably grown under various agro-ecological conditions in almost all rural or peri-urban areas of target countries.*

**Response:** This comment does not clarify any alleged "misperceptions related to biofortification" in the editorial, singled out by the authors (*...because biofortified seeds can be supplied to them for cultivation in their family or community gardens; ...the main advantage of biofortification over commercial fortification is that the biofortified crops can be grown in the poor and remote communities*). The editorial clearly states on page 4 that "Biofortified food staples with high amounts of micronutrients are recommended for use in developing countries to combat hidden hunger." There are four references cited in the paragraph, one of which is in relation to HarvestPlus. It appears that the authors engaged in selective cherry-picking here, as both "...small and large scale farmers..." were mentioned in the said paragraph, emphasizing "family gardens, community gardens, poor and remote communities because those are the neglected majority severely affected by the adverse effects of hidden hunger in the low and lower middle income countries as indicated by other researchers" [4 – 6].

**Comment 3:** *The author does not state what these controversies are. In fact, most biofortified crops are not that different from the non-biofortified varieties other than being richer in certain nutrients. Orange sweet potato (OSP), for example, is widely eaten in many regions of the world. Evidence on the nutritional impact of consuming OSP, the biofortified crop which has been around the longest, indicates that OSP was effective in providing substantial amounts of vitamin A to women and children in Mozambique and Uganda. Similarly, crops like beans and pearl millet are already high in iron. HarvestPlus and its partners are simply breeding varieties that have more iron.*

**Response:** In the editorial the statement about existing controversies is accompanied by three references, which the authors could have read for clarification. It is important for the authors to read Chapter 5 of the "UNDP African Human Development Report 2012" [7]. Biofortification is still an emerging technique, thus expressing constructive concerns about the long-term effects of consuming biofortified crops are justified [4, 7, 8].

The authors stated that "*.....most biofortified crops are not that different from the non-biofortified varieties other than being richer in certain nutrients*". This statement contradicts their earlier statement that biofortified crops have "*...various production and consumption traits farmers and consumers prefer...*" This inaccuracy in the commentary can, in fact, fuel further controversies about biofortified crops, as can the authors' un-guarded description of biofortification as "*....simply breeding varieties of beans and pearl millet that have more iron*". How much more iron? If these staple crops are for daily consumption, then it raises a series of questions, relating to iron overload or iron toxicity, especially for patients with "Primary Hemochromatosis". Publications on the just concluded clinical trial of the bioavailability of iron in iron biofortified millet are yet to be released.

**Comment 4:** *This implies that biofortified crops are somehow being imported. Crops are being bred in partnership with CGIAR centers and their partners most of which are located in the regions where these crops are intended. Candidate varieties are first widely tested and evaluated by national agricultural research centers before being approved and released by the appropriate national varietal release committee. When it eventually comes to formally trading products made from biofortified food crops, HarvestPlus is in the process of ensuring that these comply with international Codex as well as national regulations and guidelines on food labeling.*

**Response:** The statement in the editorial that attracted this comment reads thus: "*There is, therefore, the need for policy makers and program planners to ensure that only biofortified products approved by WHO, FAO and other reputable international agencies are imported and used in the country.*" The Consultative Group on International Agricultural Research (CGIAR) Consortium is one of those "reputable international agencies" this statement is referring to. The editorial did not question the procedures adopted in HarvestPlus. In my view, however, the idea that approved biofortified seeds should be "donated" to government agencies for distribution to farmers in the low and lower-middle income countries raises serious questions about the long term sustainability of the program. The need to ensure that the cost of purchasing, disseminating and monitoring these seeds

becomes an integral part of all annual central and local government budgets in the low and lower-middle income countries cannot be overemphasized.

**Comment 5**, regarding lack of consumer acceptance of biofortified products: *"This statement is not valid, since release and delivery/production of biofortified crops are too recent to make such a statement. Consumer acceptance studies conducted to date have shown that for some crops, such as orange maize, consumers prefer biofortified varieties over conventional ones, even in the absence of information about the nutritional benefits of biofortified varieties. All of the consumer acceptance studies conducted to date have shown that when consumers are informed about the nutritional benefits of biofortified crops, they prefer these to conventional ones. In the case of OSP, on average 65% of farmers in the project areas in Mozambique and Uganda willingly adopted the OSP and fed it to their families. It is now being scaled up in both countries."*

**Response:** The authors cite three references (one of which is not peer-reviewed) to support their argument. They conveniently omit to mention, however, that the projects they cited were necessitated, in the first place, by existing concerns regarding consumer acceptance of biofortified crops [6, 9]. Several other references contradict the authors' opinion, expressed so unequivocally [10 – 13].

According to Pillay et al [13], "Yellow, pro-vitamin A-biofortified maize has the potential to succeed as a new strategy of dealing with the serious problem of vitamin A deficiency, especially among children of preschool age. However, in older groups, this strategy is unlikely to be successful, unless other strategies are implemented, including intensive nutrition education programs on the nutritional benefits of the maize, targeting the market price at which yellow maize is sold, increasing its availability in local grocery stores, and improving its sensory properties through breeding".

It is, in my view, counterproductive to negate the issue of lack of consumer acceptance of biofortified products, when it is raised by researchers and scientists, especially from their regions. Objective, collective and collaborative contributions are required to justify and promote biofortification as one of the sustainable cost effective strategies for the reduction of hidden hunger and the improvement of public health in the low and lower-middle income countries [4, 6, 7].

**Comment 6:** *HarvestPlus and its partners work very closely with target countries' agriculture and health authorities as well as with the private sector and civil society organizations to ensure that appropriate awareness campaigns are developed and implemented at all levels. These campaigns are targeted not only at the small scale farmers but also at those household members who are responsible for making food consumption decisions in the households. Moreover care is taken to ensure these campaigns are implemented via the use of the appropriate media (radio, community theatre etc), in the appropriate language, providing the optimal level and amount of information. In addition, in each one of the target countries, mechanisms are in place to receive feedback from both farmers and consumers not only during the crop development phase (e.g., participatory breeding processes, farmer field days and consumer acceptance studies, including organoleptic tests), but also following delivery after each season (e.g., farmer feedback studies, and various Monitoring and Evaluation tools).*

**Response:** This comment effectively contradicts the authors' claim that there is no controversy surrounding biofortification of staple crops; rather, it is a tacit acknowledgement of some existing government and consumer concerns regarding the issue, followed by details of the measures and procedures used by their organization to resolve the issue.

In conclusion, I wish to once again express my sincere appreciation to the authors for reading and commenting on the editorial, and thus contributing to the ongoing debate about biofortification, particularly with regard to staple crops.

Highest regards,

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