

**Proposed Draft Definition for Biofortification
(at step 3)**

**CX/NSFDU 16/38/7
Agenda Item 6**

Comment from IBFAN (International Baby Food Action Network)

(i) General Comments

IBFAN wishes to note that even with the potential of increased nutrient content for one or two nutrients in a “biofortified” food, primarily through genetic engineering, that this is not a means of addressing malnutrition as claimed by the “biofortification” industries.

- Malnutrition is not the result of a lack of specific nutrients that from “biofortified” crops. Malnutrition is complex and mainly due to poverty, lack of adequate health care, lack of access to land, political and economic disparity, global economic impositions that have forced countries to convert farmland from growing food for people into growing cash crops for export. Those unable to purchase adequate food for their families will not be able to purchase “biofortified” foods.
- Malnutrition is generally not due to the deficiency of one or two nutrients. A full complex of nutrients are needed for optimal growth and development especially for infants and young children.
- The impact of biofortified crops on malnourished and undernourished populations has not been adequately investigated¹. Little is known about the safety and efficacy when compared to increased dietary diversity, nor the impact on immune-compromised and vulnerable populations. Malnutrition in young children is a multifactorial condition and generally precipitated by malaria, parasites, or infectious illness such as diarrheal disease and respiratory illness.
- The focus on only a few nutrients can lead to excess intakes. This can be risky for vulnerable populations. Excess vitamin A has been linked in some studies to an increased risk of birth defects².

IBFAN is of the belief that “biofortification” is a backdoor to scaling up genetic modification of foods. Is a similar model to genetically modified foods being used to promote “biofortified” foods and products as the champion to address global malnutrition?

- Genetic modification of foods has devastated the many family farms and the health of many farm workers. Genetic modification has increased factory farming; increased the costs of agricultural inputs; destroyed bee and butterfly populations; increased the prevalence of allergies in human populations and other unknown health impacts; and serious health impacts resulting from the pesticide products that accompany their production^{3,4,5}.
- Statements of increased production and improved nutrient content have not materialized.
- Questions have been raised about the possible impact of single nutrient focussed agriculture on biodiversity and the diversity of foods available to support local diets.
- Genetically modified food production is patented and its seed use is restricted therefore this is not a sustainable means for food production as farmers lose their independence.

The case of golden rice and vitamin A:

- Golden rice has not been subject to adequate safety testing on humans, especially those who are malnourished and immune-compromised. Basic toxicological testing in animals has not been done as required by the EU⁶ before they can be authorized for human consumption. Despite the lack of safety testing, GM rice was fed to human subjects^{7,8}. These human trials were not safety studies to determine effects on health, but efficacy tests to see whether the human subjects assimilated sufficient beta-carotene and converted it to vitamin A.

- Feeding trials generally do not reflect the nutritional reality of malnourished populations. The TUFTS University trials added butter to the feeding protocol. Malnourished populations may not have access to adequate fats in their diet for effective absorption.
- Moreover the feeding of GM golden rice to human subjects, especially young children, in the absence of prior animal toxicological testing has been condemned by international scientists as a breach of medical ethics and the Nuremberg Code⁹.
- Vitamin A can readily be accessed with emphasis on the growth of vitamin rich foods such as green leafy vegetable and other carotene rich foods combined with nutrition education. Such approaches can cover the wide breadth of nutrients required and provides sustainable local solutions to addressing situations of nutrient under nutrition. World Health Organization's (WHO) vitamin A deficiency policy recommends supplements only when necessary in countries with a high prevalence of vitamin A deficiency. WHO emphasizes the integration of all nutrition initiatives that include breastfeeding, nutrition education and home gardens. Since beta-carotene is abundant in nature there is no need to genetically modify rice.
- The lack of consumer acceptance of staple foods with altered colour and texture has also been documented.

IBFAN notes the lack of independent and substantive evidence to determine the safety of foods that are genetically modified. Studies such as the Diels¹¹ review demonstrates that research with financial or professional conflicts of interest is associated with outcomes that “cast genetically modified products in a favourable light”. A search for independently funded research on the safety and efficacy of “biofortified” foods to address malnutrition produces little or no results. However the many industry-sponsored documents show a pro-science stance while deploying PR tactics to promote their corporate objectives.

Finally, IBFAN is concerned that biofortified ingredients in ultraprocessed foods, high in salt, sugar and saturated fats will be promoted with the use of nutrition and health claims to mask the health risks of obesity and NCDs associated with such foods.

References:

1. Ross CA. Vitamin A. In: Coates PM, Betz JM, Blackman MR, et al., eds. *Encyclopedia of Dietary Supplements*. 2nd ed. London and New York: Informa Healthcare; 2010:115–120.
2. International Rice Research Institute (IRRI). Clarifying recent news about Golden Rice. <http://bit.ly/Z6ohSq>. Published February 21, 2013.
3. Székács, A. and B. Darvas (2012). Forty years with glyphosate. *Herbicides - Properties, Synthesis and Control of Weeds*. M. N. Hasaneen, InTech.
4. Benedetti, D., et al. (2013). Genetic damage in soybean workers exposed to pesticides: evaluation with the comet and buccal micronucleus cytome assays. *Mutat Res* 752(1-2): 28-33.
5. Lopez, S. L., et al. (2012). Pesticides used in South American GMO-based agriculture: A review of their effects on humans and animal models. *Advances in Molecular Toxicology*. J. C. Fishbein and J. M. Heilman. New York, Elsevier. 6: 41–75.
6. European Parliament and Council. Commission implementing regulation (EU) no. 503/2013 of 3 April 2013 on applications for authorisation of genetically modified food and feed in accordance with Regulation (EC) No 1829/2003 of the European Parliament and of the Council and amending Commission Regulations (EC) No 641/2004 and (EC) No 1981/2006. *Off J Eur Union*. 2013. Available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:157:0001:0048:EN:PDF>.
7. Tang G, Qin J, Dolnikowski GG, Russell RM, Grusak MA. Golden Rice is an effective source of vitamin A. *Am J Clin Nutr*. 2009;89:1776-83. doi:10.3945/ajcn.2008.27119.
8. Tang G, Hu Y, Yin SA, et al. Beta-carotene in Golden Rice is as good as beta-carotene in oil at providing vitamin A to children. *Am J Clin Nutr*. 2012. doi:10.3945/ajcn.111.030775.
9. Hooper M, Schubert D, Goodwin B, et al. Tufts University involvement in Golden Rice feeding trials. Letter from scientists and experts to Professor Robert Russell, Professor Emeritus, Friedman School of Nutrition Science and Policy, Tufts University School of Medicine. 2009. Available at: <http://www.issis.org.uk/SPUCTGM.php>.
10. Diels J, et al. (2011) Association of financial or professional conflict of interest to research outcomes on health risks or nutritional assessment studies of genetically modified products. *Food Policy*. 36: 197-203.
11. Enserink M. Tough lessons from Golden Rice. *Science*. 2008;230:468–471.

(ii) Specific Comments

Recommendation 1

Method of production

Add: **Must be specified**

Rationale: The public has the right to full and accurate information on how the food they consume has been modified. The majority of the public do not want to consume genetically modified foods and using euphemisms to hide the method of production is deceptive.

Recommendation 2

Definition

Biofortification is a process, **that includes genetic modification** by which the nutrient **and other properties** of the food produce and food products **are altered**. ~~by a measureable amount in a readily absorbable form, through an intervention in the source organism for an intended purpose.~~

Rationale: The public has the right to full and truthful information. Using terms such as measureable amount and readily absorbable are vague and not quantified. Research on human subjects while safety and toxicological studies have not been adequate. The health impact on immunologically compromised malnourished populations is not substantiated with independent research, hence the intended purpose cannot be stated.

Recommendation 3

IBFAN does not agree with the definition.

Rationale: Until the definition is clear to consumer needs with full and truthful information on the method of production, it is not possible to determine how it is used

Recommendation 4

CCNFSDU should **reject** the “Biofortification” terminology.

Rationale: The term is deceptive and a euphemism to hide the method of production which includes genetic modification. As well in many jurisdictions the term “bio” refers to organically produced foods. The term “biofortification” should be considered a nutrient claim and therefore a marketing tool.

Recommendation 5

No comment.