

CHAPTER 16

ADVOCACY FOR BIOFORTIFICATION: BUILDING STAKEHOLDER SUPPORT, INTEGRATION INTO REGIONAL AND NATIONAL POLICIES, AND SUSTAINING MOMENTUM

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ABSTRACT

Africa as a continent faces high prevalence of micronutrient deficiencies such as vitamin A, iron, and zinc. Biofortification offers a dietary agriculture-based strategy that has shown potential to address selected micronutrient deficiencies. This chapter describes how advocacy for biofortification by HarvestPlus and its partners has been structured, including a mix of evidence generation and sharing, stakeholder mapping, promotion to change attitudes, and efforts towards establishing Codex Alimentarius standards for biofortification. In addition, a review of African Union, Southern African Development Community, and country-level strategic policy documents on how biofortification is reflected in such documents for four country case studies, Ethiopia, Mozambique, Rwanda, and Zambia was conducted. The momentum that has been built for biofortification on the continent is in part attributed to salient advocacy that HarvestPlus and its partners have used to promote investment in biofortification and adoption by countries, to the extent that the original skepticism has dissipated and biofortified crops have been released in at least 22 African countries with plans for release in additional countries. Considerations and recommendations are suggested to inform the development of advocacy strategies at country, regional, and Africa continent levels, aimed at sustaining and accelerating the momentum for biofortification.

Key words: Biofortification, Advocacy, HarvestPlus, Micronutrients, Micronutrient Deficiency, Codex Alimentarius, Biofortification Standards, Mainstreaming

INTRODUCTION

Biofortification is being embraced by the global nutrition community as a nutrition-specific agriculture intervention that can increase the dietary intake of selected micronutrients in Africa, such as iron, zinc, and vitamin A. Because it is an agriculture intervention and agriculture is also an income-generating activity for many of the poor, it is also a nutrition-sensitive intervention that can improve access to food through other pathways, including through economic access to more diverse diets. Particularly desirable is biofortification's potential cost-effectiveness and long-term sustainability once the biofortified crops are widely adopted. Evidence is accumulating on the effectiveness to address specific micronutrient deficiencies such that the original skepticism has dissipated. This journal issue focuses on much of this evidence. Biofortified crops have now been released in 22 African countries, with testing taking place in at least seven more. Therefore, much momentum has been gained around biofortification in Africa. The advocacy approach that has been key to building momentum and highlighting successes of HarvestPlus and other efforts to promote biofortification globally should be documented to inform the development of a deliberate advocacy strategy to sustain the current momentum. The strategy should include guidelines to ensure accountability for high quality biofortification standards to avoid claims that may negatively affect the gains so far attained.

Pelletier *et al.* described advocacy as an intervention into the complex dynamics of bringing about and sustaining desired change [1]. It includes addressing different contexts of the socio-political environment within which the desired change should take place, and the need to adjust strategies and tactics as conditions and dynamics of interactions among those involved change. For biofortification, a distinction should be made between advocacy for increasing investment and that promoting activities that create awareness to build demand for biofortified crops. This paper describes components of salient advocacy that have contributed to building the current momentum for biofortification and assesses how biofortification is being reflected in key strategic/policy documents of the African Union (the Maputo Declaration, the Malabo Declaration, and the Africa Regional Nutrition Strategy 2015-2025 [ARNS-2015-2025], the Southern African Development Community [SADC] Food and Nutrition Strategy 2015-2025), and country-level strategic policy documents. The authors draw on the experience of both HarvestPlus, the key driver behind the global biofortification movement, and the International Potato Center (CIP), which has focused on promoting orange sweet potato (OSP). Key national agriculture and nutrition strategic policy documents of four country case studies were reviewed: two countries where two or more biofortified crops have been released and up-scaled (Zambia and Rwanda), one where interest has been expressed for release (Ethiopia), and one where a specialized advocacy effort for one crop paved the way for biofortified crops to be integrated into the government's social and economic plans (Mozambique). The information generated is used to identify gaps and recommend advocacy opportunities towards development of an advocacy strategy and identify challenges for maintaining both the momentum and the required quality standards going forward.

ADVOCACY FOR BIOFORTIFICATION USING EVIDENCE, STAKEHOLDER MAPPING, AWARENESS CREATION, AND EDUCATION AS TOOLS

When Dr. Howarth Bouis first presented the idea of breeding micronutrients into staple crops, there was widespread skepticism in the agriculture sector that farmer preferences for yield, pest and disease resistance, and climate adaptation would be compromised when nutritional traits were emphasized. The nutrition community, on the other hand, worried that micronutrient levels would be too low to have a nutrition effect and raised additional concerns about bioavailability and bioefficacy. Thus, the first advocacy challenge was building the scientific evidence to show that vitamin A, iron, and zinc could be bred into crops at sufficient concentrations to have a positive effect on nutrition even after processing and potential cooking losses. HarvestPlus, therefore, systematically presented evidence to scientists at scientific fora and conferences. The first crop to undergo rigorous testing and wide promotion was OSP, which addresses vitamin A deficiency. The goal of the advocacy was in part to change attitudes, beliefs, and values through raising awareness, and then sensitizing, educating and mobilizing stakeholders interested in fighting malnutrition. Diverse stakeholders were targeted, from scientists to policy and decision makers, practitioners, farmers, and consumers.

The Danish government initially provided modest financial support for biofortification, but it was only after the commitment of support from the Bill and Melinda Gates Foundation (BMGF) that HarvestPlus was formally founded and breeding work supported. HarvestPlus was able to begin to promote additional biofortified crops (vitamin A maize, vitamin A cassava, and iron beans) in different African countries. Promotion of the crops and advocacy was done simultaneously. Stakeholder mapping were conducted in Uganda, Rwanda, Zambia, and Nigeria to identify beneficiaries, decision makers, potential allies, and partners, as well as potentially resistant groups. Based on this analytical mapping exercise, an advocacy roadmap was established for each country context.

In Mozambique, several projects generated evidence using drought-tolerant OSP varieties released in 2011, prior to a major advocacy effort led by CIP and Helen Keller International (HKI) in 2012 [2]. A situational analysis was conducted by Helen Keller Foundation to understand who the key players in agriculture and nutrition were and special attention was paid to identifying influential persons to serve as champions advocating for OSP and other biofortified crops within and outside their organizations. The situational analysis included identifying potential sites for growing OSP based on malnutrition prevalence and an agro-ecological environment suitable for growing sweet potatoes. A key institutional stakeholder identified as an entry point in Mozambique was the National Secretariat for Food Security and Nutrition (SETSAN), a national level multi-sector coordinating body with provincial-level representation and district-level influence. One challenge in stakeholder mapping activities is that the socio-political environment is dynamic, and advocacy efforts can be set back when governments change and/or key advocates move on. Training several champions within organizations, including non-political appointees, and getting documented commitments, such as including biofortification as a strategy in official government policy documents, can help mitigate this challenge.

Support and championing biofortification through advocacy has built steadily as nutrition evidence has been published for the crops. Individuals within funding agencies, National Agriculture Research Systems (NARS), the African Union and New Partnership for Africa's Development (NEPAD), and in Regional Economic Communities (RECs) have supported and advocated at national and regional levels. A more complete documentation is needed of the experiences of both individual and institutional champions who have contributed to the momentum that has propelled biofortification to the current level of acceptance among diverse stakeholders. Such advocacy experiences will be valuable to inform the development of a deliberate strategy.

INTEGRATING BIOFORTIFICATION INTO THE REGIONAL AND NATIONAL POLICY ENVIRONMENT

Africa has high prevalence of micronutrient deficiencies, such as those of iron, zinc, and vitamin A. The African Union (AU) and associated RECs have made efforts to encourage a conducive environment to promote progress on nutrition for Africa. Through the Maputo Declaration that ushered in the Comprehensive Africa Agriculture Development Programme (CAADP) in 2003, the AU Heads of State declared that African countries should aim to spend at least 10% of their national budgets on the agriculture sector and aim for at least 6% annual growth in the sector, if the continent's aspirations to attain food and nutrition security were to be attained [3]. The Malabo Declaration, just over a decade later, affirmed this and further set targets to reduce stunting and underweight to 10% and 5%, respectively, by 2025 [4]. The CAADP is the key Africa-led agriculture strategy that has been widely embraced, with at least 44 African countries now at different stages of the CAADP process [5]. Realizing that nutrition was inadequately addressed in the AU New Partnership for Africa's Development (NEPAD) CAADP process, the Micronutrient Initiative supported NEPAD's multi-stakeholder consultative process (between 2005-2008), leading to the Pan African Nutrition Initiative (PANI). The PANI called for a multi-sectoral response to malnutrition using a "nutrition lens" for planning and programming. Among the 13 fast-track actions recommended was "Expanding Production and Consumption of Locally Grown, Micronutrient Rich Foods", with OSP as one of the focus crops [6]. It is not clear to what specific advocacy activities this inclusion could be attributed, but at the time the evidence on the benefits of consuming OSP was accumulating.

The broad adoption of CAADP by many African countries makes CAADP an ideal framework within which to promote both the breeding and use of biofortified crops in Africa. In 2015, some nutrition indicators were added to the CAADP Results Framework, the monitoring and evaluation tool for CAADP, making it possible to monitor nutrition in the CAADP processes [7]. Given the momentum that has built for biofortification on the continent, there is now need to advocate for biofortification indicators to be part of CAADP Results Framework.

The Africa Region Nutrition Strategy (ARNS) is also an important document that aims to harmonize nutrition action for the continent [8]. The RECs also release policy documents, and the SADC Food and Nutrition Strategy 2015-2025 is an example at this

level of AU structure [9]. The assessment of the AU policy documents is important because to advocate effectively for biofortification at the AU level, one must understand how biofortification is currently reflected in these documents. The documents have been reported to be useful advocacy tools at country level [10]. NVivo text searches of these continental documents and nutrition strategy and relevant policy/strategic documents for four countries were conducted to determine how the term biofortification is reflected therein and what the implications are for advocacy action. Statements/sections of the documents in which biofortification was included were coded to a biofortification node.

The review of the NVivo biofortification node revealed that there is no mention of biofortification in three of the four AU documents reviewed. The SADC Food and Nutrition Strategy 2015-2025 is the exception. The SADC Food and Nutrition Strategy 2015-2025 provides a definition for biofortification as, “the development of micronutrient-dense staple crop varieties using traditional breeding practices or biotechnology” [9]. The promotion of appropriate evidence-based legislation and related enforcement mechanisms on food fortification and *bio-fortification standards* was listed as a priority action area under the theme of reducing micronutrient deficiencies. Another priority area under the same theme was promoting and advocating for consumption of micronutrient adequate foods. This reflects a recognition of biofortification as a means of addressing micronutrient deficiencies and the need for standards and regulation of quality. The NEPAD/FAO-led CAADP program to mainstream nutrition into National Agricultural Investment Plans (NAIPS), in collaboration with several development partners, was implemented from 2011 to 2013 to enhance capacity for mainstreaming nutrition at the country level. HarvestPlus actively participated and supported this program, and it is possible that the conceptualization of the SADC Food and Nutrition Strategy led by NEPAD may have benefited from this participation. It would be useful to further explore the details of how biofortification came to be included in the SADC Food and Nutrition strategy.

Individual countries develop their own policy and/or strategic documents to address nutrition action. The authors’ assessment found that biofortification is reflected more strongly in country-level documents than the continental documents. Table 16.1 summarizes how biofortification is reflected by country level documents. The information indicates that biofortification is embraced as a key strategy to address micronutrient deficiencies in all four countries reviewed. Biofortification is usually mentioned alongside other interventions, indicating that it is being considered as part of the complement of interventions available. There is need to document both the individual and institutional advocacy champion experiences that facilitated these developments at country level, particularly key challenges and opportunities faced, to usefully inform future action.

The country and SADC documents also reflect quality standard concerns that would need to be addressed through appropriate regulatory processes at the country and regional levels, particularly for staple food fortification [9, 13]. The issue of biofortification standards, covered in greater detail in a later section of this article, is a top priority for advocacy.

In addition, greater attention is needed for tracking progress on biofortification both at the country and regional levels. As indicated above, nutrition indicators have been added to the CAADP Results Framework, and inclusion of additional indicators to track biofortification progress as part of diet diversity, levels of investment, and production should be considered. For example, Minimum Diet Diversity for children 6-23 months and for women 15-49 years old are already included as indicators in the CAADP Results Framework. Consideration should be given to adapting the related dietary diversity questionnaires to capture the percentage of targeted populations that consume biofortified crops. Demographic and Health Surveys and other surveys that collect dietary diversity data at the national level should equally be encouraged to do the same. In this way, progress on consumption of biofortified crops could be tracked as part of existing survey efforts.

MAINSTREAMING OF BREEDING OF INCREASED NUTRIENT DENSITY INTO THE WIDER CGIAR PLANT BREEDING ACTIVITIES

The CGIAR Research Centers have been instrumental in crop breeding globally. In anticipation of the 2nd Global Conference on Biofortification held in April 2014 in Kigali, Rwanda, the directors general of the CG centers met and formulated a statement answering the call of HarvestPlus to mainstream nutrition into breeding programs. Frank Rijsberman, CEO of the CGIAR Consortium, announced that the “CGIAR Research Centers had committed to make breeding for mineral and vitamin traits in their regular food crop development programs the norm.” This is critical to ensuring sustained commitment to biofortification and potential increase in the number of biofortified crop varieties. Figure 16.1 indicates the extent to which CGIAR Centers and specific breeding programs had progressed in mainstreaming biofortified traits between 2012 and 2014. In addition, the International Potato Centre (CIP) and 14 national partners breeding under the Sweetpotato for Profit and Health Initiative have a goal of at least 50% of the clones submitted for release in Sub-Saharan Africa being orange-fleshed. However, advocacy is still needed at the country level to encourage national breeders to use CGIAR biofortified parental material in national breeding programs. Moreover, for some crops such as rice, where private sector companies play a key role in varietal development, demonstrating the commercial value of advertising a variety as biofortified will be requisite. Educating the consumer to demand more nutritious varieties will also be critical in driving private sector buy-in.

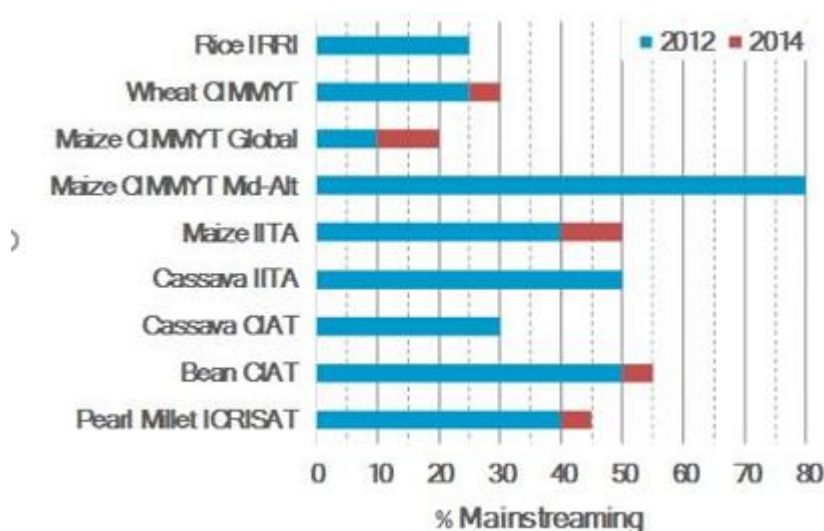


Figure 16.1: Mainstreaming progress on biofortification at CGIAR centers (%)

Source: Wolfgang Pfeiffer, HarvestPlus (personal communication, 2016)

THE ROLE OF BIOFORTIFICATION STANDARDS AND FUNCTIONAL PROPERTIES TO SUSTAIN POSITIVE MOMENTUM

A technology has to reach an adequate level of development to be recognized by Codex Alimentarius, the International Food Standards Setting Organization jointly administered by the FAO and WHO. It is clear from the information presented above that biofortification has become an important enough agricultural technology to warrant such recognition, and there is now a need to have a standard Codex Alimentarius definition for biofortification. The scientific literature gives definitions for biofortification that vary dependent on context. These include biofortification using traditional plant breeding technologies, transgenic technologies, or agronomic technologies using fertilizers as in the case of zinc [11]. A Codex Alimentarius standard definition is necessary for formal legal integration into Standards or Regulations vital to inform policy development and direction for monitoring and evaluation purposes. A process has, therefore, been initiated by HarvestPlus within the Codex Alimentarius to develop an internationally accepted definition by consensus of the member states of the institution. Progress has been made in that HarvestPlus/International Food Policy Research Institute (IFPRI) now has “Observer Status” in the Codex Alimentarius with all the privileges of the 186 Member Governments, except voting rights. A Discussion Paper, following processes outlined in the Procedural Manual of the Codex Alimentarius, was prepared by the Government of Canada and HarvestPlus/IFPRI and submitted to the 35th Session of the Codex Committee on Nutrition and Foods of Special Dietary Use (CCNFSD) in November, 2013 [12].

The mandate of the CCNFSDU is:

- To study specific nutritional problems assigned to it by the Commission and advise the Commission on general nutrition issues;
- To draft general provisions, as appropriate, concerning the nutritional aspects of all foods;

- (c) To develop standards, guidelines or related texts for foods for special dietary uses, in cooperation with other committees where necessary; and,
- (d) To consider, amend if necessary, and endorse provisions on nutritional aspects proposed for inclusion in Codex standards, guidelines and related texts.

Several important questions and considerations were raised by Committee Members at the 35th Session as follows:

1. The need for scientific evidence on bioavailability of nutrients.
2. Quality of biofortified food.
3. How would the distinction between bio-fortified and non-biofortified crops be made?
4. What considerations could be given to staple food crops that are already in the market place?
5. Consumer perception of new biofortified crops.
6. Work on biofortification should not lead to impediments to trade.
7. Biofortified food must be safe.
8. What would be the effect on smallholder farmers and traditional farming methods?

Evidence is available and is continuing to accumulate on all these aspects some of which is presented in this special issue. Preparation of the revised Discussion Paper was taken over by the Republic of Zimbabwe and the Republic of South Africa at the annual meeting of the CCNFSU in 2014, as only Member Governments can sponsor a Codex Document entering the Codex Alimentarius process. Codex follows a rather complex process towards the ultimate selection of one definition from a submission of 18 potential definitions. It is anticipated that the definition will have to be broad in scope, in order to allow for the consideration of biofortified animal food products, such as high selenium eggs, important for selenium-deficient populations.

Once a definition is agreed by CCNFSU, the Document will be referred to the Codex Committee on Food Labelling (CCFL) so that discussions can commence on what the standards would be for labelling biofortified food. The mandate of the CCFL is:

- (a) To draft provisions on labelling applicable to all foods;
- (b) To consider, amend if necessary, and endorse draft specific provisions on labelling prepared by the Codex Committees drafting standards, codes of practice and guidelines;
- (c) To study specific labelling problems assigned to it by the Commission; and,
- (d) To study problems associated with the advertisement of food with particular reference to claims and misleading descriptions.

This is particularly important for consumer information and to assist in the recognition of biofortified food in international trade. Once Codex Alimentarius Standards have been established, national governments will have a reference point to consider in the development of legislation for biofortification standards for National Nutrition Strategies and for monitoring of biofortification claims.

CONCLUSION AND RECOMMENDATIONS

Based on the documents reviewed for this article, biofortification appears to be well reflected at the level of SADC and the case countries, but it was not featured in the continent-level documents reviewed. Biofortification has generally been reflected as one among several key interventions for reducing micronutrient deficiencies. Rwanda additionally refers to the advantage of being able to reach sectors of the population that may not be reached by conventional staple fortification. The need for biofortification standards is apparent for monitoring and evaluation and to ensure that expectations of nutrition impact can be realized, especially as more actors come on board to produce different biofortified crops. HarvestPlus work has had a salient advocacy component characterized by provision of evidence that has established biofortification as a strategy accepted for addressing selected micronutrient deficiencies in target poor populations with high deficiency prevalence of the given micronutrients. Advocacy also should target and try to influence strategic national stakeholders. From the information in this chapter, lessons for future advocacy action can be drawn. The following areas are identified and recommended for sustained strategic momentum on biofortification:

- There is a need to work towards identifying the individual and institutional champions for biofortification in processes that have taken place at national and regional levels for lesson learning, as well as identifying challenges and opportunities.
- At the AU level, there is need to strategically position biofortification so that, as new relevant declarations and other strategic documents are formulated, it becomes part of the interventions encouraged by the AU. This will be critical in view of the positioning of the AU for influence.
- Communicating to countries the mounting nutritional evidence on the positive impact which biofortified crops can have on human nutrition is needed and efforts should be made towards strategically framing the existing evidence for advocacy, not only at the country level but also at the continental level.
- As momentum for biofortification further builds and more crop development programs integrate the technology, it is important to have enforceable quality standards. For example, there is a need to set minimum levels of micronutrients at which a specific crop can be considered biofortified. If inadequate levels of micronutrients were to prevail, a positive impact on the nutritional status of the consumers would not be possible, potentially leading to loss of momentum on investment, adoption and impact. Current developments towards Codex Alimentarius standards for biofortification will certainly be critical, but increased awareness of the need for standardization by all relevant stakeholders needs to be promoted.
- Country level advocacy efforts have shown that policymakers also want information on what it will cost them to implement a biofortification strategy. In the case of OSP, an investment guide, outlining the key activities and their estimated cost, has been produced [13], and this type of guide is recommended for other biofortified crops.

- The development of biofortification strategies at regional levels through CAADP and at country levels are highly recommended and these should include use of relevant indicators to track progress on investments, production, and consumption of biofortified crops. Where Dietary Diversity indicators are tracked, inclusion of survey questions on consumption of biofortified crops is recommended to help track progress.

If the above recommendations are taken into account in the development of a deliberate and targeted advocacy strategy, it would be possible to accelerate the momentum thus far generated and allow biofortified crops to contribute more fully to addressing micronutrient deficiencies as part of regional and national dietary strategies on the African continent.

Table 16.1: Summary of how biofortification-related terms are used in country-level strategic documents

Country	Policy/strategic document	Summary of how biofortification is reflected
Ethiopia	Nutrition Sensitive Agriculture Strategy 2015 [14]	- Includes biofortification among key food-based approaches to address micronutrient deficiencies. - Encourages agricultural research and adoption of biofortified crops and vegetables and increased access to farmers. - Calls for establishment of a biofortification center and created capacity at Ethiopian Institute of Agriculture Research.
	National Nutrition Programme 2008-2015 [15]	- Includes biofortification among agriculture technologies where expert research capacity on policy and programming is needed.
Mozambique	Multi-sectoral Action Plan for Chronic Malnutrition Reduction (PAMRDC) (2011-2015)	- Promotes the production of foods with a high nutritional value through the agriculture extension system and in key national programs. OSP is seen as a key component to fight undernutrition because it is a good source of provitamin A and energy.
	National Agriculture Investment Plan (2014-2018) (CAADP)	- Includes biofortified crops among key food based approaches to address micronutrient deficiencies. OSP mentioned as priority food crop along with maize, rice, wheat, beans, cassava, tomato (and horticulture more broadly), and potato. - Promotes accelerated production of staple and nutritious food products, along with other priorities of income, market, value chain, etc. Reducing hunger and chronic malnutrition are priorities.
	Action Plan for Food Security and Nutrition (PASAN) (2008-2015)	- Under Use and Utilization of Foods, advocates intensifying the consumption of micronutrients by supplementing with foods rich in zinc, iron, and vitamin A.
Rwanda	National Food and Nutrition Policy-2014 [16]	- Biofortification is considered of potential to address micronutrient deficiencies for parts of the population difficult to reach through staple fortification. - Mentions advances made in biofortification research on iron beans, acceptance by farmers, and desire to promote biofortified cassava and sweet potatoes. - Calls for extension and input support to producers of bio-fortified beans, maize seeds, sweet potato vines and communication campaigns to promote production and use of biofortified foods.
Zambia	1000 Most Critical Days Programme 2013-2015 [17]	- Includes biofortification among derivable nutrition interventions. - Supportive of NGO projects using biofortification messages, alongside growing and processing suitable complementary foods. - Supportive of provitamin A maize research by HarvestPlus, and operational research initiatives by the Ministry of Agriculture on production and consumer acceptance of OSP. - Calls for the 1000 MCD Programme to be flexible in Years 2 and 3 to adopt and take forward relevant recommendations from ongoing research, including biofortification.
	National Food and Nutrition Strategic Plan 2011-2015 [18]	- Includes biofortification among actions called for towards food diversification. - Indicates biofortification as one of the innovative interventions that would be evaluated for efficacy and possible expansion and called for follow up determination of needed resources and gaps for wider adoption where feasible. - Includes biofortification among strategies to increase micronutrient and macronutrient availability, accessibility, and utilization.

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