

Nutrition-Enhancing Interventions and Agriculture Value Chains: Preliminary Lessons from Feed the Future Implementation in Four Countries

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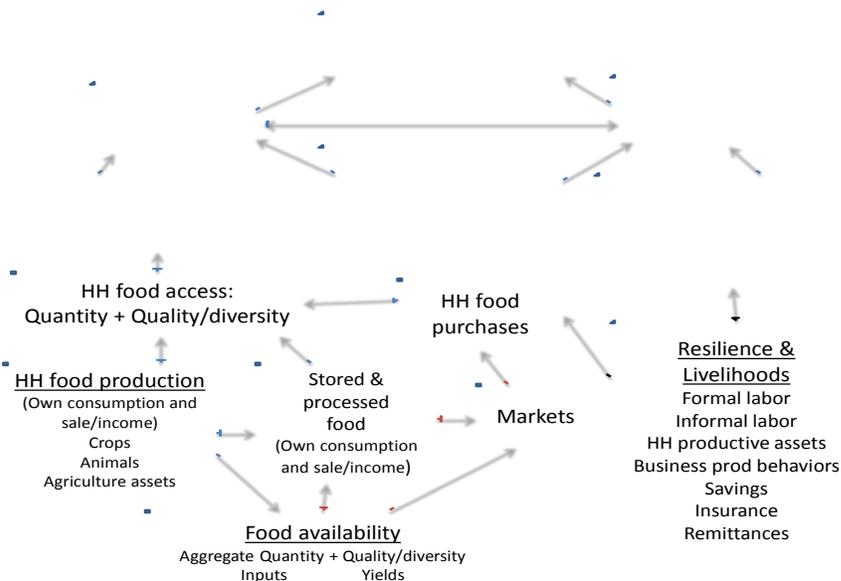
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Using four large, multisectoral, three to five year long, agriculture value chain projects being implemented with varying degrees of nutrition enhancement as case studies, preliminary lessons are drawn. The projects are located in the Democratic Republic of Congo (DRC), Liberia, Malawi and Tajikistan and are supported by USAID and the USG Feed the Future Initiative (FTF). Each is expected to improve the circumstances for 250,000-400,000 households, in the parts of their countries with populations of up to 3 million. Through them new principles of nutrition sensitivity (Herforth et al., 2012) are being blended with the existing and largely stove-piped agriculture and health-nutrition systems and beneficiary targets. In this paper the projects are described briefly and lessons from the process of the initial stages of implementation and recommendations are discussed.

Entry Points for nutrition-enhancing and nutrition-specific interventions

The figure below shows the entries points for agriculture and other interventions to contribute to the quantity and quality of household (HH) food consumption, child’s dietary intake and child nutritional

Figure 1. Entry points for influencing child nutritional status



status. The nutrition part of the framework (variables in the oval shapes), which is adapted from the UNICEF nutrition framework (1990) and Lancet series nutrition-sensitive nutrition framework (Ruel et al. 2013), shows that children’s nutritional status is determined by their dietary intake and their health, which in turn is determined by their household food consumption, care behaviours, and health services and environment. Variables in the square shapes show the many aspects of the agriculture and food security system that contribute to a household’s access to food, which is the gateway to household food consumption and dietary intake. Also included are an additional set of variables shown in the curved box that seek to improve household resilience and livelihoods, and apply especially when a household does not own land or does not have the resources to become active in an agricultural value chain. This framework is used to illustrate the approaches of each of the four FTF projects within the context of nutrition-enhancing and nutrition-specific interventions.

Nutrition-enhancing activities in the four country projects

To contribute to the improvement of nutrition outcomes in the four FTF projects, some of the agriculture value chain activities being implemented are:

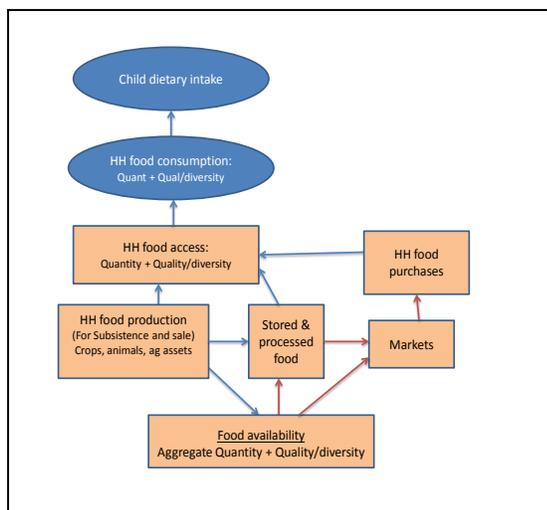
- agriculture demonstration plots with a variety of vegetables for home consumption and sale,
- nutrition education to promote dietary diversity,
- incorporation of food and nutrition messages into agriculture training,
- demonstration of labor-saving technologies,
- fortification of flours and processed foods,
- scaling up cultivation of biofortified seeds,
- production of processed complementary foods for infants and young children

The projects have mandates to increase agricultural productivity and animal husbandry, improve market access for inputs and production, reduce post-harvest losses through storage and processing technologies, and grow and husband a nutritious variety of plant and animal food sources.

In the Tajikistan and Malawi cases, nutrition-specific interventions such as promotion of exclusive breastfeeding for a child's first six months are also mandated. In Malawi, improvement of nutrition clinical services within the health system is mandated so that all three nutrition-specific interventions for reducing child stunting and underweight are addressed – food, care and health -- in addition to many of the nutrition-enhancing interventions related to the food component. Key activities for each project are listed below, as well as a figure showing the aspects of the broader conceptual framework shown above that are mandated in each country's FTF project.

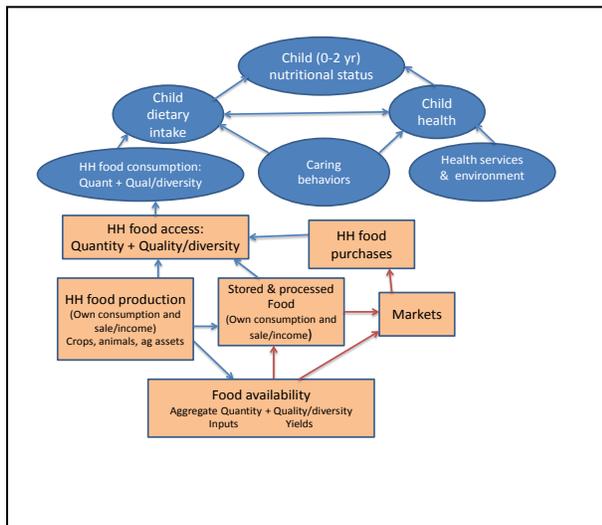
Democratic Republic of the Congo (DRC) – Food Production, Processing and Marketing (FPPM) project, 2011-2016

The FPPM project assists smallholder farmers in the districts of 3 provinces of western DRC that have the most potential to supply the markets of Kinshasa and other western Congo cities with plentiful, affordable, and nutritious food. The 5-year project's priority commodities are cassava, maize and legumes such as peanut, soya, niebe and other beans. The project seeks to assist in increasing yields of cassava and maize while simultaneously addressing post-harvest elements of their value chains, including transport, post-harvest storage, processing, and marketing so that minimal food is lost and income from sales is optimized. One element is to persuade farmers to operate like businesses, minimizing risks and maximizing returns to the land, labor, and capital they use to produce, store, process, and market their products, and to develop farmers' business management capacity accordingly. Key nutrition-enhancing activities of the project are listed below. The elements of the agriculture-nutrition conceptual framework being addressed in the project are shown in each of the boxes.



- Cassava, maize and legume value chains
 - Increase production and income among smallholder farmers
 - Establish the transport system so harvested food can be moved to Kinshasa and other cities in western DRC
 - Promote diversified diet from own consumption or purchases

The INVC project assists smallholder farmers in 7 districts in Central Malawi to harness their commercial agriculture potential, which is expected to increase their incomes, the household's diet, and the women and children's nutritional status. The 3-year project's priority commodities are soya, groundnuts, and dairy. The project supports elements all along the value chains, increasing farm, firm and industry-level competitiveness. The INVC project supports Government of Malawi that has for years co-located and integrated their agriculture and nutrition functions. Together the government and the project will enhance agricultural productivity, agro-enterprise profitability, and nutritional outcomes. Key nutrition-enhancing activities of the project are listed below. The elements of the agriculture-nutrition conceptual framework being addressed in the project are shown in the box.

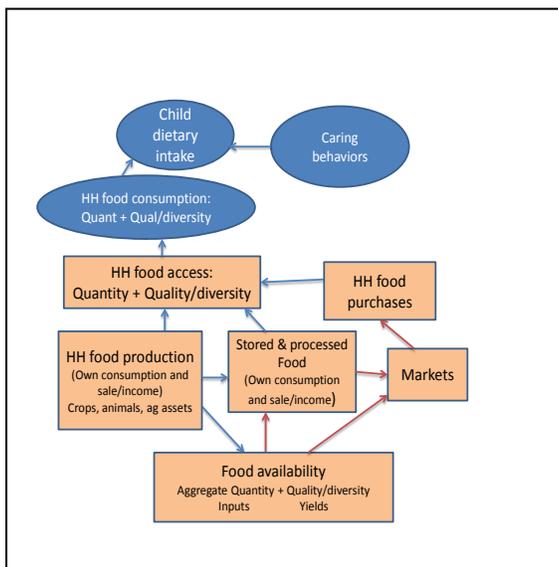


- Soybean Value Chain
 - Increase production of soy to use and sell for animal feed, cooking oil, corn-soy blend in relief efforts , and roasted flour for complementary foods under investigation
 - Increase income for smallholder farmers
- Groundnut Value Chain
 - Increase production for diversifying household consumption, including women and young children, and local markets
 - Increase production and quality for export markets
 - Increase income for smallholder farmers

- Dairy Value Chain
 - Increase production and incomes
 - Improve transport to improve food safety and reduce losses
 - Influence perceptions and demand for milk as nutritious food (formative research, BCC messaging, community groups)
- Home Gardens
 - Facilitate and promote cultivation and consumption of nutritious crops
 - Facilitate promotion of dietary diversity
- Nutrition-specific activities
 - Promote Vitamin A supplementation and deworming via health days and clinic services
 - Facilitate and promote use of micronutrient powder (Sprinkles) that are available at clinics
 - Facilitate use of growth monitoring and promotion (GMP) of young child feeding, hygiene, and child growth
- Behaviour change communication (BCC) strategy to promote practices in the agriculture and nutrition realms, for the nutrition-enhancing and nutrition-specific objectives

Tajikistan – Family Farming Project (FFP), 2010-2014

The FFP assists smallholder farmers in 3 provinces in Tajikistan to improve food security by increasing the volume of harvests and market access, raise household income levels from the sale of surplus or processed food, and improve the standard of household nutrition practices, especially for young child feeding. The 4-year project provides agriculture planning, extension, and marketing advice to farmers, as well as policy consultation with the Ministry of Agriculture. In addition, nutritious food for home consumption is stressed for the gardens inside family compounds. On home garden demonstration plots, nutritionists choose the vegetables and other crops for their nutritive value and agriculturists provide the technical support to increase productivity, as well as milk yields from the families' cows. Key nutrition-enhancing activities of the project are listed below. The elements of the agriculture-nutrition conceptual framework being addressed in the project are shown in the box.



- Nutrition Enhancement Practices
 - Provide nutrition trainings for maternal and child feeding, care, hygiene, and health-seeking practices
 - Conduct qualitative research on perceptions of child feeding and growth
 - Mobilize nutrition behaviour change throughout project
- Homestead food production – crops and livestock
 - Choose crop diversity to promote dietary diversity, e.g., kidney beans, pumpkin, peanuts
 - Apply agriculture extension advice to demonstration home gardens
 - Use demonstration gardens as sites for food processing training
 -
- Household economics
 - Conduct qualitative research on household economic decision-making, including how women plan for irregular remittances from husbands
 - Generate household economic planning options and resilience strategies

Observations and Recommendations on the Process of Implementing Nutrition-Enhancing Agricultural Programs within the FTF Initiative

Several years into the FTF Initiative is an important time to reflect on process lessons. FTF provides an unprecedented opportunity to explore enhancing nutrition outcomes from the agriculture platform. Marked by an unusually high degree of agency backing and alignment, FTF is complete with a conceptual framework, robust requirements for M&E, a learning agenda, and incentives for performance via competition to implement FTF projects. This early phase is characterized by the compelling notion that improving nutritional status will require assistance from agriculture and other sectors as well as

redoubled efforts from the health sector, yet also by inadequate experience to know how agriculture can assist. Initial attention is warranted to get the process right, and recommendations are offered.

1. *Define and use a lexicon of common key nutrition and agriculture terms to enhance joint planning.*

From the four FTF projects, it is notable that the term ‘nutrition’ has many meanings. Nutritionists are often referring to child nutritional status, usually assessed as child stunting as an impact indicator for FTF. They may also be referring to exclusive breastfeeding 0-6 months of age and good complementary feeding of children 6-24 months. In addition, a nutrition program may involve direct distribution of iron tablets to reduce women’s anaemia or of vitamin A capsules to children. These are predominately nutrition-specific interventions. When agriculturists speak of ‘nutrition’, they are often referring to healthy foods, i.e., increasing the nutritive quality of the diet, especially ensuring adequate protein, vitamin and mineral intakes, for example, vitamin and mineral fortification and biofortification. They may also be referring to ensuring adequate food consumption to reduce hunger, which is also considered a food security intervention. Agriculturists are generally focused on nutrition-enhancing interventions. To achieve initial clarity on the aspects of nutrition that can be improved, it is recommended that programs be more precise about the nutrition objective, defining the aspects of the outcomes that can be achieved. It is useful to understand the larger picture, and then segment it into discrete parts at the nexus of nutrition and agriculture. For example, the nutrition topic can be segmented into dietary diversity, anaemia, vitamin A deficiency, child stunting, adolescent nutrition, nutrition during pregnancy and others; agriculture can be segmented into productivity, storage, processing, marketing, food access and others; and, at the nexus, segmented into food consumption, dietary quality, hunger and others. The potential objectives and outcomes become clear and feasible as the parts are divide them into doable segments that can be understood, planned, and implemented.

2. *Design special studies to understand the relationships and assumptions involved in nutrition-enhancing agriculture.*

Experience is limited about getting tasty, safe, affordable food to the table and encouraging the targeted people to the table to eat it (the farm-to-fork continuum). A framework like Figure 1 will not provide results unless more is known about *how to* accomplish each step. There are parts along the farm-to-fork continuum that require exploration and deeper experience, like from crop-to-food-to-diet, i.e., how producing and marketing crops becomes the food consumption and nutritious diet of rural and urban people who are vulnerable to undernutrition. Answers to these types of questions will contribute to the FTF learning agenda, deepening the understanding of *how* the agriculture-nutrition conceptual frameworks will function and deliver. One way to deepen the understanding is to innovate by experimenting with strategies and activities under more controlled circumstances before scaling up. Both the experimentation and the scale up could occur within the framework of the large-scale project. For example, if productivity, processing and marketing of the crops chosen as value chains are main foci, but it is not clear if the efforts are leading to greater year-round access to food and reductions in hunger, the incidence and prevalence of hunger in select sites over several lean seasons could be

studied. A special study could explore *how* year-round access to food is progressing, for example: Are the hungry targeted by the project's main activities, or are they outside the target group? When productivity of the VC crops increases, how is the surplus distributed – own consumption, sold in local markets, urban markets? The emphasis on the process –the *how* – asks not only *if* certain relationships among variables and actions occur, but how they occur, to what extent and under which circumstances.

3. *Raise awareness about nutrition within sectors and among stakeholders.*

Several years were spent and a leap of faith was taken to include nutrition in the new FTF agenda at the central level, and now that process is underway in agency offices and ministries in the FTF countries. The potential for agriculture to contribute to improvements in diet and nutritional status must be compellingly argued so that it registers among the many competing development priorities of a country government. The argument must now be continually advocated to get it on countries' agriculture and nutrition-health agendas and to maintain it there. To some stakeholders, future school performance and adult productivity and wages makes the case, to others addressing undernutrition in young children is simply the right thing to do. The Scaling Up Nutrition committees, the UN REACH initiative and others have begun to assist NGOs in country provide this advocacy. Once on an agenda, a balancing point must be reached where any new activities seem doable -- specific and feasible -- yet not overly simplified – for example, not assumed to only require increased household income or to require only prevention of childhood illnesses.

4. *Understand the sectors' different approaches to targeting.*

In an agricultural value chain approach, there is a variety of target beneficiaries. Those with the spirit and circumstances allowing for entrepreneurial and risk-taking business behaviour are often targeted at project onset as early adopters and first beneficiaries, e.g., model farmers, small business entrepreneurs, who can demonstrate the economic potential as well as feasibility of project interventions like new seeds and new food processing techniques. Middle and late adopters also benefit as they decide to adopt new products or behaviours, often after observing results among the early adopters. The early adopters may be better-off economically and less vulnerable than the late ones, but benefits accrue across th variety of beneficiaries. The approach to targeting in a public health nutrition setting is more specific. Project beneficiaries are the most vulnerable, e.g., mothers with undernourished children who might receive behaviour change communication encouraging exclusive breastfeeding and diverse, frequent complementary feeding and encouragement to seek immunizations and prompt health care. Also, and in general, public health nutrition programs do not focus on beneficiaries also being the actors determining how the new products or behaviours are being taken up, whereas agriculture programs do. An additional difference in targeting is that agriculture programs target farms or farmers, while nutrition programs target children and their mothers. Both the agricultural and nutrition approaches to targeting are useful to their objectives, but can cause confusion when trying to design nutrition-enhancing agricultural programming. Clarity at the design phase is recommended, so the points for complementarity between the approaches can be identified.

5. *Capture consumption and diet benefits among urban consumers.*

In the four FTF projects in DRC, Liberia, Malawi and Tajikistan, technical support for increasing agricultural productivity is directed to farmers in the rural areas and their households are the only population being monitored. Meanwhile, an implicit goal of each is to increase the food being sold into the markets of one or more major urban areas. While the rural farmers are intended to benefit by being able to sell a greater amount of produce, the urban consumers are intended to benefit from greater food supply, hence lower prices. It is recommended that as part of its learning agenda, the FTF Initiative also assess consumption and dietary diversity benefits to urban consumers.

6. *Understand the multifactoral nature of reducing child stunting.*

As shown in Figure 1, child growth and development, as summarized in the child stunting indicator, can be strongly influenced by multiple food, care behaviour, and health factors. A young child might be fed well, but experience diarrhoea, pneumonia or malaria that stunts his growth. The opposite could also happen, with a child having not experiencing any of these three most common childhood illnesses, but not being fed well enough to maintain good growth. Thus, any of the multiple factors could be the limiting one, stunting the child's growth. The implication of the notion of the limiting factor is that no one set of interventions can assure good child growth and development by itself. Thus asking whether agriculture programs on their own can reduce child stunting is not a valid question (Masset et al., 2012). Understanding the multifactoral nature of child stunting is critical to setting realistic objectives and assessing success by aligning the right indicators to them.

7. *Manage the nutrition-enhancing agriculture mandate.*

Within the FTF Initiative, each country's FTF program decides the number of projects it will support to achieve global impacts in agricultural productivity, income, and maternal and child nutritional status. It might decide to divide the agriculture and nutrition components into separate projects as in the DRC, toward nutrition-enhancing agriculture must be managed accordingly. If the agriculture and nutrition objectives are contained in one project, the implementing partner manages the nutrition-enhancing agriculture mandate and nurtures the cross-sectoral relationships, as in the Malawi FTF project. If the nutrition and agriculture mandates are in separate projects, the FTF program takes responsibility for managing the alignments needed to achieve results from nutrition-enhancing agriculture, as in the DRC, Liberia and Tajikistan FTF projects. Since the FTF Initiative is still in its early stage, it is recommended that lessons from this cross-sectoral, cross-project management function be analyzed, documented and applied toward enhancing the viability of nutrition-enhancing agriculture.

8. *Capitalize on agriculture's economic focus when considering nutrition enhancement.*

The agriculture sector views their efforts largely from an economic perspective. How can crop and livestock productivity be enhanced? How can income be maximized and losses minimized? Where are the markets and how can they be reached more easily? How can price information flow to farmers most

expeditiously so it can inform their decisions from inputs to crop choice to selling to processing, i.e. whether and how to enter value chains? What are the circumstances for exporting food vs. selling it locally? To capitalize on the economic perspective, nutrition-enhancing agricultural efforts should consider when and where to engage business promotion. An example is to provide technical support for the development, testing and sale of food storage and food processing supplies and techniques, as is being pursued in the value chain projects in DRC, Liberia, Malawi and Tajikistan. In the DRC, the FTF project is working with local food companies to add vitamin and mineral fortification to their food processing. Economic benefits will be gained from more food saved for own-consumption or sale (less post-harvest loss), and more jobs and income generated through food processors. Public health benefits will be gained from access to safer and more nutritious food (processed and preserved), and possibly more affordable food prices (greater supply through less post-harvest loss). Going a step farther, the business incentive in agriculture may contribute to a public health perspective in nutrition. An example is the Liberia project's horticulture value chain -- the key factors considered for vegetable selection are both the end-market demand so there is a strong market for selling the surplus, and the nutrient content so that nutritious foods supply this market demand. Another example is the Tajikistan project's approach to homestead demonstration gardens -- the project nutritionists worked with families to choose nutritious crops to demonstrate cultivating and canning, and the project agriculturists worked alongside to provide the agricultural advice to enhance productivity. Emphasizing agriculture's economic perspective does not preclude nutrition-enhancing agricultural activities, such as promoting key nutrition principles through agricultural extension, but it highlights the activities on which an economic-facing, value chain project could most readily collaborate.

9. Design value chains for greater consumption of animal-source foods.

Animal source foods are an important ingredient of a diverse, quality diet, especially for young children, because the foods are concentrated with essential nutrients needed for growth and development. They are often available in the markets, and are generally preferred foods, so the main constraint to their consumption is the high price relative to other foods. Animal-based value chains have been chosen in some FTF countries, yet consumption by targeted beneficiaries is limited. In Liberia, goats are a value chain, but are kept by the beneficiary households as an asset to be sold when needed for cash, and only eaten occasionally. In Malawi, dairy is a value chain, but most milk is sold into the urban market. To allow more consumption of animal source foods among those who are nutritionally vulnerable, it is recommended that other animal-based value chains be considered so that some of animal source food can be consumed as well as sold.

10. Leverage the unique position of women farmers at the nexus of nutrition and agriculture.

Women are the primary caretakers of their children. For the youngest, most dependent children, this involves breastfeeding, preparing and feeding complementary (weaning) foods, seeking preventive health care like immunizations and vitamin A supplementation as well as treatment for children who are sick, and in some cultures it means having the youngest children with them at all times, even when they are farming or doing other work. Rural women also do a lot of the agricultural work. Women's

agricultural roles and responsibilities vary among countries and regions, and though they may not have large influence on the agriculture resource decisions, they tend to be in the fields extensively. Thus, they are the lynchpin between their households' nutrition and agriculture, a unique position that should be leveraged. In the Malawi country program, women who lead community care groups (which intensifies the preventive and basic curative health efforts of community health workers) are the same women who serve on district committees of the national farmers' association, providing a channel right at the points of intervention for cross-fertilization and innovations from both angles, helping to make nutrition-enhancing agriculture a reality. It should be noted that leveraging means being strategic about women's time and roles, but does not mean targeting women with more and more additional work, as there already exists a careful balance of women's time and energy between their nutrition, agriculture and other responsibilities.

Looking Forward – Additional Considerations

The observations and recommendations discussed above pertain to changes that could enhance results within the robust FTF framework as it has been envisioned and initiated. There are a few more observations and recommendations offered that could fit into a future iteration.

Adopt dietary guidelines at country government level.

As dietary diversity and quality get more attention as one of the lynchpin variables linking nutrition program objectives to agriculture ones, it becomes clear that the lack of reference and common understanding in many countries about what constitutes a healthy diet constrains public health and agriculture planning and programming. National dietary guidelines could fill this gap by providing recommendations on the quality and quantity of ingredients in the diet and their relative proportion, suggesting local foods as the ingredients. World Health Organisation global dietary strategy can be used to guide the development of national dietary guidelines (WHO 2004).

Through the focus on diet, address overweight and obesity simultaneously with undernutrition.

In many of the FTF countries, the prevalence of overweight and obesity in women (and also men) is approaching or is as high as the prevalence of underweight in women or stunting in young children. As a major contributor to chronic, non-communicable diseases such as cardiovascular disease, stroke, diabetes and hypertension (Murray et al. 2012 and Lim et al. 2012, WHO 2004), they have already begun to take a toll on countries' health budgets. Since diet quantity and quality are common factors influencing overweight-obesity as well as undernutrition, it is recommended that healthier diets be promoted with both conditions in mind.

Promote production of safe, diverse, accessible and affordable foods that are also nutritious.

Ultimately, if the economic objectives of the agriculture sector could be aligned more fully with the public health nutrition objectives of the health sector, a set of foods could be produced and promoted

that is nutritious as well as safe, tasty, diverse, accessible and affordable (Nugent et al. 2012). This would be a long-term achievement of nutrition-enhancing agriculture. It would blend the advantages of the economic focus of the agriculture sector with the public health focus of the nutrition aspect of the health sector. A focus on nutritious food baskets that are also safe, tasty, diverse, accessible and affordable could ultimately contribute to reducing undernutrition as well as overweight and obesity.

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