



## Viewpoint

## Nutrition, agriculture and the global food system in low and middle income countries



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## ABSTRACT

The entire food value chain and diet of low and middle income countries (LMICs) are rapidly shifting. Many of the issues addressed by the nutrition community ignore some of the major underlying shifts in purchases of consumer packaged foods and beverages. At the same time, the drivers of the food system at the farm level might be changing. There is a need for the agriculture and nutrition communities to understand these changes and focus on some of their implications for health. This rapid growth of the retail sector will change the diets of the food insecure as much as that of the food secure across rural and urban LMIC's. This short commentary contents that current research, programs and policies are ignoring these rapid dynamic shifts.

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## Introduction

We face major conflicting perceptions of the world of food, agriculture and nutrition. On the one hand there is an enormous need to focus on food insecurity and undernutrition and with it ensure adequate grain, pulse, oils and vegetable supplies and a critical focus on not only the first 1000 days of life but also key intergenerational issues of diets and adequate growth patterns of females. On the other hand overweight and all the related complications are rising rapidly in all low and middle income countries (LMIC's) and affecting all ages of the population and bringing with them a major new generation of health problems. Concurrent shifts are seen in two dimensions of the food system: the rapid growth of modern retailing and consumption of consumer packaged foods and beverages and the shift of the food value chain from traditional traders and retailers to one where supermarkets and food manufacturers directly source food from farmers and traders. From a public health perspective, the latter shift in food value chains and modern manufacture and retail will have profound effects on the diets of all LMIC's and subsequently affect both under- and over-nutrition. Coming to grips with these dynamics represents I feel a major global challenge for international agriculture and nutrition at a time great constraints are being placed on the system and funding.

This short commentary discusses some of the major conflicts in perspective, evaluates them and presents new evidence related to the advances in the modern food system and raises the challenge

to agriculture and nutrition scholars that if we are to create an integrated sense of how food system dynamics in LMIC's are affecting diet and health among urban and rural poor, we must come to grips with the changes underway soon. Ultimately global agriculture is going to have to figure out how to redirect and regulate these emerging retail and processed food sectors or we may find that the poor's diet is transformed and our efforts to enhance food production and reduce overall food insecurity really have missed the major future targets which will improve the diets of the LMIC's poor urban and rural populations.

## The perspectives within the nutrition community

*The first thousand days: should adolescence be included?*

Much of the energy of global agencies and the agriculture and food system community as it links with the human nutrition community has focused on the first 1000 days theme. This is a critical component of food insecurity and malnutrition. At the same time, there are major intergenerational and other issues linked with undernutrition at other stages in the life cycle that are critical but are ignored. This is important to note as the modern food system shifts I describe below affects quite differentially different stages of the life cycle of any person. The mantra of the first 1000 days is a bit naïve as we need to be focused not only on adequate maternal and child nutrition but also adequate growth for young females as we attempt to address intergenerational transmission of low birth weight and poor growth patterns. Getting adequate nutrition not only to women during pregnancy and lactation

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but also during adolescence plus proper infant feeding patterns are critical to prevent much of the malnutrition the globe faces in terms of both acute malnutrition and stunting. But the more complex issues of linking these same issues to an adequate growth profile that will address intergenerational transmission of undernutrition via low birth weight in South Asia and other areas of similar need represent a more complex array of issues. Even more complex is the huge gap in our understanding of the growth patterns that will be linked with the lowest risk of obesity and non-communicable diseases (Popkin et al., 2012).

*Do we just push traditional diets and consumption of real food or is it too late?*

A major theme is the push for retaining traditional diets and food patterns in general. While they might always be healthful, there is a clear sense in the nutrition world that cooking real food rather than an excessive focus on processed or ultra-processed food is important. One question this paper poses is whether the push to preserve traditional cuisines and consume real food is naïve and is ignoring the massive growth of the modern consumer packaged food and beverages sector in LMIC's. This is true for debates around weaning foods as much as it is for debates about processed foods in general. There are environmental relationships also to be considered (Food and Agricultural Organization of the United Nations, 2007); however, the major battle about food vs processed food is not pursued further here (Ludwig and Nestle, 2008; Monteiro and Cannon, 2012; Monteiro et al., 2010, 2011, 2013; Nestle, 2007a,b; Pollan, 2006a,b, 2010; Woolf and Nestle, 2008) though elements of this affect weight gain, obesity and all other major noncommunicable diseases (Mozaffarian et al., 2011; Mozaffarian, 2010; Willett, 2001, 2006). This side battle focuses the food only push vs those who focus on improving the quality of what is already purchased (Rayner et al., 2013; Roodenburg et al., 2011; Sacks et al., 2011; Wartella et al., 2010). There are major critiques of this approach (Brownell and Koplan, 2011; Nestle and Ludwig, 2010).

In a later section we discuss the importance of processed food and question whether the push to retain traditional diets may not be feasible for many subpopulations and countries.

### Perspectives in the agriculture community related to nutrition

While there is increasing awareness that we have a major global increase in obesity and undernutrition coexist throughout the low and middle income world, the bulk of the research and focus remains on food insecurity and hunger in terms of LMIC's. This could be highlighted by the IFPRI Addis Adaba conference '2020 Conference on "Building Resilience for Food and Nutrition Security"'. While most national and international agencies and non-profit groups focused on food and agriculture, provide lip service to the problem of obesity, when this is truly addressed it is mainly in higher income countries and ignores the issue in lower income countries (AGree, 2013). As we see a renewed focus on nutrition, health and agriculture much of it still focuses on traditional farming, particularly in Africa, with minimal effort to understand the rapid shifts and transformations going on globally in LMIC's agriculture. This is evident in the major research institutes in the food policy area such as IFPRI and newer ones such as the Leverhulme Centre for Integrative Research on Agriculture and Health (LCIRAH) and most research from the World Bank and regional banks. In contrast there are insightful new studies that show very rapid shifts in the food value chains underway in select countries (Gómez and Ricketts, 2013; Reardon et al., 2012a,b).

What is not clear in this entire focus on food security is how much this focuses on the very narrow clear needs to the critical maternal and child health and adolescent female populations which link to long-term adequate growth and development. Much more targeted efforts have usually been needed to truly address these issues in most countries though there are others like China and Mexico where economic growth and income transfer programs seem to have led to major reductions in undernutrition and then these have had to be followed by targeting unique subpopulations still suffering from undernutrition. Furthermore the issues of adequate weaning food and an overall appropriate infant feeding pattern do not necessarily mesh with the global focus on overall agricultural production.

It is also not clear that this entire push is taking into consideration adequately the remarkable global transformation of agriculture and food production and processing. The urban and rural poor across the world are selectively purchasing from modern retailers increasing amounts of processed foods (Gómez and Ricketts, 2013). At the same time, there are in the agricultural sector on-going studies by Reardon and others that document the enormous growth of the modern retail sector. In a large number of earlier papers Reardon and many colleagues have documented the very rapid increase in modern retail markets in Latin America, Asia and Africa (Balsevich et al., 2003; Neven et al., 2009; Reardon and Berdegue, 2002; Reardon and Timmer, 2012; Reardon et al., 2003, 2012a,b, 2004).

The most insightful and provocative study is his recent publication with a team of scholars that examined the entire food chain in India, Bangladesh and China and looked at how the food value chain was being transformed within the context of this dynamic modern food system (Reardon et al., 2012a,b). This poses major challenges for our traditional way of studying horizontally components of the food value chain when they suggest it may be driven increasingly by retailers and large consumer packaged food and beverage companies. Furthermore, there are two elements to consider in their work. If indeed the food value chains are being so transformed and if indeed modern retailing is growing this rapidly, the food consumed and available to both the urban and rural poor will be entirely different in the next decades and agriculture policy and food policy in general need to face this new reality in a much more thoughtful manner.

We know already that in the US and many other higher and some LNIC's the retail sector plus agribusinesses already have created full vertical integration of the food value chain from farm to factory or retailer. Aside from the few countries studied, we do not know at this time how universal this transformation is (Reardon et al., 2012a,b).

### The modern retail sector and its reach in selected countries

We have few studies which have examined in low and middle income countries the scope of this sector. We have Reardon and many others who document its growth. We have one small cross-sectional study that suggests that processed food purchases are linked with increased BMI (Asfaw, 2011) and indirectly links this with the rapid shift toward a modern food retail sector in that country. In several recent national studies, we have used large nationally representative (Mexico) or nationwide (China) dietary intake surveys to collect data relevant to this issue. We will continue to collect these data and once longitudinal data are available, we will begin to be able to say something about those who purchase processed food and the impact of this food on various health parameters, understanding the complex endogeneity of all food consumption decisions when it comes to selection of shopping venues.

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