



## Affordability of fruits and vegetables in Ethiopia

Kalle Hirvonen, Abdulazize Wolle, and Bart Minten

### RESEARCH OVERVIEW

As in many other low-income countries, fruit and vegetable (FV) consumption is very low in Ethiopia. Consequently, micronutrient deficiencies, such as for Vitamin A, are widespread, and more than half of young Ethiopian children suffer from anemia. Efforts to increase FV consumption in Ethiopia have focused on improving consumer knowledge of the health benefits of FV and other nutritious foods. While these interventions have been successful in improving knowledge and ultimately improving dietary diversity, diets remain extremely monotonous across the country. Recent international research in this area suggest that high relative prices of FVs could be another important constraint.

To shed more light on this issue, we assess the affordability of FVs in Ethiopia. Using expenditure and price data collected by the Central Statistical Agency of Ethiopia, we find that the average Ethiopian household would have to spend 11 percent of their income to meet the international recommendation of two servings of fruits and three servings of vegetables per person per day. This share is more than 2.5 times higher for households in the poorest quintile, indicating that meeting these guidelines is currently out of reach for the poorest households in Ethiopia. More investments and research attention to the production of fruits and vegetables is urgently needed to improve supplies and, hence, their affordability.

### INTRODUCTION

Poor dietary quality is a significant risk factor for stunting among young children and a leading cause of disease and premature death (Arimond & Ruel 2004). One area where diets fall short is the consumption of fruits and vegetables (FVs), which are the primary source of many micronutrients essential for human growth and health. Evidence shows that low intake of FVs is associated with increased risk of cardiovascular disease, cancer, and obesity (Forouzanfar et al. 2015).

In 2011, the average Ethiopian household annually consumed only 42 kg of fruits and vegetables per adult equivalent (Hassen Worku et al. 2017) – far below the World Health Organization’s recommendation of 146 kg per year (Hall et al. 2009). Consequently, micronutrient deficiencies remain widespread. More than 35 percent of young children suffer from Vitamin A deficiency (Demissie et al. 2010) and 57 percent are anemic (CSA & ICF 2016). Recent research from Ethiopia further highlights the importance of FV consumption among pregnant and lactating women. Using data from health centers in rural Oromia, Zerfu, Pinto, and Baye (2018) find that pregnant women who consumed fruits and dark green leafy vegetables more frequently were less likely to experience adverse pregnancy outcomes. Moreover, Abebe et al. (2018) find very

low concentrations of Vitamin A in breastmilk among lactating mothers in rural Amhara.

So far, efforts to increase dietary quality in Ethiopia have focused on improving nutrition knowledge through behavioral change communication. While these interventions have been successful in improving knowledge and ultimately dietary quality (Kim et al. 2016), child and adult diets remain poor. Even with sufficient nutrition knowledge, poor households may simply be unable to afford fruits, vegetables, and other nutritionally rich foods (Warren & Frongillo 2017).

To better understand this issue, we examine the affordability of FVs in Ethiopia. The starting point for this research is the international recommendation of consuming at least two servings of fruits and three servings of vegetables, amounting to 400 grams, per day (WHO/FAO 2003). We build on the approach of Miller et al. (2016) who assessed the economic feasibility of these guidelines using data from 18 countries low, middle, and high-income countries<sup>1</sup>. The study found that low-income populations would need to spend more than half their daily income to meet the recommended servings of FVs.

### DATA, METHODS, AND RESULTS

The data used come from the Central Statistical Agency of Ethiopia (CSA). We use the monthly retail price data collected by CSA. For income, we rely on CSA’s Household Consumption Expenditure (HCE) survey report based on data collected between July 2015 and June 2016 (CSA 2018). The HCE survey does not record incomes, so we proxy household incomes using CSA’s estimates of household consumption-expenditure. The mean annual per capita expenditure was estimated as 9,627 birr (CSA 2018). Table 1 shows the mean annual per capita expenditure estimates for each consumption quintile.

**Table 1: Annual household per capita expenditure in 2015/16**

	Mean	9,627 birr
Poorest quintile	3,856 birr	
2nd quintile	6,501 birr	
3rd quintile	8,857 birr	
4th quintile	12,056 birr	
Richest quintile	25,086 birr	

Source: CSA (2018).

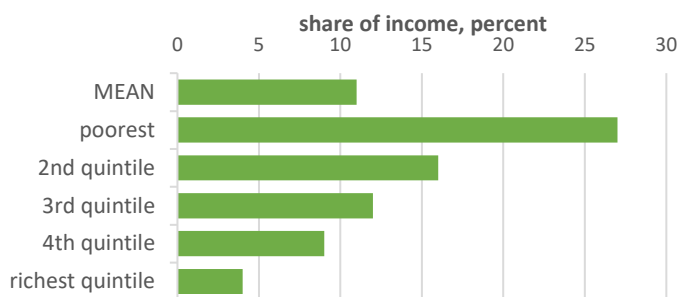
We calculated the mean price in the country for fruit and vegetable using CSA’s monthly retail price data for the same period (2015/16). To address seasonality in FV availability and prices, we selected the cheapest fruit and the cheapest vegetable in each month. For vegetables, pumpkin was the cheapest vegetable in each month between July 2015 and June 2016. For fruits, we see more variability – avocado was the cheapest between July and September, banana in October, and papaya between November and June.

<sup>1</sup> These 18 countries are Bangladesh, Argentina, Brazil, Canada, Chile, China, Colombia, India, Iran, Malaysia, Occupied Palestinian Territory, Pakistan, Poland, South Africa, Sweden, Turkey, United Arab Emirates and Zimbabwe.

We then used the prices of these fruits and vegetables to calculate the total annual cost of consuming the recommended two servings of fruits and three servings of vegetables per person per day. We estimated this annual cost to be 1,038 birr per person in 2015/16. To get the share of total income needed to meet the recommended FV servings, we divided the total annual cost of the recommended FV intake by the annual per capita consumption value for each household.

Figure 1 presents the income (proxied by total consumption) share needed to meet the FV nutritional guideline by households grouped by expenditure quintiles. To meet the recommendation of two servings of fruit and three servings of vegetables a day, the average household should spend 11 percent of their income on FVs. For poorest households, this share rises to 27 percent.

**Figure 1: Share of household income needed to meet recommended intake of fruits and vegetables, by income quintile**



Source: Authors' computations.

We explored the sensitivity of these findings by redoing the analysis using the second cheapest foods in each category. Using the second cheapest foods increased the expenditure share for the average household to 14 percent and for the poorest households to 36 percent.

## DISCUSSION

The average Ethiopian household would have to allocate at least 11 percent of their income to meet the international nutritional guideline of two servings of fruits and three servings of vegetables per person. This share is nearly three times higher for the poorest households (27 percent), indicating that healthy diets are out of reach for the poorest Ethiopians.

These calculations are admittedly crude and overlook considerable diversity in food production across the country. It is therefore likely that FVs are more affordable in some areas of the country than our estimates here. But equally, it is also likely that the situation is worse in some other areas. Nevertheless, we believe that these results highlight that high prices of FVs together with low (even if improving) incomes are likely to be key barriers to increasing FV intake in the diets of Ethiopians.

As documented by Bachewe et al. (2017), the prices of fruits and vegetables have been growing much faster than general

inflation and the prices of staple cereals over the last decade. If these trends continue, even fewer Ethiopians will be able to afford to consume a nutritionally rich and healthy diet. Therefore, production of fruits and vegetables must be significantly increased to meet the needs of the population for high-quality diverse diets. The Ethiopian government has a good track record in increasing cereal production over the last decade. This has been driven by a focus on modernizing the cereal sector and increased adoption of modern technologies (Bachewe et al. 2017). To drive down FV prices, a similar transformation is needed in the fruit and vegetable sector. To guide this process, more research is required to understand the key challenges that the farmers in this sector face.

## REFERENCES

- Abebe, Z., G.D. Haki, F.J. Schweigert, I.M. Henkel, and K. Baye. 2018. "Low breastmilk vitamin A concentration is prevalent in rural Ethiopia." *European Journal of Clinical Nutrition* (forthcoming).
- Arimond, M., and M.T. Ruel. 2004. "Dietary diversity is associated with child nutritional status: evidence from 11 demographic and health surveys." *The Journal of Nutrition* 134 (10): 2579-2585.
- Bachewe, F., K. Hirvonen, B. Minten, and F. Yimer. 2017. *The rising costs of nutritious diets in Ethiopia*. ESSP Research Note 67. Addis Ababa: IFPRI.
- Bachewe, F.N., G. Berhane, B. Minten, and A.S. Taffesse. 2017. "Agricultural Transformation in Africa? Assessing the Evidence in Ethiopia." *World Development* 105: 286-298.
- Central Statistical Agency (CSA). 2018. *The 2015/16 Ethiopian Household Consumption – Expenditure (HCE) Survey: Country Level Statistical Report*. Addis Ababa: Central Statistical Agency (CSA) of the Federal Democratic Republic of Ethiopia.
- Central Statistical Agency (CSA), and ICF. 2016. *Ethiopia Demographic and Health Survey 2016*. Addis Ababa, Ethiopia, and Rockville, Maryland, USA: Central Statistical Agency (CSA) of Ethiopia and ICF.
- Demissie, T., A. Ali, Y. Mekonen, J. Haider, and M. Umeta. 2010. "Magnitude and distribution of vitamin A deficiency in Ethiopia." *Food and Nutrition Bulletin* 31 (2): 234-241.
- Forouzanfar, M.H. et al. 2015. "Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013." *The Lancet* 386 (10010): 2287-2323.
- Hall, J. N., S. Moore, S. B. Harper, and J. W. Lynch. 2009. "Global Variability in Fruit and Vegetable Consumption." *American Journal of Preventive Medicine* 36 (5): 402-409.e405.
- Kim, S.S., R. Rawat, E.M. Mwangi, R. Tesfaye, Y. Abebe, J. Baker, and P. Menon. 2016. "Exposure to large-scale social and behavior change communication interventions is associated with improvements in infant and young child feeding practices in Ethiopia." *PloS one* 11 (10): e0164800.
- Miller, V., S. Yusuf, C.K. Chow, M. Dehghan, D.J. Corsi, K. Lock, and A. Mente. 2016. "Availability, affordability, and consumption of fruits and vegetables in 18 countries across income levels: findings from the Prospective Urban Rural Epidemiology (PURE) study." *The Lancet Global Health* 4 (10): e695-e703.
- Warren, A.M., and E.A. Frongillo. 2017. Mid-level actors and their operating environments for implementing nutrition-sensitive programming in Ethiopia. *Global Food Security* 13: 66-73.
- WHO/FAO. 2003. *Joint WHO/FAO expert consultation on diet, nutrition and the prevention of chronic diseases*. Geneva: Joint FAO/WHO Expert Consultation.
- Worlu, I., M. Dereje, B. Minten, and K. Hirvonen. 2017. "Diet transformation in Africa: the case of Ethiopia." *Agricultural Economics* 48 (supplement): 73-86.
- Zerfu, T.A., E. Pinto, and K. Baye. 2018. "Consumption of dairy, fruits and dark green leafy vegetables is associated with lower risk of adverse pregnancy outcomes (APO): a prospective cohort study in rural Ethiopia." *European Journal of Clinical Nutrition* 8 (52).

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE  
1201 Eye St, NW | Washington, DC 20006-1002 USA  
T: +1.202.862.5600 | F: +1.202.862.5606  
Skype: ifprihomeoffice | ifpri@cgiar.org | www.ifpri.org

IFPRI-ESSP ADDIS ABABA  
P.O. Box 5689, Addis Ababa, Ethiopia  
T: +251.11.617.2000 | F: +251.11.667.6923  
ifpri-essp@cgiar.org | http://essp.ifpri.info

ETHIOPIAN DEVELOPMENT RESEARCH INSTITUTE  
P.O. Box 2479, Addis Ababa, Ethiopia  
T: +251.11.550.6066; +251.11.553.8633 | F: +251.11.550.5588  
info@edri-eth.org | www.edri-eth.org



USAID  
FROM THE AMERICAN PEOPLE



The Ethiopia Strategy Support Program (ESSP) is managed by the International Food Policy Research Institute (IFPRI) and is financially supported by the United States Agency for International Development (USAID), the Department for International Development (DFID) of the government of the United Kingdom, and the European Union. The research presented here was conducted as part of the CGIAR Research Program on Policies, Institutions, and Markets (PIM), which is led by IFPRI. This publication has been prepared as an output of ESSP and has not been independently peer reviewed. Any opinions expressed here belong to the author(s) and do not necessarily reflect those of IFPRI, the Ethiopian Development Research Institute, USAID, DFID, the European Union, PIM, or CGIAR.

Copyright © 2018. Remains with the author(s). All rights reserved.