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SYNOPSIS OF ESSP WORKING PAPER 69

# *Synopsis:* Agricultural production and children's diets: Evidence from rural Ethiopia

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**We study the relationship between pre-school children's food consumption and household agricultural production. Using a large household survey from rural Ethiopia, we find that increasing household production diversity leads to considerable improvements in children's diet diversity. However, we also document how this non-separability of consumption and production does not hold for households that have access to food markets. These findings imply that nutrition-sensitive agricultural interventions that push for market-integration are likely to be more effective in reducing undernutrition than those promoting production diversity.**

## Background

Improving children's diets is intrinsically valuable, not only to improve their wellbeing but because healthy diets lead to well-nourished and healthy children, who in turn become healthy and economically productive adults. Moreover, there is growing evidence that the quality of children's diets – specifically the consumption of nutrient rich legumes and animal source foods as well as vitamin-rich fruits and vegetables – is as important as the quantity of calories consumed.

In developed countries, two sets of interventions have been adopted to improve children's diet in countries –income and in-kind transfers, and nutrition education. These approaches assume that households have good access to food markets so that production and consumption decisions do not depend on each other. But in Ethiopia, and many other developing countries, such *separability* of consumption and production may not hold. If markets are not integrated, own food production will affect what foods are available for consumption.

## Data

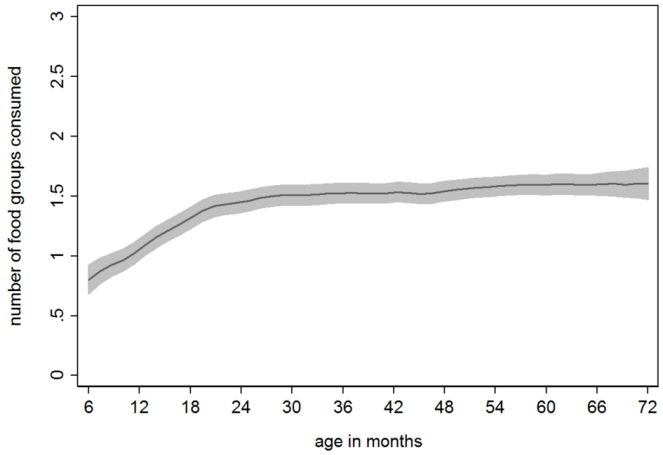
Across Ethiopia varying climatic conditions enable an enormous variety of foods to be grown. However, the rugged terrain and poor infrastructure, typical of many rural areas, mean that access to non-staple foods, such as dairy products, varies widely. This research explores the relationship between the diversity of household agricultural production and the diversity of pre-school children's food consumption in these rural parts of Ethiopia.

In our study we analyze cross-sectional survey data collected between June and July 2013 from five regions in Ethiopia – Amhara, Oromia, SNNPR, Somali, and Tigray. The survey was designed to serve as a pre-intervention (baseline) study to measure the impact of the *Feed the Future* investments of the US government in Ethiopia. The survey sample was very large (7,011 households) and widespread (252 villages in 84 woredas) with 4,214 children aged 6-71 months in the sample. The survey included data on children's food consumption based on one-day recall and rich information about households' agricultural production over the past 12 months.

## Diet, production and market access

For the average survey household, the distance to the nearest food market is more than 10 kilometers.

**Figure 1—Diet diversity for young children by age**




Notes: The shaded area represents the 95%-confidence interval
Source: Feed the Future Survey 2013

Figure 1 shows that at ages 6 to 12 months, children consume from only one food group, rising to 1.5 groups at age 24 months, and staying constant after that.

**Table 1—Food group consumption by region, percent of young children**

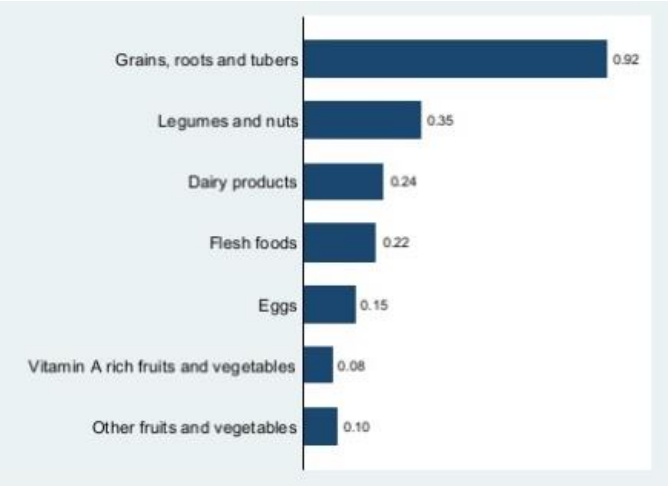
| Region | Grains, roots & tubers | Legumes & nuts | Dairy products | Fish, meat, & poultry | Eggs | Vitamin A rich fruits & vegetables | Other fruits & vegetables |
|---|---|---|---|---|---|---|---|
| **All children** | **56** | **32** | **22** | **3** | **4** | **26** | **3** |
| Tigray | 45 | 53 | 15 | 6 | 6 | 6 | 5 |
| Amhara | 29 | 42 | 6 | 1 | 2 | 10 | 0 |
| Oromiya | 62 | 42 | 27 | 2 | 7 | 27 | 4 |
| SNNP | 71 | 9 | 24 | 2 | 2 | 55 | 3 |
| Somali | 67 | 2 | 50 | 8 | 4 | 6 | 2 |

Source: Feed the Future Survey 2013

We find little difference in diet diversity between age and sex, but there are marked regional differences (Table-1), especially in the percentage of children consuming legumes (e.g., 53 percent in Tigray compared to 2 percent in Somali), dairy (e.g., 50 percent in Somali compared to 6 percent in Amhara), fruit and vegetables (e.g., 55 percent in SNNPR compared to 6 percent in Tigray and Somali).

Nearly all households produce staple foods, while more than one-third of households produce legumes and nuts. 23 percent of the households produce dairy products and 22 percent produce meat. The production of other food groups is somewhat less common ranging, between 9 and 15 percent, as shown in Figure 2.

**Figure 2—Production of food in specific food groups, proportion of households producing**




Source: Feed the Future Survey 2013

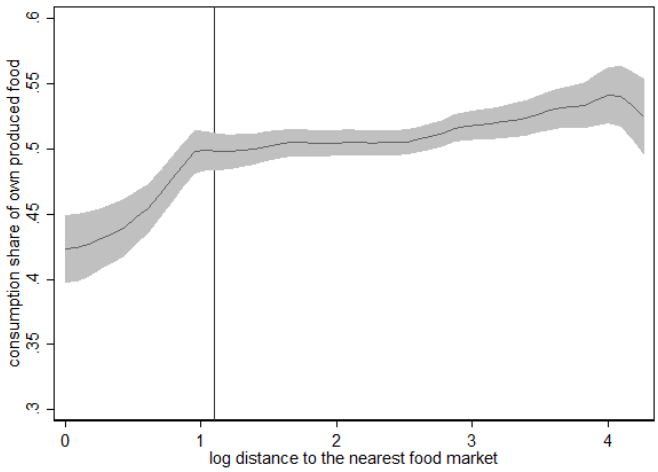
As a whole, households on average produce food from 1.98 groups, but there is considerable regional variation. About 90 percent of all households produce 3 or fewer food groups.

From the survey, the sources of food consumption reveals that for an average household in our sample, 50 percent of total food consumption comes from own production, 44 percent is purchased, and the remaining 6 percent come from gifts, food aid, or other sources. These consumption sources differ by access to markets as illustrated in Figure 3.

## Results of modeling child diet diversity score on household production diversity

Controlling for a wide range of household level characteristics, including the value of crops harvested, value of livestock production, household wealth and demographic characteristics, food prices, market access, regional fixed effects, and child sex and age, our econometric analysis shows that a one food group increase in household's production diversity leads to a 0.57 – 0.73 food group improvement in child's diet diversity score.

**Figure 3—Share of own-produced food in total food consumption and access to food markets**




Notes: The vertical line refers to 3 km distance to the food market. The shaded area represents the 95%-confidence interval.
Source: Feed the Future Survey 2013

Further exploration reveals that this relationship does not hold for households that have relatively good access to markets where they can buy and sell food products. This suggests that the non-separability between consumption and production decisions breaks down in market villages.

## Conclusions and implications

In Ethiopia, it is not just a simple matter of encouraging households to diversify their food production to improve the diets of young children in the household – limiting agro-climatic conditions and poor market access are major constraints. Rather, the results suggest that agricultural interventions that encourage increased productivity in food production by farming households (so as to increase household incomes), together with deepening market integration in remote areas to increase availability of food products that are not easily available, and behavior change communication to support learning about why it is important to feed children a diverse diet are more likely to result in improved diets and nutritional status of young children.

But further work, though more rigorous evaluation of interventions and the influence of accessible markets on nutrition, is needed to confirm the robustness of these ideas.

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