AFFORDABILITY OF NUTRITIOUS COMPLEMENTARY FOODS IN **UGANDA**

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WHY DOES AFFORDABILITY OF COMPLEMENTARY FOODS MATTER IN UGANDA?

Uganda is a low-income country with a population of 44 million, three-quarters of whom live in rural areas (1,2). Economic growth has ranged from 3–5% in the past five years, following a period of more rapid growth before 2012 (3,4). However, 21% of the population live under the national poverty line (2). The agriculture sector employs 72% of the workforce but only accounts for about 25% of GDP (5,6). Uganda is estimated to produce enough food to feed its population (5), yet there remains a substantial gap between the potential of the agriculture sector and its current performance (7). Child undernutrition is widespread, with 29% of children under five stunted and 70% of children 6–23 months old not consuming an adequately diverse diet (8). Although there have been some recent improvements in the consumption of vitamin-A rich fruits and vegetables, overall consumption of vitamin-A rich foods, nuts and legumes, and animal-source foods is low (8).

Many children in the complementary feeding period (ages 6–23 months) in Uganda do not consume enough iron, calcium, or animal-source protein, which hinders growth and development (9). Inadequate physical and economic access is one of the primary barriers to consumption of foods rich in these important nutrients. However, the extent to which affordability is a barrier for specific nutrients, which foods are the most affordable sources of these nutrients, and which households are able to afford them in adequate quantities for young children is unclear. This brief summarizes the affordability of nutritious complementary foods that could fill important nutrient gaps and discusses implications for programs and policy.

KEY MESSAGES

- Several foods commonly available in Uganda are rich in nutrients lacking in young children's diets. However, resource-constrained households (the lowest spending 15–20%) struggle to afford enough of these nutritious foods to meet even 50% of their 6–23-month-old children's dietary requirements for energy, protein (from animal sources), iron, and calcium.
- The most affordable foods to fill nutrient gaps are **dried kidney beans** (energy, iron), **amaranth greens** (calcium, iron), **small dried fish** (protein, calcium), **fresh milk** (protein, calcium), **fresh fish** (protein), and **groundnuts** (energy).
- In the short term, providing **transfers** (cash or in-kind) or, for some nutrients, commercial and point-of-use **fortification**, as well as **supplementation** may be necessary to address child undernutrition among **resource-constrained households**. In the medium-to-long-term, efforts to promote **home production** of nutritious foods, **lower prices** of these foods, and **raise incomes** are crucial.

METHODS

Using household expenditure data from the 2013–14 Living Standards Measurement Survey (LSMS) (10), we divided 728 households with children aged 6–23 months into deciles based on their current food expenditure, adjusted for household size and composition. This metric corresponds well with food insecurity indicators, as food insecurity is more common in lower-expenditure deciles and less common in higher deciles.[1] The analysis assumes lower-spending households are more economically constrained and thus less flexible in how they allocate resources devoted to food. Households in the bottom decile (decile 1) are assumed to be able to reallocate only 1% of total food expenditure towards nutritious foods for young children, households in the second-lowest decile (decile 2) 2%, and so on, with households in the highest decile (decile 10) assumed to be able to reallocate 10% of current spending. As nutrients are generally obtained from a combination of foods, we analyzed whether households could afford to meet half of the daily requirements for energy, protein, iron, and calcium for their 6–23-month-old children through specific foods. Specific foods were chosen because of their nutrient content and availability in Uganda. For protein, only animal-source foods were used since plant sources of protein are generally not complete in essential amino acids critical for child growth and development (10). Maize porridge with sugar was included in the analysis of energy to compare its affordability with more nutritious foods. The analysis calculated the cost of realistic portion sizes required to meet the 50% threshold using price data obtained from the LSMS (10). If a household's re-allocable food expenditure exceeded the total weekly cost of a food portion for all 6–23-month-old children in that household, then that food portion was considered affordable.

HOUSEHOLD EXPENDITURE AND CONSUMPTION PATTERNS

On average, households spent 59% of their total expenditures on food. Purchases made up 54% of food expenditures (i.e., total value of food from all sources) while 46% came from own production and other sources. Average food expenditure in the lowest decile was 60% less than in the average household and 80% lower than in the highest decile. Households with children aged 6–23 months allocated most of their food expenditure to staples, including cereals (mostly maize flour, also rice); roots and tubers (mostly cassava and sweet potatoes); and fruits (mostly plantains/matooke) (Figure 1), all of which were consumed by at least 80% of households in the past week. Expenditure on *meat, fish, and eggs* was also high, with 74% of households consuming foods in this category (fish and beef were most common) in the past week. The vast majority of households also consumed legumes (mostly beans) and vegetables (onions, tomatoes, and amaranth greens) regularly but allocated fewer resources to these foods.

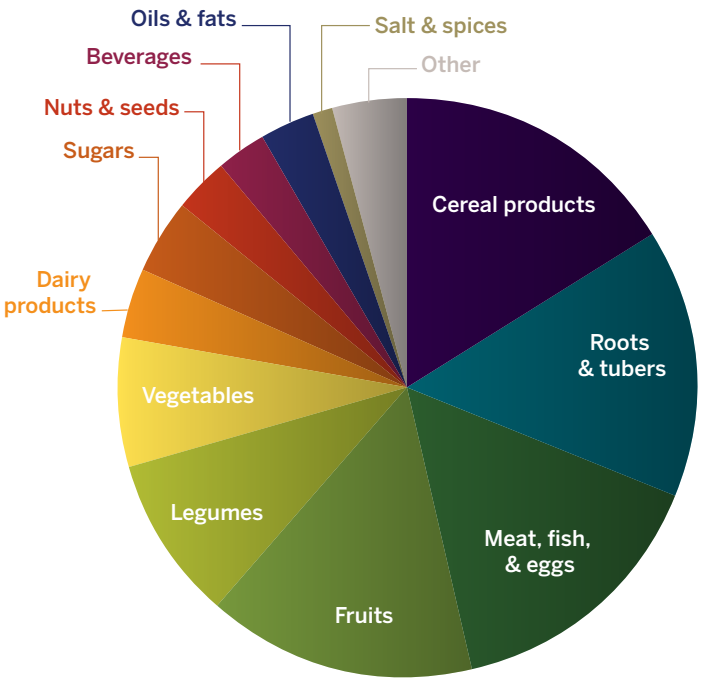

Figure 1. Breakdown of total food expenditures

1 Correlations between current food expenditure and food insecurity indicators were tested using data from Tanzania and South Africa.

AFFORDABILITY BY NUTRIENT

Energy

Almost no households in the bottom decile and few in the second-lowest decile are able to meet 50% of their young children's energy needs from the examined nutritious foods at current prices (Table 1). Dried kidney beans and groundnuts are the most affordable nutritious food to meet energy needs; many households in the third and fourth deciles and all in the top five deciles are able to afford enough beans and groundnuts to meet 50% of young children's energy needs. Maize production is slightly more affordable than dried beans and groundnuts; however, it lacks key nutrients unless fortified or prepared with more nutritious foods like milk or eggs, which reduces affordability.

Animal-source protein

Most households in the bottom decile and some in the second-lowest are unable to meet 50% of young children's protein requirements from animal sources. Dried fish and fresh milk[2] are the most affordable animal sources of protein and are affordable to most households above the bottom two deciles. Price reductions could help more households access these foods, but around 5–10% of households would still face difficulties even if prices were halved. Prices for fish vary widely across the country, but compared to other countries, the price of milk relative to other foods is low in Uganda, leaving less scope for further price reductions.

Iron

Few households in the bottom decile and half in the second-lowest decile are able to afford 50% of young children's iron requirements through food. Most households in deciles 3–10 can afford to meet 50% of young children's iron needs with dried kidney beans, which are the most affordable source of iron. However, data on the specific beans grown, purchased, and consumed by Ugandan households was not available in the survey, and many other types of beans contain less iron. Iron from beans and amaranth greens, the next most affordable source of iron, is also less easily absorbed by the body than that from animal-source foods. Most households in the top 3–5 deciles can afford the necessary quantities of beef liver and chicken liver to meet iron needs. Commercial and point-of-use fortification, biofortification, supplementation,[3] and increased home production are also options for supplying additional iron to diets.

Calcium

Meeting calcium needs is challenging for most households in the lowest decile. Amaranth greens are the most affordable option for meeting calcium needs and are affordable for some households in deciles 1–3 and almost all in deciles 4–10. About 44% of households currently consume amaranth greens, the vast majority from their own production. While small dried fish and fresh milk are almost as affordable as amaranth greens, they are rarely consumed from own production, meaning that home production of amaranth might be a more feasible option for poorer households that cannot afford to purchase foods from the market. Price reductions for calcium-rich foods could help some households in the lowest three deciles affordably meet calcium needs, however for 5–10% of households these foods would remain unaffordable.

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2 It is recommended that children under 12 months of age do not consume milks (flavored or plain) (12).

3 Some potential risks have been associated with supplemental iron in children with adequate iron status. Products with low iron doses may be more appropriate in this context.

Table 1. Proportion of households per decile able to afford foods meeting 50% of daily requirements of children 6–23 months

Nutrient	Item	Food expenditure decile									
		1	2	3	4	5	6	7	8	9	10
Energy	Maize porridge[4]										
	Dried beans										
	Groundnuts										
	Fresh milk										
	Dried fish										
	Eggs										
	Fresh fish										
	Beef										
	Chicken										
Protein	Dried fish										
	Fresh milk										
	Fresh fish										
	Beef										
	Eggs										
	Chicken										
Iron	Dried beans										
	Amaranth greens										
	Beef liver										
	Chicken liver										
	Beef										
	Dried fish										
Calcium	Amaranth greens										
	Small dried fish										
	Fresh milk										

Key[5] ■ Unaffordable ■ Moderately affordable ■ Affordable

4 Recipe yields 100 g of porridge from 93.6 g water, 16.5 g maize flour, and 4.7 g sugar.

5 Unaffordable (affordable to 0–50% of households); Moderately affordable (affordable to 51–90% of households); and Affordable (affordable to 91–100% of households).

CONCLUSIONS

This analysis has shown that complementary feeding gaps in animal-source protein, iron, and calcium cannot be affordably filled by all households, particularly the lowest-spending 15–20%. These households rely on the cheapest available staple foods and struggle to meet energy and nutrient requirements. Above the bottom two deciles, there is at least one food that can be used to affordably meet all analyzed nutrient needs for 74–100% of households, meaning that many households could meet nutrient needs without further interventions to improve affordability. Although price reductions could help some households in lower deciles afford more nutritious foods, households in the bottom deciles would still be unable to afford the foods they need to feed their children a diet meeting all nutrient requirements. Further analysis is thus needed of the potential for increased home production of nutritious foods, both for foods that are frequently home-produced (e.g., beans, amaranth greens) and foods that are not (e.g., groundnuts, fish), and other options, such as commercial and point-of-use fortification as well as supplementation. Transfers (cash or in-kind) could also be useful in the short term for food-insecure households. **Dried kidney beans** (energy, iron), **amaranth greens** (calcium, iron), **small dried fish** (protein, calcium), **fresh milk** (protein, calcium), **fresh fish** (protein), and **groundnuts** (energy) are the most affordable nutritious foods to fill gaps in young children's diets. They should be the focus of initiatives aimed at increasing the production, desirability, and consumption of nutritious complementary foods.

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