

AFFORDABILITY OF NUTRITIOUS COMPLEMENTARY FOODS IN **MOZAMBIQUE**

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WHY DOES AFFORDABILITY OF COMPLEMENTARY FOODS MATTER IN MOZAMBIQUE?

Mozambique is a low-income country in Sub-Saharan Africa with a population of 30 million, almost half of whom live under the poverty line (1,2). While economic growth ranged from 6–7% from 2007 to 2015, growth dropped in 2016 following an economic crisis, during which inflation grew to 16% (3,4). The agricultural sector employs 73% of the workforce but only accounts for 21% of GDP (5,6). Child undernutrition is widespread, with 43% of children under five stunted and 89% of children aged 6–23 months not consuming an adequately diverse diet (7,8). Dietary diversity is low in part because rural households rely heavily on foods from their own production but tend to produce only about five types of crops (8,9).

Many children in the complementary feeding period (ages 6–23 months) in Mozambique do not consume enough iron, vitamin A, and animal-source protein, which hinders growth and development (10). 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 Mozambique are rich in nutrients lacking in young children's diets. However, resource-constrained households (the lowest spending 20–30%) struggle to afford enough of these nutritious foods to meet even 50% of their under-two children's dietary requirements for energy and iron.
- About 10–15% of households face affordability barriers to meeting 50% of young children's protein needs through animal-source foods.
- While a dietary gap in vitamin A persists, it is not primarily due to affordability: nearly all households can afford enough foods rich in vitamin A to meet 100% of needs.
- The most affordable nutritious foods to fill nutrient gaps are **cowpeas** (energy), **groundnuts** (energy), **fish** (protein), **lima beans** (iron), **sweet potato leaves** (iron, vitamin A), **orange-fleshed sweet potato** (vitamin A), **chicken liver** (iron, vitamin A), and **beef liver** (vitamin A).
- 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 2014/15 Inquérito ao Orçamento Familiar (IOF, Household Budget Survey) (11), we divided 9,441 households with children under two¹ 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.² 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 vitamin A for their children under two through specific foods. Specific foods were chosen because of their nutrient content and availability in Mozambique. 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 (12). 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 IOF (11). If a household's re-allocable food expenditure exceeded the total weekly cost of a food portion for all children under two in that household, then that food portion was considered affordable.

HOUSEHOLD EXPENDITURE AND CONSUMPTION PATTERNS

On average, households spent 62% of their total expenditures on food. A substantial portion of food expenditures (i.e., total value of food from all sources) came from own production, as well as in-kind sources, with purchases making up less than half of food expenditures. Average food expenditure in the lowest decile was about four times less than for the average household and ten times less than in the highest decile. Households with children under two years old allocated the most resources to cereal products; meat, fish, and eggs; vegetables; and roots and tubers (cassava and sweet

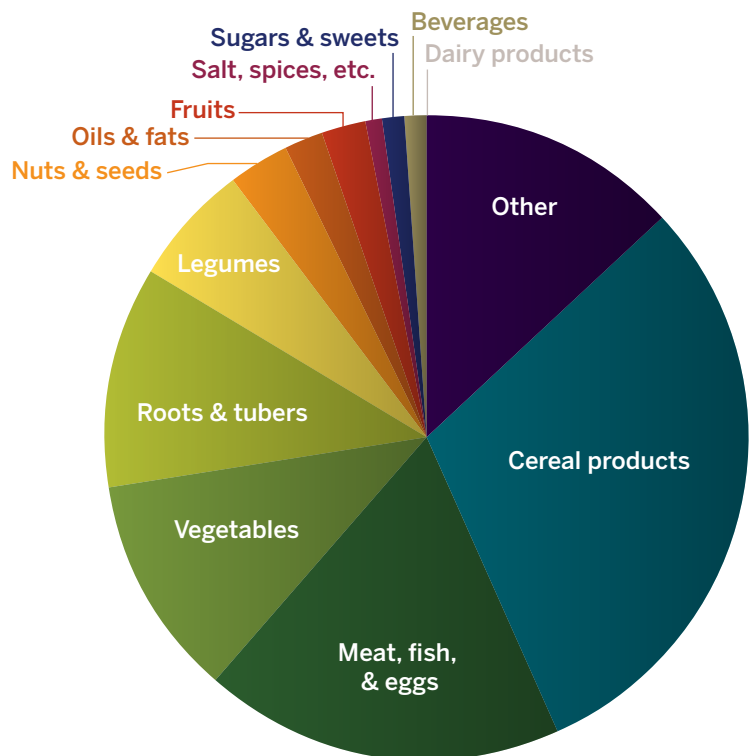


Figure 1. Breakdown of total food expenditures

1 Households with children under two were used because data on children's age in months was not available, and thus households with children in the complementary feeding period (6–23 months) could not be identified.

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

potato) (Figure 1). Cereal products and vegetables were frequently consumed from both purchases and own production, while *meat, fish, and eggs* (of which fish was by the far the most common) were more often purchased. Maize flour was the most heavily consumed cereal and was consumed by 53% of households in the past week. Commonly consumed vegetables included tomatoes, cabbage, onions, and dark leafy greens such as pumpkin leaves and cassava leaves.

AFFORDABILITY BY NUTRIENT

Energy

No households in the lowest decile and very 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). Cowpeas and groundnuts are affordable sources of energy for some households in the second decile and higher and nearly all households in deciles 6–10. Price reductions could make cowpeas and groundnuts affordable to many more households in the second decile and higher, however, they would remain unaffordable for all households in the lowest decile and many in the second. About 25% and 20% of households reported consuming cowpeas and groundnuts, respectively, from own production. Encouraging household production could make these items more available, especially for those households that are not helped by price reductions. Maize porridge is slightly more affordable than cowpeas, 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 are unable to meet 50% of young children's protein requirements from animal sources. Most households in the second decile and almost all in the third decile and above can afford to purchase enough dried fish or fresh/frozen fish to meet 50% of young children's protein needs. Most households in the sixth decile and higher can choose between several animal-source foods to meet their protein needs.

Iron

No households in the bottom decile and few in the bottom four can afford to meet 50% of young children's iron requirements through food. Lima beans, sweet potato leaves, chicken liver, and dried fish are the most affordable iron-rich foods, however, these are only affordable to most households in the fifth decile and above. Consumption of lima beans and dried fish is already relatively common, however, only 14% of households consumed sweet potato leaves and only 3% consumed chicken liver in the past week. Encouraging production of lima beans and sweet potato leaves could help fill the iron gap for young children. Commercial and point-of-use fortification, biofortification, supplementation,³ and increased home production are also options for supplying additional iron to diets.

Vitamin A

Vitamin A only presents an affordability barrier to a very small fraction of households in the lowest decile. Almost all households can afford enough beef liver or orange-fleshed sweet potato to satisfy 50% of vitamin A needs, while chicken liver and sweet potato leaves are also affordable to a large majority of the population.

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 under two

Nutrient	Item	Food expenditure decile									
		1	2	3	4	5	6	7	8	9	10
Energy	Maize porridge ⁴	Unaffordable	Unaffordable	Unaffordable	Moderately affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable
	Cowpeas	Unaffordable	Unaffordable	Unaffordable	Moderately affordable	Moderately affordable	Affordable	Affordable	Affordable	Affordable	Affordable
	Groundnuts	Unaffordable	Unaffordable	Unaffordable	Moderately affordable	Moderately affordable	Affordable	Affordable	Affordable	Affordable	Affordable
	Dried fish	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Moderately affordable
	Eggs	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Moderately affordable
	Fresh milk	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable
	Beef	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable
	Chicken	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable
Protein	Dried fish	Unaffordable	Moderately affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable
	Fresh & frozen fish	Unaffordable	Unaffordable	Moderately affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable
	Beef	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Moderately affordable	Affordable	Affordable	Affordable	Affordable	Affordable
	Chicken	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Moderately affordable	Moderately affordable	Affordable	Affordable	Affordable	Affordable
	Eggs	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Moderately affordable	Moderately affordable	Moderately affordable	Affordable	Affordable	Affordable
	Fresh milk	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Moderately affordable	Moderately affordable	Affordable
Iron	Sweet potato leaves	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Moderately affordable	Moderately affordable	Affordable	Affordable	Affordable	Affordable
	Chicken liver	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Moderately affordable	Moderately affordable	Affordable	Affordable	Affordable	Affordable
	Lima beans	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Moderately affordable	Moderately affordable	Moderately affordable	Affordable	Affordable	Affordable
	Dried fish	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Moderately affordable	Moderately affordable	Moderately affordable	Affordable	Affordable	Affordable
	Beef liver	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Moderately affordable	Moderately affordable	Affordable	Affordable	Affordable
	Beef	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Moderately affordable
Vitamin A	Beef liver	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable
	Sweet potato	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable
	Chicken liver	Moderately affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable
	Sweet potato leaves	Unaffordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable
	Mango	Unaffordable	Moderately affordable	Moderately affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable	Affordable
	Eggs	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Moderately affordable	Moderately affordable	Affordable	Affordable	Affordable	Affordable
	Fresh milk	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Moderately affordable	Moderately affordable	Affordable	Affordable
	Mackerel	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Unaffordable	Moderately affordable	Affordable

Key⁵ ■ 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 iron cannot be affordably filled by all households, particularly the lowest-spending 20–30%, and that animal-source protein is also unaffordable to 10–15% of households. These households rely on the cheapest available staple foods and struggle to meet energy and nutrient requirements. While a dietary gap in vitamin A persists, it is not primarily due to affordability: almost all households can afford enough foods rich in vitamin A to meet 100% of needs. Although price reductions could help some households 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. Most resource-constrained households (the lowest spending 10–15%) will need interventions to meet their animal-source protein and iron needs. Further analysis is thus needed of the potential for increased home production of nutritious foods 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. **Cowpeas** (energy), **groundnuts** (energy), **fish** (protein), **lima beans** (iron), **sweet potato leaves** (iron, vitamin A), **orange-fleshed sweet potato** (vitamin A), **chicken liver** (iron, vitamin A), and **beef liver** (vitamin A) 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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