

The contribution of fruit and vegetable consumption to individual dietary intake in Tanzania

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Introduction

- Nutritional Importance of Fruits and Vegetables(F&V)
 - **Source of essential vitamins, minerals, fiber, and antioxidants** (Park et al., 2011; Payne et al., 2012)
 - Vitamins: Vitamin C,A ,and folate.
 - Minerals: Potassium, magnesium.
 - **Health benefits:**
 - Lower risk of heart disease , stroke , certain cancers and mental health.(Adebawo et al., 2006; Park et al., 2011; Payne et al., 2012; Williamson, 1996).
 - Improve immune function and skin health.
 - Better weight management and digestion.

Introduction

Rationale

- Despite of health benefits of F&V, their consumption in several African countries including Tanzania is below the recommended daily intake of 400g/person (Grimm et al., 2010; PROFAV, 2011).
- Tanzania as a country continues to undergo demographic, economic, and lifestyle changes, there is a need to assess the current consumption patterns of F&V to understand their contribution to individuals' dietary intake.
- However, there is lack of studies that have included the individual food level data necessary to assess the level of consumption of fruits and vegetables.

Introduction

Rationale

- Therefore, this study aimed to shed light on the contribution of fruits and vegetables consumption to the overall nutritional profile of individuals in Tanzania using the National Panel Survey (NPS) data set that included household level food consumption data.
- The study also examined the relative contribution of different foods groups to total intake.
- Findings from this analysis could provide the starting point for further consumer-focused, food system or value chain analyses examining constraints in the supply and demand of specific foods .

Objectives

- To explored the dietary patterns, including food and nutrient intake, consumption patterns of F&V, and the adequacy of micronutrient intake.
- To examine the relative contribution of different foods to total intake (by nutrient), identify priority foods or missing foods

Data description

- The Tanzania National Panel Survey(TNPS) is an integrated survey covering a wide range of socioeconomic factors.
- The NPS is designed to collect data on the living standards of the population, including consumption expenditure, farm and non-farm activities, and other socio-economic characteristics.
- To date, the NPS has completed five survey rounds, or waves.
- The fifth wave was conducted between December 2020 and January 2022 (NPS 2020/21).
- NPS 5 provided the data for this analysis.

Sample Design

- The NPS is based on a stratified, multi-stage cluster sample design.
- The sample design for the 2020/21 NPS consisted of a combination of the previous NPS 2014/15 sample and an Booster Sample .
- The 2020/2021 NPS involved a total of 4,709 households(**NBS, 2022**)

Data Analysis

- The food consumption module of the NPS questionnaire included data on which foods the household had consumed in the seven days prior to the survey.
- The quantities(kg) of different food items consumed over the seven day period were converted into the nutrient content of energy, protein, iron, vitamin A, and zinc, using the Tanzania food composition tables(**Lukmanji et al., 2008**)
- Daily nutrient values were estimated using adult equivalents (AEs) (**Fiedler et al., 2012**).
- Daily nutrient intakes by AE were divided by appropriate nutrient reference values, including the Estimated Average Requirement (EAR) (**Allen et al., 2019**), to provide nutrient adequacy ratios (ARs).

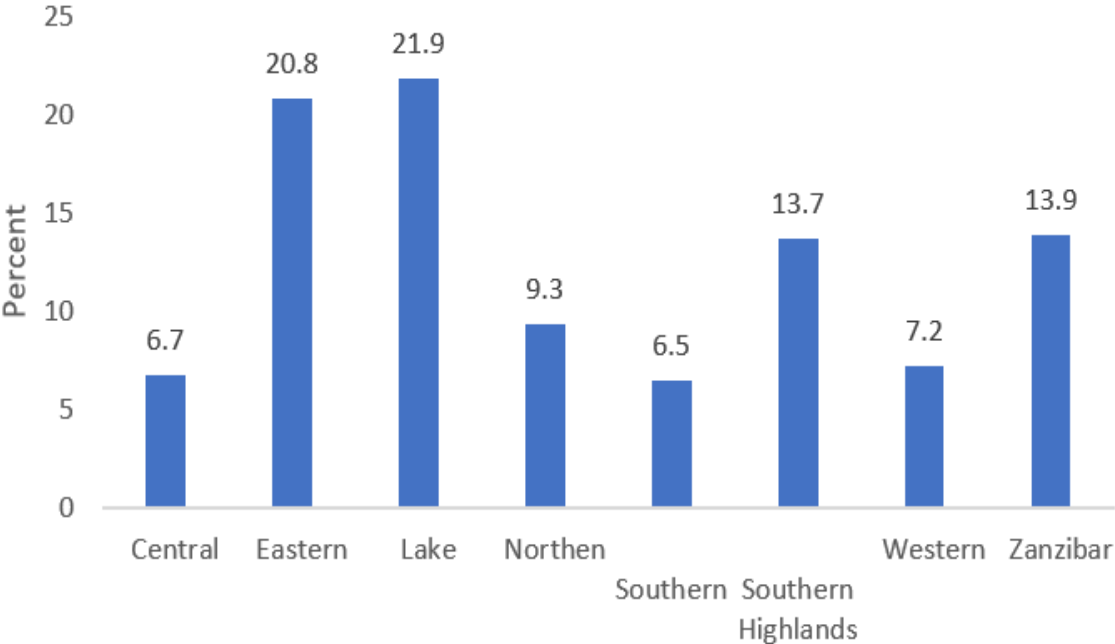
Data Analysis

- Sub-group analyses were undertaken by :
 - Socioeconomic status (based on quintiles of total household wealth index)
 - Geographical location(Zones).
- Consumption of individual foods/ingredients and dietary patterns was examined using two levels of food groups:
 - The broader level includes the 10 food groups from the minimum dietary diversity score for women (MDDW).
 - More detailed classification that included F&V subgroups.

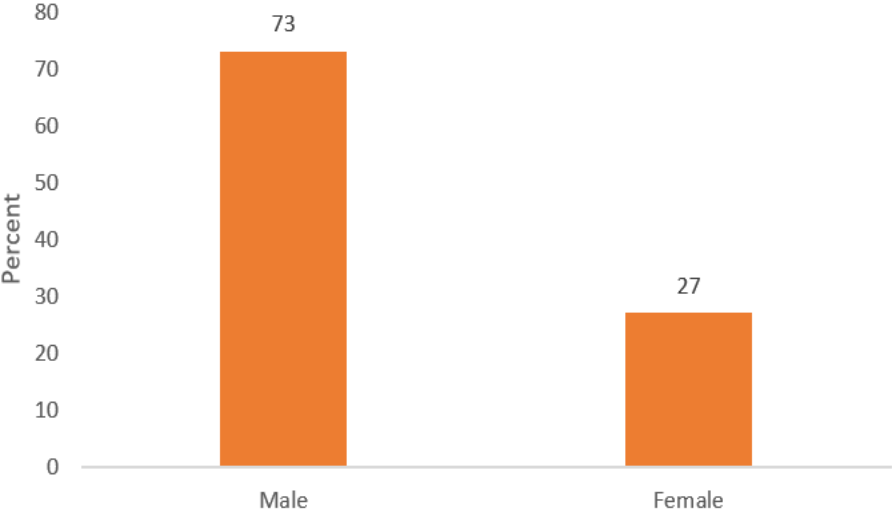
Results

Households characteristics

Households by zone



Sex of the household head



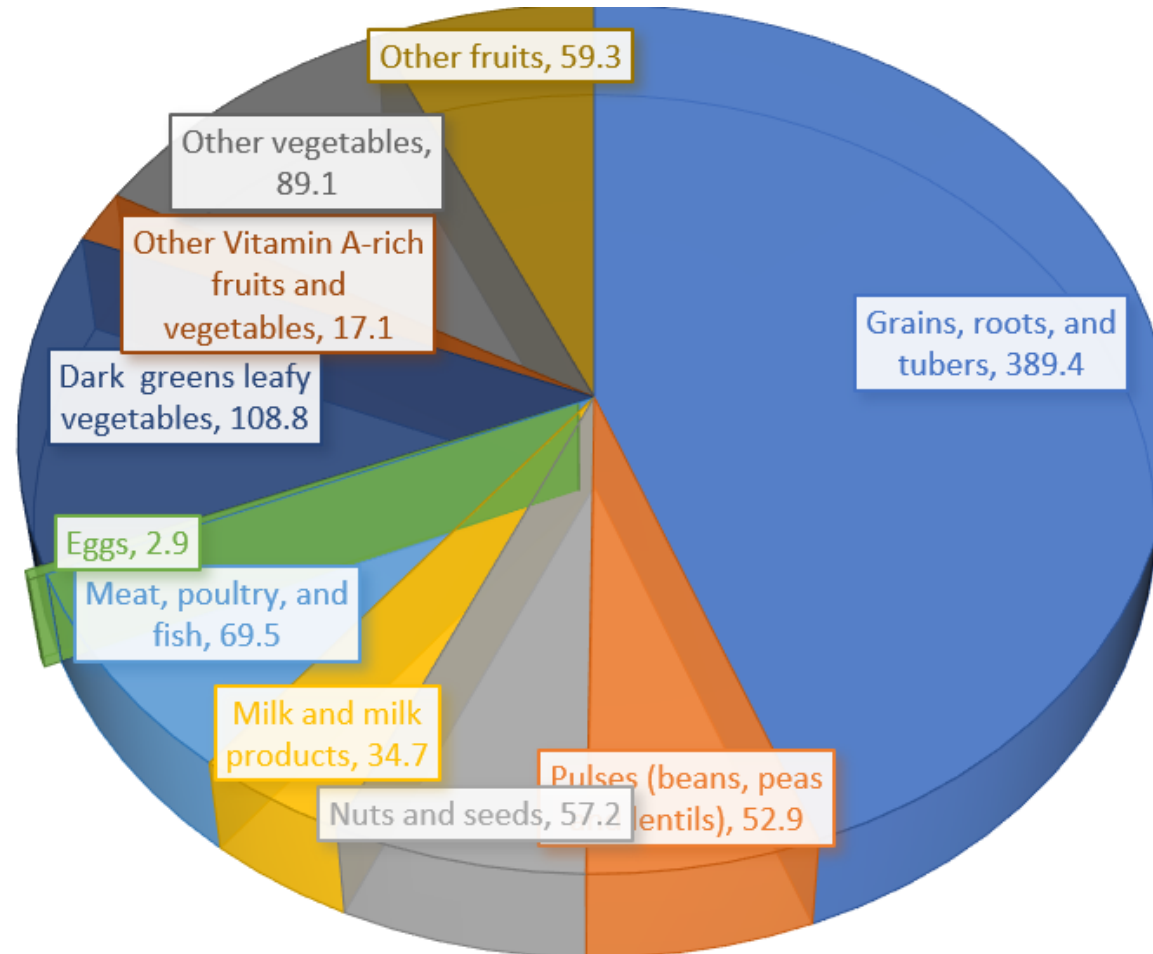
Results

Food Consumption Patterns

- Average daily food consumption per person per day was 0.9 kgs.
- Consumption of F&V was 0.5 kgs on average.

Results

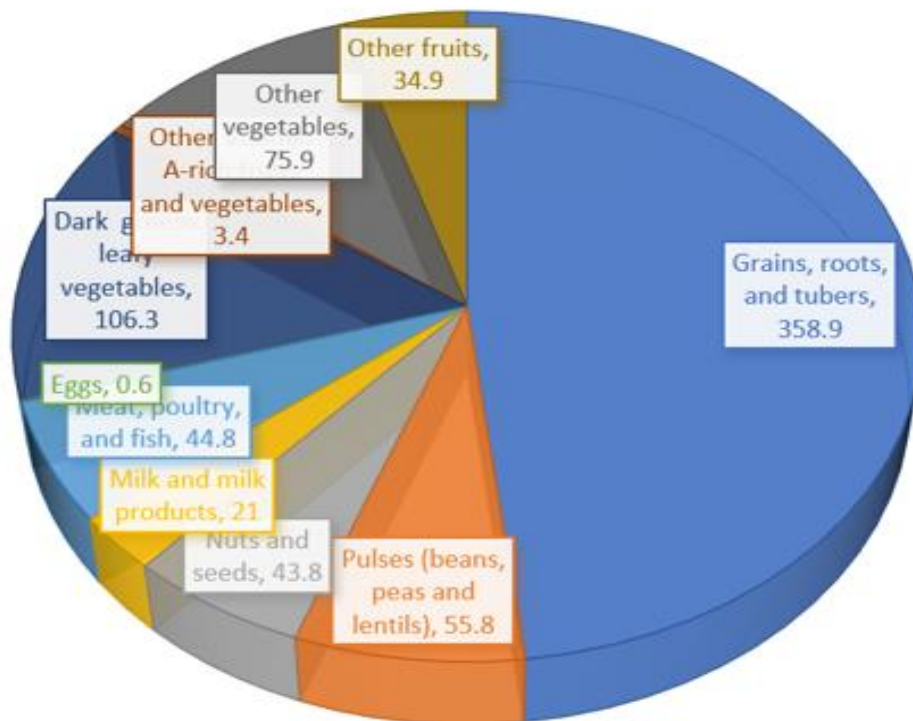
Estimated mean daily per capita food consumption in grams by MDDW food group



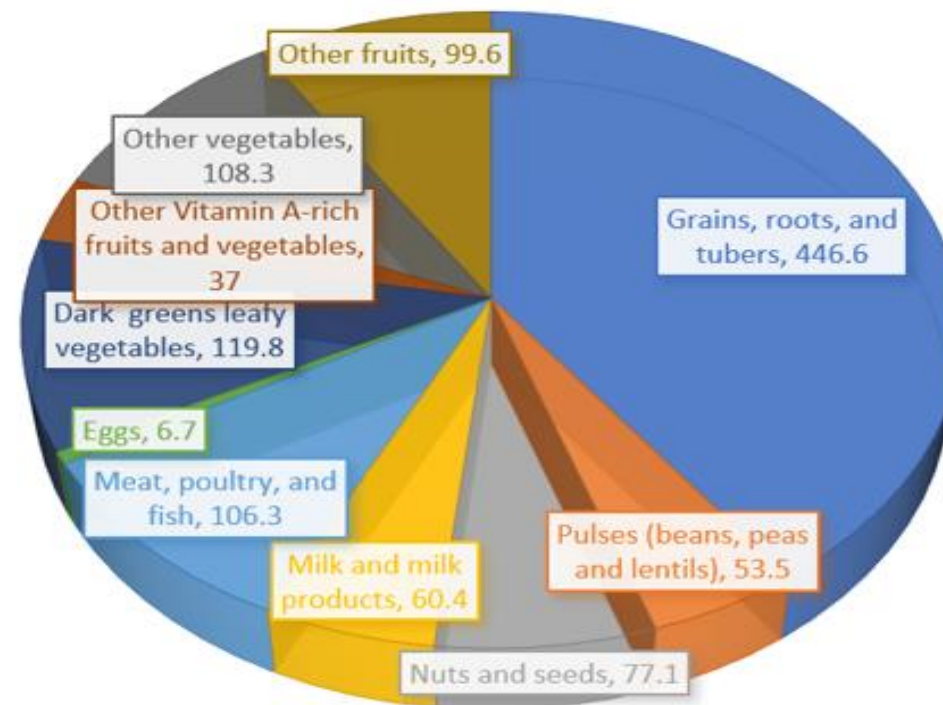
Results

Estimated mean daily per capita food consumption in grams by MDDW food group for households in the lowest and highest socioeconomic quintiles

Lowest quintile



Highest quintile



Results

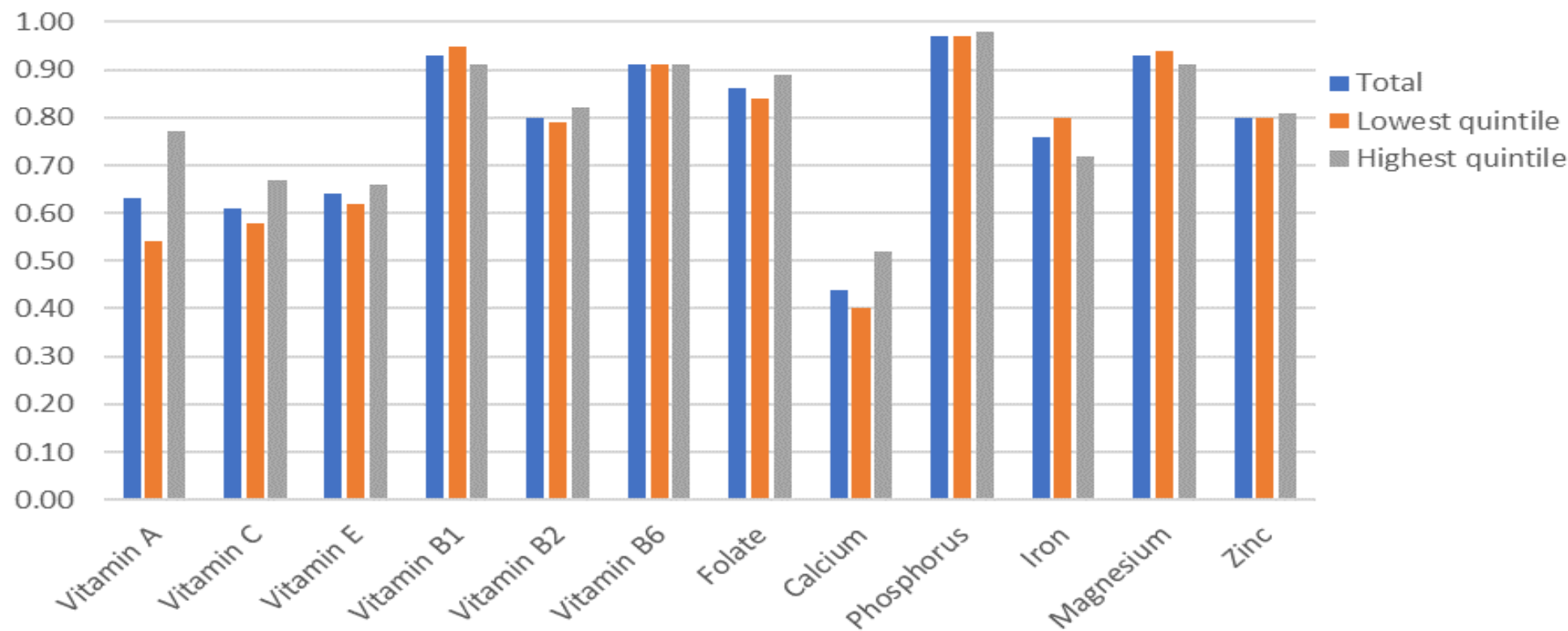
The contribution (%) of the MDDW food groups to total daily personal food consumption(grams) by socioeconomic quintiles

MDDW food groups	Lowest	Low	Middle	High	Highest	Total
Grains, roots, and tubers	46.42	44.43	43.31	43.52	40.87	43.72
Pulses (beans, peas and lentils)	9.06	8.69	7.68	5.99	5.3	7.35
Nuts and seeds	5.03	5.95	5.62	6.24	7.1	5.98
Milk and milk products	3.16	3.19	3.71	4.05	4.63	3.75
Meat, poultry, and fish	6.36	7.4	8.52	8.38	9.53	8.03
Eggs	0.07	0.16	0.22	0.46	0.56	0.3
Dark greens leafy vegetables	13.61	12.33	12.61	11.24	10.52	12.07
Other Vitamin A-rich fruits and vegetables	0.32	0.79	1.2	2.32	3.23	1.57
Other vegetables	11.86	12.21	11.93	11.16	10.13	11.46
Other fruits	4.09	4.85	5.22	6.65	8.12	5.78

Results

Household nutrient availability

The average adequacy ratios (ARs) for key micronutrients of household food by socioeconomic quintiles



Results

Relative contribution of major foods to overall delivery of energy, protein, vitamins A and C, iron, and zinc in Tanzania

Foods	Energy	Protein	Vitamin A	Vitamin C	Iron	Zinc
Other grains	0.15	0.11	0.01	0.00	0.15	0.12
Groundnut	0.14	0.25	0.00	0.00	0.19	0.23
Maize	0.13	0.19	0.00	0.01	0.35	0.29
Rice	0.12	0.03	0.00	0.00	0.01	0.04
Cassava	0.10	0.01	0.01	0.40	0.04	0.03
Millet and sorghum	0.07	0.02	0.00	0.00	0.04	0.03
Dairy	0.05	0.02	0.06	0.00	0.01	0.02
Meat	0.04	0.07	0.00	0.00	0.02	0.07
Other foods	0.04	0.00	0.00	0.00	0.01	0.00
Nuts	0.04	0.02	0.03	0.02	0.03	0.03
Fish	0.03	0.20	0.00	0.04	0.03	0.06
Coconuts	0.03	0.00	0.00	0.00	0.01	0.01
Bananas	0.02	0.00	0.02	0.04	0.01	0.00
Sweet potato	0.02	0.01	0.64	0.14	0.01	0.01
Tubers	0.01	0.01	0.00	0.06	0.01	0.01
Green beans	0.01	0.01	0.00	0.00	0.02	0.01
Other legumes	0.01	0.02	0.01	0.03	0.02	0.02
Avocado	0.00	0.00	0.00	0.02	0.01	0.01
Mango	0.00	0.00	0.00	0.03	0.00	0.00
Carrots and peppers	0.00	0.00	0.07	0.01	0.00	0.00
Eggs	0.00	0.00	0.00	0.00	0.00	0.00
Tomatoes	0.00	0.00	0.03	0.07	0.01	0.00
Cabbage	0.00	0.00	0.00	0.03	0.00	0.00
Orange/tangerine	0.00	0.00	0.00	0.03	0.00	0.00
Lemon/lime	0.00	0.00	0.00	0.03	0.00	0.00
Onion	0.00	0.00	0.00	0.01	0.00	0.00
Spinach	0.00	0.01	0.12	0.02	0.03	0.01

Conclusion

- There is a notable deficit of micronutrient particularly for Vitamins A, C, E, and calcium, with substantially higher deficits in the lowest socio-economic quintile.
- The gaps in availability of Vitamin A and C are particularly relevant for the consumption of F&Vs.
- Cereals are a major source of iron and zinc, while sweet potatoes and cassava are key sources of Vitamins A and C.

Conclusion

- Though micronutrient delivery is driven by consumption of staple foods, including cereals, tubers and legumes, there was also evidence that a range of F&V were consumed across the country.
 - Leafy greens (spinach), carrots and peppers accounted for approximately 20% of Vitamin A availability.
 - Tomatoes, cabbages, onions, mangoes, avocado, citrus fruits (including oranges, tangerines, lemons and limes) accounted for approximately 15% of Vitamin C availability in the diet.
- Increasing consumption levels of these F&Vs is likely going to address the gaps in terms of Vitamin A and C availability in the diet.

“THANK YOU”