

## Vegetable, Fruit and Peanut Product Expenditures in Urban Households in Sub-Saharan Africa: The Case of Tamale, Ghana

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### Introduction

- Ghana's economy has grown by 64% between 2000 and 2009.
- Per capita (PPP) income averaged over \$2,000 during 2000s.
- Ghana's economic growth has been concentrated in the south, where capital Accra is located. However, recently discovered iron ore deposits and other minerals renewed investor interest in the Northern Region.
- North's main economic sector is agriculture, which primarily produces cotton, cassava, yam, peanuts, tobacco, beans, soybeans, millet, and sorghum as well as a variety of vegetables.
- The traditional diet of the population in the region includes peanuts and peanut products eaten in stews or soups with gari, rice, beans, and vegetables.
- Tomatoes and onions are eaten daily by almost all families, while okra, leafy greens, and eggplants are also frequently consumed. Vegetables in combination and some starchy staple supplemented with the peanut paste are the foundation of the daily diet of many northern Ghanaians.

### Problem Statement

Anticipated economic growth is likely to increase the demand for food in general and vegetables, fruits and peanut products in particular. The increase in consumption of fruits and vegetables has been observed in response to the real income growth in other parts of the world, while the peanut paste, a great source of protein, represents a widely consumed product in the Sub-Saharan Africa. Hence, understanding household consumption characteristics and factors impacting consumption choices will be a valuable economic and marketing tool for local producers and marketers as they consider expanding fresh fruit, vegetable, and peanut product offering as a response to the anticipated growth.

### Objectives

This study uses household survey data to develop a profile of a retail buyer and quantify each effect providing a benchmark for the growers and grower groups and food distributors in their efforts to take advantage of the potentially expanding market opportunities.

### Data

Data are collected through face-to-face interviews in February 2011 from 216 households in Tamale, Ghana - a major wholesale grains and peanut trade center. The survey instrument was developed by a team of researchers from outside Ghana and the University of Ghana, Legon. The representative sample of households was selected with the help of the Ghana's National Statistical Service Office from all neighborhoods of Tamale.

### Model and Estimation Approach

The theoretical foundation of this study is the analysis of household food expenditures based on the Engel curve specification. Empirically, expenditures on fresh fruits or vegetables or peanut paste are specified as a function of socioeconomic, demographic, and consumer preference variables.

$$expenditure_i = \beta_{10} + \beta_{11}time + \sum_j \beta_{1j}socioecon_j + \sum_k \beta_{1k}demogr_k + \sum_m \beta_{1m}preference_m + \sum_{n \neq i} \beta_{1n}expenditure_n + \varepsilon_i$$

where,

**expenditure<sub>i</sub>** = household weekly spending on *i*<sup>th</sup> food item (vegetables, fruits, peanuts) in Ghanaian Cedi.

**time** = time spent on lunch and dinner preparation at home.

**socioeconomic<sub>j</sub>** = set of socio-economic household and respondent characteristics.

**demogr<sub>k</sub>** = set of demographic household and respondent characteristics.

**preference<sub>m</sub>** = set of preferences characterizing food consumption habits.

**expenditure<sub>n</sub>** = household expenditure on the other *i*<sup>th</sup> food categories (*n* ≠ *i*).

**ε<sub>i</sub>** = error term.

Due to the absence of the selectivity bias, models are estimated with ordinary least squares (OLS) method. Results satisfy tests for multicollinearity and heteroskedasticity.

Table 1. Estimation results of three expenditure equations

Variable name	Vegetables	Fruits	Peanuts
Household income ( <i>weekly</i> )	0.067	0.159**	-0.006
	-1.084	-2.483	(-0.086)
Time	-0.292***	0.023	-0.061
	(-2.724)	-0.201	(-0.478)
Age	0.001	-0.006	0.025
	-0.324	(-1.307)	-0.983
Age <sup>2</sup>			-0.000
			(-0.731)
Children 4-18 years of age ( <i>dummy</i> )	0.256**	-0.126	0.064
	-2.12	(-0.977)	-0.439
Education, at least high school ( <i>dummy</i> )	0.304***	0.066	-0.321**
	-2.741	-0.551	(-2.402)
Government Employee ( <i>dummy</i> )	-0.089	0.162	0.372**
	(-0.598)	-1.035	-2.068
Self Employed ( <i>dummy</i> )	-0.069	0.149	0.172
	(-0.556)	-1.148	-1.131
Shopping in street market stands ( <i>at least once a week</i> )	0.367***	-0.054	-0.444***
	-3.323	(-0.448)	(-3.278)
Shopping in open street markets ( <i>at least once a week</i> )	0.195*	0.001	-0.176
	-1.877	-0.012	(-1.434)
Shopping from hawkers ( <i>at least once a week</i> )			0.195*
			-1.661
Snack consumption, daily ( <i>dummy</i> )	-0.266***	0.294***	0.194
	(-2.814)	-2.964	-1.639
Expenditures ( <i>vegetables</i> )		0.296***	0.485***
		(3.618)	-5.464
Expenditures ( <i>fruits</i> )	0.267***		0.247***
	-3.618		-2.72
Expenditures ( <i>peanuts</i> )	0.329***	0.179**	
	-5.192	-2.525	
Making peanut paste at home ( <i>dummy</i> )			0.192
			-1.622
Constant	1.939***	-0.289	-0.381
	-3.196	(-0.438)	(-0.451)
Adjusted R <sup>2</sup>	0.407	0.308	0.3681

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

t-values are in parentheses

### Results and Implications

- Households with young children and at least high school education are likely to spend more on vegetable expenditure.
- Time on preparing meal is a major factor in Ghanaian household's decision on vegetable consumption, but not for fruits and peanuts. The latter requires minimum preparation time and are usually consumed as a snack (similar to other survey results).
- Households shopping frequently at street market stands and open-air markets are likely to spend more on vegetables b/c they save time finding the place that sells vegetables. In contrast, results suggest that the primary source for peanut purchases are the hawkers.
- Compared to vegetables and peanuts, fruit consumption increases as income increases suggesting that fruits are not necessarily viewed as necessities in Ghanaian households.
- Households where snacks are major part of daily diet, are likely to consume more fruits and less vegetables, suggesting that fruits are usually used as a snack.
- Negative sign on education in peanuts equation may reflect the differences in knowledge about *mycotoxin* contamination in peanuts and peanut products, which is harmful. Earlier survey results suggest that farmers associate eating too much of peanut paste with various illnesses.
- Results also highlight the complementarity among these three food categories.
- With increased employment, vegetable consumption may decline. Opportunities may arise for partially prepared vegetables, if incomes increase; or, perhaps, a change in preparation and cooking method in the longer run. Hence, a potential market for more efficient cooking appliances.
- Rapid increase in fruit consumption if incomes increase; a typical occurrence in other countries that experienced income growth.
- A further investigation of role of knowledge in peanuts consumption is needed to inquire if consumption is driven by the difference in knowledge or other factors.

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