Bangladesh Institute of
Development Studies (BIDS)

Household Nutrient Elasticities of Food Consumption and Policy Implications for Rural Bangladesh

Zabid Iqbal
Research Fellow
Bangladesh Institute of Development Studies (BIDS)
zabidecon@gmail.com

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Zabid Iqbal, Research Fellow, BIDS, Bangladesh

Background

- Bangladesh economy has grown at or over 6 percent rate over the last decade coupled with a substantial increase of per capita income and poverty reduction.
- However, about 35 percent of Bangladesh's population remains food insecure.
- Undernutrition or malnutrition is a big problem in Bangladesh and poor dietary diversity and inadequate protein and micronutrient intake exacerbate malnutrition (Magnani et al. 2015).
- About 5.5 million children under 5 years (36 percent) are suffering from chronic malnutrition (stunting or low height-for-age) and 14 percent are acutely malnourished (wasting or low weight for height) (NIPORT et al. 2016).
- Improvements in nutrition do not automatically result from efforts to reduce poverty or broad economic growth (Ruel and Alderman 2013).

Research Questions

- The poor nutritional exists because the lower-income households group do not increase consumption of high nutrient content food with the increase in income? Or
- Whether higher-income households diversify their food consumption with respect to changes in income and/or prices?
- What policies are required for improving the nutritional outcomes?

Research Objective (s)

- Addressing the research questions require detailed knowledge of the interaction between household socio-economic characteristics, food prices, and food and nutrient choice.
- Thus, we estimate the nutrient elasticities of food consumption with respect to food prices and income using a complete food demand system.

Economic Model

We use a quadratic almost ideal demand system (QUAIDS) developed by Banks et al. (1997).

$$w_i = \alpha_i + \sum_{j=1}^{n} \gamma_{ij} \ln p_j + \beta_i \ln\left[\frac{m}{a(\mathbf{p})}\right] + \frac{\lambda_i}{b(\mathbf{p})}\left\{\ln\left[\frac{m}{a(\mathbf{p})}\right]\right\}^2$$

$$\varepsilon_{ij} = \frac{\mu_{ij}}{w_i} - \delta_{ij}$$

$$e_{ij}^{c} = e_{ij}^{u} - e_i w_j$$

$$E_i = \frac{\mu_{ij}}{w_i} + 1$$

Data and Variables

- This study uses 2015 Bangladesh Integrated Household Survey (BIHS) conducted by the International Food Policy Research Institute (IFPRI), Bangladesh.
- BIHS data provides detailed information on household consumption, agriculture production, economic shocks, employment, and food security including many others.
- The sample data is nationally representative of rural Bangladesh.

Data and Variables

- In estimating nutrient elasticities, we aggregate all food commodities into 16 groups.
- They are Rice, Wheat, Other cereals, Pulses, Oil, Vegetables, Potatoes, Fruits, Egg, Milk, Fish, Meat, Spices, Sugar and sweets, Beverages, and Other food.
- We estimate nutrient elasticities of calories, protein, and fat.

Results and Discussion

Table 1. Estimates of Own price and Income (Expenditure) Elasticities of Nutrients Consumption in Rural Bangladesh

Food group	Price Elasticities		
	Calories	Protein	Fats
Rice	-0.256	-0.198	-0.070
Wheat	-0.151	-0.030	
Other cereals	-0.070	-0.053	-0.031
Pulses	-0.023	-0.069	-0.045
Oil	-0.123	-0.060	-0.413
Vegetables	-0.026	-0.076	-0.021
Potatoes	-0.011	-0.032	-0.016
Fruits	-0.056	-0.017	
Egg	-0.032	-0.051	-0.045
Milk	-0.013	-0.027	-0.031
Fish	-0.080	-0.210	-0.257
Meat	-0.034	-0.131	-0.175
Spices	-0.017	-0.012	
Sugar and sweets	-0.029	0.021	-0.078
Beverages	-0.016	-0.007	-0.005
Other food	-0.111	-0.131	-0.129
	Income (Expenditure) Elasticities		
	Calories	Protein	Fats
Overall	0.710	0.877	1.064
Poorest quintile	0.638	0.811	0.919
Richest quintile	0.734	0.935	0.954

Several findings from the Table 1 are worth mentioning here:

- The own price elasticities are in general negative and very inelastic, indicating that an increase in food prices leads to a reduction in nutrients consumption and the rate of reduction is not so sensitive to increase in prices.
- Own price calories elasticity: Rice, wheat, oil, and fish are most sensitive to changes in prices.
- Own price proteins elasticity: Rice, fish, and meat are most sensitive to changes in prices.
- Own price fats elasticity: Oil, fish, and meat are most sensitive to changes in prices.
- The income elasticities vary from 0.710 for carbohydrates to 1.034 for fats. The income elasticity of fats highest among the three nutrients followed by the elasticities of the consumption of proteins and calories. This indicates that an increase in income lead to the higher fats and proteins consumption compared to calories consumption.
- The nutrient elasticities in poorest quintile are lower than the richest quintile and are observed in all three nutrients.

Conclusions

- An increase in income leads to an improvement in nutrition. The income elasticity of fat is far more responsive than the proteins and calories, indicating that the increase in income does not necessarily improves the good nutrition.
- Income improving policies would be more effective in increasing nutrient consumption than price related policies.
- The poorest group needs addition income incentive to improve their nutrition consumption.

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Contact author: zabidecon@gmail.com