

## Research Brief

### Nutrient Density of Foods to Bridge Dietary - Nutrient Gap

#### Research Questions

1. What are the food and nutrient intake patterns of Bangladeshi population by lifecycle stage and residence?
2. To what extent is the Bangladeshi population at 'risk of inadequacy' of critical nutrients?
3. How does the energy and nutrient density (ND) of foods in the Food Composition Table (FCT) for Bangladesh, vary across food groups and price?
4. What is the cost of recommended healthy diet<sup>1</sup> (CoRD) and how does affordability of CoRD vary by region and residence? How does the CoRD relate to the household food expenditure by food groups?
5. What are the nutrient-rich foods in relation to price, that have been identified for least-cost food baskets throughout the lifecycle?

#### Answers from the Research

Cereals (rice) dominate the diets of all age groups while the consumption of pulses, nuts and seeds, and fruit are reportedly low from available latest survey estimates. Consumption of leafy vegetables, fish, meat, poultry, milk, and fat products are slightly higher, and the consumption of starchy foods, pulses, and fruits are lower among the urban residents than that of the rural residents. Broiler chicken constitutes the major share of meat intake and cultured pangash and tilapia fish constitute a major share of fish intake. Calculations from the per capita food intake show that the carbohydrates contributed around 72%, protein 18%, and fat 10% of total dietary energy per day. About a third of the total protein (54.13 g) is from high biological value, animal source foods.

Dietary inadequacy for macronutrients decreased with age but remained high for micronutrients. The prevalence of risk of inadequacy based on Estimated Average Requirement (EAR) of calcium, thiamine, riboflavin, vitamin B6, vitamin B12, and vitamin A, was between 40 to 50% in all age and sex groups. The risk of iron inadequacy was over 40% for most age groups except for 19 to 60-year-old males, for whom the rates went below 20%; the level was over 30% for adult females. The mean prevalence of risk of inadequacy across 12 estimated micronutrients was 27% in children under 2 years, 23% in adolescents, 13% in women of reproductive age, 27% in pregnant women, and 24% in lactating mothers (BIHS, 2015). Calcium, thiamine, riboflavin, zinc, iron, riboflavin, vitamin B6, folate, vitamin A, and vitamin B12 were found to be the crucial nutrients for Bangladeshi population.

Locally available foods as drawn from the Bangladesh FCT 2013 were ranked according to: Energy Density (kcal per gram of food), Nutrient Rich Food (NRF)<sup>2</sup>, and Naturally Nutrient Rich (NNR) score according to 15 food groups. The relation between cost of foods expressed as taka/100 kcal with nutrient density (NNR, NRF9.3) showed that leafy vegetables (amaranth leaves, spiny, green, and red, jute leaves, bottle gourd leaves, Indian spinach) provide highest nutrient return per taka with minimum level of energy. Comparatively, local seasonal fruits were identified as least cost in terms of nutrient return per taka. Cereals provide the highest energy per taka followed by sugar, fats and oils, and pulses, whereas meat, poultry and fish provide the lowest energy per taka followed by fruits, vegetables, egg, and milk. Overall, leafy, and non-leafy vegetables, fruits, meat, poultry and fish, egg and milk are nutrient dense, with low energy return per taka.

While the cost of a recommended healthy diet for an adult was estimated to be 83 BDT, 41.3% of households cannot afford it. Among eight divisions, unaffordability was found to be highest in Khulna (65.5%) and least in Chattogram (25.5%). The burden of unaffordability was significantly greater in rural (42%) than urban (39%) areas. Households were found to spend 38% and 6% on staples, and fats, and oils, respectively whereas only 21% and 3%, respectively, of their expenditure could meet the requirements of the range of food groups in the recommended diet. In contrast, households spend less on protein foods, dairy products, fruits, and leafy vegetables.

Linear programming identified 32 key nutrient-dense foods that comprised nutritionally adequate, health-promoting, and culturally acceptable, least costly food baskets for different population groups across the life cycle. Food items that were almost universally included in the food baskets across the lifecycle stages were rice, wheat flour, grass pea, egg (chicken), potato, melon (futi), slender amaranth leaves, water spinach, whole milk, soya oil, and sugar. Other food items in the food baskets included millet, soybean, Bengal gram, radish, amaranth stem, cabbage, sweet potato, colocasia (taro), carambola, banana, red amaranth leaves, green amaranth leaves, radish leaves, jute leaves, Indian spinach, egg (duck), pool barb, palm oil, jackfruit seeds, and jaggery.

#### Implications for Policy

A robust nutrition education program through multiple channels can sensitize people and help to bring about changes from rice-based diets to more diversified ones. The prevalence of 'risk of micronutrient inadequacy' of 30 – 40 per cent in the population has to be targeted under nutrition intervention programs.

<sup>1</sup> Ministry of Food and Ministry of Health and Family Welfare, Dietary guidelines for Bangladesh 2020 (Draft).

<sup>2</sup> A tool used to classify foods in varying ND categories using FCT of countries as determined by linear programming.

The government should consider applying nutrient density scores of foods, to set targets for food diversification policies and interventions around food production, especially for nutrient dense foods like dairy, fruits, vegetables, and animal source protein-rich foods, and help influence price policies and increase the availability of a broader set of food groups that constitute healthy diets. Policies should also support the flow of diverse nutritious foods into markets.

As healthy diets remain unaffordable even in their cheapest form to the poor population, nutrition education and behaviour change communication (e.g., counselling on specific nutrient-dense foods identified through nutrient-density scoring) should be complemented with social protection and

food systems policies (e.g., scaling up and intensifying home production of diverse foods through kitchen gardens), to improve access to and consumption of healthy diets. Poverty lines may need to be reconstructed so that they account for the cost of healthy diets beyond the current principle of meeting only the cost of energy sufficiency.

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This fact sheet presents the summary of a research study undertaken by the *Institute of Nutrition and Food Science and Institute of Health Economics, University of Dhaka*, with support under the Research Grants Scheme (RGS) of the Meeting the Undernutrition Challenge (MUCH) project. MUCH is implemented in collaboration with the Food Planning and Monitoring Unit of the Ministry of Food with technical support from the Food and Agriculture Organization of the United Nations (FAO).

MUCH is financially supported by the European Union (EU) and the United States Agency for International Development (USAID). The opinions expressed in this fact sheet are attributed to the research team and do not necessarily reflect those of the Government of Bangladesh, FAO, EU or USAID. For further information and comments: [fpmu.gov.bd](http://fpmu.gov.bd), Food Planning and Monitoring Unit (FPMU), Ministry of Food, Khaddya Bhaban, 16 Abdul Ghani Road, Dhaka-1000, Bangladesh