

# Analysis of Trends in Food Supply and Intake in Bangladesh

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**Abstract:** the nutritional scenario is gradually improving in developing countries like Bangladesh. This study presents analytical description on the supply trend of rice, wheat, total cereals, pulses, edible oil or oil seeds, sugar or sugarcane, etc during 2004, 2010, and 2016. These statuses have been based on change in supply levels in the light of data available. Data available on food supply from food balance sheet in FAOSTAT of FAO; on food intake from Household Income and Expenditure Survey (HIES) were the basis of trend analysis of the study. In the year of 2004 to 2016 total food supply increased from 297.6kg to 417.21kg per capita year: whereas during the same period the total food intake decreased from 856.1g to 852.67g per capita per day in the country. There might be surplus of cereals in the country, but these prospects are likely to reduce in the years to come. This situation is even more alarming for pulses. Food based approach particularly supply of adequate safe and nutritious food, adequate intake of diversified food can ensure sustainable health and nutritional status of the population. To meet the future food requirements, the country have to either increase food production and supply, or depend on imports.

**Keywords:** Food supply, Food intake, Trend analysis, Bangladesh

## I. INTRODUCTION

Nutrition is a dynamic process involving food values, food processing, digestion and assimilation of food for nourishing the body. Malnutrition results from inadequate food intake, increased nutrients need, decreased nutrient absorption and/ or increased nutrient losses (Muaz, 2010). Food is consumed by every individual as an essential item of living (Bangladesh Bureau of Statistics Report, 2006). It is important to know the feasibility of achieving food supply and food intake constraints that are crucial. The imbalance between food supply and food intake impacts the prices and profitability. Thus, the intake side and supply side become very relevant to make policy interventions.

Intake and supply prospects of food items become important indicators to the country's food availability concerns. These projections are based on at the national levels of food supply and food intake. Although, various intake and supply estimates are available for cereals with alternative assumptions in literature, and beside much has been said about other food items. The intake and supply estimates for food items like, cereals, potatoes and products, pulses, edible

vegetable oil, vegetables, fruits, spices, meat, eggs, milk, fish, sea food and sugar and sweeteners.

Good nutrition is a prerequisite for the national development and for the well-being of individual's nutritional status is the ultimate result of complex interactions between food consumption, overall health status, and caring practices (NIPORT, 2009; Mitra & Associates and ICF international, 2009). Poor nutritional status is a key health problem in Bangladesh (NIPORT, 2009; Mitra & Associates and ICF international, 2009). Sufficient amount of food supply improve nutritional condition of the population.

Food energy efficiency is our ability to minimize the loss of energy in food from harvest potential through processing to actual consumption and recycling. By optimizing this chain, food supply can increase with much less damage to the environment, similar to improvements in efficiency in the traditional energy sector ([www.grida.no/citations/rr/food-crisis/page/3562.aspx](http://www.grida.no/citations/rr/food-crisis/page/3562.aspx)). It maintains demand for proper balance of food supply. But, in Bangladesh, a large segment of the people fails to consume necessary food items at the required level. This inability may be attributed to food poverty. Although, some rich and old people may take less energy dense food for health related issues (Bangladesh Bureau of Statistics Report, 2006). It is important to note that food supply is not only a function of production, but also of energy efficiency ([www.grida.no/citations/rr/foodcrisis/page/3562.aspx](http://www.grida.no/citations/rr/foodcrisis/page/3562.aspx)). A substantial share of the increasing food demand could be met by introducing food energy efficiency ([www.grida.no/citations/rr/food-crisis/page/3562.aspx](http://www.grida.no/citations/rr/food-crisis/page/3562.aspx)).

Demand and supply prospects of food items become important Indicators to the country's food security concerns (Mittal & Surabhi, 2008). Aquaculture, freshwater and marine fisheries supply about 10% of world human calorie intake - but this is likely to decline or at best stabilize in the future, and might have already reached the maximum ([www.grida.no/citations/rr/food-crisis/page/3562.aspx](http://www.grida.no/citations/rr/food-crisis/page/3562.aspx)).

The objective of the study was to assess the trend of food supply and food intake according to different food items to predict the pattern in the future.

## II. METHODOLOGY

This study was undertaken on the basis of secondary data collected and analyzed during the period from July 2004-June 2016. The methodology involved desk review of different library searches like Food Directorate's library, Food and Agricultural Organization's (FAO) library, National Institute of Population Research and Training (NIPORT) library and corresponding internet search like PubMed, Med Line, Google, and also the FAO website (<http://faostat.fao.org/site/368/desktopdefault.aspx?PageID=368>). Besides published results of various national-level nutrition surveys conducted by the Government and non-government organizations (NGOs) were also used. These surveys included, among others. Report of the Household Income and Expenditure Survey (HIES) of 2005 and 2010 (Bangladesh Bureau of Statistics Report, 2011). Bangladesh Demographic and Health Survey (BDHS) of 2004, 2007 and 2011 (NIPORT, 2009; Mitra & Associates and ICF international, 2009) and National Food Policy Plan of Action and Country Investment Plan Monitoring Report 2013 & 2014 and the nutrition surveys conducted by Helen Keller International and United Nations Children's Fund (UNICEF).

Based on the information, the data were compiled mainly on Report of the Household Income and Expenditure Survey of 2005, 2010 and 2016 ; Bangladesh Demographic and Health Survey (BDHS) of 2004, 2011 and 2016; ([www.grida.no/citations/rr/food-crisis/page/3562.aspx](http://www.grida.no/citations/rr/food-crisis/page/3562.aspx)) and information on food supply was collected from the food balance sheet in FAOSTAT of FAO website (<http://faostat.fao.org/site/368/desktopdefault.aspx?PageID=368>).

In this study the trend in national food supply and intake was constructed based on the food items like cereals, potatoes and its products, sugar and sweeteners, pulses, vegetable oils, vegetables, fruits, spices, meat, eggs, milk, fish, and seafood's trends during 2004 to 2016.

## III. LITERATURE REVIEW

The ability to reduce energy loss in food from potential harvest through processing to actual consumption and recycling is referred to as food energy efficiency. Similar to gains in energy efficiency in the conventional energy sector, this chain can be optimized to boost food supply while causing significantly less environmental harm (Grida, 2009). It keeps up demand for a balanced supply of food. However, a substantial portion of the population in Bangladesh fails to consume vital dietary items at the requisite level. Food insecurity may be to blame for this impossibility. Even said, some wealthy and elderly individuals may choose to eat less nutritiously (Bangladesh Bureau of Statistics Report, 2006). It is significant to remember that the availability of food depends on both energy efficiency and production (Grida, 2009). By implementing food energy efficiency, a significant portion of the rising food demand might be satisfied (Grida, 2009). Food security problems in the nation are reflected in

both the demand and supply outlook for various food commodities (Grida, 2009). Aquaculture, freshwater and marine fisheries supply about 10% of world human calorie intake – but this is likely to decline or at best stabilize in the future, and might have already reached maximum (Grida, 2009).

Food intake is a term that can be used ([www.vocabulary.com/dictionary/intake](http://www.vocabulary.com/dictionary/intake)). In rural areas, people eat the majority of their food at home (Latham, 1997). Long-term effects of developing healthy eating habits are shown in (Shubhangini, 2010). Food intake is referred to as nutrition when compared to the body's nutritional requirements. The foundation of good health is excellent nutrition, which includes eating an appropriate, well-balanced diet and engaging in regular physical activity. Additionally, it is well-known that inadequate diet can lower immunity, increase illness susceptibility, hinder physical and mental growth, and decrease productivity (WHO). Usual dietary intake is the average daily intake of a nutrient or food over a lengthy period of time ([riskfactor.cancer.gov](http://riskfactor.cancer.gov)). In addition to being direct causes of malnutrition, diseases, especially infections, and improper food consumption can also result in serious sickness and even death (Latham, 1997). Therefore, it's important to consume a healthy, balanced diet. Controlling infectious diseases and increasing child nutrition and care are both necessary for enhancing children's health and lowering mortality (Latham, 1997).

A high sugar diet may also contribute to obesity, which raises the risk of non-communicable diseases like coronary heart disease and diabetes mellitus, as well as excessive calorie intake. Consuming sugar is associated with dental cavities. Children who eat sugary meals frequently have poor appetites and are more likely to develop dental damage. A daily sugar intake of no more than 25g is advised. Additionally, encouraging the consumption of natural sugars from a variety of seasonal fruits (Nahar et al., 2013) and eating fresh, unprocessed foods (Shubhangini, 2010) is advised. Given that milk consumption is crucial for young children and adolescents in order to develop optimum peak bone mass, the dietary recommendations advocated consuming enough amounts of milk and milk products. Additionally, drinking milk can help stave off osteoporosis in later life. It is crucial for the bone and dental health of both the mother and the fetus during pregnancy and nursing. In our country, milk from cows, goats, and buffalo is common (Nahar et al., 2013). Additionally, it recommended eating a lot of fruits and vegetables every day. Fruits and vegetables should be consumed often to prevent anemia and vitamin A deficiency. In addition to lowering the risk of various cancers, studies have shown that the beta carotene and vitamin C found in vegetables and fruits help stop fat from accumulating in blood vessels. To maintain children and adolescents robust and healthy, the diet should include leafy vegetables and locally grown seasonal fruits on a regular basis. Everyone is advised to eat a variety of vegetables at each meal and to routinely consume fruits, especially after meals or as a snack. In

addition, it advised eating two seasonal fruits per day, one from a vitamin A source and the other from a citrus source. Every day, 200g of non-leafy vegetables and 100g of leafy vegetables must be ingested (Nahar et al., 2013).

IV. RESULT AND DISCUSSION

Trends of food supply in Bangladesh

**Total food supply:** The trends of total food supply in Bangladesh was measured by kg/capita/year unit indicator are shown in Table I The FAOSTAT reported the food supply data in Bangladesh in the year 2004, 2010 and 2016. The per capita per year supply of total foods has increased from 297.6 kg in 2004 to 417.21 kg in the year 2016. The change in percentage point was 40.19 in the last decade. This improvement in total food supply was possible due to farmers' motivation and the extended services of department of agriculture extension (DAE) and NGOs.

Table I. Trends In Food Supply (Kg/Capita/Year) By Food Items

Food Items	Year			Change in % point
	2004	2010	2016	
Cereals	196.4	274.85	269.92	37.43
Potatoes and products	22.6	45.37	49.77	120.22
Pulses	5	3.11	4.48	-10.4
Sugar and sweeteners	8	8.6	8.2	2.5
Fruits	13.3	15.51	17.84	34.13
Vegetable	16.1	16.62	19.57	21.55
Meat	3.6	3.9	4.47	24.17
Eggs	1.3	1.51	2.86	120
Milk	16.8	18.84	17.82	6.07
Fish, Sea food	14.5	17.37	22.28	53.65
Total	297.6	405.68	417.21	40.19

**Cereals supply:** Cereals include rice, wheat, maize, etc. The per capita per year supply of cereals has increased from 196.4 kg in 2004 to 269.92 kg in the year 2016 (Table 1). It shows a positive trend that means cereals supply is duly increased. It is encouraging to observe that supply of cereals increased and sustained in 2016 over the last 13 years. The trends in supply of cereals, potatoes and pulses are shown in Figure 1.

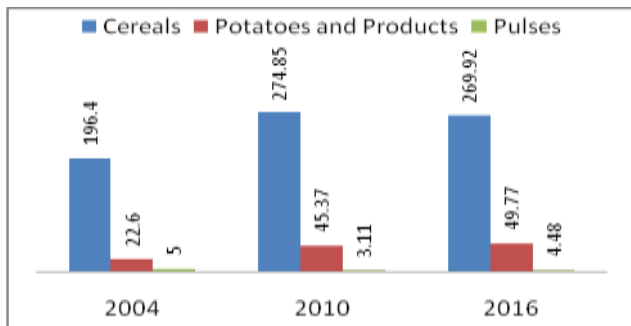


Fig. 1 Trends in food supply (kg/capita/year) by cereals, potato and products and pulses

**Potatoes supply:** Figure 1 shows that the per capita per year supply of potatoes and potato products increased from 22.6 kg in 2004 to 49.77 kg in the year 2016. The supply of potatoes and products has increased by 27.17 kg per capita per year in 2016 over the year since 2004. This indicates 120.22% point of increment during this period.

**Pulses supply:** Per capita per year supply of pulses reduced from 5 kg in 2004 to 4.48 kg in the year 2016. The supply of pulses reduced by 0.52 kg per capita per year in 13 years. This indicates -10.4% point of decrement, means reduction of 10.4% point during this period.

**Sugars and sweeteners supply:** The supply of sugars and sweeteners increased from 8.0 kg/cap/year in 2004 to 8.2 kg/cap/year in 2016 (Figure 2). The improvement in percentage point over the decade was 2.5 only.

**Vegetables supply:** per capita year supply of vegetables increased from 16.1 kg in 2004 to 19.57 kg in the year 2016. This indicates 21.55% point of increment over the period.

**Fruits supply:** The Figure 2 shows that the per capita per year supply of fruits increased from 13.3 kg in 2004 to 17.84 kg in the year 2016. This indicates 34.13 % point of increment, means an increase of 34.13 % during this period.

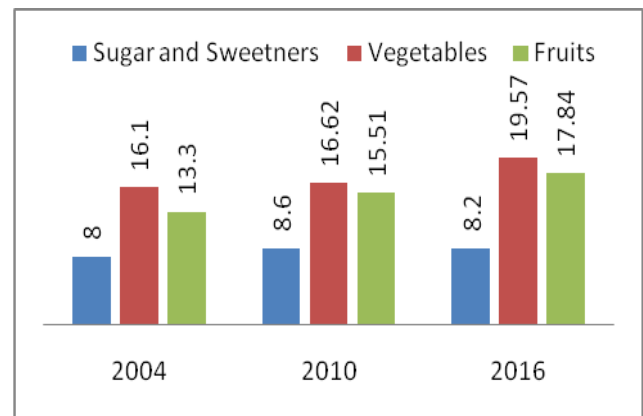


Fig. 2 Trends in food supply (kg/capita/year) by sugar and sweeteners, vegetables and fruits

**Supply of meat:** per capita per year supply of meat increased from 3.6 kg in 2004 to 4.47 kg in the year 2016 (Figure 3). This indicates 24.17 % point of increment, means an increase of 24.17% during this period. That shows a positive trend that means meat supply is successfully developed.

**Eggs supply:** Figure 3 shows that per capita per year supply of eggs increased from 1.3 kg in 2004 to 2.86 kg in the year 2016. The supply of eggs was increased by 1.56 kg per capita per year in 2016 over the year since 2004. This indicates 120 % point of increment, means an increase of 120 % during this period.

**Milk supply:** Figure 3 also shows that the per capita per year supply of milk increased from 16.8 kg in 2004 to 17.82 kg in the year 2016. This indicates 6.07 % point of increment mean 6.07 % during this period.

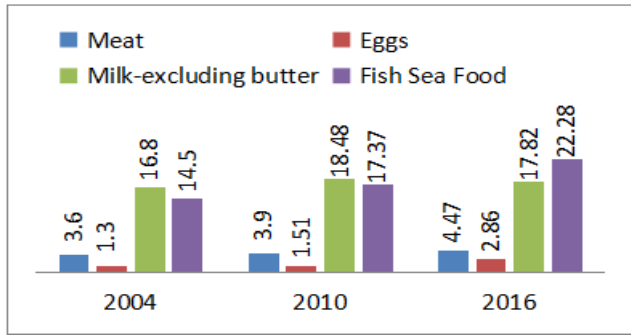


Fig. 3 Trends in food supply (kg/capita/year) by meat, eggs, milk -excluding butter, fish and sea food

**Fish supply:** Figure 3 indicates that per capita per year supply of fish and sea food increased from 14.5 kg in 2004 to 22.28 kg in the year 2016. The supply of fish and sea food increased by 7.78 kg per capita per year in 2016 over the year since 2004. This indicates 53.65 % point of increment during this decade. The positive trend means good supply of fish and sea food.

*Trends in food intake in Bangladesh*

Below Table II shows the trends in food intake in Bangladesh as measured by g/capita/day indicator. The data in the food supply in Bangladesh were collected from the report of the Household Income and Expenditure Survey (HIES) of 2005, 2010, and 2016 along with Dietary Guideline for Bangladesh 2013.

Table II. Trends In Food Intake (G/Capita/Day) By Food Items

Food Item	Year			Change in % point
	2005	2010	2016	
Cereals	469.2	463.9	406.5	-13.36
Potatoes	63.3	70.3	64.8	2.37
Sugar or gur	8.1	8.4	6.9	-14.81
Pulses	14.2	14.3	15.7	10.56
Edible oils	16.5	20.5	26.8	62.42
Vegetables	157	166.08	167.3	6.56
Fruits	32.5	44.7	35.78	10.09
Meat, poultry	15.6	19.07	25.42	62.95
Egg	5.2	7.25	13.58	161.15
Milk or milk products	32.4	33.72	27.31	-15.71
Fish	42.1	49.5	62.58	48.65
Total	856.1	897.72	852.67	-0.40

**Total food intake:** Table II shows that the per capita per year total food intake has changed slightly from 856.1 g in 2005 to 852.67 g in the year 2016. This indicates -0.40 % point of reduction, means shrinking of -0.40 % during this period.

**Cereals intake:** Figure 4 shows that the per capita per day intake of cereals reduce from 469.2 g in 2005 to 406.5 g in the year 2016. The intake of cereals was reduced by 62.7 g per

capita per day in 12 years. This indicates 13.36 % point of decrement, means reduced of 13.36 % during this period. It shows a positive trend that means cereals intake is reduced and other food intake is increased and thus diversified. It is happened due to peoples increased consciousness on other foods intake besides staple food.

**Potato intake:** Figure 4 shows that per capita per day intake of potatoes increased from 63.3 g in 2005 to 64.8 in the year 2016 the intake of potatoes was increased by 1.5 g day in 2016 over the year since 2005. This indicates 2.37 % point of increment, means increased of 2.37 % during this period. It shows a positive trend that means potatoes intake is successfully increased. Consumption of potatoes not only reduces pressure on rice but also increase the supply of energy and micronutrients. Increased consciousness among people also helped. It is very encouraging to see that intake of potatoes increased significantly in 12 years.

**Pulse intake:** Figure 4 shows that per capita per day intake of pulses increased from 14.2 g in 2005 to 15.7 g in the year 2016. The intake of pulses was increased by 1.5 g per capita per day in 2016 over the year since 2005. This indicates 10.56% point of increment, means increase of 10.56% during this period. It shows a positive trend that means pulses intake is increased. This is happening because of the fact that, intake of pulses have become popular than other foods due to its relative cost according to protein value.

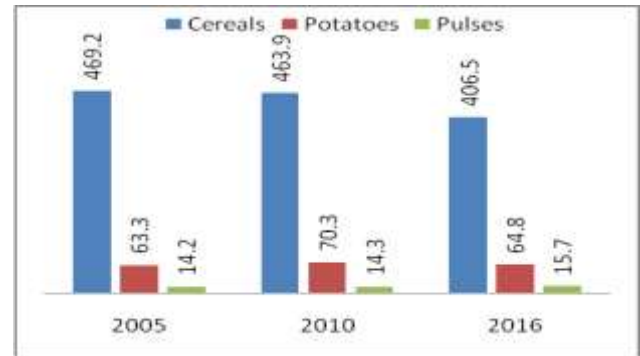


Fig. 4 Trends in food intake (g/capita/kg) by cereals, potatoes and pulses

**Sugar or Gur intake:** Figure 5 shows that the per capita per day intake of sugar or gur increased from 8.1 g in 2005 to 6.9 g in the year 2016. The intake of sugar or gur was decreased by 1.2 g per capita per day in 2016 over the year since 2005. This indicates -14.81% point of reduction.

**Vegetable intake:** Figure 5 shows that the per capita per day intake of vegetables increased from 157 g in 2005 to 167.3 g in the year 2016. The intake of vegetable was increased by 10.3 g per capita per day in 2016 over the year since 2005. This indicates 6.56% point of increment. Means increase of 6.56% during this period. It shows a positive trend that means vegetable intake is successfully increased. This is happening because of the fact that, intake of vegetable is growingly very popular than other foods. It is due to peoples' consciousness about its micronutrient value and low cost.

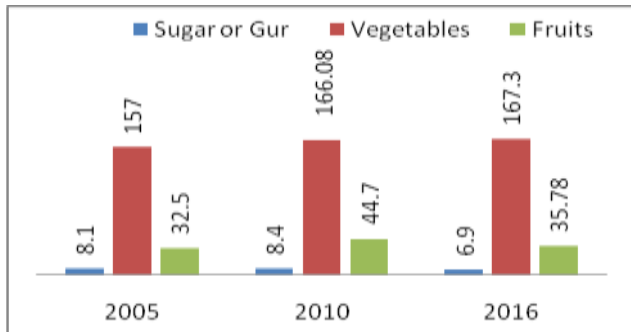


Fig. 5 Trends in food intake (g/capita/day) by sugar or gur, vegetables and fruits

**Fruits intake:** Figure 5 shows that the per capita per day intake of fruits increased from 32.5 g in 2005 to 35.78 g in the year 2016. The intake of fruits was increased by 3.28 g per capita per day in 2016 over the year since 2005. This indicates 10.09% point of increment, means increase of 10.09% during this period. It shows a positive trend that means fruits intake is improved. Intake of fruits is growingly very popular than other foods. It perhaps developed sense of people about its vitamins and low cost or available. It is very encouraging to see that intake of fruits increased significantly in 12 years.

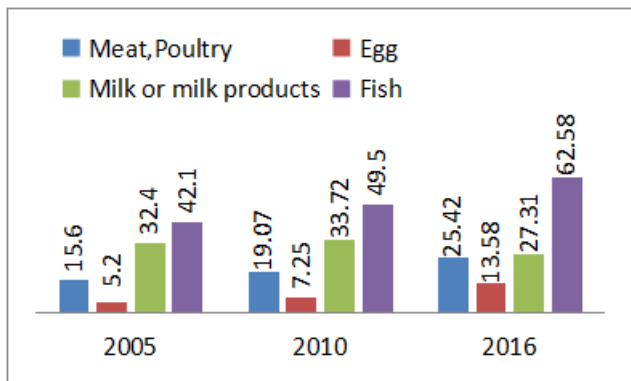


Fig 6 Trends in food intake (g/capita/day) by meat, poultry, egg, milk or milk products and fish

**Animal food intake:** Figure 6 shows that the per capita per day intake of meat, poultry, egg increased from 20.8 g in 2005 to 39 g in the year 2016. The intake of meat, poultry, egg increased by 18.2 g per capita per day in 2016 over the year since 2005. This indicates 87.5% point of increment, means increased of 87.5% during this period. It shows a positive trend that means of meat, poultry, and egg intake is increased. This has happened because of the fact that, intake of meat, poultry, and egg is growingly popular items within different kinds of foods. It is very encouraging to see that intake of meat, poultry, and egg is increased in 12 years.

**Milk or milk products intake:** Figure 6 shows that the per capita per day intake of milk or milk products increased from 32.4 g in 2005 to 27.31 g in the year 2016. The intake of milk or milk products decreased by 5.09 g per capita per day in 2016 over the year since 2005. This indicates -15.71% point of reduction. It shows a negative trend.

**Fish intake:** Figure 6 shows that the per capita per day intake of fish increased from 42.1 g in 2005 to 62.58 g in the year 2016. The intake of fish was increased by 20.48 g per capita per day in 2016 over the year since 2005. This indicates 48.65% point of increment during this period. It shows a positive trend that means fish intake is successfully increased. The department of fisheries and its extension services is growing rapidly and the fish farmers are encouraged to fish production as it is profitable.

## V. CONCLUSION

The study gives us the scope of analyzing food supply, which has an important role to play for household food intake in Bangladesh. National food supply has an important role to play for household food intake in Bangladesh. Bangladesh is progressing well in terms of food supply and food diversity, but more intensification is necessary. Food intake particularly rice consumption is being reduced but very slowly. It means food consumption diversity will be established for better health and productive life. This analysis showed that increase in food intake come mainly from increases in food supply. So, excess requirement for food intake should be met up by increasing food supply. The study considers that the policy focus needs to be laid, towards productivity for the enhancement in supply, development of research and extension.

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