

Developing Food Basket for the Consumers in Punjab, Pakistan: Evaluating Cost and Affordability

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Abstract

Food is a basic human need and recognized as fundamental human rights in all over the world. It is necessary for the survival of human beings. Food and Agriculture Organization (FAO) is working to eradicate hunger and poverty from all over the world. FAO gave comprehensive definition of food security which emphasizes on availability, accessibility, utilization and stability of food for every one end everywhere. United Nations also launched agenda 2030 and introduced seventeen Sustainable Development Goals (SDGs) for member countries to achieve by 2030. Eradication of poverty and hunger are the first and foremost sustainable goals and the third one is defined as “Good Health and Well-Being”. Most of the developing countries like Pakistan are focusing to eradicate hunger by introducing several initiatives but the third goal which is interrelated to nutritional food is overlooked. The initiatives taken by governments to enhance food security did not take into account the nutritional elements of food and also ignored the food preferences and eating pattern of the people. This study develops a customized basic and economical food basket (BEFB) in accordance with the food preferences and eating behaviors of the people of Punjab. Secondary data is taken from different sources to develop the food basket while cost and affordability of the developed food is also determined. Results show that the developed BEFB is economical, affordable and full of nutrition. Study also suggested some policy recommendations to enhance nutritional food security in the country.

Keywords: Food Basket, Nutritional Security, SDGs’, Poverty and Hunger

Introduction

Food security has become the most discussed issue of the world. Every country is giving priority to this issue and trying to secure his citizens from food insecurity, starvation and famine. Food is a basic need and one cannot survive without food. It is a basic right and comes first in the list “hierarchy of needs” described by famous psychologist ‘Abraham Maslow’¹. According to Maslow, self-

¹ <http://www.managementstudyguide.com/maslows-hierarchy-needs-theory.htm>

actualization is the esteem of humanity and it cannot be achieved without eradicating hunger. Because hunger is the first and basic need of human beings. A person, who is not free from hunger, cannot achieve the other milestones towards self-actualization. So, food security is most significant and notable issue which needs to be addressed at priority.

Along with food security, nutritional security is also essential. Food security and nutritional security are closely interrelated but there is a big difference between the two. Food security is necessary but not sufficient condition for nutritional security. All acceptable definitions of food security can implies nutritional security only if the household food security means that the all members of household are consuming food as per the given dietary guidelines which fulfills the daily micro and macro nutrients of all family members of the household.

Punjab is a most populous province of Pakistan hence is suitable for developing a food basket. It is enriched in agriculture, cultural and interpersonal differences, and population density. Despite having fertile land and agricultural richness, there is still malnutrition and food insecurity in the province. Current nutrition frameworks of country tends to follow the ideal nutritional best practices and the recommendations are based on technical committees or international standards without considering the fact that whether that recommended diet is affordable or acceptable to the target outcomes. This study fills that gap by developing a customized, cost-effective, and nutritionally adequate food basket based on actual consumption behavior, household income, and market realities in Punjab.

The innovation of the present research is that it does not follow a top-down approach to nutrition recommendations; it is instead a bottom-up approach to the development of a food basket, a food basket that fits what people in Punjab do eat, afford, and like, but does not compromise on basic calorie and nutrient needs.

By taking into consideration the economic realities of Pakistan such as the minimum wage, the average income level of the households, food costs, and the cultural modes of food preparation, this research undertakes a mixed-method empirical study to draw up a feasible, realistic, and replicable cost-effective food basket. The development of the proposed basket has been done on the basis of secondary data sources, which consist of the Household Integrated Economic Survey (HIES), Bureau of Statistics (BOS) Punjab and MoP- Nutrition Section. The data set provides details of food consumption pattern, tastes, prices, family size and structure, as well as the income in rural and urban areas of Punjab.

Study also takes into consideration, the staple foods consumed both in rural as well as urban Punjab like wheat products, including whole-wheat flatbread, rice, legumes and other staple foods such as vegetables (potatoes, onions, and tomatoes) meat and dairy, which are predominate in food preferences. This plays a significant role in making sure that the basket will be capable of showing affordability without diluting the nutritional value. The other important element of this study is the affordability evaluation. The food basket is not only be tested by the per capita nutritional standards, but it also be tested against average household income in rural and urban areas of Punjab. This ensures that the customized basket is not simply nutritious in theory but also affordable to a great number of people. The given strategy corresponds with the overall purposes of Sustainable Development Goals (SDGs), in particular, SDG 2 ("Zero Hunger") and SDG 3 ("Good Health and Well-being").

Literature Review

Pakistan joined FAO on 7th Sep 1947, soon after independence. FAO assisted to the government of Pakistan to strengthen the agriculture infrastructure by emphasizing on irrigation. FAO focused on poverty reduction, food security, sustainable livelihood and rural development etc. in the decades to

follow. FAO also supported to government in capacity building of staff of agriculture sector, policy guidelines of agriculture and in strengthening the agricultural sector to eradicate hunger and poverty from Pakistan which was the second major goal of MDGs' and now listed as a first goal in SDGs'². But unfortunately Pakistan could not achieve the target of halving hunger and poverty by 2015. Now Pakistan is also a signatory of SDGs' which bound countries to achieve "zero hunger" goal by 2030. (Lewis & Lee, 2016) narrated that nutritional food practices are costly and people are unaware about healthy choices. People who can afford healthy diets are more inclined towards fast foods and ready available foods which are not prepared by keeping in view the standardized food practices. This is because of the unawareness of the significance of healthy food. The authors concluded that there is a dire need to promote the healthy eating practices through media and public campaigns.

(Munialo, et al., 2023) described that food basket models have a conceptual origin in the research on public health, economic policy, and food security. In several developed countries like United Kingdom, Canada, New Zealand, Australia, and the United States, standard food basket models have been adopted to track the cost of healthy diet and welfare schemes designed by governments for public. These models generally rely on national nutrient intake guides to compose a list of foodstuffs that are essential as part of a healthy diet, after which the prices of these foodstuffs are determined relying on market information in order to determine the affordability and prices as well as affordability among the different socioeconomic strata.

(Vermeulen, Meyer, & Schönfeldt, 2023) discussed that mainstream of recent literature is comprised of the healthy diet approach and to determine whether healthy diets are affordable are not they used this framework in South Africa and Kenya. The authors have combined demographic information, national dietary recommendations, food market prices data, and the level of household income to build a representative food basket of a four-member family. Its findings revealed that simple healthy food baskets were out of reach of more than 60 per cent of households in the two nations, demonstrating how far dietary recommendations are off the economic reality. It is worth noting that the researchers suggested more plant based food instead of meat options to decrease expenditures, and then basket prices have decreased by about 15 percent and became affordable.

(Balvert, Koenen, Geelen, & Fleuren, 2024) narrated that the standardized definitions of a healthy diet based on governmental guidelines or by international entities such as the World Health Organization (WHO) and the (FAO) are used in studies. But these guidelines are based on scientific facts, they are not universally context-based especially in countries where the food culture and income distribution are not equal. Therefore, standard guidelines or food bundles cannot be replicated in all countries.

(Hayat, Alotaibi, Mustafa, Nayak, & Naeem, 2024) concluded that food basket models are not well-researched in Pakistan. Government programs such as the Benazir Income Support Programme (BISP), Sassti Roti Scheme and other food programs overlooked nutritional elements and focus is only made on accessibility of food. There is not a single program that focus on nutritional or economic sustainability of dietary requirements. Furthermore, adaptation of FAO-based dietary guidelines has remained inadequate in country, where food preferences are highly influenced by the local agricultural produce and social stratification of income.

(Herforth, et al., 2024) discussed that cost of healthy diet is much higher in developing countries. People are starving for food without considering the quality of food. Healthy diets are the concept which people can adopt only if they have enough food choices in form of affordability and accessibility. Issues of malnutrition and stunning growth are common in developing countries. People feed their children to satisfy the hunger nit for better growth and nourishment.

² <https://www.un.org.pk/fao/>

(Headey, Hirvonen, & Alderman, 2024) investigated that poor diets are effecting the mental health and behavior of the people. There are economic and non-economic barriers in achieving food security but for many decades research is made on economic barriers without considering the non-economic barriers like nutritional element, eating pattern and food preferences etc. Though affordability is also a huge issue but availability of nutritional food and affordable cost is more important issue and need to be addressed at first. FAO, WFP and World Bank all are focusing to eradicate hunger from all over the world. But eradication of hunger without utilization and sustainability will not bear fruit in long run. Therefore, efforts are need to be made to achieve nutritional security instead of only food security.

(Lindsey, 2024) explored that agricultural production, cultural identity and prices strongly influenced the food preference in South Asian countries like Pakistan but are usually not considered in food models and food programs. Now several countries are trying to build food baskets based on national nutrition recommendations and scholars have also spoken increasingly about evidence-based and situation-specific dietary choices. The authors concluded that the introduction of dietary food at the community level must be based on real food consumption patterns and the food bundles must contain more of the foodstuffs that people consume to make food baskets more realistic and practical.

Methodology

This study used secondary data to develop customized basic and economical food basket. The data for the development of food basket was collected from secondary sources like data of prices, household size and income of the household was obtained from Household Integrated Survey (HIES) and Bureau of Statistics Punjab (BoS) 2024. The data of food preferences, serving units and nutritional value was obtained from, WHO, FAO and MoP-Nutrition Section.

Description of Variables

i. Food preferences

Every region or country has different eating habits and consumption pattern. Major staple food of one country or region can be a second staple food of any other country. Eating patterns of any community or country mostly depends upon the food production of that country (Rehman, Khattak, Israr, & Hashim, 2021), (Hayat, Alotaibi, Mustafa, Nayak, & Naeem, 2024). In this study, food preferences means eating pattern of people living in Punjab.

ii. Household size

Household size means the number of individuals living under one roof and sharing the income and all expenditures including food expenses. It is composed of total number of individuals living in one house. (Hayat, Mustafa, Alotaibi, Nayak, & Naeem, 2023). The data of average household size of Punjab is obtained and used in this study.

iii. Serving unit

Serving unit means the amount of any food required to an individual at one time (Hayat, Mustafa, Alotaibi, Nayak, & Naeem, 2023). The data of defined single serving unit is obtained and used in this study.

iv. Prices

Prices are the amount of money paid for the consideration or paid for the value of any commodity. Prices are mostly determined by the market forces or set by the governments for the goods of basic necessities including food items (Mahmood, Kumar, Ali, & Naeem, 2023). The average price data of the selected food items is obtained and used in the study to determine the cost of food basket.

v. Income of the households

Minimum income is determined by the governments in all around the world. This initiative help in

reduction in poverty and hunger items (Mahmood, Kumar, Ali, & Naeem, 2023). The data of average income of the households is obtained and used in the study to assess the affordability of food basket.

Results

Table: 1 Household Size in Punjab, Pakistan

Country-Province	Variables	Characteristics	Literature Source
Pakistan-Punjab	Household Size	The average family size in Punjab is 5.78 members, rounded up to 6 member-household.	HIES
	Household Composition	Breakdown by age is 2 adults and 4 children.	HIES

Source: Household Integrated Economic Survey

Table1 shows that in Punjab average household size in Punjab is six family members consist of two adults and four children. This information helps in development of food basket for an average household.

Table 2: Composition of the Customized Basic & Economical Food Basket (BEFB)

Food Groups	Literature Information	Literature Sources	Food Items included in BEFB
	Most Popular Food Items in Punjab, Pakistan ³		
Grains and Cereals (Starch-rich food items)	Wheat>Rice>Maize(Corn)> Barley	MoP, HIES	Wheat, Rice
Vegetables	Traditional Vegetables> Potatoes>Tomatoes> Onions> Carrots	MoP, HIES	Seasonal Vegetables, Potatoes, Onion, Tomatoes
Legumes	Chickpea>Mungbeans>Redlentils, >Blackgrams>Beans>Groundnuts	MoP, HIES	Chickpea, Mungbeans, Red lentils
Meat, Fish & Eggs	Mutton>Chicken>Beef>Eggs>Fish	MoP, HIES	Mutton, Chicken, Eggs
Dairy	Milk>Yoghurt>Butter>Cheese	MoP, HIES	Milk, Yoghurt
Fruits	Banana>Oranges>Mango>Guava>Dates> Melon>Others	MoP, HIES	Banana, Oranges, Mango
Fats/Oils, Sugar, Spice (Other)	Palm Oil>Ghee>Sunflower Oil>Canola Oil> Soybean Oil >Mustard Oil>Olive Oil =Sugar, Spice	MoP, HIES	Palm Oil, Ghee Sunflower Oil, Canola Oil, Sugar, Spice

Source: Author's calculation of customized BEFB on the basis of available data

The above Table No.2 shows the food items which are commonly used by the population of Punjab. Food items are given in order of importance and consumption. Last column shows the customized food items of BEFB. These food items fulfill all the requirement of daily meals for an average household in Punjab. Food items which are included in BEFB are of daily use by the majority of the common population of Punjab.

³ Presented in Order of Importance and consumption

Table.No.3: Quantities of Food Items (BEFB) Required for Six Members Household for One Month

Food Groups	Punjab BEFB Food Items	Daily Requirement/ Consumption (Per Person/ Per Day) ⁴	Quantity Per Month (Kg/Liters)	Frequency of Use
Grains and Cereals	Wheat, Rice	(0.34 kg) (100 grams rice)	62 kg (Flour), 5 kg (Rice)	Daily (flatbread, meals)
Vegetables	Seasonal Vegetables, Potatoes, Onion, Tomatoes	100-150 grams	30 kg (combined)	Daily
Legumes	Chickpea, Mungbeans, Red lentils	70-100 grams	4.5 kg (combined)	2-3 days/week
Meat, Fish & Eggs	Mutton, Chicken, Eggs	62 grams, 1 egg	4 kg (Meat), 6 dozen (eggs)	2-3 days/week
Dairy	Milk, Yoghurt	(360 grams or 0.36 liter Milk) 34.84 gram Yoghurt	65 Liter (milk), 6.5 kg (Yogurt)	Daily
Fruits	Banana, Oranges, Mango	187 gram/ (2 Bananas)	4 dozen (bananas), 9 kg (others)	2-3Days/week
Fats/Oils, Sugar, Spice(others)	Palm Oil, Ghee Sunflower, Oil, Canola Oil, Sugar Spice (others)	65.7 gram or 0.0657 liter Oil 25-36 gram Sugar	12 Kg or 12 liters, 6 Kg Sugar, 1 Kg Spice (Others)	Daily as Staple for Cooking

Source: Author's own calculation on the basis of data

The above Table No.3 shows per person/per day required quantities of food basket items. On the basis of that per month required quantities are calculated for an average household of six family member. Frequency of use is also given in the last column of the table.

This food basket ensures that the household consumes adequate levels of staple foods such as wheat and lentils. Only required level of animal protein and adequate levels of micronutrients obtained through dairy, fruits, and vegetables and that total expenditure does not exceed manageable and affordable levels. The basket contains a balanced intake of calories as well as nutrients and relies extensively on inexpensive but nutrient-dense foods like grains, legumes, and dairy.

Nutritional Analysis

To determine whether the proposed food basket would be nutritionally adequate, the level of macronutrients and micronutrients was calculated based on the customized BEFB.

Caloric and Macronutrient Coverage:

- The total daily energy: ~14,400- 15,600 kcal in the household (2400- 2600 kcal per person).
- Protein: The basket contains protein, which consists of legumes, dairy, and meat, meeting 100 percent of daily dietary needs.
- Fat: Basket contains healthy fats which are essentials for human health and are recommended by the MoP and World Health Organization (WHO).

⁴ MoP-Nutrition Section

- Carbohydrates: Wheat, rice, and potatoes are major sources of carbohydrates in the basket, constituting almost 45 to 65 percent of total daily energy intake (Mantantzis, Schlaghecken, Sünram-Lea, & Maylor, 2019).

Micronutrient Coverage:

The presence of dairy, lentils, vegetables, and fruits implies that the basket covers a high percentage of the daily needs of:

- Calcium (yogurt and milk),
- Iron and Folate (lentils and green vegetables),
- Vitamin A and C (vegetables, mangoes, and citrus fruits),
- Whole wheat and legumes (Zinc and Magnesium) (Stephen, Manoharan, & Radhakrishnan, 2023).

The basket includes all necessary micro and macronutrients rich foods, and the overall diet is declared nutritionally sufficient according to the dietary guidelines.

Cost Estimation of the BEFB

The cost of the suggested basket is based on average retail prices provided by the BOS Punjab, 2024. Cost of BEFB for one month is given below.

Table No.4: Estimation of Monthly Cost of BEFB for Six Members Household

Food Group	Estimated Cost (PKR)
Grains (Wheat Flour, Rice)	3250
Vegetables	2400
Legumes	603
Meat (2kg Mutton, 2kg Chicken), Eggs	2808
Dairy (Milk, Yogurt)	6175
Fruits	1222
Fats/Oils, Sugar, Spice (Others)	2476
Total Monthly Cost	Rs. 18,934

Source: Author's own calculation based on data of prices (BOS Punjab, 2024)

The overall budget of a food basket with average prices for a six member household is found Rs. 18,934 per month. The largest percentage is found for grains, meat and dairy as consumption of these food items is high in the province of Punjab.

Affordability Assessment

Table No.5: Affordability Assessment

Income Group	Monthly Income (PKR)	Consumption on food, Beverages	% of Income Spent on Food Basket Items	Population living in Punjab in Percentage ⁵	Affordability of BEFB
Average Rural Household	Rs 34,520	37%	36% (Rs.12,420)	RA=63.60%	100% (If cost of grains and dairy is excluded as home-based products)
Average Urban Household	Rs 53,010	37%	36% (Rs.19,084)	UA= 34.60%	100%

Source: Author's own calculation based on the data of Households' income and consumption

⁵ RA=Rural Areas, UA=Urban Areas

The above table shows that average household income in urban and rural areas separately. As per data of HIES average percentage of monthly consumption on food is 36% while 1 % is on alcoholic beverages and tabaco etc. Therefore affordability assessment is compared with 36% of total income. Table shows that in rural areas household spend Rs. 12,420 of their income on food while in urban areas household spending of income on food is calculated Rs. 19,084. As the cost of monthly BEFB is calculated Rs. 18,934 so in urban areas 100% household can afford this basket. In rural areas people spend Rs.12,420 on food which is less than the estimated cost of BEFB and depicts that rural population which is 63.60% can't afford this food basket. But in rural areas household have their own home based grown grains and possess livestock for their daily need of dairy items like milk and yoghurt. Therefore, they did not have to pay for these two food items from food basket. By excluding the cost of these two items, monthly cost of BEFB is calculated Rs.9509 for rural population. Hence, 100% of rural household can afford this BEFB which fulfills their dietary needs and nutritional requirement for a healthy life. The customized BEFB is developed as per the eating pattern of the people of Punjab and included food items are locally available and acceptable by all communities. Cost and affordability assessment as per the required quantities made this basket different and novel from all previous studies in which only generic and broad nutritional guidelines are given without taking into account the local availability and affordability. By summing up all above, it is concluded that customized BEFB is not only economical, affordable and acceptable but also fulfills the dietary guidelines given by FAO for better nutrition and health, consequently nutritional as well as food security will be enhanced.

Conclusion & Policy Recommendations

The food basket developed in this research contains a balanced source of macronutrients and micronutrients of essential minerals and vitamins in line with the usual eating patterns of Punjabi families. The model presents commonly consumed and culturally suitable food items like wheat, lentils, vegetables, milk, eggs which boosts the acceptability and convenience of the basket. Determination of nutrition revealed that the basket covered 100 percent of the recommended protein and calories intake, and included a great share of micronutrients like calcium, iron, and vitamin A. Findings of the study are align with previous global and international literature regarding food baskets, which focus on the practicality of context-specific and culturally sensitive dietary frameworks (Vermeulen, Meyer, & Schönfeldt, 2023).

The implementation of this BEFB needs some specific policy interventions. There is strong possibility that income of some households will be low from average income. The cash support programs may increase the buying capacity of households but they need to be supported with provisions of food such as wheat flour, pulses, and subsidies milk so that the prices of these products are brought down to reach all. Furthermore, including customized BEFB in any public feeding initiatives like school lunch programs or physical support for deserving families, may positively affect the dietary habits of the vulnerable and poor communities. The governments can also use the model as a reference to the poverty line level or minimum consumption level in Punjab. On the basis of the findings if the study, following policy recommendation are suggested.

1. Introduce Targeted Food Subsidies

The items that are cost drivers of basic food baskets like wheat flour, meat, milk, and cooking oil, should be subsidized especially among the low-income households and rural households. This model can be incorporated into utility stores run by governments and food vouchers can be issued to poor households for subsidized food items that are essential and included in BEFB.

2. Integrate the Basket into Social Safety Net Programs

This food basket could be used to develop the standard school feeding programs, maternal health projects, and conditional cash transfer schemes. This is to make sure that such interventions are nutritionally in synchronization with local diets and are based on affordability parameters.

3. Use the Basket as a Poverty and Nutritional Benchmark

Food security scale and poverty line in Punjab should be measured on the BEFB. The transformation to nutrition-based measures will give a true picture of poverty and the real cost of living.

4. Promote Seasonal and Plant-Based Dietary Alternatives

To lessen the cost burden and make the BEFB more flexible, seasonal produce should be promoted, along with the less expensive sources of protein like (legumes) through increased public awareness. This transition can be supported and promoted by both in media and schools so that the target of nutritional health can be achieved without upsetting cultural inclinations.

Final Reflection

Food basket developed in this study is socially acceptable and full of nutrition. It is helpful for policy makers to devise policies for food security. Inflation is assumed to be constant in this study while measuring cost and affordability, but it can be adjusted in future studies by other researchers. Furthermore, the food basket is developed for adults and an average household. It can be adapted for other income and age groups and also can be replicated in different regions of the country by making slight adjustments to reflect local tastes and cultural preferences in future studies.

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