

# Food and Nutrition: Is the Meal Balanced?

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**Abstract**—Food is important for livelihood irrespective of age, gender, condition of health and income level. However, mere consumption of food is not sufficient for healthy and sustainable lifestyle, it is vital that human beings know what they are consuming in the form of food. Here what is being referred to is nutrition and not only food. Consumption of nutritious food is of paramount importance so as to ensure balanced intake of vital nutrients in the body. Considering the importance of creating awareness amongst people on food and nutrition, Indira Gandhi National Open University (IGNOU) has been offering a number of programs focusing on this crucial aspect of human life. This includes a basic certificate level program namely, “Certificate in Food and Nutrition (CFN)” which is a popular program amongst people of all eligible age groups.

The present research is an effort to make an assessment of the awareness amongst the enrolled students towards food and nutrition. The program has been selected for study in view of fairly large enrolment in this program during the last five years, the crucial space that this subject area occupies in the life of an individual, growing lifestyle transformations, stressful surroundings, health disorders, radical changes in the food habits of the people in urban areas, etc. It is one of the very popular programs indicating the fact that the people in general are inclined to learn about nutrition and nutrients in the food that is being consumed in day to day life. This study is based on primary data collected through an online survey wherein the questionnaire has been administered to around 1920 learners to know their level of awareness towards importance of nutrients and balanced diet for sustaining a healthy life. On the basis of the responses received, this paper will highlight the challenges faced by educational institutions in undertaking efforts for creation of awareness amongst the people on this vital aspect of life.

**Keywords:** Food, nutrition, balance diet, nutrients, health, lifestyle, sustainability.

## 1. INTRODUCTION

Food and nutrition is the cornerstone of life and good health. Food is basically any nutritious element living beings consume for maintaining life and livelihood. So here when food is defined, it is important to underline and understand the most vital aspect of this word “food”. It refers to not only any substance that living being consume but it actually points to

the nutritious constituents existing in food for the purpose of daily intake.

It is this crucial characteristic of food that has drawn the attention of scientists, educationists, nutritionists, dieticians, and even governments across the globe to research on various aspects of food and nutrition. Efforts are also being made by all the nations including India to make people aware of what they actually eat and ideally what they should eat, what should be the constituents of food that is being consumed and what needs to be avoided. Food and the kind of nutrients existing in the food being consumed in daily life has a major role to play in the life cycle of human beings, their day to day activity, their health conditions and ultimately their contribution to the national growth and development. Since substantial amount of expense is incurred on food by every family, it becomes all the more pertinent that they should be aware whether the food consumed by them contains all the basic nutrients that are essential for healthy life.

In view of the pivotal role played by food and nutrition in the daily life of people and the growing need to create awareness amongst people on food and nutrition, Indira Gandhi National Open University (IGNOU) has been offering a number of programs focusing on this essential aspect of human life such as “Certificate Program in Food Safety”, “Certificate Program in Nutrition and Child Care”, “Diploma Program in Nutrition and Health Education”, “Master of Science Degree in Dietetics and Food Service Management”, and “P.G. Diploma in Dietetics and Public Nutrition”. This includes a basic certificate level program namely, “Certificate in Food and Nutrition (CFN)” which is a popular program amongst people of all eligible age groups.

## 2. THE PROGRAM: AN OVERVIEW

The program “Certificate in Food and Nutrition (CFN)” offered by IGNOU is a six-months Certificate level basic program, meant to make the people aware of the nature and kind of nutrients present in varying types of food, what are the fundamental requirements of a human body during the span of life, effect of consuming inappropriate quantity and food with imbalanced constituents, and how the food can be made

healthier by selecting right kind of ingredients and also cooking them in the right and healthy way.

The program has three subjects, namely, “You and Your Food”, “Your Food and its Utilization”, and “Economics of Food”. The first subject “You and Your Food” delves in detail on three vital aspects of food and nutrition i.e. Food Groups, Nutrients and their Functions, Food Choice and Preparation, and Process of Food Selection and Preparation. The second subject “Your Food and its Utilization” focuses on How to meet the nutritional requirements of the body, Assimilation of Food and Effects on Growth and Activity, and Nutrition of Mother and Child, Nutrition from School Age to Old Age, and Nutritional Status, Food Habits and Food Misconceptions. The third subject highlights on Food Budgeting, Agricultural Production and Distribution, Governmental Policies and Programs, and Protection, Safety and Consumer Education.

The present research is an effort to make an assessment of the awareness amongst the enrolled students of CFN program towards food and nutrition. The program has been selected for study in view of fairly large enrolment in this program during the last five years, the crucial space that this subject area occupies in the life of an individual, growing lifestyle transformations, stressful surroundings, health disorders, radical changes in the food habits of the people in urban areas, etc. It is one of the very popular programs indicating the fact that the people in general are inclined to learn about nutrition and nutrients in the food that is being consumed in day to day life.

The following sections highlight on the methodology adopted for this research study, a comprehensive presentation and discussion on the research results and the inferences of the study that charts the future path of study on this important area of research.

### 3. RESEARCH METHOD

As already stated in the aforesaid section, this research study is an attempt to make an assessment of the awareness amongst the enrolled students of CFN program towards food and nutrition. For this purpose, a total of 1920 CFN students of two sessions of 2018 (January and July) and one session of 2019 (January) from Regional Centre Noida were selected as research units. Considering the large sample size and how geographically dispersed these learners are, it was decided to use an online questionnaire for getting their responses on various facets of food and nutrition. Due to paucity of time, repeated reminders could not be sent and therefore responses were received from 486 (25.31%) student respondents of CFN program. These responses were classified on the basis of their gender and location so as to ascertain the difference in awareness level amongst male and female respondents and urban and rural respondents.

The ensuing section gives a detailed analytical insight into the awareness level of the students who have either already

completed or are pursuing the program on food and nutrition. The analysis and interpretation of data has been done by classifying the questions into four similar groups, namely, physiological function of food; food and its nutrients; constituents of food; and the diseases caused due to deficiency of particular nutrients in food.

### 4. IS THE MEAL BALANCED?: AN ANALYSIS

The researchers in this section have attempted to analyze the primary data collected by classifying the questions in the questionnaire in four different groups, each highlighting a salient aspect of food and nutrition. From the Table 1 below, it is evident that the student respondents have varied awareness level for different characteristics of food and nutrition which varies as per their gender and also the location/area where they are based.

**Table 1: Responses of the CFN learners on Food and Nutrition**

Q. No.	Correct Response					Total Correct Response (in %)
	Total correct response (in no.)	Male (in %)	Female (in %)	Urban (in %)	Rural (in %)	
1	409	59.4	40.6	53.5	46.5	84.16
2	196	53.3	46.7	52	48	40.33
3	315	54.6	45.4	53.2	46.8	64.81
4	158	57	43	52.4	47.6	32.51
5	149	52	48	56.8	43.2	30.66
6	378	55.3	44.7	52.6	47.4	77.78
7	326	54.2	45.8	55.7	44.3	67.08
8	423	59.1	40.9	51.2	48.8	87.04
9	245	52.7	47.3	52.3	47.7	50.41
10	389	51.8	48.2	54.6	45.4	80.04
11	276	58.7	41.3	53.1	46.9	56.79
12	269	52.1	47.9	55.6	44.4	55.35
13	428	61	39	59.1	40.9	88.07
14	456	49.3	50.7	52.6	47.4	93.83
15	312	59.8	40.2	53.2	46.8	64.20

#### 4.1 Physiological Function of Food

Considering the importance of consuming the right nature and kind of food, in correct quantity coupled with standard quality, the responding students were asked about the physiological functions of food such as the factors influencing the choice of food and its level of acceptance; the physiological functions of food; functions of nutrients available in food such as the function of fats in food for human beings; components most abundant in the human body; and variance of energy requirement in different stages of a human being. The responses received to these questions (Table 2 and Figure 1) reveal that only 32.51% of the respondents were aware of various physiological factors influencing food, out of which 57% were males and 43% were females, and students in urban areas (52.4%) were more aware than those in rural areas (47.6%). Similarly, it was also seen that only 30.66%

respondents were in the know of physiological functions of food, in which again male respondents (52%) were more aware than female respondents (48%) and students in urban areas (56.8%) responded correctly in comparison to 43.2% students in rural areas.

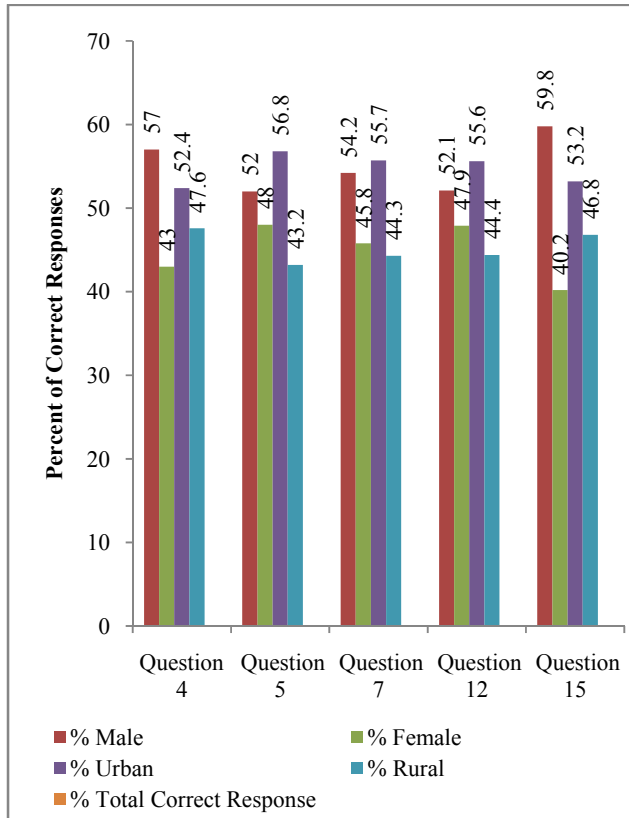


Figure 1: Physiological Functions of Food

Feedback was also taken on knowing their awareness of the various functions of nutrients available in food such as that of fat. In this aspect again males (54.2%) and urban (55.7%) gave correct responses. The responses were similar in case of questions related to components of human body and variance of energy requirement in different stages of life. All these five aspects point to the fact that male respondents and the respondents in urban areas are more aware about the physiological functions of food. A significant facet emerges from the aforementioned analysis and that is although females have the major role in planning the daily meals in a household but they are less aware of the physiological functions of food content and nutrition. Thus, there is a need for creating more awareness amongst the women in India on these aspects of food and nutrition. Table 2 represents the responses received in this context.

Table 2: Responses on Physiological Functions of Food

Q. No.	Correct Response					Total Correct Response (in %)
	Total correct response (in no.)	Male (in %)	Female (in %)	Urban (in %)	Rural (in %)	
4	158	57	43	52.4	47.6	32.51
5	149	52	48	56.8	43.2	30.66
7	326	54.2	45.8	55.7	44.3	67.08
12	269	52.1	47.9	55.6	44.4	55.35
15	312	59.8	40.2	53.2	46.8	64.2

#### 4.2 Food and its Nutrients

In the next section, the students were asked about the food and nutrients available in the food consumed. The responses received to these queries are presenting a mixed picture and they too are indicative of the facts that here again males are more aware of the nutrients available in the food than the female and the urban population is better equipped with the knowledge in this regard. Table 3 portrays the clear picture on this pivotal issue of food and nutrition.

Table 3: Responses on Food and its Nutrients

Q. No.	Correct Response					Total Correct Response (in %)
	Total correct response (in no.)	Male	Female	Urban	Rural	
3	315	54.6	45.4	53.2	46.8	64.81
6	378	55.3	44.7	52.6	47.4	77.78
9	245	52.7	47.3	52.3	47.7	50.41
11	276	58.7	41.3	53.1	46.9	56.79

As is evident from the Table 3 above, 54.6% males were aware of the nutrients which are a part of food in comparison to only 45.4% females, and 53.2% students living in urban areas were aware in contrast to 46.8% students in rural areas. Likewise, 55.3% males and 52.6% students in urban areas responded correctly to the question on what are the examples of micronutrients available in food. It was observed that the more number of males (52.7% and 58.7% respectively) knew about the various kinds of food groups and categories of beverages as compared to the female students (47.3% and 41.3%). Here again, the learners in urban areas had better knowledge of these factors as compared to that of rural areas. This can also be seen in the Figure 2 below.

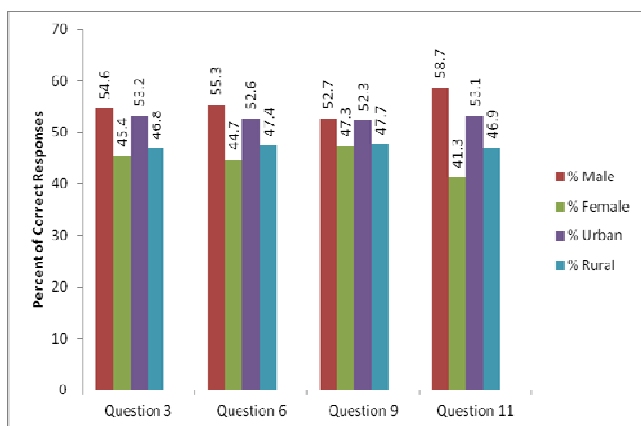


Figure 2: Awareness of Food and Nutrients

4.3 Constituents of Food:

This segment of the paper deliberates upon the crucial subject matter related to constituents of food. Here the participating respondents were asked about the four vital elements available in food i.e. food rich in Vitamin C, what are nutrients in food, the important source of Vitamin A and what do yellow fruits contain as principal constituent, and the responses so received have been depicted in Table 4 and Figure 3 below.

Table 4: Responses on Constituents of Food

Q. No.	Correct Response					Total Correct Response (in %)
	Total correct response (in no.)	Male	Female	Urban	Rural	
1	409	59.4	40.6	53.5	46.5	84.16
2	196	53.3	46.7	52	48	40.33
8	423	59.1	40.9	51.2	48.8	87.04
10	389	51.8	48.2	54.6	45.4	80.04

Although the responses received in this section of the questionnaire again demonstrate the fact that male learners are more aware of these aspects related to constituents of food, however more percentage of females responded correctly to this section of the questionnaire, denoting the fact that they are better aware of this aspect of food and nutrition as compared to other facts of this subject under study. But when the responses of urban and rural learner participants are analyzed, it is observed that they are similar to those responses received in the earlier sections of the research study, indicating the fact that there is a dire need to create more awareness amongst the people in rural areas about the various dimensions of food and nutrition, knowledge of food and its implications on health and constituents of food they consume so that the contents of day to day food consumed by them can be enriched, meaning

thereby, enhancement in their level of health conditions directly impinged by the food intake. Specifics about the responses received can be studied from Table 4 above.

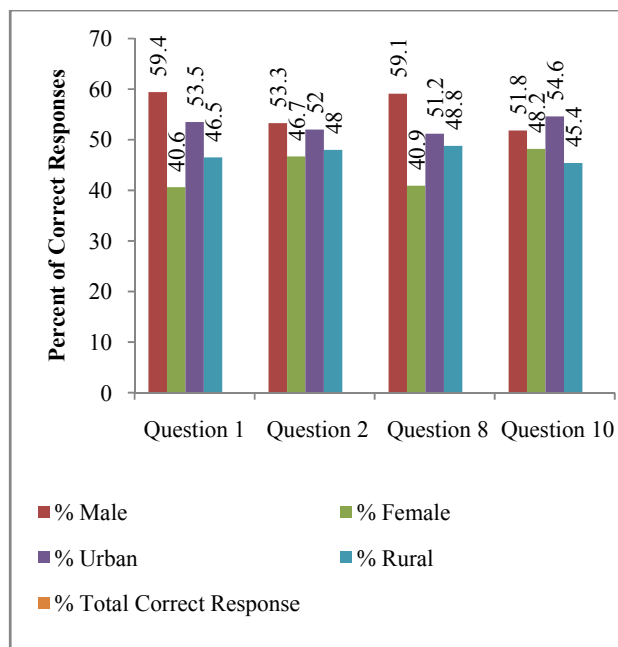


Figure 3: Feedback on Constituents of Food

4.4 Deficiency of Nutrients in Food and Related Diseases:

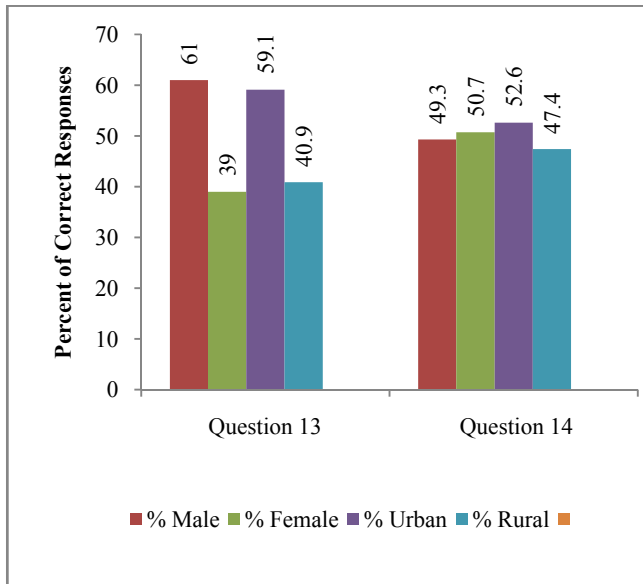
The fourth and final section of the study delves upon one of the most critical areas of study on food and nutrition i.e. the diseases that can be caused in human beings in case of deficiency of a particular nutrient in the body. The data pertaining to this crucial factor of food and nutrition is illustrated in Table 5 below.

Table 5: Responses on Diseases caused by Deficiency of a Nutrient in the Human Being

Q. No.	Correct Response					Total Correct Response (in %)
	Total correct response (in no.)	Male	Female	Urban	Rural	
13	428	61	39	59.1	40.9	88.07
14	456	49.3	50.7	52.6	47.4	93.83

As can be seen from the Table 5 and Figure 4 here, there is a significant change in the pattern of responses received so far. Although the awareness level in this aspect amongst the rural population remains similar to that of the earlier sections in this research study, but the responses received from females to questions such as causes of anaemia and the nomenclature for the state of insufficient supply of essential nutrients was indeed encouraging, pointing to the fact that the female

participating learners were aware of the vital aspect of food and nutrition.



**Figure 4: Awareness on Diseases Caused by Deficiency of Nutrients in Food**

Therefore, adequate and timely education and training on these factors to women in the families irrespective of their place of dwelling can help in ameliorating the quality of contents of food being prepared in the households in the country thus contributing to better health of the children nurtured by them.

**5. SUMMARY AND CONCLUSION**

The present research study proves and points to an important aspect on the awareness level of people related to food and nutrition. Evidently, the learners of the program are quintessentially aware of the varying dimensions of food and nutrition, ergo there is variance in the level of awareness amongst male and female participating learners and also amongst the rural and urban people. However the brighter facet of this study emerging here is the fact that there exists awareness which only needs to be further enhanced.

Concerted efforts by way of initiatives are required to be embarked upon by the institutions at national as well as regional level so as to further improve the awareness of people at grassroots level towards food, nutrients, balanced diet, and healthy regimen for life full of vitality and vigour. It is also essential that such educational programs are made mandatory for the youth in all educational institutions and also as a part of adult education so as to ensure holistic and sustainable development of a healthy nation.

**REFERENCES**

[1] Report on Nutrition, Geneva: World Health Organization; 2019. <https://www.who.int/topics/nutrition/en/>, accessed on 3<sup>rd</sup> March 2019.

[2] Definition of Food <https://en.wikipedia.org/wiki/Food>, accessed on 15<sup>th</sup> March 2019.

[3] Healthy Diet: Key Facts, Geneva: World Health Organization; 2018, <https://www.who.int/en/news-room/fact-sheets/detail/healthy-diet>, accessed on 15<sup>th</sup> March 2019.

[4] Guideline: Sugars intake for adults and children. Geneva: World Health Organization; 2015.

[5] Guideline: Sodium intake for adults and children. Geneva: World Health Organization; 2012.

[6] Comprehensive implementation plan on maternal, infant and young child nutrition. Geneva: World Health Organization; 2014.

[7] Global action plan for the prevention and control of NCDs 2013–2020. Geneva: World Health Organization; 2013.

[8] Guideline: Potassium intake for adults and children. Geneva: World Health Organization; 2012.

[9] Food & Nutrition Overview, <https://www.healthline.com/health/food-nutrition#good>, accessed on 20<sup>th</sup> March 2019.

[10] Levin, Robert E., “A Look to the Future Regarding Present Food Concerns”, in Journal of Food and Nutrition, <http://www.jscholaronline.org/full-text/JFN/e101/A-Look-to-the-Future-Regarding-Present-Food-Concerns.php>, September 2014, accessed on 20<sup>th</sup> March 2019.

[11] Niyogi, M., “Vegetarian Diet: A Preventive for Mental Diseases”, Journal of Food Nutrition and Health, Vol. 1(1), 2018, <http://www.alliedacademies.org/articles/vegetarian-diet-a-preventive-for-mental-diseases-9796.html>, accessed on 19<sup>th</sup> March 2019.

[12] Sam Abraham, Brooke R. Noriega, Ju Young Shin, “College Students Eating Habits and Knowledge of Nutritional Requirements”, Journal of Nutrition and Human Health, Vol. 2(1), 2018, <http://www.alliedacademies.org/articles/college-students-eating-habits-and-knowledge-of-nutritional-requirements-9188.html>, accessed on 18<sup>th</sup> March 2019.

[13] CFN Programme Guide, Delhi: IGNOU; 2013, <http://www.ignou.ac.in/ignou/aboutignou/school/soce/programmes/detail/244/2>, accessed on 5<sup>th</sup> March 2019.

**1. Annexure (The Questionnaire)**

1. Two common food rich in Vitamin C are:
  - a. Orange and Banana
  - b. Banana and Grapes
  - c. Orange and lemon**
  - d. None of the above
2. Nutrients are ..... Of food:
  - a. Constituents**
  - b. Parts
  - c. Determinants
  - d. None of the above
3. Which of the following is not a part of nutrients available in food:

- 
- a. Protein and carbohydrates  
b. Fats  
c. Minerals and vitamins  
**d. Uric acid**
4. Which one of the following is not a physiological factor influencing food acceptance:  
**a. Culture**  
b. Hunger  
c. Age  
d. Characteristics and sensation of food
5. Which of the following is a physiological function of food:  
**a. Growth and development**  
b. Hunger  
c. Social relation  
d. Hospitality
6. An example of micronutrient is:  
a. Carbohydrates  
b. Water  
**c. Vitamins**  
d. None of the above
7. Which one of the following is not a function of fats:  
a. Source of energy  
b. Insulation  
**c. Palatability**  
d. Growth
8. Source of vitamin A is:  
a. Soya bean  
b. Sunlight  
c. Citrus fruits  
**d. Green leafy vegetables**
9. How many kinds of food groups are there:  
a. 4  
b. 10  
c. 6  
**d. 3**
10. Yellow fruits are rich in :  
**a. Vitamin A**  
b. Protein  
c. Vitamin D  
d. None of the above
11. Beverages can be classified into how many categories:  
a. 5  
b. 4  
**c. 3**  
d. 9
12. The most abundant component of human body next to water is:  
a. Carbohydrate  
**b. Protein**  
c. Fat  
d. Minerals
13. When there is an insufficient supply of essential nutrients, what occurs:  
**a. Under nutrition**  
b. Over nutrition  
c. Malnutrition  
d. Excessive nutrition
14. Deficiency of Iron causes:  
**a. Anaemia**  
b. Beri beri  
c. Goiter  
d. Kwashiorkor
15. The energy requirement per kg body weight during infancy is higher than that of an adult's energy requirement.  
**a. True**  
b. False