



Assessment of Daily Food Intake in Allahabad District: A Geographical Analysis

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Abstract

Proper and adequate nutrition is essential for good health of men and women not only in urban areas but also in rural. The food behavior is directly related to nutritional and health status of individual. There is need of sufficient amount of nutrients in the form of daily diet for the maintenance of good health. Many factors, particularly socio-economic such as living condition and other factors related to dietary intake influence the nutritional status. Malnutrition causes increasing illness, morbidity and mortality as well as diminishing the quality of life (Antia,1989). In this present study an attempt has been made to analyse the socio-economic factors that influence the nutritional status and health of people living in Allahabad district. It is based on primary data collected through personal survey based on randomly chosen samples in the study area. Various statistical methods are used for analysis of the data. Study reveals that dietary intake is higher among respondents of general caste than the other caste. It is also observed that younger women diet intake is slightly better than older women.

Key Word: Assessment, consumption, food intake, nutritional status, malnutrition, meal,

Introduction

India has become self-sufficient in production of food grains after launching green revolution in 1970s. Despite all efforts under nutrition is still a serious problem especially faced in rural areas. While we are in the midst of combating these long-standing problems of under nutrition in children and women, a new situation has arisen. The World Bank has predicted that coronary heart disease will become the leading cause of premature death in India by 2015 and that the maximum number of diabetic patients in the world will be in India (Bulatao and Stephens, 1992). Nutrition deals with the digestion, absorption and metabolism of food that is nourishing the body. It is a science that refers to the relationship of food to the functioning of living organism. It includes the uptake of food, liberation of energy, elimination of wastes and all the processes of synthesis essential for maintenance, growth and reproduction (Pike and Brown, 1984). Food from where we get all nutrients such as carbohydrate, fat, protein, vitamins, minerals and water, does influence our health. However improper food intake not only responsible for ill health but also there are numbers of other factors also play an important causative role. Good health is a complete physical, mental and social well being and not merely the absence of disease or infirmity (World Health Organization, 1948). The major challenge in the field of nutritional sciences is to analyze how food insecurity interacts with poverty status to influence important health outcomes and overall quality of life. Poverty and low socioeconomic status have well-documented relationships to poor health status (Link and Phelan 1996). However balance diet meet our day to day nutrient requirements as well as provide an extra allowance of the nutrients to our body, which can be used in condition of stress. On the other hand malnutrition is result of deficiency, excess or imbalance of nutrients that provide improper growth

maintenance and repair to our body. At India level the number of meals eaten at home by household members had decreased by 0.57% in the rural areas between 1993-94 and 2004-05. In urban India popularity of home kitchen had declined by 1.66% over last ten years. Kerala, Tamil Nadu and Gujarat have nutritional levels that are almost 10% lower than the national average for rural areas while UP, Punjab, Haryana and Rajasthan have levels 10 to 20% higher (TOI) In rural India, a person belonging to the poorest 10% of population has a daily calorie intake of less than 1,724 Kcal, which includes 45g of protein and 24g of fat. At the other end, a person from the richest 10% segment consumes more than 2,531 Kcal every day, almost 47% more than the poor person. A similar chasm can be seen in protein and fat consumption too (TOI).

The consumer expenditure survey shows that the percentage share of food expenditure in total expenditure by Indian population was 55.0% in the rural areas and 42.5% in the urban areas. Relative to the comparable survey results for 1993- 94, the share of food expenditure has dropped by 8.2 and 12.2 percentage points in rural and urban areas respectively (NSSO, 2007).

Balance diet contains different types of food in such quantities and proportion that the needs for all the nutrients are adequately met and a small extra allowance are made as a margin of safety. However the nutrition requirement for men and women are varies due to difference in their body weight, body composition. It is imperatively requirement of balance diet and good nutrition during pregnancy and lactation as the expectant or nursing mother not only has to nourish herself but also growing foetus or the infant who is being breast-fed (Kumud et al., 2005).

Study Area

The district of Allahabad is extend between 24⁰47' N and 25⁰47' N latitudes and between 81⁰19' E and 82⁰30' E longitudes. It covers an area of 5,246 km². Allahabad district is in the southern part of Uttar Pradesh. The northern part of the district is in the Gangetic Plain and southern part is in Vindhyan Plateau. To its south and southeast is the Bagelkhand region, to its north and northeast is the Awadh region, and to its west along with Kaushambi it forms the part of Doab i.e. the lower Doab region. Allahabad District is surrounded by district Bhadohi and Mirzapur in the east, Kaushambi and Banda in the west, Pratapgarh and Jaunpur in the north and Banda and Madhya Pradesh are in the south. River Ganga and Yamuna flow through the district.

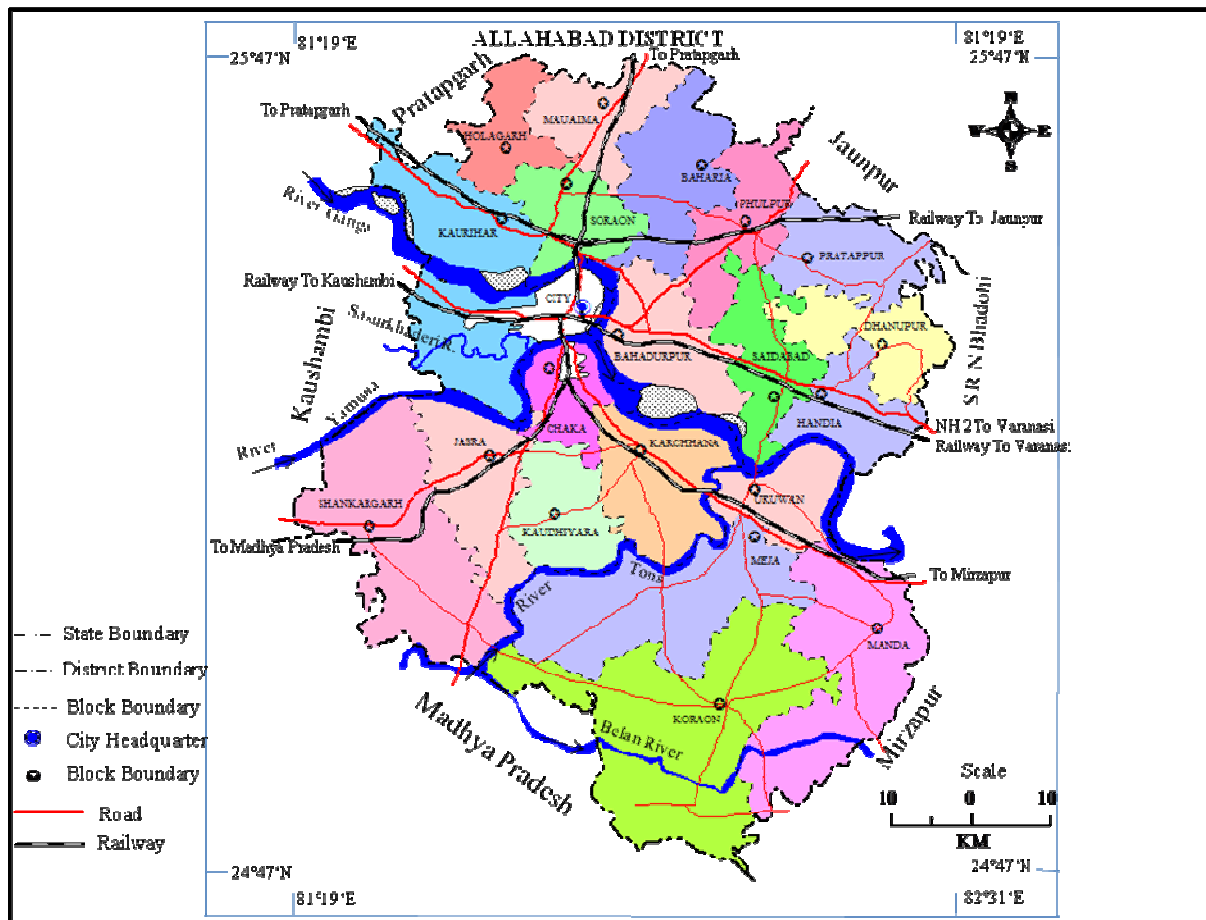


Figure 1. Location and Extend Map of Study Area

Objectives

The study aims to explore the present state of daily food intake status of Allahabad district. The main objectives of the study are as follows:

- To assess the food and nutrient intake among different age/caste/community/educational status wise in the rural communities.
- To identify the relationship between socio-economic status of people and their dietary behavior

Data Base and Methodology

Relevant literatures will be consulted from the different sources to collect literatures, reports, publications and articles based on the topic. The present study is based on primary data for the year 2014-15 which is obtained from questionnaire based survey of 800 respondents selected from 40 villages. Among the 20 blocks of Allahabad districts with a total rural population of 44, 81, 518 are covered under this quantitative study. In each block a simple purposive random sampling procedure was followed to select the respondents. For data entry and analysis; data entry package namely Statistical Package for Social

Sciences (SPSS- Version 20.0) has been used. The result of the survey have been compiled in the required format and compared with different indicators to understand the impact of the research.

Result and Discussion

Analysis of Nutritional Food Intake

The consumption of variety of nutritional food is essential for people’s healthy lifestyle. Adequate amounts of proteins, fats, carbohydrates, vitamins and minerals are required for a well balanced diet. Meat, fish, egg and milk as well as pulses and nuts are rich in protein. Green vegetables are rich sources of vitamins. Bananas is rich in carbohydrates Papayas, mangos and other yellow fruits containing carotene, which is converted to Vitamin A. Vitamin A is also present in milk products, as well as egg yolk (Gopalan et al., 1996, 1994). Nutrition and food intake are closely related to nutritional status and health of an individual. Adequate amount of nutrients in the form of daily diet are essential for the maintenance of health and good nutrition (Negi et al., 1995). It is often thought that Indians are eating better over the years - including more dairy products, eggs and meat, fruits and vegetables in their diet. A recent survey searched for evidence of this and came up with some strange, even worrying, conclusions. In the past two decades, Indians eating habits have changed while the nutritional level seems to be the same (TOI). Many factors, particularly socio-economic such as living condition and other factors related to dietary intake influence the nutritional status. This study highlights the daily food consumption trend among rural population of Allahabad district.

Food Behaviour of Respondents

To get information about the nutritional food status a question was asked from the respondents that ‘how often they consume various types of food (daily, weekly, sometime and never)’. In the study area people reported that they consume grains and cereals on daily basis and non-veg very often. From Table 1, out of total 800 respondents, 548 (68.5%) are using green vegetables daily while, 12.8 per cent sometime taking green vegetable in their meal and interestingly 12 (1.5%) respondents never take any green vegetable in their dietary habit.

Table 1. Food Intake by Respondents

Food Consumption	Daily		Weekly		Sometime		Never	
	No.	%	No.	%	No.	%	No.	%
Milk and Milk Product	506	63.2	96	12.0	132	16.5	66	8.2
Vegetable	548	68.5	138	17.2	102	12.8	12	1.5
Pulses and Beans	536	67.0	92	11.5	136	17.0	36	4.5
Fruits	138	17.2	264	33.0	340	42.5	58	7.2
Eggs	42	5.2	246	30.8	298	37.2	214	26.8
Chicken, Meat and Fish	00	0.0	184	23.0	324	40.5	292	36.5
Grains and Cereals	800	100	00	0.0	00	0.0	00	0.0
Junk and Other Foods	18	2.2	178	22.2	476	59.6	128	16.0

Source: Based on personal field survey, 2014-15

Similarly, 506 (63.2%) people use milk and milk products per day while 12 per cent consume it weekly, 16.5 per cent consume milk and milk product sometimes whereas, 66 (8.2%) respondents could not afford milk or milk products in their daily diet. A variety of seasonal fruits are not eaten everyday by majority of the people. This food item is consumed sometime (42.5%), weekly (33.0%) and daily basis (17.2%). Akin to fruits, in context of the consumption pattern of junk and other foods is pitiable. About 37.2 per cent respondents eat eggs sometime. In the case of chicken, meat or fish 324 (40.5%) consume it

sometimes. In the mean time 292 (36.5%) respondents mentioned that they never eat chicken, meat or fish. Although respondents who never consume any non-veg. items in Indian dietary system does not reveal true picture of non availability/affordability because the sizeable proportion of Hindu community respondents retain themselves not to consume meat like products due to the religious taboo.

Consumption of Food across different Social Groups

Table 2 provides caste wise food consumption pattern of respondents in study area. All respondents take grains and cereals daily but amount of other nutritionful food item in different quantity. According to table 2, out of total 800 respondents 506 were taken milk and milk product daily whereas, 66 (8.2 percent) respondents never take these products in their diet.

Table 2. Caste wise Food Consumption Pattern of Respondents

Food Consumption		Caste						Total		
		General		OBC		SC/ST		No.	%	
		No.	%	No.	%	No.	%			
Milk and Milk Product	Daily	254	70.9	168	57.5	84	56.0	506	63.2	$\chi^2 = 20.006^a$ P= 0.003 df = 6
	Weekly	39	10.9	35	12.0	22	14.7	96	12.0	
	Sometime	43	12.0	57	19.5	32	21.3	132	16.5	
	Never	22	6.1	32	11.0	12	8.0	66	8.2	
Vegetable	Daily	255	71.2	187	64.0	106	70.7	548	68.5	$\chi^2 = 13.194^a$ P= 0.040 df = 6
	Weekly	57	15.9	49	16.8	32	21.3	138	17.2	
	Sometime	42	11.7	50	17.1	10	6.7	102	12.8	
	Never	4	1.1	6	2.1	2	1.3	12	1.5	
Pulses/ Beans	Daily	229	64.0	205	70.2	102	68.0	536	67.0	$\chi^2 = 7.241^a$ P= 0.299 df = 6
	Weekly	51	14.2	27	9.2	14	9.3	92	11.5	
	Sometime	64	17.9	44	15.1	28	18.7	136	17.0	
	Never	14	3.9	16	5.5	6	4.0	36	4.5	
Fruits	Daily	76	21.2	46	15.8	16	10.7	138	17.2	$\chi^2 = 23.015^a$ P= 0.001 df = 6
	Weekly	110	30.7	106	36.3	48	32.0	264	33.0	
	Sometime	152	42.5	124	42.5	64	42.7	340	42.5	
	Never	20	5.6	16	5.5	22	14.7	58	7.2	
Eggs	Daily	15	4.2	15	5.1	12	8.0	42	5.2	$\chi^2 = 19.487^a$ P= 0.003 df = 6
	Weekly	100	27.9	98	33.6	48	32.0	246	30.8	
	Sometime	136	38.0	94	32.2	68	45.3	298	37.2	
	Never	107	29.9	85	29.1	22	14.7	214	26.8	
Chicken/ Meat /Fish	Daily	00	0.0	00	0.0	00	0.0	00	0.0	$\chi^2 = 18.561^a$ P= 0.001 df = 4
	Weekly	70	19.6	80	24.4	34	22.7	184	23.0	
	Sometime	131	36.6	119	40.8	74	49.3	324	40.5	
	Never	157	43.9	93	31.8	42	28.0	292	36.5	
Grains and Cereals	Daily	358	100	292	100	150	100	800	100	
Junk Foods	Daily	10	2.8	2	0.7	6	4.0	18	2.2	$\chi^2 = 9.174^a$ P= 0.164 df = 6
	Weekly	86	24.0	66	22.6	26	17.3	178	22.2	
	Sometime	207	57.8	173	59.2	96	64.0	476	59.5	
	Never	55	15.4	51	17.5	22	14.7	128	16	
Total		358	100	292	100	150	100	800	100	

Source: Based on personal field survey, 2014-15.

On the other hand 70.90 per cent general, 57.50 per cent OBC and 51.00 per cent ST/SC category of respondents take daily milk and milk products respectively. This is because of most of the rural people have their own cattle and produce milk and milk products by themselves so, they use daily but those respondents who don't produce their own have only use sometime due to low income. Similarly, 67 per cent respondent's consumes pulses daily whereas, 4.5 per cent respondents belong to the category who never consumed a particular product, 17 per cent respondents consume sometimes and 11.50 per cent consume pulses weekly. Out of total 536 respondents who consume pulses or beans on daily basis in their meal, 229 (42.72%) belongs to general, 205 (38.24%) to OBC and SC/ST category 102 (19.02%). It is observed that a total of 548 (68.5%) respondents consume vegetables daily whereas, 1.10 per cent, 2.10 per cent, 1.30 per cent consumers of general, OBC and SC/ST category respectively have never consumed vegetables because some of the respondents dislike vegetables and instead of green vegetables they consume only potato or pulses.

Table 2 also depicts that 138 (17.2%) respondents consume fruits daily. Among daily user of fruits most of them belong to general category (55.07%). About 46 (33.33%) respondents came under OBC and 16 (11.59%) to SC/ST category. Nearly 33 per cent respondents consume fruits weekly, whereas, 42.50 per cent sometimes only 7.20 per cent have never consumed fruits. Fruits are mostly consumed by general category respondents because of their high purchasing power capacity. SC/ST people have low economic status and they consume only those fruits which are produced by them. Similarly, 5.20 per cent respondents consume egg daily whereas 30.80 per cent weekly, 37.20 per cent sometimes and 26.8 per cent have never consumed eggs. It is found that not a single respondent consume chicken/meat daily whereas, 23 per cent consume it weekly, 40.50 per cent sometimes and 36.50 per cent never consumed chicken/meat. Among egg and chicken consumer of respondents, percentage of SC/ST and OBC category is higher than general category because general category of respondents is also bounded by traditions.

Food Consumption Pattern of Respondents According to their Sex

Table 3 pointed out sizeable difference in nutritional food intake by gender of the respondent's. Among the total 800 respondents male respondents have taken a better dietary intake than females. The most interesting fact of the study is that male consumes dairy product more often than females. Out of total 354 female respondents only 60.5 per cent have taken milk and milk product whereas 9 per cent female respondents have never consumed these products. Similarly, 548 respondents consumed vegetables everyday, of which most of them 298 were males and 250 (45.62%) are females.

Of the total 354 female respondents, 1.1 per cent have never consumed vegetable because of their dietary behavior or unavailability of products. Pulses or beans are the major source of protein which built our body healthier. Table 1.3 further depicts that 536 respondents who consumes pulses or beans in their meal every day. Of this 288 (53.73%) are males and 248 (46.26%) belongs to female category. Females need more protein than male. Out of total 354 female respondents, 14.7 per cent take pulses sometime and 3.4 per cent have never consumed pulses or beans. Similarly, among daily user of fruits, 84 (60.86%) are male and 54 (39.13) are female whereas, among both the categories 7.2 per cent respondents have never eaten any fruit in their food intake because fruits are not easily available for everyone. Besides, 42.5 per cent respondents have taken fruit sometime because some seasonal fruits are available for them.

Table 3 Food Consumption Pattern of Respondents According to their Sex

Food Consumption	Days	Sex				Total		
		Male		Female		No.		
		No.		No.				
Milk and Milk Product	Daily	292	65.5	214	60.5	506	63.2	$\chi^2 = 6.238^a$ P= 0.101 df = 3
	Weekly	58	13.0	38	10.7	96	12.0	
	Sometime	62	13.9	70	19.8	132	16.5	
	Never	34	7.6	32	9.0	66	8.2	
Vegetable	Daily	298	66.8	250	70.6	548	68.5	$\chi^2 = 2.493^a$ P= 0.477 df = 3
	Weekly	84	18.8	54	15.3	138	17.2	
	Sometime	56	12.6	46	13.0	102	12.8	
	Never	8	1.8	4	1.1	12	1.5	
Pulses/ Beans	Daily	288	64.6	248	70.1	536	67.0	$\chi^2 = 4.692^a$ P= 0.196 df = 3
	Weekly	50	11.2	42	11.9	92	11.5	
	Sometime	84	18.8	52	14.7	136	17.0	
	Never	24	5.4	12	3.4	36	4.5	
Fruits	Daily	84	18.8	54	15.3	138	17.2	$\chi^2 = 7.072^a$ P= 0.070 df = 3
	Weekly	142	31.8	122	34.5	264	33.0	
	Sometime	180	40.4	160	45.2	340	42.5	
	Never	40	9.0	18	5.1	58	7.2	
Eggs	Daily	24	5.4	18	5.1	42	5.2	$\chi^2 = 0.654^a$ P= 0.884 df = 3
	Weekly	132	29.6	114	32.2	246	30.8	
	Sometime	168	37.7	130	36.7	298	37.2	
	Never	122	27.4	92	26.0	214	26.8	
Chicken/ Meat /Fish	Daily							$\chi^2 = 1.279^a$ P= 0.528 df = 2
	Weekly	102	22.9	82	23.2	184	23.0	
	Sometime	174	39.0	150	42.4	324	40.5	
	Never	170	38.1	122	34.5	292	36.5	
Grains and Cereals	Daily	446	100	354	100	800	100	
Junk Foods	Daily	12	2.7	6	1.7	18	2.2	$\chi^2 = 1.225^a$ P= 0.747 df = 3
	Weekly	96	21.5	82	23.2	178	22.2	
	Sometime	268	60.1	208	58.8	476	59.5	
	Never	70	15.7	58	16.4	128	16.0	
Total		446	100	354	100	800	100	

Source: Based on personal field survey, 2014-15.

Eggs, chicken, meat, fish are most commonly consumed by male respondents. No one consume meat or fish on daily basis either they belongs to male or female category. Out of the total, 354 females 34.5 per cent is have never consumed meat or fish whereas, this percentage is found upto 38.1 among males. Only 184 (23%) respondents have taken these animal products (non-veg.) weekly, of which 102 (55.43%) are male and 82 (44.56%) are females. Junk food is mostly utilized by males. Out of the total 800 respondents, 18 (2.2%) have taken junk food daily. Of this 66 per cent are males and rest of them belongs to female category. Major factor behind daily consumption behavior of males is their tendency of marketing several times.

Family type wise nutritional food intake of respondents

Family type wise dietary behavior of respondents is also an important factor in nutritional food intake. In nuclear family couples are free to take different food item according to their will. While in joint family so many times they don't get better diet for their family members because of their large size and money constraints. From this point of view, in the study area there are 420 respondents who belong to joint and 380 families belonging to nuclear family. Respondents who live in nuclear family are more likely to consume milk or milk product (65.8%), eggs (5.8%) and junk food (3.2%) daily whereas chicken, meat, fish (23.2%) are utilized weekly as compared to members of joint family. It is also noticed from Table 1.4 that, 40 per cent of nuclear family respondents never consume meat or fish. Grains and cereals were daily consumed by both types of families. There is found significant difference in utilization of pulses or beans among nuclear and joint families ($P = 0.003$).

Pattern of Percentage Energy Intake against Total Energy Required

As individual has to spend a certain amount of energy even when at rest, to carry out essential functions such as respiration, blood circulation, digestion, etc. Activity involving manual work, light or heavy, requires additional amounts of energy. All this energy is supplied through food. The three components of food which provide this energy are carbohydrates, fat and proteins. Proteins normally supply 10-12 per cent of energy in most diets; energy that carbohydrate and fat contribute may vary from diet to diet (CBHI, 1989). Quantitative food requirements are usually set in terms of energy. Tables 1.5, shows distribution of respondents are shown using only 3 broad calorie intake classes. In all the tables showing distribution of calorie intake, calorie intake per consumer unit is expressed as a percentage of a level of 2700 Kcal per day per consumer unit. Thus the calorie intake classes used in table are:

- (i) "<80", which means 0 to 80% of 2700 Kcal, that is, 0-2160 Kcal
- (ii) "80-100", which means 80% of 2700 Kcal to 2700 Kcal, that is, 2160-2700 Kcal
- (ii) ">100", which means 2700 Kcal and above 2700 Kcal, that is, 2700-3240 Kcal

Association between percentage energy intake against total energy required and socio-economic characteristics of the respondents is furnished in Table 1.5. Energy intake by respondents is found to be significantly associated with different age group ($p < 0.001$). Out of the total 800 respondents, 11.2 per cent were taken energy intake upto 80 percent of the total required energy, 44.8 per cent have taken 80-100 per cent and 44 per cent have taken more than 100 per cent. Energy intake by respondents upto 80 percent has followed decreasing trend from lower to upper age group, whereas, it reflects increasing trend among respondents who utilize more than 100 per cent of their total energy required. Because younger people require more energy for their daily activity and elderly people need less energy intake. Energy intake by male and female respondents is significantly associated with required energy ($P = 0.001$). Out of the total respondents 224 (28%) have taken energy from 80 to 100 per cent, whereas, only 32 (4%) have taken upto 80 per cent of the total energy required. Similarly, religion of the respondents is also significantly associated with energy intake and required energy. Out of the total 800 respondents who take energy upto 80 per cent, of which 12.5 per cent are Hindu and 3.6 are Muslims. Among those respondents who take more than 100 per cent of required energy, 44.6 per cent belongs to Hindu whereas 40 per cent were from Muslim community. Chi-square test of significance accepted the hypothesis that 'there is no association between caste and energy intake' ($\chi^2 = 8.062^a$, $P = 0.089$). This is high among non-SC/ST respondents than SC/ST respondents. Out of the total 352 respondents who have taken more than 100 per cent of the required energy, 159 (45.17%) belongs to general, 135 (38.35%) to OBC and 58 (16.47%) are from SC/ST category.

Table 1.5 also presents the energy intake and economic conditions of respondents. Energy intake against total required energy has increased as the level of income increase. Chi – square test of significance rejects the hypothesis that 'there is no association between utilization and income level of household'. Association of economic status of family with the energy intake ($p < 0.01$) is significant. This implied that

families with high economic status are more likely to consume better quality of food and balanced diet than others.

Conclusion

The study revealed that the food and nutrient intake levels in OBC were relatively higher than compared to general and other category. Therefore, there is need to carry out in depth studies to assess the lifestyle and dietary practices and other associated factors. The results also presented here to give rise a number of health and nutritional consequences of food insecurity. The field of nutritional sciences is at the beginning of a potentially rich stream of socially relevant research on the nutrition and health consequences of food insecurity and hunger. There is also an urgent need to educate them about the need for adopting appropriate life styles and dietary habits

References

- Antia F P (1989). *Clinical Dietetics and Nutrition*, 3rd ed., Oxford University press.
- Bulatao, R. A & Stephens, P. W. 1992 “Global estimates and projections of mortality by Cause” 1970–2015; Working Paper Series No. 1007 (Population and Human Resources Department, The World Bank).
- CBHI (Central Bureau of Health Intelligence) (1989). *Health Information India Directorate General of health Services, Ministry of Health and Family Welfare, (Govt. of India), New Delhi.*
- Gopalan C (1994). *Low birth weight: Significance and implications, Nutrition in children, developing country concerns, New Delhi Imprint, New Delhi.*
- Gopalan C Ramasastry B V Balasubramanian S C 1996 *Nutritive Value of Indian Food. National Institute of Nutrition, ICMR, Hyderabad.*
- <http://timesofindia.indiatimes.com/india/Indias-eating-habits-may-have-changed-but-not-nutrition-levels/articleshow/45655606.cms>
- Kumund K, Gupta , Santosh J P, Rama S, Ranjana M & Puri (2005). *Text Book of Nutrition and Dietetics, Elite Publishing House Pvt. Ltd., New Delhi.*
- Link B G & Phelan J C (1996). *Understanding Sociodemographic Difference in Health- the role of fundamental social Causes, Am. J. Public Health 86, 471-473.*
- Negi M S, Tandon V N, Rawat H S (1995). *Biomass and nutrient distribution in young teak (Tectona grandis Linn. f.) plantation in Tarai Region of Uttar Pradesh, Indian Forestry, 121(6), 455–464.*
- NSSO Report (2007) *Nutritional Intake in India, NSS 61st Round, Ministry of Statistics and Programme Implementation, (Govt. of India), May 2007, 513(61/1.0/6).*
- Pike R L and Brown M L 1984 *Nutrition-An Integrated Approach, 3rd ed., John Willey and Sons.*
- WHO 1974 *Hand Book on Human Nutritional Requirements, World Health Organization, Geneva.*