

Under-Nutrition Among Rural Women of Eastern Uttar Pradesh, India: Results from a Survey

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Abstract

The present article shows some light on various nutritional aspects of a rural society in eastern Uttar Pradesh, India. The findings are based on a sample survey conducted in 2003-04 by Centre of Population Studies, Department of Statistics, Banaras Hindu University, Varanasi, Uttar Pradesh, India in which data were collected from 1800 households of the study area. Various nutritional aspects include anthropometric measurements, consumption of various foods in a day, and daily energy intake along with various food habits. In the study area, caste is a major determinant of socio-economic status of a household; hence differentials have been studied according to 'caste group'. Findings show major differences in different caste groups. The study also shows differentials among adult males and females as well as male and female children. Although the results relate to a period of about 20 years back, but these may work as a benchmark for similar further studies in the context of present-day situation.

Keywords: Nutritional Aspects, Rural Society, Eastern Uttar Pradesh, Anthropometric Measurements, Food Consumption, Daily Energy Intake.

INTRODUCTION

India is trying hard to tackle the compounding problems of poverty and under nutrition under the excessive population growth. The country at present has an alarming population size which has already crossed the 1.4 billion marks. A significant proportion of the population of the country still lives under sub-human conditions. In the hierarchy of needs for human resources development, nutrition occupies the first place. Poor nutritional status is an associated phenomenon of poverty as poor people do not have enough money to purchase food to fulfill their nutrition requirement [1]. The widespread nutrition amongst our people is acting as an impediment for our human resources to achieve their complete potential and contribute more substantially to the overall development of the nation. The rapid population growth as a consequence of steady decline in mortality and relatively high fertility is adding fuel to the already burning problems of poverty and nutrition. With this background it was planned to examine the nexus of poverty, under nutrition and fertility in the rural context [2]. For this purpose, a research project entitled "Poverty, Under-nutrition and Fertility Nexus in Rural eastern Uttar Pradesh"

sponsored by Indian Council of Medical Research (ICMR), New Delhi, was conducted at the Center of Population Studies, Department of Statistics, Banaras Hindu University. We know that India is the second most populous country in the world [34].

Uttar Pradesh is the most populous state of India which inhibits around one-sixth population of the country. Uttar Pradesh is a poorer state which has second lowest Human Development Index in India. As the name suggests, eastern Uttar Pradesh is situated in the eastern part of the state. This part is somewhat poorer than the western part of the state [56].

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The Major Issues/Objectives of the Project Were:

1. To estimate the levels of poverty, under nutrition and fertility in different groups of society so as to know the extent of variation in these characteristics in different segments of the society.
2. To examine the nature of inter-relationships among these characteristics and possible reasons for the same.
3. To examine the gender gap in terms of consumption of various food items especially prestigious food items viz. milk, vegetables, pulses etc by comparing the consumption patterns of male and female children and adult males and females of the same household.

As mentioned above, one of the major objectives of the project was to study the levels of poverty, under nutrition and fertility in different groups of the rural society. The 'caste' plays an important role in stratification of rural society because it is a major determinant of occupation, education and other socioeconomic indicators. It also determines the pattern of culture and ordinarily decides the position of an individual in the social hierarchy. Therefore, it was decided to take caste as the major background variable for study of differentials in various characteristics [5,6].

In rural eastern Uttar Pradesh, more than 85% of the households are Hindus consisting of large number of castes and rest are Muslims. Keeping in view a large number of castes in Hindus, the Hindu castes have been grouped into four broad categories on the basis of homogeneity in the pattern of living and relative importance of the caste in the society. These four Hindu caste groups have been termed as Upper, Middle, Lower Middle and Scheduled Castes/Scheduled Tribes (SC/ST). The name of each caste group has mainly been given on the basis of relative status of the caste group in the social ladder. Some type of caste system is also present in Muslim society. Since their number is relatively small hence, the Muslim society has been grouped in two caste groups viz. Upper Muslims and Lower Muslims [7,8].

Thus, in all there are six caste groups viz. Upper, Middle, Lower middle, SC/ST, Upper Muslim and Lower Muslim. As the names suggest the Hindu caste groups can be ordered in the context of socio-economic condition i.e. Upper>Middle>Lower middle>SC/ST. The Upper Muslim are somewhat near to Middle caste group of Hindus, while Lower Muslims are nearer to SC/ST of Hindu society.

Although the major objective of the project was to study differentials in the context of poverty, under-nutrition and fertility but the present article focuses its attention only on the nutritional aspect in the study area.

The data were collected from 1800 households of 5 districts of eastern Uttar Pradesh on sample basis using multistage stratified random sampling, the household being the last stage unit. The present study is essentially based on primary data collected by the researchers appointed in the project [9].

Although, the major objective of the present article is to throw some light on nutritional status of the females of the study area i.e. eastern Uttar Pradesh, however, for comparison purpose, similar findings are presented for males also.

In fact from each selected household, data were obtained from one adult male, one adult female, one male child and one female child. Of course, whenever no male or female child was available, no data could be collected for such cases [10].

As for as the data on nutritional aspect are concerned, the major items of information were

- Anthropometric measurements viz. height, weight and computed value of Body Mass Index (BMI),
- Consumption of different food items along with their quantities using 24 hour recall method i.e. foods consumed on one day prior to the day of survey.

It is also pertinent to mention that since these were to be obtained for males as well as females; hence male as well as female investigators were employed for collecting data. The primary tool to collect data used has been a pre-designed and pre-tested interview schedule.

We have mentioned earlier that data were collected from 1800 households. In fact, these 1800 households were from 6 caste groups (6 strata), 300 households from each stratum. The equal allocation was done mainly to get results of approximately the same efficiency.

It is known that usually the results based on multistage sampling are less reliable than from Simple Random Sampling or Stratified Random Sampling of same sample size, but most of the large sample surveys are conducted under multistage sampling for administrative convenience and significantly reduced cost of transportation and other similar costs. Keeping in view the above fact, the multistage sampling was preferred.

Duration of Data Collection

The data were collected during December 2003 to November 2004 at different intervals of time. Thus the data relate to various seasons of the year and consequently the food consumption varies according to season; especially related to consumption of vegetables, fruits and milk.

Weights for Caste Groups

In the present study, it was considered desirable to get results of almost same reliability for each of the six-caste group; hence it was decided to have equal allocation for each stratum. Such procedure is capable of providing estimates of means or proportions of various characteristics for each stratum separately. However, for getting estimates for the entire population, these estimates are to be weighted according to number or proportion of households in each caste group in the population. It is to be mentioned that strata have been formed according to caste/religion. However, no data on castes (except SC/ST) are available. Consequently, based on experience and data from other sources, the following weights have been given for the six caste groups. These weights have been used to compute the estimates for the entire population. The weights for different caste groups are given below (Table) Now we present the findings on various aspects.

Caste Groups	Weights
Upper	0.20
Middle	0.25
Lower Middle	0.25
SC/ST	0.20
Upper Muslim	0.02
Lower Muslim	0.08
Total	1.00

Table 1. Distribution of Weights Among Various Caste and Religious Groups.

Anthropometric Measurements

Nutritional anthropometry is an important tool to detect mild under nutrition. Weight and height recordings are the most common measurements that are performed for assessing nutritional status of an individual. Weight (in kg)/ [Height (in meter)]² popularly known as Body Mass Index (BMI) is normally considered to be the best index for measuring nutritional status of adult population. In the following paragraphs, we have presented the findings based on anthropometric measurements of the population in eastern Uttar Pradesh. In this context, results are presented regarding height and weight of selected adult female and male as well as selected male and female children of the household.

Weight (Female)

It is a well-accepted fact that women of reproductive age group become more at-risk during pregnancy if their pre-pregnancy weight is less than 40 kg (Central Technical Committee on Health and Nutrition, 1990). Table 1 presents caste wise percent distribution weights of females of study area. In the present study it was found that around 31% females had weight less than 40 kg; Corresponding values in Upper and SC caste groups are 18.4% and 39.7% respectively showing a large gap between

the two groups of Hindu society. Similarly values for Upper and Lower Muslim groups are 20.0% and 36.2% respectively. Thus, there seems to be a clear-cut caste gradient in this parameter (mean weight). Even the mean weight for the population is less than 50 kg; the weight of the reference woman (ICMR, 1990) [2].

This clearly indicates that on an average every one female out of three females of reproductive age group are below body weight of even 40kg. This figure itself shows the poor nutritional level of females of eastern Uttar Pradesh. Even one –fourth females of the so-called Upper caste group belong to this group showing shocking position of the region.

When the situation is further examined in this context, it is found that as much as 77.9% women have weight below 50 kg in the study area. Caste differentials show a more astonishing situation. In SC, the percentage of females having weight below 50 kg is as high as 90.1%, showing the severity of the problem of underweight in this group. Even for the Lower Middle caste group, this percentage is 82.4%. The situation is also not promising for the highest caste groups (i.e. Upper castes of Hindu and Upper Muslims), where these percentages are as high as 61.0% and 63.5% respectively.

The height measurement has a special place as an index of socio-economic development in populations which have yet to find full expression to their genetic potential for growth. Height measurements could help to bring out glaring socio-economic inequalities and the consequent disparities in nutritional status among classes in society. It must also be noted that weight is a measure of current nutritional status while height is a measure of long-term nutritional status.

A well-nourished woman of reproductive age group is expected to achieve the height of a reference woman i.e. 150 cm (ICMR, 1990) [2]. However, in the study area 33.1% women are having height less than that of a reference woman (see Table 2). The average height of the study subjects was found to be 151.4 ± 5.5 cm. According to NFHS (1998-99), the average height has been found to be 150.2 cm for rural Uttar Pradesh which is a bit lower than the present study.

When the data are analysed according to cast, the results are in the expected direction. Declining trend is observed in the mean height of the females of different caste groups when arranged according to their position in the social hierarchy. The average height for Upper castes is 153.0 cm while for SC it is only 150.1 cm showing a gap of 2.9 cm.

If we consider the proportion of females having height below the height of a reference woman, there are striking differences among various caste groups. More than 40.0% of the females of Lower Middle and SC caste groups come under this category while around 21.0% of Upper caste females have height less than 150 cm.

HEIGHT (cm)	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
<140	2.0	0.9	2.0	2.1	0.9	0.4	1.6
140-144	5.1	6.4	12.2	10.5	4.7	8.5	8.5
145-149	14.1	19.1	26.8	31.5	20.9	24.7	23.0
150-154	39.5	45.1	39.0	37.0	42.6	41.3	40.5
155-159	23.4	18.7	15.0	17.2	23.0	18.2	18.5
≥160	16.0	9.8	4.9	1.7	8.1	6.9	7.9
Total %	100	100	100	100	100	100	100
Number	265	246	261	258	241	258	1529
Mean	153	152.1	150.3	150.1	152	151.2	151.4

S.D.	6.0	5.4	5.4	4.9	5.2	5.3	5.5*
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*For study subjects

Table 2. Caste wise percent distribution of females according to their height.

Women with height less than 145 cm are considered as malnourished and are termed as stunted (ACC/SCN, 1992) [1]. According to this criterion 10.1% females are belonging to this category in the whole sample. Of course, there are variations among different caste groups of Hindus ranging from 9.1% to 17.4%. In the National Family Health Survey (NFHS 1998-99) this percentage has been reported to be 16.6 while this percentage was found to be 14.4 in rural Uttar Pradesh. In a survey carried out by the Institute of Applied Statistics and Development Studies (IASDS) in 1995 (Nigam, 1999), this percentage was even more for eastern rural Uttar Pradesh (21.1%) [4].

Table 3 shows caste wise percent distribution of males according to their weight. In this Table, 39.8% males have weight less than 50 kg, the above values for Upper and SC caste groups of Hindus are 16.4% and 55.6% respectively showing a large gap between the two. Mean weight for different caste groups is also given in the bottom of the Table.

It is found that as much as around 80% men have weight below 60 kg in the study area. Caste differentials show a more astonishing situation. In Lower Middle caste group, the percentage of males having weight below 60kg is 90%. Almost similar situation is observed for SC also showing the severity of the problem of underweight in these groups. Even for Lower Muslim, this percentage is more than 84%.

WEIGHT (in kg.)	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
<35	6.0	5.6	7.8	11.2	5.2	11.1	7.8
35-39	12.4	24.0	28.3	28.5	14.8	25.1	23.6
40-44	18.7	30.9	30.7	34.7	25.2	29.2	28.9
45-49	23.9	17.6	15.6	15.7	18.3	13.2	17.6
50-54	14.3	11.2	10.3	5.0	16.1 8.7	13.6	10.6
55-59	11.6	6.9	4.9	3.3	11.7	3.7	6.4
>=60	13.2	3.9	2.5	1.7		4.1	5.1
Total %	100	100	100	100	100	100	100
Number	265	246	261	258	241	258	1529
Mean	47.9	44.1	42.9	41.3	47.1	43.2	44.0
S.D.	9.3	7.7	7.3	6.6	9.7	8.2	8.5*

*For study subjects

Table 3. Caste wise percent distribution of males according to their weight.

WEIGHT (in kg.)	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
<40	1.7	1.2	7.7	7.7	1.4	8.3	4.8
40-44	4.5	9.2	14.7	22.5	7.0	11.1	12.4
45-49	10.2	21.4	29.5	25.4	21.1	28.9	22.6
50-54	21.5	27.7	25.0	19.5	20.4	20.6	23.4
55-59	20.9	18.5	14.1	13.6	13.4	15.0	16.5
60-64	16.4	9.8	3.8	7.1	10.6	7.8	8.9
>=65	24.9	12.1	5.1	4.1	26.1	8.3	11.3

Total %	100	100	100	100	100	100	100
Number	183	183	166	178	155	194	1059
Mean	58.3	54	49.8	49.4	56.7	51.1	52.7
S.D.	10	8.8	7.8	8.4	10.9	8.7	9.7*

Table 4 presents the distribution of heights of males. The results show striking differences in this distribution according to caste groups in the obvious direction. However, one point needs important mention that many of the males of the selected households were not available in the household at the time of survey as they have gone to the city or town to earn their livelihood. Consequently, the results contained in the Table should be seen from this perspective. Similar caution is needed for the results of Table 3 also.

HEIGHT (cm)	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
<150	0.0	0.6	1.3	1.8	0.0	2.1	1.0
150-154	1.1	4.0	9.5	5.9	2.1	5.9	5.3
155-159	4.0	10.2	16.5	20.1	6.3	15.4	12.9
160-164	23.4	34.1	29.1	30.8	23.6	37.2	30.1
165-169	23.4	26.7	27.8	27.8	39.6	22.9	26.5
>=170	48.0	24.4	15.8	13.6	28.5	16.5	24.3
Total %	100	100	100	100	100	100	100
Number	183	183	166	178	155	194	1059
Mean	168.2	164.8	162.9	163.1	166.4	163.4	164.6
S.D.	5.8	6.5	6	6.3	5.6	6.3	6.4*

* For study subjects

Table 4. Caste wise percent distribution of males according to their height

Body Mass Index (Female)

Table 5 presents the Body Mass Index (BMI) distribution of the study females of the different caste groups. Women with BMI less than 18.5 have been taken to be suffering from severe Chronic Energy Deficiency (CED). Females with BMI between 18.5 to 20.0 have been considered as undernourished.

The females with BMI ranging from 20 to 25 have been considered to be normal while with BMI more than 25 have been termed as obese. The Table reveals that about 48.7% of women suffer from malnutrition as judged by BMI<18.5. While this percentage becomes 69.0%, if we consider BMI<20. Similar findings in the context of CED have been reported in NFHS (1998-99) and Nigam (1999) [4]. The NFHS has shown that in rural Uttar Pradesh 39.1% females have BMI<18.5 whereas Nigam has reported this figure to be 41.0% respectively for rural eastern Uttar Pradesh 9.0% females have been reported to be severely malnourished (BMI<16) by Nigam (1999) for rural eastern Uttar Pradesh whereas in our finding this percentage is 13.2% (Figure not shown in the Table) [4]. In the present study small segment i.e. 5.8% of the females are found to be obese (BMI > 25). Majority of them are belonging to Upper caste group of Hindu and Upper Muslim group.

As regards differentials according to caste, CED is most pronounced in SC (59.7%). The prevalence rate of CED among females of Upper caste group is found to be half of the SC females. It is 53.5% for Lower Muslim. This shows glaring differences among different caste groups, indicating very high degree of underdevelopment of females in lower strata of the society. As for as mean BMI is concerned, it is found to be 19.2 which is even lower than the cut off point for deciding under nutrition. Almost similar meaning value of BMI has been reported in NFHS (1998-99).

(BMI) (in kg/m ² .)	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
<18.5	32.1	49.6	51.7	59.7	37.5	53.5	48.7
18.5-20.0	18.5	18.7	22.6	21.7	15.0	20.5	20.3
20.0-25.0	36.6	28.5	20.3	16.3	34.2	21.7	25.2
>25	12.8	3.3	5.4	2.3	13.3	4.3	5.8
Total %	100	100	100	100	100	100	100
Number	265	246	261	258	240	258	1528
Mean	20.46	19.07	18.99	18.32	20.38	18.82	19.2
S.D.	3.68	3.19	3.01	2.93	4.05	3.29	3.46*

Table 5. Caste wise percent distribution of females according to their body mass index (BMI).

*For study subjects

Body Mass Index (Male)

Table 6 presents the caste wise percent distribution of males according to their Body Mass Index (BMI). The Table reveals that about 42.1% of men suffer from chronic energy deficiency (CED) as judged by BMI<18.5 which is 6.6% less than the corresponding figure for females. In the present study a small segment i.e. 4.2% of study subjects are obese (BMI>25). Majority of them are belonging to Upper caste group of Hindus and Upper Muslim group (10.4% and 11.0% respectively).

As regards differentials according to caste, CED is most pronounced in SC, while this is only 25.7 for Upper caste group. For other caste groups the values are in the expected order.

A critical review of Table 5 and Table 6 reveals that 48.7% of women and about 42.1% of men suffer from CED (BMI<18.5). This is showing gender gap. This gender gap is maximum in Middle caste group (16.8%) while this gender gap is only 6.4% in Upper caste group. For Lower Middle caste group, this gap is very small showing minor gender gap in the lower stratum of the society. A big gap for Middle and Upper caste groups is an eye opener showing need for attention on this issue. Obesity is also a part of malnutrition which is high in women in comparison to men.

(BMI) (in kg/m ² .)	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
≤18.5	25.7	32.8	51.8	56.2	37.0	47.4	42.1
18.5-20.0	24.6	25.1	22.9	19.7	15.6	17.0	22.5
20.0-25.0	39.3	39.9	22.9	21.3	36.4	33.0	31.2
>25	10.4	2.2	2.4	2.8	11.0	2.6	4.2
Total %	100	100	100	100	100	100	100
Number	183	183	166	178	154	194	1058
Mean	20.59	19.83	18.74	17.99	20.44	19.13	19.3
S.D.	3.29	2.64	2.70	2.63	3.69	2.87	2.98*

Table 6. Caste wise percent distribution of males according to their body mass index (BMI).

*For study subjects

Weight of Female and Male Children

In the survey, we collected data on the height and weight of male and female children of the selected households. From each household data were collected for 1 male and 1 female child available in the household who were in the age group of 3-14 years. Table 7 presents the average height of selected male and female children of different caste groups. Apart from this the numbers on which these means are computed are also given.

From the Table 7 it is evident that there is a clear-cut caste differential. In the Upper Caste group mean weight of female children is 24.5 kg which is only 20.1 kg and 20.2 kg for Lower Middle and SC caste groups respectively, showing a gap of more than 4 kg between the Upper and Lower strata of the society. Similar findings are also found for male children. It is pertinent to mention that these means are based on the data of available children at the time of survey. In many of the situations the children were not available at the time of survey because they were away in the schools and consequently the findings should be seen in this perspective.

Caste	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	TOTAL
	Female						
Number	170	169	170	155	158	184	966
Mean (in Kg)	24.5	21.6	20.1	20.2	23.2	20.8	21.6
	Male						
Number	140	166	172	145	149	190	965
Mean (in Kg)	22.9	21.8	19.9	20.5	21.7	19.7	20.9

Table 7. Caste wise mean weight (in Kg) of male and female children.

Similar findings for the height of selected male and female children are given in the Table 8 and the results are in expected direction.

Caste	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	TOTAL
	Female						
Number	170	169	170	155	158	184	966
Mean	125.8	121.2	117.2	117.9	123.8	119.1	120.6
	Male						
Number	140	166	172	145	149	190	965
Mean	124.0	120.1	117.4	118.4	120.3	116.9	119.3

Table 8. Caste wise mean height (in cm) of male and female children.

We have mentioned above that the means are based for the children aged between three to fourteen years and consequently if the age distributions of selected male and female children are different than the means are likely to be affected accordingly. To avoid this difficulty, we have computed the mean height and mean weight for males and females separately keeping the age as fixed. These ages are grouped as 3-4 years, 5-6 years, 7-8 years, 9-10 years, 11-12 years, 13-14 years. The results are presented in Table 9 and Table 10 respectively.

Age (in years)	3-4	5-6	7-8	9-10	11-12	13-14	TOTAL
	Female						
Number	162	165	195	161	146	133	962
Mean	11.5	14.6	19.1	23.3	29.1	36.5	21.6
	Male						

Number	195	201	173	146	133	109	957
Mean	12.2	15.6	19.5	23.9	28.6	35.9	20.9

Table 9. Age wise mean values of weight (in Kg) for female and male children.

Age (in years)	3-4	5-6	7-8	9-10	11-12	13-14	TOTAL
			Female				
Number	162	165	195	161	146	133	962
Mean	90.4	105.4	119.3	128.7	139.9	147.8	120.6
			Male				
Number	195	201	173	146	133	109	957
Mean	92.6	107.3	119.0	130.3	138.9	151.2	119.3

Table 10. Age wise mean values of height (in cm) for male and female children.

It would have been better if the analysis could have been done for children of different caste groups for different age groups. However, this could not be done because of lesser number of observations in different cells after classification.

Dietary Pattern

Although, anthropometry and clinical indicators are more appropriate for measuring nutritional status, dietary survey is helpful to determine and evaluate intake levels of food and nutrients and special food practices, that is to assess what people eat qualitatively and quantitatively and find out the inadequacies in the existing dietary pattern and habits. Dietary profiles enable comparison between deficiency arising from dietary intakes and malnutrition by anthropometry. In reality nutritional status is the mirror of nutrition and diet is one of the main determinants of the nutritional status.

So, the value of nutritional assessment is greatly enhanced when it is supplemented by an assessment of food consumption. Direct assessment of food consumption involves dietary survey which may be household inquiries or individual food consumption surveys. In the present study, dietary intake of selected adult female, adult male, female child and male child of each household have been measured by asking questions to the adult female of the household regarding their food consumption on the day preceding the survey date. As already mentioned earlier the selected adult female was one eligible married female aged 15-49 years in the household while adult male was husband of the female. The selected children are from son(s)/daughter(s) of the couple. The survey was conducted during December 2003 to November 2004 at different places and hence dietary intakes do not correspond to a particular season.

Now we present below the detailed description of the daily intake of various food stuffs for study subjects.

Daily Intake of Various Food Stuffs by adult Female

Table 11 shows the mean intake levels of various food stuffs, demonstrating the pattern of variation in the intake of different foodstuffs among different caste groups. Overall, mean intake levels of various foodstuffs are observed to be very low except mean intake of potato. However, grossly differing patterns of food consumption are observed among various caste groups. Now we give below a detailed description of consumption of various foodstuffs separately.

	CASTE		TOTAL
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FOOD STUFF	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
[A]CEREALS (in gram)							
MEAN	317.15	374.81	333.51	349.74	324.22	323.12	336.80
MEDIAN	310.00	360.00	320.00	340.00	310.00	320.00	325.00*
S.D.	134.52	182.84	159.16	157.64	150.29	150.67	157.25*
[B]PULSES (in gram)							
MEAN	25.99	28.27	22.04	23.29	31.30	28.25	26.46
MEDIAN	30.00	30.00	20.00	20.00	30.00	30.00	30.00*
S.D.	18.83	22.87	21.36	20.92	22.22	23.18	21.78*
[C]POTATO(in gram)							
MEAN	101.95	94.62	84.11	78.04	64.97	76.41	83.49
MEDIAN	80.00	69.50	53.00	62.00	50.00	52.00	62.00*
S.D.	98.11	98.46	94.01	88.87	64.48	83.92	89.58*
[D]OTHER VEGETABLES (in gram)							
MEAN	49.56	39.10	35.59	29.26	39.89	27.49	36.79
MEDIAN	39.50	25.00	25.00	0.00	20.00	0.00	20.00*
S.D.	51.91	45.19	46.17	48.89	53.47	41.55	48.50*
[E]GREEN VEGETABLES (in gram)							
MEAN	12.83	11.46	9.47	15.19	8.25	5.35	10.44
MEDIAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00*
S.D.	43.32	34.03	33.82	49.60	25.60	20.28	36.03*
[F]MILK (in gram)							
MEAN	159.39	126.38	47.99	39.22	62.31	27.07	76.94
MEDIAN	70.00	25.00	0.00	0.00	25.00	0.00	0.00*
S.D.	193.92	189.36	106.53	118.53	111.80	82.27	148.27*
[G]SUGER (in gram)							
MEAN	22.27	15.46	13.16	10.57	15.46	10.97	14.65
MEDIAN	20.00	9.00	10.00	0.00	11.10	10.00	10.00*
S.D.	20.60	25.14	25.37	17.53	15.09	16.67	20.82*
[H]OILS (in gram)							
MEAN	11.64	8.66	8.72	8.17	12.05	9.35	9.76
MEDIAN	10.00	10.00	10.00	8.00	10.00	10.00	10.00*
S.D.	6.91	6.79	5.65	6.24	8.66	7.02	7.07*
[I]MEAT(in gram)							
MEAN	0.67	0.20	3.04	3.52	16.75	10.27	5.67
MEDIAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00*
S.D.	7.83	3.17	16.21	34.63	42.82	35.62	28.24*

Table 11: Caste wise mean intake of various food items by the females.

*For study subjects

(A) *Cereals*: The average consumption of cereals has been found to be 336.8 g per day per female. In the study area main cereals consumed are rice and wheat (see Table 11). The average consumption of cereals in the upper, middle, lower middle, SC, Upper Muslim and Lower Muslim caste groups is found to be 317.15 g, 324.81 g, 333.51 g, 349.74 g, 324.22 g and 323.12 g respectively. This shows that there is little variation in consumption level of different caste groups. However,

interestingly upper caste group shows the lowest consumption level and middle caste group shows the highest level. The lowest level among the upper caste group may be due to the fact that these females on average do less physical work in comparison to females of other caste groups. The highest level for middle caste group is an indicator of their doing hardwork and availability of required cereals. For other caste group females, although they may also be hard worker but non-availability of enough food for some time to some part of the females may be responsible for slightly lower averages than for middle caste females.

- (B) *Pulses*: Table 11 shows the average consumption level of pulses per day per female in the study area. From the Table the overall mean intake of pulses is found to be 26.46 g per day. The overall average seems to be quite low of the RDA. This shows the poor condition of protein intake which mainly comes through pulses in the rural areas. Further the consumption level is almost similar for all the caste groups with minimum level for lower middle (22.04 g) while maximum for Upper Muslims (31.30 g). The standard deviation is also low and almost same for all caste groups indicating similar variability in all caste groups.
- (C) *Root and Tubers (Potato)*: The average consumption of root and tubers consisting mainly of potato is 83.49 gm. Similar finding has been reported by several other workers also. The higher consumption of root and tubers in the study area may be perhaps due to the fact that potato is the most popular form of vegetables used in the area. Further in the year of study there was good production of potato which was available at cheaper rate in comparison to other vegetables. As regards the caste differentials, mean intake is maximum for Upper caste group while minimum for Upper Muslim. Lower consumption in Muslims may be due to their higher intake of meat and egg relative to other caste groups.
- (D) *Other Vegetables*: Overall mean consumption of other vegetables such as tomato, cauliflower, brinjal etc. is only 36.79 g. Further the consumption level of Upper Caste group is significantly higher (49.56 g) than other caste groups; of course it is minimum for Lower Muslims (27.49 g). The very low consumption in the study area may be perhaps due to the fact that people do not attach much importance to such vegetables in comparison to potato because potato is much cheaper.
- (E) *Green Vegetables*: The consumption of green vegetables such as spinach, leaves of young plant of pea and gram, goosefoot (Bathua) etc. is quite low (10 gm) in the community. The main reason for this may be that people do not attach much importance to leafy vegetables. Interestingly the median is zero for all caste groups showing that more than 50% of households do not consume green vegetables at all in their daily use.
- (F) *Milk and Milk Products*: Milk is consumed as such as well as in the form of tea, curd and butter milk. Overall, mean intake of milk and milk products has been found to be 76.94 g. Further milk consumption is higher by several times in Upper (159.39 g) and Middle (126.38 g) caste groups compared to other caste groups. Of course the lowest is for Lower Muslims 27.49 g. which is almost one-sixth of Upper Castes. It is important to mention that consumption of milk and milk products is mainly production based and whenever it is purchased, it is mainly for feeding young children and preparing tea. Thus who are well to do or who have the man power and money to keep the milk giving animals, try to keep at least as many animals which can provide them milk for almost whole of the year but this type of households are not much in number. This is the main reason for getting low consumption level of milk and milk products especially in the lower strata of the society. For this see Table 11.
- (G) *Oil*: The main oil used in the study area is mustard oil. Mean intake is 9.76 g. Oil consumption is significantly higher in Upper and Lower Muslim caste groups in comparison to other caste groups and there exist no significant difference among middle, lower middle and SC/ST caste groups. The oil is generally used in preparing the vegetables. Since the consumption level of vegetables itself is low hence the consumption level of oil also becomes low. Moreover, the quantity of oil used for preparing vegetables is also generally low. A bit higher level of oil consumption in Muslims may be perhaps due to consumption of meat frequently by them which requires large amount of oil for its preparation.
- (H) *Sugar and Jaggery*: Table 11 presents the average consumption of sugar for different caste groups. The average consumption of sugar and jaggery is 14.65 g. The table shows that there is a quite large

differential in the consumption level of sugar and jaggery among different caste groups. The very low level of consumption of sugar and jaggery in the area is mainly due to the fact that sugar and jaggery does not constitute a regular part of the food.

- (I) *Meat/Egg*: As for as meat and egg is concerned, it is observed that the mean intake is only 5.6 g. however, Upper Muslims with mean intake of (16.75 g) have maximum and middle caste group (0.20 g) is minimum. The higher value for Muslims is mainly due to the fact that almost all Muslim females are non-vegetarian by habit. However, even with this situation the average intake is quite low perhaps due to lack of purchasing ability of meat by large proportion of the females of this caste group. The very low values for middle and upper caste groups may be due to the fact that quite a large proportion of females of these caste groups are vegetarian due to religious belief.

Further Remarks

Till now we were mainly discussing about the differentials in the values of mean intake for different food stuffs. It is to be mentioned that in Table 11 the median values of the consumption level of different food items are also given. From the median values it is observed that almost in all cases the mean is larger than the median indicating that the curve of consumption level is positively skewed.

Further, in the case of consumption of meat and green vegetables the median is 0 for all the caste groups indicating that more than 50% of females do not consume these items at all. Even in the case of consumption of milk, the median is zero for caste groups like Lower Middle and Schedule Castes whereas for consumption of sugar the median is zero for Lower middle and Schedule Castes.

In the same table the values of standard deviation (S.D.) for the consumption level of different food items are also given. It is seen from the values of S.D. that in almost all caste groups, the values are quite high, indicating large variation in the consumption level within a caste group showing large inequality in the consumption level within the same caste group. It is also observed that the values are almost same in all caste groups showing similar variability in the consumption level in different caste groups.

Daily Intake of Various Food Stuffs by adult Male

In the previous section we have discussed about the consumption pattern of different food stuffs for females of different caste groups. In this section we present the pattern of consumption level of different food stuffs by the Males of selected households. Table 12 presents the values in terms of meaning and media for different food stuffs for different caste groups. The differentials in the mean consumption level for different food stuffs are almost similar to that of females in the sense that wherever level is high for females, the level is also high for males and wherever low for females it is also low for males. To make more meaningful comparison, we have computed the difference between the average consumption level of males and females and the ratio of mean consumption of males and females. These values are presented in Table 13 and Table 14.

FOOD STUFF	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
[A]CEREALS (in gram)							
MEAN	424.77	465.33	419.99	456.97	427.29	456.09	441.8
MEDIAN	415.00	470.00	400.00	440.00	420.00	440.00	420.0*
S.D.	176.14	186.99	183.55	186.93	187.79	189.37	185.6*
[B]PULSES (in gram)							
MEAN	33.34	31.27	25.72	27.70	36.69	32.64	31.20
MEDIAN	30.00	30.00	27.50	30.00	30.00	30.00	30.00*
S.D.	22.39	25.41	23.88	25.96	25.53	26.45	25.20*

[C]POTATO(in gram)							
MEAN	122.33	112.03	102.55	92.39	75.96	92.23	100.00
MEDIAN	100.00	80.00	71.50	62.00	60.00	62.00	75.00*
S.D.	111.22	124.10	107.63	108.21	85.28	103.36	108.30*
[D]OTHER VEGITABLES (in gram)							
MEAN	56.77	41.33	37.21	33.69	45.58	31.59	41.00
MEDIAN	50.00	25.00	25.00	0.00	25.00	7.50	25.00*
S.D.	73.24	48.68	44.10	64.55	55.73	44.67	56.90*
[E]GREEN VEGITABLES (in gram)							
MEAN	16.42	16.56	10.73	15.34	7.46	7.74	12.40
MEDIAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00*
S.D.	51.76	51.39	41.32	47.46	22.08	27.77	42.20*
[F]MILK (in gram)							
MEAN	191.95	167.23	63.34	51.90	104.94	32.85	102.00
MEDIAN	56.00	40.00	0.00	0.00	26.30	0.00	0.00*
S.D.	254.63	233.43	135.71	141.95	165.99	85.55	189.00*
[G]SUGER (in gram)							
MEAN	28.68	22.71	13.21	10.46	18.38	12.43	17.70
MEDIAN	20.00	10.00	0.00	0.00	12.00	9.50	10.00*
S.D.	34.59	42.74	24.23	20.32	19.22	22.09	29.30*
[H]OILS (in gram)							
MEAN	13.52	10.46	10.15	9.42	13.78	11.13	11.39
MEDIAN	10.00	10.00	10.00	10.00	10.00	10.00	10.00*
S.D.	9.72	9.73	6.84	7.22	9.76	9.33	8.98*
[I]MEAT (in gram)							
MEAN	3.26	1.49	5.25	5.00	16.57	15.64	7.78
MEDIAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00*
S.D.	35.69	12.29	26.35	32.12	48.12	46.99	36.14*

Table 12. Caste wise mean intake of various food items by males.

*For study subjects

CASTE						TOTAL
UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
[A]CEREALS (in gram)						
107.62	90.52	86.48	107.23	103.07	132.97	105.00
[B]PULSES (in gram)						
7.35	3.00	3.68	4.41	5.39	4.39	4.74
[C]POTATO(in gram)						
20.38	17.41	18.44	14.35	10.99	15.82	16.51
[D]OTHER VEGITABLES (in gram)						
7.21	2.23	1.62	4.43	5.69	4.10	4.21
[E]GREEN VEGITABLES (in gram)						
3.59	5.10	1.26	0.15	-0.79	2.39	1.96
[F]MILK (in gram)						

32.56	40.85	15.35	12.68	42.63	5.78	25.06
[G]SUGER (in gram)						
6.41	7.25	0.05	-0.11	2.92	1.46	3.05
[H]OILS (in gram)						
1.88	1.80	1.43	1.25	1.73	1.78	1.63
[I]MEAT (in gram)						
2.59	1.29	2.21	1.48	-0.18	5.37	2.11

Table 13. Difference in mean values of various food intake by males and females.

CASTE						TOTAL
UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
[A]CEREALS (in gram)						
1.34	1.24	1.26	1.31	1.32	1.41	1.31
[B]PULSES (in gram)						
1.28	1.11	1.17	1.19	1.17	1.16	1.18
[C]POTATO (in gram)						
1.20	1.18	1.22	1.18	1.17	1.21	1.20
[D]OTHER VEGITABLES (in gram)						
1.15	1.06	1.05	1.15	1.14	1.15	1.11
[E]GREEN VEGITABLES (in gram)						
1.28	1.45	1.13	1.01	0.90	1.45	1.19
[F]MILK (in gram)						
1.20	1.32	1.32	1.32	1.68	1.21	1.33
[G]SUGER (in gram)						
1.29	1.47	1.00	0.99	1.19	1.13	1.21
[H]OILS (in gram)						
1.16	1.21	1.16	1.15	1.14	1.19	1.17
[I]MEAT (in gram)						
4.87	7.45	1.73	1.42	0.99	1.52	1.37

Table 14. Ratio of mean of various food intake by males and females (Adult).

As expected, almost everywhere the difference is positive. As far as the ratio is concerned, the ratio is found to be high in the case of consumption of cereals. The ratios for this case are 1.34, 1.24, 1.30, 1.31, 1.41, and 1.31 for Upper, Middle, Lowe Middle, S.C., Upper Muslims and Lower Muslim caste groups respectively showing significantly higher average consumption by males than females. However, in the case of other food items also in all cases the ratio is greater than 1 but the values are in the vicinity of 1.15-1.30 showing less variation in the consumption of these food stuffs between males and females. This may mainly be because of the fact that in many cases more than 50% of the males as well as females have zero consumption level. Generally, the consumption of milk and meat is significantly high among males in comparison to females. Main reason for this may be that males frequently move from the household to earn their livelihood in nearby areas, where they may consume meat without the preparation of meat in the household. The more consumption of milk in males in comparison to females may be due to cultural practice of higher attention to a man in comparison to his counterpart woman.

As far as the values of S.D. are concerned, the values show similar pattern as is found in the case of females. However, one must also keep in mind that the mean values themselves are very small in some

cases and consequently even for smaller changes the ratio becomes larger due to smaller values in the denominator.

Daily Intake of Various Food Stuffs by Female Children

Table 15 presents daily intake of various food items according to caste by female children. The Table gives the values of mean, median and standard deviation. The values relate to consumption of female children of different age groups, hence any meaningful conclusion from the mean or median may not be possible. However, the means for different caste groups may give indication of differentials in consumption level of different caste groups.

From the Table, it is clear that there are not major differences in the consumption level of various food stuffs except milk. There are large differentials as far as consumption of milk is concerned, the highest value is for Upper caste group (162.59 gm) while the minimum is for Lower Muslims (25.25 gm). The values for Lower Middle and SC/ST are also quite low (37.15 gm and 31.55 gm) giving indication of large differences between Upper and Lower strata of the society.

FOOD STUFF	CASTE				UPPER MUSLIM	LOWER MUSLIM	TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST			
[A]CEREALS (in gram)							
MEAN	223.25	241.27	215.04	219.69	240.32	241.09	230.48
MEDIAN	230.00	220.00	200.00	207.00	225.00	230.00	220.00*
S.D.	113.12	125.07	105.75	115.24	109.12	117.96	114.93*
[B]PULSES (in gram)							
MEAN	21.39	20.22	15.94	18.48	23.05	22.34	20.19
MEDIAN	20.00	20.00	12.50	20.00	25.00	20.00	20.00*
S.D.	16.47	16.71	16.49	17.19	14.56	18.91	16.97*
[C]POTATO(in gram)							
MEAN	55.77	44.01	47.95	41.54	43.83	46.44	46.31
MEDIAN	50.00	27.50	30.00	25.00	26.00	31.00	30.00*
S.D.	51.50	54.56	58.43	50.46	50.68	55.24	53.78*
[D]OTHER VEGITABLES (in gram)							
MEAN	22.66	22.08	16.84	18.06	16.44	14.72	18.27
MEDIAN	20.00	2.500	5.00	0.00	0.00	0.00	0.00*
S.D.	30.74	33.67	25.44	41.78	28.47	25.39	31.32*
[E]GREEN VEGITABLES (in gram)							
MEAN	4.57	6.11	4.38	8.63	4.58	2.70	5.12
MEDIAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00*
S.D.	20.94	25.86	19.79	26.86	15.08	11.21	20.61*
[F]MILK (in gram)							
MEAN	162.59	132.68	37.15	31.55	53.76	25.25	70.14
MEDIAN	50.00	30.00	0.00	0.00	20.00	0.00	0.00*
S.D.	201.73	178.30	88.79	95.29	104.59	68.05	138.27*
[G]SUGER (in gram)							
MEAN	17.72	14.75	11.25	10.67	14.80	11.19	13.20
MEDIAN	13.00	4.50	0.00	0.00	10.00	8.00	10.00*
S.D.	16.54	24.54	18.93	19.22	19.88	16.72	19.66*

[H]OILS (in gram)							
MEAN	6.79	5.25	5.67	4.74	7.60	5.48	5.88
MEDIAN	5.00	5.00	5.00	5.00	5.00	5.00	5.00*
S.D.	5.66	8.61	4.93	4.38	7.06	5.01	6.19*
[I]MEAT (in gram)							
MEAN	0.55	0.14	2.26	1.48	9.01	4.04	2.97
MEDIAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00*
S.D.	4.79	1.88	11.22	10.52	24.35	21.99	15.47*

Table 15. Caste wise mean intake of various food items by the female children.

*For study subjects

Daily Intake of Various Food Stuffs by Male Children

In this section also we have made a computation of consumption level by male and female children selected in the survey. Table 16 gives the consumption level of different food stuffs in different caste groups for the male children. The values include the mean, median and standard deviation for different categories. As in the case of adult males and females, here also the difference as well as ratio in the consumption level of male and female children have been computed. These are presented in Table 17 and Table 18.

FOOD STUFF	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
[A]CEREALS (in gram)							
MEAN	254.90	270.62	245.28	245.33	246.93	257.69	253.67
MEDIAN	250.00	250.00	225.00	230.00	222.50	240.00	240.00*
S.D.	119.16	134.95	120.79	110.19	125.15	130.96	124.26*
[B]PULSES (in gram)							
MEAN	22.76	21.47	17.19	21.71	24.52	22.91	21.69
MEDIAN	20.00	20.00	15.00	20.00	20.00	20.00	20.00*
S.D.	15.99	19.81	18.00	18.51	18.01	18.71	18.38*
[C]POTATO(in gram)							
MEAN	56.55	56.02	54.58	46.82	44.22	47.17	50.84
MEDIAN	42.50	32.00	32.50	26.00	33.00	37.50	35.00*
S.D.	56.15	68.51	63.26	60.53	51.32	51.35	58.95*
[D]OTHER VEGITABLES (in gram)							
MEAN	23.79	20.45	20.32	15.76	20.95	15.037	19.21
MEDIAN	17.50	0.00	10.00	0.00	0.005	0.007	0.00*
S.D.	31.51	30.05	27.82	31.68	39.27	27.93	31.47*
[E]GREEN VEGITABLES (in gram)							
MEAN	5.64	4.64	5.29	8.83	5.47	3.30	5.43
MEDIAN	.00	0.00	0.00	0.00	0.007	0.00	0.00*
S.D.	23.54	14.32	22.93	31.37	18.15	12.19	21.08*
[F]MILK (in gram)							
MEAN	209.87	177.58	58.76	29.33	77.98	30.85	94.02
MEDIAN	100.00	83.00	0.00	0.00	25.00	0.00	0.00*
S.D.	252.74	224.05	131.22	79.21	125.60	72.32	173.38*

[G]SUGER (in gram)							
MEAN	22.78	19.69	15.18	11.48	15.29	11.84	15.85
MEDIAN	20.00	10.00	10.00	.00	10.00	10.00	10.00*
S.D.	23.85	31.97	25.27	19.99	17.58	16.73	23.44*
[H]OILS (in gram)							
MEAN	6.75	5.46	6.37	4.73	7.73	6.23	6.20
MEDIAN	5.00	5.00	5.00	5.00	5.00	5.00	5.00*
S.D.	4.98	7.71	6.32	4.32	7.1275	5.4103	6.17*
[I]MEAT(in gram)							
MEAN	0.67	0.56	1.89	0.69	10.52	6.59	3.56
MEDIAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00*
S.D.	8.21	5.29	8.65	6.24	26.05	25.28	16.62*

Table 16. Caste wise mean intake of various food items by the male children.

*For study subjects

CASTE						TOTAL
UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
[A]CEREALS (in gram)						
31.65	29.35	30.24	25.64	6.61	16.60	23.19
[B]PULSES (in gram)						
1.37	1.25	1.25	3.23	1.47	0.57	1.50
[C]POTATO(in gram)						
0.78	12.01	6.63	5.28	0.39	0.73	4.53
[D]OTHER VEGITABLES (in gram)						
1.13	-1.63	3.48	-2.30	4.51	0.32	0.94
[E]GREEN VEGITABLES (in gram)						
1.07	-1.47	0.91	0.20	0.89	0.60	0.31
[F]MILK (in gram)						
47.28	44.90	21.61	-2.22	24.22	5.60	23.88
[G]SUGER (in gram)						
5.06	4.94	3.93	0.81	0.49	0.65	2.65
[H]OILS (in gram)						
-0.04	0.21	0.70	-0.01	0.13	0.75	0.32
[I]MEAT (in gram)						
0.12	0.42	-0.37	-0.79	1.51	2.55	0.59

Table 17. Difference of mean of various food intake by male and female children.

CASTE						TOTAL
UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
[A]CEREALS (in gram)						
1.14	1.12	1.14	1.12	1.03	1.07	1.10
[B]PULSES (in gram)						
1.06	1.06	1.08	1.17	1.06	1.03	1.07
[C]POTATO (in gram)						

1.01	1.27	1.14	1.13	1.01	1.02	1.10
[D]OTHER VEGITABLES (in gram)						
1.05	0.93	1.21	0.87	1.27	1.02	1.05
[E]GREEN VEGITABLES (in gram)						
1.23	0.76	1.21	1.02	1.19	1.22	1.06
[F]MILK (in gram)						
1.29	1.34	1.58	0.93	1.45	1.22	1.34
[G]SUGER (in gram)						
1.29	1.33	1.35	1.08	1.03	1.06	1.20
[H]OILS (in gram)						
0.99	1.04	1.12	1.00	1.02	1.14	1.05
[I]MEAT (in gram)						
1.22	4.00	0.84	0.47	1.17	1.63	1.20

Table 18. Ratio of mean of various food intake by male and female children.

It is pertinent to mention here that the consumption level among children may heavily depend on the ages of the selected children. However, it has been found that the average age of male children is almost equal to average age of female children and consequently the comparison between males and females can be made safely. However, because of the variation in the ages of selected children, the values of mean, median and standard deviation should be interpreted in the light of above fact. As far as the level of consumption among different caste groups is concerned, there is a similar pattern in the males as found in the case of females in most of the cases. However, there is little deviation also. When we see the values of the ratios then following points are noted:

- (1) In most of the cases the ratio is more than one but it is clear that the ratios are in the vicinity of 1.05-1.15.
- (2) As far as the consumption of milk and milk products is concerned the average consumption is significantly higher in male children in comparison to female children. The six ratios of the caste groups are 1.29, 1.34, 1.58, 0.92, 1.45 and 1.22 respectively. The overall ratio is 1.34. This shows that still the male children occupy the higher preference in the consumption of milk in comparison to their counterparts' i.e. female children. This shows that even today there exists a gender gap in the consumption level of male and female children in the society.
- (3) Similarly, in the consumption of sugar also the ratio is significantly more than one. This is more prevalent in Upper, Middle and Lower Middle caste groups where these ratios are 1.29, 1.33 and 1.58 respectively. This shows that at least in these caste groups male children get more preference than female children.

Energy Intake

In the previous section we have discussed about the consumption level of various food stuffs by adult males and females as well as male and female children. The results are mainly based on the mean consumption level and median consumption level along with values of standard deviation to have some idea about the variability in the consumption level in different caste groups. In this section we give the distribution of the energy intake per day by adult males and females as well as male and female children. Table 19 and Table 20 give the distribution of energy intake by adult females and males respectively.

In the distribution, the females with energy intake less than 1200 Kcal as well as females having energy intake between 1200-1600 Kcal need special mention. From Table 19 it is observed that around 22% females in the society consume even less than 1200 Kcal per day which is an indicator of a very low level of nutritional status of the society. When we observe this according to caste groups then the situation in the lower strata of the society viz. S.C. Lower Middle and Lower Muslim is still worst, where around one fourth of the females consume less than 1200 Kcal per day. As regards the

consumption level between 1200-1600 Kcal the percentages for six caste groups are 26.7, 25.5, 30.4, 33.5, 33.6, 33.7 respectively. If we combine the two percentages of females i.e. consuming energy less than 1600 Kcal is 53%. Further it is around 58% for Lower Muslim, SC/ST and Lower Middle whereas it is around 44% in Upper and Middle caste groups.

ENERGY INTAKE (in kcal.)	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
upto1200	18.3	17.6	26.8	24.8	22.4	24.5	22.4
1200-1600	26.7	25.5	30.4	33.5	33.6	33.7	30.6
1600-1900	22.9	16.3	19.1	14.2	16.2	21.3	18.4
1900-2200	17.6	14.6	10.1	11.0	13.7	10.8	13.0
2200-2500	9.2	10.0	6.2	9.4	5.4	3.2	7.3
Above 2500	5.3	15.9	7.4	7.1	8.7	6.4	8.4
Total %	100	100	100	100	100	100	100
Number	262	239	257	254	239	249	1502
Mean	1675.7	1829.3	1548.8	1583.9	1590.6	1544.7	1627.5
Median	1666.4	1769.7	1499.0	1491.2	1498.6	1511.7	1568.9*
S.D.	513.1	685.6	581.8	591.9	567.2	527.9	586.6*

Table 19. Caste wise percent distribution of females according to their daily energy intake.

*For study subjects

ENERGY INTAKE (in kcal.)	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
upto1200	8.8	8.1	16.4	13.2	13.6	13.3	12.2
1200-1600	13.5	12.2	20.4	17.6	17.4	16.1	16.2
1600-1900	15.3	13.7	19.4	14.1	17.4	16.6	16.1
1900-2200	15.8	15.7	15.9	21.5	12.0	18.0	16.6
2200-2500	15.8	20.3	11.9	11.2	16.3	14.2	14.9
Above 2500	30.7	29.9	15.9	22.4	23.4	21.8	24.1
Total %	100	100	100	100	100	100	100
Number	215	197	201	205	184	211	1213
Mean	2148.2	2191.9	1864.1	1967.5	2013.7	2004.3	2032.2
Median	2104.4	2204.0	1788.7	1992.8	1957.3	1949.0	1989.4*
S.D.	719.9	726.9	706.9	729.1	734.6	728.9	731.2*

Table 20. Caste wise percent distribution of males according to their daily energy intake.

*For study subjects

The similar Table 20 is given for males and the findings are almost on the same line as found in case of females. Table 21 and Table 22 present the distribution of energy intake by male children and female children respectively. Due to different age groups included in sample, any meaningful conclusion may not be drawn safely from the table. However, from the mean values it is found that the means for children of Upper castes and Middle castes are significantly higher than the mean of other caste groups. This is true for both female and male children. Further, when we compare mean energy intake for the male and female children, male children are slightly higher than female children showing a gender gap. Fortunately, the gap is quite low.

ENERGY			CASTE			TOTAL
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INTAKE (in kcal.)	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
Upto 800	8.1	15.8	25.3	25.5	19.8	23.5	20.0
800-1100	23.0	18.6	27.5	31.7	28.4	26.0	25.8
1100-1400	28.4	26.6	20.9	20.5	21.6	23.5	23.5
1400-1700	16.2	11.9	14.8	10.6	15.4	12.2	13.5
1700-2000	13.5	11.3	4.9	9.9	8.6	9.7	9.6
Above 2000	10.8	15.8	6.6	1.9	6.2	5.1	7.7
Total %	100	100	100	100	100	100	100
Number	148	177	182	161	162	196	1026
Mean	1373.3	1367.5	1145.6	1101.8	1207.9	1170.5	1224.5
Median	1283.5	1318.7	1066.2	1025.1	1133.3	1107.2	1137.9*
S.D.	514.5	583.8	463.4	429.8	486.2	499.9	508.7*

Table 21. Caste wise percent distribution of male children according to their daily energy intake.

*For study subjects

ENERGY INTAKE (in kcal.)	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
Upto 800	14.5	20.7	34.3	30.8	19.0	22.0	23.9
800-1100	27.5	20.1	28.0	29.5	30.1	30.8	27.7
1100-1400	29.8	24.9	22.3	23.1	20.2	24.7	24.0
1400-1700	13.0	18.9	10.9	7.7	20.9	12.1	13.9
1700-2000	9.9	7.1	2.3	7.1	7.4	7.1	6.7
Above 2000	5.3	8.3	2.3	1.9	2.5	3.3	3.9
Total %	100	100	100	100	100	100	100
Number	131	169	175	156	163	182	976
Mean	1230.2	1236.8	1015.4	1049.5	1164.8	1128.4	1134.1
Median	1177.0	1186.3	970.9	1003.6	1103.5	1082.1	1084.8*
S.D.	423.5	480.0	397.9	389.7	422.3	427.9	431.9*

Table 22. Caste wise percent distribution of female children according to their daily energy intake.

*For study subjects

Food Habits Prevalent in The Study Area Vegetarian Vs. Non-Vegetarian

Recently dietary fibers and vegetarianism is getting importance in human nutrition. Table 23 presents caste wise percent distribution of females according to their food habits. As much as 48.3% upper and 36.7% middle caste females are vegetarian. Among the females belonging to Lower Middle, SC/ST and Muslim caste groups, more than 90% are non-vegetarian. But, the fact that many of them are consuming only once in a week or month or occasionally should not be ignored.

FOOD HABIT	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
Vegetarian	48.3	36.7	8.0	6.5	0.8	1.1	17.0
Non vegetarian	1.1	4.0	1.5	0.8	0.0	0.0	1.2
(only egg)	50.6	59.4	90.5	92.7	99.2	98.9	81.7
Non vegetarian							
Total %	100	100	100	100	100	100	100

Number	269	251	262	260	248	266	1556
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Table 23. Caste wise percent distribution of females according to their food habit.**Type of Flour Used for Making Chapatti (Bread)**

Cereals, particularly the whole grains are important source of B-vitamins in our diet. Removal of bran reduces B-vitamin content. Table 24 presents the percent distribution of females according to type of flour used in making chapatti. Rejection of choker (wheat bran) is quite prevalent (90%) in all caste groups.

TYPE OF FLOUR	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
With Choker	12.6	8.8	8.0	10.5	7.8	13.0	8.8
Without Choker	87.4	91.2	92.0	89.5	92.2	87.0	89.8
Total %	100	100	100	100	100	100	100
Number	262	251	261	256	243	262	1535

Table 24. Caste wise percent distribution of females according to type of flour used in making chapatti**Type of Salt Used**

Table 25 presents the distribution of females according to type of salt used during cooking. Consumption of iodized salt in the refined form is found to be to the extent of 38.2% only. This is the maximum in upper caste group (57.2%). According to NFHS (1998-99) 58.2% eastern Uttar Pradesh rural households used iodized salt.

TYPE OF SALT	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
With Iodine	57.2	34.0	33.6	30.1	45.3	36.5	39.5
Without Iodine	36.1	61.7	63.0	61.8	45.7	60.5	54.8
Both Type	6.7	4.3	3.4	8.1	8.9	3.0	5.7
Total %	100	100	100	100	100	100	100
Number	269	253	262	259	247	266	1556

Table 25. Caste wise percent distribution of females according to type of salt used.**Cleaning of Vegetables**

Table 26 provides caste wise percent distribution of females according to practice of the washing green vegetables before cutting. Findings reveal that poor castes do not follow proper way of making green vegetables that may cause some toxic issues. Preferably green vegetables should be washed properly before cutting.

PRACTICE	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
Before cutting	30.0	30.8	18.4	23.3	23.2	20.1	24.3
After cutting	37.5	42.8	56.3	55.8	48.0	60.2	50.1
Not definite	32.6	26.4	25.3	20.9	28.9	19.7	25.6
Total %	100	100	100	100	100	100	100
Number	267	250	261	258	246	264	1546

Table 26. Caste wise percent distribution of females according to practice of washing green vegetables before cutting

Pre-cooking Washing Habits of Food Grains and Vegetables

Nutrient loss during pre-cooking stage occurs when green vegetables are washed after cutting. This practice (Table 27) has been quite prevalent in the study area (49.2%). This is more common in lower category of both religions. Table 27 presents the caste wise distribution of females according to how many times they wash rice before cooking. 76% females wash rice two times before cooking. The percentage for three times washing the rice is also substantial for Muslim females. Similarly, Table 28 presents the caste wise percent distribution of females according to how many times they wash pulse before cooking. 46% and 35.7% females wash pulse three and two times respectively before cooking. The table also reveals the fact that as many as 24.9%, 18.7% and 20% of females of Middle, Lower Middle and SC/ST caste groups respectively do not wash pulse before cooking.

TIMES	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
One	0.4	5.5	10.3	14.2	2.4	7.5	6.7
Two	78.1	79.1	81.7	70.0	54.0	70.6	72.4
Three	17.1	15.0	5.7	12.3	37.9	20.4	17.9
Four	4.5	0.4	2.3	3.5	5.6	1.5	3.0
Total %	100	100	100	100	100	100	100
Number	269	253	262	260	248	265	1557

Table 27. Caste wise percent distribution of females according to how many times washing rice before cooking.

TIMES	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
No wash	1.9	24.9	18.7	20.0	1.2	2.6	11.5
One	30.9	36.8	38.9	41.2	16.9	25.7	31.8
Two	63.9	37.2	40.5	36.9	62.1	63.8	50.8
Three	3.3	1.2	1.9	2.0	19.7	7.9	5.9
Total %	100	100	100	100	100	100	100
Number	269	253	262	260	248	265	1557

Table 28. Caste wise percent distribution of females according to how many times washing pulse before cooking.

Dietary Pattern During Pregnancy

Pregnancy is a physiological state in which nutrient requirements are increased to maintain the health of mothers as well as the growing fetus. Unfortunately, only 11.2% females increased their nutrients intake during pregnancy whereas as high as 65.7% of the females decreased their intake and remaining 23.1% had no change (Table 29). In conversations, it was found that the main reason for the decrease of food intake during pregnancy is the unlinking of food due to vomiting tendency and lack of appetite and in few cases a fear that by taking excessive food the health of the child will be affected. It was also observed that quite a large proportion of females did not even know that food intake should be increased during pregnancy.

CHANGE	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
Increased	12.1	12.9	9.2	11.7	11.2	10.1	11.2
Decreased	63.6	66.8	65.9	62.9	62.6	72.0	65.7
No change	24.3	20.3	24.9	25.4	26.2	17.9	23.1

Total %	100	100	100	100	100	100	100
Number	214	217	229	213	206	218	1297

Table 29. Caste wise percent distribution of females according to change in the amount of taking food during pregnancy.

Dietary Pattern During Lactation

Breast-feeding imposes a greater strain than pregnancy on the mother; because the woman nourishes a 'fully developed' and 'rapidly growing' baby whose food needs increase day by day. Dietary practice during lactation is more favorable than pregnancy in the study area. As much as 77.2% females increased their dietary intake during lactation (Table 30).

CHANGE	CASTE						TOTAL
	UPPER	MIDDLE	LOWER MIDDLE	SC/ST	UPPER MUSLIM	LOWER MUSLIM	
Increased	72.6	79.5	74.6	82.9	75.5	76.3	76.9
Decreased	4.7	5.6	4.5	1.9	4.4	8.5	4.9
No change	22.6	14.9	21.0	15.2	20.1	15.2	18.2
Total %	100	100	100	100	100	100	100
Number	212	215	224	210	204	211	1276

Table 30. Caste wise percent distribution of females according to change in the amount of taking food during breastfeeding.

CONCLUSION

It is very important to mention that the findings reported in this article are based on a survey conducted about 20 years back, hence the findings and the conclusions should be seen in this perspective. It is expected that during time, the nutritional status might have improved substantially due to various efforts by the government as well as more awareness among the people. However, it is hoped that although the level of nutrition might have improved but the pattern of differentials is likely to be almost of the same type which was present at the time of the survey. It is to be further noted that similar findings are also available from different sources but data with such details classified by castes/religion are rarely available resulting from a large-scale survey mentioned here. It is further to be noted that although the findings relate to a period about 20 years back but these may work as benchmark for further similar studies in the context of present time.

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