

# Assessment of Fat / Saturated Fat Consumption Levels Among Rural & Urban Population in India: National Nutrition Monitoring Bureau Surveys



Division of Public Health Nutrition  
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Indian Council of Medical Research  
Hyderabad  
And  
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# **Assessment of Fat/ Saturated Fat Consumption Levels Among Rural & Urban Population in India: National Nutrition Monitoring Bureau Surveys**

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## EXECUTIVE SUMMARY

This is the first of its kind study; the study was carried out in 10 states among rural population during year 2011-12 and 16 states among urban population during 2015-2016. In more than 20,000 households in urban and rural areas, a 24-hour recall diet surveys were carried out to assess their diet including fat intakes and nutritional status. For the present analysis, the food intake data especially fat consumption data was obtained and for fat consumption levels in different age, gender, rural, urban, occupation, type of activity and region were assessed and have been provided in this report.

In the present context of nutrition transition and epidemic increase of diet related non-communicable diseases, assessment of consumption levels of fats and oils is very important for development of prevention and control strategies of Non Communicable Diseases (NCDs), especially Coronary Heart Disease (CHD), Obesity and Hypertension. Over the past few decades, nutrition transition is associated with rising rates of obesity and chronic diseases such as diabetes, cardiovascular diseases and some cancers. Monitoring of dietary patterns within countries is achieved by carrying out nationwide nutrition monitoring systems. Such studies are used to understand long-term changes in individual food and nutrient intakes. This information is also used to identify trends in foods, nutrients and eating patterns among various sub-populations of interest.

Therefore, it is essential to assess consumption levels of fats and oils in foods and beverages among individuals to enable the planners and implementers to develop intervention strategies to maintain consumption levels at desirable levels. With the given context, it was proposed to study at household and individual-level consumption of fat and its derivatives. Findings of the present analysis will be helpful to design targeted interventions and policy measures.

### **The salient observations of the study are given below:**

The foods and nutrients intakes were available for 46,438 urban and 46,076 rural individuals. The mean intake of both **visible and total fat** by the rural and urban population following different criteria was studied. The mean consumption levels of visible and total fat were higher among urban households (27.97g/CU/day and 49.42 g/CU/day respectively) as compared to rural households (14.38 g/CU/day and 26.80 g/CU/day respectively).

The maximum consumption levels of total fat among the male population in the rural and urban regions was found to be 31.6 grams in males aged 30-34 years age groups and 56.03 grams in the 50-59 years age groups, respectively. In case of females, the maximum total fat consumption levels were found to be 28.8 grams in 25-34 years age

group in the rural region. In the urban population, maximum fat consumption among females was observed to be 51.27 grams in the age group of 35-39 years and minimum fat consumption levels among the females was found to be 20.2 grams in the age group 5-14 and 20.26 grams in the age group of >=80 years in the rural and urban regions respectively.

In general, the consumption of total fat was high in all age group of individuals, who are literates as compared to illiterates.

The consumption of fat was high among agricultural laborers and also who were in service and business. The mean consumption of fat was high among men who were moderately and heavily active as compared to the individuals involved in the sedentary activity whereas among women, it was high among those who were sedentarily active. The consumption levels of fat were lower among other communities than in SC, ST and BC in rural areas. This trend was not observed among urban population.

The consumption levels of fat were high among Christians and Muslims as compared to Hindus. The consumption level of fat through foods like Puri, Wheat Paratha, Chicken deep fry and egg rice was maximum about 10-20g/serving as compared to other processed and non-processed foods. The fat consumption levels through packaged foods was 0.05-4g, routine home preparations was 0.5-20g, snacks was 0.15-11.5g, various street foods was 1.0-12.0g, cereal based fried items was 0.5-7.5g and sweet based preparations was 0.5-9.0g.

India is witnessing huge rise in the risk factors as well as the chronic disease burden across all age groups. We must also invest more resources to get periodical data by conducting well designed studies like NNMB in all the states. The NNMB studies have been showing that the fat intake among rural population (14g/day) was within the suggested levels (20g/day). While, in case of urban population (28g/day), the consumption levels were above the suggested levels (20g/day). The urban population needs to be sensitized about the dangers of the high fat consumption and its health consequences.

## 1. INTRODUCTION

Dietary fat (lipids) provides energy and essential fatty acids, serve as a vehicle for fat-soluble vitamins and facilitates their absorption. Since fat provides high energy value (9 kcal or 37.7 kJ/g) as compared to carbohydrates or proteins (4 kcal or 16.7 kJ/g), the fat content of a diet contributes significantly to its caloric density. Fat enhances texture, taste and flavor of food, reduces its gastric emptying and thereby affects satiety. Fatty acids are the building blocks of various lipids. In the body, fatty acids, used for generation of cellular energy and biosynthesis of membrane lipids and lipid mediators (1, 2), are essential in development of central nervous system (3), modulate lipoprotein metabolism and risk for diet-related non-communicable diseases (DR-NCD), namely, coronary heart disease (CHD), diabetes and cancers (4-8).

The composition of dietary fat is the primary determinant of the main blood lipid risk factors for cardiovascular disease such as serum total cholesterol, high-density lipoprotein (HDL) cholesterol, low-density lipoprotein (LDL) cholesterol and triglycerides. It is evident that saturated fatty acids increase serum cholesterol and dietary polyunsaturated fatty acids lower serum cholesterol contrarily (9). General population studies on consumption of diets high in fat, especially saturated fat have shown increased risk of cancer (10-12) diabetes (13) and heart disease (13). Saturated fats are important as sources of energy and to make up cell membranes. They

are considered to show adverse effect on health if consumed in large amounts. Dairy products, meat and eggs are the primary dietary sources of saturated fats (14).

The main sources of fat in a typical Indian diet (which is predominantly either rice or wheat based) are vegetable oils, ghee (clarified butter), milk and dairy products. With the publication of the Indian Recommended Dietary Allowance (RDA) (15) and the general hype against the use of Saturated Fatty Acid (SFA) in the diet, the dietary advice given in the 1980s and 1990s was to reduce the intake of ghee and traditional oils such as coconut and groundnut oils and to use new Polyunsaturated Fatty Acid (PUFA) -rich oils such as safflower and sunflower oils.

**The National Nutrition Monitoring Bureau data showed that between 1980 and 2002, there was an increase in the dietary intake of fat, both in urban and rural India (16). However, it is important to note that the overall fat intake continued to be <15%E in many States of India (17).** Surveys by the Indian Agricultural Research Institute (18) have suggested that the trends in consumption of different edible oils have changed over the past three decades. There has been an overall increase in the consumption of refined oils, with decreased intakes of ghee/vanaspati (Hydrogenated Fat). **A significantly higher consumption of oils (such as sunflower, soybean and other unsaturated vegetable oils) reflects a greater concern for consumption of**

**healthier edible oils, both in urban and rural areas.** Thus, it appears that the hype against SFA was certainly effective.

The most abundant PUFA in most plant products is linoleic acid. Therefore, a typical, balanced Indian diet would provide reasonable amounts of linoleic acid irrespective of the type of vegetable oil used. In fact, the data used to compute the minimum amount of fat in the diet required to prevent Essential Fatty Acid (EFA) deficiency were based on the assumption that the vegetable oil would contain only 20 percent of linoleic acid (15).

The dietary recommendations by the Indian Council of Medical Research (ICMR) (15,19) have always stressed on increasing n-3 PUFA intake in Indian diets; however, it is not quite clear how that can be achieved. One suggestion given is to use a combination of vegetable oils. The only oils that contain reasonable amounts of the n-3 FA, ALNA, are mustard oil, soybean oil and canola oil. While

mustard oil is commonly consumed in the northern and eastern Indian States, the abundance of erucic acid (22:1 n-9) in this oil (~45%) has always raised a question about its overall nutritive value. Moreover, oils such as mustard and soybean have a flavour that is not acceptable to the southern and western Indian States. Canola oil is a good option, but the main problems concerned with this oil are its cost and availability, especially since attempts to cultivate it in India have not been very successful (20).

It was proposed to study individual-level consumption and associations of demographic and socio-economic status (SES) with various sources of fat including from fast foods/snacks by utilizing the NNMB database. Findings from the proposed study regarding fat consumption levels and associations with high consumption levels and its sources are important to help design better targeted policy measures to control or to promote good quality fat at permissible level.

## 2. GENERAL PHYSIOLOGY

The physical properties of cell membranes depend on their lipids and fatty acids composition. Replacing the usual fatty acid in cis form by the trans configuration leads to a significant reduction in the membrane fluidity. The fusion of trans fatty acids into membrane phospholipids may alter their physical properties and the associated enzymatic activities (15). The biological properties and nutritional effects of dietary fats are fundamentally related to their fatty

acid components which are broadly classified into three categories: saturated, monounsaturated and polyunsaturated. It is evident through few studies that high levels of Low Density Lipoprotein (LDL) circulating in the blood are vulnerable to lipid peroxidation that results in the oxidized LDL being scavenged by the macrophages lining few arteries, especially around the heart, leading to atherosclerosis (16).

### 3. OBJECTIVES OF THE STUDY

1. To assess the mean consumption levels of fat (g/CU/day) among various age, gender, physiological, and physical activity groups among rural (2011-12) and urban population (2014-15),
2. To assess mean fat consumption levels in different socio-economic population groups,
3. To assess quality fat like saturated, poly and mono-unsaturated and trans fats based on food computations, and
4. To assess the mean consumption through various food sources.

### 4. METHODOLOGY

For the purpose, we have utilized the NNMB database collected from rural and urban areas in different point of time. The NNMB recent studies titled 'diet and nutritional status of rural population and prevalence of obesity, hypertension and diabetes' were collected during 2011-12 in 10 states (13) and diet and nutritional status of urban population and prevalence of obesity, diabetes and hypertension among adults (14) were collected in 16 states during 2014-15. The data collected from these surveys were demographic and socio-economic anthropometric, diet and nutrient intakes including fats and oils data. The response rate of these surveys was 96% and 90%. During the survey, the information collected was on demographic and socio-economic status, as well as information on health and nutrition practices, morbidity and food and nutrients intakes and fasting blood sugar and blood pressure measurements.

The variables included in the analysis were: **age** (5-14, 15-19, 20-24, 25-29, 30-34,

35-39, 40-44, 45-49, 50-59, 60-69, 70-79 and >80 years); **residence** (urban, rural); **education** (illiterate, literate but less than middle school complete, middle school complete but less than high school complete, high school complete or higher); **husband's education** (illiterate, literate but less than middle school complete, middle school complete but less than high school complete, high school complete or higher); **food habits**, **morbidity status** and **physical activity status**, **type of work** (professional/technical, clerical/sales /service, laborer including agricultural work, household worker); **religion** (Hindu, Muslim, Sikh, other); **caste/tribe** (scheduled caste/scheduled tribe, other backward class, other); and **standard of living** (low, medium, high).

*Definitions for some of the terms used in the report:*

**Illiterate:** A person who is unable to read or write,

**Literate:** Able to read and write.

**Artisans:** A worker who is involved in making things by hand,

**Business:** Persons involved in a commercial operation or company,

**Agricultural labourers:** Persons who are involved in agri-labour

**Physical Activity status:** The physical activity status is classified into three categories:

- Sedentary: to spend much time seated; somewhat inactive (white collar jobs)
- Moderate: a lifestyle that includes light physical activity (agri-labour/manual labour)
- Heavy: involving energetic physical effort and action (gang men/mine workers/those who are involved in digging wells).

**Scheduled Caste (SC) and Scheduled Tribe (ST):** The Scheduled Castes (SCs) and Scheduled Tribes (STs) are officially designated groups of historically disadvantaged people in India. This population comprises about 16.6% and 8.6%, respectively, of India's population (according to the 2011 census).

**Other Backward Class (OBC)** is a collective term used by the Government of India to classify castes, which are socially or educationally or economically disadvantaged group.

In the following foods, the types of fat consumption levels were assessed (Table 10.1-10.4):

1. **Routine home preparation:** From various curries like veg or non-veg/fried or deep fried e.g. Parathas, Poories, Bhature, Pakoras, Samosas, Vada, Dosa, Uthapam, Chilla, Tikki, Kachori etc.
2. **Street Foods:** All above items as present in the NNMB database only,
3. **Packaged foods:** Fats contributions to the total fat consumption from various processed and packaged foods, as per the availability of nutritive values (majority of outside foods, nutritive values are not available).
4. **Sweet based preparations:** Ladoo, Barfi, Kheer, Imarti, Jalebi, Halwa, Gulab Jamun, Soan Papdi, Rasgulla, Kalakand, Panjeeri, Brittles (Chikki), Khumanji Ka Meetha, Karachi Ka Halwa, Panjeeri, Meetha Chawal, Kulfi etc., Ice Creams, Flavoured Milk, Yoghurts, Sweetened Lassie, Mishtidoi etc.
5. **Bakery and Biscuits:** Cakes, Pastries, Biscuits, Bakery Items, Jams, Jellies, Cookies, Chocolates, Sugar Confectionaries etc, and
6. **Milk and Milk Products:** Whole milk, Curd, Butter Milk, Khoya, Ghee, Health Food Supplements etc.

## 5. PLAN OF ANALYSIS

We first examined inter-state differentials in the consumption levels of fat. Percentage contribution of fats from consumption of various fatty foods using NNMB 2012 rural

survey for adults was worked out in this activity. However, this information is not available with the urban dietary data.

## 6. RESULTS

The National Nutrition Monitoring Bureau (NNMB) has carried out two nutrition studies, one is among rural population with sample size 46,438 from 10 states during the year 2011-12 and among urban population, with sample size of 46, 076 from 16 states of the country during 2015-16.

The mean intake of both **visible and total fat** by the rural and urban population in different states is presented in **Table 1** and **Figs 1 and 2**. The following may be noted:

- The mean intake of visible fat in rural areas was 14.38g and the intake ranged from a high of 21.62 g in the state of

Gujarat to a low of 8.64g in West Bengal.

- Similarly, the mean intake of total fat was 26.80g and the intake ranged from a high of 40.03g in Gujarat to a low of 15.05g in West Bengal.
- Besides this, the mean intake of visible fat in urban areas was 27.97g and the intake ranged from a high of 48.24g in Rajasthan to a low of 18.18g in Kerala.
- In case of mean total fat intake in urban areas, maximum consumption was observed in Rajasthan (69.53g) and minimum was observed in Andhra Pradesh (42.19g).

**Fig 1: Mean Consumption of Fat in Rural Areas of NNMB States**

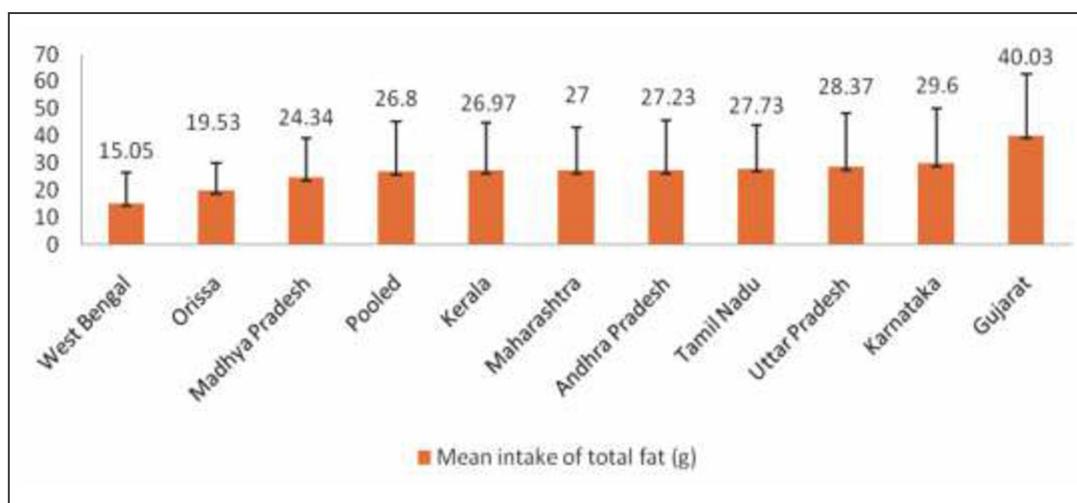
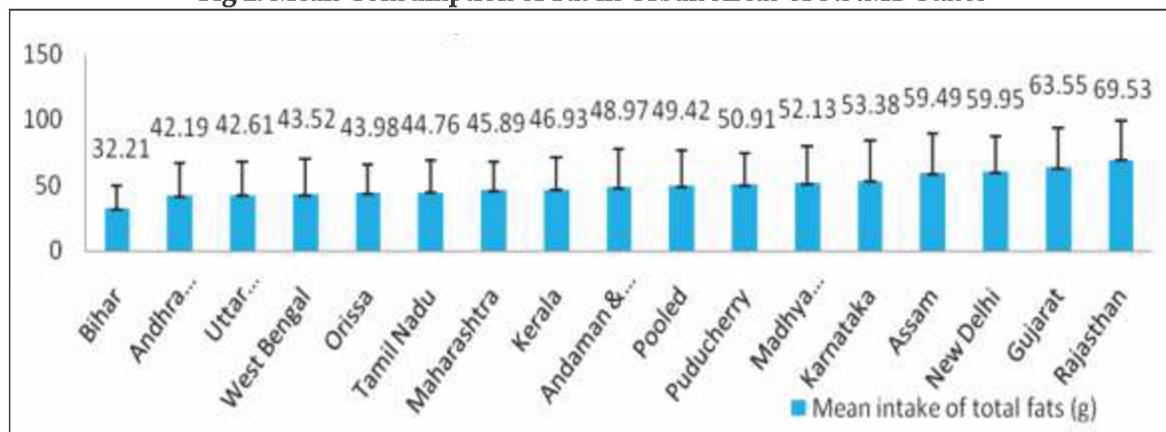


Fig 2: Mean Consumption of Fat in Urban Areas of NNMB States



The mean intake of both visible and total fat by gender and age among the rural and urban population is presented in Table 2 and Figs 3,4,5 and 6:

#### Males

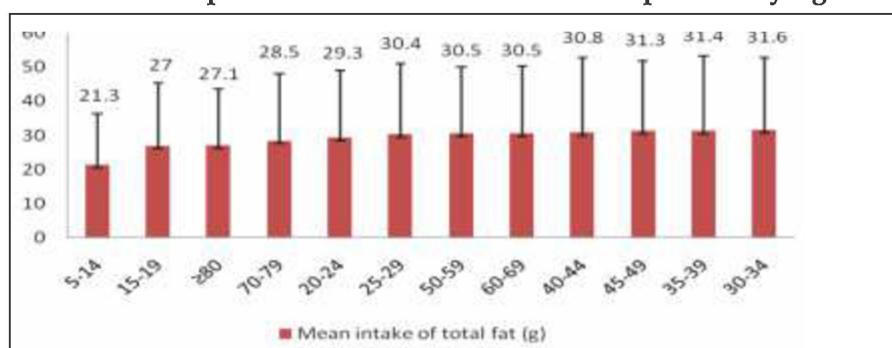
- Among males, in rural areas, total fat intake was high among the age group of 30-34 yrs (31.6 g) and low among the age group of 5-14yrs (21.3g).
- Contrarily in the urban areas, total fat intake was high among the age group of 50-59 yrs (56.03g) and low among the age group of 5-14yrs (43.24g).
- Similarly, the intake of visible fat in rural areas was maximum among 30-34 yrs age group (17.7g) and minimum among 5-14 yrs age group (11.16g), and
- Intake of visible fat in urban areas was found to be maximum in the age group of

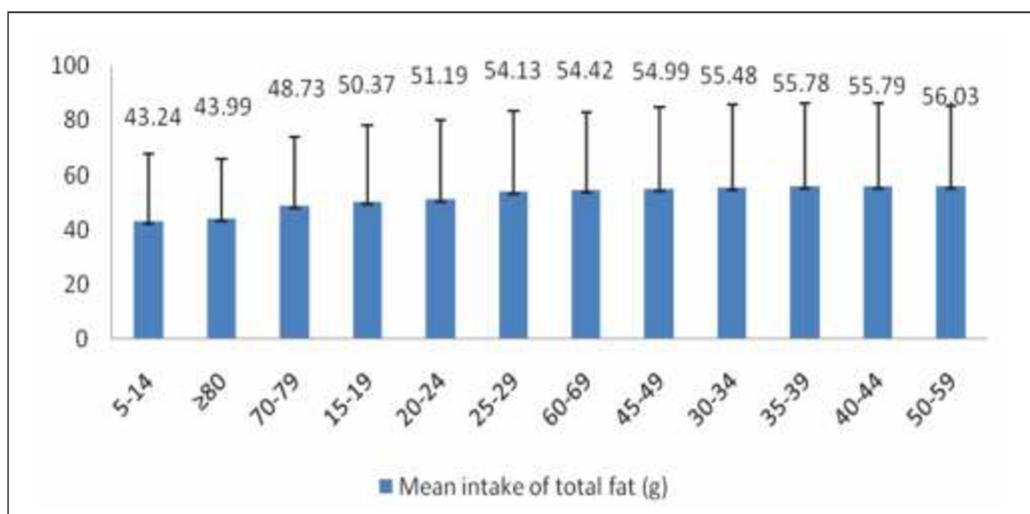
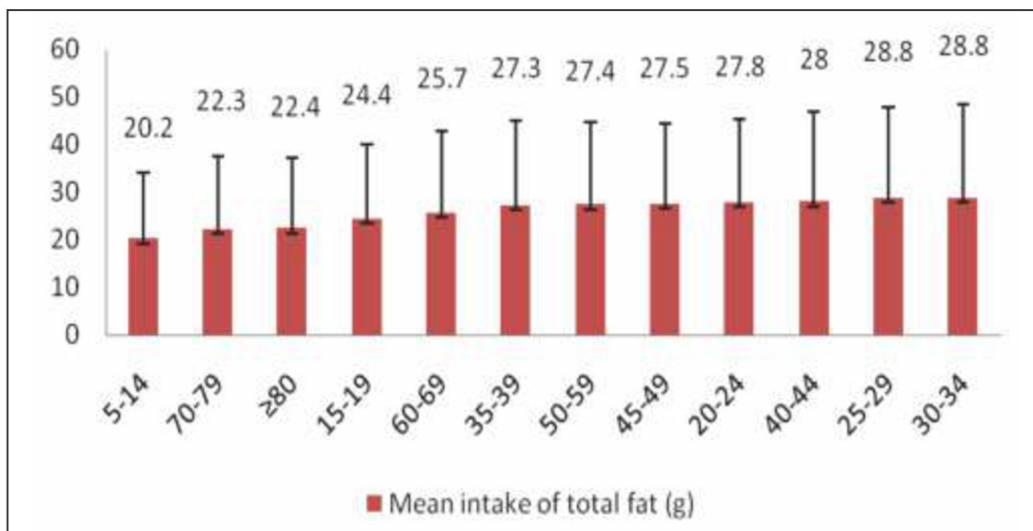
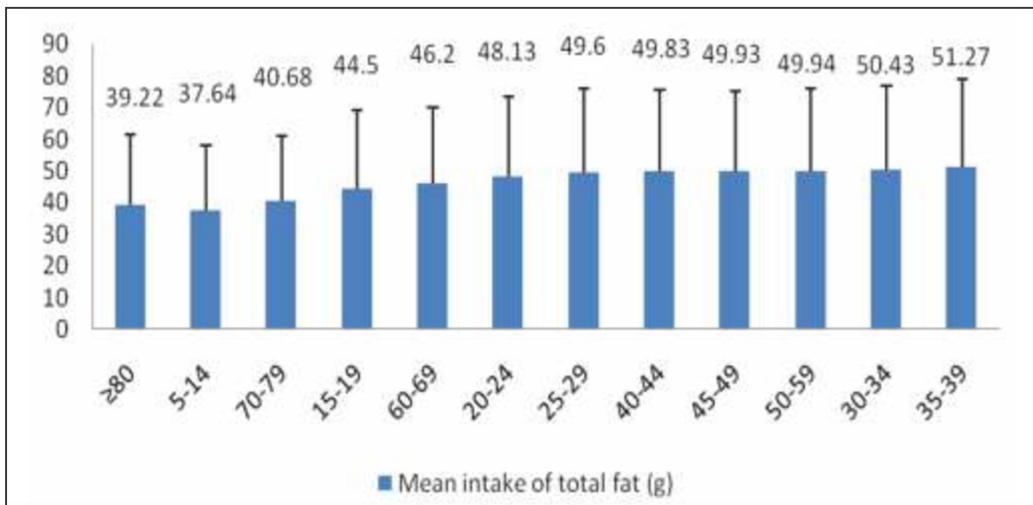
35-39 yrs (33.15g) and minimum among >=80 yrs (14.76g).

#### Females

- Among the females, in rural areas, total fat intake was high among the age group of 25-34 yrs (28.8 g) and low among the age group of 5-14yrs (20.2g).
- Contrarily in the urban areas, total fat intake was high among the age group of 35-39 yrs (51.27g) and low among the age group of >=80yrs (37.64g).
- Similarly, the intake of visible fat in rural areas was maximum among 25-29 yrs age group (15.8g) and minimum among 5-14 yrs age group (10.5g).
- In the urban areas intake of visible fat was found to be maximum in the age group of 30-34 yrs (29.34g) and minimum among >=80 yrs (19.10g).

Fig 3: Mean Consumption of Total Fats of Rural Male Population by Age Groups



**Fig 4: Mean Consumption of Total Fats of Urban Male Population by Age Groups****Fig 5: Mean Consumption of Total Fats of Rural Female Population by Age Groups****Fig 6: Mean Consumption of Total Fats of Urban Female Population by Age Groups**

The mean intake of both visible and total fat by age and gender according to the **literacy status** among the rural and urban population is presented in **Table 3.1** and **Table 3.2**.

### **Males**

- Among males, in rural areas, total fat intake was high among the  $\geq 9$ th class studied group of age 60-69 yrs (36.57g) and low among the illiterate group of 5-14yrs (17.9g).
- Contrarily in the urban areas, total fat intake was high among the  $\geq 9$ th class group of 50-59 yrs (59.34 g) and low among the illiterate group of 15-19yrs (29.06g).
- Similarly, the intake of visible fat in rural areas was maximum among the  $\geq 9$ th class group of age 20-24 yrs (19.9g) and minimum among the illiterate group of 5-14yrs age group (9.5g).
- In the urban areas the intake of visible fat was found to be maximum in the  $\geq 9$ th class group of age 40-44 yrs (34.26g) and minimum among the illiterate group of age 15-19yrs (17.0g).

### **Females**

- Among the females, in rural areas, total fat intake was high among the  $\geq 9$ th class group of age 30-34 yrs (33.59g) and low among the illiterate group of age  $\geq 80$ yrs (17.20 g).
- Contrarily in the urban areas, total fat intake was high among the  $\geq 9$ th class group of age 50-59 yrs (55.71g) and low among the illiterate group of 5-14yrs (29.46g).
- Similarly, the intake of visible fat in rural areas was maximum among the  $\geq 9$ th class group of age 20-24 yrs (18.60g) and minimum among the illiterate group of age 5-14yrs (9.21g)

- In the urban areas the intake of visible fat was found to be maximum in the  $\geq 9$ th class group of age 30-34 yrs (30.40g) and minimum among the illiterate group of age 5-14 yrs (16.93g).

A similar study was carried out among the male and female population of rural and urban areas based on their **major occupation** (classified into five categories: Laborers, Agriculture Laborers, Artisans, Service and Business, House wives and Others) and the results of the analysis were summarized in **Table 4.1** and **Table 4.2** respectively.

### **Males**

- Among males, in rural areas, total fat intake was high among the Agricultural Laborers in the age group 35-39 yrs (37.8 g).
- Contrarily in the urban areas, total fat intake was high among the Service and Business group of both 30-34 and 35-39 yrs (58.57g) and low among the Laborers group of  $\geq 80$ yrs (33.83g).
- Similarly, the intake of visible fat in rural areas was maximum among the Artisans group of age  $\geq 80$  yrs (21.6g) and minimum among the Laborers group of 5-14 yrs age (8.8g), and that of urban areas was found to be maximum in the Service and Business group of age 25-29 yrs (35.50g) and minimum among the Laborers group of age  $\geq 80$  yrs (15.68g).

### **Females**

- Among the females, in rural areas, total fat intake was high among others group of age 25-29 yrs (34.1g) and low among the Laborers group of 5-14yrs (16.7g).
- Contrarily in the urban areas, total fat intake was high among the Housewives group of age 35-39 yrs (52.31g) and low among the Laborers group of 5-14yrs (24.37g).

- Similarly, the intake of visible fat in rural areas was maximum among service and business in age group 30-34 yrs (18.8g) and minimum among Artisans group of age >=80(7.9g).
- The intake of visible fat in urban areas was found to be maximum in the housewives group of age 30-34 yrs (30.11g) and minimum among the illiterate group of age 5-14 yrs (16.93g).

The analysis of mean consumption of fat by **activity status** (classified into two categories: Sedentary, Moderate & Heavy) in males and females of different age groups among rural and urban population was carried out and the following conclusions were drawn as shown in the **Table 5.1** and **Table 5.2**.

### **Male**

- Among the male population, a maximum total fat consumption of 35.2 grams was observed among the population aged 30-34 years with moderate and heavy activity and a minimum of 21.3 grams was observed among the population under age group 5-14 years and >=80 yrs with sedentary and moderate and heavy activity respectively in the rural region.
- Whereas, in the urban region, a maximum total fat consumption of 58.30 grams was observed among the population aged 30-34 and 50-59 years with sedentary activity and a minimum of 29.82 grams was seen among the population under age group >=80 years with moderate and heavy activity.
- The visible fat consumption in rural areas was found to be maximum among the population aged 25-29 and 30-34 yrs (19.8g) with moderate and heavy activity and minimum was found to be 11.2g among the

- population aged 5-14 yrs and >=80 years with sedentary and moderate and heavy activity respectively.
- Visible fat consumption in urban areas was found to be maximum among the population aged 35-39 yrs (35.50g) with sedentary activity and a minimum was found to be among the population aged >=80 yrs (15.07g) with moderate and heavy activity.

### **Female**

- Among the female population, a maximum total fat consumption of 29.6 grams was observed among the population aged 30-34 years with sedentary activity and a minimum of 20.2 grams was observed among the population under age group 5-14 years with sedentary activity in the rural region.
- In the urban region, a maximum total fat consumption of 51.93 grams was observed among the population aged 35-39 with sedentary activity and a minimum of 17.20 grams was seen among the population under age group >=80 years with moderate and heavy activity.
- Besides this, the visible fat consumption in rural areas was found to be maximum among the population aged 25-29 and 30-34 yrs (16.1g) with moderate and heavy and sedentary activity respectively and minimum was found to be 10.5g among the population aged 5-14 yrs with sedentary activity.
- Visible fat consumption in urban areas was found to be maximum among the population aged 30-34 yrs (29.79g) with sedentary activity and a minimum was found to be among the population aged >=80 yrs (8.40g) with moderate and heavy activity.

The mean consumption of fat among both male and female population of different age groups in rural and urban areas was also studied based on their **community** (classified into four categories: ST, SC, BC and Others) and the following outcome was obtained as summarized in **Table 6.1** and **Table 6.2** respectively:

### **Male**

- In rural areas, a maximum total fat consumption of 35 grams was observed among the communities other than ST, SC and BC population aged 30-34 years and a minimum total fat consumption of 18.2 grams was obtained among the ST population aged 5-14 years.
- Besides this, in urban areas, a maximum total fat consumption of 59.85 grams was seen among the communities other than ST, SC and BC population aged 40-44 years and a minimum total fat consumption of 34.51 grams among the SC population aged >=80 years.
- In rural areas, a maximum visible fat consumption of 17.9 grams was observed among the communities other than ST, SC and BC population aged 25-29 years and a minimum of 8.9 grams was obtained among the ST population aged both 5-14 years.
- Besides this, in urban areas, a maximum visible fat consumption of 36.13 grams was seen among the communities other than ST, SC and BC population aged 40-44 years and a minimum visible fat consumption of 18.18 grams among the ST population aged 70-79 years.

### **Female**

- When the mean consumption of total fat among the female population was considered, it revealed that in rural

areas, a maximum total fat consumption of 32 grams was seen among the communities other than ST, SC and BC population aged 25-29 years and a minimum total fat consumption of 16.7 grams was obtained among the ST population aged both 70-79 years.

- In urban areas, a maximum total fat consumption of 55.12 grams was observed among the ST population aged 30-34 years and a minimum total fat consumption of 18.63 grams was observed among the ST population aged 70-79 years.
- In rural areas, a maximum visible fat consumption of 17.9 grams was observed among the communities other than ST, SC and BC population aged 25-29 years and a minimum visible fat consumption of 8.8 grams was obtained among the ST population aged 70-79 years.
- Contrary to this, in urban areas, a maximum visible fat consumption of 31.16 grams was seen among the communities other than ST, SC and BC population aged 40-44 years and a minimum total fat consumption of 8.30 grams was obtained among the ST population aged both >=80 years.

The mean consumption of fat was studied among both male and female population of different age groups in rural and urban areas based on their **religion** (classified into three categories: Hindu, Muslim and Christian). The results of the analysis for both male and female populations were summarized in **Table 7.1** and **Table 7.2** respectively.

### **Male**

- Among male population, In rural areas, a maximum total fat consumption of 40.9

grams was observed among the Christian population aged  $\geq 80$  years and a minimum total fat consumption of 21.0 grams was obtained among the Muslim population aged 5-14 years.

- Besides this, in urban areas, a maximum total fat consumption of 58.27 grams was seen among the Muslim population aged 30-34 years and a minimum total fat consumption of 41.76 grams among the Muslim population aged 5-14 years.
- In rural areas, a maximum visible fat consumption of 20.1 grams was observed among the Muslim population aged 30-34 years and a minimum of 10.0 grams was obtained among the Christian population aged both 5-14 years.
- Besides this, in urban areas, a maximum visible fat consumption of 34.53 grams was seen among the Muslim population aged 35-39 years and a minimum visible fat consumption of 18.93 grams among the Christian population aged 5-14 years.
- Contrary to this, in urban areas, a maximum total fat consumption of 51.83 grams was observed among the Christian population aged 30-34 years and a minimum total fat, cereal based fried items and sweet items is given in **Table 10.1-10.6**.
- Consumption of 36.13 grams was observed among the Hindu population aged  $\geq 80$  years.
- In rural areas, a maximum visible fat consumption of 18.1 grams was observed among the Muslim population aged 40-44 years and a minimum visible fat consumption of 7.1 grams was obtained among the Christian population aged  $\geq 80$  years.
- Contrary to this, in urban areas, a maximum visible fat consumption of 29.58 grams was seen among the Muslim population aged 25-29 years and a minimum total fat consumption of 15.54 grams was obtained among the Christian population aged both 70-79 years.

### *Female*

- When the mean consumption of total fat among the female population was considered, it revealed that in rural areas, a maximum total fat consumption of 34.6 grams was seen among the Muslim population aged 40-44 years and a minimum total fat consumption of 18.3 grams was obtained among the Muslim population aged  $\geq 80$  years.

The source of fats consumed through various foods is given in the **Table 8**. The main source of fat consumed by the rural population is through chutneys, flesh foods, and vegetable curries. In case of consumption of quality of fats, majority of fat consumed by the rural population was polyunsaturated fat (about 50%), saturated fat about 20% and mono-unsaturated fat was about 30%.

## 7. DISCUSSION

The rural and urban NNMB studies have been showing that the fat consumption was high among the urban population as compared to that of the rural population. Over the past few decades, nutrition transition is associated with rising rates of obesity and chronic diseases such as cardiovascular disease and cancer. The monitoring of dietary patterns within countries is achieved by the use of nationwide monitoring systems. Such studies are used to understand long-term changes in individual dietary intake. This information is used to identify trends in foods, nutrients and eating patterns among various sub-populations of interest. Also, the variability within areas of a country or between different socio-demographic subgroups in the population can be studied. Studies have concluded that developing countries between 1963 and 2003 revealed large increases in the available consumption of calories from vegetable oils (199%) (17). For an Indian adult, not more than 30% of the total calorie intake should be from fats (18).

Evidence shows that in terms of energy balance and body weight maintenance, the critical issue is not the relative proportion of macronutrients in the diet but rather the total energy consumed per day. It has been reported that a relatively modest change in the overall energy density of the diet of a person consuming a consistent weight of food would significantly impact his or her daily energy consumption (19). Because of its high energy content of 37.7KJ per gram, fat influences energy density values of foods more than carbohydrate or protein (16.8KJ per gram) (19,20). Also, scientists reported that subjects in experimental situations readily overeat when presented with high-fat foods. This has been

attributed to the weak satiating capacity of fat (21). Acceptable macronutrients distribution in the diet, along with quality choices of unsaturated fats, unrefined cereals, and plant-based or animal-based high biological value proteins, ought to be maintained to reduce metabolic complications and chronic disease risks (20,22,23,24).

Some studies have indicated that excess weight and obesity are inversely correlated with socio-economic status in developed countries (25,26,27), especially among women. These results also show that the source of fat consumed among rural population was mainly from chutneys, flesh food and vegetables curries, junk diets etc. The quality fats are mostly polyunsaturated fats, mono-unsaturated and saturated fats in that order as similar to that of the recommendations.

### **Limitations of the Study:**

Primarily, the data collection of these studies did not focus on the concept of estimation of consumption of fat from different sources of foods and estimation of quality of fats. We could calculate almost accurately the total consumption of fat, but estimation of specific sources of fat consumption would be difficult, especially in case of urban diets. Total re-entry of dietary data /resurvey among all the individuals is very difficult and expensive. However, in case of rural dietary data, most of the data was re-entered into the computers for analysis of its specific contribution and to get the specific quality of oils consumed by the rural population. Therefore, the time taken to complete this study also doubled as against the target.

## 8. FINDINGS AND CONCLUSION

India is witnessing huge rise in the risk factors as well as the chronic disease burden across all age groups. The related public health and nutrition issues need to be addressed urgently to be able to tackle this rising epidemic. This needs stronger policies and their improved implementation, an enabling environment for making better dietary choices, and effective surveillance of risk factors among general and vulnerable populations. We must also invest more resources to get periodical data by conducting well designed studies like NNMB in all the states. The levels of consumption of fat and its correlates will help the policy makers and food

processing industries including fats and oil industries in the country to develop strategies on appropriate use of oils and fats by food processing industries, households, street food vendors and others for protecting health and avoiding non-communicable diseases in India.

NNMB studies have been showing that the fat intake among rural population is within the suggested levels, while in case of urban population, the consumption levels are above the suggested levels. The urban population needs to be sensitized about the dangers of high fat consumption and its health consequences.

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**Table 1: Mean Consumption of Fat in Rural and Urban Areas of NNMB States**

State	Rural					Urban				
		Visible Fat (g)		Total Fat (g)			Visible Fat (g)		Total Fat (g)	
		N	Mean	SD	Mean		N	Mean	SD	Mean
Kerala	4109	8.8	10.29	27.0	17.92	2844	18.2	13.6	46.9	24.07
Tamil Nadu	4176	14.8	12.6	27.7	16.39	2986	19.9	15.97	44.8	24.15
Karnataka	4852	12.9	14.15	29.6	20.29	3103	21.4	18.23	53.4	30.22
Andhra Pradesh	4386	15.8	14.37	27.2	18.67	3074	22.1	17.59	42.2	24.38
Maharashtra	5017	16.1	10.71	27.0	16.19	3376	26.4	15.68	45.9	22.38
Gujarat	5165	21.6	18.12	40.0	22.65	3228	41.6	23.96	63.6	29.67
Madhya Pradesh	4931	12.8	10.88	24.3	14.67	3310	32.7	21.7	52.1	27.82
Orissa	4478	13.8	7.92	19.5	10.53	2898	27.5	15.25	44.0	21.84
West Bengal	4448	8.6	7.57	15.1	11.23	3389	25.7	18.54	43.5	26.57
Uttar Pradesh	4876	16.9	16.47	28.4	19.95	3555	25.7	18.54	42.6	25.2
Andaman & Nicobar	--	--	--	--	--	3067	27.7	18.94	49.0	28.37
Assam	--	--	--	--	--	1506	38.3	22.98	59.5	29.73
Bihar	--	--	--	--	--	2221	20.7	12.7	32.2	17.32
New Delhi	--	--	--	--	--	2657	39.5	21.15	60.0	27.79
Puducherry	--	--	--	--	--	2854	22.2	13.86	50.9	23.76
Rajasthan	--	--	--	--	--	2008	48.2	25.75	69.5	29.43
<b>Pooled</b>	<b>46438</b>	<b>14.4</b>	<b>13.38</b>	<b>26.8</b>	<b>18.46</b>	<b>46076</b>	<b>28.0</b>	<b>20.24</b>	<b>49.4</b>	<b>27.3</b>

**Table 2: Mean Consumption of Visible Fats and Total Fats by the Different Gender and Age Groups of Rural and Urban Population**

Gender	Age group (yrs)	Rural					Urban				
		N	Visible fat (g)		Total fat (g)		N	Visible fat (g)		Total fat (g)	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
Males	5-14	5265	11.16	10.8	21.3	15.0	4526	22.75	17.06	43.24	24.74
	15-19	2344	14.7	13.7	27.0	18.3	2328	29.20	20.50	50.37	27.97
	20-24	2031	15.0	15.3	29.3	19.8	2049	29.74	21.26	51.19	28.94
	25-29	2011	16.7	15.5	30.4	20.7	1830	32.67	22.52	54.13	29.43
	30-34	1875	17.7	16.2	31.6	21.3	1877	32.87	23.20	55.48	30.23
	35-39	1800	17.0	15.7	31.4	21.8	1961	33.15	23.33	55.78	30.32
	40-44	1539	17.0	16.7	30.8	22.1	1935	33.12	23.56	55.79	30.56
	45-49	1511	16.7	14.9	31.3	20.6	1803	31.58	22.41	54.99	30.10
	50-59	2106	15.9	13.9	30.5	19.5	2641	31.82	22.32	56.03	29.30
	60-69	1578	15.9	14.3	30.5	19.8	1366	30.62	21.29	54.42	28.35
	70-79	560	14.2	13.6	28.5	19.5	486	25.00	17.25	48.73	25.23
	≥80	180	14.0	11.5	27.1	16.5	143	22.80	14.76	43.99	21.69
<b>Males Pooled</b>		<b>22800</b>	<b>15.1</b>	<b>14.32</b>	<b>28.0</b>	<b>19.59</b>	<b>22945</b>	<b>29.7</b>	<b>21.54</b>	<b>51.9</b>	<b>28.86</b>
Females	5-14	4965	10.5	9.4	20.2	14.0	3961	20.57	15.89	39.22	22.13
	15-19	2447	13.3	11.2	24.4	15.7	2188	25.08	17.71	44.50	24.71
	20-24	2367	15.5	13.0	27.8	17.5	2139	28.10	19.07	48.13	25.36
	25-29	2330	15.8	14.3	28.8	19.0	2163	28.81	19.27	49.60	26.22
	30-34	1890	15.7	14.2	28.8	19.7	2177	29.34	20.67	50.43	26.47
	35-39	2015	15.0	13.0	27.3	17.6	2163	28.95	19.39	51.27	27.85
	40-44	1541	15.0	13.9	28.0	18.9	2139	27.83	19.03	49.83	25.53
	45-49	1667	14.6	12.2	27.5	17.0	1810	28.17	18.97	49.93	25.12
	50-59	2125	14.1	12.4	27.4	17.2	2284	27.75	19.37	49.94	26.20
	60-69	1528	13.4	12.2	25.7	17.0	1339	24.64	17.31	46.20	23.86
	70-79	571	11.0	9.9	22.3	15.1	561	21.29	14.73	40.68	20.48
	≥80	192	11.2	10.4	22.4	14.8	207	19.10	13.82	37.64	20.26
<b>Females Pooled</b>		<b>23638</b>	<b>13.7</b>	<b>12.37</b>	<b>25.6</b>	<b>17.21</b>	<b>23131</b>	<b>26.3</b>	<b>18.70</b>	<b>47.0</b>	<b>25.42</b>

**Table 3.1: Mean Consumption of Visible Fat and Total Fat by Different Age Groups and Literacy Status of Rural and Urban Population (Males)**

Age (yrs)	Literacy status	Rural				Urban			
		N	Visible fat (g)		Total fat (g)		N	Visible fat (g)	
5-14	Illiterate	1778	9.5	8.71	17.9	12.16	124	17.67	14.11
	1-8 <sup>th</sup> Class	1779	11.3	10.70	21.0	14.46	3479	22.75	16.78
	≥9 <sup>th</sup> class	1708	12.7	12.49	25.1	17.26	508	26.93	20.08
15-19	Illiterate	891	13.0	12.14	23.8	16.66	58	17.00	11.15
	1-8 <sup>th</sup> Class	797	14.3	13.24	26.8	18.28	275	26.07	17.97
	≥9 <sup>th</sup> class	656	17.5	15.53	31.6	19.51	1959	29.93	20.81
20-24	Illiterate	713	13.4	13.67	25.1	17.53	76	27.54	20.95
	1-8 <sup>th</sup> Class	754	15.6	14.94	28.8	19.02	291	25.93	18.04
	≥9 <sup>th</sup> class	564	19.9	16.91	35.2	21.87	1644	30.15	20.89
25-29	Illiterate	604	14.4	15.27	26.4	20.86	103	28.70	21.55
	1-8 <sup>th</sup> Class	781	16.8	15.75	30.9	21.00	364	32.60	23.76
	≥9 <sup>th</sup> class	626	18.8	15.07	33.7	19.66	1336	32.91	22.28
30-34	Illiterate	501	15.1	15.39	27.4	21.09	132	27.62	20.02
	1-8 <sup>th</sup> Class	677	17.5	15.79	31.5	21.03	459	30.50	21.99
	≥9 <sup>th</sup> class	697	19.7	16.81	34.6	21.15	1262	34.11	23.76
35-39	Illiterate	513	14.4	13.53	25.9	18.43	136	25.54	20.10
	1-8 <sup>th</sup> Class	586	16.8	16.55	31.2	22.05	449	32.21	23.95
	≥9 <sup>th</sup> class	701	19.2	16.08	35.7	23.02	1362	34.18	23.25
40-44	Illiterate	469	14.7	15.11	26.3	19.66	147	25.95	21.61
	1-8 <sup>th</sup> Class	502	16.5	15.39	29.9	20.07	474	31.61	23.59
	≥9 <sup>th</sup> class	568	19.3	18.58	35.2	24.75	1294	34.26	23.43
45-49	Illiterate	481	14.3	11.55	26.6	17.80	171	26.17	19.72
	1-8 <sup>th</sup> Class	572	17.1	15.45	31.5	20.26	499	28.90	21.80
	≥9 <sup>th</sup> class	458	18.6	16.83	36.0	22.49	1122	33.48	22.77
50-59	Illiterate	680	13.5	11.00	26.1	17.44	250	27.87	20.60
	1-8 <sup>th</sup> Class	828	15.9	15.25	30.5	20.10	688	29.26	20.61
	≥9 <sup>th</sup> class	598	18.7	14.42	35.4	19.65	1684	33.31	22.83
60-69	Illiterate	576	14.1	13.14	26.9	18.21	167	27.40	21.40
	1-8 <sup>th</sup> Class	602	15.4	13.45	30.0	18.88	393	28.58	21.60
	≥9 <sup>th</sup> class	400	19.3	16.30	36.57	21.92	798	32.36	20.99
70-79	Illiterate	178	13.3	12.36	24.4	16.74	77	21.76	15.64
	1-8 <sup>th</sup> Class	195	12.8	11.56	27.2	16.50	176	23.63	15.95
	≥9 <sup>th</sup> class	187	16.7	16.23	33.8	23.36	222	27.36	18.53
≥80	Illiterate	51	12.0	9.64	25.0	16.09	48	20.52	13.43
	1-8 <sup>th</sup> Class	60	14.5	11.61	26.3	14.87	38	23.26	17.91
	≥9 <sup>th</sup> class	69	15.0	12.50	29.2	18.00	54	23.98	13.28
Pooled	Illiterate	7435	12.9	12.22	23.9	17.48	1489	25.4	19.74
	1-8 <sup>th</sup> Class	8133	15.0	14.29	27.9	19.25	7585	26.4	19.84
	≥9 <sup>th</sup> class	7232	17.4	15.65	32.4	21.05	13245	32.2	22.23

**Table 3.2: Mean Consumption of Visible Fat and Total Fat by the Different Age Groups and Literacy Status of Rural and Urban Population (Females)**

Age group (yrs)	Literacy status	Rural					Urban				
		N	Visible fat (g)		Total fat (g)		N	Visible fat (g)		Total fat (g)	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
5-14	Illiterate	1680	9.21	8.38	17.42	12.90	118	16.93	11.60	29.46	15.31
	1-8 <sup>th</sup> Class	1655	10.60	9.46	20.00	13.41	3017	20.71	16.11	39.54	22.38
	≥9 <sup>th</sup> class	1630	11.63	10.33	23.22	15.03	484	23.30	16.52	41.81	22.69
15-19	Illiterate	885	11.81	9.74	21.82	13.84	45	19.80	14.44	34.84	23.27
	1-8 <sup>th</sup> Class	873	13.89	11.77	25.11	15.96	247	24.11	17.84	39.77	24.07
	≥9 <sup>th</sup> class	689	14.35	12.13	26.67	17.04	1861	25.33	17.76	45.34	24.75
20-24	Illiterate	689	12.43	9.81	22.64	14.43	103	24.44	17.45	39.40	24.96
	1-8 <sup>th</sup> Class	917	15.14	12.54	27.90	16.83	365	28.38	18.58	45.64	24.19
	≥9 <sup>th</sup> class	761	18.60	15.30	32.22	19.34	1643	28.11	19.17	49.04	25.45
25-29	Illiterate	677	13.44	13.15	24.42	17.94	200	26.02	22.15	41.50	28.20
	1-8 <sup>th</sup> Class	789	16.29	14.42	29.33	18.86	497	27.85	18.01	47.60	26.00
	≥9 <sup>th</sup> class	864	17.31	14.84	31.64	19.22	1446	29.53	19.23	51.35	25.59
30-34	Illiterate	522	13.12	11.86	23.56	15.92	241	24.60	15.82	40.88	23.19
	1-8 <sup>th</sup> Class	649	15.42	14.45	27.65	18.30	542	28.37	20.31	48.39	25.52
	≥9 <sup>th</sup> class	719	17.84	15.29	33.59	22.16	1369	30.40	21.23	52.85	26.87
35-39	Illiterate	669	13.25	12.29	24.30	17.25	316	25.92	19.54	42.68	25.92
	1-8 <sup>th</sup> Class	650	15.45	13.65	27.38	17.90	592	28.51	19.90	50.08	30.43
	≥9 <sup>th</sup> class	696	16.18	12.80	30.02	17.32	1237	29.68	18.76	53.69	26.16
40-44	Illiterate	539	13.13	11.14	24.02	16.07	401	24.96	18.47	41.80	25.13
	1-8 <sup>th</sup> Class	541	14.61	13.06	27.56	18.05	626	26.79	17.63	47.38	23.13
	≥9 <sup>th</sup> class	461	17.72	16.91	33.26	21.56	1097	29.54	19.88	54.26	26.10
45-49	Illiterate	549	12.67	9.97	23.19	14.40	443	26.57	18.97	43.43	24.51
	1-8 <sup>th</sup> Class	636	14.63	13.17	27.99	17.37	522	27.29	18.42	48.01	24.48
	≥9 <sup>th</sup> class	482	16.66	12.68	31.72	17.97	829	29.51	18.90	54.70	24.65
50-59	Illiterate	702	12.36	11.70	23.67	16.31	632	24.20	17.71	41.94	24.39
	1-8 <sup>th</sup> Class	803	13.72	11.92	26.86	16.22	712	27.37	19.88	49.72	25.12
	≥9 <sup>th</sup> class	620	16.45	13.39	32.30	18.34	909	30.38	19.69	55.71	26.86
60-69	Illiterate	494	12.33	10.92	22.79	15.65	481	23.12	16.40	40.43	22.33
	1-8 <sup>th</sup> Class	547	13.04	11.20	25.33	15.95	460	24.85	16.52	47.31	23.84
	≥9 <sup>th</sup> class	487	15.04	14.23	28.99	18.89	359	26.52	19.34	52.79	24.40
70-79	Illiterate	143	10.37	10.49	19.00	14.60	281	21.32	15.10	36.97	19.11
	1-8 <sup>th</sup> Class	210	10.10	8.08	21.08	12.38	162	21.07	13.67	43.24	21.15
	≥9 <sup>th</sup> class	218	12.31	10.87	25.65	17.14	95	21.48	14.15	46.95	19.59
≥80	Illiterate	42	9.55	8.08	17.20	9.80	123	18.82	13.51	34.83	17.90
	1-8 <sup>th</sup> Class	65	10.94	10.83	20.23	12.85	58	19.01	14.03	38.84	21.31
	≥9 <sup>th</sup> class	85	12.15	11.04	26.56	17.02	17	19.14	16.66	48.91	26.42
Pooled	Illiterate	7591	11.9	10.71	21.9	15.33	3384	24.0	17.71	40.6	23.81
	1-8 <sup>th</sup> Class	8335	13.8	12.35	25.6	16.72	7800	24.5	17.95	44.4	24.56
	≥9 <sup>th</sup> class	7712	15.5	13.60	29.3	18.64	11346	28.4	19.24	50.9	25.82

**Table 4.1: Mean Consumption of Visible Fat and Total Fat by the Different Age Groups and Occupation of Rural and Urban Population (Males)**

Age group (yrs)	Occupation	Rural				Urban			
		N	Visible fat (g)		Total fat (g)		N	Visible fat (g)	
			Mean	SD	Mean	SD		Mean	SD
15-19	Other Labour	762	12.6	12.10	22.4	16.37	126	23.99	18.03
	Agriculture Labour	606	16.6	15.80	31.0	20.87	--	--	--
	Artisans	110	12.7	10.35	23.8	14.89	--	--	--
	Service & Business	386	16.3	12.68	30.1	17.42	119	30.18	20.68
	Others	58	17.2	12.83	32.1	17.94	2059	29.37	20.49
20-24	Other Labour	581	13.6	14.51	24.8	17.75	321	26.04	18.28
	Agriculture Labour	623	18.1	16.30	33.3	21.62	--	--	--
	Artisans	77	15.2	13.28	27.4	17.69	--	--	--
	Service & Business	333	17.5	12.99	31.8	17.41	556	30.85	21.05
	Others	72	16.4	21.51	29.5	24.52	1141	29.73	20.82
25-29	Other Labour	610	13.7	15.17	25.0	19.91	464	29.49	20.87
	Agriculture Labour	625	18.7	15.91	34.9	22.01	--	--	--
	Artisans	101	15.6	12.91	28.5	15.79	--	--	--
	Service & Business	299	19.4	14.04	33.7	18.17	883	35.50	23.80
	Others	74	15.8	18.36	30.8	22.62	461	30.10	20.92
30-34	Other Labour	636	15.5	16.05	25.8	19.51	500	28.20	20.48
	Agriculture Labour	493	18.9	16.53	35.7	22.35	--	--	--
	Artisans	90	19.5	16.58	34.6	20.06	--	--	--
	Service & Business	298	20.7	14.97	35.7	19.61	1096	35.28	24.34
	Others	80	17.1	14.21	32.7	17.78	262	30.75	21.22
35-39	Other Labour	617	14.2	13.10	26.0	18.17	514	29.02	22.14
	Agriculture Labour	461	20.2	18.92	37.8	24.39	--	--	--
	Artisans	90	15.9	11.78	31.4	19.24	--	--	--
	Service & Business	306	20.6	17.61	35.6	23.70	1210	35.17	23.59
	Others	51	13.3	11.98	29.5	19.64	224	31.38	23.06
40-44	Other Labour	522	14.1	15.05	25.6	19.97	470	30.91	24.56
	Agriculture Labour	412	19.7	18.66	35.8	23.80	--	--	--
	Artisans	79	14.8	14.37	29.0	23.31	--	--	--
	Service & Business	276	19.2	16.14	34.5	22.43	1249	34.41	23.38
	Others	34	17.0	17.96	30.4	23.40	198	28.93	20.24

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**Table 4.1: Mean Consumption of Visible Fat and Total Fat by the Different Age Groups and Occupation of Rural and Urban Population (Males)**

Age group (yrs)	Occupation	Rural				Urban			
		N	Visible fat (g)		Total fat (g)		N	Visible fat (g)	
			Mean	SD	Mean	SD		Mean	SD
45-49	Other Labour	491	13.3	12.02	25.1	16.82	446	26.10	20.43
	Agriculture Labour	403	19.6	17.32	36.7	23.11	--	--	--
	Artisans	75	14.7	12.26	30.0	18.69	--	--	--
	Service & Business	243	17.5	13.68	33.9	19.35	1144	33.91	22.99
	Others	39	17.3	14.54	32.8	18.59	202	29.80	20.69
50-59	Other Labour	606	12.2	10.76	24.2	16.28	486	27.53	21.05
	Agriculture Labour	703	18.7	16.20	34.6	22.04	--	--	--
	Artisans	89	16.7	14.94	31.9	18.40	--	--	--
	Service & Business	361	17.7	13.18	33.9	18.24	1742	33.53	22.54
	Others	51	16.1	14.82	34.4	21.11	398	28.80	20.79
60-69	Other Labour	442	13.6	13.42	25.2	17.81	169	25.28	18.40
	Agriculture Labour	508	18.4	15.36	34.3	20.96	--	--	--
	Artisans	63	15.5	13.71	31.5	21.56	--	--	--
	Service & Business	195	17.9	16.24	34.2	21.99	452	31.36	22.81
	Others	149	14.2	12.83	32.3	18.81	740	31.39	20.80
70-79	Other Labour	160	11.3	9.74	21.9	14.22	33	20.39	15.09
	Agriculture Labour	165	17.4	17.45	33.6	25.36	--	--	--
	Artisans	19	12.9	9.16	23.8	10.73	--	--	--
	Service & Business	89	14.8	12.5	30.2	16.83	99	25.19	19.06
	Others	72	13.2	10.95	31.5	16.01	344	25.47	16.88
≥80	Other Labour	50	10.2	8.10	21.5	12.99	4	15.68	7.83
	Agriculture Labour	52	15.0	10.86	30.0	17.05	--	--	--
	Artisans	8	21.6	25.47	36.1	28.07	--	--	--
	Service & Business	34	16.3	12.31	28.6	17.26	15	26.13	12.99
	Others	19	11.8	9.05	28.9	16.39	123	22.47	15.04

**Table 4.2: Mean Consumption of Visible Fat and Total Fat by the Different Age Groups and Occupation of Rural and Urban Population (Females)**

Age group (yrs)	Occupation	Rural					Urban				
			Visible fat (g)		Total fat (g)			Visible fat (g)		Total fat (g)	
			N	Mean	SD	Mean	SD	N	Mean	SD	Mean
15-19	Other Labour	776	11.1	9.03	19.8	12.48	19	25.63	21.38	38.83	26.07
	Agriculture Labour	668	15.1	13.68	28.5	18.22	--	--	--	--	--
	Artisans	108	12.7	11.78	23.8	15.03	--	--	--	--	--
	Service & Business	--	--	--	--	--	108	28.08	16.73	47.80	21.35
	Others	441	15.0	11.22	27.6	16.51	28	20.91	12.00	38.46	23.02
	Other Labour	67	10.7	7.78	21.4	10.93	2008	24.93	17.77	44.40	24.87
20-24	Agriculture Labour	726	12.6	11.04	22.4	14.45	19	24.95	18.65	46.75	28.49
	Artisans	675	16.9	13.58	31.3	18.80	--	--	--	--	--
	Service & Business	115	15.8	15.41	28.3	19.57	--	--	--	--	--
	Others	--	--	--	--	--	847	29.64	19.11	49.28	25.33
	Other Labour	395	19.1	15.00	32.7	17.91	207	25.69	19.10	46.88	25.18
	Agriculture Labour	83	17.3	16.32	31.3	20.32	1051	27.20	18.78	47.28	25.24
25-29	Artisans	811	13.8	14.18	24.3	18.35	59	19.56	14.47	37.67	23.88
	Service & Business	569	17.7	14.44	32.9	19.15	--	--	--	--	--
	Others	107	17.8	15.57	32.2	19.71	--	--	--	--	--
	Other Labour	--	--	--	--	--	1514	29.75	19.17	50.63	25.89
	Agriculture Labour	405	17.5	13.06	31.4	17.30	238	26.32	18.08	47.21	23.68
	Artisans	90	16.3	13.21	34.1	18.93	338	27.93	20.61	48.86	28.93
30-34	Service & Business	645	13.3	11.37	23.8	15.35	68	27.84	22.97	45.32	28.12
	Others	460	17.9	17.23	33.4	21.79	--	--	--	--	--
	Other Labour	96	13.9	10.19	29.3	21.21	--	--	--	--	--
	Agriculture Labour	--	--	--	--	--	1681	30.11	20.90	51.50	26.97
	Artisans	342	18.8	15.87	33.9	23.49	206	27.11	18.31	47.35	23.61
	Service & Business	64	12.4	9.86	25.7	15.16	202	24.42	17.68	45.40	22.76
	Others	699	12.3	11.33	22.0	15.28	92	26.92	19.99	44.63	24.70
	Other Labour	495	18.1	15.56	33.3	20.35	--	--	--	--	--
	Agriculture Labour	95	14.8	14.50	26.5	17.69	--	--	--	--	--
	Artisans	--	--	--	--	--	1650	29.81	19.45	52.31	28.12
	Service & Business	385	16.8	12.13	30.4	16.65	234	26.97	17.89	49.53	25.35
	Others	58	15.4	14.39	28.4	17.09	175	23.01	17.49	45.13	26.13
35-39	Other Labour	508	12.2	10.65	22.7	15.29	122	23.71	16.05	43.01	25.57
	Agriculture Labour	367	17.2	18.28	32.1	21.41	--	--	--	--	--
	Artisans	71	12.3	8.82	26.0	15.95	--	--	--	--	--
	Service & Business	--	--	--	--	--	1577	28.54	19.25	50.63	25.33
	Others	272	17.3	14.65	32.5	19.18	230	28.15	19.39	50.91	26.82
40-44	Other Labour	50	13.8	14.78	30.2	20.42	199	24.40	18.24	46.53	24.96
	Agriculture Labour	500	11.1	9.45	21.8	13.57	83	20.37	12.60	35.97	18.40
	Artisans	495	16.9	14.05	30.9	18.61	--	--	--	--	--
	Service & Business	72	13.6	11.39	26.8	14.26	--	--	--	--	--
	Others	298	16.9	11.39	31.9	17.28	1319	28.68	18.87	51.34	25.24
45-49	Other Labour	64	17.4	16.77	33.9	21.97	188	28.20	19.07	49.35	24.04

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**Table 4.2: Mean Consumption of Visible Fat and Total Fat by the Different Age Groups and Occupation of Rural and Urban Population (Females)**

	Agriculture Labour	587	11.7	11.64	22.3	15.44	209	27.69	19.51	47.20	24.67
	Artisans	670	15.6	12.49	30.2	17.65	--	--	--	--	--
	Service & Business	78	12.5	10.90	25.8	17.12	--	--	--	--	--
	Others	--	--	--	--	--	87	25.97	19.72	45.39	26.22
50-59	Other Labour	335	16.7	14.41	32.7	18.40	1422	28.65	19.88	51.51	26.30
	Agriculture Labour	162	12.7	11.43	28.5	16.06	218	27.53	18.80	49.75	26.01
	Artisans	454	11.3	10.37	21.5	15.28	536	25.41	17.84	46.41	25.70
	Service & Business	418	15.9	14.71	29.4	19.29	--	--	--	--	--
	Others	67	11.7	11.28	24.5	15.47	--	--	--	--	--
60-69	Other Labour	--	--	--	--	--	41	19.49	14.68	35.25	17.34
	Agriculture Labour	259	13.7	11.16	26.4	15.13	508	24.80	17.30	47.87	24.32
	Artisans	123	12.5	11.12	28.5	17.32	49	21.55	16.02	43.47	21.04
	Service & Business	188	8.3	7.96	17.0	12.14	718	25.00	17.47	45.82	23.86
	Others	143	14.1	11.53	26.8	16.39	--	--	--	--	--
70-79	Other Labour	31	8.8	6.47	21.7	12.39	--	--	--	--	--
	Agriculture Labour	--	--	--	--	--	6	13.68	6.41	28.93	8.31
	Artisans	103	11.6	8.81	24.4	14.54	86	21.01	14.45	43.13	21.42
	Service & Business	54	11.0	8.63	24.7	13.23	12	13.79	9.07	37.38	12.34
	Others	41	9.2	8.73	17.3	11.51	443	21.82	15.03	40.67	20.71
≥80	Other Labour	59	13.3	11.90	23.8	14.18	--	--	--	--	--
	Agriculture Labour	9	7.9	9.43	15.9	12.34	--	--	--	--	--
	Artisans	--	--	--	--	--	15	19.46	11.96	50.26	25.45
	Service & Business	47	12.3	11.86	27.1	19.11	3	9.00	6.00	26.67	11.08
	Others	15	8.0	6.06	25.5	10.93	182	19.10	14.07	36.36	19.27

**Table 5.1: Mean Consumption of Visible Fat and Total Fat by Different Age Groups and Activity Status of Rural and Urban Population (Males)**

Age group (yrs)	Activity Status	Rural				Urban					
		N	Visible fat (g)	Total fat (g)	N	Visible fat (g)	Total fat (g)	Mea n	SD	Mea n	SD
20-24	Sedentary	1215	15.3	14.74	28.1	18.67	1612	31.05	21.61	53.24	29.20
	Moderate & Heavy	498	17.4	14.88	31.8	19.60	437	24.91	19.19	43.63	26.63
25-29	Sedentary	1512	16.5	15.69	29.9	21.09	1192	34.65	23.44	56.89	29.97
	Moderate & Heavy	368	19.8	14.94	35.0	19.23	638	28.95	20.19	48.97	27.68
30-34	Sedentary	1507	17.2	16.41	30.7	21.66	1206	35.22	24.39	58.30	30.77
	Moderate & Heavy	339	19.8	16.87	35.2	22.73	671	28.64	20.24	50.41	28.55
35-39	Sedentary	1460	16.4	15.32	30.6	21.54	1245	35.50	24.18	58.12	30.92
	Moderate & Heavy	304	18.1	15.80	32.7	22.24	716	29.06	21.17	51.71	28.83
40-44	Sedentary	1235	16.7	16.86	30.3	22.03	1245	34.98	24.03	58.07	29.83
	Moderate & Heavy	281	17.3	14.17	33.9	20.00	690	29.77	22.33	51.67	31.44
45-49	Sedentary	1230	16.5	15.04	30.7	20.65	1174	34.12	23.33	57.65	31.09
	Moderate & Heavy	462	17.5	14.64	33.3	20.40	629	26.85	19.76	50.03	27.50
50-59	Sedentary	1644	15.5	13.68	29.7	19.14	1919	33.45	22.78	58.30	29.42
	Moderate & Heavy	582	15.2	13.97	30.2	19.85	722	27.48	20.43	50.03	28.13
60-69	Sedentary	996	16.4	14.41	30.7	19.85	1124	31.36	21.74	55.74	29.20
	Moderate & Heavy	383	13.7	12.02	27.6	17.62	242	27.20	18.71	48.29	23.10
70-79	Sedentary	177	15.4	16.53	30.5	22.97	451	25.54	17.57	49.83	25.52
	Moderate & Heavy	156	13.9	11.49	27.6	16.69	35	18.01	10.19	34.52	15.32
≥80	Sedentary	23	14.7	11.70	23.3	14.92	134	23.32	14.84	44.94	21.69
	Moderate & Heavy	5263	11.2	10.80	21.3	15.03	9	15.07	11.53	29.82	16.95
Pooled	Sedentary	11240	13.9	13.28	26.1	18.39	17961	30.2	21.83	52.5	28.97
	Moderate & Heavy	11554	16.2	15.19	29.9	20.53	4984	27.8	20.38	49.3	28.30

**Table 5.2: Mean Consumption of Visible Fat and Total Fat by Different Age Groups and Activity Status of Rural and Urban Population (Females)**

Age group (yrs)	Activity Status	Rural					Urban				
			Visible fat (g)		Total fat (g)			Visible fat (g)		Total fat (g)	
			N	Mean	SD	Mean	SD	N	Mean	SD	Mean
20-24	Sedentary	1706	15.8	13.66	28.0	17.96	2089	28.15	19.05	48.18	25.32
	Moderate & Heavy	660	14.8	11.22	27.1	16.03	50	26.08	19.77	46.29	27.28
25-29	Sedentary	1395	15.7	14.94	28.9	19.48	2058	29.22	19.40	50.12	26.29
	Moderate & Heavy	934	16.1	13.31	28.5	18.16	105	20.82	14.51	39.48	22.63
30-34	Sedentary	1056	16.1	14.87	29.6	20.96	2018	29.79	20.73	50.96	26.61
	Moderate & Heavy	833	15.2	13.39	27.7	17.95	159	23.60	19.09	43.68	23.60
35-39	Sedentary	999	15.1	13.39	27.8	18.3	1978	29.43	19.60	51.93	27.97
	Moderate & Heavy	1016	14.8	12.56	26.8	16.34	185	23.79	16.19	44.21	25.59
40-44	Sedentary	766	15.5	14.77	29.4	19.95	1936	28.33	19.14	50.49	25.43
	Moderate & Heavy	772	14.5	12.91	26.7	17.74	203	23.09	17.30	43.48	25.74
45-49	Sedentary	813	15.3	13.45	28.9	18.65	1659	28.70	19.16	50.75	25.22
	Moderate & Heavy	854	13.9	10.73	26.2	15.09	151	22.37	15.72	40.89	22.16
50-59	Sedentary	1205	14.0	12.55	28.5	17.51	2126	27.96	19.29	50.17	26.03
	Moderate & Heavy	920	14.1	12.2	26.0	17.76	158	24.94	20.23	46.85	28.34
60-69	Sedentary	1163	13.2	12.33	25.7	17.44	1284	24.78	17.38	46.53	24.01
	Moderate & Heavy	365	14.3	11.80	25.5	15.66	55	21.44	15.38	38.47	18.76
70-79	Sedentary	539	10.9	9.93	23.3	15.26	546	21.26	14.68	40.76	20.48
	Moderate & Heavy	31	12.0	8.65	21.2	12.61	15	22.49	17.07	37.93	20.78
≥80	Sedentary	192	11.2	10.39	22.4	14.79	206	19.15	13.84	37.74	20.26
	Moderate & Heavy	-	-	-	-	-	1	8.40	-	17.20	-
Pooled	Sedentary	16870	13.4	12.41	25.2	17.38	22015	26.4	18.75	47.2	25.44
	Moderate & Heavy	6758	14.6	12.22	26.6	16.75	1116	23.2	17.43	42.9	24.78

**Table 6.1 Mean Consumption of Visible Fat and Total Fat by Different Age Groups and Community of Rural and Urban Population (Males)**

Age group (yrs)	Literacy status	Rural						Urban					
		N	Visible fat (g)		Total fat (g)		N	Visible fat (g)		Total fat (g)		Mean	SD
			Mean	SD	Mean	SD		Mean	SD	Mean	SD		
5-14	ST	887	8.9	6.69	18.2	10.82	103	20.26	14.24	38.44	22.15		
	SC	1287	10.9	10.03	19.6	13.39	831	22.91	18.38	40.28	24.72		
	BC	1774	12.00	11.78	22.5	15.44	1736	20.34	16.03	40.50	23.80		
	Others	1316	11.8	12.10	23.3	17.69	1787	24.95	17.09	47.38	25.17		
15-19	ST	320	12.4	11.79	24.3	16.31	41	24.85	18.36	46.49	27.55		
	SC	627	14.1	12.09	24.5	16.08	390	27.11	19.30	46.38	26.50		
	BC	759	15.2	15.14	29.1	20.11	893	26.15	19.22	46.70	26.61		
	Others	634	15.9	13.99	28.4	18.67	980	32.80	21.38	55.31	28.81		
20-24	ST	295	13.1	11.53	24.9	15.77	46	30.93	25.71	44.69	28.55		
	SC	523	15.4	15.92	27.0	19.45	397	30.64	21.04	50.60	27.88		
	BC	706	16.2	14.07	31.1	19.00	772	26.82	18.85	49.09	27.84		
	Others	506	18.0	17.79	31.6	19.76	803	31.31	21.31	53.00	28.90		
25-29	ST	300	14.8	10.98	27.4	16.58	38	35.87	19.83	51.31	24.53		
	SC	470	16.4	18.38	28.0	18.87	374	33.19	21.73	51.35	27.35		
	BC	694	16.7	13.76	31.6	22.57	670	30.32	21.83	52.97	29.58		
	Others	546	18.1	16.82	32.6	22.97	726	34.19	23.56	56.71	30.56		
30-34	ST	301	14.5	10.21	28.1	16.38	41	29.37	17.74	45.33	22.36		
	SC	432	17.0	16.00	28.0	20.75	353	33.31	23.16	53.86	29.91		
	BC	660	18.0	15.30	32.9	20.17	685	29.72	22.38	52.90	29.72		
	Others	482	19.9	19.77	35.0	24.87	779	35.31	23.74	58.78	30.79		
35-39	ST	280	15.2	12.98	30.5	20.14	36	35.91	30.34	59.18	38.43		
	SC	425	15.3	14.07	26.7	18.97	335	34.15	23.58	55.61	31.51		
	BC	599	18.5	17.47	33.9	22.61	760	29.46	21.73	52.73	28.48		
	Others	496	17.9	15.87	33.1	22.90	817	35.96	23.82	58.49	30.78		
40-44	ST	217	13.8	10.22	26.5	15.56	35	29.18	19.36	46.74	27.80		
	SC	320	16.2	14.32	27.8	19.11	294	34.27	23.10	54.01	30.52		
	BC	539	17.2	18.16	31.6	22.81	762	29.26	22.27	52.08	28.94		
	Others	461	18.7	18.50	33.8	25.10	826	36.13	24.30	59.85	31.49		
45-49	ST	203	14.6	10.12	27.8	16.38	34	28.67	23.19	52.30	34.93		
	SC	333	15.6	15.12	27.4	19.49	251	32.74	21.59	52.90	27.19		
	BC	538	16.7	15.00	32.45	20.44	754	27.82	19.90	52.53	29.04		
	Others	436	18.3	16.21	34.5	22.54	753	34.91	24.31	58.04	31.22		

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**Table 6.1 Mean Consumption of Visible Fat and Total Fat by Different Age Groups and Community of Rural and Urban Population (Males)**

Age group (yrs)	Literacy status	Rural				Urban					
		N	Visible fat (g)		Total fat (g)		N	Visible fat (g)		Total fat (g)	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
50-59	ST	275	13.8	8.91	26.3	14.39	49	27.40	17.58	47.60	26.76
	SC	449	14.7	12.61	27.5	17.75	374	32.44	21.57	54.56	28.81
	BC	735	16.0	13.14	31.5	18.43	1012	28.69	21.14	53.67	28.17
	Others	646	17.6	16.90	33.2	22.88	1191	34.20	23.02	58.65	29.97
60-69	ST	172	13.8	10.53	26.3	16.03	24	34.44	20.35	56.37	26.31
	SC	368	14.3	15.04	26.4	20.75	178	31.57	21.31	51.23	26.91
	BC	534	16.1	13.35	32.9	19.73	525	27.44	20.81	51.78	27.88
	Others	504	17.6	15.47	31.3	20.84	634	32.84	21.44	57.37	28.92
70-79	ST	46	17.4	26.39	28.4	34.70	9	18.18	10.99	43.68	29.43
	SC	107	14.4	11.66	24.8	15.68	71	23.24	15.19	42.60	21.44
	BC	203	12.3	9.79	27.1	14.38	174	21.89	16.56	45.43	24.99
	Others	203	15.2	13.37	31.7	20.51	222	28.40	18.05	53.50	25.73
>=80	ST	9	11.6	4.63	26.0	9.43	2	24.25	5.16	36.35	19.16
	SC	30	10.9	8.71	20.8	11.66	14	20.26	11.44	34.51	16.10
	BC	67	13.6	13.24	25.9	16.73	49	18.23	10.61	40.11	19.37
	Others	74	15.85	11.09	30.8	17.77	77	25.88	16.84	47.65	22.57
Pooled	ST	3305	12.7	10.61	24.6	16.21	458	27.9	20.54	46.8	27.77
	SC	5371	14.2	13.92	25.0	18.21	3862	29.9	21.40	49.4	28.18
	BC	7808	15.4	14.39	29.4	19.40	8792	26.6	20.19	49.2	27.89
	Others	6304	16.5	15.97	30.7	21.87	9595	32.3	22.20	55.3	29.44

**Table 6.2 Mean Consumption of Visible Fat and Total Fat by Different Age Groups and Community of Rural and Urban Population (Females)**

Age group (yrs)	Literacy status	Rural				Urban					
		N	Visible fat (g) Mean	SD	Total fat (g) Mean	SD	N	Visible fat (g) Mean	SD	Total fat (g) Mean	SD
5-14	ST	847	9.1	7.66	18.2	11.52	90	18.68	15.12	33.43	23.22
	SC	1136	10.2	9.22	18.3	13.12	705	19.73	15.02	36.29	20.78
	BC	1738	10.7	9.88	21.1	14.45	1555	19.02	14.93	37.34	21.04
	Others	1242	11.3	10.11	22.1	15.26	1550	22.60	17.10	42.83	23.29
15-19	ST	371	10.6	7.24	21.6	12.52	39	28.18	19.42	43.63	21.87
	SC	563	12.9	10.25	22.4	13.40	381	26.80	18.00	44.10	25.02
	BC	840	13.3	10.83	25.0	15.00	840	22.46	16.41	42.39	24.01
	Others	672	15.0	13.79	26.7	19.07	903	26.57	18.38	46.53	25.18
20-24	ST	363	13.6	10.66	25.1	15.83	45	27.18	14.50	45.26	20.64
	SC	566	15.1	12.80	25.3	16.32	388	27.98	17.79	46.21	23.50
	BC	769	15.7	12.66	29.1	16.66	822	25.37	17.82	45.76	24.86
	Others	667	16.5	14.66	29.9	19.60	869	30.56	20.41	51.14	26.40
25-29	ST	378	13.0	10.25	24.4	14.52	56	24.78	15.14	39.07	20.40
	SC	555	15.1	14.90	26.2	19.28	416	28.05	17.56	46.62	24.72
	BC	828	16.1	13.24	30.2	17.68	799	27.82	20.17	50.13	27.05
	Others	567	17.9	16.95	32.0	21.98	878	30.31	19.33	51.23	26.18
30-34	ST	292	14.0	12.79	27.4	17.98	55	35.67	32.32	55.12	36.13
	SC	425	14.6	12.85	24.8	17.02	372	30.39	21.04	50.17	27.75
	BC	657	16.0	14.49	30.5	19.96	846	25.54	17.82	47.73	23.87
	Others	516	17.2	15.59	30.8	21.76	884	31.84	21.25	52.61	27.24
35-39	ST	284	13.3	10.98	24.6	16.11	42	26.47	17.62	45.05	23.68
	SC	439	14.5	13.35	24.4	16.56	332	28.93	19.51	48.77	25.97
	BC	701	15.3	13.17	28.8	17.85	848	26.46	18.78	49.38	26.60
	Others	590	15.8	13.28	28.9	18.46	929	31.04	19.42	53.76	29.05
40-44	ST	224	13.2	9.43	24.8	14.32	39	28.79	23.15	47.96	29.84
	SC	352	13.0	11.14	23.7	16.00	326	28.83	18.51	48.46	24.44
	BC	540	14.8	14.52	28.7	19.20	880	24.09	17.01	46.99	24.55
	Others	425	17.9	18.33	32.4	21.65	883	31.16	20.30	53.27	26.34
45-49	ST	208	13.1	8.25	23.5	12.14	37	26.59	14.90	43.04	19.69
	SC	362	13.6	11.05	24.8	14.84	274	30.02	20.68	49.18	25.78
	BC	581	14.7	12.27	28.9	17.18	690	24.93	17.26	47.46	23.96
	Others	515	15.8	13.88	29.4	19.18	798	30.31	19.18	52.66	25.52

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**Table 6.2 Mean consumption of Visible Fat and Total Fat by Different Age Groups and Community of Rural and Urban Population (Females)**

Age group (yrs)	Literacy status	Rural				Urban					
		N	Visible fat (g)		Total fat (g)		N	Visible fat (g)			
			Mean	SD	Mean	SD		Mean	SD		
50-59	ST	261	11.8	8.03	23.1	13.56	52	29.38	17.41	47.89	24.53
	SC	475	12.9	13.09	23.3	17.30	292	27.96	20.43	46.69	27.65
	BC	720	13.6	10.69	28.1	15.48	854	24.24	17.70	47.42	25.27
	Others	668	16.3	14.53	31.3	19.18	1065	30.26	19.99	52.86	26.34
60-69	ST	177	13.6	12.42	24.8	17.12	18	30.66	22.98	50.06	32.38
	SC	325	12.4	11.05	22.0	15.17	196	24.79	16.53	41.58	23.17
	BC	534	12.7	10.93	25.3	15.57	516	20.76	15.58	42.96	22.68
	Others	491	14.9	13.97	28.9	19.03	586	27.78	18.10	50.47	24.12
70-79	ST	54	8.8	7.13	16.7	10.26	3	11.60	5.31	18.63	7.04
	SC	115	11.4	9.84	19.7	13.98	77	21.74	15.41	38.83	18.69
	BC	207	10.3	9.83	22.9	14.68	217	19.48	14.34	39.48	19.63
	Others	195	12.1	10.46	24.7	16.75	250	23.14	14.93	42.95	21.85
>=80	ST	9	11.9	10.35	20.4	12.51	1	8.30	.	20.50	
	SC	38	9.8	8.41	16.9	10.39	18	16.50	10.96	31.73	18.66
	BC	63	9.9	8.39	21.4	12.05	86	17.37	15.34	36.64	22.01
	Others	82	12.7	12.37	25.8	17.68	95	21.01	12.78	39.03	18.25
Pooled	ST	3468	11.8	9.68	22.7	14.43	477	26.6	20.03	43.6	25.95
	SC	5351	13.0	11.90	22.7	15.87	3777	26.5	18.53	44.8	24.90
	BC	8178	13.7	12.11	26.6	16.87	8953	23.6	17.41	45.0	24.50
	Others	6630	15.2	14.03	28.2	19.33	9690	28.6	19.40	50.0	26.05

**Table 7.1 Mean Consumption of Fat by Religion in Different Age Groups among Rural and Urban Population (Males)**

Age group (yrs)	Religion	Rural				Urban			
		N	Visible fat (g)		Total fat (g)		N	Visible fat (g)	
			Mean	SD	Mean	SD		Mean	SD
5-14	Hindu	4779	11.1	10.19	21.1	14.50	3597	22.80	17.19
	Muslim	332	11.2	11.25	21.0	15.38	622	22.20	16.40
	Christian	151	10.0	8.61	23.6	15.90	164	18.93	13.10
15-19	Hindu	2137	14.7	13.81	27.0	18.34	1883	29.54	20.90
	Muslim	158	14.4	12.63	26.2	18.67	317	28.01	17.47
	Christian	45	12.9	9.27	28.3	15.99	57	20.94	15.02
20-24	Hindu	1870	16.1	15.62	29.3	20.07	1628	30.18	21.10
	Muslim	103	15.4	11.58	28.9	16.95	266	25.40	15.54
	Christian	56	11.6	8.79	27.8	13.50	71	24.95	17.11
25-29	Hindu	1848	16.9	15.42	30.5	20.58	1509	32.77	21.73
	Muslim	101	14.6	16.76	25.9	21.46	197	33.28	28.38
	Christian	59	13.8	14.70	33.6	23.29	63	24.55	19.15
30-34	Hindu	1726	17.6	15.42	31.4	20.83	1546	32.61	23.20
	Muslim	87	20.1	17.81	33.4	20.04	215	33.89	22.77
	Christian	59	13.3	12.81	29.4	19.11	69	29.26	23.71
35-39	Hindu	1636	17.0	15.69	31.1	21.75	1609	33.11	23.45
	Muslim	106	18.0	14.51	31.9	19.67	210	34.53	23.81
	Christian	58	16.8	17.37	39.0	26.37	92	24.60	13.98
40-44	Hindu	1418	17.0	16.89	30.8	22.23	1611	33.02	23.36
	Muslim	71	15.6	13.88	27.8	20.08	201	31.20	21.66
	Christian	47	15.9	13.29	32.6	21.00	68	28.97	23.16
45-49	Hindu	1381	16.7	15.06	31.1	20.58	1536	31.60	22.46
	Muslim	74	15.9	13.77	30.8	20.91	176	31.66	22.49
	Christian	54	15.3	11.70	37.8	19.18	53	27.83	19.23
50-59	Hindu	1919	16.0	14.07	30.4	19.71	2166	32.26	22.55
	Muslim	106	15.7	11.41	28.7	16.22	246	29.99	20.74
	Christian	79	13.8	13.1	32.7	17.90	137	23.43	14.42
60-69	Hindu	1437	15.9	13.91	30.2	19.59	1110	30.34	20.19
	Muslim	81	17.6	14.23	33.5	22.96	139	33.27	28.03
	Christian	59	12.3	16.31	33.0	19.83	77	24.96	18.85
70-79	Hindu	495	14.2	14.24	28.2	19.65	383	26.02	18.31
	Muslim	40	15.1	13.64	29.5	17.17	43	20.44	10.93
	Christian	24	11.5	11.67	32.3	18.94	36	20.34	11.72
≥80	Hindu	163	14.0	13.56	26.6	16.14	118	22.11	13.37
	Muslim	11	14.2	11.32	25.7	19.01	10	28.87	28.42
	Christian	6	14.1	10.95	40.9	17.05	9	19.88	12.17
Pooled	Hindu	20809	15.1	14.25	27.9	19.50	18696	29.8	21.52
	Muslim	1270	14.8	13.63	27.1	18.88	2642	28.6	21.13
	Christian	697	13.0	12.20	30.9	19.55	896	23.9	17.25

**Table 7.2 Mean Consumption of Fat by Religion in Different Age Groups among Rural and Urban Population (Females)**

Age group (yrs)	Religion	Rural					Urban				
		N	Visible fat (g)		Total fat (g)		N	Visible fat (g)		Total fat (g)	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
5-14	Hindu	4486	10.5	9.47	20.0	13.89	3125	20.63	16.10	38.99	22.06
	Muslim	352	10.5	9.66	20.6	14.86	566	20.09	14.92	38.47	21.82
	Christian	121	9.9	8.42	23.7	14.72	151	19.13	15.19	45.56	24.71
15-19	Hindu	2190	13.4	11.42	24.4	15.74	1740	25.58	18.28	45.15	25.17
	Muslim	182	12.7	9.80	23.9	15.05	324	22.36	14.31	39.38	21.27
	Christian	74	11.2	8.70	24.7	15.27	63	20.81	12.53	47.07	24.20
20-24	Hindu	2158	15.6	13.03	27.9	17.45	1698	28.05	18.85	48.00	25.00
	Muslim	144	13.3	13.57	25.0	17.56	304	28.38	19.17	47.28	26.06
	Christian	62	13.6	11.51	27.4	16.51	76	23.04	19.18	46.63	27.79
25-29	Hindu	2119	15.6	13.52	28.2	18.17	1763	28.93	19.20	49.59	26.07
	Muslim	132	17.6	17.04	32.6	21.42	251	29.58	20.82	49.77	27.49
	Christian	75	14.8	10.65	33.4	19.89	92	24.30	16.61	49.24	25.08
30-34	Hindu	1744	15.8	14.45	28.8	19.85	1766	29.44	20.72	50.05	26.23
	Muslim	91	14.6	12.39	25.8	16.41	249	28.76	21.49	51.50	30.19
	Christian	54	13.6	9.74	32.8	19.70	100	23.42	11.56	51.83	19.98
35-39	Hindu	1823	15.0	13.07	27.1	17.68	1789	28.74	19.26	51.01	27.68
	Muslim	122	14.7	11.64	27.2	17.09	238	29.53	19.05	50.80	25.48
	Christian	69	15.3	12.82	30.4	17.45	91	25.04	18.92	50.45	32.77
40-44	Hindu	1394	14.9	13.81	27.5	18.61	1779	27.98	19.27	49.87	25.60
	Muslim	82	18.1	16.36	34.6	23.40	227	27.39	17.06	48.44	24.11
	Christian	65	12.9	10.64	31.6	17.03	85	21.86	14.20	50.65	26.93
45-49	Hindu	1519	14.7	12.14	27.5	16.91	1482	28.43	18.87	50.17	24.90
	Muslim	95	13.3	12.97	24.7	17.13	176	25.92	17.56	45.84	25.40
	Christian	51	14.0	11.16	32.0	17.67	90	23.39	15.90	48.10	22.90
50-59	Hindu	1928	14.2	12.53	27.3	17.31	1855	27.98	19.70	49.89	26.30
	Muslim	103	14.0	11.72	27.8	18.20	225	26.91	18.75	48.73	26.84
	Christian	91	10.3	8.82	27.4	13.79	133	21.75	13.26	49.37	24.70
60-69	Hindu	1386	13.5	12.32	25.5	17.02	1073	24.96	17.22	45.89	23.66
	Muslim	89	13.8	12.24	26.9	16.97	115	23.22	19.29	45.36	26.28
	Christian	52	11.2	9.06	27.5	17.35	90	19.81	12.94	49.01	22.65
70-79	Hindu	512	11.2	10.04	22.2	15.09	436	21.77	14.62	40.77	20.38
	Muslim	34	10.6	7.82	23.5	15.24	55	22.95	19.20	40.11	23.17
	Christian	25	7.2	8.15	22.5	16.08	41	15.54	8.81	42.06	20.65
≥80	Hindu	173	11.5	10.64	22.5	14.94	166	18.49	13.37	36.13	19.05
	Muslim	6	9.6	8.62	18.3	7.93	18	26.56	18.72	45.52	25.32
	Christian	13	7.1	6.47	22.2	15.63	14	15.97	9.53	42.61	21.23
POOLED	Hindu	21432	13.8	12.36	25.5	17.13	18672	26.5	18.79	47.0	25.37
	Muslim	1432	13.4	12.39	25.5	17.64	2748	25.5	18.24	45.3	25.46
	Christian	752	12.1	10.13	28.2	16.95	1026	21.7	14.98	48.4	25.02

**Table 8: Mean Consumption of Visible Fat through Various Food (Groups) Sources per CU/day among Rural Population**

Food Source	g/CU/day
Chutney with Pulses	1.8
GLV with Chutney	2.8
Vegetable Chutney	2.0
Other Chutneys	1.4
Dhal Curries	1.1
Vegetable Curries	1.8
GLV Curries	2.1
Flesh Food Curries	3.5
Junk Foods* (foods which contain high sugar, fats and salts and no minerals and vitamins)	1.4
Milk and Milk Products	1.6
Total	19.5

\*Junk Foods-Sweets, Carbonated Beverages, Chips, Bakery Foods etc

**Table 9: Percent Contribution of Saturated, Mono, Poly Unsaturated Fatty Acids from the Consumption of Various Fatty Foods in the Rural Population**

Type of Fat Consumption			
Saturated	Mono-unsaturated	Poly-unsaturated	Trans fats
22.6	27.9	49.0	0.5

**Table 10.1: Mean Consumption of Total Fat (g) from Various Packaged Foods**

Packaged Foods	Total Fat (g)
Biscuits	0.05-2.2
Healthy Food Drinks	1.7-4.1

**Table 10.2: Mean Consumption of Total Fat (g) from Routine Home Preparations**

Routine Home Preparations	Total Fat (g)
Puri	21.96
Wheat Parota	10.38
Rice-Plain Rice/Rice Bath	0.47
Tea	2.10
Wheat - Phulka/Roti	2.48
Potato – Curry	3.74
Red Gram Dhal - Sambar Type	3.44
Fish - Curry –Gravy	5.62
Mixed Vegetables – Curry	2.82
Idly	0.88
Dosa	3.67
Tamarind – Rasam	1.94
Brinjal – Curry	4.64
Tomato Green – Chutney	3.83
Chicken - Curry –Gravy	5.65

**Table 10.3: Mean Consumption of Total Fat (g) from Various Snacks**

Snacks	Total Fat (g)
Egg - Fry/Deep Fry/ Snack	5.37
Salted Fish - Fry/Deep Fry/ Snack	3.93
Chicken - Fry/Deep Fry/ Snack	11.50
Prawn - Fry/Deep Fry/ Snack	2.76
Goat Meat - Fry/Deep Fry/ Snack	3.20
Pakodi (All Varieties)	9.03
Mixture	0.14
Egg Puff / Egg Roll	2.07
Banana Fritters	5.10

**Table 10.4: Mean Consumption of Total Fat (g) from Various Street Foods**

Street Foods	Total Fat (g)
Veg Noodles/Foodiles	0.95
Non-Veg Manchuria	2.43
Momo- Fried (Veg./Non-Veg)	5.05
Rice-Egg Rice	11.80
Rice-Fried Rice	7.56

**Table 10.5: Mean Consumption of Total Fat (g) from Various Cereal Based Fried Items**

Cereal Based Fried Items	Total Fat (g)
Cow Pea - Deep Fry	4.38
Field Bean - Deep Fry	3.00
Green Gram Dhal - Deep Fry	6.43
Red Gram Dhal - Deep Fry	5.33
Peas Green - Deep Fry	1.66
Green Gram Whole - Deep Fry	7.40
Rajmah - Deep Fry	1.78
Soya Bean - Deep Fry	6.60
Moth Beans - Deep Fry	6.05
Rice Flakes - Rice Flakes-Chudva( Deep Fried)	0.40

**Table 10.6: Mean Consumption of Total Fat (g) from Various Sweet Based Preparations**

Sweet Based Preparations	Total Fat (g)
Appam	6.76
Idiappam/Noolputtu	2.80
Achappam	6.78
Homemade Sweet Cake (rice)	8.86
Barfi	0.07

[Disclaimer-ILSI/ILSI India are not responsible for veracity of any statement or finding]



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