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EXECUTIVE SUMMARY

Diet plays a crucial role in determining the health and nutritional status of the population. The dietary diversity of a food plate is determined by several factors such as personal factors and environmental factors. Keeping this in view, an attempt has been made to understand (i) region wise food groups consumption and macronutrient intake (ii) contribution of different food groups to energy, protein, fat and carbohydrates (iii) proportion of population consuming energy obtained from various food groups as per ICMR-NIN “**My Plate for the Day**” recommendations (iv) region-wise variations in the prevalence of obesity and hypertension (HTN) and diabetes (T2D).

Region wise information on dietary consumption in terms of food groups is essential for developing an appropriate region specific food based strategies for tackling the triple burden of malnutrition in India with diverse cultural and food behaviour practices. Also, it would help in evolving inter-ministerial convergence related to production, processing, distribution, availability etc., for ensuring food and nutrition security to achieve 'zero hunger' by 2030.

Dietary data analysis of adults in urban and rural India on macronutrient intakes based on household 24 hour dietary recall showed that an average adult from urban India consumed 1943 Kcal/day, 289 g carbohydrates, 51.6 g fat and 55.4 g protein. In rural region, an average adult consumed 2081 kcal/day, 368 g of carbohydrates, 36 g of fat and 69 g of protein. As per food groups, the total energy (E) intake from cereals contributed to 998 Kcal/day, while visible fats and pulses & legumes contributed to 265 Kcal/day and 119 Kcal/day respectively in urban areas. In contrast, the total energy intake from cereals was much higher (1358) Kcal/day, and considerably lower from fats (145 Kcal/day), pulses and legumes (144 Kcal/day) in rural areas. Whereas, milk and milk products contributed almost similar in urban (99 Kcal/day) and rural areas (87Kcal/day). As per the recommendations on food groups, not more than 45% of energy should be contributed by cereals and millets, whereas, the actual contribution was 51% in urban region and 65.2%

in rural region; while pulses, legumes, meat, poultry and fish contributed to mere 11% of the total energy per day in urban areas and rural areas, as against the recommended minimum intake level of 17% of total energy from these foods.

As for milk and milk products, only 8.7% in rural and 14.3% of the population in urban areas consumed as per the recommended intakes. About 8.8% of the population in rural and 17% in urban areas consumed vegetables as per the recommended intake while, 22 % in rural and 27 % in urban areas consumed the recommended intake of nuts and oil seeds. Importantly, other foods (chips, biscuits, chocolates, sweets, juices, etc.,) contributed to 11% E per day in urban areas as compared to 4% in rural areas. When compared with the '**My Plate**' recommendations, majority of the population consumed lower than recommended levels of pulses, legumes, milk, nuts and vegetables while consumption of cereals and millets was higher than recommended levels.

The prevalence of abdominal obesity (AOb), overweight (OW) and obesity (Ob) were 53.6%, 31.4% and 12.5% among urban population, while chronic energy deficiency (CED) was 9.3%. Among rural India, the prevalence of AOb, OW and Ob were 18.8%, 16.6% and 4.9% respectively, while CED was 35.4%.

KEY HIGHLIGHTS

- The report presents, for the first time, the contribution of various food groups to the total energy (E), proteins, fats and carbohydrates from the dietary data of two large-scale surveys in India that used 24-hour recall method.
- Proportion of population consuming more than recommended intakes of cereal was 97.1% in rural and 68.8% in urban region.
- Low consumption of fruits and vegetables and low intake of milk and milk products increased the risk of diabetes and hypertension respectively.

Background

My plate for the day typically recommends 40% of calorie/energy (E) intakes from cereals and millets, 17% E from pulses and flesh foods and 10% E from milk and milk products for a 2000 Calories diet in a day (Table 1).

The '**My Plate for the Day**' developed by the ICMR-National Institute of Nutrition has been designed on the basis of Recommended Dietary Allowances (RDA), typically illustrates proportion of foods from different food groups to be sourced for a 2000 Kcal Indian diet. The plate recommends sourcing of macronutrients and micronutrients from minimum of 8 food groups per day with vegetables, fruits, green leafy vegetables, tubers forming essentially half the plate of the recommended foods per day. The other major portion consists of cereals and millets, followed by pulses and milk/curd.

Based on ICMR-NIN 'My Plate' recommendations, the intake of cereals should be not more than 40% of the total energy, while for pulses, eggs and flesh foods the total energy percentage can be around 17% , total fat intake is less than or equal to 30%, while milk and milk products intake should be more than or equal to 300ml/day. As for vegetables including GLV, tubers (excluding potato) the intake should be 350g, fruit intake and nuts should be 150g and 30g per day respectively. In this report, for the first time, contribution of different food groups to energy, protein, fat and carbohydrate was analyzed for different regions of urban and rural India. The proportion of population consuming energy obtained from various food groups as per ICMR-NIN My Plate recommendations (Table-1), and region-wise variations in macro-nutrient intakes and indicators of body mass index (BMI), hypertension (HTN) and diabetes (T2D) are presented.

Though 'My Plate' is not a representation of any therapeutic diet, regular consumption of foods in the mentioned proportions coupled with regular physical activity has the potential to optimize immune function and reduce Communicable and Non-Communicable Diseases (NCD) (diabetes, hypertension, coronary heart disease, stroke, cancer, arthritis etc.,).

My Plate for the Day

Promotes Health

Prevents Hidden Hunger and Protects from Diseases



Table 1. Calories (energy, E) and Protein from different Food Groups ('MY PLATE' Recommendations)

Food groups	Foods to be Consumed (g) / day	Percent of Total E /day	Total E (kcal) /day	Total Protein (g) / day	Total fat (g)/ day	Carbohydrate (g)/day
Cereals (incl. Nutri-cereals)	240	40	800	18	4	162
Pulses [*]	90	17	340	21	3	41
Milk/ Curd (ml)	300	10	200	10	12	18
Vegetables ⁺ green leafy vegetable (GLV)	350	5	100	4	1	17
Fruits [#]	150	5	100	1	1	20
Nuts & Seeds	30	11	217	4	12	6
Fats & Oils ^{\$}	27	12	243	-	27	0
Total	1187	100	2000	60	60	264

Source: ICMR-NIN My Plate

* Eggs/fish/meat can substitute a portion of pulses

+ Prescribed amount of vegetables (excluding potato) may be consumed either in cooked form/ salad

Prefer fresh fruits (avoid juices)

\$ Use different varieties of cooking oils, vegetables, fruits, nuts etc to obtain a variety of phytonutrients, vitamins, minerals and bioactive compounds.

Methods

To understand the region wise dietary habits of urban population, macronutrients intakes and energy source from each food groups were evaluated from NNMB urban survey data collected from 16 states across 6 regions in India (Urban survey, 2016) and 10 states from 4 regions in rural India (Rural survey, 2012). Food intake was determined by 24-hour diet recall method from the household members. The nutrient intakes were computed for adults aged 18 and above, using Indian Food Composition Tables (IFCT) (Longvah *et al.*, 2017) and Nutritive value of Indian Foods (NVIF) (Gopalan *et al.*, 1983) data. For foods that are not listed in the IFCT or NVIF, such as instant foods, biscuits or chips and so on, the data were collected from food labels and United States Department of Agriculture

(USDA) database. Foods consumed were categorized into 15 food groups as mentioned in annexures. The mean energy (calories), carbohydrate, protein and fat intakes were calculated region wise (East, West, North, South, Central and Northeast) for each food group separately and expressed as percentage of total intakes. Computations were made in SPSS (19.0 version) and R package.

Details of the survey methods are available in the respective NNMB Technical Reports on NIN website. The states across different regions in both urban and rural areas are considered as per the NNMB survey (Table 2).

Household survey (HHs) of the total sample of adults in urban areas was 34671 across the six regions in the country and for the rural areas 33261 adults across four regions. The distribution of samples across regions in rural and urban areas in India and their proportion to the total sample is given in Table 3.

**Table 2. Regions and States considered in NNMB
Urban & Rural Surveys**

	Urban Survey	Rural Survey
Regions	States	
North	New Delhi	NA
	Rajasthan	NA
Central	Madhya Pradesh	Madhya Pradesh
	Uttar Pradesh	Uttar Pradesh
East	Odisha	Odisha
	West Bengal	West Bengal
	Bihar	NA
Northeast	Assam	NA
West	Maharashtra	Maharashtra
	Gujarat	Gujarat
South	Kerala	Kerala
	Tamil Nadu	Tamil Nadu
	Karnataka	Karnataka
	Andhra Pradesh	Andhra Pradesh
	Andaman and Nicobar Islands	NA
	Puducherry	NA

Source: NNMB rural and urban surveys; NA: Not available

Table 3. Distribution and proportion of the adults across regions and areas in India

	Urban		Rural	
Region	N	%	N	%
Central	4934	14.2	6296	18.9
East	6385	18.4	6391	19.2
North	3436	9.9	-	-
Northeast	1124	3.2	-	-
South	13633	39.3	13220	39.7
West	5159	14.9	7354	22.1
Total	34671	100.0	33261	100.0

Source: NNMB rural and urban surveys

The following section gives an account of the actual energy intakes of the food groups across different regions and areas among the adults.

Results

Food and nutrient intakes for urban and rural population are given in Tables 4 & 5. Mean calorie intake of adults (all states) in urban areas was 1943 kcal/day with 289 g of carbohydrate (CHO) and 52 g and 55 g of fat and protein intake respectively per day while in rural areas the mean calorie intake was 2081 Kcal/day with 368g of carbohydrates and 36 g of fat and 69 g of protein. As per food groups, the total energy/ calorie (hence forth referred as E) intake from cereals contributed to 998 Kcal/day, while visible fats and pulses & legumes contributed to 265 Kcal/day and 119 Kcal/day respectively in urban areas. In contrast, the total energy intake from cereals was much higher (1358) Kcal/day, and considerably lower from fats and pulses & legumes in rural areas (fats, 145 Kcal/day and pulses & legumes, 144 Kcal/day respectively). Whereas, milk and milk products contributed almost similar in urban (99 Kcal/day) and rural areas (87 Kcal/ day).

The % E (Energy/ Calories) derived from different food groups showed that cereals and millets contributed 51% of E per day in urban areas and 65.2% of E in rural areas, while milk and milk products, pulses and legumes contributed 5% and 6% of E per day respectively, in urban areas, which was similar to rural areas (4% E and 7% E respectively). Together, pulses, legumes, meat, poultry and fish contributed to 11% of the total energy per day in urban areas and 11.4% of E in rural areas as against the recommended intake level of 17% of total energy from these foods.

In addition, energy source from fruits and vegetables was only 2.6% E in urban areas and 2.3% E in rural areas as against the minimum requirement of 8-10% E per day. Similarly, whole nuts and oilseeds formed only 2% E in urban areas and 2.9% E in rural areas as against recommendation of 8% E per day. Other foods (which include chips, biscuits, chocolates, sweets, juices, etc.,) contributed to 11% E per day in urban areas, while it was low in rural areas (4%). The pooled analysis of the mean and percent of energy from carbohydrates, protein and fat intake from different food groups among adults in urban India are provided in Table-4 and more information region-wise is given in Annexure 1 and 2.

Table 4. Mean intakes and percent of energy (E), CHO, protein and fat from different food groups among urban adults in India

Food groups	Intake		Energy		Protein		Fat		Carbohydrate	
	(g)	(%)	(Kcal)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Cereals and Millets	293.4	33.7	998	51.4	26.3	47.5	2.9	5.6	212	73.4
Pulses and Legumes	38.6	4.4	119	6.1	8.2	14.8	0.8	1.6	19	6.6
Fats and Edible Oils	29.5	3.4	266	13.7	0	0	29.5	57.2	0	0
Meat, Poultry, Fish and Sea foods	32.1	3.7	104	5.4	6.4	11.6	2.1	4.1	0	0
Milk and Milk products	120.7	13.9	99	5.1	4.2	7.6	6	11.6	8	2.8
Nuts and Oil seeds	8.9	1	39	2	0.8	1.4	3.6	7	1	0.3
Vegetables	92.2	10.6	29	1.5	1.9	3.4	0.3	0.6	4	1.4
Roots and tubers	87.5	10	53	2.7	1.4	2.5	0.2	0.4	11	3.8
Fruits	51.6	5.9	22	1.1	0.5	0.9	0.2	0.4	4	1.4
Others	116.8	13.4	215	11.1	5.7	10.3	6	11.6	31	10.7
Total	871.3	100	1943	100	55.4	100	51.6	100	289	100

Energy Intakes by Regions

The region wise energy intakes from various food groups among adults in urban and rural India.

Region: NORTH (Urban)

In north India, the mean intake of total calories (1723 Kcal), protein (47g), and carbohydrate (221g) were lower than that of national average. However, fat intake (67.3g) was much higher than the national average (51.6g). The total calorie intake from cereals was the lowest (700 Kcal/day) among all the regions forming only 40.7% of the total E (energy or calories). Pulses, legumes and flesh foods contributed to about 8% E of the total energy, which was 50% less than the recommended 17% of energy intake from those foods. Similarly, milk & milk products contributed to only 6.7%E. Contribution of energy intake from visible fats was highest (413 Kcal/day) among all the regions, contributing to 24% E. However, fruits and vegetables contributed to less than 3% E against the required 8-10% E. Further, nuts and oil seeds contributed to only 0.3% E against the required 8% E per day.

Region: CENTRAL (Urban & Rural)

In Central India, the intake of total calories (1825 Kcal), protein (50.2g), fat (49.8g) and carbohydrate (277g) were lower than that of pooled average intake in urban areas, while in rural areas, the total calories intake (2269 Kcal) protein (85g), fat (36g) and carbohydrate (400g) were above the urban areas of central region with the exception of fat intake. The total calorie contribution from cereals was 983 Kcal/day and pulses and legumes was 113 Kcal/day in urban areas while in rural areas it was 1555 Kcal/day and 113 Kcal/day respectively. The contribution of energy intake from visible fats was 281 Kcal/day and 153 Kcal/day in urban and rural areas respectively, while from other foods was 208 Kcal/day and 69 Kcal/day in urban and rural areas respectively. When looked into the percentage contribution of different groups, cereals contributed 53.9% E and 68.5% E in urban and rural areas respectively. While, pulses, legumes

and flesh foods contributed to 7.8%E and 11.4%E in urban and rural areas respectively, which was less than the recommended 17% of energy per day from those foods. On the other hand, milk & milk products contributed to 6.5%E (urban) and 3.9%E (rural), while visible fats and other foods contributed to 15.4%E and 11.4%E respectively in urban areas, in contrast to 6.8%E and 3% E respectively for the same foods in rural areas. Fruits and vegetables contributed to only a third of the recommended energy (8-10% E) from these foods, while nuts contributed to less than 1% E. Mean percent of energy from various food groups across regions in urban and rural areas in India is given (Figures 1 & 2).

Figure 1. Percent of energy derived from various food groups in urban adults by Indian regions

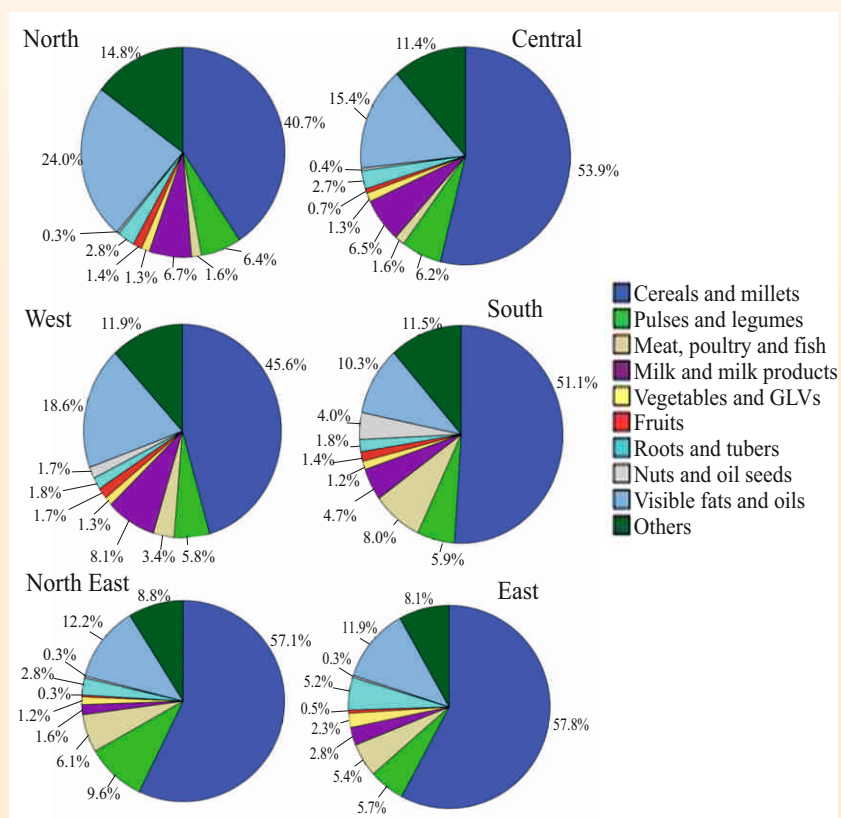
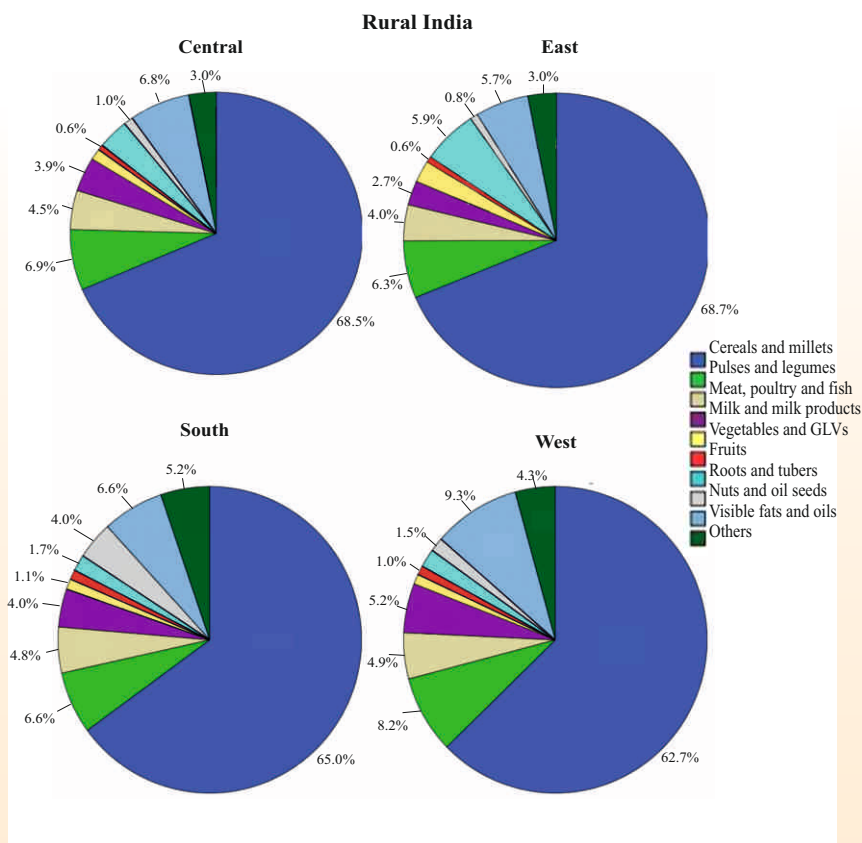


Figure 2. Percent of energy derived from various food groups in rural adults by regions in India



Region: EAST (Urban & Rural)

In east India, the intake of total calories (2013 Kcal), protein (57.7g) and carbohydrate (323.4g) were close to the pooled average intakes in urban areas, while intake of total calories 1983 Kcal, protein (58.6g) and carbohydrate (383.8g) in rural areas were lesser than the pooled average rural intakes except for carbohydrate intake. The calories from fat 42.8g and 23.4g in urban and rural areas, respectively were lower than the national average. The total calorie contribution from cereals was 1662 Kcal/day, 1362 Kcal/day in urban and rural areas respectively, while that of pulses, and legumes were

115 Kcal/day and 124.5kcal/day in urban and rural areas respectively. The contribution of energy intake from visible fats was 239 Kcal/day and that from other foods was 163 Kcal/day in urban areas, compared to 112 Kcal/day and 60 Kcal/day respectively for the same foods in rural areas. Cereals contributed 57.8%E and 68.7%E of the total energy intake in urban and rural areas respectively, while, pulses, legumes & flesh foods contributed to 11.1%E and 10.3%E of the total energy in both areas respectively. Milk & milk products contributed to 2.8%E and 2.7%E of total energy, while visible fats and other foods contributed to 11.9%E and 8.1%E, respectively in urban areas in contrast to 5.7%E and 3%E respectively in rural areas. Fruits and vegetables contributed to 2.8% E and 3% E respectively, while nuts contributed to 0.3% E and 0.8%E of the total energy intake in urban and rural areas respectively.

Region: NORTH-EAST (Urban)

In northeast India, the intake of total calories (2908 Kcal), protein (86.7g), fat (61.5g) and carbohydrate (457g) was higher than that of pooled average Indian intake. The total calorie contribution from cereals was 1662 Kcal/day, while that of pulses and legumes were 279 Kcal/day. The contribution of energy intake from visible fats was 355 Kcal/day and that from other foods was 255 Kcal/day. Cereals contributed 57.1% of the total energy intake, while contribution of % E from pulses, legumes and flesh foods was the highest (15.7%) among all the regions in India. Milk & milk products contributed to 1.6% of total energy, whereas, visible fats and other foods contributed to 12.2% and 8.8%, respectively. Fruits and vegetables contributed to only 1.5% of total energy, while nuts contributed to 0.3% of the total energy intake (Table-5).

The mean and percent of energy derived from carbohydrate, protein and fat from different food groups among rural adults in India (all regions) is given in Table-5 (Annexure-2).

Table 5. Mean and percent of energy (E), carbohydrate, protein and fat intake from different food groups among adults in Rural India

Food groups	Intake		Energy		Protein		Fat		Carbohydrate	
	(g)	(%)	(kcal)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Cereals and Millets	394.4	43.8	1358	65.2	33.4	48.4	4.2	11.9	295.4	80.3
Pulses and Legumes	42.9	4.8	144	6.9	9.7	14	0.8	2.4	24.2	6.6
Fats and Edible Oils	16.2	1.8	145	7	0	0	16.1	45.2	0	0.0
Meat, Poultry, Fish and Sea foods	75.2	8.4	93	4.5	16.1	23.3	2.8	8	0.7	0.2
Milk and Milk products	117.9	13.1	87	4.2	3.8	5.5	5.1	14.3	6.3	1.7
Nuts and Oil seeds	12.7	1.4	60	2.9	1.2	1.7	5.3	14.7	2	0.5
Vegetables	79.7	8.9	28	1.4	1.9	2.7	0.3	0.9	4.6	1.3
Roots and tubers	73.9	8.2	62	3	1.1	1.6	0.1	0.2	14.3	3.9
Fruits	46.8	5.2	18	0.9	0.4	0.6	0.1	0.3	3.8	1.0
Others	40.1	4.5	86	4.1	1.5	2.1	0.8	2.1	17.1	4.6
Total	900	100	2081	100	69	100	36	100	368	100.0

Region: WEST (Urban & Rural)

In west India, the intake of total calories (1738 Kcal), protein (47.5g), and carbohydrate (240.9g) in urban areas was lower than that of pooled average Indian intakes, while total calories (2016 Kcal), protein (70.4g) and carbohydrate (336.7g) intake was higher in rural areas than that of pooled average urban intake but lower than pooled average rural intake except for proteins. Similar to northern region, intake of fat was higher (56.9g) in urban areas when compared to rural areas (42.9g).

The total calorie contribution from cereals was 792 Kcal/day, while that of pulses and legumes was 101 Kcal/day, the contribution of energy intake from visible fats was 323 Kcal/day and that from other foods was 207 Kcal/day in urban areas, while total calorie contribution from cereals (1264 Kcal) and pulses and legumes (165 Kcal/day) was higher in rural areas, when compared to urban areas, and total calorie contribution from visible fats (188 Kcal/day) and other foods was 86 Kcal/day which was comparatively lower in rural areas. Cereals contributed 45.6% E. while, pulses, legumes and flesh foods contributed to 9.2%E. On the other hand, milk & milk products contributed to 8.1%E, visible fats and other foods contributed to 18.6%E and 11.9%E, respectively.

Fruits and vegetables contributed to 3%E of total energy, while nuts contributed to 1.7%E in urban areas while total energy intake from cereals (62.7%E), pulses and legumes and flesh foods (13.1%E), milk and milk products (5.2%E), visible fats and other foods contributed to 9.3%E and 4.3%E respectively. Fruits and vegetables in rural areas contributed to 2.1%E of total energy, while nuts contributed to 1.5%E.

Thus, total energy intake from cereals and pulses was higher in rural areas compared to urban areas, while total energy intake from all other foods was higher in urban areas.

Region: SOUTH (Urban & Rural)

In urban areas of south India, the intake of total calories (2005 Kcal), protein (58.5g), and carbohydrate (297.8g) was higher than that of pooled average intake in India, but less than the intake in rural areas with total calories (2023 Kcal), protein (63.7g) and carbohydrate (360.6g), while intake of 49.8g of fat per day was less than the national average and more than the rural intake of 34.4g/day.

The total calorie contribution from cereals was 1024 Kcal/day and 1314 Kcal/day in urban and rural areas respectively, while that of pulses and legumes were 119 Kcal/day and 133 Kcal/day in both areas. The contribution of energy intake from visible fats was 205 Kcal/day and that from other foods (chips, biscuits, chocolates, sweets, juices etc.) was 230 Kcal/day in urban areas compared to 133 Kcal/day and 106 Kcal/day in rural areas.

Cereals contributed 51.1% and 65% of the total energy intake in urban and rural areas. While, pulses, legumes and flesh foods contributed to 13.9%E and 11.4%E of the total energy in both the areas. On the other hand, milk & milk products contributed to 4.7%E and 4%E of energy intake in urban and rural areas, visible fats and other foods contributed to 10.3% E and 11.5 % E, respectively in urban areas compared to 6.6% E and 5.2% E respectively in rural areas. Fruits and vegetables contributed to 2.6% E and 2.1% E, while nuts contributed to 4% E of the total energy intake in both areas respectively.

The median and percent energy from carbohydrates, fats, proteins from different food groups among adults by regions in urban India is presented in Annexure-3 and rural India in Annexure-4.

Protein intakes by regions

The region wise protein intakes from different food groups in India are provided in figures 3a & 3b.

The total protein intake was higher in the central India (48.6g/d) followed by northeast (41.2 g/day) and was lowest in the north (21.8 g/day). Cereals and millets contributed to the highest proportion of protein intakes in both urban (26.3 g/day) and rural India (33.4 g/d) among all food groups, which represented 47.5% and 48.4% of the total protein contribution in urban and rural India, respectively. Among the regions, contribution of protein from cereals and millets was higher than the national average for central India (urban, 58.8%; rural, 57.3%).

The next food group that contributed to protein intake was pulses & legumes (8.2 g/day), which represented 14.8% of total contribution of protein among all food groups in urban India. The highest percent contribution of protein from pulses & legumes was seen in the north-east (22.0%). And meat, poultry, fish and seafood's contributed to 11.6% of total protein intakes that ranged from 2.2% in the central to 16.9% in the south. Southern region had the highest intake of protein from flesh foods for both urban and rural areas, while pulses & legumes and flesh foods contributed to good amount of protein in the northeast urban region. Milk and milk products contributed to 7.6% of total protein intakes in urban India, and ranged from 2.9% in the northeast to 11.4% in the west.

In rural India, total protein intake from meat, poultry, fish and sea foods was 16.1 g/d, which represented 23.3% of the total contribution of protein among all food groups, with highest levels at 28% in the south and lowest at 19.5% in the central rural regions. Pulses and legumes contributed to 14% of total protein intake and ranged from 15.7% in the west to 12.5% in the central states in India.

Figure 3a. Intake of protein (%) from different food groups in urban India by regions

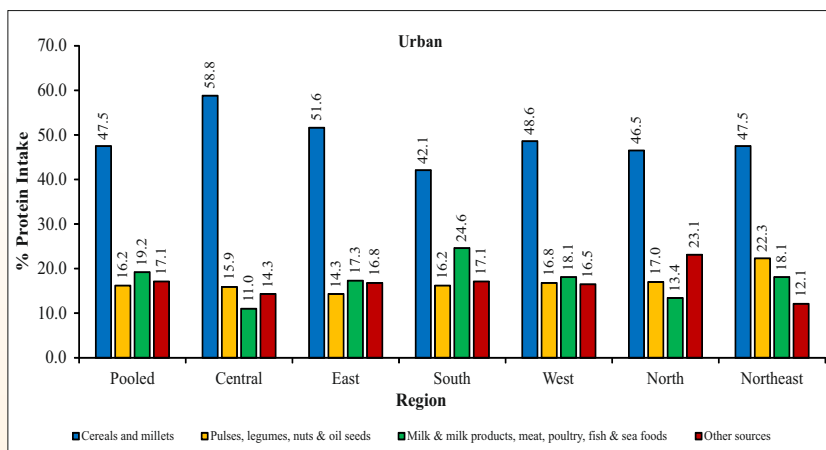
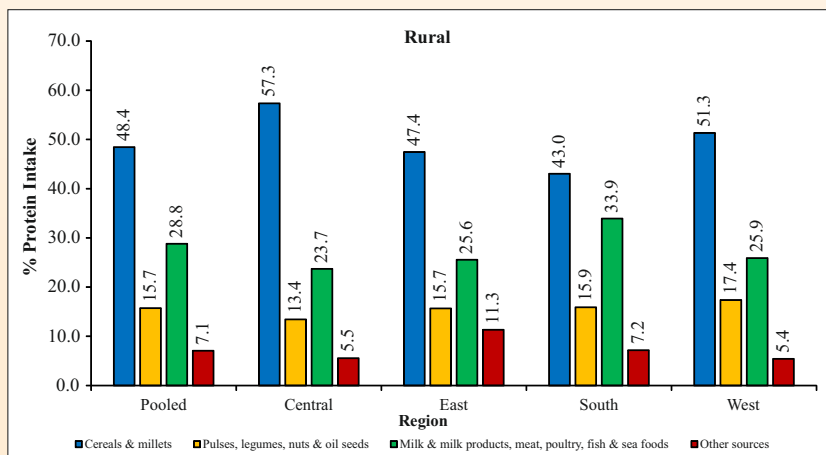


Figure 3b. Intake of proteins (%) from different food groups in rural India by regions

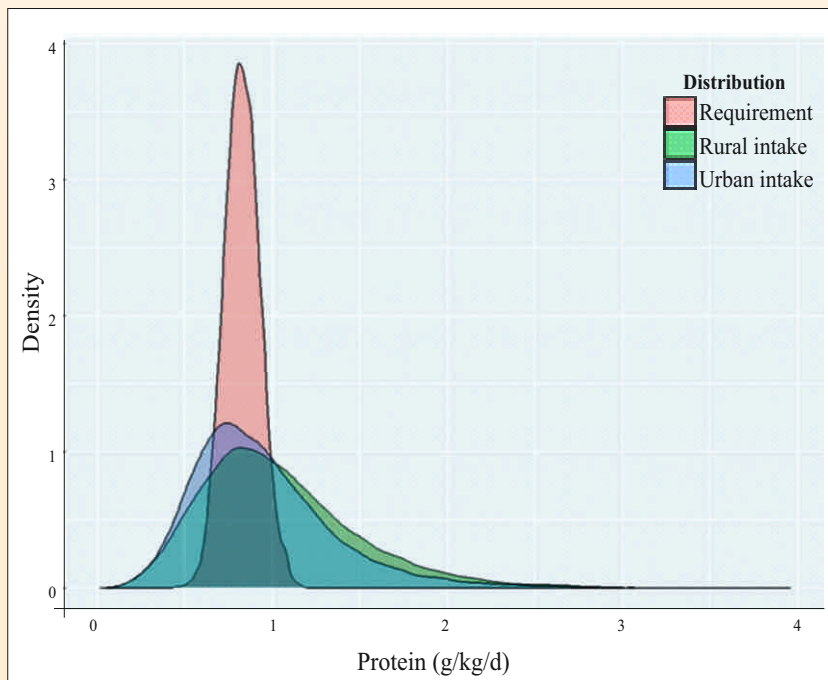


Protein - Energy ratio by region

Protein Energy ratio (PE): The protein content of a food or diet is expressed as the proportion of total energy provided by protein and termed as PE ratio. This is estimated by the ratio of the energy from protein to total energy. The threshold for this ratio as per the recommendations is 10.4% in males and 11.1% in females. The PE

ratio was as per recommendation, ranging from 10.98% in the west to 11.95%, in the northeast among the males. In the rural regions, the PE ratio among males was less than the threshold limit of 10.4% in the east and southern region, and was as per recommendation in the central (12.42%) and the west (11.6%) regions. Among the females, the mean values of the PE ratio was as per the recommendation in all the four rural regions, ranging between 10.87% and 11.96% (east, 11.47%; northeast, 11.96% and southern regions, 11.69%). The probability of protein inadequacy based on requirement distribution ranged from 36% to 44% among rural and urban population respectively (Figure 4). Even among those population where the total protein intake appears to be adequate in terms of quantity and PE ratio, the protein quality was poor across various regions in India. A minimum of 66% of total protein should come from pulses, beans, milk, flesh foods and nuts as per the recommendation of ICMR-NIN.

Figure 4. Intake and reference distribution of protein (g/kg/d) in rural and urban population



Fats and Oils consumption by regions

Region wise fats and oils consumption in India is given in figures 5a & 5b. Oils or fats used for food preparation and oils used in fried foods including fats derived from flesh food sources are termed visible or added fats; and oils / fats from foods such as rice, pulses, nuts and oilseeds are termed invisible fats.

Nearly 84% of the population from rural areas and 38% from urban areas had <20% of E/day from total fats/oils, which is below the normal recommendation level. Additionally, 25% of the population from urban areas had more than 30% E/day from total fats which is higher than the normal recommended levels. The region wise fat intake (represented as percentage) from different foods is provided in figure 5. Mean intake of total fat was 51.6g and 36.0g per day in urban and rural India respectively, of which, 29.5 g and 16.1g/d were from visible fats/oils in urban and rural India. Among the regions in urban areas, north had the highest intake of added fat/oils (45.9 g) /per day, while the south region had the lowest 22.9 g added fat/oils intake per day. Thus, added (visible) fat/oils intake contributed to 68.2% and 46 % of total fat intake in north and south urban regions respectively.

While in rural areas, eastern states had the highest contribution of fat intake from visible fats /oils (53.3%), and the southern region (42.9%) had the lowest fat intake from visible fats/oils. In contrast, nuts and oil seeds contributed to only 0.7% of total fat intake in northern region (urban), while 15.3 % of total fat intake was from nuts and oil seeds in urban southern region. While in rural areas, the contribution of percentage fats from nuts and oilseeds was 14.7% and ranged from 21% in the south to 4.9% in the central.

The next highest contribution of percent of fats intake (6.0 g/day) was from other food groups in urban India representing 11.6% of overall fat intake and ranged from 7.6% in the West to 13.3% in the South. Similarly, milk and milk products contributed to 11.6% of total fat intake, ranging from 4.1% in the northeast and 15.5% in the

west region in urban India. While, in the rural areas the next highest contribution of fats intake was from nuts and oil seeds (5.3 g/day) representing 14.7% of the total fat intake and ranged from 21% in the south to 4.9% in the central. Milk and milk products also contributed to 14.3% of the total % fat intake. Meat, poultry, fish and seafood contributed to 4.1% of total fat intake, ranging from 0.9% in the North and 7.0% in northeast in the urban areas, while in rural areas these foods contributed to 8% of total % fat intake, ranging from 8.1% in the south to 10.8% in the east. As per recommendation, not more than 50% of total fat/oils intakes can come from visible fats/oils and another half should from invisible fats such as nuts and oil seeds, pulses and legumes etc, to achieve appropriate balance of essential n-3 and n-6 poly unsaturated fatty acids (PUFA) and MUFA to reduce risk of CVDs.

The region wise fat intake (%) from visible (added oil/ fats) and invisible (food sources) in urban and rural India is given in figures 5a & 5b.

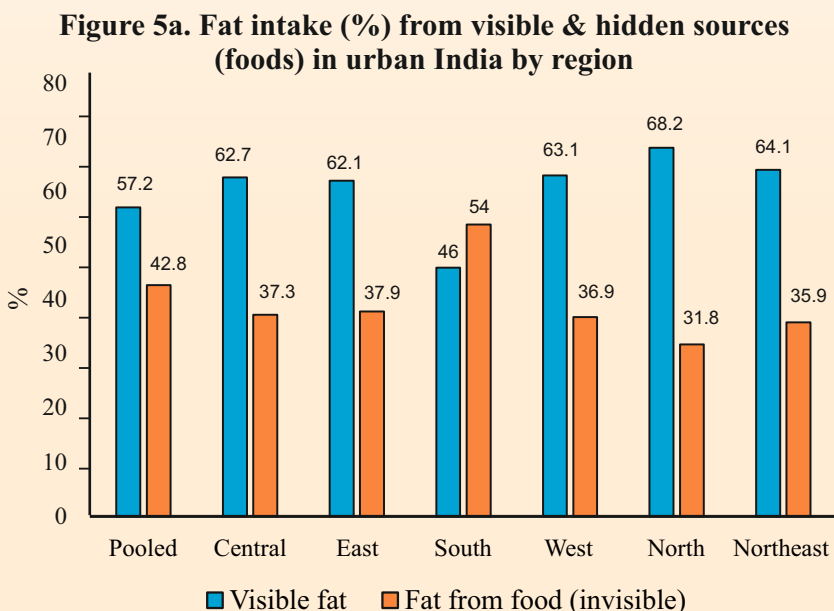
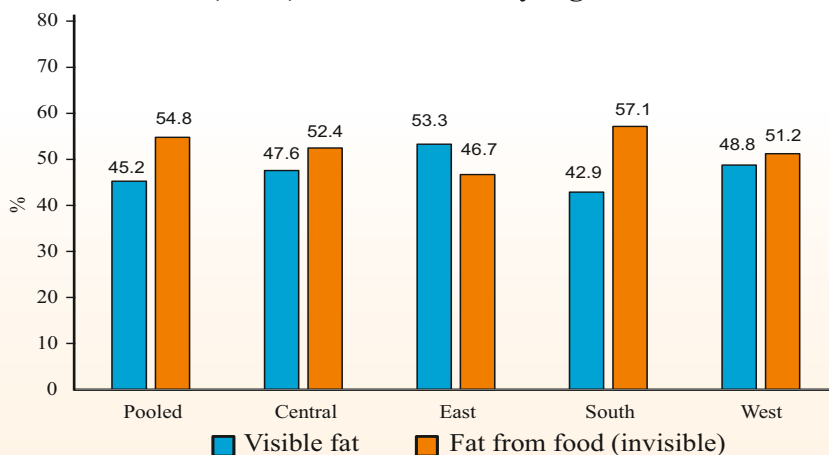


Figure 5b. Fat intake (%) from visible & hidden sources (foods) in Rural India by region



Region wise Carbohydrate Intakes

The regions wise Carbohydrate intake in India is provided in figures 6a & 6b. The mean intake of total carbohydrate was 289 g/day in urban India and 368 g/day in rural India. The total carbohydrate intake was highest in northeast region (357 g/day) and lowest in the north (143 g/day) in urban areas while the total intake was highest in central (325 g/day) and lowest in western states (264.1 g/day) of rural India. Cereals and millets contributed to the highest proportion of carbohydrate intakes (212 g/day) among all the food groups, which represented 73.4% of the total contribution of carbohydrate among all food groups in urban India, while in rural areas, cereals and millets contributed to highest proportion of carbohydrate intake of 295 g/day among all the food groups, representing 80.2% of the total carbohydrate intake.

Among the regions, the highest proportion of carbohydrate from cereals and millets was seen in the northeast (78%) and the lowest was seen in north India (64.7%) in urban areas; in contrast to highest proportion in central (47.8%) and lowest proportion in east (42.4%)

in rural areas. Pulses and legumes contributed to 19g of carbohydrate per day, representing only 6.5% of total contribution of carbohydrate among all food groups in urban India; while carbohydrate intake from pulses and legumes was 24.2 g/day in rural areas, which represented 6.7% of total carbohydrate intake.

The highest percent contribution was seen in northeast (9.6%) and lowest in the south (6.4%) and central India (6.4%) in urban areas, while highest percentage of energy contribution was seen in west (5.8%) and lowest in east (3.9%) in rural areas. Roots & tubers contributed to 3.8% of total intake and ranged from 2.7% in the west to 6.8% in the east in urban areas, while the contribution of roots and tubers to total intakes was 8.2%, and ranged from 14% in the east to 5.4% in the west in rural areas. It is important to include complex carbohydrates such as pulses, legumes & nuts and vegetables, which should contribute to more than 30% of total energy in the diet. Inclusion of complex carbohydrates will also satisfy the fiber requirements of an individual per day.

Region-wise percent carbohydrates intake from cereals and millets as one group and pulses, vegetables and fruits combined as another group in urban and rural areas in India among adults is given in figure 6a & 6b.

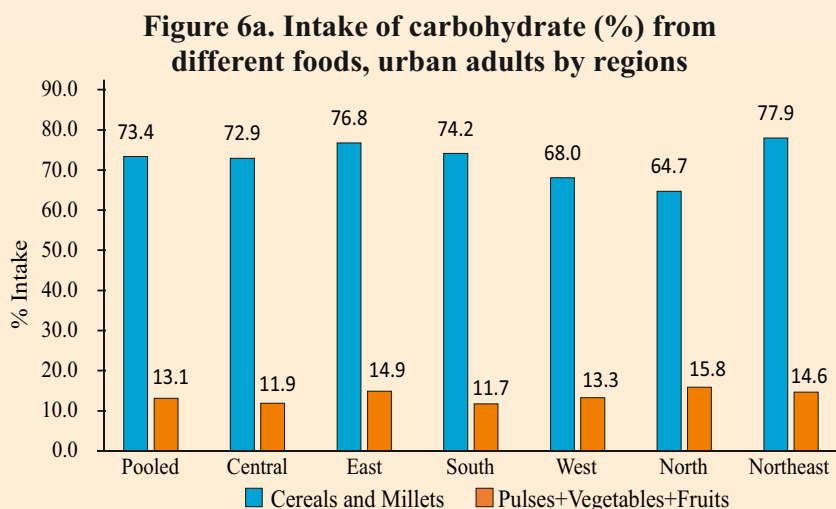
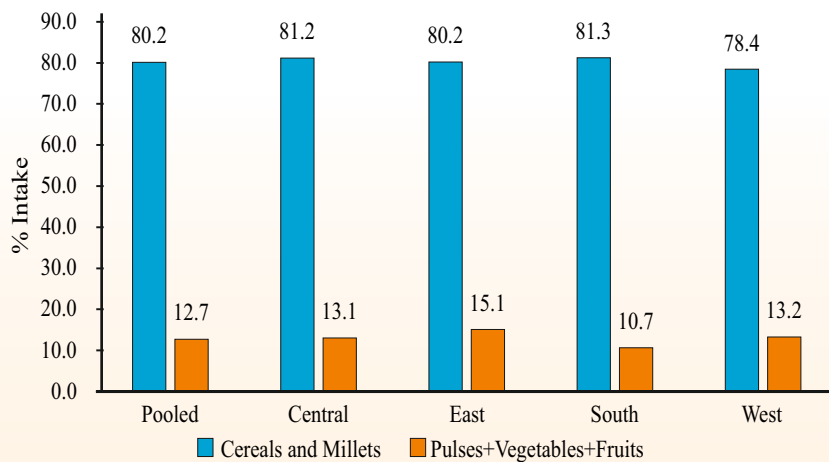


Figure 6b. Intake of carbohydrate (%) from different foods, rural adults by regions



Energy consumption status and Recommendations of ICMR-NIN My Plate

The recommended intakes are expressed as percentage energy recommended from major food groups such as cereals, pulses and fats. While other food groups such as fruits, vegetables, nuts and milk and milk products are expressed in terms of raw intakes. The recommended intake of cereals was considered when it was less than or equal to 45% of the total energy, while for pulses upto 17% and for total fats 20-30% of the total E/d were considered normal. For milk and milk products, vegetables, fruits, nuts intakes/day are given as g/ml and other foods, including snacks and savouries, the energy intake as percent of the total energy intake are given in Table 6.

The overall percentage of population taking more than the recommended intakes of cereals was 97.1% in rural and 68.8% in urban region. And, only 7.2% of the population in rural and 16.4% in urban areas consumed pulses as per the recommendation. Similarly, proportion of people consuming milk and milk products (rural, 8.7%; urban, 14.3%), and vegetables and fruit as per the recommendation were low among rural (vegetables 8.8%; fruits 15.9%) and urban population (vegetables, 17%; fruits, 28.6%).

Nuts consumption as per the recommended intake was observed

Table 6. Criteria for assessing recommended intakes of food groups

Foods	Recommended intake
Cereals	≤40% E
Pulses	≥17% E
Total fat	20-30% E
Milk & Milk products	Intake ≥300 ml or g
Vegetables	Intake ≥300 g
Fruits	Intake ≥75 g
Nuts	Intake ≥30 g
Others	<10% E

Source: ICMR-NIN My Plate recommendations; E=energy

among 22.2% and 27.1% of the population in rural and urban areas respectively. Thus, a major segment of population was consuming far more cereals than recommended and less protective foods such as legumes, milk, nuts, vegetables and fruits. In addition, 10% of total calorie intake was contributed by ready to eat foods such as chips, biscuits, chocolates, sweets and juices, among majority of the population (Figure 7). The percentage of adult population consuming the recommended levels of foods by region in urban and rural areas is given in Annexure-5.

There were regional differences in intake pattern of different food groups. Going by region, majority of the population in the north (64.9%) followed by west (46.7%) were consuming cereals as per recommendation (45% E from cereals) in urban areas, pulses intake as per recommended intake was observed by majority in the northeast (33.8%) followed by south (20.4%) in the urban areas. In the rural region, intake of pulses was very poor and was highest at 12.3% in western region.

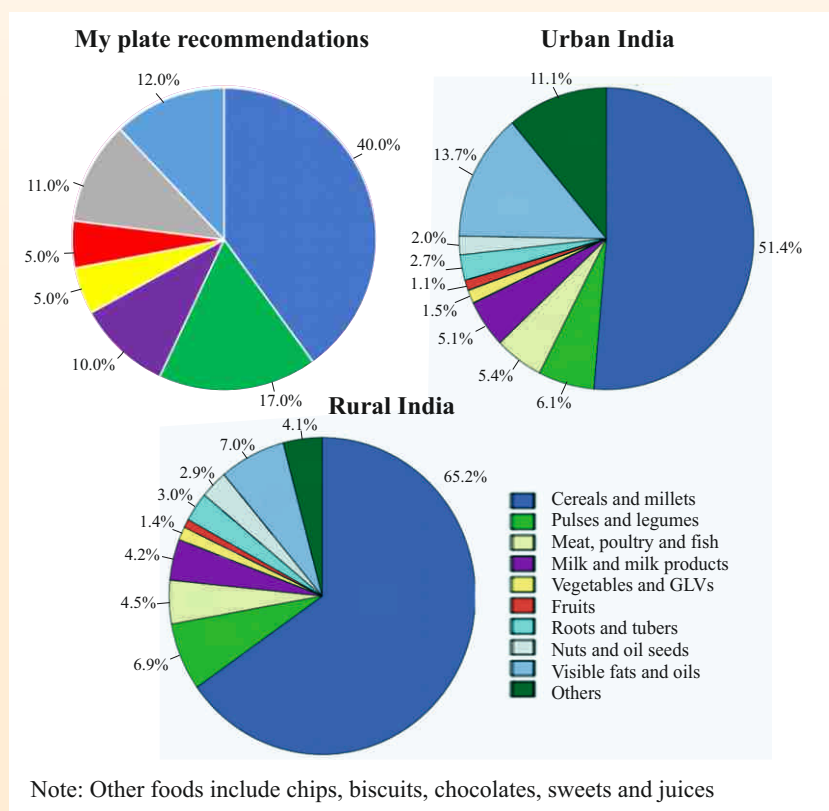
As for fat intake, nearly 85% of the population from rural areas and 38% from urban consumed fat/oils below the recommended level. Moreover, 25% of the population from urban area consumed more than the recommended level of fat/oil/day. Milk and milk products intake as per recommendations was highest in the north (33.5%) followed by west (20.2%) in urban areas. While in rural areas, the highest numbers consuming milk as per the recommendations was in the western region (15.8%).

Vegetable consumption was observed as per the recommended intakes among majority of the population in the east (49.9%) followed by northeast (28.3%) in urban areas, while in the rural areas highest consumption of vegetables was observed as recommended in the eastern region (28%). Fruits were consumed by majority as per the recommended intake in the south (34.3%) followed by 31% each in north and western regions in urban areas, while in the rural areas highest consumption of fruits as per recommended intake was found in the south (19.6%) followed by east (16.3%). The consumption of

nuts as per the recommended intake was highest in the regions of northeast and south at 28.6% and 25.1% respectively in the urban areas, while in rural areas highest consumption of nuts was observed in south (21.3%) as per the recommended intake. As for other foods, 78.1% from east, 73% from northeast and 65% from south in the urban areas were getting more than 10% of total calories from processed and ready to eat foods.

The pooled analysis of all states as mean percent of energy from various food groups in comparison with 'My Plate' recommendations in urban and rural India among adults is given in Figure 7.

Figure 7. Mean Percent of energy from various food groups in Urban and Rural India (Pooled) in adults.



Region wise Prevalence of Obesity

The region wise indicators of BMI is represented in Figure 8. In urban areas overweight was prevalent in 31.4%, and ranged from 34.7% in north to 23.9% in central India. Similarly, overall obesity prevalence was 12.5% and was highest in the north (15.4%) and lowest in the central (7.9%). Abdominal obesity was prevalent in 53.1% and ranged from 61.4% in the north to 42.4% in the Central region. The overall Chronic energy deficiency (CED) or undernourishment as measured by low BMI (<18.5 BMI) was 9.3% and ranged from 15.4% in the central region to 6.5% in the north in urban India.

While in the rural areas overall overweight prevalence was 16.6% and ranged from 22.2% in south to 10.1% in central region. On the other hand, overall obesity prevalence was 4.9% and ranged from 7.7% in the south to 2.1% in the central. Similarly, abdominal obesity was 18.8% and was highest in the south (25.7%) and lowest in the east (11.9%). CED was observed among 35.4% and was highest in the central region (41.2%) and lowest in the south (28.5%) in rural areas. On the whole it was observed that overweight, obesity and abdominal obesity was highest in the south while CED was highest in the central regions followed by east and west regions of the country. The region wise indicators of BMI among adults in urban and rural areas is given in figure 8a & 8b.

Figure 8a. Prevalence of obesity among urban Indians by regions

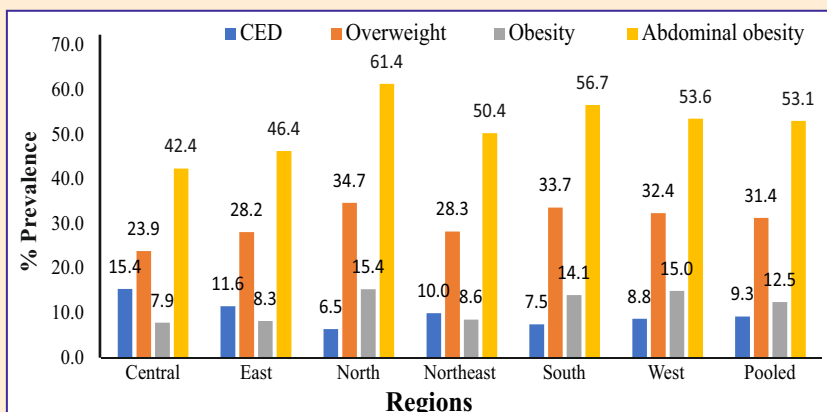
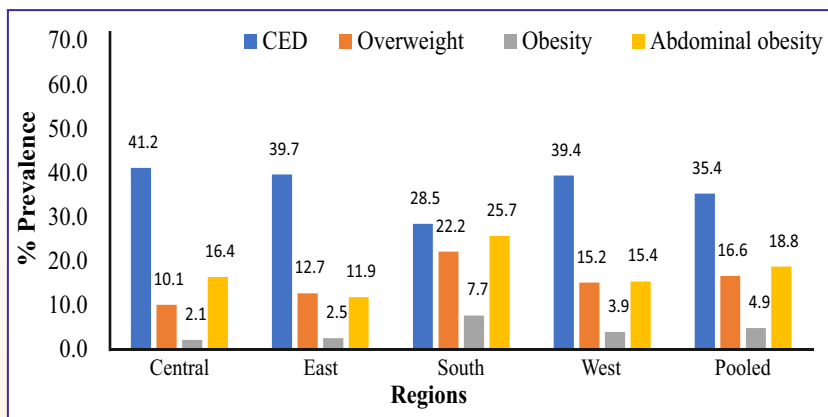


Figure 8b. Prevalence (%) of obesity among rural adults by region



Hypertension

The overall prevalence of hypertension (HTN) was 32.8% and 21.9% in urban and rural regions respectively. In the urban region, highest prevalence was observed in the north east (39.6%) and central region had comparatively lower prevalence of HTN (25.1%), while in the rural region, the east (27.8%) had highest prevalence and the central region (15.4%) had comparatively lower prevalence. Thus, northeast in the urban region and east in the rural region had highest prevalence of hypertension, while both urban and rural regions of central India comparatively had lower prevalence of hypertension.

Diabetes

The overall prevalence of diabetes was 25.4% in urban and 7.4% in rural regions. The highest prevalence was observed in the south (29.3%) followed by north (28.1%) and lowest in central region (17.7%) followed by east (18.7%) in the urban areas. Whereas in the rural areas the highest prevalence was observed in south (10.3%) and lowest in east (3.5%) followed by central (4.9%) region. Thus, highest prevalence was observed in the south in urban and rural areas and lowest in the east and central regions. The prevalence of hypertension and diabetes among adults in urban and rural areas across regions in India is given in figure 9a & 9b.

Figure 9a. Prevalence of hypertension (%) among adults by region

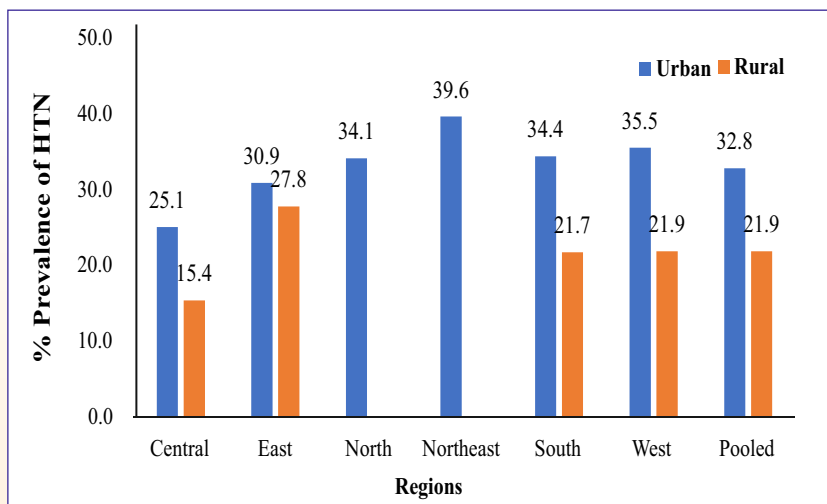


Figure 9b. Prevalence of diabetes (%) among adults by region

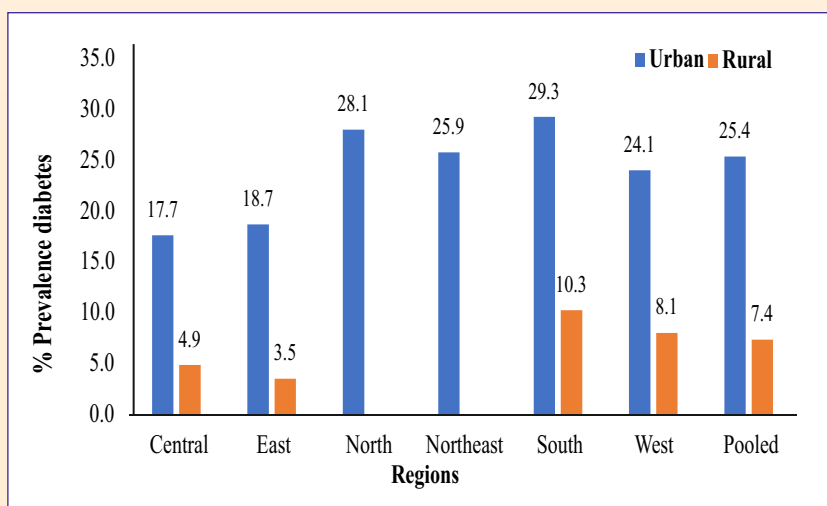
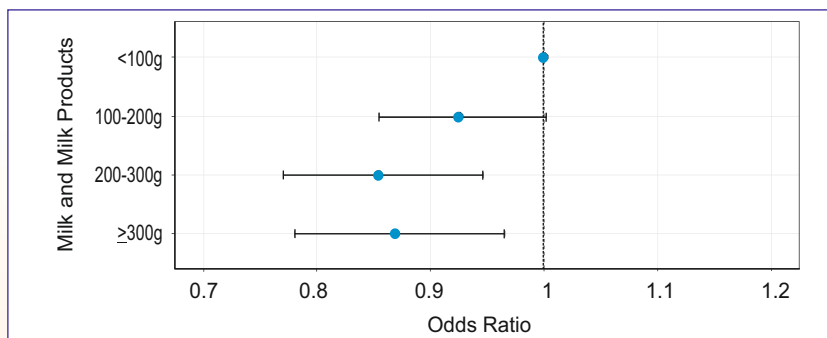


Fig 10a. Intake of milk & milk products and risk of hypertension



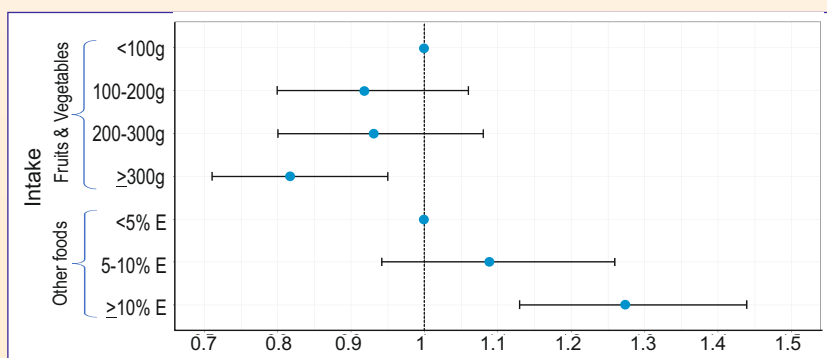
Total N=93,851

Odds ratio was adjusted for age, gender, BMI, total energy and total fat

Source: NNMB Urban Survey 2016

Figure 10a shows increased risk of hypertension with low intake of milk and milk products.

Figure 10b. Fruits & vegetables and other food intakes on the risk of diabetes



Total N=40,727; Odds ratio adjusted for age, gender, BMI, total energy and total fat;

*Fruits & vegetables (excluding potato); *Other foods include, sweets, ice-creams, carbonated beverages, fried snacks and packaged foods;

*E= Energy; Source: NNMB Urban Survey 2016.

Figure 10b shows increased risk of diabetes with low intake of vegetables and fruits. Higher intake of other foods such as sweets, ice-creams, carbonated beverages, fried snacks and packaged foods increased the risk of diabetes.

Conclusion

What India eats has very wide regional differences depending on food and cultural practices. But a major segment of population was consuming far more cereals than recommended and less protective foods such as legumes, milk, nuts, vegetables and fruits. The main aspects were more or less similar across India as highlighted below

- In the urban region of north India, fat intake (67.3 g) was among the highest; and overweight, obesity and abdominal obesity were highest when compared to other regions. Hypertension (34%) and diabetes (28%) were also high.
- Northeast India consumed the highest total calorie (2908 Kcal) and carbohydrate (457 g) per day, and comparatively had higher proportion of people (39.6%) with hypertension.
- The highest percent contribution of protein (22.0%) from pulses and legumes was observed in the north-east region (urban).
- Highest percent protein from meat, poultry, fish and sea foods was observed in the urban (16.9%) and rural (28%) of southern regions in India.
- As for milk and milk products, only 8.7% in rural and 14.3% of the population in urban areas consumed as per the recommended intakes.
- Vegetable consumption as per the recommended intakes was observed among majority of the population in the east (urban-49.9%: rural 28%) in urban areas.
- Total calorie intake contributed by ready to eat foods such as chips, biscuits, chocolates, sweets and juices was >10% among majority of the population in urban areas.
- Abdominal obesity was prevalent in 53.1% and 18.8% among urban and rural population respectively.
- Low consumption of vegetables and fruits increased the risk of diabetes.
- Consumption of other foods such as sweets, ice-creams, carbonated beverages, fried snacks and packaged foods increased the risk of diabetes by nearly 30%.

- Low intake of milk and milk products increased the risk of hypertension.

For achieving health, elimination of all forms of malnutrition, to reach the SDGs and to reduce NCDs, there is an urgent need to create awareness among households for inculcating healthy dietary practices and improve consumption of locally grown and available protective foods. The increased availability of inexpensive staple cereal crops has reduced hunger, but at the expense of diet diversity, displacing local ingredients and protective foods.

Also, while not everyone has equal access to diverse, micronutrient rich foods such as fresh fruits, vegetables, legumes, pulses and nuts, foods that are high in salt, sugars, saturated fats and trans fats have become cheaper and are more widely available. Healthy diet and adequate physical activity are the only strategies for halting or preventing the development of type 2 diabetes, coronary heart disease, stroke etc. Small, judicious changes in dietary intakes will result in huge difference in the health and nutrition of our population.

ANNEXURES

Annexure 1. Mean and percent of energy (E) from carbohydrate, protein and fat intake from different food groups among adults residing in 6 regions of urban India

Regions	Intake		Energy		Protein		Fat		Carbohydrate	
	(g)	(%)	(kcal)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
CENTRAL	779.9	100	1825	100	50.2	100	49.8	100	277	100.0
Cereals and Millets	298.9	38.3	983	53.9	29.5	58.8	3.8	7.6	202	72.9
Pulses & Legumes	39.7	5.1	113	6.2	7.7	15.3	0.8	1.6	18	6.5
Fats & Edible Oils	31.2	4	281	15.4	0	0	31.2	62.7	0	0.0
Meat, Poultry, Fish & Sea foods	6.3	0.8	28	1.6	1.1	2.2	0.5	1	0	0.0
Milk and Milk products	117.3	15	119	6.5	4.4	8.8	7.4	14.9	9	3.2
Nuts & Oil seeds	1.3	0.2	7	0.4	0.3	0.6	0.5	1	0	0.0
Vegetables	76.7	9.8	24	1.3	1.4	2.8	0.2	0.4	3	1.1
Roots & tubers	79.1	10.1	50	2.7	1.3	2.6	0.2	0.4	10	3.6
Fruits	36.2	4.6	12	0.7	0.3	0.6	0.2	0.4	2	0.7
Others	93.2	12	208	11.4	4.2	8.4	5	10	32	11.6

Contd..

Regions	Intake		Energy		Protein		Fat		Carbohydrate	
	(g)	(%)	(kcal)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
EAST	939.2	100	2013	100	57.7	100	42.8	100	323	100.0
Cereals and Millets	340.2	36.2	1164	57.8	29.8	51.6	3.2	7.5	248	76.8
Pulses & Legumes	36.6	3.9	115	5.7	8.1	14	0.8	1.9	18	5.6
Fats & Edible Oils	26.6	2.8	239	11.9	0	0	26.6	62.1	0	0.0
Meat, Poultry, Fish & Sea foods	38.7	4.1	108	5.4	7.4	12.8	2.4	5.6	0	0.0
Milk and Milk products	68.5	7.3	57	2.8	2.6	4.5	3.5	8.2	4	1.2
Nuts & Oil seeds	1.4	0.1	6	0.3	0.2	0.3	0.5	1.2	0	0.0
Vegetables	161.9	17.2	46	2.3	2.9	5	0.6	1.4	6	1.9
Roots & tubers	163.5	17.4	105	5.2	2.6	4.5	0.3	0.7	22	6.8
Fruits	28	3	10	0.5	0.2	0.3	0.1	0.2	2	0.6
Others	73.8	7.9	163	8.1	3.9	6.8	4.8	11.2	23	7.1
NORTH	869.7	100	1723	100	46.9	100	67.3	100	221	100.0
Cereals and Millets	215.2	24.7	700	40.7	21.8	46.5	3	4.5	143	64.7
Pulses & Legumes	38.2	4.4	111	6.4	7.8	16.6	0.9	1.3	17	7.7
Fats & Edible Oils	46	5.3	413	24	0	0	45.9	68.2	0	0.0
Meat, Poultry, Fish & Sea foods	7.3	0.8	27	1.6	1.4	3	0.6	0.9	0	0.0
Milk and Milk products	142.4	16.4	115	6.7	4.9	10.4	7.2	10.7	10	4.5
Nuts & Oil seeds	1.1	0.1	6	0.3	0.2	0.4	0.5	0.7	0	0.0
Vegetables	88.2	10.1	23	1.3	1.5	3.2	0.3	0.4	3	1.4
Roots & tubers	77.3	8.9	48	2.8	1.2	2.6	0.2	0.3	10	4.5
Fruits	62.4	7.2	24	1.4	0.5	1.1	0.3	0.4	5	2.3
Others	191.6	22	255	14.8	7.6	16.2	8.4	12.5	34	15.4

Contd. .

Regions	Intake		Energy		Protein		Fat		Carbohydrate	
	(g)	(%)	(kcal)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
NORTHEAST	1088.1	100	2909	100	86.7	100	61.5	100	458	100.0
Cereals and Millets	480.1	44.1	1662	57.1	41.2	47.5	3.8	6.2	357	77.9
Pulses & Legumes	86	7.9	279	9.6	19.1	22	2.3	3.7	44	9.6
Fats & Edible Oils	39.4	3.6	355	12.2	0	0	39.4	64.1	0	0.0
Meat, Poultry, Fish & Sea foods	66.2	6.1	179	6.1	13.2	15.2	4.3	7	0	0.0
Milk and Milk products	50.7	4.7	47	1.6	2.5	2.9	2.5	4.1	4	0.9
Nuts & Oil seeds	1.9	0.2	9	0.3	0.3	0.3	0.7	1.1	0	0.0
Vegetables	110.8	10.2	36	1.2	2.2	2.5	0.4	0.7	5	1.1
Roots & tubers	126.7	11.6	80	2.8	2	2.3	0.3	0.5	17	3.7
Fruits	24.3	2.2	8	0.3	0.2	0.2	0.1	0.2	1	0.2
Others	102	9.4	255	8.8	6	6.9	7.7	12.5	30	6.6
SOUTH	884.6	100	2005	100	58.5	100	49.8	100	298	100.0
Cereals and Millets	294.6	33.3	1024	51.1	24.6	42.1	2.2	4.4	221	74.2
Pulses & Legumes	37.3	4.2	119	5.9	8.2	14	0.8	1.6	19	6.4
Fats & Edible Oils	22.9	2.6	206	10.3	0	0	22.9	46	0	0.0
Meat, Poultry, Fish & Sea foods	48.3	5.5	161	8	9.9	16.9	3.3	6.6	0	0.0
Milk and Milk products	122.6	13.9	95	4.7	4.5	7.7	5.6	11.2	7	2.3
Nuts & Oil seeds	18.9	2.1	80	4	1.3	2.2	7.6	15.3	2	0.7
Vegetables	71.3	8.1	25	1.2	1.6	2.7	0.3	0.6	3	1.0
Roots & tubers	68.2	7.7	37	1.8	1	1.7	0.2	0.4	7	2.3
Fruits	62.9	7.1	28	1.4	0.6	1	0.3	0.6	6	2.0
Others	137.6	15.6	231	11.5	6.8	11.6	6.6	13.3	32	10.7

Contd..

Regions	Intake		Energy		Protein		Fat		Carbohydrate	
	(g)	(%)	(kcal)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
WEST	793.2	100	1739	100	47.5	100	56.9	100	241	100.0
Cereals and Millets	238.3	30	792	45.6	23.1	48.6	3.1	5.4	164	68.0
Pulses & Legumes	33.2	4.2	101	5.8	6.9	14.5	0.6	1.1	16	6.6
Fats & Edible Oils	36	4.5	324	18.6	0	0	35.9	63.1	0	0.0
Meat, Poultry, Fish & Sea foods	14.4	1.8	59	3.4	3.2	6.7	1.2	2.1	0	0.0
Milk and Milk products	184.6	23.3	141	8.1	5.4	11.4	8.8	15.5	12	5.0
Nuts & Oil seeds	5.5	0.7	30	1.7	1.1	2.3	2.4	4.2	1	0.4
Vegetables	74.3	9.4	23	1.3	1.6	3.4	0.2	0.4	3	1.2
Roots & tubers	51	6.4	32	1.8	0.8	1.7	0.1	0.2	7	2.9
Fruits	64.7	8.2	29	1.7	0.5	1.1	0.3	0.5	6	2.5
Others	91.2	11.5	207	11.9	4.9	10.3	4.3	7.6	33	13.7

Source: NNMB urban survey 2016

Annexure 2. Mean and percent of energy (E) from carbohydrate, protein and fat intake from different food groups among adults residing in 4 regions of rural India

Regions	Intake		Energy		Protein		Fat		Carbohydrate	
	(g)	(%)	(kcal)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
CENTRAL	950	100	2269	100	85	100	36	100	400	100.0
Cereals and Millets	454.4	47.8	1554.6	68.5	48.6	57.3	6.7	18.7	325	81.3
Pulses & Legumes	47.6	5	157.5	6.9	10.6	12.5	0.9	2.5	26.8	6.7
Fats & Edible Oils	17	1.8	153.3	6.8	0	0	17	47.6	0	0.0
Meat, Poultry, Fish & Sea foods	85.3	9	101.8	4.5	16.6	19.5	3.2	9	1.6	0.4
Milk and Milk products	99.9	10.5	88.7	3.9	3.5	4.2	5.1	14.2	5.6	1.4
Nuts & Oil seeds	4	0.4	23.1	1	0.8	1	1.8	4.9	1	0.3
Vegetables	83.4	8.8	28.3	1.2	1.9	2.3	0.4	1	4.3	1.1
Roots & tubers	89.4	9.4	79.6	3.5	1.4	1.7	0.1	0.3	18.4	4.6
Fruits	39.5	4.2	13.7	0.6	0.3	0.4	0.1	0.3	2.8	0.7
Others	29.9	3.1	68.9	3	1	1.2	0.6	1.7	14.8	3.7

Contd..

Regions	Intake		Energy		Protein		Fat		Carbohydrate	
	(g)	(%)	(kcal)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
EAST	932.9	100	1983	100	58.6	100	23.4	100	382.8	100.0
Cereals and Millets	395.7	42.4	1361.6	68.7	27.8	47.4	2.1	8.8	307	80.2
Pulses & Legumes	36.8	3.9	124.5	6.3	8.6	14.7	0.6	2.6	21.1	5.5
Fats & Edible Oils	12.5	1.3	112.3	5.7	0	0	12.5	53.3	0	0.0
Meat, Poultry, Fish & Sea foods	62.7	6.7	78.5	4	12.4	21.2	2.5	10.8	1.5	0.4
Milk and Milk products	73.9	7.9	52.7	2.7	2.5	4.3	3.2	13.7	4.1	1.1
Nuts & Oil seeds	3.2	0.3	16.2	0.8	0.5	0.9	1.2	5.2	0.7	0.2
Vegetables	140.4	15	47.2	2.4	3.2	5.5	0.6	2.4	7.1	1.9
Roots & tubers	130.8	14	117.6	5.9	2.1	3.6	0.1	0.6	27	7.1
Fruits	45.3	4.9	12.6	0.6	0.4	0.7	0.1	0.5	2.5	0.7
Others	31.7	3.4	59.7	3	0.9	1.6	0.5	2.2	11.7	3.1
SOUTH	852.7	100	2022.6	100	63.7	100	34.4	100	360.6	100.0
Cereals and Millets	381.2	44.7	1313.7	65	27.4	43	2.6	7.5	293	81.3
Pulses & Legumes	39.3	4.6	132.6	6.6	8.8	13.9	0.8	2.3	22.2	6.2
Fats & Edible Oils	14.8	1.7	132.6	6.6	0	0	14.7	42.9	0	0.0
Meat, Poultry, Fish & Sea foods	80.7	9.5	98	4.8	17.8	28	2.8	8.1	0.4	0.1
Milk and Milk products	112.3	13.2	81.6	4	3.8	5.9	4.8	14.1	6.3	1.7
Nuts & Oil seeds	17.5	2.1	80.5	4	1.3	2	7.2	21	2.6	0.7
Vegetables	56.7	6.7	22.6	1.1	1.4	2.1	0.2	0.6	4	1.1
Roots & tubers	49.3	5.8	35.3	1.7	0.7	1	0.1	0.2	8	2.2
Fruits	52.3	6.1	20.2	1	0.5	0.8	0.1	0.4	4.2	1.2
Others	48.8	5.7	105.6	5.2	2.1	3.2	1	3	19.9	5.5

Contd..

Regions	Intake		Energy		Protein		Fat		Carbohydrate	
	(g)	(%)	(kcal)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
WEST	853.1	100	2016.4	100	70.4	100	42.9	100	336.7	100.0
Cereals and Millets	365.7	42.9	1264.1	62.7	36.1	51.3	7	16.4	264.1	78.4
Pulses & Legumes	49.7	5.8	165.2	8.2	11.1	15.7	1.1	2.5	27.9	8.3
Fats & Edible Oils	21	2.5	188.4	9.3	0	0	20.9	48.8	0	0.0
Meat, Poultry, Fish & Sea foods	66.8	7.8	98	4.9	13.9	19.7	4.6	10.6	0.4	0.1
Milk and Milk products	154	18.1	105.1	5.2	4.3	6.1	6.1	14.3	7.6	2.3
Nuts & Oil seeds	5.2	0.6	29.6	1.5	1.1	1.6	2.2	5.1	1.3	0.4
Vegetables	66.5	7.8	21.2	1.1	1.5	2.2	0.3	0.6	3.5	1.0
Roots & tubers	46.3	5.4	39.6	2	0.7	1.1	0	0.1	9	2.7
Fruits	37.4	4.4	19.2	1	0.3	0.4	0.1	0.3	4.2	1.2
Others	40.4	4.7	86	4.3	1.2	1.8	0.6	1.4	18.8	5.6

Source: NNMB rural survey 2012

Annexure 3: Median Energy, carbohydrate, protein and fat intake from different food groups among adults residing in 6 regions of urban India

Regions	Intake (g)	Energy (Kcal)	Protein (g)	Fat (g)	Carbohydrates (g)
POOLED STATES	580.3	1442.1	37.7	32.9	239.3
Cereals	271.3	923.3	24.2	2.4	195.7
Pulses& Legumes	30.8	95.9	6.7	0.5	15.3
Fats & Edible Oils	24.6	221.5	0	24.6	0
Meat & Poultry	0	0	0	0	0
Fish & Sea foods	0	0	0	0	0
Milk and Milk products	80	69.9	3	4.3	5.2
Millets	0	0	0	0	0
Nuts & Oil seeds	0.5	2.6	0.1	0.2	0.1
Condiments & Spices	11.8	21.5	0.9	0.5	2.9
GLVs	1	0.8	0.1	0	0
Roots & tubers	66.2	37.1	1	0.1	7.6
Other vegetables	41.7	10.1	0.6	0.1	1.3
Fruits	26.7	5.4	0.2	0.1	0.7
Snacks &Savories	0	0	0	0	0
Sugars	12.2	48.4	0.2	0	10.3
Others	13.5	5.6	0.8	0	0.2
CENTRAL	564.2	1477.1	39.7	36.1	237.9
Cereals	280	922.6	27.5	3.5	189.6
Pulses& Legumes	32.9	97.1	6.6	0.5	15.3
Fats & Edible Oils	26.3	236.6	0	26.3	0
Meat & Poultry	0	0	0	0	0
Fish & Sea foods	0	0	0	0	0
Milk and Milk products	79.1	82.1	2.9	5.1	6.5
Nuts & Oil seeds	0	0	0	0	0
GLVs	0.4	0.5	0	0	0
Roots & tubers	66.5	41.2	1.1	0.1	8.5
Other vegetables	22.7	5.3	0.1	0.1	0.6
Condiments & Spices	9.1	15.1	0.6	0.4	2
Fruits	18.4	3.8	0.2	0.1	0.5
Snacks &Savories	0	0	0	0	0
Sugars	17.5	69.5	0.3	0	14.8
Others	11.3	3.3	0.4	0	0.1

Contd..

Regions	Intake (g)	Energy (Kcal)	Protein (g)	Fat (g)	Carbohydrates (g)
EAST	706.3	1642.1	42.7	28.9	291.5
Cereals	329	1124.7	28.9	3	238.7
Pulses& Legumes	30.7	97.1	7	0.4	15.4
Fats & Edible Oils	22.8	205.2	0	22.8	0
Meat & Poultry	0	0	0	0	0
Fish & Sea foods	0	0	0	0	0
Milk and Milk products	26.3	25.5	1.3	1.5	1.8
Nuts & Oil seeds	0	0	0	0	0
GLVs	0	0	0	0	0
Roots & tubers	153.1	99	2.4	0.3	20.8
Other vegetables	103	26.5	1.5	0.3	3.2
Condiments & Spices	10.1	19.5	0.8	0.5	2.7
Fruits	11	2.2	0.1	0.1	0.3
Snacks & Savories	0	0	0	0	0
Sugars	10	39.8	0.2	0	8.5
Others	10.3	2.6	0.5	0	0.1
NORTH	589.6	1372.7	34.3	51.9	183.3
Cereals	201.9	656.8	20.5	2.7	133.5
Pulses& Legumes	31.6	93.3	6.6	0.5	14.6
Fats & Edible Oils	43	386.8	0	43	0
Meat & Poultry	0	0	0	0	0
Fish & Sea foods	0	0	0	0	0
Milk and Milk products	67.6	50.1	2.2	3.1	4.4
Nuts & Oil seeds	0	0	0	0	0
GLVs	0	0	0	0	0
Roots & tubers	61.5	36.9	1	0.1	7.6
Other vegetables	50	9.5	0.4	0.1	1.4
Condiments & Spices	9.1	16.4	0.7	0.5	2
Fruits	36	7.2	0.3	0.2	1
Snacks & Savories	0	0	0	0	0
Sugars	18.9	75.2	0.4	0	16.1
Others	70	40.4	2.3	1.7	2.8

Contd..

Regions	Intake (g)	Energy (Kcal)	Protein (g)	Fat (g)	Carbohydrates (g)
NORTHEAST	813.8	2333.6	60.3	40.9	405.9
Cereals	449.7	1561.6	37.9	3.2	336.3
Pulses& Legumes	76.9	248.9	16.7	1.3	40.1
Fats & Edible Oils	33.7	302.2	0	33.6	0
Meat & Poultry	0	0	0	0	0
Fish & Sea foods	0	0	0	0	0
Milk and Milk products	0	0	0	0	0
Nuts & Oil seeds	0	0	0	0	0
GLVs	0	0	0	0	0
Roots & tubers	115.3	72.7	1.8	0.2	15.2
Other vegetables	68.9	16.9	0.9	0.2	2.2
Condiments & Spices	9.4	17.1	0.6	0.3	2.7
Fruits	15.4	3.5	0.1	0.1	0.5
Snacks &Savories	14	61.7	1	2	0
Sugars	10	40	0.2	0	8.5
Others	20.4	9.1	1.1	0	0.3
SOUTH	584.3	1453.8	37.3	30.3	248.7
Cereals	274.9	957.4	22.8	1.8	207.3
Pulses& Legumes	29.9	95.7	6.5	0.5	15.4
Fats & Edible Oils	18.8	169.4	0	18.8	0
Meat & Poultry	0	0	0	0	0
Fish & Sea foods	0	0	0	0	0
Milk and Milk products	100	73	3.6	4.5	5.3
Nuts & Oil seeds	8.6	38.2	0.5	3.6	0.7
GLVs	1.5	1.2	0.1	0	0.1
Roots & tubers	50.6	25.1	0.7	0.1	5
Other vegetables	22.9	6.5	0.3	0.1	0.9
Condiments & Spices	14	25.6	1.1	0.5	3.5
Fruits	37.2	7.7	0.3	0.2	1
Snacks &Savories	0	0	0	0	0
Sugars	10	39.8	0.2	0	8.5
Others	15.9	14.3	1.1	0.2	1

Contd..

Regions	Intake (g)	Energy (Kcal)	Protein (g)	Fat (g)	Carbohydrates (g)
WEST	521	1294.4	32.8	41.9	189.2
Cereals	201.5	670.3	19.4	2.3	139.5
Pulses& Legumes	27.2	85.5	5.8	0.4	13.8
Fats & Edible Oils	31	279.1	0	31	0
Meat & Poultry	0	0	0	0	0
Fish & Sea foods	0	0	0	0	0
Milk and Milk products	118	107	3.9	6.7	9
Nuts & Oil seeds	1.2	6	0.2	0.5	0.2
GLVs	3	3.2	0.1	0	0.1
Roots & tubers	38.7	23.4	0.6	0.1	4.8
Other vegetables	25	5.4	0.2	0.1	0.7
Condiments & Spices	14	25.1	1.1	0.7	3.3
Fruits	29.8	6.2	0.3	0.1	0.8
Snacks & Savories	0	0	0	0	0
Sugars	19.9	78.8	0.4	0	16.9
Others	11.7	4.4	0.7	0	0.2

Source: NNMB Urban Survey 2016

Annexure 4: Median energy, carbohydrate, protein and fat intake from different food groups among adults residing in 4 regions of rural India

Regions/ Food groups	Intake (g)	Energy (Kcal)	Protein (g)	Fat (g)	Carbo- hydrates (g)
POOLED STATES	796.1	2005.6	65.6	23.4	368.1
Cereal Grains	311.5	1070.8	24	1.9	235.2
Pulses & Legumes	31.2	104.6	7.1	0.5	17.7
Fats & Edible Oils	11	99	0	11	0
Meat & Poultry	42.1	69.2	5.9	1.9	0
Fishes & Other Sea Foods	60	60.5	11.4	1	0.3
Milk & Milk Products	66	53.9	2.3	3.2	3.6
Nuts & Oil Seeds	1.9	10.3	0.3	0.8	0.4
GLVs	2.9	1.9	0.1	0	0.2
Roots & Tubers	44.7	32.6	0.7	0	7.3
Other Vegetables	59.8	15.6	0.9	0.1	2.7
Condiments & Spices	8.2	18.1	0.8	0.4	2.7
Fruits	23.8	4.8	0.2	0	0.9
Sugars	10	39.8	0	0	9.9
CENTRAL	952.9	2505.1	93	27.5	459
Cereal Grains	385.6	1318.3	40.4	5.1	275.5
Pulses & Legumes	36.4	120.8	8.1	0.5	20.7
Fats & Edible Oils	11	99	0	11	0
Meat & Poultry	50	70.6	9.3	1.8	0
Fishes & Other Sea Foods	68.4	74.3	10.6	1.3	2
Milk & Milk Products	50	45.3	1.8	2.6	3
Nuts & Oil Seeds	1	5.4	0.2	0.4	0.2
GLVs	12.7	5.5	0.4	0.1	0.3
Roots & Tubers	61.2	54.9	1	0.1	12.7
Other Vegetables	55.1	13.2	0.8	0.1	2.2
Condiments & Spices	7	15.3	0.7	0.4	2.2
Fruits	20	4	0.2	0	0.7
Sugars	10	39.8	0	0	9.9
EAST	859.3	1827.5	55.1	18.8	352.3
Cereal Grains	338	1162.6	23.9	1.6	262.3
Pulses & Legumes	26	89.2	6.3	0.3	15
Fats & Edible Oils	9	81	0	9	0
Meat & Poultry	44	68.8	5.9	2.9	0
Fishes & Other Sea Foods	50	50.5	8.3	0.9	1.6
Milk & Milk Products	42.4	33.5	1.6	1.9	2.8
Nuts & Oil Seeds	1.2	6.5	0.2	0.5	0.3
GLVs	70.8	26.1	2.2	0.3	2.6
Roots & Tubers	110	98.9	1.7	0.1	22.6
Other Vegetables	82.6	21.6	1.3	0.2	3.6
Condiments & Spices	5.4	13.2	0.5	0.2	2.2
Fruits	30	6	0.3	0.1	1.1
Sugars	8	31.8	0	0	8

Contd..

Regions/ Food groups	Intake (g)	Energy (Kcal)	Protein (g)	Fat (g)	Carbo- hydrates (g)
WEST	702.9	1901.1	65.9	27.9	338
Cereal Grains	251.6	862.5	23.1	2.6	185.3
Pulses & Legumes	34	113.2	7.6	0.6	19
Fats & Edible Oils	14.3	127.8	0	14.2	0
Meat & Poultry	52.6	76	10.6	1.1	0
Fishes & Other Sea Foods	15.3	16.8	2.5	0.3	0.5
Milk & Milk Products	73.8	61.6	2.6	3.6	4.2
Nuts & Oil Seeds	1.3	7	0.3	0.5	0.3
GLVs	3	1.7	0.1	0	0.2
Roots & Tubers	23.5	18.6	0.4	0	4.1
Other Vegetables	56	14.2	0.9	0.2	2.5
Condiments & Spices	8.4	18.3	0.9	0.4	2.8
Fruits	9.1	2	0.1	0	0.4
Sugars	10	39.8	0	0	9.9
SOUTH	746.4	1847.5	59.9	23.2	340.3
Cereal Grains	289	997	19.9	1.4	225.2
Pulses & Legumes	29	98	6.5	0.5	16.5
Fats & Edible Oils	10	90	0	10	0
Meat & Poultry	40	69.2	5.3	1.8	0
Fishes & Other Sea Foods	67	68	13.6	1.1	0
Milk & Milk Products	75	57.8	2.6	3.4	4.1
Nuts & Oil Seeds	6.3	31.6	0.5	2.7	1
GLVs	1.2	1.1	0.1	0	0.2
Roots & Tubers	25.4	13.7	0.3	0	3
Other Vegetables	50.5	14.4	0.8	0.1	2.7
Condiments & Spices	12	25	1.1	0.5	3.8
Fruits	30	6.1	0.3	0.1	1.1
Sugars	11	43.4	0	0	10.8

Source: NNMB Rural Survey 2012

Annexure 5: Percent of adult population consuming recommended intakes in rural and urban areas of 6 regions in India

Regions/ Food groups	Rural		Urban	
	% Population with Recommended Intakes	% Population not taking the Recommended Intakes	% Population with Recommended Intakes	% Population not taking the Recommended Intakes
POOLED STATES				
Cereals	1.5	98.5	21.6	78.4
Pulses	7.2	92.8	16.4	83.6
Total fat	97.4	2.6	74.9	25.1
Milk & Milk products	8.7	91.3	14.3	85.7
Vegetables	8.8	91.2	17.0	83.0
Fruits	15.9	84.1	28.6	71.4
Nuts	14.3	85.7	17.9	82.1
Others*	91.9	8.1	62.5	37.5
CENTRAL				
Cereals	1.1	98.9	16.3	83.7
Pulses	3.7	96.3	10.6	89.4
Total fat	97.8	2.2	75.1	24.9
Milk & Milk products	7.3	92.7	9.3	90.7
Vegetables	7.8	92.2	10.1	89.9
Fruits	8.8	91.2	19.0	81.0
Nuts	2.0	98.0	2.3	97.7
Others*	96.7	3.3	57.8	42.2
EAST				
Cereals	0.3	99.7	8.6	91.4
Pulses	3.9	96.1	12.8	87.2
Total fat	99.9	0.1	93.3	6.7
Milk & Milk products	3.0	97.0	7.2	92.8
Vegetables	28.0	72.0	49.9	50.1
Fruits	16.3	83.7	18.0	82.0
Nuts	1.8	98.2	8.8	91.2
Others*	96.3	3.7	78.1	21.9
SOUTH				
Cereals	2.0	98.0	19.4	80.6
Pulses	7.4	92.6	20.4	79.6
Total fat	97.5	2.5	84.0	16.0
Milk & Milk products	6.2	93.8	13.2	86.8
Vegetables	3.4	96.6	8.8	91.2
Fruits	19.6	80.4	34.3	65.7
Nuts	21.3	78.7	25.1	74.9
Others*	87.7	12.3	65.0	35.0

Contd..

Regions/ Food groups	Rural		Urban	
	% Population with Recommended Intakes	% Population not taking the Recommended Intakes	% Population with Recommended Intakes	% Population not taking the Recommended Intakes
WEST				
Cereals	2.2	97.8	34.4	65.6
Pulses	12.3	87.7	12.8	87.2
Total fat	94.6	5.4	54.2	45.8
Milk & Milk products	15.8	84.2	20.2	79.8
Vegetables	1.8	98.2	4.8	95.2
Fruits	10.4	89.6	31.3	68.7
Nuts	2.6	97.4	4.1	95.9
Others*	91.3	8.7	51.7	48.3
NORTH				
Cereals			47.4	52.6
Pulses			12.5	87.5
Total fat			28.5	71.5
Milk & Milk products			33.5	66.5
Vegetables			11.3	88.7
Fruits			31.0	69.0
Nuts			12.4	87.6
Others*			43.4	56.6
NORTHEAST				
Cereals			9.2	90.8
Pulses			33.8	66.2
Total fat			95.0	5.0
Milk & Milk products			4.2	95.8
Vegetables			28.3	71.7
Fruits			9.0	91.0
Nuts			28.6	71.4
Others*			73.0	27.0

Source: NNMB Rural and Urban Surveys

*Others include chips, biscuits, chocolates, sweet, juices, etc.,

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