



BURDEN OF PACKAGED FOOD ON SCHOOLCHILDREN

BASED ON THE CSE SURVEY
'KNOW YOUR DIET'



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Introduction

Non-communicable diseases (NCDs) are a major cause of concern around the world. According to the World Health Organization (WHO), about 40 million people die each year as a result of NCDs, accounting for 70 per cent of all deaths globally.¹

NCDs include diabetes, cardiovascular diseases and some cancers. Along with tobacco, alcohol and physical inactivity, an unhealthy diet is strongly linked with NCDs, which are a major challenge in India. In 2016, risk factors such as unhealthy diet, high blood pressure, high blood sugar, high cholesterol and overweight contributed to a quarter of the total disease burden in India.²

For several reasons, the dietary habits of people, including children, are changing. Packaged food is becoming popular and people are eating more food cooked outside their homes.

A common view is that excess consumption of food high in fat, salt or sugar (HFSS) is responsible for obesity and NCDs, with both fresh preparations and packaged foods often grouped together. But there is a difference between them not only with respect to the high levels of fat, sugar or salt—which can be controlled in a fresh culinary preparation—but also the low levels of micronutrients and dietary fibre and presence of chemical additives in packaged HFSS food. Further, packaged food items such as chips, instant noodles, soft drinks and chocolates are ultra-processed, aggressively marketed, cheaper and more easily available than fresh-food options.

While limiting exposure and availability to schoolchildren is of paramount importance to contain rising NCDs, HFSS food continues to be widely consumed in schools. Children are bombarded with aggressive marketing and promotion tactics across all kinds of media. Celebrities continue to lure children through food endorsements and our food labelling regulatory system remains far from adequate. Moreover, there is limited information on dietary habits of children in India particularly in the context of the growing packaged food phenomenon.

In view of the linkages between food and NCDs, the Centre for Science and Environment (CSE) has been working for necessary policies and practices aimed at promoting good food, especially among schoolchildren. CSE has also, in the past, highlighted measures to regulate marketing and promotion of HFSS foods through necessary laws on food labelling, claims and advertisements.

In an attempt to address this issue further, CSE conducted a survey, Know Your Diet—Schoolchildren Survey, a one-of-its-kind online diet survey to understand what schoolchildren in India were eating. The survey, meant for children of 9–17 years, also provided an instant diet report to each respondent. Over 13,000 children responded from various states of India.

The results reveal a grim picture. They throw light on the current dietary habits of urban Indian schoolchildren. The issues highlighted show that the policymakers and regulators at the Central and state levels have a key role in containing NCDs related to diet in India.

Executive summary

Children from urban areas across India responded to the survey.

- Responses were received from 13,274 schoolchildren in the age group 9–17 years.
- Similar numbers of boys and girls took the survey.
- About 90 per cent of respondents were from north, south and west India.
- About 90 per cent of the responses were received from urban areas.
- 97 per cent of the responses were from 97 districts spread across 15 states of India.
- 130 schools contributed to about 93 per cent of the responses.

Most schoolchildren were not eating a balanced diet.

- About 66 per cent children had a low frequency of intake of cereals and millets.
- 45 per cent children had a low frequency of intake of vegetables.
- Over 54 per cent children had a low frequency of intake of milk and milk products.
- 65 per cent children had a low frequency of fruit intake.
- Over 73 per cent of the vegetarian children had a low frequency intake of pulses.
- 49 per cent of the non-vegetarian children had a low frequency of intake of protein sources such as pulses, eggs, meat and fish.

Packaged food was more popular among children than non-packaged food.

- 53 per cent children consumed packaged food or beverages at least once a day.
 - 53 per cent children consumed salted packaged food such as chips and instant noodles at an average of over twice a week.
 - About 56 per cent children consumed sweet packaged food such as chocolates and ice creams at an average of over twice a week.
 - 49 per cent children consumed sugar-sweetened packaged beverages at an average of over twice a week.
- Boys consumed packaged food and beverages more frequently than girls.
- Older children consumed packaged food and beverages more frequently than younger children.
- 83 per cent children had milk with milk-food drinks and 69 per cent children had milk with breakfast cereal.
- Over 16 per cent children consumed street food, about 20 per cent consumed sweets, about 35 per cent consumed fresh sweet beverages and over 16 per cent consumed concentrated sweet beverages at an average of over twice a week.

Schools or nearby areas were prominent sources of packaged food for children

- Over 70 per cent children consumed packaged food items in schools or bought them from or near schools.
- For a high percentage of children, school was a source of packaged foods and beverages such as chocolates (48.6 per cent), chips (45.9 per cent) and packaged juice-based beverages (36.6 per cent).
- Of the children who consumed packaged foods very frequently, an even higher percentage consumed or bought packaged food in or near schools.
- About 91 per cent children almost always carried lunch or a meal to school. However, over half of them consumed or bought packaged SSBs, salted packaged food or sweet packaged food from or near schools.

Children with higher screen time consumed more packaged and fast food and were more sedentary

- High screen time, a source of exposure to advertisements, is connected with frequent consumption of packaged food, beverages and fast food.
 - Among the children who had screen time of over two hours per day, about 73 per cent consumed packaged food, beverages or fast food at least once a day.
 - Among children who had a screen time less than or equal to two hours per day, about 44 per cent children consumed packaged food, beverages or fast food at least once a day.
- High screen time is also connected with a perception that packaged food is not harmful to health.
 - Among the children who had screen time of over two hours per day, about 17 per cent children believed that packaged food was not harmful to health.
 - Among the children who had screen time less than or equal to two hours per day, about 10 per cent believed that packaged food is not harmful to health.
- High screen time is linked with sedentary behaviour in school children.
 - Among children who have screen time higher than 2 hours per day, about 29 per cent have sedentary lifestyles.
 - Among children who have screen time less than or equal to 2 hours per day, 17 per cent have sedentary lifestyles.
- Key reasons selected by children for consuming packaged food revolve around the perception of packaged food being tasty and attractive as well as lack of options, easy availability of packaged food and peer pressure.

CSE recommendations

- FSSAI must prohibit the availability and promotion of packaged HFSS food in and near schools. It must also enforce its guidelines to ensure availability of wholesome and nutritious food in and near schools.
- Marketing of packaged HFSS food targeted at children must be strictly regulated. Celebrity endorsement of HFSS packaged food should not be permitted. Broadcast timings of advertisements of HFSS food targeted at children should be strictly regulated.
- Laws related to food labelling and claims must be strengthened with reference to nutrition-fact labelling, front-of-pack labelling and health and nutrition claims.

1. ‘Know Your Diet’ Schoolchildren Survey

1.1 OBJECTIVE AND DESIGN

The objective of the survey was to understand eating habits and preferences of Indian schoolchildren in the age group 9–17 years. The survey included questions on the following key themes:

- Number and type of meals consumed in a day
- Consumption of cereals, fruits, vegetables, pulses, milk and milk products and meat, fish and eggs
- Consumption of packaged and non-packaged beverages
- Consumption of packaged and non-packaged food
- Eating in school and buying from or near school
- Reasons for consuming packaged food and food from fast-food outlets
- Screen time and physical activity

For survey questionnaire, see Annexure I.

The survey was launched in September 2016. CSE approached its network of schools from across the country and the survey was promoted alongside on social media as well. Responses were received from students belonging to about 300 schools. About 93 per cent of the responses were received from about 130 schools—a mix of private schools, government schools and Kendriya Vidyalayas.

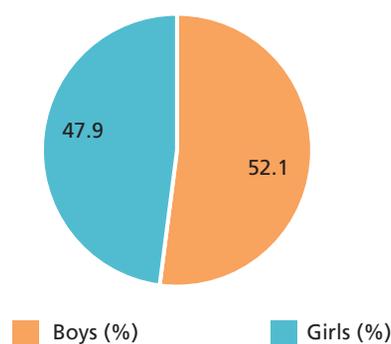
1.2 MAPPING RESPONSES

13,274 entries were considered for analysis.

1.2.1 Gender ratio

Among the respondents, there were similar numbers of boys and girls (see *Graph 1: Gender breakup of respondents*).

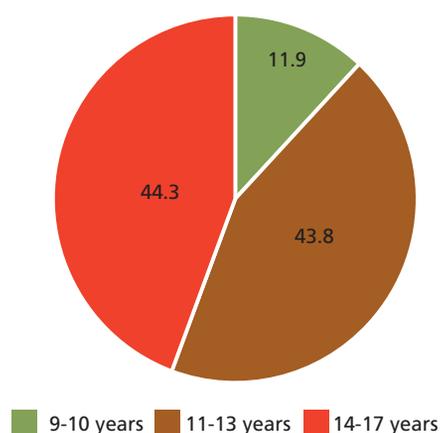
Graph 1: Gender breakup of respondents



1.2.2 Age distribution

The survey was meant for children 9–17 years of age, i.e. typically students from Class 4 to Class 12. The respondents were divided into three age groups, i.e. 9–10 years, 11–13 years and 14–17 years. It was found that about 90 per cent of the responses were from children from Classes 6–12. A similar number of responses were received from children in Classes 6–8 and Classes 9–12 (see *Graph 2: Age distribution of respondents*).

Graph 2: Age distribution of respondents



1.2.3 Geographical distribution

About 90 per cent of the responses were received from north, south and west India (see *Graph 3: Regional distribution of responses*). Based on the location of the school, the district was ascertained and it was found that responses were received from 123 districts spread across 24 states and 1 union territory. However, about 97 per cent of the responses were received from 97 districts spread across 15 states. (For districts, see Annexure II)

Graph 3: Regional distribution of responses



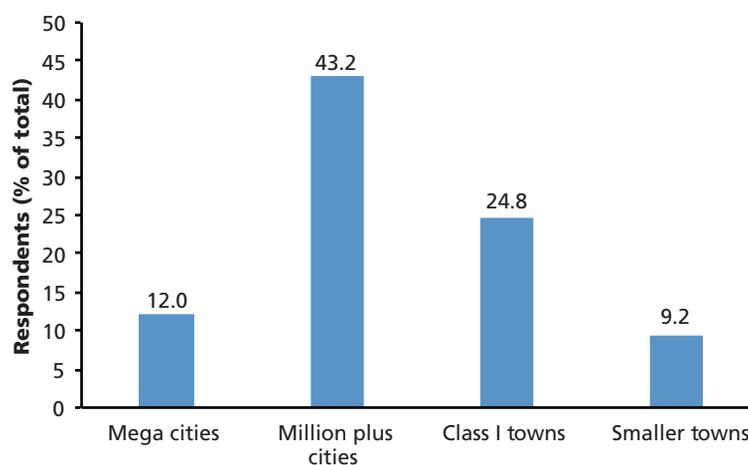
Note: 'North' includes Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Uttar Pradesh, Punjab, Chandigarh, NCT of Delhi and Haryana; 'South' includes Telangana, Tamil Nadu, Kerala, Karnataka and Andhra Pradesh; 'East & North East' includes Bihar, Jharkhand, Odisha, Arunachal Pradesh, Assam, Sikkim and Tripura; 'West' includes Rajasthan, Gujarat and Maharashtra; and 'Centre' includes Madhya Pradesh and Chhattisgarh.

The 15 states were Punjab, Tamil Nadu, NCT of Delhi, Rajasthan, Telangana, Maharashtra, Madhya Pradesh, Haryana, Gujarat, Karnataka, Uttar Pradesh, Bihar, Kerala, Andhra Pradesh and Uttarakhand.

On the basis of the criteria of 'urban India' as per Census 2011, it was found that approximately 90 per cent of the responses were from urban areas. Responses were received from two 'mega cities',³ i.e. Delhi and Greater Mumbai and 28 'million-plus

cities',⁴ including Gwalior, Jaipur and Hyderabad and 44 'Class I towns'⁵, including Secunderabad, Palakkad and Moga and other smaller towns including Pilani, Faridkot and Chengalpet (see *Graph 4: Distribution of responses from urban areas*).

Graph 4: Distribution of responses from urban areas



Note: 'Mega cities' includes cities or urban agglomerations (UA) with a population of 10 million or more; 'million-plus city' means a city/UA with a population of over 1 million; 'Class I town or UA' refers to a town with a population of 1 lakh or more

2. Balance in diet

A nutritionally adequate and balanced diet is necessary for optimal growth and development in children and adolescents.⁶ The survey results show that 39 per cent children have all three meals (breakfast, lunch and dinner) and one snack (mid-morning snack, evening snack or bedtime snack) in a day while 26 per cent children have all three meals and two snacks in a day. Further, 40 per cent children were found to have two or three snacks in a day and 15 per cent of these children, skip at least one of the meals.

In order to ascertain the balance in diet of children, a criterion based on weekly and intra-day frequency of consumption was used to understand the frequencies that contribute to balance in diet. To develop this criterion, the opinion of practising experts was sought and NIN dietary guidelines were referred to. The results showed that for most food groups, a small percentage of children met the criteria (see *Table 1: Intake of food groups in appropriate frequency*).

Table 1: Intake of food groups in appropriate frequency

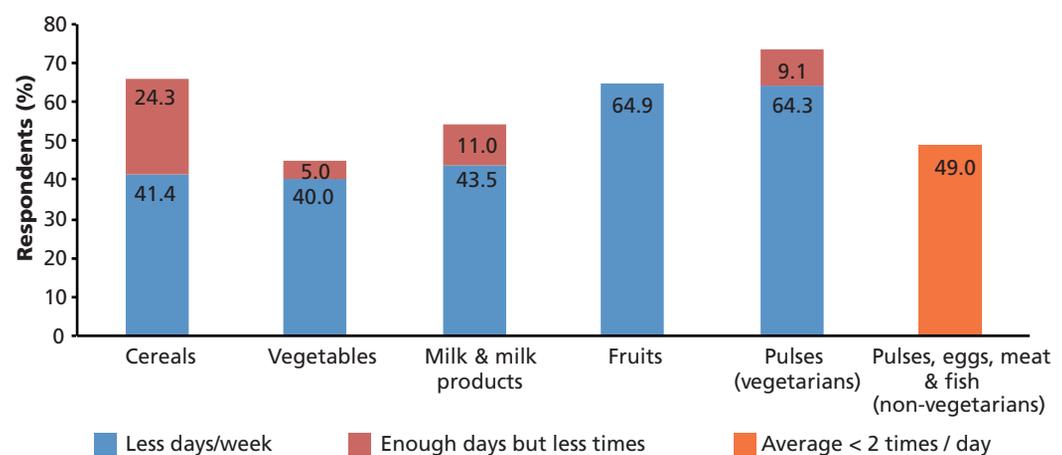
Food group	Criteria		Children (%)
	Days/week	Times/day	
Cereals and millets	6-7	3-6	23.6
Vegetables		2-5	40.3
Milk and milk products		2-3	25.9
Fruits		1-2	17.6
Pulses (for vegetarians)		2-3	18.9
Pulses, meat, fish, eggs (non-vegetarians)	Average frequency 2-3 times per day		17.4

Note: In this analysis, 'vegetables' includes all kinds of vegetables such as roots/tubers, green leafy vegetables etc.

N (vegetarians) = 4116 and N (non-vegetarians) = 9,158.

Calculation of average frequency of intake of pulses, meat, fish and eggs (in the case of non-vegetarians) = [Days (pulses) * Times (pulses)] + [Days (eggs) * Times (eggs)] + [Days (meat) * Times (meat)]/30

Graph 5: Intake of food groups in low frequency



2.1 CEREALS AND MILLETS

- The survey results show that only 23.6 per cent children consume cereals or millets in the appropriate frequency.
- Almost 66 per cent children have a low frequency of intake of cereals or millets—41.4 per cent children consumed cereals or millets five days or fewer per week and 24.3 per cent did so six to seven days a week but less than thrice a day (see *Graph 5: Intake of food groups in low frequency*). On the other hand, 10.7 per cent children consumed cereals or millets in a frequency higher than recommended.

2.2 VEGETABLES

- The survey results show that only 40.3 per cent children consume vegetables in appropriate frequency.
- 45 per cent children have a low frequency of intake of vegetables—40 per cent of the children consumed vegetables five or fewer days per week and 5 per cent did six to seven days per week but less than twice a day. 47 per cent boys and 42 per cent of the girls didn't consume vegetables often enough.
- On the other hand, 14.6 per cent children consumed vegetables in a frequency higher than recommended.

2.3 MILK AND MILK PRODUCTS

- The survey shows that only about 26 per cent children consume vegetables in appropriate frequency.
- 54.5 per cent children had a low frequency of intake of milk and milk products—43.5 per cent children consumed milk and milk products five or fewer days per week and 11 per cent did so six to seven days but less than twice a day. The data also showed that 52 per cent of the boys and 58 per cent girls consumed milk and milk products in low frequency.
- On the other hand, 19.5 per cent children consumed milk and milk products in a frequency higher than recommended.

2.4 FRUITS

- The survey showed that only about 18 per cent children consumed fruits in appropriate frequency.
- About 65 per cent children consumed fruits on five or fewer days per week. On the other hand, 17.5 per cent children consumed fruits in a frequency higher than recommended.

2.5 PULSES, EGGS, MEAT AND FISH

2.5.1 Vegetarians

- The survey showed that 31 per cent of the children were vegetarians (i.e. don't consume eggs, meat or fish). Among the vegetarians, 18.9 per cent children consumed pulses in appropriate frequency.
- 73.4 per cent vegetarian children had a low intake of pulses—64.3 per cent children consumed pulses five days or fewer per week and 9.1 per cent children did so six to seven days but less than twice a day. On the other hand, 7.7 per cent vegetarian children consumed pulses in a frequency higher than recommended.

2.5.2 Non-vegetarians

- 17.4 per cent of the non-vegetarian children consumed pulses, eggs, meat or fish in appropriate frequency.
- 49 per cent of the non-vegetarian children consumed pulses, eggs, meat or fish on an average of less than twice per day—53 per cent of the non-vegetarian girls were found to have a low frequency of intake while 46 per cent of the non-vegetarian boys were found to have a low frequency of intake.
- On the other hand, 33.6 per cent non-vegetarian children consumed pulses, eggs, meat or fish more often than recommended.

Key takeaways

The survey shows worrying trends in the consumption of different food groups among urban Indian schoolchildren.

- School children in the age group 9–17 years are not consuming a balanced diet. The percentage of children consuming each food group in appropriate frequency is low.
- Among the 31 per cent vegetarian children, 73.4 per cent children have a low intake of pulses, indicating a possibly low intake of proteins.
- Gender disparity can be seen in the consumption of pulses, eggs, meat or fish and milk and milk products. With respect to these foods, more girls were found to have a low frequency of intake than boys.

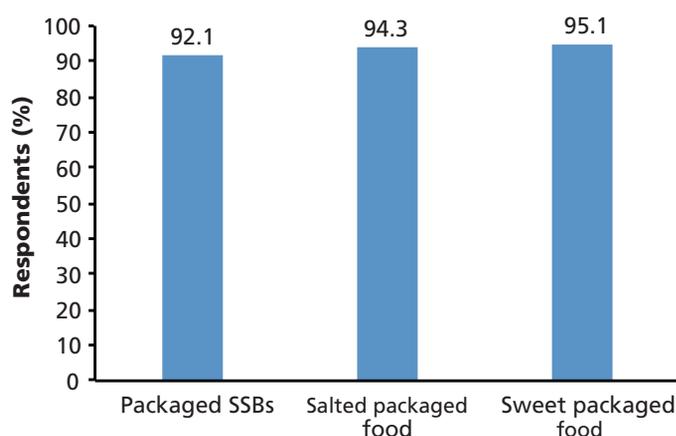
3. Packaged food and beverages

As our lives become more fast-paced, ultra-processed packaged food and beverages are becoming a convenient option for both adults and children. With the rising incidence of diet-related NCDs and childhood obesity, this trend presents a worrying picture for the future adults of India.

3.1 CONSUMPTION OF PACKAGED FOOD AND BEVERAGES IS VERY HIGH

- Almost every child consumed packaged sugar-sweetened beverages (SSBs) (92.1 per cent), salted packaged food (94.3 per cent) and sweet packaged food (95.1 per cent) (see *Graph 6: Consumption of packaged food and beverages*).
- Every other child (53 per cent) consumed packaged food or beverages at an average of at least once a day (see *Graph 7: Consumption of packaged food or beverages at least once a day*).
 - Every other child (53.2 per cent) consumed salted packaged foods such as chips and noodles at an average of over twice a week (see *Graph 8: Consumption of packaged food or SSBs more than twice a week*).
 - Every other child (55.8 per cent) consumed sweet packaged food such as chocolate and ice cream at an average of over twice a week.
 - Every other child (49.3 per cent) consumed packaged SSBs such as carbonated soft drinks, juices and milk-based sweet drinks at an average of over twice a week.
 - Two-thirds of the children (66 per cent) consumed biscuits or candies more than twice a week.
- It was found that children who consumed each packaged food more days in a month also consumed it multiple times in a day.
- Data for all kinds of packaged food (including beverages) shows that older children consume packaged food more frequently than younger age groups.
- Boys were found to be consuming packaged SSBs and salted packaged food more frequently than girls. However, girls were found to be consuming sweet packaged food more frequently than boys (see *Graph 9: Consumption of different kinds of packaged food or beverages in both genders*).

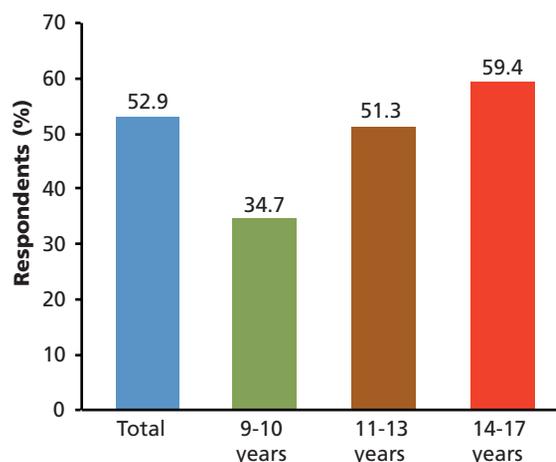
Graph 6: Consumption of packaged food and beverages



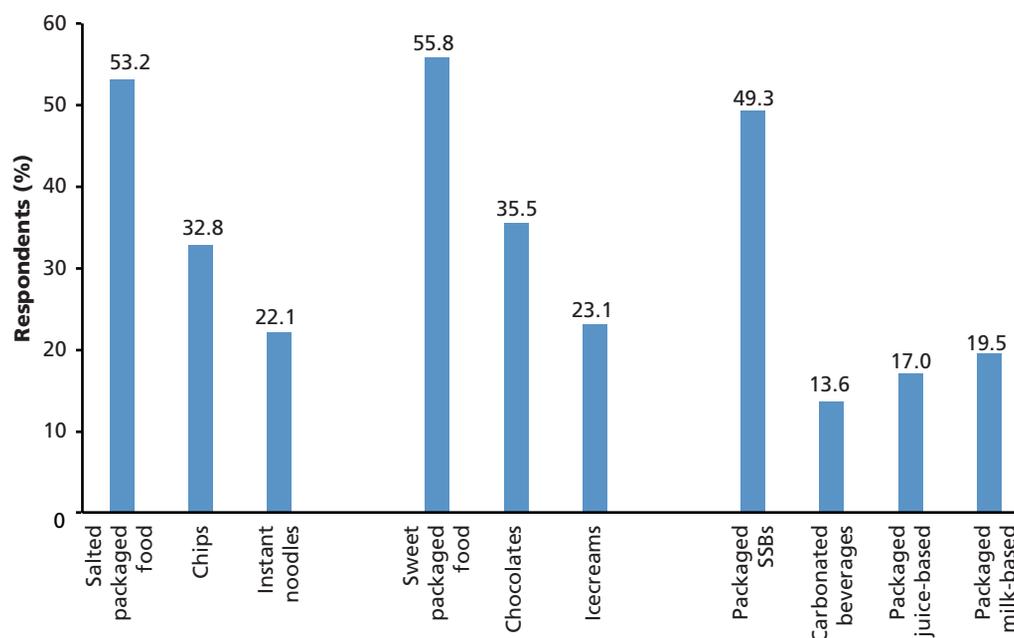
Note for Graphs 6, 7, 8 and 9: For the purpose of this analysis, packaged food includes (i) Sweet packaged food—ice cream and chocolate, (ii) salted packaged food: chips etc. and instant noodles.

Packaged SSBs include (i) Carbonated soft drinks such as Pepsi, Thumbs up, Coca Cola, Limca, Fanta etc. (ii) Packaged fruit juices or fruit-juice based drinks such as Tropicana, Real, Maaza, Slice etc. (iii) Packaged milk-based drinks such as lassi, flavoured milk etc.

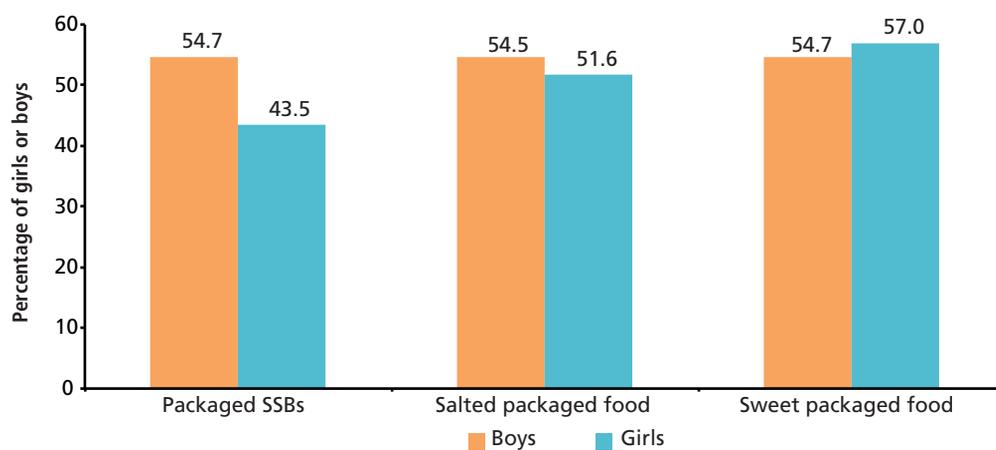
Graph 7: Consumption of packaged food or beverages at least once a day



Graph 8: Consumption of packaged food or SSBs more than twice a week



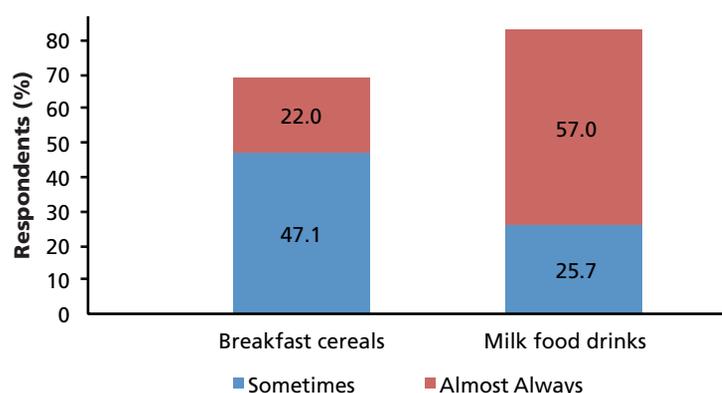
Graph 9: Consumption of different kinds of packaged food or beverages in both genders



3.2 MILK-FOOD DRINKS AND BREAKFAST CEREALS

Apart from beverages, processed and packaged accompaniments of milk seem to be very popular among children. Data shows that more than 8 out of 10 children have milk with milk-food drinks like Bournvita, Horlicks, Complan etc. and seven out of 10 children consume breakfast cereals such as corn flakes and strawberry flakes (see *Graph 10: Consumption of milk accompaniments*).

Graph 10: Consumption of milk accompaniments



Note: N (milk-food drinks) = 12,628, N (breakfast cereals) = 12,637

Key takeaways

The data shows that packaged food is no longer an occasional treat but is becoming the norm for urban Indian children.

- Every other child consumes packaged food or beverages on an average of at least once a day.
- Older children consume packaged food more frequently than younger age groups. This could be because as children grow older, they have more control over their dietary choices and have greater access to markets etc.
- An analysis of the sugar content in typical portions of different kinds of packaged SSBs shows that one portion can account for the entire sugar quota for the day or even much more (see *Table 2: Sugar content in popular packaged SSBs and contribution to daily upper limit*).

Table 2: Sugar content in popular packaged SSBs and contribution to daily upper limit

Packaged SSB	Sugar content (grams per 100 ml)	Standard serving size (ml)	Contribution to daily recommended upper limit of sugar (25 grams) (%)
Amul Sweet Lassi	12 [*]	200	96
Real Pineapple Juice	13 [†]	200	104
Tropicana Litchi Delight	14.1 [‡]	200	112.8
Tropicana Mango Delight	15 [§]	200	120
Pepsi	10.9 [¶]	300	130.8

Sources:

* Amul website, Product specifications of Amul Lassi available at <http://www.amul.com/products/amul-lassee-info.php> (accessed on 25 July 2017).

† Real Fruit Power website, Pineapple juice available at <http://www.realfruitpower.com/pineapple-juice> (accessed on 25 July 2017).

‡ PepsiCo India website, Tropicana Litchi Delight-Fruit Beverage Nutritional Information, available at <http://www.pepsicoindia.co.in/Download/Tropicana%20Litchi%20Twirl-Fruit%20Beverage.pdf> (accessed on 25 July 2017).

§ PepsiCo India website, Tropicana Mango Delight-Fruit Beverage Nutritional Information, available at <http://www.pepsicoindia.co.in/download/Tropicana%20Mango-Fruit%20Beverage.pdf> (accessed on 25 July 2017).

¶ PepsiCo India website, Nutritional Facts & Ingredients Details: Pepsi, available at <http://www.pepsicoindia.co.in/brands/pepsi.html#code> (accessed on 25 July 2017)

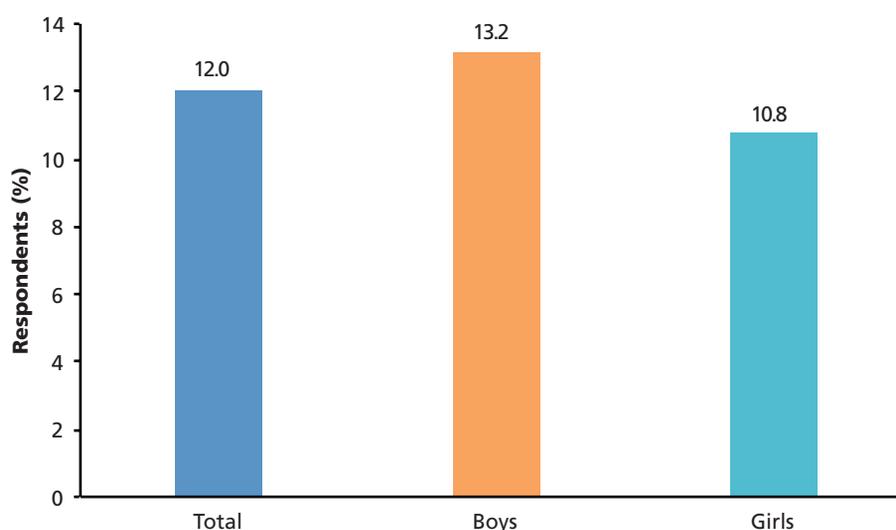
- Milk-food drinks typically contain high amounts of sugar. For example, one serving of Bournvita (20 grams) contains 14.2 grams of sugar. Even if no sugar is added, two servings of Bournvita per day will exceed the recommended daily upper limit of added sugar.

4. Food from fast-food outlets

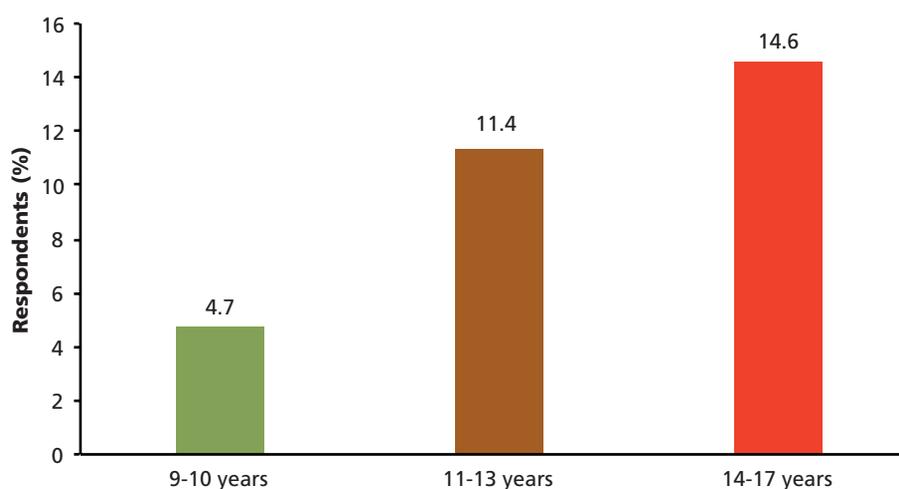
Even though not strictly packaged, food sold at quick-service restaurants—fast food, such as pizzas, burgers, fries, wraps etc.—is typically ultra-processed or made from ultra-processed packaged ingredients and is aggressively marketed. These factors make fast food very similar to packaged food.

- The survey shows that 76.5 per cent children consume fast food from fast food outlets.
- 12 per cent children consume fast food more than twice a week. The percentage of boys who do so is slightly higher than the percentage of girls (see *Graph 11: Consumption of fast food more than twice a week*).
- Data shows that older children tend to consume fast food more frequently (see *Graph 12: Consumption of fast food over twice a week across different age groups*).

Graph 11: Consumption of fast food more than twice a week



Graph 12: Consumption of fast food over twice a week across different age groups



Key takeaways

- The survey shows that three out of four children have access to fast-food outlets. This reflects the impact that the expansion of the industry has had on buying behaviours of children and adults. The chained restaurants segment is projected to grow in double digits during 2016–20,⁷ further increasing its penetration across the length and breadth of the country.
- Fast food is likely to have a substantial contribution to one's daily recommended intake of salt, sugar, fat or calories. CSE did a study in 2012 and found that several fast food and packaged food items are calorie dense. For example, a McDonald's meal comprising one McChicken burger, fries and one carbonated beverage (300 ml) was found to meet about 50 per cent of a child's daily calorie requirement.

5. Non-packaged food and beverages

The survey showed that 83.6 per cent children consume street food, 91 per cent children eat sweets such as cakes and traditional sweets, 89.5 per cent children eat fresh sweet beverages and 63.7 per cent consume concentrate-based beverages.

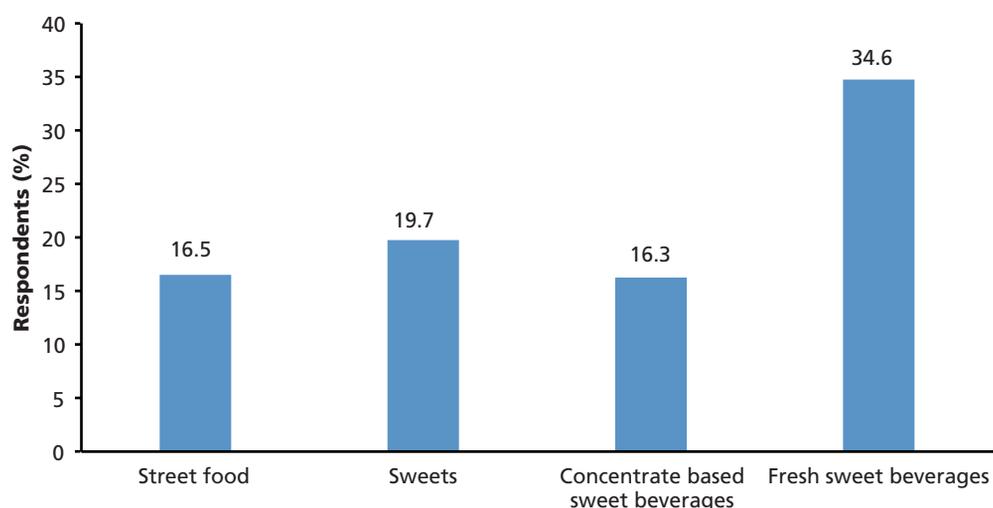
Analysis show that children consume street food and other non-packaged foods and beverages. However, they do so less frequently than they consume packaged food.

5.1 CONSUMPTION OF NON-PACKAGED FOOD AND BEVERAGES

- Street food was found to be more popular than fast food, but much less popular than packaged food. While 16.5 per cent children consumed street food more than twice a week, the number is 12 per cent for fast food and 53 per cent for salted packaged food (see *Graph 13: Consumption of non-packaged food and beverages more than twice a week*).
- Sweets were found to be much less popular than sweet packaged food such as chocolates and ice creams. While 19.7 per cent children consumed sweets more than twice a week, the number is 56 per cent for sweet packaged food.
- Fresh sweet beverages were found to be more popular than concentrate-based sweet drinks but less popular than packaged SSBs. While, over 49 per cent of the children consumed packaged SSBs more than twice a week, the number is 34.6 per cent for fresh sweet beverages and 16.3 per cent for concentrate-based sweet beverages.

For standard deviations in number of days of consumption of different food groups, packaged and non-packaged food items, refer to Annexure III.

Graph 13: Consumption of non-packaged food and beverages more than twice a week



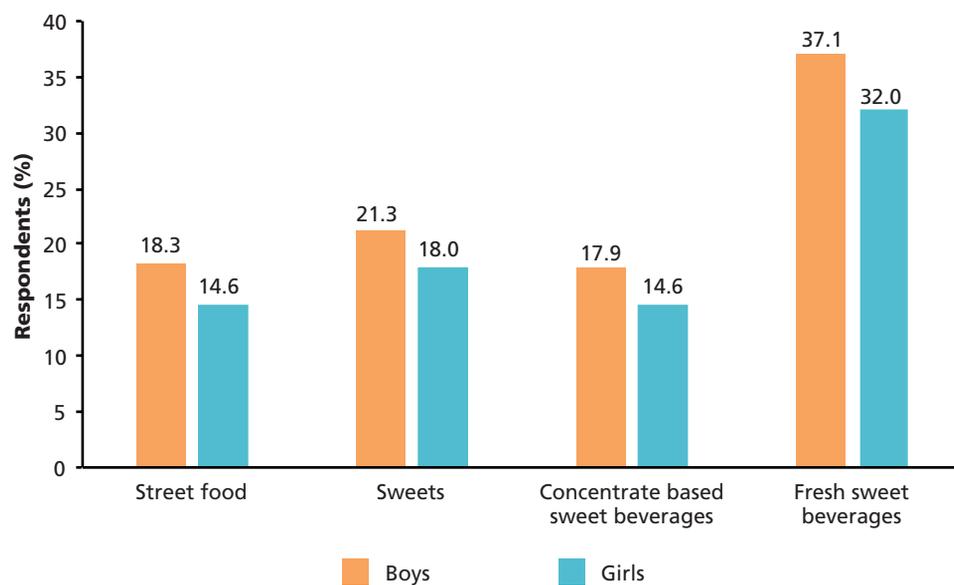
Note: In this survey:

- (i) 'Street food' refers to chaat, pakora, samosa, momos, kachori, pav bhaji, chhole bhature etc.
- (ii) 'Sweets' include cake, pastry or traditional sweets like rasagulla, halwa, jalebi etc.
- (iii) 'Fresh sweet beverages' include fruit or vegetable juice, lassi, shakes, fresh lime etc.
- (iv) 'Concentrate-based sweet drinks' include squash, sherbet, iced tea etc.

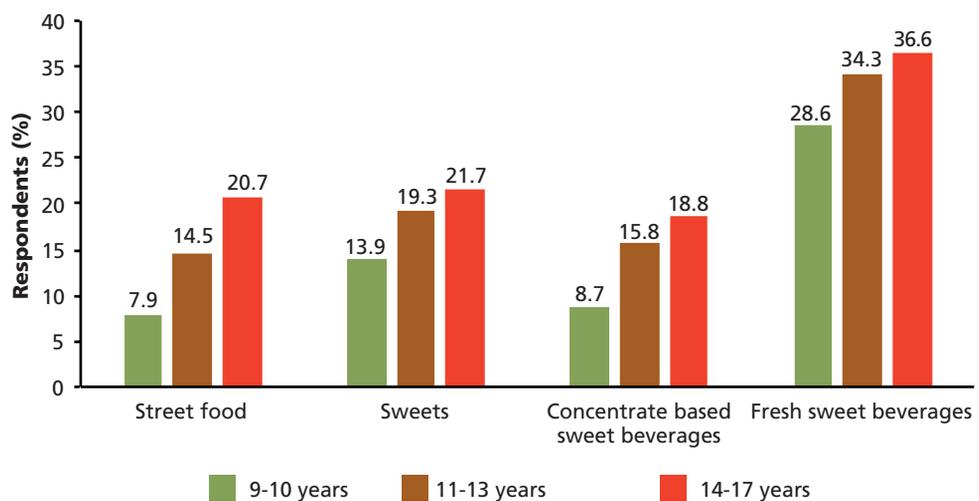
5.2 AGE AND GENDER TRENDS IN CONSUMPTION OF NON-PACKAGED FOOD

- It was found that for each of the categories of non-packaged food and beverages, boys consumed more frequently than girls [see *Graph 14: Consumption of non-packaged food and beverages more than twice a week (gender trends)*].
- In each category of non-packaged food and beverages, older children’s consumption was more frequent than younger age groups [see *Graph 15: Consumption of non-packaged foods and beverages more than twice a week (across different age groups)*].

Graph 14: Consumption of non-packaged foods and beverages more than twice a week (gender trends)



Graph 15: Consumption of non-packaged foods and beverages more than twice a week (across different age groups)



Key takeaway

- Non-packaged food and beverages are not as popular as their packaged options.

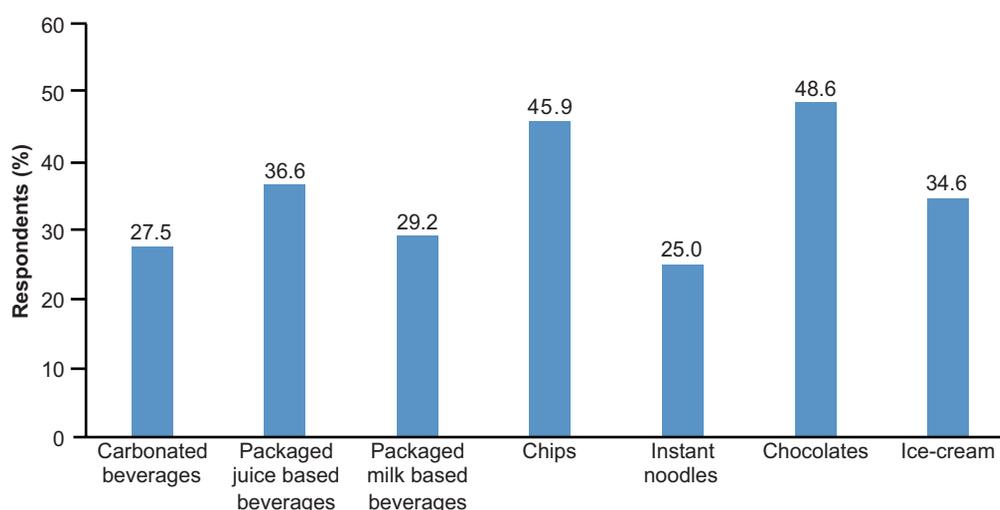
6. Eating in and around schools

Children spend a significant amount of time in school. Schools can therefore act as important avenues where they can develop good eating habits. However, the survey presents worrying results.

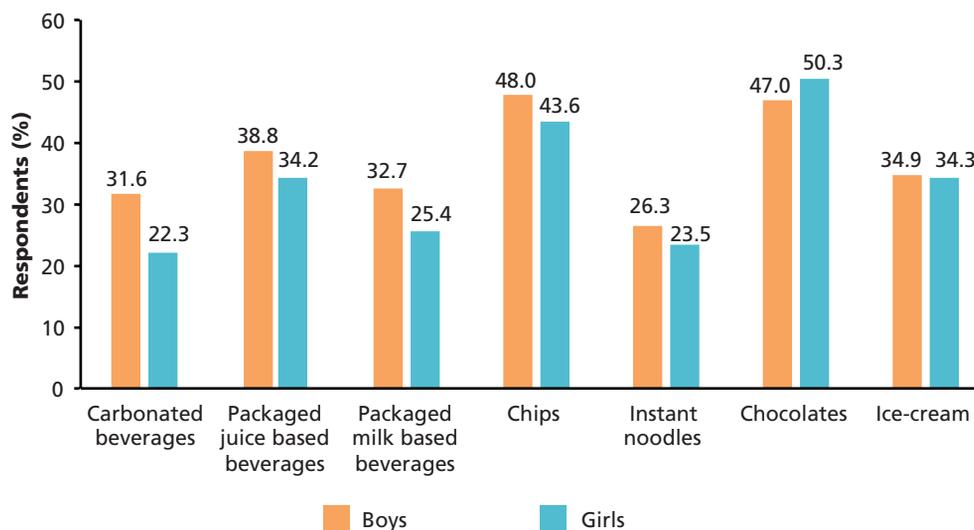
6.1 SCHOOLS ACT AS CRUCIAL SOURCE OF PACKAGED FOOD FOR CHILDREN

- The survey shows that over 70 per cent children consume packaged food items in schools or buy from or near schools.
- Chips and chocolates seem to be the most popular items consumed by children in schools. While about 46 per cent children reported eating chips in school or buying chips from or near school, the number was about 49 per cent for chocolates (see *Graph 16: Children who consume or buy different packaged food items from or near school*).
- Only in the case of chocolates did more girls consume or buy it from or near schools. For every other packaged food or beverage, more boys consumed or bought it from or near schools (see *Graph 17: Gender breakup of children who consume or buy packaged food items from or near school*).
- With respect to each kind of packaged food or beverage, the percentage of children consuming it at school or buying it from or near school increased in the higher age groups. However, an exception was observed. Children in the age group 11–13 years were found to consume packaged juice-based beverages and packaged milk-based beverages in higher frequency than 14–17-year-olds (see *Graph 18: Age breakup of children who consume or buy packaged food items from or near schools*).

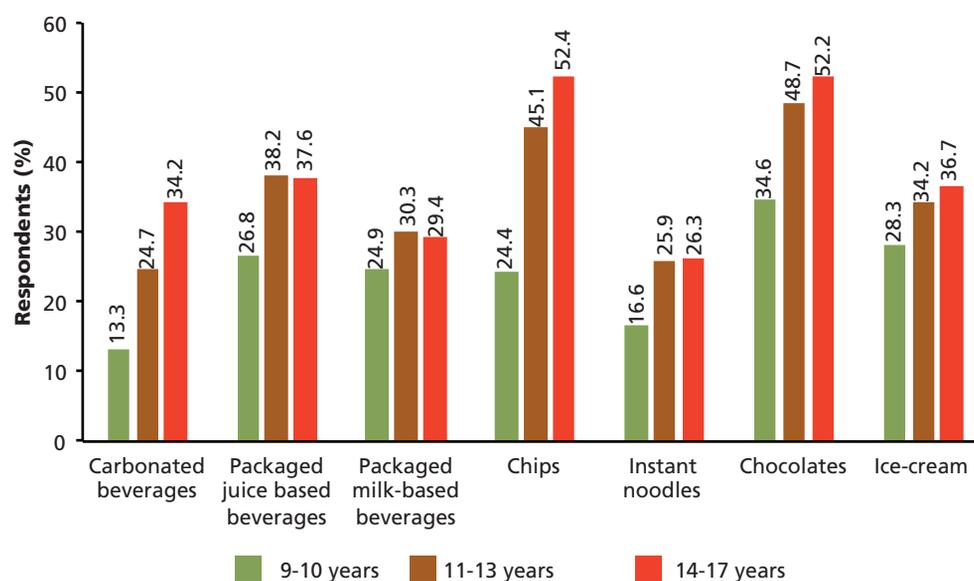
Graph 16: Children who consume or buy different packaged food items from or near school



Graph 17: Gender breakup of children who consume or buy packaged food items from or near school



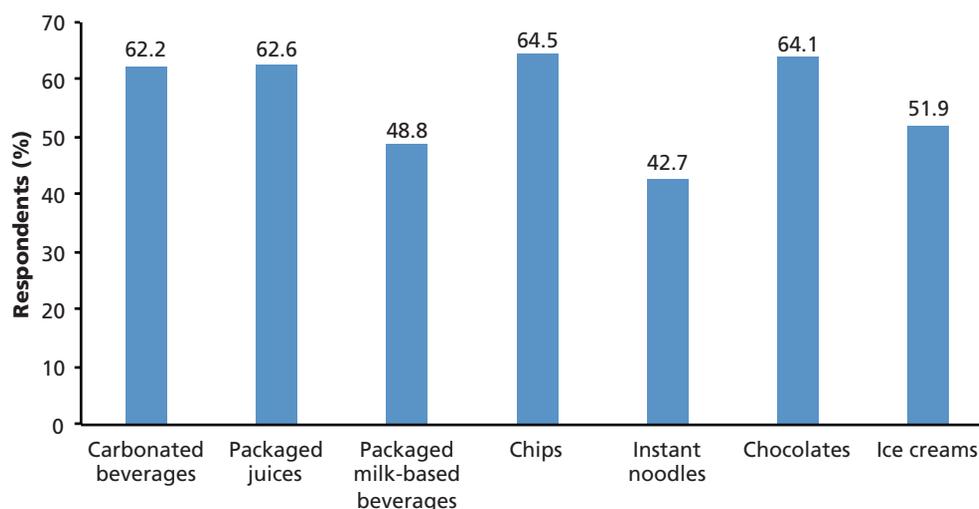
Graph 18: Age breakup of children who consume or buy packaged food items from or near school



6.2 AVAILABILITY IN SCHOOLS AND NEARBY AREAS CONTRIBUTING TO HIGH CONSUMPTION

- It was also seen that of the children who consume various packaged food items more than twice a week, a much higher percentage consumed the packaged food item in school or bought it from or near school. For example, while about 46 per cent children consume or buy chips from or near schools, out of those who eat chips more than twice a week, about 65 per cent usually eat or buy chips in or near school (see *Graph 19: Children eating or buying from schools or nearby areas (out of those consuming more than twice per week)*).

Graph 19: Children eating or buying from schools or nearby areas (out of those consuming more than twice per week)



6.3 DESPITE CARRYING MEALS FROM HOME, MANY CHILDREN ALSO ATE PACKAGED FOOD IN SCHOOL

- Even though close to 90.6 per cent children almost always carried lunch or a meal to school, 19.8 per cent of those children almost always also carried a packaged food item.
- Out of the children who carried lunch from home almost always:
 - 51.4 per cent reported consuming or buying one or more packaged SSBs in or near school.
 - 50.7 per cent reported consuming or buying one or more of salted packaged foods in or near school.
 - 56.2 per cent reported consuming or buying one or more sweet packaged foods in or near school.

Key takeaway

A substantial percentage of children consume packaged food items in and near schools. Of those who consume very frequently, an even higher percentage was found to be eating or buying in or near schools. Even though the percentage of children carrying a meal to school almost always seemed encouraging, a very high percentage of those children also ate packaged food in schools or nearby areas. All these results point in one direction, i.e. easy availability of packaged food, especially in and around schools, is a big contributor to bad eating habits among children.

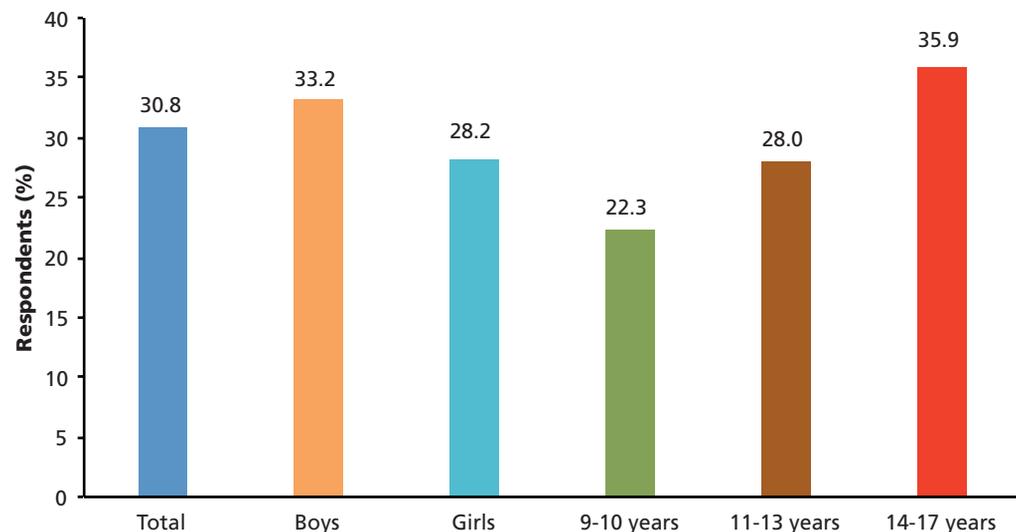
7. Screen time and physical activity

As per a consensus statement for diagnosis of obesity, abdominal obesity and the metabolic syndrome published in 2009 by a group of medical experts, screen time for children should be less than two hours a day.⁸

7.1 SCREEN TIME AMONG SCHOOLCHILDREN

- About one-third of the children were found to spend over two hours watching television or browsing the Internet for recreation every day (see *Graph 20: Percentage of children with over two hours of screen time per day*). Television viewing was a substantial contributor to screen time across both genders and all age groups (see *Table 3: Internet browsing for recreation and television viewing in both genders and across all age groups*).
- More boys than girls and a higher percentage of older children were found to have high screen time. Usage of internet for recreation was higher among boys than girls and was also seen to increase with age.

Graph 20: Percentage of children with over two hours of screen time per day



Note: Screen time = Time spent (i) Watching television and (ii) Browsing the Internet for recreation

Table 3: Internet browsing for recreation and television viewing in both genders (%) and across all age groups (%)

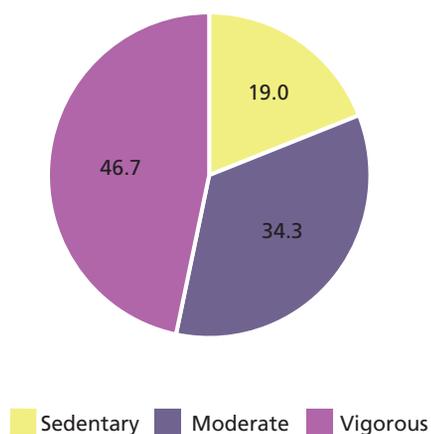
Activity	Time spent (per day)	Total	Boys	Girls	9–10 years	11–13 years	14–17 years
Internet for recreation	>1hour	29.8	34.3	24.9	16.1	26.2	36.9
	>2 hours	14.5	17.1	11.7	7.1	11.4	19.6
Television viewing	>1hour	42.2	41.8	42.7	39.3	42.0	43.2
	>2 hours	17.7	17.9	17.5	15.5	17.3	18.7

7.2 PHYSICAL ACTIVITY AMONG SCHOOLCHILDREN

In the survey, children were asked to select their level of physical activity based on descriptions given.

- 22 per cent of children chose ‘sedentary’ (i.e. barely any activity, mostly sitting),
- 42 per cent chose ‘moderately active’ (i.e. brisk walking, dancing, light weight training, yoga for 60 minutes) and
- 36 per cent chose ‘vigorous’ (i.e. running/jogging, cycling, swimming, aerobics, weight lifting etc.).
- More girls are sedentary and moderately active, while more boys are vigorously active (see *Graph 21: Physical activity among boys* and *Graph 22: Physical activity among girls*).
- Higher percentage of older children have sedentary lifestyles (see *Table 4: Physical activity levels across different age groups*).

Graph 21: Physical activity among boys



Graph 22: Physical activity among girls

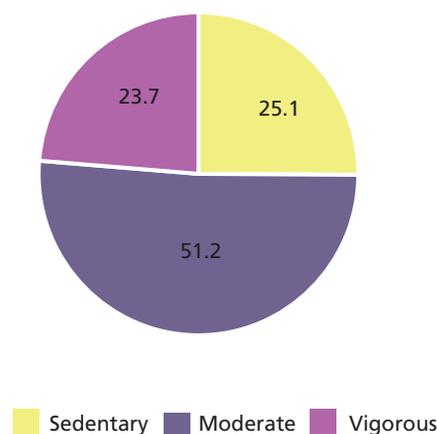


Table 4: Physical activity levels across different age groups

Activity level	9–10 years (%)	11–13 years (%)	14–17 years (%)
Sedentary	16.8	18.6	26.6
Moderate	48.6	40.5	42.5
Vigorous	34.6	40.9	30.9

Key takeaway

- It was found that among children who spent more than two hours every day watching television or browsing the internet, a higher percentage had sedentary lifestyles as compared to those who spent less time in front of screens. This shows that high screen time is linked with sedentary behaviour (see *Table 5: Screen time and physical activity*).

Table 5: Screen time and physical activity

Screen time (per day)	Sedentary (%)
>2 hours	28.8
<2hours	17.2

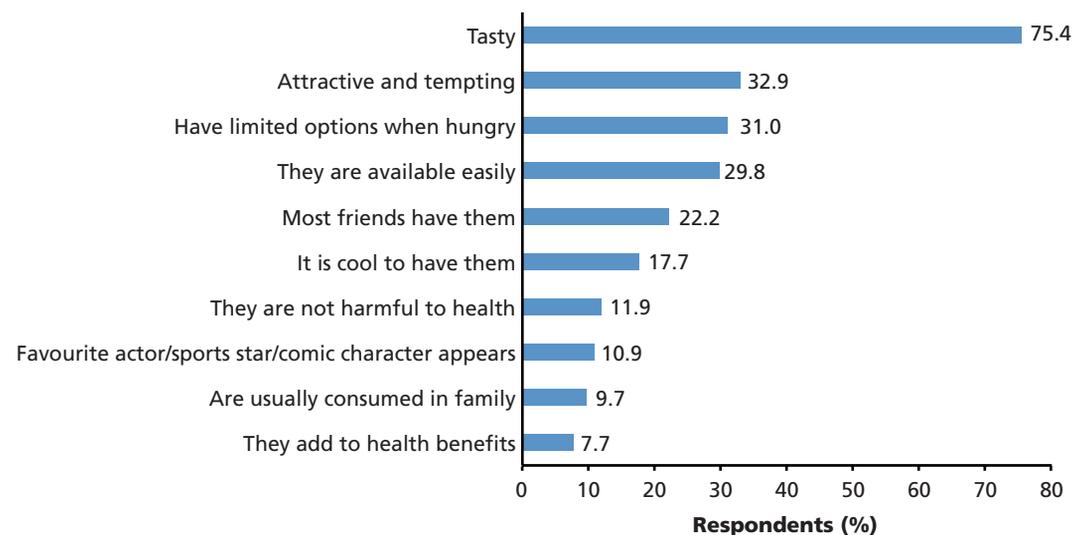
8. Factors influencing consumption of packaged food

In today's world, especially in urban areas, food choices are plenty. Packaged food was found to be very popular among children and it is crucial to determine what factors influence consumption of packaged food.

8.1 TASTE, ATTRACTIVENESS AND EASY AVAILABILITY ARE THE TOP REASONS FOR CONSUMPTION OF PACKAGED FOOD

- In the survey, children were asked why they consumed packaged food. The results show that key factors were taste, attractiveness and lack of healthy options (see *Graph 23: Reasons for consumption of packaged food*).
- Peer pressure also appeared to be an important reason for consumption of packaged food among children.

Graph 23: Reasons for consumption of packaged food



8.2 EXPOSURE TO TELEVISION AND INTERNET CONNECTED WITH FREQUENT INTAKE OF PACKAGED AND FAST FOOD

- The survey shows that among the children who spend more than two hours per day watching television or browsing the internet for recreation, a very high percentage (72.8) consumed packaged food or beverages or fast food at an average of at least once a day (see *Table 6: Screen time and consumption of packaged food or beverages or fast food*).
- Among the children who spent two or less hours in front of screens, only about 44 per cent consumed packaged food or beverages or fast food at an average of at least once a day.

Table 6: Screen time and consumption of packaged food or beverages or fast food

Total screen time (per day)	Packaged food and beverages and fast food at least once a day (% of respondents)
> 2 hours	72.8
<= 2 hours	43.9

8.3 PERCEPTION THAT PACKAGED FOOD IS HEALTHY OR NOT UNHEALTHY ALSO PLAYS AN IMPORTANT ROLE

Apart from making packaged food appear attractive and tempting, advertisements, by making health claims, often create a misleading perception among both children and adults that packaged food is healthy or not harmful to health as, for example, the claims of Maggi Atta Noodles and Maggi Oats Noodles of ‘Health bhi’ and ‘Health ko mazedar banane ka ek aur tarika’.

- The results of the survey show that among children who had screen time of over two hours per day, a higher percentage believed that packaged food is healthy or not unhealthy (see *Table 7: Screen time and perception of packaged food*).

Table 7: Screen time and perception of packaged food

Total screen time (per day)	Percentage of respondents who feel that packaged food is not harmful to health	Percentage of respondents who feel that packaged food ads to health benefits
> 2 hours	16.9	10.7
<= 2 hours	9.6	6.7

Examples of claims made in India which would not be allowed in other countries

Kellogg’s Special K claims to be 98 per cent fat free. In the EU, no food is allowed to make a claim of being ‘X per cent fat free’

Bournvita Lil Champs’s claim that it ‘Contains DHA known for brain development’ falls under the category of unacceptable health claims in Canada

Health claims of dietary fibre and cardiovascular disease are not authorized in the US. In India such claims are often made.

Key takeaways

- High screen time is connected with frequent consumption of packaged food, beverages and fast food.
- High screen time is also connected with a perception that packaged food has health benefits and is not harmful to health.
- Key reasons selected by children for consuming packaged food revolve around the perception of packaged food being tasty, attractive and easily available.

9. CSE recommendations

Several policy gaps could be linked to influencing dietary habits of children in India. FSSAI is yet to enforce its guidelines to make available wholesome and nutritious food in and near schools. As compared to some international best practices, Indian laws on marketing of food items and misleading claims are quite weak and there is no restriction on broadcast timings of food advertisement targeted at children.

To curb the burden of childhood obesity and diet-related NCDs among children, India must limit the exposure of children to HFSS packaged food and ensure that they consume a balanced diet. Against this background, CSE recommends the following policy and legal steps:

FSSAI must strictly regulate availability of packaged HFSS food in and near schools

- FSSAI must prohibit the availability and promotion of packaged HFSS food in and near schools. As directed by the Delhi High Court, it must enforce the guidelines to ensure the availability of wholesome and nutritious food in and near schools. Apart from restricting the availability of most common HFSS foods in and near schools, these guidelines also recommend developing a school canteen policy to provide wholesome food and regulate promotion of HFSS food to school children.
- As recommended in the guidelines, the school canteen policy should be formulated based on the concept of colour coding according to which food items are divided into three categories: green, yellow and red (see *Table 8: Concept of colour coding of foods*), with the green category comprising 80 per cent of the available options and the yellow category comprising 20 per cent of the available options.

Table 8: Concept of colour coding of foods

Green	Always on the menu	Vegetables and legumes, fruits, grain (cereal) foods; mostly wholegrain and/or high in fibre, lean meat, egg, fish etc.
Yellow	Select carefully; approach should be towards greening, small portion size and reduced frequency	Baked vegetable-based snacks, ice creams, milk-based ices and dairy desserts etc.
Red	Not on the menu; banned from schools as these foods are high in fat, salt and sugar	Energy drinks, carbonated and other sweetened beverages, fried packaged foods, chocolates, potato fries

- The guidelines also mention about providing guidance to school managements on non-standardized deep fried food items such as samosa, chana bhatura etc.

Marketing of HFSS packaged food targeted at children must be strictly regulated to limit exposure and influence.

- FSSAI along with the Ministry of Information and Broadcasting must develop a framework for broadcasting regulations for HFSS food. This should include restricting food advertisements during sports, cartoon and other programmes/channels viewed mostly by children. This should also check for design of advertisement and presence of children and adolescents as their presence should be prohibited.
- There should be no advertisements allowed for categories, such as soft drinks (non-dairy, non-fruit-based SSBs), on the lines of tobacco-based products.
- Celebrities such as personalities from entertainment, film, TV, media and sports should not be allowed to endorse packaged foods.
- There should be no advertising of HFSS packaged food in places where children aggregate, such as stadiums, theatres and schools. Municipal corporations and other civic bodies should be involved in implementing this.
- Advertising of HFSS foods in social media and other new age media platforms needs to be regulated.
- There should be enforceable guidelines to restrict disguised promotion of HFSS foods in schools and mass media and companies selling such products. Such initiatives (e.g. Support My School Campaign) should not be viewed as an activity under corporate social responsibility. Besides food companies, both schools and mass media should be directed accordingly.
- Advertisements of HFSS food should be approved prior to screening. They should be based on approved and unapproved claims finalized by the FSSAI. There should be stringent legal and financial penalties for misleading claims (labelled and/or advertised). The liability should be aligned with the scale of damage.

Laws related to food labelling and claims must be strengthened with reference to nutrition fact labelling, front-of-pack labelling and health and nutrition claims.

Labelling declarations may not impact young children directly but they definitely have an impact on the decision making of parents, teachers and older children.

- The current nutrition labelling or nutrition facts labelling needs to strengthen. It should include:
 - Mandatory labelling of salt/sodium and added sugar.
 - Nutrient declaration per serve should be made mandatory. It should no longer be optional. Accordingly, serving size, number of servings in a pack must be mentioned wherever applicable.
 - Serving size must be standardized for food categories to help per serve information disclosure.
 - Per serve nutrient information should be mentioned along with percentage contribution to the daily value or RDA. The reference value used for calculating percentage should also be mentioned.
- An easy-to-understand front-of-pack labelling system should be developed. It could be based on a colour-coded format and should include energy, salt, sugar and fat and percentage contribution to daily value or RDA.
- Only authorized health claims should be allowed. A procedure to approve health claims should be developed. A well-defined criterion for requirement and evaluation of scientific substantiation of claims needs to be worked upon.

A well-structured curriculum on balanced diet, healthy food and unhealthy food should be introduced in schools. Public communication programmes regarding the same should be disseminated through mass media.

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Annexure

ANNEXURE I — ‘KNOW YOUR DIET’ SCHOOL CHILDREN SURVEY QUESTIONNAIRE

Q1. Usually, what do you eat in a day? (Options: Yes, No)

- (i) Breakfast
- (ii) Midmorning snack (b/w breakfast and lunch)
- (iii) Lunch
- (iv) Evening snack
- (v) Dinner
- (vi) Bedtime snack

Q 2(a) How many days in a week do you eat foods like? (Options: 0 to 7)

- (i) Cereals and millets—roti, rice, porridge, thepla, jowar, bajra etc.
- (ii) Fruits—raw fruits, not juiced
- (iii) Vegetables—sabzi, raw salad etc.
- (iv) Milk or milk-based—paneer, curd, buttermilk, lassi etc. (not ghee, butter)

Q2(b) How many days in a month do you eat foods like? (Options: 0 to 30)

If required, recall number of days you eat in a week or fifteen days to calculate per month.

- (v) Pulses—dal, chickpea, black gram etc.
- (vi) Egg
- (vii) Meat and fish

Q2(c) On days when you eat, how many times do you generally eat foods like? (Options: 1 to 10)

For cereals and millets, do not include packaged snacks such as chips, biscuits etc.

- (i), (ii), (iii), (iv), (v), (vi), (vii)

Q 3(a) How many days in a month do you generally drink beverages like? (Options: 0 to 30)

If required, recall number of days you drink in a week or fifteen days to calculate per month. Answer for months when you are likely to drink more, such as cold beverages during summer and hot beverages during winter

- (i) Carbonated soft drinks—Pepsi, Thumps Up, Coca Cola, Limca, Fanta etc.
- (ii) Packaged fruit juices or fruit-based drinks—Tropicana, Real, Maaza, Slice etc.
- (iii) Packaged milk-based sweet drinks—Lassi, flavoured milk etc.
- (iv) Fresh sweet fruit, vegetable or milk based preparations—Fruit or vegetable juice, lassi, shakes, fresh lime etc.
- (v) Concentrate based sweet drinks—Squash, sherbet, ice tea etc.
- (vi) Tea/coffee with sugar

Q 3(b) Do you drink following beverages more than once in a day? (Options: ‘Yes, on most days’ / ‘Yes, some days’ / ‘Rarely or never’)

- (i) Carbonated soft drinks—Pepsi, Thumps Up, Coca Cola, Limca, Fanta etc.
- (ii) Packaged fruit juices or fruit-based drinks—Tropicana, Real, Maaza, Slice etc.
- (iii) Packaged milk-based sweet drinks—Lassi, flavoured milk etc.

Q 3(c) Do you drink or buy following beverages at your school or its near-by areas? (Options: Yes, No)

- (i), (ii), (iii), (iv), (v)

Q 4. If you drink milk, how often you drink it with foods like? (Options: ‘Almost always’ / ‘Sometimes’ / ‘Rarely or never’ / ‘I do not drink milk’)

- (i) Breakfast cereals —Corn/chocolate/strawberry flakes etc.
- (ii) Milk food drinks —Horlicks, Bournvita, Boost, Complan etc.

Q 5(a) How many days in a month do you generally eat packaged foods like? (Options: 0 to 30)

If required, recall number of days you eat in a week or fifteen days to calculate per month.

- (i) Chips, puff snack – Lays, Uncle Chips, Kurkure, Mad Angles etc.
- (ii) Biscuits or cookies
- (iii) Chocolate
- (iv) Candy/toffee, jelly, lollipop etc.
- (v) Ice cream
- (vi) Instant noodles, such as Maggi, Top Ramen, Wai Wai

Q 5(b) Do you eat following packaged foods more than once in a day? (Options: ‘Yes, on most days’ / ‘Yes, some days’ / ‘Rarely or never’)

- (i), (iii), (v), (vi)

Q 5(c) Do you eat or buy following packaged foods at your school or its near-by areas? (Options: Yes, No)

- (i), (ii), (iii), (iv), (v), (vi)

Q 6(a) How many days in a month do you eat? (Options: 0 to 30)

If required, recall number of days you eat in a week or fifteen days to calculate per month.

- (i) Fries, burgers, pizzas, wraps etc. from fast food outlets such as Pizza Hut, Domino’s, McDonald’s, KFC etc.
- (ii) Street food like chaat, pakora, samosa, momos, kachori, pav bhaji, chole bhature etc.
- (iii) Cake, pastry or Indian sweets like rasagulla, halwa, jalebi etc.

Q 6(b) Do you eat or buy foods at your school or its near-by areas? (Options: Yes, No)

- (i), (ii), (iii)

Q7. What is true for your food intake during school hours? (Options: ‘Yes, almost always’ / ‘Yes, sometimes’ / ‘Rarely or never’)

- (i) You carry lunch/a meal from home
- (ii) You carry packaged food items from home
- (iii) You buy food items from school canteen/cafeteria
- (iv) Your school provides food—lunch/midday meal

Q 8. If you eat packaged foods like chips, chocolate, soft drinks, juice, biscuit and/or fast foods such as burger, pizza etc., why do you do so?

Choose multiple options, if required

- (i) They are tasty
- (ii) They are available easily
- (iii) They are attractive and tempting
- (iv) It is cool to have them
- (v) Most of your friends have them
- (vi) Your favourite actor/sports star/comic character appears in the advertisement

- (vii) You feel they add to health benefits
- (viii) You feel they are not harmful to health
- (ix) Are usually consumed in your family
- (x) You have limited options when hungry
- (xi) You don't eat packaged food at all
- (xii) None of the above

Q 9. How much time you generally spend in front of a screen in a day?

- a. Watching television
- b. Browsing internet for recreation, playing games on computer, tabs, smart phones etc.

Options:

- (i) Less than 30 minutes
- (ii) 30 minutes to 1 hour
- (iii) 1.1–2 hours
- (iv) 2.1–3 hours
- (v) 3.1–4 hours
- (vi) Over 4 hours

Q 10. Your physical activity level in a day can be described as:

- Sedentary—Mostly sitting, barely any exercise
- Moderate—Brisk walking, dancing, light weight training, yogasanas etc. for about 60 minutes
- Vigorous —Running/jogging, cycling swimming, aerobics, weight lifting, sports

Q 11. How much water do you drink in a day?

1 standard glass = 250 ml

- (i) 4 or less glasses
- (ii) 5–7 glasses
- (iii) 8–10 glasses
- (iv) 11 or more glasses

Q 12. How often do you eat one or more of papad, pickles and chutneys?

- (i) Almost daily, at least once
- (ii) Almost daily, more than once
- (iii) 2–4 times in a week
- (iv) 2–4 times in a month
- (v) Never /rarely

ANNEXURE II: LIST OF DISTRICTS

S. no.	State/Union Territory	Districts
1	Andhra Pradesh	Nellore , Prakasam, Visakhapatnam
2	Arunachal Pradesh	West Kameng, Tirap
3	Assam	Kamrup
4	Bihar	Gaya, Muzaffarpur, Patna, Rohtas, Samastipur
5	Chandigarh	Chandigarh
6	Chhattisgarh	Bilaspur, Korba, Raipur
7	NCT of Delhi	All districts
8	Gujarat	Ahmedabad, Amreli, Sabarkantha, Tapi, Vadodara
9	Haryana	Ambala, Faridabad, Fatehabad, Gurgaon, Hisar, Jhajjar, Yamunanagar
10	Himachal Pradesh	Kangra, Mandi, Shimla, Una
11	Jammu & Kashmir	Jammu
12	Jharkhand	East Singhbhum
13	Karnataka	Bangalore, Bellary, Dharwad, Koppal
14	Kerala	Ernakulam, Kottayam, Kozhikode, Palakkad, Thiruvananthapuram
15	Madhya Pradesh	Bhopal, Chhatarpur, Dewas, Dhar, Gwalior, Indore, Jabalpur, Satna, Ujjain
16	Maharashtra	Chandrapur, Mumbai, Nashik, Pune, Raigad, Thane, Yavatmal
17	Odisha	Bhubaneshwar, Dhenkanal, Kandhamal, Nayagarh
18	Punjab	Amritsar, Faridkot, Ferozepur, Gurdaspur, Hoshiarpur, Jalandhar, Kapurthala, Ludhiana, Moga, Mohali, Pathankot, Rupnagar, Sangrur, Shaheed Bhagat Singh Nagar
19	Rajasthan	Ajmer, Baran, Bharatpur, Bhilwara, Jaipur, Jhunjhunu, Kota, Pali, Sri Ganganagar
20	Sikkim	East Sikkim, South Sikkim, West Sikkim
21	Tamil Nadu	Chennai, Coimbatore, Kancheepuram, Madurai, Thanjavur, The Nilgiris, Vellore
22	Telangana	Hyderabad, Medchal, Ranga Reddy
23	Tripura	West Tripura
24	Uttar Pradesh	Aligarh, Ballia, Farrukhabad, Gautam Budh Nagar, Ghaziabad, Gorakhpur, Jhansi, Kanpur, Lucknow, Saharanpur
25	Uttarakhand	Dehradun, Haridwar, Pauri Garhwal

ANNEXURE III: STANDARD DEVIATION IN NUMBER OF DAYS OF CONSUMPTION OF VARIOUS FOOD ITEMS

Food item	Standard deviation (no. of days of consumption)
Cereals and millets	9.1
Fruits	9.4
Vegetables	9
Milk and milk products	9.8
Carbonated beverages	5.1
Packaged juice-based beverage	5.7
Packaged milk-based sweet beverages	7.4
Fresh sweet beverages	8.8
Concentrate based beverages	5.9
Chips	7
Biscuits and cookies	8.8
Chocolates	7.7
Candies	7.5
Ice creams	6
Instant noodles	6
Fast food	4.7
Street food	5.1
Sweets (cakes, mithai etc.)	5.3

Note: The number of days of consumption of cereals, fruits, vegetables, milk and milk products were asked for a week, while the number of days of consumption of the rest of the items was asked for a month. Before calculating standard deviation, the former category was converted from 'per week' to 'per month'.

A commonly held view is that excess consumption of food high in fat, salt or sugar (HFSS)—with both fresh preparations and packaged foods grouped together—is responsible for obesity and non-communicable diseases.

But there is a difference between them both with respect to the high levels of fat, sugar or salt—which can be controlled in fresh preparations—as well as low levels of micro-nutrients and dietary fibre, and presence of chemical additives in packaged HFSS food.

Packaged food items such as chips, instant noodles, soft drinks and chocolates are also ultra-processed, aggressively marketed, cheaper and more easily available than fresh-food options and therefore need more regulatory attention.



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