

Importance of Sweetness in Indian Diet and Vehicle for Satisfying Sweet Taste: Sugar

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The importance of sweet taste and diet

Different sources of sugar and added sugar in Indian diet

Sugar consumption

How does sugar intake in India compare with WHO recommendations

Dietary guidelines for Indians for sugar intake



The importance of sweet taste and diet

- Sweetness is one of the five “**basic tastes**” detected by sensory receptors in the oral cavity
- Liking for sweetness is **innate** and influenced by cultural and personal preferences
- Sweetness increases the **palatability** of numerous foods and beverages, and stimulates intake
- All humans express the same response to **sweetness** immediately after birth
- With the acquisition of various food likes as the child grows, the liking for sweetness changes
- In adolescents, the preferred intensity of sweetness is lower than in younger children, and it is lower in adults than in adolescents.
- An appetite for sweetness is present in most adults, although large individual differences exist in both the preferred level of sweetness in familiar products and in the range of foods and drinks that are consumed sweet.

Two main features determining acceptance of a food by a young child are familiarity and sweetness

Sources of sugar in the Indian diet

- Sugar, was invented in India. There is reference to sugarcane cultivation and preparation of sugar in the Atharva Veda
- The word sugar is a derivative of “sarkara”, meaning gravel in Sanskrit
- Sugar became known to the world when the army of Alexander the Great came to India in 327 BC. They were surprised to see another alternative to honey to sweeten food, and described it as a “reed that gives honey without bees”
- Traditionally, any joyous occasion, religious festival, social gathering in India is celebrated with intake of sweets. It is considered mandatory to offer sweets to the gods on every religious occasion
- While sugar is of considerable cultural relevance in India, nutritionally it provides only “empty” calories (1 g of sugar gives 4 kcal)

Sources of sugar in the Indian diet

- **Sugar, honey, brown sugar, jaggery, khandsari**
- **Traditional sweets**
- **Bakery and confectionary – cakes, biscuits, chocolates, candies**
- **Processed foods – breakfast cereals, salad dressings, spreads and sauces, aerated beverages**
- **Hidden sugar - high fructose corn syrup, cane sugar, glucose, lactose, maltose, dextrose, malt syrup, molasses, agave nectar, maple syrup**



Read food labels carefully to spot hidden sugars

Agave nectar Agave syrup Barley malt **Beet sugar** **Brown rice syrup**
Brown sugar Buttered syrup Cane sugar Cane juice Cane juice crystals
Carob syrup Confectioner's sugar Corn syrup **High fructose corn syrup**
Corn sugar Corn sweetener Corn syrup solids Crystallized fructose
Date sugar **Dextran** Dextrose Diatase Diastatic malt Evaporated cane juice

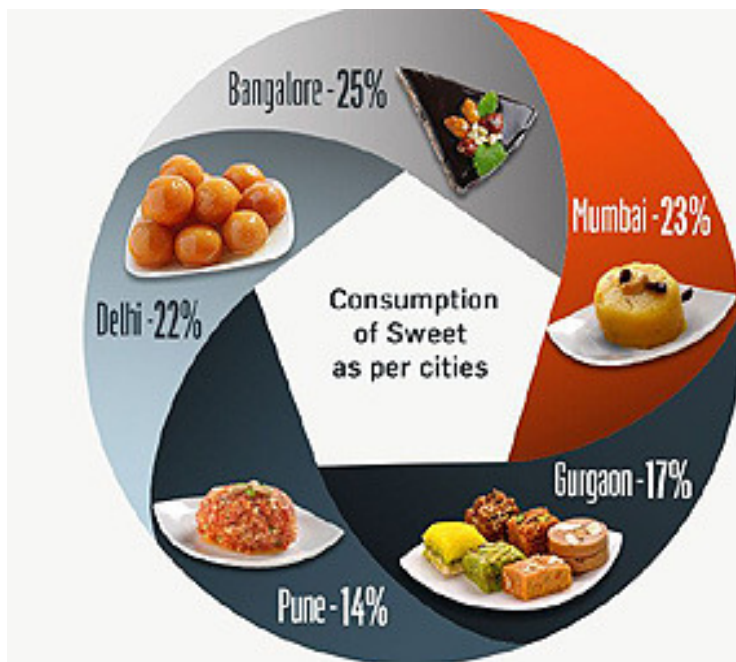
WHERE'S ALL THAT SUGAR HIDING?

Fructose Fruit juice Fruit juice concentrate Glucose Glucose solids
Golden sugar Golden syrup **Grape sugar** Grape juice concentrate Honey
Invert sugar **Lactose** Malt Maltodextrin Maltose **Maple syrup** Molasses
Raw sugar Refiner's syrup Sorghum syrup Sucanat Sucrose **Sugar**
Turbinado sugar Yellow sugar

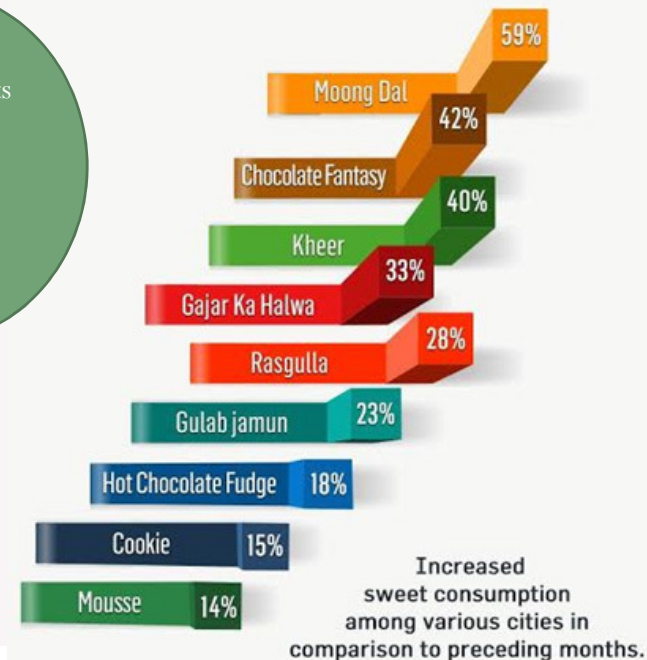
Trends in Sweets Consumption

Foodpanda.in, the online food ordering platform, conducted a survey across India to comprehend sweets consumption trends during the festive season (October)

The survey was made on the basis of two verticals i.e. Traditional Sweet Consumption and Overall Sweet Consumption



Traditional Indian sweets market estimated at Rs.49,000 crore (\$8 billion)



- ✓ Overall sweet consumption is the highest in Bengaluru, followed by Mumbai, Delhi and Gurgaon, with a distinct preference for western sweets such as chocolate mousse, chocolate fantasy cake etc
- ✓ Gurgaon ranks first on traditional sweets, followed by Delhi, Pune and Bengaluru.
- ✓ A 20 % spurt is observed in people indulging in sweet delicacies pan India during the festive season, as compared to preceding months

Sugar Consumption in India

- The per capita consumption of sugar in India is 20.2 kg. It is lower than the global average of 24.8 kg, but consumption of sugar in India is growing more rapidly than the global average
- In the last 50 years, sugar consumption in India has risen from 5% of the global production to 13%. India has become the world's biggest sugar consumer today, consuming one-third more sugar than the entire E.U. and 60% more than China!

India and China are the largest consumers of sugar and are growing above the world average in terms of consumption.

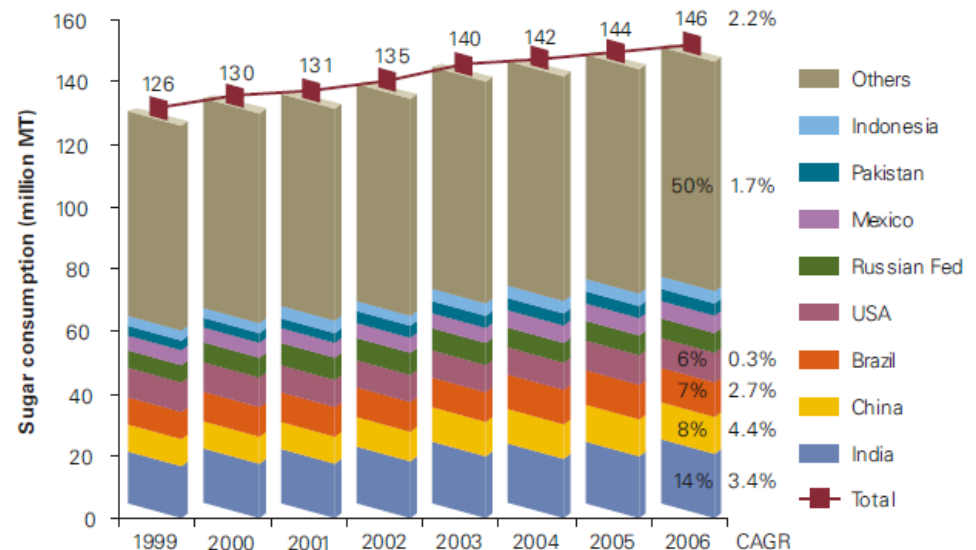


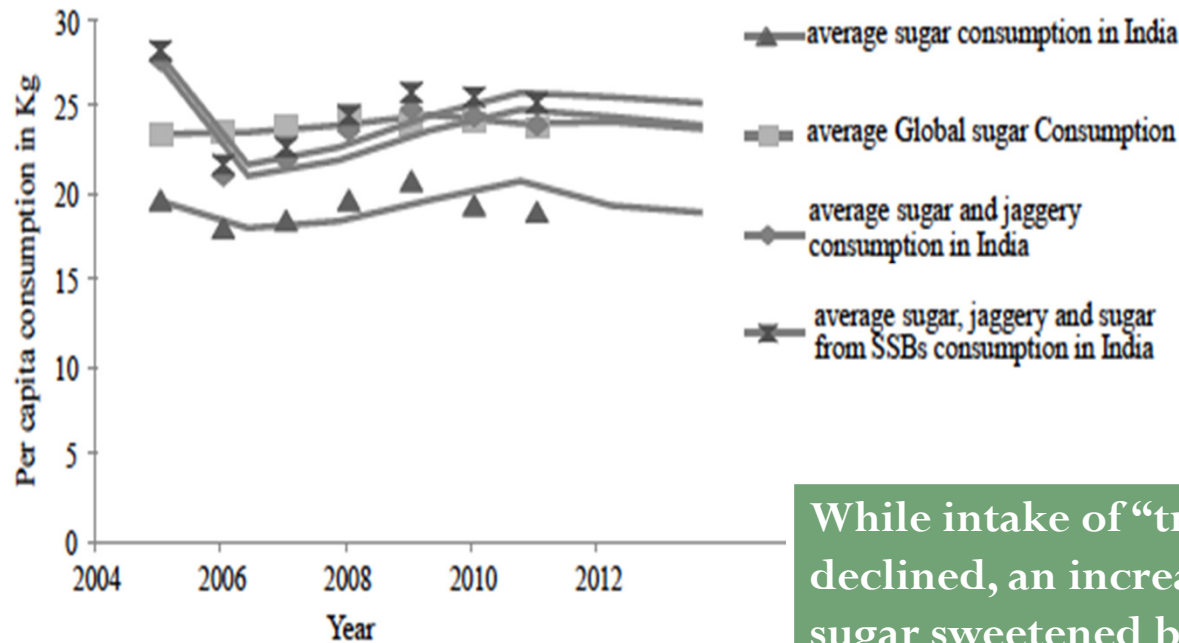
Figure 40: World sugar consumption (1999-2006)

Source: FO. Lichts World Sugar Yearbook 2007, KPMG analysis

Sugar intake in adults is 7-8% of total energy intake in countries like Hungary and Norway, 16-17% in countries like Spain and the UK. Intake is much higher among children, ranging from about 12% in countries like Denmark, Slovenia and Sweden, to nearly 25% in Portugal

In India, the increase in sugar consumption has been at the cost of gur and khandsari

Figure 3. Trend line showing average intake of sugar globally and total sugar intake from various sources (“traditional sugars”: jaggery and *khandsari*; sugar and sugar from sugar-sweetened beverages) compiled for India.



Source: [24–26].

Gulati and Misra, 2014

While intake of “traditional sugars” has declined, an increase in the intake of sugar from sugar sweetened beverages has been recorded. There is increasing concern that intake of free sugars – particularly in the form of sugar-sweetened beverages – increases overall energy intake and may reduce the intake of foods containing more nutritionally adequate calories, leading to an unhealthy diet, weight gain and increased risk of NCDs

Sugar Consumption in India

- Indian sugar consumption is majorly dominated by the **industrial sector** (61%) followed by the **household** (39%) or the consumer sector
- The industrial sector includes companies that produce products which require sugar e.g. confectionary, carbonated beverages, dairy processing, bakery and others
- The household sector has been subdivided into lower and higher income group
- The **lower income group** consumed the maximum sugar with 3.0 million tons which is followed by the **higher income group** which consumed around 1.4 million tons of sugar in FY'2015

Per capita consumption of low income segments is nearly half that of high income segments

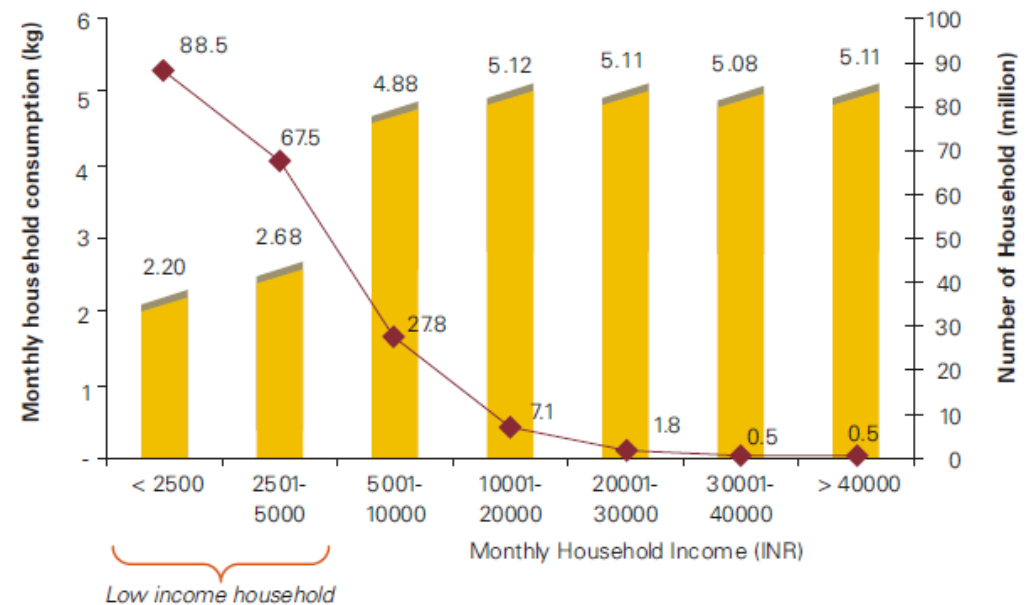


Figure 20: All India non-levy household monthly sugar consumption by income levels (2006-07)²⁷

Source: AC Nielsen survey conducted in March 2007, KPMG analysis

Sugar Consumption in India

Dairy, confectionary, bakery and beverages account for 75 percent of industrial consumption

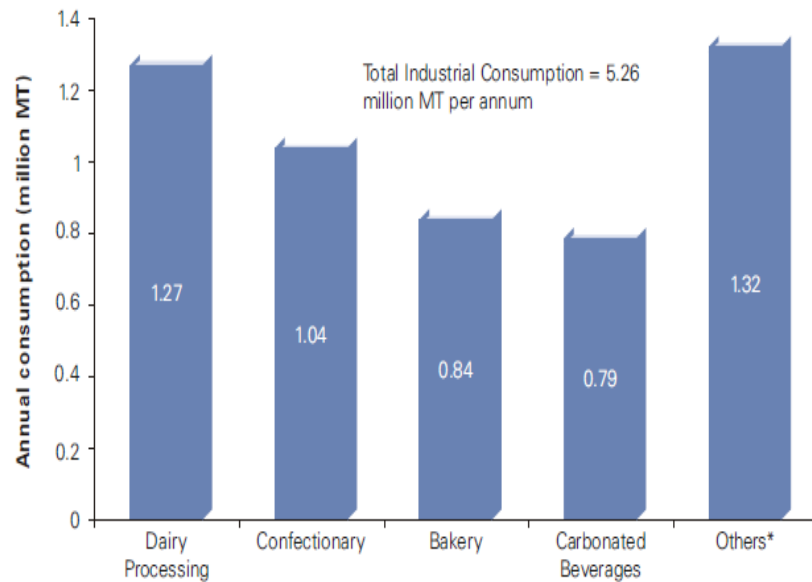


Figure 22: Industrial consumption by segments (2006-07)²⁹

Source: AC Nielsen survey conducted in March 2007, KPMG analysis

Sweet meat vendors are the largest consumers of sugar amongst small businesses

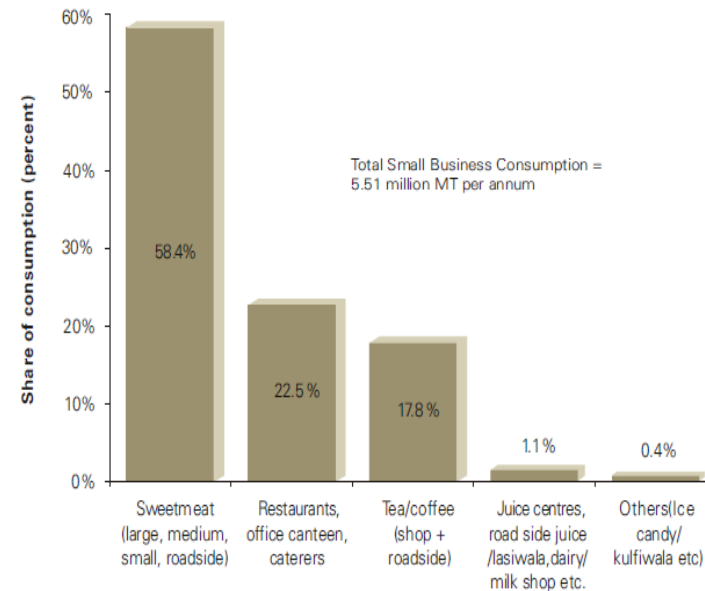
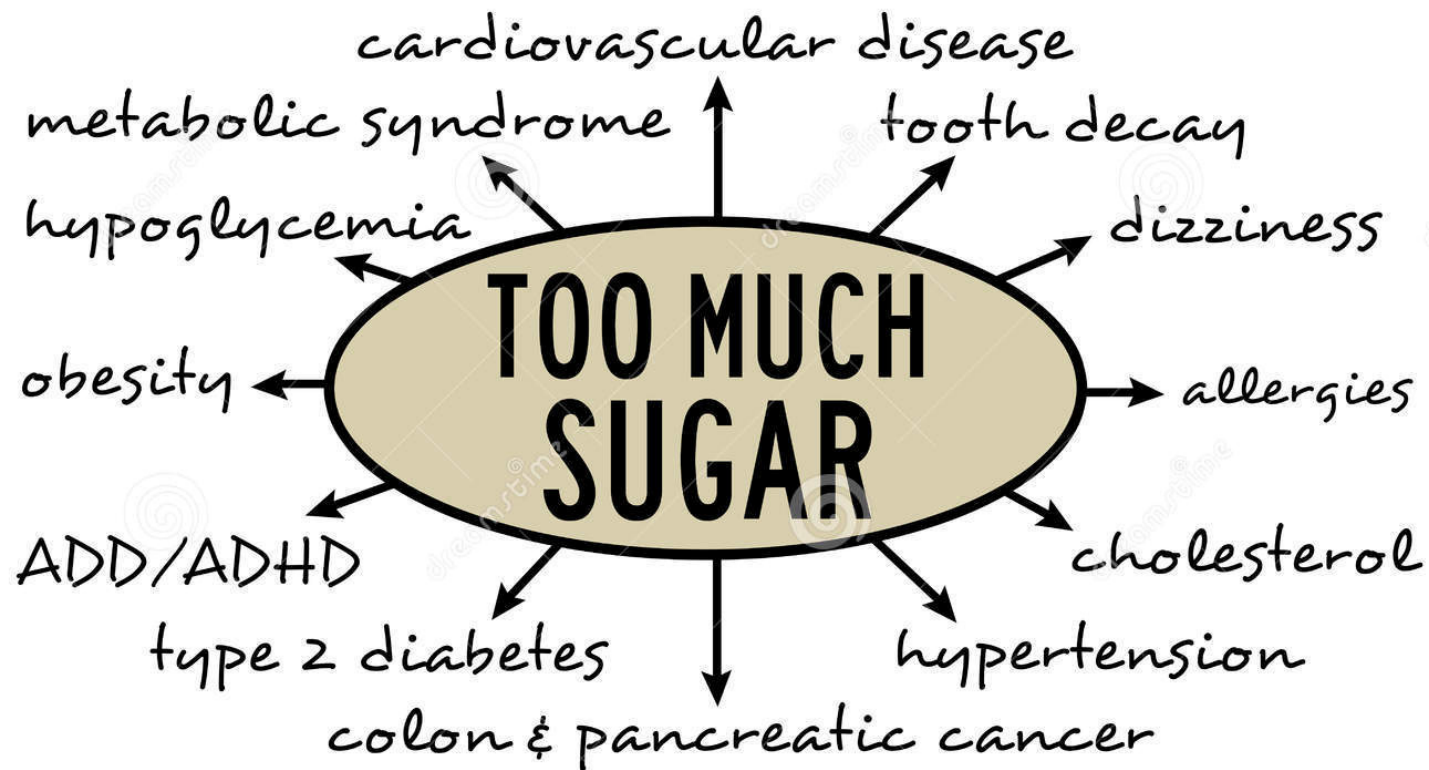


Figure 23: Small business consumption by segments (2006-07)

Source: AC Nielsen survey conducted in March 2007, KPMG analysis

²⁹ Others include ice cream, fruit juices, fruit drinks, fruit nectars, squashes, health drinks, beer, wine, pharmaceuticals, chyawanprash, ketchup/sauces, jams and star hotels



Sugar is the “new tobacco” as it is highly addictive

Sugar is the “new cholesterol” because it gets converted into stored fat and increases risk of NCDs

International Guidelines for Sugar

- Various government and health authorities have suggested new sugar recommendations and guidelines as low as 5% of total calories from free sugars
- Definitions for total sugars, free sugars, and added sugars are not standardized, nor are there accepted nutrient databases for this information
- Without an accepted definition and equation for calculating added sugar, added sugar recommendations are arbitrary and may reduce intakes of nutrient-rich, recommended foods, such as yogurt, whole grains, and tart fruits including cranberries, cherries, and grapefruit.

US Recommendations

- **The Institute of Medicine** has not issued an RDA for sugar as it is not a nutrient
- It suggests that no more than 25% calories come from added sugars – or 38-55% of all calories from carbohydrates
- In the Dietary Guidelines for Americans 2010, the **USDA**'s recommendation is more vague, advising that combined calories from saturated or trans – fats and added sugar be limited to 5 to 15 % of total calories. On a 2,000-calorie diet, this would mean limiting yourself to between 100 and 300 calories from these two types of ingredients, but the USDA offers no separate recommendation for sugar
- Compliance with proposed added sugar recommendations would require strict dietary compliance and may not be sustainable for many Americans.
- According to the **American Heart Association (AHA)**, the maximum amount of added sugars you should eat in a day are: Men: 150 calories per day (37.5 grams or 9 tsps). Women: 100 calories per day (25 grams or 6 tsps)

WHO Recommendations for Sugar

- Free sugars refer to monosaccharides (glucose, fructose) and disaccharides (sucrose or table sugar) added to foods and drinks and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates
- WHO strongly recommends a reduced intake of free sugars throughout the life course
- In both adults and children, WHO recommends reducing the intake of free sugars to less than 10% of total energy intake. Evidence that this level reduces the risk of overweight, obesity and tooth decay
- WHO suggests a further reduction of the intake of free sugars to below 5% of total energy intake as a “conditional” recommendation
- The WHO guideline does not refer to the sugars in fresh fruits and vegetables, and sugars naturally present in milk, because there is no reported evidence of adverse effects of consuming these sugars
- These sugars guidelines should be used in conjunction with other nutrient guidelines and dietary goals, in particular those related to fats and fatty acids, including saturated fat and trans-fat

Indian Recommendations for sugar

- The National Institute of Nutrition recommends an added sugar intake of not more than 20 to 25g a day for normal adults
- To achieve this, one needs to avoid processed foods rich in sugar like soft drinks, sugary beverages like coffee and excessive over-the-table use of sugar.
- Just one can of soft drink may contain eight teaspoons of sugar, one tablespoon of ketchup may contain one teaspoon of sugar
- The Consensus Dietary Guidelines for Indians recommend less than 10% of total calories from free sugars per day.

Public health interventions to reduce free sugar intakes

- Translate recommendations into food-based dietary guidelines that consider locally available food and customs
- Nutrition labeling of food products
- Restricting marketing to children of food and non-alcoholic drinks that are high in free sugars
- Fiscal policies targeting foods and beverages high in free sugars
- Dialogue with food manufacturers to reduce free sugars in processed foods
- Some international scientists are now demanding that sugar be regulated in the same way as tobacco and alcohol

Sufficient evidence exists for public health strategies to discourage consumption of such foods as a part of healthy lifestyle

Translate recommendations into food-based dietary guidelines that consider locally available food and customs

- Dietary guidelines should clearly translate the recommendations of sugar into daily consumable portions of foods
- While promoting locally available and seasonal foods, guidelines should also give details of processed foods and the contents of sugar, salt and fat in these foods
- Dissemination of dietary guidelines among the community is very imperative

United States of America

Los Angeles County's "Sugar Pack" campaign (2011-2012)

- This campaign aimed to increase awareness of the number of "sugar packs" (a packet containing 3g sugar,) in sugary drinks, as well as the adverse health effects of obesity.
- Used paid media messages placed on billboards, buses, and railways, a short video on transit TV, a website that included a sugar calculator, and social media.
- Results from an evaluation demonstrated that the campaign increased the public's knowledge of the number of sugar packs in drinks and the health effects of obesity.
- The campaign also resulted in favourable recognition of health messages, and over 60% of respondents reported they were likely to reduce their daily intake of sugary drinks.

Sugar in a soda presented as sugar packets rather than other measures such as grams resonated with the public. Consumers were provided with a measure that was clear, striking, and very familiar to them – really driving the point home.

Hungary

Increasing the acceptability of water relative to sugary drinks

Hungarian Aqua Promoting Programme in the Young (HAPPY)

- Implemented in 2007, HAPPY aimed to increase the popularity of drinking water among primary school students.
- The programme promoted **water consumption** by educating students about adequate fluid consumption and making free water available (in water coolers) on school premises.
- At the end of the intervention, there was a significant increase in the children's knowledge about fluid intake, a significant decrease in sugary drinks consumption, and an increase in water consumption. Fewer students brought sugary drinks to school.
- The programme HAPPY was extended nationwide for voluntary adoption by schools

Nutrition labeling of food products

- Currently, U.S. food labels contain information on total sugars per serving, but do not distinguish between sugars naturally present in foods and added sugars
- The FDA proposed the addition of the category of “Added Sugars” listed beneath “Sugars” or “Total Sugars”. Added sugars are sugars and syrups added during the food manufacturing process. Fruit juice concentrates are considered added sugars, while fruit juice is not considered to be added sugar
- The addition of an “added sugars” category on the food label would provide a tool for consumers to assess compliance with added sugar recommendations and compare food products
- This addition will help consumers in making healthier choices and will cause food manufacturers to alter product formulations to decrease the amount of added sugars

India: Mandatory nutrition labeling for calories, CHO, sugars, fat, protein, sodium, and fiber, and trans fat

Restricting marketing to children of food and non-alcoholic drinks that are high in free sugars

Promotion of soft drinks/ snacks

- In-school marketing – canteens, free samples
- Sales promotions – free offers, subsidized rates
- Celebrity endorsements
- Sponsorships - student events, infrastructure
- Product Placement
- “School Health Initiatives”

There has been little to no government regulation of these practices until recently. Currently, voluntary guidelines are in place by at least two different bodies

May 2017: Maharashtra banned sales of junk food in public schools. “Junk food” includes potato chips, noodles, carbonated soft drinks, pizzas, burgers, cakes, biscuits, buns, pastries, among other foods.



Australia

Queensland's "Smart Choices – Healthy Food and Drink Supply Strategy"

Reducing the availability of sugary products in schools

- Smart Choices are school nutrition standards that separate foods and drinks into three categories 'green, amber and red,' based on their energy, saturated fat, sugar, sodium and fibre content.
- Smart Choices ensures that 'red' foods and drinks (those high in saturated fat, added sugar or salt) are eliminated across the entire school environment (e.g. tuck shops, vending machines, school events, sponsorship and advertising).
- The availability of 'green' foods was increased.
- Smart Choices therefore effectively reduced the availability of 'unhealthy foods' on school premises, especially sugary drinks and confectionery. Targeting drink vending machines was particularly effective in reducing the supply of sugary drinks.

France

Vending machine ban

- France's 2004 Public Health Law includes a vending machine ban in schools, which has been enforced since September 2005
- Before the ban, vending machines were present on the school premises of 89.4% of public *lycées* (students aged 14-17) and 39.3% of public *collèges* (students aged 11-13)
- Comparing data from 1998 and 2006 (before and after the ban was implemented), a significant reduction in calories (between 90-115 calories), fat, sodium and, especially, free sugar intakes (10-12 grams) was observed during morning break after the ban came into force

Norway

School fruit programme

- In 2007, a free school fruit programme was implemented nationwide in all secondary and elementary schools
- A piece of fruit or vegetable was provided every school day to students
- Research shows that the students increased their overall fruit and vegetable intake and reduced the frequency of their unhealthy snack consumption (sugary drinks, candy and potato chips)
- The reduced frequency in consumption of unhealthy snacks was especially evident among students with parents with lower educational attainment
- Norway's Free School Fruit Programme was replaced with a subscription programme in 2014.

The National Education Act was revised in 2008 and made it clear that the municipalities (as school owner) were responsible for providing free fruit and vegetables every school day to all students attending the included schools.

Dialogue with food manufacturers to reduce free sugars in processed foods

- Evidence shows that reformulation to reduce the amount of sugars added to processed foods is possible
- A lot of the global sugar supply is sold to food manufacturers for use in processed foods, rather than to households for use in the home
- Yet, actions to reformulate products around the world still focus on salt and trans fats.
- What are the challenges faced by food manufacturers to reduce added sugars in their products?
- Can government policies and investments help address some of these challenges and motivate change?

United States

Shop healthy New York city

- An initiative to increase access to healthy food and engage food retailers, distributors and suppliers, residents and organisations in supporting sustainable food retail changes in their community
- Low calorie refrigerated drinks and water was displayed at eye level in the supermarkets and stores
- Ratio of unhealthy to healthy ads shifted from 11:1 to 1:1
- Stores advertising healthy options (e.g. snacks with limits on calories, fat, salt and sugar) increased from 42% to 90%
- Advertising for sugary drinks decreased from 85% of ads to 52% of ads
- Advertising for water increased from 3% of ads to 12% of ads
- 64% of customers who saw any *Shop Healthy NYC* materials said the materials made them consider purchasing the healthier option advertised, with 49% ultimately purchasing the healthier advertised product.

India

Food and Beverage Alliance of India

- Voluntary initiative by food industry – 9 companies are signatory
- Common nutrient criteria (CNC) effective from 31 Dec17. Until then members define nutrient criteria. Pledge to adopt the CNC
- FBAI members agree to only advertise products to children < 12 years that meet common FBAI (CNC); or not to advertise their products at all to children <12 years
- The FBAI marketing policy became effective on December 31, 2016

Advertising Standard Council of India (ASCI)

ASCI also has voluntary standards in place. Principles specific to food are:

1. Messages in advertising to children will portray accurately the products, in a way that is in keeping with their ability to understand
2. Advertisements should not show over consumption of Foods & Beverages. It should reflect moderation in consumption and portion sizes appropriate to occasion or situation.
3. Advertising of promotional offers on Food & Beverage products should also not show excessive consumption.

HFSS Report, India 2017

A guidance document for industry, FSSAI, and consumers. It includes eight recommendations:

- Establish nutrient-specific guidelines for fats, sugars, and salt
- Establish reliable monitoring systems to assess national intakes
- Ban HFSS foods from advertising on children's TV channels or during children's shows (this "is urged") – children are defined as 5-12
- Tax ultra-processed commodities (pre-packaged foods with high salt and fat content) and SSBs
- Increase nutrition education and awareness (multi-faceted, multi-sector approach with policy convergence) to bring down population intakes
- Encourage industry to voluntarily reformulate products
- Mandatory nutrition labeling for calories, CHO, sugars, fat, protein, sodium, and fiber, and trans fat
- Provide a nutrition-sensitive and enabling environment to make healthier choices (sync health, agriculture, and food systems sectors)

Thank You



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