FIZZY YUMMY LIQUID: THE MOST HANKERING ITEM IN AGE EIGHT TO EIGHTY 😊

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Abstract: Soft drink, any of a class of nonalcoholic beverages, usually but not necessarily carbonated, normally containing a natural or artificial sweetening agent, edible acids, natural or artificial flavours and sometimes juice. Natural flavours are derived from fruits, nuts, berries, roots, herbs, and other plant sources. Coffee, tea, milk, cocoa, and undiluted fruit and vegetable juices are not considered soft drinks. The term was originated to distinguish the flavoured drinks from hard liquor, or spirits. Soft drinks were recommended as a substitute in the effort to change the hard-drinking habits of early Americans. Indeed, health concerns of modern consumers led to new categories of soft drinks emphasizing low calorie count, low sodium content, no caffeine, and “all natural” ingredients. There are many specialty soft drinks. Carbonated beverages and waters were developed from European attempts in the 17th century to imitate the popular and naturally effervescent waters of famous springs, with primary interest in their reputed therapeutic values. The effervescent feature of the waters was recognized early as most important. Joseph Priestley is nicknamed “the father of the soft drinks industry” for his experiments on gas obtained from the fermenting vats of a brewery. All ingredients used in soft drinks must be of high purity and food grade to obtain a quality beverage. These include the water, carbon dioxide, sugar, acids, juices and flavours. Although water is most often taken from a safe municipal supply, it usually is processed further to ensure uniformity of the finished product; the amount of impurities in the municipal supply may vary from time to time. In some bottling plants the water-treatment equipment may simply consist of a sand filter to remove minute solid matter and activated carbon purifier to remove colour, chlorine, and other tastes or odours. In most plants, however, water is treated by a process known as superchlorination and coagulation. There, the water is exposed for two hours to a high concentration of chlorine and to a flocculant, which removes such organisms as plankton (minute plants and animals); it then passes through a sand filter and activated carbon.

Keywords: Carbonated drinks, Soft drinks, 777 – soft drink, 7 Up, Appy Fizz, Banta, Bovonto, Campa Cola, Citra, Coca-Cola, Duke's Lemonade, Duke's Mangola, Fanta, Frooti, Gold Spot, Limca, Maaza, Mirinda, Pepsi, Sprite, Thums Up

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INTRODUCTION

A **soft drink** is a beverage that typically contains carbonated water, a sweetener and a flavoring. The sweetener may be sugar, high-fructose corn syrup, fruit juice, sugar substitutes (in the case of diet drinks) or some combination of these. Soft drinks may also contain caffeine, colorings, preservatives and other ingredients. Soft drinks are called "soft" in contrast to "hard drinks" (alcoholic beverages). Small amounts of alcohol may be present in a soft drink, but the alcohol content must be less than 0.5% of the total volume if the drink is to be considered non-alcoholic. Fruit juice, tea and other such non-alcoholic beverages are technically soft drinks by this definition but are not generally referred to as such. Soft drinks may be served chilled or at room temperature and some, such as Dr Pepper, can be served warm.¹

**History**

The first marketed soft drinks in the Western world appeared in the 17th century. They were made of water and lemon juice sweetened with honey. In 1676, the *Compagnie des Limonadiers* of Paris was granted a monopoly for the sale of lemonade soft drinks. Vendors carried tanks of lemonade on their backs and dispensed cups of the soft drink to thirsty Parisians.

**Carbonated drinks**

In the late 18th century, scientists made important progress in replicating naturally carbonated mineral waters. In 1767, Englishman Joseph Priestley first discovered a method of infusing water with carbon dioxide to make carbonated water when he suspended a bowl of distilled water above a beer vat at a local brewery in Leeds, England. His invention of carbonated water (also known as soda water) is the major and defining component of most soft drinks. Priestley found that water treated in this manner had a pleasant taste and he offered it to friends as a refreshing drink.

![Figure-1: Carbonated fizzy soft drink](image-url)
In 1772, Priestley published a paper entitled *Impregnating Water with Fixed Air* in which he describes dripping *oil of vitriol* (or sulfuric acid as it is now called) onto chalk to produce carbon dioxide gas and encouraging the gas to dissolve into an agitated bowl of water. Another Englishman, John Mervin Nooth, improved Priestley's design and sold his apparatus for commercial use in pharmacies. Swedish chemist Torbern Bergman invented a generating apparatus that made carbonated water from chalk by the use of sulfuric acid. Bergman's apparatus allowed imitation mineral water to be produced in large amounts. Swedish chemist Jöns Jacob Berzelius started to add flavors (spices, juices and wine) to carbonated water in the late eighteenth century.

**Figure-2: Soft drink**

**Soft drink production**
Soft drinks are made by mixing dry ingredients and/or fresh ingredients (for example, lemons, oranges, etc.) with water. Production of soft drinks can be done at factories or at home. Soft drinks can be made at home by mixing either a syrup or dry ingredients with carbonated water. Carbonated water is made using a soda siphon or a home carbonation system or by dropping dry ice into water. Syrups are commercially sold by companies such as Soda-Club; dry ingredients are often sold in pouches, in the style of the popular U.S. drink mix Kool-Aid. Drinks like ginger ale and root beer are often brewed using yeast to cause carbonation.²

**Ingredient quality** Of most importance is that the ingredient meets the agreed specification on all major parameters. This is not only the functional parameter (in other words, the level of the major constituent), but the level of impurities, the microbiological status, and physical parameters such as color, particle size, etc.

**Potential alcohol content**
A report in October 2006 demonstrated that some soft drinks contain measurable amounts of alcohol. In some older preparations, this resulted from natural fermentation used to build the carbonation. In the United States, soft drinks (as well as other beverages such as non-alcoholic
beer) are allowed by law to contain up to 0.5% alcohol by volume. Modern drinks introduce carbon dioxide for carbonation, but there is some speculation that alcohol might result from fermentation of sugars in an unsterile environment. A small amount of alcohol is introduced in some soft drinks where alcohol is used in the preparation of the flavoring extracts such as vanilla extract.

Health concerns

The consumption of sugar-sweetened soft drinks is associated with obesity, type 2 diabetes, dental caries and low nutrient levels. Experimental studies tend to support a causal role for sugar-sweetened soft drinks in these ailments, though this is challenged by other researchers. "Sugar-sweetened" includes drinks that use high-fructose corn syrup, as well as those using sucrose. Many soft drinks contain ingredients that are themselves sources of concern: caffeine is linked to anxiety and sleep disruption when consumed in excess and some critics question the health effects of added sugars and artificial sweeteners. Sodium benzoate has been investigated by researchers at University of Sheffield as a possible cause of DNA damage and hyperactivity. Other substances have negative health effects, but are present in such small quantities that they are unlikely to pose any substantial health risk provided that the beverages are consumed only in moderation.³

Obesity and weight-related diseases

From 1977 to 2002, Americans doubled their consumption of sweetened beverages a trend that was paralleled by doubling the prevalence of obesity. The consumption of sugar-sweetened beverages is associated with weight and obesity, and changes in consumption can help predict changes in weight. One study followed 548 schoolchildren over 19 months and found that changes in soft drink consumption were associated with changes in body mass index (BMI). Each soft drink that a child added to his or her daily consumption was accompanied by an increase in BMI of 0.24 kg/m². Similarly, an 8-year study of 50,000 female nurses compared women who went from drinking almost no soft drinks to drinking more than one a day to women who went from drinking more than one soft drink a day to drinking almost no soft drinks. The women who increased their consumption of soft drinks gained 8.0 kg over the course of the study while the women who decreased their consumption gained only 2.8 kg. In each of these studies, the absolute number of soft drinks consumed per day was also positively associated with weight gain. It remains possible that the correlation is due to a third factor: people who lead unhealthy lifestyles might consume more soft drinks. If so, then the association between soft drink consumption and weight gain could reflect the consequences of an unhealthy lifestyle rather than the consequences of consuming soft drinks. Experimental evidence is needed to definitively establish the causal role of soft drink consumption. Reviews
of the experimental evidence suggest that soft drink consumption does cause weight gain, but the effect is often small except for overweight individuals. Many of these experiments examined the influence of sugar-sweetened soft drinks on weight gain in children and adolescents. In one experiment, adolescents replaced sugar-sweetened soft drinks in their diet with artificially sweetened soft drinks that were sent to their homes over 25 weeks. Compared with children in a control group, children who received the artificially sweetened drinks saw a smaller increase in their BMI (by \(-0.14 \text{ kg/m}^2\)), but this effect was only statistically significant among the heaviest children (who saw a benefit of \(-0.75 \text{ kg/m}^2\)). In another study, an educational program encouraged schoolchildren to consume fewer soft drinks. During the school year, the prevalence of obesity decreased among children in the program by 0.2%, compared to a 7.5% increase among children in the control group. Another study, published in Pediatrics in 2013, concluded that for children from the age of 2 to 5, their risk of obesity increased by 43% if they were regular soft drink consumers as opposed to those who rarely or never consumed them. Sugar-sweetened drinks have also been speculated to cause weight gain in adults. In one study, overweight individuals consumed a daily supplement of sucrose-sweetened or artificially sweetened drinks or foods for a 10 week period. Most of the supplement was in the form of soft drinks. Individuals in the sucrose group gained 1.6 kg, and individuals in the artificial-sweetener group lost 1.0 kg. A two week study had participants supplement their diet with sugar-sweetened soft drinks, artificially sweetened soft drinks, or neither. Although the participants gained the most weight when consuming the sugar-sweetened drinks, some of the differences were unreliable: the differences between men who consumed sugar-sweetened drinks or no drinks were not statistically significant. Other research suggests that soft drinks could play a special role in weight gain. One four-week experiment compared a 450 calorie/day supplement of sugar-sweetened soft drinks to a 450 calorie/day supplement of jelly beans. The jelly bean supplement did not lead to weight gain, but the soft drink supplement did. The likely reason for the difference in weight gain is that people who consumed the jelly beans lowered their caloric intake at subsequent meals, while people who consumed soft drinks did not. Thus, the low levels of satiety provided by sugar-sweetened soft drinks may explain their association with obesity. That is, people who consume calories in sugar-sweetened beverages may fail to adequately reduce their intake of calories from other sources. Indeed, people consume more total calories in meals and on days when they are given sugar-sweetened beverages than when they are given artificially sweetened beverages or water. However, these results are contradicted by a study by Adam Drewnowski published in 2004, in which "32 subjects consumed a 300-calorie snack of fat-free raspberry cookies or regular cola on two occasions each – either two hours ("early") or 20 minutes ("late") before lunch." It found that "...the calories eaten at lunch were not affected by whether the snack was cookies or cola." A study by Purdue University reported that no-calorie sweeteners were linked to an increase in body weight. The experiment compared rats who were fed saccharin-
sweetened yogurt and glucose-sweetened yogurt. The saccharin group eventually consumed more calories, gained more weight and more body fat, and did not compensate later by cutting back. The consumption of sugar-sweetened soft drinks can also be associated with many weight-related diseases, including diabetes, metabolic syndrome and cardiovascular risk factors and elevated blood pressure.¹

Dental decay

Most soft drinks contain high concentration of simple carbohydrates: glucose, fructose, sucrose and other simple sugars. Oral bacteria ferment carbohydrates and produce acid, which dissolves tooth enamel during the dental decay process; thus, sweetened drinks are likely to increase risk of dental caries. The risk is greater if the frequency of consumption is high. A large number of soft drinks are acidic, and some may have a pH of 3.0 or even lower. Drinking acidic drinks over a long period of time and continuous sipping can therefore erode the tooth enamel. However, under normal conditions, scientific evidence indicates Coca-Cola's acidity causes no immediate harm. Using a drinking straw is often advised by dentists as the drink does not come into as much contact with the teeth. It has also been suggested that brushing teeth right after drinking soft drinks should be avoided as this can result in additional erosion to the teeth due to the presence of acid.

Hypokalemia

There have been a handful of published reports describing individuals with severe hypokalemia (low potassium levels) related to chronic extreme consumption (4-10 L/day) of colas.

Soft drinks related to bone density and bone loss

In a meta-analysis of 88 studies, drinking soda correlates with a decrease in milk consumption along with the vitamin D, vitamin B6, vitamin B12, calcium, protein and other micronutrients. Phosphorus, a micronutrient, can be found in cola-type beverages, but there may be a risk in consuming too much. Phosphorus and calcium are used in the body to create calcium-phosphate, which is the main component of bone. However, the combination of too much phosphorus with too little calcium in the body can lead to a degeneration of bone mass. Research suggests a statistically significant inverse relationship between consumption of carbonated beverages and bone mineral density in young girls, which places them at increased risk of suffering fractures in the future. One hypothesis to explain this relationship is that the phosphoric acid contained in some soft drinks (colas) displaces calcium from the bones, lowering bone density of the skeleton and leading to weakened bones, or osteoporosis. However, calcium metabolism studies by Dr. Robert Heaney suggested that the net effect of
carbonated soft drinks, (including colas, which use phosphoric acid as the acidulent) on calcium excretion in urine was negligible. Heaney concluded that carbonated soft drinks, which do not contain the nutrients needed for bone health, may displace other foods which do, and that the real issue is that people who drink a lot of soft drinks also tend to have an overall diet that is low in calcium. In the 1950s and 1960s there were attempts in France and Japan to ban the sale of Coca-Cola as dangerous since phosphates can block calcium absorption. However, these were unsuccessful as the amounts of phosphate were shown to be too small to have a significant effect.5

Sugar content

The USDA's recommended daily intake (RDI) of added sugars is less than 10 teaspoons per day for a 2,000-calorie diet. High caloric intake contributes to obesity if not balanced with exercise, with a large amount of exercise being required to offset even small but calorie-rich food and drinks. Until 1985, most of the calories in soft drinks came from sugar or corn syrup. As of 2010, in the United States high-fructose corn syrup (HFCS) is used nearly exclusively as a sweetener because of its lower cost, while in Europe, sucrose dominates, because EU agricultural policies favor production of sugar beets in Europe proper and sugarcane in the former colonies over the production of corn. HFCS has been criticized as having a number of detrimental effects on human health, such as promoting diabetes, hyperactivity, hypertension, and a host of other problems. Although anecdotal evidence has been presented to support such claims, it is well known that the human body breaks sucrose down into glucose and fructose before it is absorbed by the intestines. Simple sugars such as fructose are converted into the same intermediates as in glucose metabolism. However, metabolism of fructose is extremely rapid and is initiated by fructokinase. Fructokinase activity is not regulated by metabolism or hormones and proceeds rapidly after intake of fructose. While the intermediates of fructose metabolism are similar to those of glucose, the rates of formation are excessive. This fact promotes fatty acid and triglyceride synthesis in the liver, leading to accumulation of fat throughout the body and possibly non-alcoholic fatty liver disease. Increased blood lipid levels also seem to follow fructose ingestion over time. A sugar drink or high-sugar drink may refer to any beverage consisting primarily of water and sugar (often cane sugar or high-fructose corn syrup), including some soft drinks, some fruit juices, and energy drinks.

Benzene In 2006, the United Kingdom Food Standards Agency published the results of its survey of benzene levels in soft drinks, which tested 150 products and found that four contained benzene levels above the World Health Organization (WHO) guidelines for drinking water. The United States Food and Drug Administration released its own test results of several soft drinks containing benzoates and ascorbic or erythorbic acid. Five tested drinks contained benzene levels above the Environmental Protection Agency's recommended standard of 5 ppb.
The Environmental Working Group has uncovered additional FDA test results that showed the following results: Of 24 samples of diet soda tested between 1995 and 2001 for the presence of benzene, 19 (79%) had amounts of benzene in excess of the federal tap water standard of 5 ppb. Average benzene levels were 19 ppb, about four times tap water standard. One sample contained 55 ppb of benzene, 11 fold tap water standards. Despite these findings, as of 2006, the FDA stated its belief that "the levels of benzene found in soft drinks and other beverages to date do not pose a safety concern for consumers".6

**Pesticides in India**

In 2003, the Delhi non-profit Centre for Science and Environment published a disputed report finding pesticide levels in Coke and Pepsi soft drinks sold in India at levels 30 times that considered safe by the European Economic Commission. This was found in primarily 12 cold drink brands sold in and around New Delhi. The Indian Health Minister said the CSE tests were inaccurate, and said that the government's tests found pesticide levels within India's standards but above EU standards. A similar CSE report in August 2006 prompted many state governments to have issued a ban of the sale of soft drinks in schools. Kerala issued a complete ban on the sale or manufacture of soft drinks altogether. (These were later struck down in court.) In return, the soft drink companies like Coca-Cola and Pepsi have issued ads in the media regarding the safety of consumption of the drinks. The UK-based Central Science Laboratory, commissioned by Coke, found its products met EU standards in 2006 Coke and the University of Michigan commissioned an independent study of its bottling plants by The Energy and Resources Institute (TERI), which reported in 2008 no unsafe chemicals in the water supply used.7

**Kidney stones** A study published in the *Clinical Journal of the American Society of Nephrology* in 2013 concluded that consumption of soft drinks was associated with a 23% higher risk of developing kidney stones.

**Schools** In recent years, debate on whether high-calorie soft drink vending machines should be allowed in schools has been on the rise. Opponents of the (soft drink) vending machines believe that soft drinks are a significant contributor to childhood obesity and tooth decay, and that allowing soft drink sales in schools encourages children to believe they are safe to consume in moderate to large quantities. Opponents argue that schools have a responsibility to look after the health of the children in their care, and that allowing children easy access to soft drinks violates that responsibility. Vending machine proponents believe that obesity is a complex issue and soft drinks are not the only cause. They also note the immense amount of funding that soft drink sales bring to schools. Some people take a more moderate stance, saying that soft drink machines should be allowed in schools, but that they should not be the only option available.
They propose that when soft drink vending machines are made available on school grounds, the schools should be required to provide children with a choice of alternative drinks (such as fruit juice, flavored water and milk) at a comparable price. Some lawmakers debating the issue in different states have argued that parents—not the government—should be responsible for children's beverage choices.  

**India**


777 – soft drink – panner, cola, orange, lemon, clear lemon lime, mango.

![Figure-3: 777 club soda](image)

7 Up is a brand of lemon-lime flavored, non-caffeinated soft drink. The rights to the brand are held by Dr Pepper Snapple Group in the United States, and PepsiCo (or its licensees) in the rest of the world. The U.S. version of the 7 Up logo includes a red spot between the "7" and "Up"; this red spot has been animated and used as a mascot for the brand as Cool Spot.

**History** 7 Up was created by Charles Leiper Grigg, who launched his St. Louis–based company The Howdy Corporation in 1920. Grigg came up with the formula for a lemon-lime soft drink in 1929. The product, originally named "Bib-Label Lithiated Lemon-Lime Soda", was launched two weeks before the Wall Street Crash of 1929. It contained lithium citrate, a mood-stabilizing drug, until 1950. It was one of a number of patent medicine products popular in the late-19th and early-20th centuries. Westinghouse bought 7 Up in 1969 and sold it in 1978 to Philip Morris, who, in turn, sold it in 1986 to a group led by the investment firm Hicks & Haas. 7 Up merged with Dr Pepper in 1988; Cadbury Schweppes bought the combined company in 1995. The Dr Pepper Snapple Group was spun off from Cadbury Schweppes in 2008.
Formula
7 Up has been reformulated several times since its launch in 1929. In 2006, the version of the product sold in the U.S. was re-formulated so that it could be marketed as being "100% natural". This was achieved by eliminating the chelating-agent calcium disodium EDTA and replacing sodium citrate with potassium citrate in order to reduce the beverage's sodium content. This re-formulation contains no fruit juice and, in the U.S., is sweetened with high-fructose corn syrup (HFCS). The manufacturing process used in the production of HFCS has led some public health and advocacy groups to challenge the ad campaign's "natural" claims. In 2007, after the Center for Science in the Public Interest threatened to sue 7 Up, it was announced that 7 Up would stop being marketed as "100% natural". Instead, it is now promoted as having "100% Natural Flavors". The controversy does not extend to other countries, such as the United Kingdom, where HFCS is not generally used in foods, including 7 Up. In 2011, 7 Up began test-marketing a formula, called 7 Up Retro, using sugar rather than HFCS. Container labels sport the caption, "Made With Real Sugar". There exists a myth that the 7 Up name comes from the drink having a pH over 7. That would make it neutral or alkaline on the scale; however, this is not the case, as the 7 Up pH is close to 3.79, similar to other drinks of the type. The real origin of the name is unclear, though Britvic claims that the name comes from the seven main ingredients in the drink.
Appy Fizz by Parle

Figure-5: Appy fizz

Appy Fizz is a product by Parle Agro, introduced in India in 2005. Appy Fizz consists of carbonated apple juice and is used as the basis for cocktails and is a popular drink with the youth. After the success of Appy which was clean apple juice, Parle launched its sequel product as Grappo Fizz, which is a carbonated grape juice. The drink was the subject of a successful campaign of advertising at cricket matches in 2007-08.¹⁰

Banta – lemon-flavoured soft drink

Figure-6: Banta drink

Banta also known as Goli Soda or Goti Soda (Goti = marble in Hindi) is a lemon or orange-flavored drink popular in India available for as low as Rs 6. It is available in a Codd-neck bottle, a heavy glass bottle in which a round marble seals the mouth of the bottle by the pressure of the
contents, instead of a cap. The distinctive bottle has led to the drink also being called *goli soda* in South India.\(^1\)

**Bovonto** – grape soda produced by Kali Mark

![Bovonto drink](image)

**Figure-7: Bovonto drink**

*Bovonto* is a soft drink popular in South India, especially Tamil Nadu with a select fan following. It is manufactured and marketed by Kali Mark (Kalis Sparkling Water (P) Ltd.), which has offices and bottling plants at several locations in Tamil Nadu. At present it has put up a distribution point at Chennai. You can contact them through [www.kalimarkbovonto.com](http://www.kalimarkbovonto.com) The drink is mildly carbonated and has a tangy grape-cola taste. Kali Mark is a regional-level player and is one of the very few indigenous soft-drink manufacturers in India that survived the onslaught of take-overs by multinational giants Pepsi and Coca Cola, during the mid-1990s. Other than Bovonto, the company also used to produce soft drinks like Trio, Solo and Frutang. The company still maintains a low profile in areas of marketing advertising. It has a minimal online presence.

**Campa Cola** – popular Indian soda introduced in 1977. Campa Cola is a soft drink brand in India. It was a market leader in most regions of India for a period spanning several years until the advent of the foreign players Pepsi and Coca-Cola after the liberalisation policy of the P. V. Narasimha Rao Government in 1991.
Campa Cola was a drink created by the Pure Drinks Group in the 1970s. The Pure Drinks Group pioneered the India soft drink industry when it introduced Coca-Cola into India in 1949, and were the sole manufacturers and distributors of Coca-Cola till the 1970s when Coke was asked to leave. The Pure Drinks Group and Campa Beverages Pvt. Ltd. virtually dominated the entire Indian soft drink industry for about 15 years, and then started Campa Cola during the absence of foreign competition.\(^\text{13}\)

**Citra**

Citra was a clear lemon and lime flavoured soda sold in India in the 1980s and early 90s. Citra was owned by Parle. Along with other Parle brands, Thums Up, Limca, Gold Spot and Maaza, Citra was sold to Coca-Cola in 1993 in a deal that was reportedly worth $40 million. At the time
of sale, the Parle brands together had a 60% market share in the aerated water industry. The brand was strong in South India. Citra was phased out by the year 2000 to make way for Coke's international brand, Sprite. In 1998, Coke introduced a new drink in the US market, Coca-Cola Citra. Although the brand name was similar, this was a totally different grapefruit based formula. In February 2012, Coke announced that it was reviving the Citra brand in rural areas of Maharashtra and Gujarat on a pilot basis, on a price strategy that will be 20% cheaper than other Coke and competitor brands. The relaunch is aimed at competing with smaller regional brands.14

Coca-Cola

Coca-Cola is a carbonated soft drink sold in stores, restaurants and vending machines throughout the world. It is produced by The Coca-Cola Company of Atlanta, Georgia, and is often referred to simply as Coke (a registered trademark of The Coca-Cola Company in the United States since March 27, 1944). Originally intended as a patent medicine when it was invented in the late 19th century by John Pemberton, Coca-Cola was bought out by businessman Asa Griggs Candler, whose marketing tactics led Coke to its dominance of the world soft-drink market throughout the 20th century. The company produces concentrate, which is then sold to licensed Coca-Cola bottlers throughout the world. The bottlers, who hold territorially exclusive contracts with the company, produce finished product in cans and bottles from the concentrate in combination with filtered water and sweeteners.

Figure-10: Coca cola drink

The bottlers then sell, distribute and merchandise Coca-Cola to retail stores and vending machines. The Coca-Cola Company also sells concentrate for soda fountains to major restaurants and food service distributors. The Coca-Cola Company has, on occasion, introduced other cola drinks under the Coke brand name. The most common of these is Diet Coke, with others including Caffeine-Free Coca-Cola, Diet Coke Caffeine-Free, Coca-Cola Cherry, Coca-Cola Zero, Coca-Cola Vanilla, and special versions with lemon, lime or coffee. In 2013, Coke products
could be found in over 200 countries worldwide, with consumers downing more than 1.8 billion company beverage servings each day. Based on Interbrand's best global brand study of 2011, Coca-Cola was the world's most valuable brand.\(^{15}\)

**Duke's Lemonade**

![Duke's Lemonade bottle](image)

**Figure-11: Duke's lemonade**

**Duke's Lemonade** is a lemon based aerated drink marketed in India since 1889. The brand has a strong presence in western India. Originally owned by Duke and Sons, the brand was sold to PepsiCo in 1994. PepsiCo phased out most drinks under the Duke's brand in 2004, though it retained Duke's Lemonade. Not only was Duke's Lemonade retained, in the same year PepsiCo launched a new advertisement campaign in Mumbai to promote the brand, with a new tagline, "takatak taajgi". Duke's Lemonade was once a favorite in Irani cafés. It is also used as a mixer with alcohol based drinks. In an interview in 2008, Ramesh Chauhan of Parle said that he had approached the owners of Duke's Lemonade, requesting them to share the formula for the drink with the promise not to market it in India, which was turned down. Chauhan decided to come up with his own formula, which he launched under the Limca brand in 1977.\(^{16}\)

**Duke's Mangola** – mango drink from Dukes bought by PepsiCo.

**Duke's Mangola** is a mango flavoured drink marketed by PepsiCo in India. Originally owned by the Pundole family and part of Duke and Sons, Mangola was launched in the 1950s to counter Coca-Cola. Duke's was sold to PepsiCo in 1994. Though PepsiCo phased out most drinks under the Duke's brand in 2004, it retained lemonade and Mangola. Marketed in western India, Duke's Mangola was the market leader in the segment in that region. PepsiCo has been slowly
merging Mangola with its other mango based drink, Slice. As of 2010, only one franchise of Mangola had been retained in Mumbai, since it was loyal to the brand.\footnote{17}

\begin{figure}
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\includegraphics[width=0.5\textwidth]{Mangola.png}
\caption{Duke's mangola drink}
\end{figure}

\textbf{Fanta} is a global brand of fruit-flavored carbonated soft drinks created by The Coca-Cola Company. There are over 100 flavors worldwide. The drink originated in Nazi Germany in 1941. In the UK, Fanta is a rival to Tango made by British company Britvic.\footnote{18}

\begin{figure}
\centering
\includegraphics[width=0.5\textwidth]{Fanta.png}
\caption{Fanta drink}
\end{figure}

\textbf{Frooti} – mango-flavored drink from Parle Argo.

\textbf{Frooti} is the largest-selling mango flavored drink in India. It is the flagship product of and the most successful drink offered by Parle Agro India Pvt. Ltd. in India and Parle Agro Nepal Pvt. Ltd. in Nepal. Frooti was launched in 1985 in TetraPak packages. It is also now available in PET bottles and rectangular shaped packs. Frooti is exported to the United States, Canada,
the United Kingdom, the United Arab Emirates, Saudi Arabia, Malaysia, Maldives, Singapore, Thailand, New Zealand, Australia, Mozambique, Ghana, Malawi, Zambia, Nigeria, Tanzania, Japan, Ireland, etc. Frooti is currently endorsed by Shah Rukh Khan, in India.¹⁹

Figure-14: Frooti drink

Ingredients

The drink contains mango pulp, water, sugar, citric acid, ascorbic acid, salts and approved colouring and flavouring. Gold Spot

Figure-15: Gold spot drink

Gold Spot was one of the three brands of carbonated soft drink started in India by Parle under the initiative of its founder Ramesh Chauhan in 1977 after the exit of Coca-
Cola and PepsiCo from the Indian market. Gold Spot was introduced along with Thums Up and Limca.

- It was artificially flavoured and coloured orange. Parle sold Gold Spot along with Thums Up, Limca, Citra and Maaza to Coca-Cola in 1993 (which had just relaunched in the Indian market), reportedly for $40 million. In spite of its wide popularity, Gold Spot was withdrawn by Coke from the market in order to re-make space for Coca-Cola's Fanta brand.

- Gold Spot had a catchy punch line - "The Zing Thing."

- As per data available from the Ministry of Food Processing Industries of India (MoFPI), Gold Spot had a 2% market share during the years 2009-10 among all soft drink companies (Cola + Non-Cola drink Manufacturers).\(^\text{20}\)

Limca – lemon-lime soda

Limca is a lemon and lime flavoured carbonated soft drink made primarily in India and certain parts of the U.S. In an interview in 2008, Ramesh Chauhan of Parle revealed that he had approached the owners of Duke's Lemonade, requesting them to share the formula for the drink with the promise not to make it in India, which was turned down. Chauhan decided to come up with his own formula, which he launched under the Limca brand in 1977.

- In 1992, when the Indian government allowed Coca-Cola to return for operations, at the same time as it admitted Pepsi for the first time, Coca-Cola bought local soft-drink (soda) brands, from Parle Agro owner Mr Ramesh Chauhan including Limca, Thums Up (a cola-like drink), Maaza (a mango-juice based drink), Citra and Gold Spot (Orange flavour).

![Figure-16: Limca drink](image-url)
Like most other sodas, Limca is generally sold in glass bottles within India, which are returned to the store or restaurant after the contents have been consumed. The bottles are sent back to the manufacturer, washed and reused, because the bottles are more expensive than the drink itself, and selling the drink in tin cans and plastic bottles steps up its market price. However, the drink is also sold in tin-cans and plastic bottles.

Prior to 1988 the original formula of Limca contained brominated vegetable oil (BVO). After world wide reports of ill effects of BVO - the use of BVO in soft drinks was banned in India. As a result of this ban - the formula for Limca was changed and BVO was removed from the concentrate for Limca.

Limca is marketed in 200 ml and 300 ml glass bottles with national maximum-retail prices of 8 Indian Rupees (INR) and 11 INR, respectively; 330 ml cans priced at 18 INR, 600 ml plastic bottles priced at 30 INR, 1.5 liter "Family Pack" plastic bottles at 45 INR, and 2 liter "Party Pack" plastic bottles priced at 55 INR. In certain establishments such as cinema-halls, snack-bars, and bakeries, Limca is available from soda-fountains, in 350 ml paper glasses (tumblers). Prices of fountain Limca vary.

Limca also publishes the Limca Book of Records, a record book similar to the Guinness Book of Records, started originally by Mr Ramesh Chauhan. The Limca Book of Records details feats, records and other unique statistics from an Indian perspective.

One of Limca's original and very popular taglines was "Limca. It's veri veri Lime & Lemoni." In India reigning top Hindi film actress and actors are generally chosen as brand-ambassadors for the product.  

Maaza is a Coca-Cola fruit drink brand marketed in Middle East, Africa, Eastern Europe and Asia, the most popular drink being the mango variety, so much that over the years, the Maaza
brand has become synonymous with Mango. Initially Coca-Cola had also launched Maaza in orange and pineapple variants, but these variants were subsequently dropped. Coca-Cola has recently re-launched these variants again in the Indian market. Mango drinks currently account for 90% of the fruit juice market in India. Maaza currently dominates the fruit drink category and competes with Pepsi's Slice brand of mango drink and Frooti, manufactured by Parle Agro. While Frooti was sold in small cartons, Maaza and Slice were initially sold in returnable bottles. However, all brands are also now available in small cartons and large PET bottles. Of late, the Indian market is witnessing the entry of a large number of small manufacturers producing only mango fruit drink. Maaza has a distinct pulpy taste as compared to Frooti and tastes slightly sweeter than Slice. Maaza claims to contain mango pulp of the Alphonso variety, which is known as the "King of Mangoes" in India.\textsuperscript{22}

\textbf{Mirinda} is a brand of soft drink originally created in Spain, with global distribution. The word Mirinda means "admirable" or "wonderful" in Esperanto.

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{mirinda-drink.jpg}
\caption{Mirinda drink}
\end{figure}

It is available in fruit varieties including orange, grapefruit, apple, strawberry, raspberry, pineapple, pomegranate, banana, passion fruit, lemon, hibiscus, guarana, tangerine and grape flavours as well as tamarind. A "citrus" flavour is also available in certain areas of the Middle East. It is part of a beverage area often referred to as the flavor segment, comprising carbonated and non-carbonated fruit-flavored beverages. The orange flavor of Mirinda now represents the majority of Mirinda sales worldwide following a major repositioning of the brand towards that flavor in the early 1990s. Mirinda has been owned by PepsiCo since 1970 and is primarily commercialized outside North America. It competes with Coca-Cola's Fanta and Dr Pepper's Orange Crush or Sunkist (soft drink) brands, with flavour brands localized to individual countries. As with most soft drinks, Mirinda is available in multiple formulations of flavour, carbonation and sweetener depending on the taste of individual markets.\textsuperscript{23}
Pepsi (stylized in lowercase as pepsi, formerly stylized in uppercase as PEPSI) is a carbonated soft drink that is produced and manufactured by PepsiCo. Created and developed in 1893 and introduced as Brad's Drink, it was renamed as Pepsi-Cola on August 28, 1898, then to Pepsi in 1961, and in select areas of North America, "Pepsi-Cola Made with Real Sugar" as of 2014.24

Ingredients

<table>
<thead>
<tr>
<th>Nutrition facts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serving size 12 fl oz (355 ml)</td>
</tr>
<tr>
<td>Servings per container 1</td>
</tr>
<tr>
<td>Amount per serving</td>
</tr>
<tr>
<td>Calories 150[^1]</td>
</tr>
<tr>
<td>% Daily value*</td>
</tr>
<tr>
<td>Total fat 0 g</td>
</tr>
<tr>
<td>Saturated fat 0 g</td>
</tr>
<tr>
<td>Trans fat 0 g</td>
</tr>
<tr>
<td>Cholesterol 0 mg</td>
</tr>
<tr>
<td>Sodium 15 mg</td>
</tr>
<tr>
<td>Potassium 0 mg</td>
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<tr>
<td>Total carbohydrate 41 g</td>
</tr>
<tr>
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</tr>
<tr>
<td>Sugars 41 g</td>
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<tr>
<td>Protein 0 g</td>
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</tr>
<tr>
<td>Vitamin C</td>
</tr>
<tr>
<td>Calcium</td>
</tr>
<tr>
<td>Iron</td>
</tr>
</tbody>
</table>

[^1]: Percent daily values are based on a 2,000-calorie diet. Your daily values may be higher or lower depending on your calorie needs.
Table-1: Calorie measure in soft drinks

In the United States, Pepsi is made with carbonated water, high fructose corn syrup, caramel color, sugar, Phosphoric acid, caffeine, citric acid and natural flavors. A can of Pepsi (12 fl ounces) has 41 grams of carbohydrates (all from sugar), 30 mg of sodium, 0 grams of fat, 0 grams of protein, 38 mg of caffeine and 150 calories. The caffeine-free Pepsi-Cola contains the same ingredients but without the caffeine.

Figure-20: Sprite drink

In August 2010, PepsiCo entered into a 4-year agreement with Senomyx for the development of artificial high-potency sweeteners for PepsiCo beverages. Under the contract, PepsiCo is paying $30 million to Senomyx for the research and future royalties on PepsiCo products sold using Senomyx technology. According to PepsiCo, this collaboration will focus on the discovery, development and commercialization of sweet enhancers, with the purpose of providing lower-calorie PepsiCo beverages. PepsiCo will have exclusive rights to the Senomyx sweet flavor ingredients developed through the collaboration. In September 2012 Pepsi launched a new product called Pepsi Next which contains 30% less sugar and added Stevia as a zero calorie sweetener. The product was rolled out in Australia and is expected to be launched in the US starting February 27.  

Sprite is a colorless, lemon-lime flavored, caffeine-free soft drink, created by the Coca-Cola Company. It was developed in West Germany in 1959 as Fanta Klare Zitrone ("Clear Lemon Fanta") and introduced in the United States as Sprite in 1961. This was Coke's response to the popularity of 7 Up. It comes in a primarily silver, green, and blue can or a green translucent bottle with a primarily green and blue label.
Thums Up is a brand of cola in India. The logo is a red thumbs up. It was introduced in 1977 to offset the withdrawal of The Coca-Cola Company from India. The brand was later bought by Coca-Cola who re-launched it in order to compete against Pepsi. As of February 2012, Thums Up is the leader in the cola segment in India, commanding approximately 42% market share and an overall 15% market share in the Indian aerated waters market. According to Coca-Cola's Indian website, Thums Up contains: carbonated water, sugar, acidity regulator (E338), natural colour (150d) and added flavours ("natural, nature-identical and artificial flavouring substances"). Coca-Cola also states that Thums Up contains caffeine, but does not list it with the other ingredients. During the late 1970s, American cola giant Coca-Cola abandoned operations in India rather than accept a forced sale of 60% of their equity to an Indian company. Following this, the Parle brothers, Ramesh Chauhan and Prakash Chauhan, along with then CEO Bhanu Vakil, launched Thums Up as their flagship drink, adding to their portfolio of older brands Limca (lime flavour) and Gold Spot (orange flavour). Thums Up enjoyed a near monopoly with a much stronger market share, often overshadowing domestic rivals like Campa Cola, Double Seven, Dukes and United Breweries Group's McDowell's Crush, although many small players sold well in their own markets. It was one of the major advertisers throughout the 1980s. In the mid '80s it faced short-lived competition from Double Cola. In 1990, when the Indian government opened the market to multinationals, Pepsi was the first to come in. Thums Up and Pepsi subsequently engaged in heavy competition for endorsements.27,28

Figure-21: Thums Up drink

Pepsi spokespersons included major Indian movie stars like Juhi Chawla, while Thums Up increased its spending on Cricket sponsorship. Thums Up also introduced a larger 300 ml (10 US fl oz) bottle, branded "MahaCola" (the original size was 250 ml (8.5 US fl oz)). This nickname gained popularity in smaller towns where people would ask for "Maha Cola" instead of Thums Up. Consumers were divided, with some saying that Pepsi’s mild taste was rather bland.
CONCLUSION

Carbonation or fizz is the process of dissolving carbon dioxide in a liquid. The process usually involves carbon dioxide under high pressure. When the pressure is reduced, the carbon dioxide is released from the solution as small bubbles, which causes the solution to become effervescent, or fizzy. An example of carbonation is the dissolving of carbon dioxide in water, resulting in carbonated water.

Craze of soft drinks in age 8 to 80!

Carbon dioxide gas gives the beverage its sparkle and tangy taste and prevents spoilage. While it has not been conclusively proved that carbonation offers a direct medical benefit, carbonated beverages are used to alleviate postoperative nausea when no other food can be tolerated, as well as to ensure adequate liquid. Carbon dioxide is supplied to the soft drink manufacturer in either solid form (dry ice) or liquid form maintained under approximately 1,200 pounds per square inch (84 kilograms per square centimetre) pressure in heavy steel containers. Lightweight steel containers are used when the liquid carbon dioxide is held under
re refrigeration. In that case, the internal pressure is about 325 pounds per square inch. Carbonation (of either the water or the finished beverage mixture) is effected by chilling the liquid and cascading it in thin layers over a series of plates in an enclosure containing carbon dioxide gas under pressure. The amount of gas the water will absorb increases as the pressure is increased and the temperature is decreased. Noncarbonated beverages require ingredients and techniques similar to those for carbonated beverages. However, since they lack the protection against spoilage afforded by carbonation, these are usually pasteurized, either in bulk, by continuous flash pasteurization prior to filling, or in the bottle. Soft drinks are packaged in glass or plastic bottles, tin-free steel, aluminum, or plastic cans, treated cardboard cartons, foil pouches, or in large stainless steel containers. Vending of soft drinks had its modest beginning with the use of ice coolers in the early 20th century. Nowadays, most drinks are cooled by electric refrigeration for consumption on the premises. Vending machines dispense soft drinks in cups, cans, or bottles and restaurants, bars and hotels use dispensing guns to handle large volume. There are two methods of vending soft drinks in cups. In the “pre-mix” system, the finished beverage is prepared by the soft drink manufacturer and filled into five- or 10-gallon stainless steel tanks. The tanks of beverage are attached to the vending machine where the beverage is cooled and dispensed. In the “post-mix” system the vending machine has its own water and carbon dioxide supply. The water is carbonated as required and is mixed with flavoured syrup as it is dispensed into the cup. The term soft drink was originated to distinguish nonalcoholic beverages from hard liquor, or spirits. Soft drinks are nonalcoholic carbonated or noncarbonated beverages, usually containing a sweetening agent, edible acids and natural or artificial flavors. Soft drinks include cola beverages, fruit-flavored drinks, and ginger ale and root beer. Coffee, tea, milk, cocoa and undiluted fruit and vegetable juices are not considered as soft drinks.

REFERENCES


