

## **Smoothie: A nutritional and commercial point of view and future aspects .**

### **Abstract**

Smoothies can improve the daily diet because they frequently contain healthy elements including vitamins, minerals, and fibre. However, there are a few things to keep in mind while choosing components to prevent health hazards. First, it is important to remember that a lot of fruit can lead to a significant increase in energy intake. Only plants or parts of them should, in theory, be used in smoothies since they have also been used traditionally as foods and are therefore thought to be safe. According to sources like Horizon Databook, the smoothie industry in India is a vast and attractive market. With a sales share of 51.62% in 2023, the fruit-based industry was the largest. Horizon Databook has divided the Indian smoothie industry into two segments: those based on dairy and those based on fruit. It has also examined the revenue growth of each sub-segment from 2017 to 2030.. The global smoothie market's size, which is growing yearly, was also revealed by Polaris market research investigation.

So in modern scenario where people moved towards the food items like smoothie because its nutritional values and wholesomeness also they look the market of smoothie as business prospectives and try to grave the opportunity in smoothie industry.

### **Keywords:-**

Smoothie, Nutritional aspects, Market view , lifestyle, habits, revenue.

### **Introduction**

First established in the United States in 1960, the smoothie concept reappeared in 2000, first focussing solely on fresh fruit and vegetables (Titus, 2008). Smoothies are known to be "natural and healthy" and may be made quickly. As a result, smoothies are now a popular culinary trend. Typically made by combining fruit, fruit juice, or fruit puree, smoothies are thick, semi-liquid drinks. Smoothies provide more nutrients because they don't separate the fibre from the juice and contain entire or varied sections of fruits and vegetables. Smoothies have been a more and more popular fruit consumption method in recent years. Fruit purée and fruit juice (or less frequently, vegetables) are combined with optional ice, yoghurt, and/or milk to create this non-alcoholic, creamy beverage. Polyphenols, which are abundant in fruits and vegetables, have physiological functions in plants as well as antioxidant properties. They scavenge free radicals, quench singlet oxygen, donate an electron or hydrogen atom to other compounds, and maintain

a balance between oxidants and antioxidants to enhance human health. Numerous studies have found that eating a lot of fruits and vegetables is good for your health and lowers your risk of developing degenerative diseases (Miller et al., 2017). Thus, customers can incorporate fruits and vegetables into their diets in a variety of ways, Freshly made green smoothies can greatly support a healthy diet because they are packed with vitamins, minerals, and dietary fibre, among other components. However, there are a few things to think about when choosing ingredients and making the smoothie in order to prevent health hazards. For instance, items included in smoothie recipes that have not previously been ingested raw or at all, in addition to plants or parts of them that are normally consumed as food, may be harmful to one's health. In addition to its convenience and alleged health benefits, smoothies have become increasingly popular as a result of changing lifestyle choices including meal skipping. Blending whole fresh vegetables [FV] preserves the fibres, which is one advantage of smoothies. Smoothies can offer a healthier substitute for conventional sugary drinks and are a simple method to consume FV in a single beverage. Smoothies Market Analysis - Industry Report - Trends, Size & Share, n.d.) As a result, the market for smoothies has grown. The WHO's recommendation for daily FV consumption was shown to be more likely to be met by smoothie drinkers than by non-smoothie drinkers. Furthermore, smoothie drinkers were more likely to consume more dietary fibre and vitamins A, C, and E. The purpose of this study was to examine smoothie users' FV intake and how it relates to WHO FV guidelines. Additionally, to determine the attributes of smoothie consumers, such as sustainable practices and health. The findings of this study may help guide public health regulations and promote the adoption of wholesome eating practices.

### **Nutritional aspects**

There is no legally enforceable definition for the term "smoothie," and it is not protected. As a result, there are no set guidelines regarding which ingredients and in what amounts must be added to the beverage. A green smoothie often consists of greens, fruits, and/or vegetables that have been puréed with water. Numerous nutrients deemed necessary for human health can be found in smoothies. Everything is dependent on the components utilised. Fruits and vegetables will provide the majority of the nutritious components in our smoothies. A diet rich in fruits and vegetables has several advantages, including a decreased risk of diabetes, obesity, cancer, and heart disease (Slavin & Lloyd, 2012). Smoothies could be a useful tool for increasing our intake of fruits and vegetables (Bates & Price, 2015). In addition to being rich in colour, fruits and vegetables are also a good source of vitamins and minerals, which the body uses for vital purposes (Slavin & Lloyd, 2012). Building tissues like skin and bones, maintaining immune system function, repairing damage, and hundreds of other bodily functions all depend on vitamins and minerals. Among other things, calcium and vitamin D, which are abundant in dairy, are essential for maintaining strong bones.

**Fibre.** Smoothies are generally composed of blended whole fruit, which has two parts: the juice and the pulp. The fibre can be found in the pulp. By slowing down digestion and the absorption of sugar, fibre helps maintain a healthy digestive system by adding bulk (Escalona et al., 2015).

**Water.** To survive, you need water. Smoothies are a fantastic way to obtain and stay hydrated because fruits and vegetables are mostly made of water and provide some of the minerals needed to rehydrate (Escalona Navarro et al., 2015; Slavin & Lloyd, 2012).

**Protein.** Protein is an essential nutrient found throughout the body – in muscle, bone, skin, red blood cells, and hair just to name a few (Brown & Isaacs, 2011). It is the basic building block for every tissue (Brown & Isaacs, 2011). Protein can be obtained in a smoothie in several ways, by including dairy, peanut and other nut butters, whole nuts, seeds, legumes, and protein powders or supplements. High protein smoothies or protein shakes are most commonly used by bodybuilders and athletes, but they can also be beneficial to people suffering from protein deficiency, pregnant women, and the older adults (Brown & Isaacs, 2011).

Specifically, because of their high vegetable content—which isn't always encouraging—green smoothies are also frequently used to help people lose weight. The high amounts of naturally occurring sugars in the green juices, particularly from the added fruits, allow them to have a high energy content. For instance, a homemade smoothie made with 200 g of leafy spinach, a banana, and half an apple has about 200 calories and roughly 30 g of sugar (tab 1).

Quantity		125 g	75 g	200 g	30 ml	
Water	g	94	64	185	28	370
Calories	kcal	123	46	54	6,6	229
<b>Macronutrients</b>						
Protein (total)	g	0,9	0,1	5,7	0,1	6,8
Fat (total)	g	0,4	0,1	1,2	0,1	1,8
Carbohydrates (total)	g	29	11	4,8	2,1	47
• Fiber	g	2,5	1,6	3,2	0,1	7,4
• Sugar (total)	g	20	8,9		0,8	30
of which sucrose	g	5,3	1,5		0,1	6,9
of which fructose	g	7,6	5,9		0,3	14
of which glucose	g	6,9	1,5		0,3	8,7
<b>Minerals and vitamins</b>						
Calcium	mg	6,3	5,3	136	1,8	149
Sodium	mg	4,0	0,5	222	0,3	227
Potassium	mg	408	80	1164	31	1682
Magnesium	mg	35	3,7	186	1,8	226

Phosphorus	mg	28		6,0	78	2,4	114
Vitamin C	mg	15		3,5	53	12	83
Iron	mg	0,4		< 0,1	2,5	< 0,1	3,0

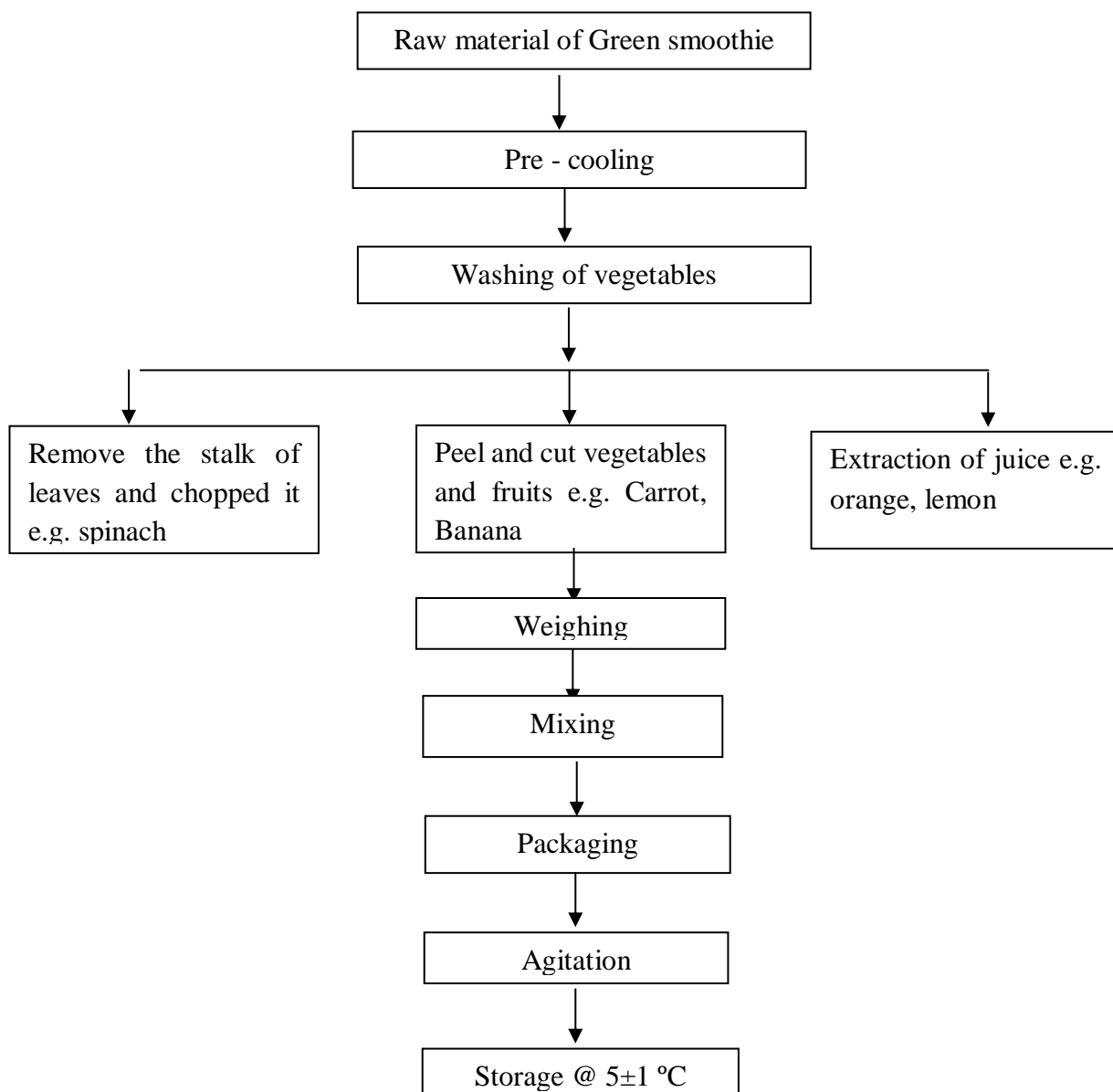
Table 1: Nutritional profile of a green smoothie (sample recipe)

[source: U.S. Department of Agriculture, Agricultural Research Service. FoodData Central, 2019-2021]

### Preparation of Smoothie

Smoothie are prepared with various fruits and vegetables but in green smoothie vegetables leads such as carrot, spinach, cucumber, bottle gourd etc.

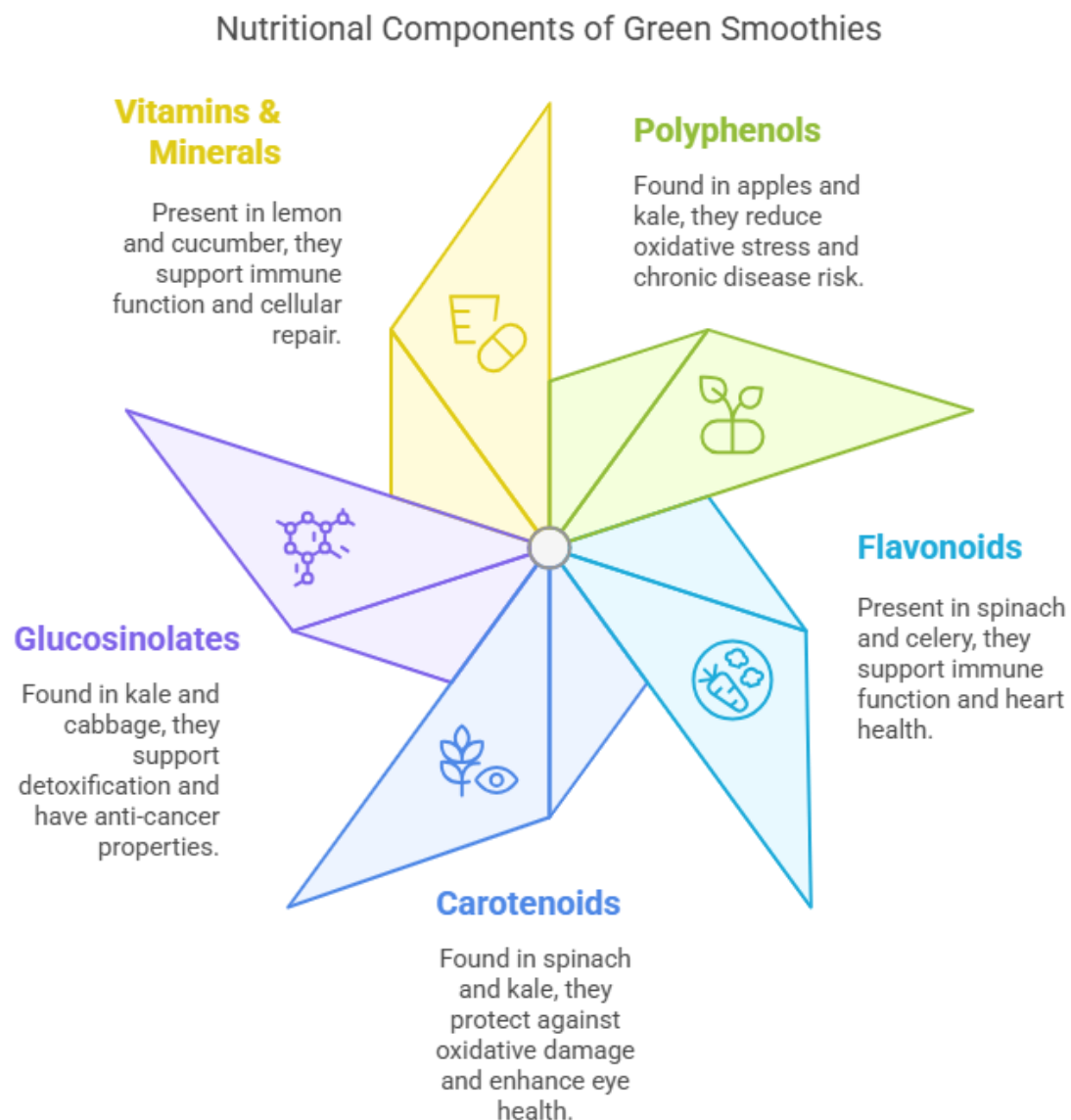
chart 1 Here a flow chart cleared the technique of smoothie preparation ( Brown, A. (2020) ).



## Bioactive Compounds in Green Smoothies

Green smoothies are nutrient-dense beverages made primarily from leafy greens, vegetables, fruits, and herbs. They provide a significant source of bioactive compounds that contribute to various health benefits, including antioxidant, anti-inflammatory, detoxifying, and disease-preventing effects. These compounds include polyphenols, flavonoids, carotenoids, glucosinolates, and essential vitamins and minerals.

**Fig 1:** Nutritional components of green smoothies



<b>Ingredient</b>	<b>Bioactive Compound</b>	<b>Health Benefits</b>	<b>References</b>
Spinach	Flavonoids, Carotenoids (Lutein, Zeaxanthin), Vitamin C	Antioxidant, eye health, anti-inflammatory	(Kim et al., 2019)
Kale	Glucosinolates, Flavonoids, Vitamin K	Detoxification, anti-cancer, heart health	(Fahey et al., 2015)
Parsley	Apigenin, Luteolin, Vitamin C	Anti-inflammatory, immune-boosting	(Pereira et al., 2020)
Celery	Phthalides, Flavonoids	Blood pressure regulation, anti-inflammatory	(Luo et al., 2021)
Cucumber	Cucurbitacins, Flavonoids	Hydration, anti-diabetic, digestive aid	(Goyal et al., 2019)
Ginger	Gingerols, Shogaols	Anti-nausea, anti-inflammatory, digestive health	(Zick et al., 2008)
Lemon	Vitamin C, Hesperidin, Flavonoids	Antioxidant, immune-boosting, skin health	(Milind & Dev, 2012)
Apple	Quercetin, Catechins, Pectin	Heart health, gut health, anti-inflammatory	(Boyer & Liu, 2004)

Table 2: Bioactive Compounds in Common Green Smoothie Ingredients

### **Health Benefits of Green Smoothies**

Green smoothies offer a wide range of health benefits due to their rich content of bioactive compounds, including antioxidants, anti-inflammatory agents, and fiber. These compounds collectively contribute to improved overall health and disease prevention.

One of the primary benefits of green smoothies is their antioxidant protection. Oxidative stress, which results from an imbalance between free radicals and antioxidants in the body, is a major contributor to aging and the development of chronic diseases. The antioxidants in green smoothies, such as flavonoids, carotenoids, and vitamin C, help reduce oxidative damage. Flavonoids like quercetin and kaempferol, found in spinach and kale, exhibit strong free radical scavenging properties, reducing cellular damage and inflammation (García-Lafuente et al.,

2009). Similarly, carotenoids such as lutein and beta-carotene protect cells from oxidative stress and support skin and eye health (Krinsky & Johnson, 2005).

Green smoothies also exhibit anti-inflammatory properties, which play a crucial role in reducing the risk of chronic diseases such as arthritis, diabetes, and cardiovascular conditions. Bioactive compounds such as apigenin, found in parsley, and gingerols, present in ginger, have been shown to modulate inflammatory pathways by inhibiting the production of pro-inflammatory cytokines (Zhang et al., 2017). These anti-inflammatory effects help reduce systemic inflammation and support overall health.

The consumption of green smoothies can significantly benefit cardiovascular health. Ingredients such as celery and apples contain flavonoids and phthalides, which have been associated with lower blood pressure, improved cholesterol levels, and enhanced blood vessel function. Flavonoids in apples, such as epicatechin, improve endothelial function and reduce the risk of atherosclerosis, while phthalides in celery promote vasodilation, contributing to blood pressure reduction (Li et al., 2015).

Green smoothies also support detoxification and liver health. Cruciferous vegetables like kale contain glucosinolates, which are broken down into bioactive compounds such as sulforaphane. Sulforaphane activates phase II detoxification enzymes in the liver, aiding in the removal of harmful toxins and carcinogens from the body (Traka & Mithen, 2009). Regular consumption of glucosinolate-rich smoothies may therefore enhance the body's natural detoxification processes.

Another notable benefit of green smoothies is their role in eye and skin health. Carotenoids such as lutein and zeaxanthin, found in spinach and kale, contribute to eye protection by filtering harmful blue light and reducing the risk of age-related macular degeneration (Moeller et al., 2000). Additionally, these carotenoids, along with vitamin C, support skin health by reducing oxidative stress and promoting collagen synthesis, thereby preventing premature skin aging (Pérez-Sánchez et al., 2018).

Lastly, green smoothies promote digestive health and support a balanced gut microbiome. Prebiotic fibers such as pectin, found in apples, act as a food source for beneficial gut bacteria, enhancing gut microbiota diversity and promoting digestive health (Slavin, 2013). Hydrating ingredients like cucumber further support digestion by maintaining water balance and preventing constipation.

### **Commercial aspects**

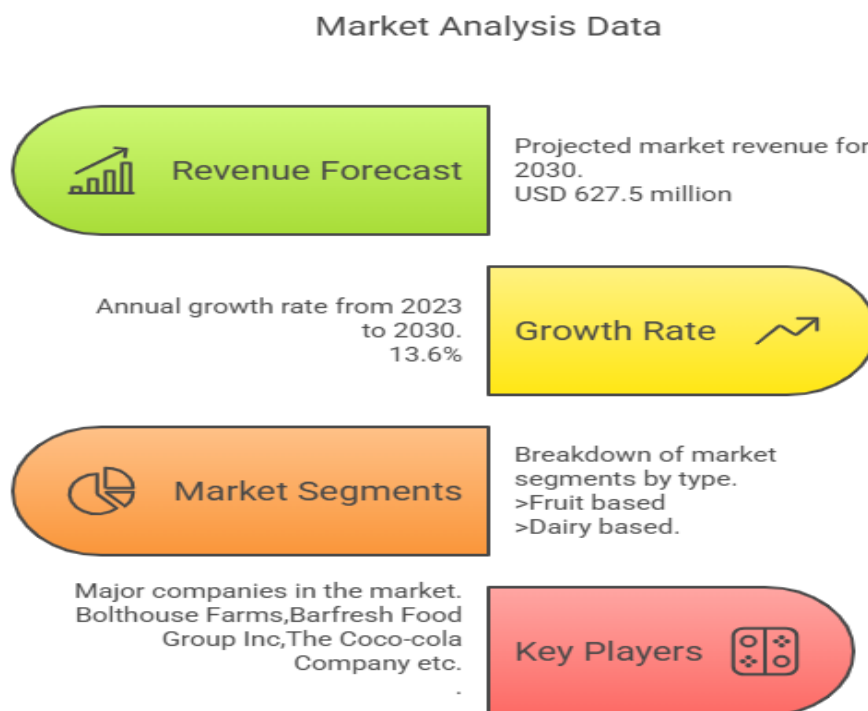
The purpose of the Horizon Databook is to provide a thorough manual for navigating this industry. The Databook focusses on global and regional market statistics expressed as revenue, year-over-year growth, and CAGR. Companies and investors can create strategic landscapes with the aid of a thorough competitive and potential analysis of the smoothie market. In 2023, the largest segment was fruit-based, accounting for 51.62% of total revenue. The Indian smoothie market has been divided into two segments by Horizon Databook: fruit-based

and dairy-based. The study covers the revenue growth of each sub-segment from 2017 to 2030. Due to growing knowledge of nutrition and health, smoothies have become more and more popular in India, especially in urban areas. Many consumers are looking for quick and wholesome food options, and the abundance of fresh produce has made it simpler for people to include smoothies in their regular diets. Additionally, a number of beverage companies are launching cutting-edge, healthful drinks that are especially designed for Indian consumers. For example, Parle Agro, a beverage firm based in India, announced the release of fruit yoghurt smoothies in February 2023. Guava chilli, banana rum, and mixed berry flavours are among the varieties.

**The smoothie premix industry offers significant commercial opportunities:**

In Market Growth Potential the global smoothie premix market is projected to reach \$5 billion by 2028, driven by health-conscious consumers (Global Market Insights, 2023). In Retail and E-commerce Expansion online marketplaces such as Amazon, Flipkart, and specialty health stores are key distribution channels (Singh & Gupta, 2023). In Private Label and Brand Development many companies are launching private-label smoothie premixes to compete with established brands (Forbes, 2022). In Foodservice Industry cafés, gyms, and health clubs are incorporating smoothie premixes into their offerings to cater to on-the-go consumers (BusinessWire, 2023). In Export Opportunities With increasing international demand, Indian manufacturers are tapping into global markets, particularly in the U.S. and Europe (Sharma & Mehta, 2022)

**Fig 2** : Revenue, Growth rate, and market



**Table 3** : Smoothies market data book summary (Horizon Databook 2024)

Market revenue in 2023	USD 256.3 million
Market revenue in 2030	USD 627.5 million
Growth rate	13.6% (CAGR from 2023 to 2030)
Largest segment	Fruit-based
Fastest growing segment	Dairy-based
Forecast period	2024 - 2030
Market segmentation	Fruit-based, Dairy-based
Key market players worldwide	Bolthouse Farms, Barfresh Food Group Inc, The Hain Celestial Group Inc, The Coca-Cola Company, Jamba Juice, MAUI WOWI HAWAIIAN COFFEES & SMOOTHIES, Smoothie King, Suja Life, Tropical Smoothie Cafe

### Future Scope of Smoothie in India

In Herbal and Ayurvedic Infusions for added health advantages, smoothie premixes that include traditional Indian herbs like moringa, ashwagandha, and turmeric. For Local Superfoods including native ingredients such as coconut, amla, jamun, and millets to satisfy Indian dietary needs and palates. Options That Are Accessible and Affordable such as cost-effective premixes are being developed to satisfy price-conscious customers in both urban and rural locations. In Growth of Direct-to-Consumer (DTC) Brands with E-Commerce expansion of internet sales channels, increasing the availability of smoothie premixes throughout India. For Regulatory Improvements tighter laws governing food safety and quality assurance procedures to guarantee product genuineness and customer confidence and in sustainability initiatives using recycled materials to reduce food waste and placing more of an emphasis on biodegradable packaging

### Conclusion

Green smoothies can improve the daily diet and make a substantial contribution to the total amount of fruits and vegetables consumed. They frequently include a variety of healthy ingredients, particularly when made fresh. However, from a nutritional perspective, it should be mentioned that fruit-rich smoothies in particular have high natural sugar content, which contributes to a substantial energy consumption. When utilising the ingredients, care should be given to ensure their freshness and adherence to proper kitchen cleanliness. In order to prevent both an imbalanced nutritional supply and a long-term high intake of potentially dangerous compounds, it is typically advised to utilise a variety of fruits, vegetables, and other plants, or parts of them. From a market perspective, India has a huge and attractive market, according to research such as the Horizon Databook smoothie industry, where fruit-based smoothies accounted for the largest sector in 2023 with a revenue share of 51.62%. In addition to

analysing the revenue growth of each sub-segment from 2017 to 2030. Polaris market research analysis also assessed the size of the global smoothie industry, which is expanding annually. Therefore, in the current environment, where people are gravitating towards foods like smoothies due to their wholesomeness and nutritional benefits, they also view the smoothie market as a business potential and attempt to seize the chance in the smoothie sector.

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