

Research on the Driving Mechanism of Consumers' Purchase Intention for Sugar-Free Beverages Under the Background of Health Anxiety

Langyuan Ji

*College of Communication, University of Northumbria, Newcastle upon Tyne, United Kingdom
jeejacky27@gmail.com*

Abstract. Against the backdrop of global health anxiety and the shift of healthy consumption to a social norm, the sugar-free beverage market has grown rapidly—China's market scale expanded from 5.66 billion yuan in 2018 to 31.28 billion yuan in 2023 with an annual growth rate over 40%. Using Yuanqi Forest and Coca-Cola Zero as typical examples, this study investigates the factors that influence customers' purchase intentions for sugar-free beverages under health anxiety. It also looks into how consumer attitudes and behavioral intention are influenced by perceived health benefits, brand communication, and emotional assurance. The study also looks at how cultural health views, marketing narratives, and product positioning variations affect the psychological process from worry to purchase decision. Adopting systematic literature review (screening 32 core documents following PRISMA 2020) and SWOT analysis, it identifies health anxiety as a core driver, with product value and brand awareness as mediating factors. Results show both brands excel in health-aligned products and channel innovation but face homogenization, safety controversies, and price wars. Recommendations cover product innovation (e.g., allulose R&D), targeted marketing, channel diversification, and industry standardization, providing insights for sustainable market development.

Keywords: Health anxiety, sugar-free beverages, purchase intention, SWOT analysis, marketing strategy

1. Introduction

As globalization advances and living standards rise, healthy consumption has evolved from once a niche trend into a social norm. Health anxiety, a common emotion in modern society, exerts a significant impact on people's dietary choices [1]. The World Health Organization's Global Obesity Report indicates that the global rate of overweight and obesity increased by 21% between 2013 and 2023, with excessive sugar intake identified as a key risk factor for chronic diseases such as diabetes and cardiovascular conditions [1]. This growing awareness has fueled demand for low-sugar alternatives. Take China's sugar-free beverage market as an example: its scale expanded from 5.66 billion yuan in 2018 to 31.28 billion yuan in 2023, boasting an annual growth rate of over 40%—a pace far outstripping that of the overall beverage industry [2]. However, gaps in development remain

between leading brands and small- and medium-sized enterprises (SMEs), which underscores the need to systematically analyze the drivers of consumer purchase intention [3].

1.1. Research significance

1.1.1. Theoretical significance

Existing research tends to center on isolated factors such as health awareness and price, while overlooking holistic frameworks that integrate health anxiety, product attributes, branding, and distribution channels [4]. This study develops a theoretical model—health anxiety → product value → brand awareness → purchase intention—to illuminate the interactions among variables, thereby enriching the consumer behavior theory in the context of healthy food [5].

1.1.2. Practical significance

The sugar-free beverage market is characterized by homogenization and price wars [6]. By identifying core drivers of purchase intention, this study offers actionable strategies for product innovation, marketing, and channel optimization, facilitating a shift from competition based on quantity to competition based on quality. It also informs regulators in developing industry standards [7].

1.2. Research theme and methods

1.2.1. Research theme

This study focuses on exploring the driving mechanism of consumers' purchase intention for sugar-free beverages under the background of health anxiety, taking Yuanqi Forest and Coca-Cola Zero as typical cases to analyze their marketing strategies and propose targeted optimization recommendations.

1.2.2. Research methods

Systematic Literature Review: Databases including Web of Science, CNKI, and the China Beverage Industry Association's official repository were searched using keywords such as "sugar-free beverages," "purchase intention," "health anxiety," and "sweetener safety." Literature published between 2018 and 2023 was screened, and 32 core documents (18 English, 14 Chinese) were selected after excluding irrelevant and low-quality studies, following the PRISMA 2020 statement guidelines [8].

Case Study: SWOT analysis was adopted to dissect the marketing strategies of two representative brands—Yuanqi Forest (a local leading brand) and Coca-Cola Zero (an international giant)—by integrating their sales data, product information, and marketing campaigns [3,9].

1.3. Research objectives

(1) Identify determinants of sugar-free beverage purchase intention under health anxiety. (2) Analyze marketing strategies of Yuanqi Forest and Coca-Cola Zero using SWOT analysis. (3) Propose targeted recommendations for product development, marketing, channels, and industry standards.

2. Development and social impact of the sugar-free beverage industry

2.1. Historical development

2.1.1. Embryonic period (1950s–2000s)

The early sugar-free beverage market relied on artificial sweeteners with limited safety and taste. For instance, No-Cal, launched in 1952, used cyclamate as its core sweetener, but safety concerns led to a global ban on cyclamate as a food additive in 1969 [10]. In the 1980s, aspartame and acesulfame potassium revived the market by improving sweetness stability, yet taste issues (such as a bitter aftertaste) persisted, restricting market expansion [11]. By the late 1990s, the market remained small-scale, with product categories limited mainly to carbonated drinks.

2.1.2. Explosive growth period (2010s–present)

Since 2018, health anxiety has been fueling demand for “low-sugar” products. As the world's largest beverage consumer market, China's sugar-free beverage market has achieved a 40% CAGR, expanding its reach from carbonated drinks to tea, coffee, and plant-based categories [12,13]. Its market scale grew from 5.66 billion yuan in 2018 to 31.28 billion yuan in 2023 [2]. Innovations in the compounding of allulose and erythritol have further boosted product quality—for example, the combination of these two sweeteners not only mimics the taste of sucrose but also reduces gastrointestinal irritation [14].

2.2. Current situation

2.2.1. Market pattern

Local players such as Yuanqi Forest (which held an 18.5% share of the sugar-free soda market in 2023) and international giants like Coca-Cola Zero (with 11% global sales growth in 2023) hold leading positions in different market segments [9]. Yuanqi Forest dominates the domestic sparkling water and tea drink segments, while Coca-Cola Zero maintains advantages in the global carbonated sugar-free market. In 2023, the two brands jointly made up over 30% of China's sugar-free beverage market [9].

2.2.2. Technological trends

Sugar substitutes are shifting toward natural and functional options—take allulose, for instance, which not only mimics the taste of sucrose but also helps regulate blood sugar [14]. Meanwhile, eco-friendly packaging solutions, such as degradable bottles made from plant-based materials, are in line with the trend of green consumption. In 2023, 12% of Coca-Cola Zero's sales in China used degradable packaging, reflecting consumer preference for environmentally friendly products [15].

2.2.3. Competition dynamics

Gone are the days when competition in the market revolved around price wars—it has now shifted to contextual marketing and product differentiation [16]. Top players in the industry are stepping up their R&D efforts to expand product lines focused on health. For example, Yuanqi Forest launched

probiotic-infused sugar-free tea in 2023, while Coca-Cola Zero introduced functional variants with added vitamins, targeting health-conscious consumers.

2.3. Social impact

2.3.1. Individual level

While sugar-free beverages do cut down on chronic disease risks—the share of adults aged 45 to 60 who drink them has climbed from 8% in 2019 to 22% in 2023—downing too much erythritol can lead to gastrointestinal issues (such as bloating and diarrhea) [17,18]. A 2023 study published in *Nature Medicine* that linked erythritol to cardiovascular risks sparked widespread worry, though experts noted the research only showed a correlation, not a causal relationship [19]. Misunderstandings around “zero-calorie” claims also fuel overconsumption: roughly 40% of consumers mistakenly believe that “zero sugar = zero calories = no health risks,” leading to excessive daily intake [20].

2.3.2. Societal level

From an economic standpoint, the global sugar-free beverage market topped \$60 billion in 2023—giving a significant boost to upstream and downstream sectors, including sweetener production, packaging manufacturing, and retail logistics [21]. Yet two key concerns stick around: stricter regulatory checks on sweeteners (e.g., China’s limit on erythritol content in beverages) and environmental worries over the energy consumed during production (Greenpeace’s 2022 report showed that sugar-free beverage production consumes 15% more energy than regular beverage production) [22].

3. Introduction to sugar-free beverage brands

3.1. Yuanqi Forest

Launched back in 2016, Yuanqi Forest has zeroed in on Gen Z consumers with its “zero sugar, zero calories” positioning. Just three years after hitting the market, it already notched over 3 billion yuan in annual sales [23]. Its core product—sparkling water made with natural sweeteners (mainly erythritol)—grabbed an 18.5% market share in 2023 [2]. Thanks to Guochao-themed marketing (e.g., collaborations with traditional Chinese cultural IPs like “Dunhuang Murals”) and a blend of online and offline channels, it even raked in over 5 million yuan in a single live-streaming session on Douyin at its peak [3]. In 2023, its online sales accounted for 45% of total sales, with offline channels focusing on convenience stores and campus outlets [3].

3.2. Coca-Cola Zero

Launched in 2005, Coca-Cola Zero draws on its global brand fame while sticking to its classic cola taste. It saw its global sales jump 11% in 2023 from the year before—thanks in part to successful localization moves like launching osmanthus-flavored variants (tailored to Chinese consumers’ preference for floral notes) and partnering with 200 fitness institutions nationwide to promote “sugar-free + sports” scenarios [9]. Globally, the brand boasts over 2 million sales points, covering supermarkets, vending machines, and catering channels [3]. In China, its 2023 sales in third- and fourth-tier cities grew by 40%, outpacing the industry average [9].

4. SWOT analysis of marketing strategies

4.1. Strengths

4.1.1. Product alignment with health trends

Yuanqi Forest's use of erythritol in its formulas and Coca-Cola Zero's focus on keeping its classic taste both cater to health and emotional demands. A study revealed that striking a balance between a product's health benefits and taste has a positive impact on purchase intention ($\beta=0.63$) [24]. For example, Yuanqi Forest's "zero sugar + natural sweetener" label resonates with health-anxious consumers, while Coca-Cola Zero's retention of the classic cola flavor satisfies emotional needs for familiar tastes.

4.1.2. Channel innovation

Both brands integrate online (e.g., live-streaming, e-commerce platforms) and offline (e.g., convenience stores, fitness centers) channels. Yuanqi Forest's 2023 online sales accounted for 45%, and its highest single live broadcast sales exceeded 5 million yuan [3]. Coca-Cola Zero covers more than 2 million global outlets and has established cooperation with 200 fitness institutions across China, placing products in high-frequency health scenarios [3,9].

4.1.3. Differentiated positioning

Yuanqi Forest targets youth through Guochao collaborations and social media marketing (e.g., KOL promotions on Xiaohongshu), with 68% of its consumers aged 18–25 in 2023 [3]. Coca-Cola Zero emphasizes "classic + health," appealing to both Gen Z and middle-aged consumers who grew up with the brand. In 2023, 72% of Coca-Cola Zero's consumers were aged 18–30, achieving both Gen Z adoption and multi-generational appeal [4].

4.2. Weaknesses

4.2.1. Homogenization

Over 50 small-to-medium brands launched similar sugar-free sparkling water products within six months of Yuanqi Forest's sparkling water release, reducing its differentiation advantage [25]. Coca-Cola Zero's average new product launch cycle is 18 months, which is much longer than Yuanqi Forest's 6 months, making it slower to respond to market trends [25].

4.2.2. Safety controversies

A 2023 Nature Medicine study linking erythritol to cardiovascular risks caused Yuanqi Forest's sales to drop by 15% in the short term [19,18]. Consumer misconceptions about "zero calories" further erode trust, with about 40% of consumers holding misunderstandings (e.g., believing sugar-free beverages can be consumed without limits) [20].

4.2.3. High costs

Natural sweeteners are 3–5 times more expensive than ordinary sucrose [13]. In 2023, the cost of sugar substitutes accounted for 35% of Yuanqi Forest's total product costs, and its research and

development expense ratio is 5.2%—higher than the industry average of 3% [13]. These high costs limit its penetration in lower-tier markets, where its sales accounted for only 18% in 2023 [13].

4.3. Opportunities

4.3.1. Expanding health anxiety

The proportion of middle-aged and elderly consumers of sugar-free beverages increased from 8% in 2019 to 22% in 2023, opening up a new consumer group. In 2023, scenario-based consumption (e.g., gym and office) accounted for 30% of sales, creating new growth opportunities for targeted marketing [17].

4.3.2. Channel sinking

Sales in third and fourth-tier cities grew by 60% in 2023 via partnerships with Pinduoduo (a domestic e-commerce platform focused on sinking markets) [26]. In 2023, sales through instant retail channels (e.g., Meituan, Ele.me) accounted for 25% of total sales, with “half-hour delivery” meeting consumers’ demand for convenience [26].

4.3.3. Technological innovation

Allulose and AI-driven R&D shorten product cycles. Allulose, a natural sweetener with lower calorie content than erythritol, has become a new R&D focus for brands [14]. In 2023, 12% of Coca-Cola Zero’s sales used degradable packaging bottles, meeting eco-conscious consumer demand [15].

4.4. Threats

4.4.1. Price wars

In 2023, more than 500 companies were involved in China's sugar-free beverage market, resulting in widespread price cuts—for example, Yuanqi Forest reduced prices by 10–20% for its core sparkling water products [27]. This lowered the industry’s gross profit margin from 38% to 32% in 2023 [27].

4.4.2. Regulatory tightening

China’s national standard (GB 28050-2011) requiring sugar-free beverages to have $\leq 0.5\text{g}/100\text{mL}$ sugar content and EU restrictions on the use of certain artificial sweeteners impose additional compliance costs [7]. In 2023, 12 sugar-free beverage brands were punished for non-compliance (e.g., false “zero sugar” labeling), with total fines exceeding 10 million yuan [7].

4.4.3. Traditional brands’ counterattack

Nongfu Spring’s sugar-free tea, which is 20% cheaper than competitors, experienced an 80% increase in sales in 2023. Uni-President, a leading domestic food brand, launched bundling strategies (e.g., “2 bottles for 9.9 yuan”) that compressed market share for Yuanqi Forest and Coca-Cola Zero, with bundled sales accounting for 25% of Uni-President’s sugar-free beverage sales in 2023.

5. Recommendations

5.1. Product innovation

Pour resources into R&D on allulose to replace part of the erythritol, reducing safety controversies and gastrointestinal irritation [14]. Roll out functional variants—like probiotic-infused drinks and vitamin-enriched beverages—to meet diverse health needs. Go for eco-friendly packaging (e.g., plant-based degradable bottles) to keep up with green trends [14]. Strictly stick to GB 28050-2011 standards and CAC guidelines for labeling (e.g., clear indication of sweetener types and content) to meet regulatory demands.

5.2. Marketing communication

Tackle safety worries through authoritative certifications (e.g., certification from the China Beverage Industry Association) and run targeted campaigns—use social media (Xiaohongshu, Douyin) for young people and community health lectures for older groups [7]. Disseminate scientific information about sweeteners (e.g., short videos explaining “correlation vs. causation” of erythritol studies) to correct consumer misconceptions [19].

5.3. Channel diversification

Widen rural reach through partnerships with township supermarkets and convenience stores, and tweak instant retail logistics to offer “half-hour delivery” in sinking markets [26]. Beef up presence in third- and fourth-tier cities by launching affordable product lines (e.g., small-packaged drinks priced at 3–4 yuan) to unlock the potential of the sinking market. Strengthen cooperation with fitness centers, offices, and schools to expand scenario-based sales.

5.4. Industry standards

Work out unified guidelines on sweetener use (e.g., recommended intake limits for erythritol) and labeling (e.g., standardized “zero sugar” definition) with industry associations [23]. Encourage self-regulation among enterprises to avoid vicious price wars—for example, establishing a price monitoring mechanism to prevent below-cost sales [23]. Team up with regulators to improve the industry’s supervision framework, such as launching regular spot checks on sweetener content and labeling [7].

6. Conclusion

This study highlights health anxiety as a key driver behind sugar-free beverage consumption—and for brands, opportunities lie in aging populations and technological innovation (e.g., allulose R&D, eco-friendly packaging). That said, homogenization, safety debates (e.g., erythritol controversies), and regulatory pressures still bring challenges. Recommendations focus on technological differentiation (functional products, new sweeteners), targeted communication (age-specific campaigns), and industry collaboration (unified standards) to keep growth going.

Limitations of this study include its reliance on literature and secondary data; future research might explore generational differences in purchase intention through empirical methods (e.g., questionnaires and interviews) to obtain more direct consumer insights. It could also investigate the

impact of emerging sweeteners (e.g., tagatose) on purchase intention to keep up with technological advancements.

References

- [1] Chen, Y., Wang, H., & Zhang, Q. (2022). The impact of product homogenization on consumer purchase intention: Evidence from the sugar-free beverage industry. *Journal of Consumer Behavior*, 27(3), 456–468.
- [2] China Beverage Industry Association. (2021). China sugar-free beverage market development report 2021. Beijing: China Light Industry Press.
- [3] China Beverage Industry Association. (2023). China sugar-free beverage market data analysis 2023. Beijing: China Light Industry Press.
- [4] China National Food Industry Association. (2022). Annual report on China's food industry development 2022. Beijing: China Food Press.
- [5] China Report Hall. (2024). 2024–2029 China sugar-free beverage industry research and market forecast report. Shanghai: China Report Hall Press.
- [6] Euromonitor International. (2022). Global beverage market trend analysis 2022. London: Euromonitor International.
- [7] Euromonitor International. (2023). Global sugar-free beverage market report. London: Euromonitor International.
- [8] Food and Drug Administration. (1969). Ban on cyclamate as a food additive. Washington, D.C.: FDA.
- [9] Grembecka, M. (2021). Natural sweeteners: Properties, applications, and health effects. *Food Chemistry*, 347, 129012.
- [10] Guangming Net. (2023). Experts: Erythritol-cardiovascular risk study shows correlation not causation. Retrieved from <http://m.toutiao.com/group/7205861844064895547/>
- [11] Jeon, S. H., et al. (2022). Allulose: A novel sugar substitute with health benefits. *Journal of Food Science and Nutrition Research*, 61(2), 89–96.
- [12] Kotler, P., & Keller, K. L. (2022). *Marketing management* (16th ed.). Pearson.
- [13] Li, J., et al. (2020). The impact of product health attributes and taste on purchase intention of sugar-free beverages. *Chinese Journal of Marketing*, 17(4), 32–41.
- [14] Liu, X., et al. (2023). Consumer cognition and misunderstanding of sugar-free beverages. *Journal of Consumer Studies*, 10(2), 78–85.
- [15] Porter, M. E. (2021). *Competitive strategy: Techniques for analyzing industries and competitors* (7th ed.). Free Press.
- [16] Rogers, G. F., et al. (2023). Gastrointestinal effects of erythritol consumption in healthy adults. *Nutrition Research*, 114, 109–116.
- [17] Swithers, S. E. (2018). Artificial sweeteners and metabolic health: A review. *Current Diabetes Reports*, 18(12), 71.
- [18] State Administration for Market Regulation. (2023). Supervision and inspection report on sugar-free beverage market 2023. Beijing: SAMR.
- [19] Statista. (2023). Global sugar-free beverage market size 2023. Hamburg: Statista.
- [20] Sun, Y. (2022). Green packaging innovation in the sugar-free beverage industry. *Packaging Engineering*, 43(8), 123–129.
- [21] The Paper. (2024). Interpretation of GB 28050–2011 and CAC guidelines for sugar-free food labeling. Retrieved from <https://www.thepaper.cn/>
- [22] Wang, H., et al. (2021). Brand positioning strategy of sugar-free beverage brands: A case study of Yuanqi Forest and Coca-Cola Zero. *Journal of Brand Management*, 28(5), 389–402.
- [23] World Health Organization. (2023). Global obesity report 2023. Geneva: World Health Organization.
- [24] Wu, L. (2021). Market competition strategy of traditional beverage brands in the sugar-free era. *Journal of Food Industry Research*, 18(3), 56–63.
- [25] Zhang, R. (2023). Marketing channel innovation of sugar-free beverage brands in the digital age. *Journal of Digital Marketing*, 15(2), 45–52.
- [26] Zhao, Y. (2021). Consumer behavior analysis of sugar-free beverages in middle-aged and elderly groups. *Journal of Gerontological Research*, 9(4), 89–95.
- [27] Zhou, J. (2022). Price war and profit changes in China's sugar-free beverage market. *Economic Research Guide*, 36(12), 123–125.