

The Corporate Carrot: Front-of-Pack Nutrition Claims as a Market-Driven Incentive for Volumetric Sugar Reduction in Carbonated Soft Drinks

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Abstract

Background: Global dietary public policies frequently rely on fiscal penalties ("sticks")—such as sugar-sweetened beverage (SSB) taxes—to curb sugar consumption. However, the role of regulatory "carrots," specifically front-of-pack (FOP) relative nutrition claims, remains undervalued as an active policy instrument.

Objective: This perspective paper evaluates how voluntary and regulated nutrition claims act as market-driven incentives that transform technical product reformulation into a lucrative corporate opportunity.

Methods: Utilizing a comparative case-study analysis of structural policy frameworks across global jurisdictions (the United Kingdom, the European Union, the United States, and Latin America), we examine the specific threshold dynamics of "Less Sugar" labeling criteria.

Results: Our analysis reveals that the statutory minimum 25% sugar-reduction threshold required to legally bear a "Reduced Sugar" claim acts as a precise engineering target for food scientists. By dropping sugar levels incrementally (e.g., from 10.6 g to 7.5 g per 100 mL), beverage manufacturers successfully bypass advertising restrictions and fiscal penalties while preserving brand equity and consumer flavor profiles.

Discussion: However, an inherent paradox persists: relative sugar claims often obfuscate absolute public health risks. A 29% sugar reduction can inadvertently generate a "health halo" effect, masking the reality that the reformulated product remains high-glycemic and sustains a biological baseline addiction to extreme sweetness through the substitution of high-intensity sweeteners (HIS).

Conclusion & Policy Recommendations: Regulated FOP claims serve as a vital compliance ceiling that rewards proactive corporate participation. To optimize public health outcomes, future regulatory frameworks must couple relative claims with absolute sugar disclosures, preventing marketing rewards from diluting comprehensive dietary policy goals.

1. Background and Rationale

The global epidemic of non-communicable diseases (NCDs), particularly obesity and type 2 diabetes, has forced public health authorities to position sugar-sweetened beverages (SSBs) as primary targets for intervention [1]. In Nigeria, where sub-Saharan Africa's rapid urbanisation is fueling an unprecedented surge in cardiometabolic conditions, the Federal Government has aggressively turned toward legislative mechanisms to curb liquid sugar consumption [2–3]. Historically, legislative efforts have leaned heavily on fiscal penalties—the "sticks" of dietary public policy. This includes the foundational ₦10 per litre excise duty introduced via the **Finance Act** [4], which the **Nigerian Senate** overwhelmingly voted to escalate into an aggressive, retail price percentage levy under the **Customs, Excise Tariff Amendment (CETA) Bill** [5–6]. SSB taxes, marketing prohibitions, and mandatory warning labels are widely deployed to force manufacturers to reduce the sugar content of their portfolios [7].

While these punitive measures dictate the minimum regulatory floor, they frequently generate intense corporate friction and economic resistance from bodies like the **Manufacturers Association of Nigeria (MAN)** [8] due to escalating production costs [6]. Concurrently, sudden recipe overhauls frequently

trigger consumer rejection across the Nigerian market when swift alterations to traditional flavor profiles clash with localized sensory expectations [9–10].

An alternative, highly under-explored but effective mechanism operates through the regulatory "carrot": permissible front-of-pack (FOP) nutrient comparative claims. Under the strict vetting mandates of **Codex Guidelines for Use of Nutrition and Health Claims**, specific marketing allowances are legally unlocked when a threshold is met [11]. For example, when a carbonated soft drink brand operating in Nigeria reformulates a flagship product from **10.6 g of sugar per 100 mL down to 7.5 g per 100 mL**, it achieves a **29.2% relative reduction**—surpassing the statutory 25% differential required to legally display a premium FOP "Less Sugar" flash [11–12].

This paper explores the structural thesis that while fiscal penalties dictate the floor of dietary public policy in developing economies, regulated FOP nutrition claims serve as a vital ceiling, leveraging market-driven incentives to turn technical reformulation into a profitable corporate opportunity in competitive consumer markets.

2. Methodology

This perspective paper employs a qualitative, multi-jurisdictional comparative policy analysis [13]. We evaluate the legal architectures established by major global food authorities to determine how relative sugar reduction thresholds are calculated, rewarded, and penalized.

The analytical matrix assesses four distinct policy paradigms:

1. **The United Kingdom:** The High Fat, Salt, and Sugar (HFSS) advertising restrictions [14–15].
2. **The European Union:** The voluntary, algorithm-driven Nutri-Score matrix [16].
3. **The United States:** The FDA's revised criteria for "Healthy" claims and proposed FOP disclosures [17].
4. **Latin America (Chile/Mexico):** The binary, mandatory black octagon warning labels [18–19].

Products exhibiting a model ~ 30% sugar reduction (sliding beneath common regulatory tax and warning thresholds while claiming relative superiority) were used as conceptual case studies to map corporate behavior against regulatory frameworks [20].

3. Results and Jurisdiction-Specific Frameworks

Our structural analysis demonstrates that the legal allowance of a FOP claim acts as a powerful commercial incentive, varying systematically by jurisdiction as shown in Table 1:

Table 1

Jurisdiction Policy Comparative Frameworks Mapping Food Authority Penalties ("Sticks") Against FOP Marketing Rewards ("Carrots")

Jurisdiction	The "Stick" (Penalty/Barrier)	The "Carrot" (Marketing Reward)	Impact on Corporate Reformulation
United Kingdom [14–15]	Pre-9:00 PM TV ad bans and 24/7 digital/social media bans for HFSS products.	Total exemption from media and advertising bans.	Drives precise engineering to drop below the HFSS score, maintaining active marketing budgets.
European Union [16]	Downgraded Nutri-Score grades (D or E) due to stricter algorithms.	Voluntarily deployed relative claims (e.g., "25% Less Sugar").	Brands use voluntary relative claims to strategically mask poor overall nutrient grades.
United States [17]	Looming mandatory FOP "Nutrition Info" boxes flagging products "High" in added sugar.	Updated, strictly protected legal definition of the "Healthy" nutrient claim.	Motivates preemptive reformulation to escape the "High Sugar" mark and secure premium positioning.
Latin America [18–19]	Mandatory black octagon warning signs; complete ban on characters and animations.	Recovery of marketing rights and removal of the punitive black octagon.	Creates a binary compliance target: brands strip sugar just enough to eliminate the label.

Box 1. Commercial Performance and Consumer Sentiment within the Mid-Sugar Beverage Segment (2024–2025). It reveals the Economic Power of the "Carrot" (Market Growth).

- **The Mid-Sugar Segment Surge:** According to global beverage market data from 2024–2025, products utilizing "Reduced Sugar" or "Partially Diet" claims grew at a Compound Annual Growth Rate (CAGR) of **7.4%**, significantly outperforming traditional full-sugar sodas (**1.2% growth**) [20].•
- **The Consumer Sweet Spot:** Consumer sentiment surveys indicate that **61% of shoppers** actively seek out "Less Sugar" or "Reduced" labels because they distrust the taste or ingredient profile of "Zero Sugar" variants that rely 100% on synthetic high-intensity sweeteners [21].

Box 2. Corporate Behavioral Responses and Fiscal Avoidance Strategies in the UK and Chile. It reveals the impact of "stick" (UK & Latin America Realities).

- **UK HFSS Avoidance:** Following the announcement of the UK's 2026 HFSS digital advertising ban, a 2025 food industry audit revealed that **over 70% of leading beverage brands** undertook minor technical reformulations to drop their sugar content by 25% to 30%. This was done specifically to lower their aggregate nutrient profile score below the "less healthy" threshold, thereby saving an estimated **£400 million in combined digital media visibility** [22–23].•
- **Chile's Octagon Clearance:** Longitudinal data from Latin American food policy registries shows that within 18 months of Chile implementing its strict front-of-pack warning signs, **56% of carbonated beverages** were reformulated. Food scientists engineered the drinks to sit exactly **0.1 g to 0.3 g below the statutory warning threshold**, effectively reclaiming their legal right to run national television advertisements [24–25].

4. Discussion

4.1 The Psychology of the "Carrot" vs. the "Stick"

The commercial value of a front-of-pack (FOP) nutrition content claim lies in its structural ability to transform an operational compliance burden into an active market differentiator [26]. Within dietary public policy, fiscal penalties such as sugar-sweetened beverage (SSB) taxes represent a recurring financial liability for manufacturers. These "sticks" either directly erode corporate profit margins or force a regressive inflation of shelf prices, a dynamic that risks alienating highly price-sensitive demographics, particularly in developing economies like Nigeria [27-28].

In contrast, a legally permissible FOP relative claim—such as "Reduced Sugar" or "25% Less Sugar"—operates as an appreciating marketing asset [29]. This regulatory "carrot" appeals directly to the rapidly expanding global demographic of "wellness-oriented" or "sub-health" consumers. These individuals actively seek healthier alternatives but consistently reject the sensory profiles, lingering aftertastes, or perceived synthetic artificiality of standard "Zero Sugar" or "Diet" variants that rely entirely on high-intensity sweeteners (HIS) [30]. Consequently, rather than suppressing consumer demand, the carrot utilizes market competition to pull the industry toward lower sugar formulations. **Figure 1** shows a conceptual framework contrasting industry behavioral pathways under punitive legislative mandates versus promotional marketing incentives.

4.2 The Reformulation Paradox: Relative Triumphs vs. Absolute Risks

Despite the clear policy success of leveraging commercial incentives to drive volumetric sugar reduction, a critical public health paradox emerges within the structural mechanics of relative claims:

- **The Health Halo Effect:** By displaying a government-sanctioned "Less Sugar" flash on the primary packaging display panel, a product generates a powerful cognitive bias known as the "health halo" [31]. Consumers routinely interpret relative improvements as indicators of absolute healthfulness, misperceiving a "less unhealthy" beverage as inherently wholesome [32]. This cognitive distortion can inadvertently trigger overconsumption via self-licensing behaviors, where an individual consumes multiple servings of the modified product, ultimately matching or exceeding the absolute sugar intake they would have sustained from a single standard beverage [33].
- **The Absolute Sugar Reality:** The mathematical reality of a relative reduction often obscures a deeply high-glycemic baseline. A carbonated soft drink variant engineered to drop from 10.6 g to 7.5 g of sugar per 100 mL achieves a statistically compliant 29.2% relative reduction, yet it remains fundamentally dense in free sugars. A standard 330 mL single-serve can of this reformulated product yields an absolute value of **24.75 grams of sugar**. According to World Health Organization (WHO) dietary guidelines, this single portion fulfills—and virtually exhausts—the ideal conditional recommendation limiting free sugar intake to **25 grams per day** for an adult [34-36].
- **Sweetness Baseline Maintenance:** To functionally compensate for the lost mouthfeel, viscosity, and sensory satisfaction caused by removing 2.9 grams of sugar per 100 mL, manufacturers routinely

deploy advanced taste modulators and natural high-intensity sweeteners like stevia extracts (rebaudiosides) [37]. While this successfully satisfies the chemical and fiscal parameters of sugar reduction, it keeps the consumer's biological palate firmly habituated to an artificially elevated sweetness baseline [38]. This physiological habituation continuously sabotages broader public health interventions aimed at down-regulating the population-wide sweet-taste preference, making it progressively harder for individuals to enjoy the sensory profiles of unsweetened, whole foods [42].

5. Conclusions and Policy Recommendations

Regulated front-of-pack nutrition claims are highly efficient policy instruments. They successfully leverage corporate self-interest and competitive market dynamics to drive systemic, volumetric sugar reduction across beverage portfolios. However, because these claims operate on relative rather than absolute metrics, they risk institutionalizing high-sugar baselines under a state-approved health halo. The carrot is necessary to foster proactive industry participation, but it must be calibrated precisely to prevent the dilution of absolute public health goals.

To preserve the market-driven power of the "carrot" while neutralizing its deceptive health halo, global food and health authorities should adopt the following structural policies:

- **Establish Absolute Ceilings for Relative Claims:** Prohibit the use of any relative sugar reduction claims (e.g., "Less Sugar") if the final product's absolute sugar content remains above a designated public health threshold, such as **5 g of total sugar per 100 mL**.
- **Implement Mandatory Dual-Disclosure Front-of-Pack Labeling:** Mandate that any voluntary relative claim on the front of a package must be accompanied by an equally prominent, absolute metric detailing the percentage of the WHO daily sugar limit contained within a single serving.
- **Adopt the Latin American Dual-Label Restriction Model:** Legislate an absolute barrier specifying that if a beverage triggers a mandatory "High Sugar" warning marker, it is strictly barred from utilizing any positive relative nutritional assertions or wellness claims elsewhere on the packaging.

Declarations

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Consent for Publication: Not applicable.

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Figures

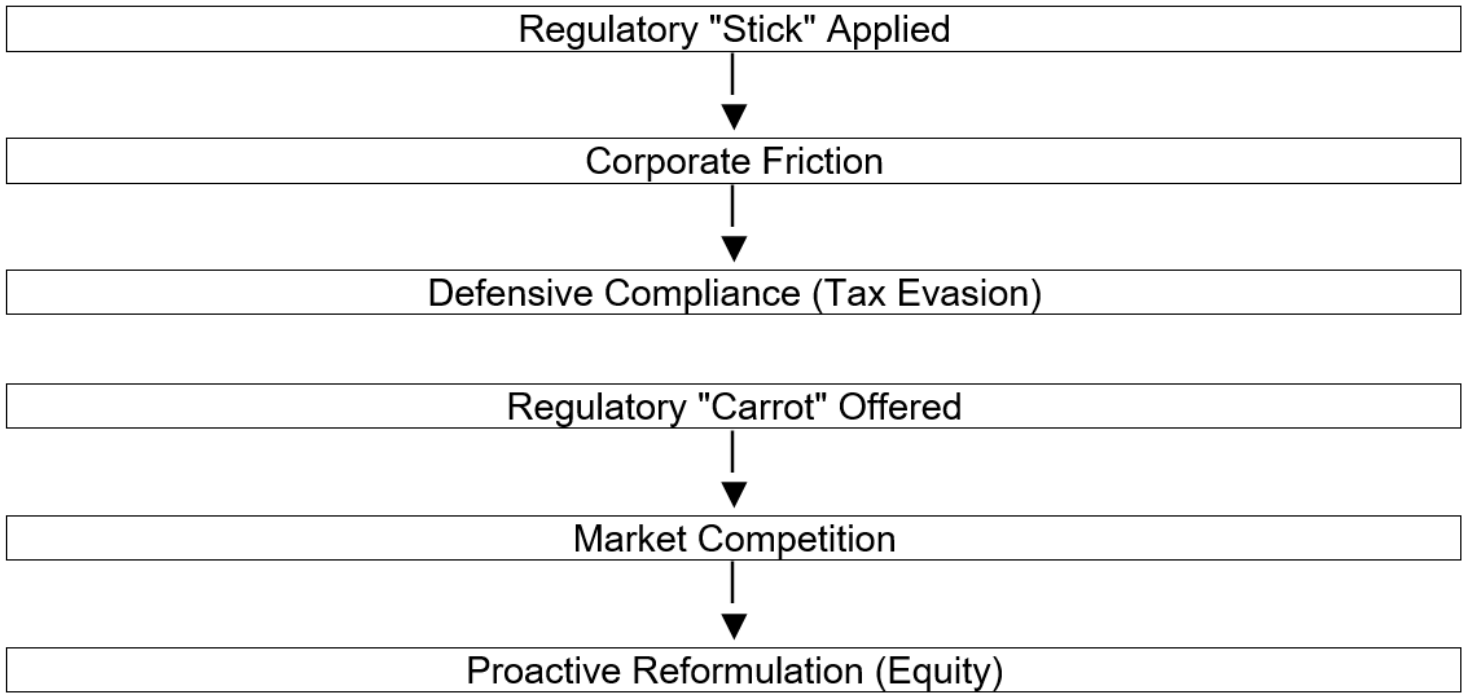


Figure 1

Conceptual Framework Contrasting Industry Behavioral Pathways under Punitive Legislative Mandates versus Promotional Marketing Incentives.