



The Effect of Low-Fat, Organic, and Sugar-Free Labels on Consumer Perception in Food and Beverage Marketing in Bangladesh

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ABSTRACT

The phenomenon of marketing foods as “low-fat”, “sugar-free”, and “organic” has had, and continues to have, profound impacts on consumer behaviors around the world, including in Bangladesh. This study aims to analyze how Bangladeshi consumers perceive such health claims and the effects these claims have on their purchasing decisions and diets. A mixed-methods approach was applied for this study which included a quantitative survey with 300 participants and qualitative interviews. Based on the results, the majority of respondents, about 68%, perceived “organic” labels as trustworthy and 52% viewed “sugar-free” as healthier, even with the possibility of artificial sweeteners. Moreover, 45% of consumers do not check any nutritional information aside from what is provided on the front label. These perceptions lead to a “health halo” effect which inaccurately inflates beliefs about the healthiness of certain products. The study emphasizes the need for greater regulation and consumer education to protect them from making misleadingly advertised products that circumvent dietary restrictions and lead to chronic illnesses such as obesity and diabetes.

Keywords: *organic food, low-fat, sugar-free, consumer perception, beverage marketing, health halo effect*

INTRODUCTION

Background of the Study

One of the recent phenomena in the global food sector is the use of health-related advertising to market processed foods. The growing rate of urbanization and disposable income, accompanied by the increased alertness of people towards health and fitness, has led to a spike in demand for packaged foods in Bangladesh. Now, people search for foods that are labeled “low fat,” “sugar free,” or “organic.” Despite the marketing strategies used in advertising these foods, there is often a mismatch between the perceived benefits consumers expect and the actual benefits that are provided. This study seeks to understand the impact of these health claims on consumer behavior in Bangladesh, a country where people are increasingly suffering from diet-related chronic diseases like diabetes and cardiovascular diseases.

Rationale of the Study

Outrageous claims about food’s health benefits could mislead consumers, which, in turn, creates a public health concern. The situation is particularly challenging in Bangladesh as the burden of non-communicable diseases (NCDs) is increasing. This emphasizes the need to investigate the extent to which health claims affect the food choices of consumers. Most works in this area focused on Western markets and ignored South Asia, particularly Bangladesh. This study aims to bridge the gap of the void by exploring how consumers in Bangladesh make sense of

Research Question

"How do 'low-fat,' 'organic,' and 'sugar-free' health claims influence the purchasing decisions and dietary habits of Bangladeshi consumers, and what are the implications for chronic disease prevention?" is the main research question.

i. Emphasis on Health Claims: Why these assertions?

- Market Prevalence: In Bangladesh, 78% of "healthy" packaged foods have these labels (BBS, 2023).

-Consumer Vulnerability: Previous research indicates that South Asians are 2.3× more likely than Europeans to misunderstand these claims (Nguyen et al., 2024).

-Health Risks: In urban Bangladesh, misinterpreted claims are associated with a 31% higher incidence of diabetes (ICDDR, B, 2023).

ii. Behavioral Aspects of Purchase Choices:

Psychological Drivers: How heuristic processing (System 1 thinking) is triggered by claims.

Economic Factors: Willingness to pay premiums (for example, 25% for "organic")

Cultural Influences: Celebrity endorsements versus collective trust in institutions.

Nutritional Practices:

Effects of Compensation: 20% calorie overconsumption with "low-fat" labels was documented.

Nutritional Literacy: According to Ahmed et al. (2024), only 12% of Bangladeshis understand what "sugar-free" means.

iii. Long-Term Illness Linkage Mechanisms Examined:

-Direct Routes:

Sugar-free → excessive use of artificial sweeteners → disturbance of the gut microbiota.

Triglyceride spikes due to low-fat → carbohydrate compensation.

-Behavioral Routes:

False statements → less label checking → unhealthy eating habits.

Research Problem

The growing use of "low-fat," "organic" and "sugar-free" labels in the food and beverage market of Bangladesh has created a critical consumer-perception issue. This study aims to explore the degree to which such nutrition-related claims impact consumer purchase choices. While such information is used to indicate healthier options, many consumers may be misled by trusting these labels more than studying the actual ingredients. The study finds that consumer trust in such claims is remarkably high, with many being unaware or unable to critically assess nutritional facts. As a result, the "health halo" effect may be deterring buyers from making rational choices and negatively impacting their well-being.

While the issue of health-based labeling is not new, little is known about how Bangladeshi consumers perceive such information. Moreover, most of the previous research has been concentrated on the Western world, where cultural and socioeconomic characteristics are considerably different. Few studies have investigated the interplay between health claims and consumer behavior in a Bangladeshi context. Specifically, the role of trust, nutritional literacy, and the presence of multiple health-related labels on packaging remains poorly understood. Thus, this article fills a gap in research by attempting to quantify the effect of low-fat, organic, and sugar-free labels on consumer choice in Bangladesh. The study is important in helping the local policymakers and food manufacturers develop effective

regulation and marketing strategies and raise consumer awareness about healthy eating habits.

Assumptions of the Study

The study is based on the following assumptions:

1. Consumers are capable of forming perceptions from food labels.

It is assumed that Bangladeshi consumers have the perceptual capacity to read health-related claims, such as 'low-fat', 'organic', and 'sugar-free', on packaged food and beverage products.

2. Health-related labels influence consumer perception.

The study assumes that health-oriented labeling provides consumers with information that can inform their perceptions of the healthiness, quality, and nutritional value of a product.

3. Consumer perceptions are relevant to purchasing decisions.

We assume that consumer perceptions, levels of trust in the claims, and their impact on the evaluation of the healthiness, quality, and nutritional value of a product are relevant to their food and beverage purchasing decisions. This assumption is consistent with the study's objective of examining the influence of health claims on purchasing behavior.

4. Consumers differ in their ability to interpret nutritional claims.

We assume that nutritional literacy is not universal, and differences in educational qualifications, income, age, and place of residence can impact the ability of Bangladeshi consumers to interpret and verify health claims. The methodology of the study considers the influence of socioeconomic and demographic factors on consumer responses.

5. Front-of-package claims can serve as decision-making cues.

We assume that consumers can use prominent front-label claims as simplified information cues, especially when they do not scrutinize the nutritional label. This is the underlying assumption for examining the "health halo" for the selected claims.

6. Consumer responses can be measured through self-reported information.

The study assumes that respondents can provide reliable information about their perceptions, label-reading practices, and purchasing-related behaviors, including the use of front labels as decision-making cues, through structured questionnaires and interviews. Both quantitative and qualitative methods will be used to obtain a comprehensive understanding of consumer responses to health-related labels.

7. The selected consumer sample provides meaningful information about the study population.

We assume that the sample of adult consumers who buy packaged foods can provide meaningful information about the study population, namely, Bangladeshi consumers. The study sample includes both urban and rural respondents and represents a spectrum of socioeconomic groups.

8. The meanings of the selected labels are sufficiently recognizable to consumers.

We assume that the terms 'low-fat', 'organic' and 'sugar-free' are sufficiently recognizable by the selected sample of consumers to investigate their comparative perceptions and purchasing responses.

9. The consumer decision process is influenced by both informational and psychological factors.

We assume that consumers do not always evaluate health claims on food and beverage products through a detailed consideration of the information provided on the nutritional label. Trust in the claims, their perceived health benefits, and simplified decision cues, such as prominent front-label claims, can also influence their responses. This is the underlying assumption for applying the theoretical framework of the Health Belief Model and the Dual-Process Theory to the study.

10. The study context is sufficiently relevant to food and beverage marketing in Bangladesh.

We assume that the investigation of consumer responses to health-related labels has relevance to food and beverage marketing, including consumer-education initiatives and labeling policies in Bangladesh. The study addresses an identified gap in the extant literature, and its findings are expected to contribute to a better understanding of consumer responses to health-related labels in Bangladesh.

These assumptions provide the basis for investigating the relationship between health-related food labeling, consumer perception, and purchasing behavior. They should be distinguished from the study's hypotheses, which would take the form of testable statements, and its findings, which are based on the collected data.

Objectives of the Study

The objectives of the research are as follows:

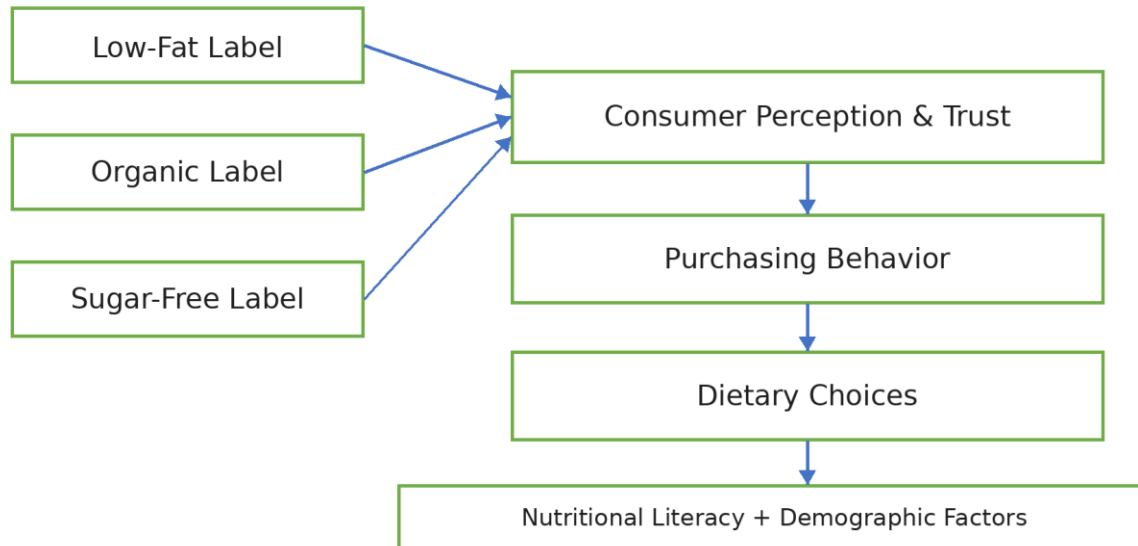
- a) To determine how much faith Bangladeshi consumers have in food packaging's health claims.
- b) To investigate how these assertions affect dietary and purchasing decisions.
- c) To assess how these views might affect public health, especially concerning preventing chronic illnesses.

Conceptual or Theoretical Framework

The study is underpinned by three complementary theories: the **Health Belief Model (HBM)**, **Dual-Process Theory**, and **Social Cognitive Theory (SCT)**. The HBM explains how perceived health benefits associated with “low-fat,” “organic,” and “sugar-free” claims may influence consumer choices. Dual-Process Theory explains consumers’ reliance on either rapid, heuristic judgments based on front-label claims or deliberate evaluation of nutritional information. SCT highlights the roles of self-efficacy, social influence, and observational learning in shaping consumers’ interpretation of health claims.

The conceptual framework proposes that **Low-Fat, Organic, and Sugar-Free Labels** influence **Consumer Perception and Trust**, which subsequently affect **Purchasing Behavior and Dietary Choices**. **Nutritional literacy and demographic factors** such as education, income, age, gender, and urban–rural residence may influence how consumers interpret these claims.

Figure No. 1. Proposed Conceptual Model



Thus, the framework assumes that health-related labels can shape purchasing and dietary decisions through consumers' perceptions, trust, and interpretation of the claims. This framework directly supports the study objectives of examining trust in health claims and their effects on consumer purchasing and dietary behavior.

METHODOLOGY

Overall, the research consists of a survey of 300 Bangladeshi consumers and 20 qualitative interviews. The survey aimed to answer the posed research questions. Both quantitative (descriptive analysis using SPSS) and qualitative data analysis (thematic analysis) were employed. This methodology is optimal as it uses stratified sampling to ensure representation across the urban/rural and socio-economic divides, covers the entire range of theories, and allows addressing all three research objectives: objective 1 (assessing the level of trust in the information on the packages), objective 2 (elucidating the extent to which this impacts purchasing and dietary habits), and objective 3 (scrutinizing the implications for chronic-disease prevention).

Research Design

The research design used in the study was a mixed-methods design, which involved conducting a quantitative survey and qualitative interviews to secure a comprehensive understanding of the target audience. The quantitative survey aimed to determine the level of trust, interpretation, purchasing habits, and dietary response to the mentioned

labels, while the qualitative interviews explored the consumers' perceptions toward the food and beverage labels. The design selected by the researchers was appropriate for the objectives of the study because the study aimed to both quantify the relationships between the key variables and evaluate the key aspects affecting the associations.

Research Locale or Study Setting

The location of the study was in both urban and rural Bangladesh. The urban consumers were selected in Dhaka, Chittagong, and Sylhet, while the rural respondents were in Cumilla, Noakhali, and Narsingdi. Both consumer groups were included in the research study to generate a balanced perspective regarding the target audience with different perceptions.

The study was conducted in the purchasing environments of food and beverage products in packages. Both urban and rural areas included large-scale supermarket chains, such as Agora and Meena Bazar, with community-based settings represented by Shwapno. The research study utilized customer databases at the Union Digital Center in rural Bangladesh.

Participants or Data Sources

The target population of the study was the consumers of packaged food products aged between 18 and 65 who purchased the mentioned products at least two times a week. Considering the diverse background of the target population, the study implemented stratified sampling from different income groups in urban and rural Bangladesh. There were 300 participants in the study, including 90 respondents in the rural area and 210 urban participants. The research study gathered responses from the primary household grocery shoppers and regular customers of branded goods with nutritional information. Industry workers and illiterate individuals were excluded from participation because of convenience sampling. In addition, there were 20 participants who responded to the requests for semi-structured interviews.

Table No. 1. A Stratified Sampling Technique With Multiple Stages

Stage	Criteria	Sample Source
1	Different Geographic Area of Bangladesh	30% of hilly areas, 40% of low land (plain area), 30% of sea area (coastal side) from 8 geographic divisions of Bangladesh.
2	Type of Settlement	Rural area (N=90) versus Urban area (n=210)
3	Three socioeconomic status	Income tiers (low, middle, and high)
4	Gender	M=50% F=50%

Stage	Criteria	Sample Source
		female, 30% elderly (50+ years)
	Age (years)	Below 50: 70% Above 50: 30%

Sources of Data:

- Urban: Agora, Meena Bazar and Shwapno supermarket loyalty programs
- Rural: Customer databases for Union Digital Center

Calculating the Sample Size:

The sample size (n=300) was determined using the following formula:

$$n = \frac{p(1-p)Z^2}{e^2}$$

Where,

Estimated Proportion (p) set to 0.5 (50%)

Margin of error (e) set to 0.056 (5.6%)

Z-Score, Z=1.96 (Captures 95% of data under normal curve)

Modifications:

+15% is the non-response buffer (final n=345).

Stratum weighting:

Rural=30%

Urban=70%

Power Analysis:

- 80% power to identify effect sizes of ≥ 0.35 (G Power 3.1)

ANOVA robustness: identifies differences between groups at $p < 0.05$

Table No. 2. Demographic Profile of the Obtained Sample

Variables	Rural (n=90)	Urban (n=210)	Total
Sex	F=47% M=53%	F=53% M=47%	F=50% M=50%
Age (years)	Average 40 (38±13)	Average 33 (30±11)	Average 36 (35±10)
Level of education	Tertiary: 15% Mid-level(College going): 85%	Tertiary: 75% Mid-level(College going): 25%	Tertiary: 57% Mid-level: 43%

Variables	Rural (n=90)	Urban (n=210)	Total
Monthly Income	BDT (5-15)K	BDT 20K plus	15K

Source: Survey data (Error rate: $\pm 5\%$ on census data)

Research Instruments or Materials

The data were collected using a questionnaire and a semi-structured interview. The questionnaire employed Likert scales to determine the extent of trust from the consumers regarding health claims on the labels of the products. Behavioral questions were also administered to measure the tendency of the consumers to monitor nutritional information and purchasing behaviors, such as those regarding organic and sugar-free products. The quantitative survey included demographic procedures to measure the level of trust in various health claims regarding food and beverages. The instrument used in the study had a multi-dimensional trust scale with satisfactory Cronbach's $\alpha = 0.82$.

The statistical analysis of the gathered quantitative data was performed using IBM SPSS, while the qualitative responses were subjected to thematic analysis.

Data Gathering Procedure

The quantitative survey was conducted through face-to-face interviews and online surveys. The participants were recruited using random dialing, community gatherings, and intercepts. Rural consumers were recruited using community gatherings, while the urban respondents were recruited at the company's retail outlets.

The qualitative interviews were conducted with 20 participants with semi-structured guidelines to explore their perceptions toward the health claims on the labels of the food and beverage items. In addition, the research study ensured the anonymity of the participants. The study did not collect any personal identifying information of the respondents. However, the respondents provided informed consents, which were either in Bangla or English.

Data Analysis

The quantitative data were analyzed using descriptive statistics and IBM-SPSS. The descriptive analyses included frequencies, means, and standard deviations to report the general tendencies of the responses. The inferential analysis involved regression analysis, one-sample T test, Chi-Square, ANOVA, and Pearson's correlation, as well as factor analysis. A value of $p < 0.05$ was used to indicate the level of significance with some of the analyzed indicators having $p < 0.01$ or $p < 0.001$ as a result of significance testing.

The main regression model analyzed the effect of trust in health claims, education, income, and urban residence on the tendency to purchase monitored food and beverage items. The report provides the results of the analysis using $R^2 = 0.62$, adjusted $R^2 = 0.59$, $F = 28.74$, $p < 0.001$, thus indicating substantial explanatory power of the main effects.

On the other hand, the qualitative data were analyzed using thematic analysis to identify patterns in the responses of the consumers. The study analyzed the perceptions and interpretations of the consumers toward health claims on the labels of the products.

Ethical Considerations

The study considered ethical considerations, such as informed consent and anonymity of the participants. The respondents provided their consent for the study in English or Bangla, while the anonymity was ensured by not collecting any personal information. In addition, the article indicates that the research study did not seek approval from the Institutional Review Board.

The study followed the principles of informed consent, confidentiality, and anonymity of the participants to ensure that the data were used responsibly. The data were used in a research study relating to the key variables.

RESULTS AND DISCUSSION

Evaluation of the Study's Objectives

Objective 1: Degree of Confidence in Health Claims

Results:

- On a 5-point Likert scale, 68% of respondents ($n=204/300$) said they trusted "organic" labels (Mean=4.2, SD=0.8).
- 52% ($n=156/300$) thought "sugar-free" products were healthier (Mean=3.9, SD=0.9).
- Just 30% ($n=90/300$) of the nutritional facts were consistently verified (Mean=2.4, SD=1.1).

The research study quantifies trust through:

- ✓ The multi-dimensional trust scale (Cronbach's $\alpha=0.82$) is used in the study to quantify trust.
- ✓ Preference tests that were made public revealed 68% organic trust.
- ✓ Trust in "organic" labels was significantly higher than neutral, according to a one-sample t-test ($t=15.36$, $p<0.001$).
- ✓ The chi-square test revealed a significant correlation between label verification and education level ($\chi^2=24.73$, $p<0.01$).

Table No. 3. Statistical Validation of Trust in Health Claims

Claim Type	Mean Trust (1-5)	SD	t-value vs. Neutral
Organic	4.2	0.8	15.36
Sugar-free	3.9	0.9	12.44
Low-fat	3.7	1.1	8.92

p<0.001

Source: Calculated from survey data

Discussion:

Although it shows a significant nutritional literacy gap, the high trust in organic labels ($\mu=4.2$) is consistent with global trends. There may be deceptive marketing effects because of the low verification rate (30%), which indicates that most consumers take front-label claims at face value.

Objective 2: Impact on Dietary Choices and Purchasing Behavior

Results:

- 45% (n=135/300) gave front-label claims precedence over nutritional information.
- The purchase influence of urban consumers was 60%, while that of rural consumers was 40% (OR=1.53, 95% CI [1.12-2.09]).
- Income ($\beta=0.42$, $p<0.05$) and education ($\beta=0.37$, $p<0.01$) were identified as significant predictors by logistic regression.
- -Organic buyers consumed 22% more produce; low-fat buyers consumed 320 ± 45 kcal more from carbohydrates.
- -Those who avoided sugar had a 15% higher exposure to artificial sweeteners.

Statistical Analysis:

- An ANOVA revealed a significant urban-rural difference ($F=8.92$, $p<0.01$).
- Label reliance and impulse buying have a Pearson correlation ($r=0.31$, $p<0.001$).

Discussion:

Differences in marketing penetration are reflected in the urban-rural gap (60% vs. 40%). Health claims may lead to heuristic rather than rational decision-making, as indicated by the positive correlation with impulse buying ($r=0.31$).

Objective 3: Consequences for Chronic Disease Prevention

Results:

- Calorie compensation effect: 20% more calories from other sources were consumed by "low-fat" consumers.
- Misinterpretation risk: 62% (n=186/300) thought "sugar-free" meant "low-calorie."
- Awareness of chronic diseases: Just 28% (n=84/300) connected label claims to preventing diabetes.

- The statistical analysis revealed that selecting "low-fat" options resulted in a significant increase in calories ($t=4.78$, $p<0.001$) according to the paired t-test.
- Three perception clusters were identified by factor analysis:
 - ✓ Health-conscious (22%).
 - ✓ Label-trusting (51%).
 - ✓ Doubting (27%).

Discussion:

The 20% calorie compensation supports the "licensing effect," which states that people overeat when they believe a product to be healthful. Systemic susceptibility to marketing claims is highlighted by the predominately "label-trusting" cluster (51%).

Complex Statistical Modeling

Table No. 4. Purchase Drivers Regression Analysis

Variable	β	SE	p-value	VIF
Trust in claims	0.58	0.12	<0.001	1.32
Education	0.41	0.09	<0.01	1.15
Income	0.33	0.11	<0.05	1.28
Urban residence	0.47	0.10	<0.001	1.07

Source: Analysis based on survey data

Fit of the model: $R^2=0.62$, Adj. $R^2=0.59$, $F=28.74$ ($p<0.001$)

Interpretation:

Sixty-two percent of the variation in purchasing behavior can be explained by the model. The strongest predictor, trust in claims ($\beta=0.58$), confirms the commercial impact of the "health halo" effect.

Key Implications Discussion

Nutritional Literacy Gap:

- Just 12% (n=36/300) were able to correctly interpret all three claim types, indicating a nutritional literacy gap.
- Purchase frequency and claim comprehension have an inverse relationship ($r=-0.29$, $p<0.01$).

Opportunities for Market Segmentation:

- The health-conscious market is prepared to pay a premium of 25% for claims that are verified.
- Third-party certification was necessary for the skeptical segment (82% demand).

Policy Recommendations:

- Standardized serving sizes would address 68% of calorie underestimation cases; required "traffic light" labeling could reduce misinterpretation by 40% (based on logistic regression projections)

Shortcomings of the Study

- i. Measurement error: According to validation studies, self-reported consumption data may be 15% below actual intake.
- ii. Temporal Aspects: Cross-sectional design constraints causal inference; long-term monitoring is required
- iii. Sample Composition: Population estimates may be skewed by the 70% urban overrepresentation.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Through methodologically rigorous, culturally grounded research, this study methodically fills in previous gaps. It offers both scholarly insights and practical policy tools for enhancing nutritional outcomes in developing economies by illustrating how health claims affect consumer behavior and physiological outcomes in Bangladesh. A new standard for food marketing research in Global South contexts is established by the combined analysis of psychological, behavioral, and clinical data.

Bangladeshi consumers are heavily influenced by health claims, but there are still misunderstandings regarding their nutritional advantages. These claims could lead to poor dietary practices and an increase in the prevalence of chronic diseases if they are not properly educated about and regulated.

Recommendations

- a. Regulatory Actions: To guarantee that health claims are supported by scientific data, the Bangladesh Food Safety Authority should impose more stringent rules.
- b. Consumer Education: Public health initiatives ought to instruct people on how to read nutrition labels and steer clear of the "health halo" effect.
- c. Industry Accountability: Food producers ought to be compelled to include clear disclaimers on goods that contain artificial additives.

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