

Greenwashing, Health-Washing, and Food Quality Communication: A Review of Consumer Perception and Market Practices*

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Abstract

Food communication plays an increasingly important role in shaping consumer perceptions of quality, safety, health, and sustainability. However, the growing use of environmental and health-related claims has raised concerns regarding misleading communication practices such as greenwashing and health-washing. Although these phenomena have been widely discussed, less attention has been devoted to the mechanisms through which they influence perceptions of food quality and safety.

This paper examines how sustainability and health-related claims shape consumer perceptions of food products. The study is based on a literature review supported by selected international case studies from the food sector.

The findings suggest that misleading communication increasingly relies on selective information disclosure, symbolic narratives, scientific framing, and the amplification of limited product attributes rather than on explicitly false claims. The analysis further highlights the role of information asymmetry, credence attributes, and cognitive biases in enhancing the persuasive power of such claims. The reviewed cases indicate that these practices may contribute to consumer misunderstanding and weaken trust in food communication systems. The paper emphasizes the importance of transparency, independent verification, traceability, and consumer education in supporting credible communication about food products.

Keywords: food communication, food quality, food safety, consumer trust, food marketing, greenwashing, health-washing

Introduction

In recent years, food communication has become a central element of the modern agri-food system, reflecting both the increasing complexity of global supply chains and the evolving expectations of consumers. The globalization of food production, alongside recurring food safety incidents and cases of food fraud, has significantly reshaped consumer–food relationships, increasing the importance of trust, transparency, and risk communication (Wu et al., 2021; van Rijswijk & Frewer, 2008). At the same time, the contemporary information environment—characterized by rapid digital dissemination and the growing presence of misinformation—has further intensified the need for clear and credible communication (Lamm et al., 2025). As a result, modern consumers no longer rely solely on sensory attributes or price when making purchasing decisions; instead, they actively seek reliable information that allows them to evaluate product characteristics that are not directly

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observable, such as origin, production methods, nutritional value, and environmental impact. This reflects the complexity of how consumers perceive food quality and safety. (Niewczas-Dobrowolska, 2020).

In this context, food labels, certifications, and communication strategies function as key interfaces between producers and consumers, providing not only basic product information but also assurances regarding safety, quality, authenticity, and traceability (Tonkin et al., 2016; Rembischevski and Caldas, 2023). Many of these characteristics correspond to so-called *credence attributes*, which cannot be directly verified by consumers even after consumption, thereby increasing reliance on communicated claims and institutional guarantees (Schroback et al., 2023; Fernqvist and Ekelund, 2014).

Consequently, marketing communication in the food sector has evolved beyond its traditional informational role. It increasingly serves as a mechanism for constructing and delivering promises to consumers, embedding symbolic meanings related to health, naturalness, sustainability, and ethical production within product narratives.

However, the rapid proliferation of quality labels, health claims, and environmental declarations has introduced significant challenges. The increasing number and diversity of such claims may exceed consumers' cognitive capacity to process information, leading to confusion, skepticism, or reliance on simplified heuristics (Grunert & Wills, 2007). Studies indicate that food labeling remains a key public health communication tool, yet its effectiveness depends on consumers' ability to correctly interpret the information provided (Mehanna et al., 2024). At the same time, health-related and sustainability claims may generate "halo effects," whereby consumers perceive products as healthier or more environmentally friendly regardless of their actual characteristics (Talati et al., 2017). In parallel, increasing attention has also been devoted to the phenomenon of "spin effect," understood as the selective presentation or overinterpretation of scientific findings through the emphasis of favorable results while minimizing information regarding limitations, uncertainties, or less favorable outcomes (Goldberg & Vandenberg, 2021). This mechanism may contribute to strengthening the health halo effect, whereby consumers attribute higher levels of health quality, functionality, or safety to products regardless of their actual nutritional profile or the robustness of the scientific evidence supporting the communicated claims. This creates fertile ground for misleading practices such as greenwashing or health-washing.

Moreover, empirical evidence highlights that inconsistencies in labeling practices and the presence of fraudulent or misleading claims can significantly undermine consumer trust across the entire food system (Mardenli et al., 2025). Trust itself is increasingly recognized as a dynamic construct, influencing not only purchasing decisions but also how consumers interpret and use food labels over time (Baek, 2026). While regulatory frameworks such as Regulation (EC) No 1924/2006, aim to ensure that nutrition and health claims are accurate and scientifically substantiated challenges related to enforcement, standardization, and communication clarity persist.

Therefore, while food communication holds substantial potential to enhance transparency, support informed decision-making, and strengthen consumer trust, it simultaneously entails risks related to misinformation, overcommunication, and the strategic manipulation of product perceptions. Understanding these dual dynamics—the promises and the risks—has become essential for researchers, policymakers, and industry stakeholders seeking to improve the credibility and effectiveness of communication in the contemporary food sector.

Despite the growing body of literature on food labeling, consumer trust, greenwashing, and health-washing, these issues are most often examined as separate phenomena. Relatively limited attention has been devoted to the shared communication mechanisms through which environmental and health-related claims shape consumer perceptions of food quality and safety, as well as to their broader implications for consumer trust. Addressing this gap, the present paper explores how sustainability- and health-related claims function as promises within food communication, which communication mechanisms support their effectiveness, and how such promises may contribute to both consumer trust and consumer misunderstanding.

Green washing and health washing in the food sector and communication

Greenwashing refers to the practice of conveying a false or exaggerated impression of a product's environmental benefits. In the food industry, this may involve claims such as "eco-friendly," "sustainable," or "carbon neutral" that are vague, unverified, or not supported by robust evidence. These claims can exploit consumers' growing environmental concerns, leading them to perceive products as more sustainable than they actually are. Research indicates that the increasing demand for sustainability information, combined with a lack of standardized

communication, creates favorable conditions for such practices (Pedersen et al., 2024). As a result, greenwashing can undermine trust not only in individual brands but also in environmental labeling systems more broadly.

Health-washing refers to the use of nutrition or health-related claims that create an inflated perception of a product's healthfulness. This may include highlighting a single positive attribute (e.g., "high in protein," "contains vitamins") while downplaying less desirable aspects such as high sugar, salt, or fat content. Another practice observed within health-washing involves the previously mentioned selective presentation of scientific findings through the emphasis of favorable results while minimizing information regarding research uncertainty, methodological limitations, or less favorable outcomes. Studies have shown that such claims can trigger the so-called "halo effect," where consumers generalize one positive feature to the overall product evaluation (Heiss et al., 2021; Ares et al., 2023). Consequently, consumers may perceive products as healthier than they actually are, which can distort dietary choices and reduce the effectiveness of public health communication.

While greenwashing focuses on environmental attributes, and health-washing on nutritional or health-related attributes, both practices: rely on information asymmetry between producers and consumers, exploit credential attributes that are difficult to verify, and contribute to misinformation risks and erosion of trust in food communication systems. Both phenomena – greenwashing and health-washing – rely on several common communication and cognitive mechanisms that increase their effectiveness in influencing consumers. First, selective information communication plays a key role. Manufacturers emphasize selected, positive product attributes (e.g., "no added sugar," "recyclable packaging") while omitting less favorable information, such as high sugar content, processing level, or the full environmental footprint. Additionally, promotional materials often emphasize favorable research findings while minimizing information regarding research uncertainty, methodological limitations, or less favorable results. This strategy leads to information asymmetry, where consumers base their judgments on incomplete data, which can lead to a false perception of product quality and safety. Second, both phenomena leverage credence attributes, product characteristics that consumers cannot independently verify either before or after purchase. This category includes, among others, "ecological," "natural," "climate neutral," or "healthy." As the literature indicates, the growing importance of these attributes increases consumers' dependence on information provided by producers and certification systems, which simultaneously increases susceptibility to communication abuse. Third, the effectiveness of greenwashing and health-washing is reinforced by cognitive heuristics, i.e., simplified information-processing strategies used by consumers. One key mechanism is the halo effect, which involves the transfer of one positive attribute of a product to its overall evaluation (Kahneman, 2011; Wang and Begho, 2024). For example, information about a high protein content may lead to the perception of a product as generally healthy, even if it contains significant amounts of sugar or fat. Similarly, visual elements such as green colors or references to nature can suggest a product's beneficial environmental impact regardless of its actual impact (Pedersen et al., 2024). The phenomenon is further reinforced by the aforementioned biased presentation of information, for example through promoting a product as supporting fat burning without specifying that the observed effect concerns only a minor reduction in body fat and applies exclusively to a specific study group (Chiu et al., 2017). In an environment of information overload and limited cognitive resources, consumers often base their decisions on such simplified cues (heuristics) rather than detailed information analysis. As a result, the interplay of selective communication, the use of credibility characteristics, and cognitive heuristics leads to a situation in which marketing messages can significantly deviate from the product's actual properties while remaining formally compliant with applicable regulations.

Practices in the Food Industry – Case Studies

One of the most widely discussed examples of greenwashing concerns Tyson Foods - the world's second-largest meat producer. Since 2021, the company had declared its intention to achieve net-zero greenhouse gas emissions by 2050, while a year later it began promoting initiatives related to its "climate-smart beef" strategy. These declarations triggered significant public criticism, with numerous commentators and environmental organizations arguing that Tyson Foods' sustainability communication overstated the actual effectiveness of the company's environmental actions in relation to the substantial climate impact associated with large-scale meat production. In 2024, the American Environmental Working Group (EWG) filed a lawsuit against Tyson Foods, accusing the company of misleading environmental communication (Brown, 2024). Critics emphasized that the company's broad climate-related declarations were not sufficiently supported by transparent reporting mechanisms or measurable implementation indicators. Investigations additionally suggested that Tyson Foods allocated approximately 0.1% of its revenue to research and initiatives aimed at reducing greenhouse gas emissions, while simultaneously spending nearly three times more on promoting "green" marketing narratives and sustainability-related communication. Following a legal dispute lasting more than a year, Tyson Foods reached a settlement agreement with EWG under which the company committed to discontinue the use of terms such as "climate-smart beef" in product communication, cease advertising claims concerning the achievement of climate neutrality by 2050, and avoid communicating similarly ambitious environmental commitments without independent scientific verification (Earthjustice, 2025).

The systemic dimension of health-washing can be observed in Japan, a country with one of the world's most highly developed functional food markets and the first to introduce the Foods for Specified Health Uses (FOSHU) policy in 1991. Following the implementation of the Foods with Function Claims (FFC) system in 2015, Japanese producers gained the ability to communicate selected health benefits of food products through a simplified notification procedure based primarily on scientific evidence submitted by the companies themselves (Sato et al., 2023). A study published in 2024 (Someko et al., 2024) revealed a high prevalence of health-washing practices strongly associated with the use of spin effect mechanisms. According to the findings, 72% of scientific abstracts, 81% of study conclusions, and 73% of analyzed promotional materials and press releases contained elements exaggerating product effectiveness. A particularly significant example of such practices involved Sakura Forest Co., against which the Japanese Consumer Affairs Agency (CAA) issued an administrative order in 2023 for violating the Act against Unjustifiable Premiums and Misleading Representations. The company's supplements, "Kinari Takumi" and "Kinari Kyoku", registered within the FFC system and promoted as products "reducing neutral fats/triglycerides" and supporting other health benefits, lacked sufficient scientific evidence substantiating the communicated effects. According to the CAA, the presentation of the products could mislead consumers regarding both the actual efficacy of the supplements and the level of scientific substantiation supporting the communicated health effects (Tanaka et al., 2023). Both products were withdrawn from the market on the day the administrative order was issued, while regulatory authorities expanded the investigation to approximately 90 additional products containing the same functional ingredients or relying on comparable scientific substantiation for their health claims. As a consequence, 15 products were removed from the FFC register (Koe, 2023).

Discussion

The findings suggest that sustainability- and health-related promises are primarily constructed through selective information disclosure, symbolic narratives and the use of credence attributes. These mechanisms contribute to consumer trust but may also increase the risk of misunderstanding and misinformation.

These findings are consistent with previous research showing that sustainability- and health-related claims may generate halo effects extending beyond the specific attributes being communicated (Talati et al., 2017; Heiss et al., 2021; Wang & Begho, 2024). They also support earlier research emphasizing the role of information asymmetry and credence attributes in shaping consumer trust and product evaluations (Fernqvist & Ekelund, 2014; Schrobback et al., 2023).

The Tyson Foods case illustrates that greenwashing within the food industry increasingly involves not only directly false environmental claims, but also the strategic amplification of limited sustainability initiatives through highly symbolic climate narratives. The case also highlights the important role of consumer education in strengthening the credibility of sustainability communication. Tyson Foods indicated that one of the factors contributing to its controversial communication practices was the growing consumer preference for products associated with more sustainable production systems. In response to these expectations, the company appeared willing to provide information desired by consumers despite the limited feasibility of achieving such

environmental outcomes within current industrial beef-production systems. These observations suggest that greater consumer awareness regarding the technological limitations of intensive beef production may reduce the risk of unrealistic sustainability expectations and misleading environmental communication. The Tyson Foods case further demonstrates the growing importance of independent verification, measurable sustainability indicators, and regulatory scrutiny in assessing the credibility of environmental communication within contemporary food systems.

Similarly health-washing may develop not only through explicitly false health claims, but also through the selective presentation and exaggeration of limited or insufficiently substantiated health benefits in ways that create a “halo effect” and strengthen consumer trust in functional food products. In this context, the Sakura Forest Co. case should not be perceived solely as an isolated example of misleading communication, but rather as part of a broader systemic problem concerning the transparency and scientific credibility of food communication. The case illustrates how the commercialization of scientific evidence, the simplification of health-oriented narratives in food marketing, and the increasing market pressure to differentiate products through functional claims may contribute to weakening consumer trust and reducing the effectiveness of public health communication. These observations are consistent with previous studies highlighting the role of health claims and scientific framing in creating health halo effects and shaping consumer perceptions of product healthfulness (Heiss et al., 2021; Talati et al., 2017; Ares et al., 2023).

Overall, the analysis suggests that sustainability- and health-related claims function as promises that help consumers evaluate food products in situations characterized by information asymmetry. Their effectiveness is primarily supported by selective information disclosure, symbolic narratives, and the use of credence attributes. At the same time, the reviewed cases demonstrate that these mechanisms may contribute not only to consumer trust but also to consumer misunderstanding when communicated promises are not supported by transparent and verifiable evidence.

Conclusions

The analysis demonstrates that greenwashing and healthwashing share several common communication mechanisms, including selective information disclosure, reliance on credence attributes, symbolic narratives, and the exploitation of cognitive biases. The findings further indicate that these mechanisms operate through information asymmetry, credence attributes, and cognitive biases, allowing sustainability- and health-related promises to influence both consumer trust and consumer misunderstanding.

Marketing communication in the food sector has undergone a profound transformation. It increasingly functions not merely as a channel of information but as a mechanism for constructing promises related to health, environmental responsibility, and ethical production.

Despite these regulatory efforts, the market has seen a rapid expansion of voluntary claims, including environmental, social, and wellness-oriented messages. Recent research indicates that consumers increasingly expect detailed sustainability information and are influenced by packaging and labeling cues related to environmental performance. As a result, food communication has become highly competitive, with brands seeking to differentiate products through increasingly complex and value-laden narratives.

The progressive commercialization of scientific communication and the growing market pressure to differentiate products through environmental and health-related claims may contribute not only to misleading consumers, but also to the gradual erosion of public trust in food communication as a whole. The analyzed cases suggest that the future credibility of information concerning food products may depend less on the intensity of sustainability and health-related declarations, and more on the ability of companies to provide transparent, measurable, and scientifically verifiable evidence supporting the promises communicated to consumers.

Therefore, maintaining the credibility of contemporary food systems appears to require simultaneous action involving the strengthening of regulatory oversight (including higher transparency standards and support for independent scientific verification) as well as increasing consumer awareness.

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