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ESG Practices and Customer-Based Brand Equity in Dairy Agribusiness: Implications for Sustainable Agricultural Markets

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ABSTRACT

The dairy sector contributes significantly to agricultural economies through its role in food security, nutrition, and rural livelihoods. Although agri-food firms increasingly adopt Environmental, Social, and Governance (ESG) practices, empirical evidence on how these practices translate into brand-related market outcomes in emerging agricultural markets remains scarce. Drawing on stakeholder theory and signaling theory, this study investigates whether ESG practices function as signals that shape customer-based brand equity in the dairy industry. Survey data collected from 280 dairy consumers in Vietnam were analyzed using partial least squares structural equation modeling. The results indicate asymmetric effects of ESG dimensions on customer-based brand equity. Governance practices influence all brand equity dimensions, environmental practices are associated with brand associations and brand loyalty, while social practices primarily relate to brand loyalty. These results suggest that ESG initiatives help reduce information asymmetry and strengthen the perceived credibility of agri-food brands. This study contributes to branding and agri-food sustainability research by providing evidence of asymmetric ESG signaling effects in an emerging market context. The findings further inform managers and policymakers about the importance of governance transparency and ESG communication in building consumer trust and enhancing competitiveness in developing dairy markets.

Keywords: Agri-Food Industry; ESG Practices; Consumer Perceptions; Customer-Based Brand Equity; Dairy Industry; Partial Least Squares Structural Equation Modeling (PLS-SEM)

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1. Introduction

In recent decades, firms have increasingly recognized that long-term competitiveness and sustainability depend not only on financial performance but also on their ability to address environmental, social, and governance (ESG) responsibilities. ESG has emerged as a comprehensive framework that extends beyond traditional Corporate Social Responsibility (CSR) by emphasizing measurable, strategic, and governance-related practices that influence firm value and stakeholder trust^[1]. ESG builds on CSR by providing measurable criteria to evaluate a company's ethical, social, and governance performance, while CSR lays the foundation by promoting corporate responsibility toward stakeholders, society, and the environment^[2]. As markets become more transparent and information more accessible, consumers are no longer passive recipients of corporate claims but active evaluators of firms' environmental stewardship, social engagement, and ethical governance.

From a marketing perspective, ESG practices play an important role in shaping consumer perceptions and strengthening brand-related outcomes. Prior research suggests that responsible corporate behavior enhances consumer trust, favorable brand attitudes, and purchase intentions, thereby contributing to stronger brand equity^[3, 4]. Customer-Based Brand Equity (CBBE), as conceptualized by Keller^[5], refers to the differential effect of brand knowledge on consumer responses to marketing activities. ESG practices may influence CBBE by signaling credibility, transparency, and a firm's long-term commitment to stakeholders, thereby shaping consumers' evaluations of brand value^[5]. Compared to CSR, ESG provides a more structured and multidimensional lens through which consumers may evaluate corporate responsibility and brand value.

Prior studies have shown that ESG practices enhance corporate reputation, stakeholder trust, and customer loyalty^[6-9], existing research has largely concentrated on macro-level outcomes such as financial performance and investor behavior^[10, 11]. Consequently, the mechanisms through which ESG initiatives influence consumer-level brand responses remain underexplored^[8, 9, 12]. Existing research has primarily exam-

ined the relationship between sustainability initiatives and customer-based brand equity (CBBE) in service industries and consumer goods sectors, such as fashion^[8], banking^[13], and energy^[14]. However, the mechanisms through which ESG practices influence brand equity may differ significantly in agri-food contexts due to the unique characteristics of agricultural products, including issues related to food safety, traceability, and complex value chains. Agri-food markets are characterized by a high prevalence of credence attributes, including food safety, animal welfare, environmental sustainability, and production transparency, which consumers cannot easily verify even after consumption. Under such conditions, consumers often rely on external signals to assess product quality and brand credibility^[6, 7]. ESG-related initiatives may therefore function as informational signals that reduce uncertainty, enhance perceived brand reliability, and thereby shape consumer evaluations of brand value.

Despite the relevance of this mechanism, existing literature has not sufficiently examined how different ESG dimensions contribute to the formation of specific components of customer-based brand equity within agricultural markets. Against this backdrop, the dairy sector provides a particularly relevant setting for investigating these dynamics. In such a setting, ESG practices may influence not only consumer perceptions of brand credibility but also broader market coordination mechanisms that sustain trust across stakeholders. These dynamics may become even more salient in emerging dairy markets, where rapid industry expansion, evolving regulatory frameworks, and growing public attention to food safety and environmental sustainability heighten consumer sensitivity to ESG-related information when forming brand evaluations. However, most empirical studies examining ESG-branding relationships have been conducted in developed economies and have not systematically explored how ESG initiatives influence brand equity formation in emerging agri-food markets.

Vietnam represents a particularly relevant context for examining sustainability and ESG practices in the dairy sector. The Vietnamese dairy market has experienced rapid expansion in recent years, driven by rising incomes, urbanization, and increasing health awareness.

Market reports estimate that the industry reached approximately USD 5.7 billion in 2024 and is projected to exceed USD 13 billion by 2033^[15]. Similarly, Statista^[16] reports that the Dairy Products & Eggs market in Vietnam is expected to generate USD 8.495 billion in revenue in 2024, with a projected compound annual growth rate (CAGR) of 7.61% from 2024 to 2029, reaching USD 12.257 billion by 2029. This rapid expansion highlights the growing importance of trust, quality assurance, and transparency in shaping consumer perceptions of dairy brands. At the same time, increasing consumer awareness of food safety, health, and corporate responsibility has intensified expectations for sustainable and responsible business practices. Despite these developments, empirical evidence on how environmental, social, and governance (ESG) practices influence consumer perceptions and brand-related outcomes in Vietnam's dairy industry remains limited^[17-20].

To address this gap, the present study examines the impact of Environmental, Social, and Governance (ESG) practices on Customer-Based Brand Equity (CBBE) in the Vietnamese dairy industry. This research contributes to the literature in three important ways. First, it develops a clearer theoretical linkage between ESG practices and the customer-based brand equity framework within agri-food markets. Specifically, the study conceptualizes ESG initiatives as credibility signals that reduce information asymmetry and influence consumers' brand evaluations in markets where product quality and production processes are difficult for consumers to directly observe. By framing ESG as a signaling mechanism, the study explains how sustainability practices can shape consumer perceptions of trust, responsibility, and brand value. Second, the study extends ESG and branding research to the context of an emerging agricultural economy. Empirical evidence from the Vietnamese dairy sector highlights how governance quality, transparency, and social responsibility function as critical mechanisms for strengthening trust in agricultural value chains. Finally, the research provides insights into how ESG-driven branding strategies may enhance brand equity while simultaneously supporting sustainable agricultural market development, linking consumer perceptions with broader value-chain governance and

long-term market sustainability.

The remainder of the paper is structured as follows. The next section reviews the theoretical foundations and relevant literature on ESG and customer-based brand equity, followed by the development of the research framework and hypotheses. The methodology section describes the data collection procedures and analytical approach. The results are then presented and discussed in relation to existing literature. Finally, the study concludes with implications, limitations, and directions for future research.

2. Literature Review and Hypotheses Development

2.1. Underpinning Theory

This study draws on stakeholder theory and signaling theory to explain the relationship between Environmental, Social, and Governance (ESG) practices and Customer-Based Brand Equity (CBBE) in the dairy industry. Stakeholder theory conceptualizes firms as entities that are accountable not only to shareholders but also to a wider set of stakeholders whose interests are affected by corporate activities^[21-23]. In food-related industries such as dairy, consumers constitute a particularly influential stakeholder group due to the close linkage between products, public health, nutrition, and everyday consumption. From this perspective, consumers do not merely evaluate functional product attributes but also assess firms' environmental responsibility, social engagement, and ethical standards when forming brand-related judgments. When dairy firms demonstrate ESG practices that are consistent with stakeholder expectations, they are more likely to achieve legitimacy and cultivate trust, which serve as essential foundations for the development of strong brand equity.

While stakeholder theory explains firms' motivations to adopt ESG practices, signaling theory provides insight into how such practices shape consumer perceptions in markets characterized by information asymmetry. Signaling theory addresses situations in which one party holds superior information and communicates this information through observable signals to reduce uncer-

tainty for the receiving party^[24, 25]. In the dairy sector, consumers often lack the ability to directly verify critical attributes such as food safety, nutritional quality, production processes, or ethical sourcing prior to purchase. Consequently, ESG practices operate as salient market signals that convey information about a firm's credibility, quality orientation, and long-term commitment. Signaling theory further highlights that consumers are often exposed to multiple signals that may be complementary or contradictory, requiring them to integrate diverse pieces of information when forming brand evaluations^[25, 26]. In industries characterized by high levels of information asymmetry, such as the dairy industry, the interpretation of ESG-related signals becomes particularly important. Well-aligned and coherent ESG practices help reduce perceived uncertainty and mitigate ambiguity, thereby supporting more positive assessments of brand credibility and integrity.

Environmental initiatives, social responsibility programs, and governance mechanisms function as visible indicators that allow consumers to infer a firm's ethical orientation and operational reliability. Previous studies suggest that consumers increasingly rely on sustainability-related cues when evaluating food brands, particularly in contexts where concerns about health, safety, and environmental impact are pronounced^[20, 27, 28]. The effectiveness of these signals depends not only on their presence but also on their perceived consistency and transparency. Clear and credible communication of ESG commitments enhances signal reliability, strengthens consumer confidence, and fosters favorable brand perceptions^[28, 29]. By integrating stakeholder theory and signaling theory, this study conceptualizes ESG practices as strategic responses to stakeholder expectations that simultaneously function as market signals to reduce information asymmetry.

2.2. Environmental, Social, and Governance

Environmental, Social, and Governance (ESG) has emerged as a dominant framework for assessing corporate sustainability and ethical performance beyond traditional financial indicators. Unlike Corporate Social Responsibility (CSR), which is often conceptualized as voluntary and philanthropic, ESG emphasizes struc-

tured, measurable, and strategically integrated practices that reflect firms' accountability to a broad set of stakeholders^[1]. The ESG framework encompasses environmental responsibility, such as resource efficiency and emissions reduction; social responsibility, including labor practices, community engagement, and consumer protection; and governance quality reflected in transparency, accountability, and ethical leadership.

From a theoretical perspective, ESG is closely aligned with stakeholder theory, which posits that firms generate long-term value by addressing the interests of multiple stakeholder groups rather than prioritizing shareholders alone^[22]. ESG practices signal a firm's commitment to responsible value creation, thereby reducing information asymmetry and enhancing stakeholder trust. From the lens of signaling theory, ESG initiatives serve as observable indicators of firm quality, particularly in markets where consumers have limited ability to directly evaluate product safety, ethical standards, or corporate integrity^[10]. In marketing and branding research, ESG has increasingly been recognized as an important driver of consumer perceptions and brand-related outcomes. Empirical studies suggest that firms with strong ESG performance tend to enjoy higher levels of consumer trust, more favorable brand attitudes, and stronger emotional attachment^[4, 30]. By associating brands with ethical values, social contribution, and long-term orientation, ESG initiatives enhance brand meaning and strengthen customer-based brand equity^[5]. Compared to CSR, ESG provides a more comprehensive and credible framework that allows consumers to evaluate not only firms' environmental and social engagement but also the consistency and reliability of such efforts through governance mechanisms.

Despite the growing body of ESG research, much of the existing literature remains focused on financial outcomes, including firm performance, risk mitigation, and investment attractiveness^[31]. Empirical studies adopting a consumer-centric perspective, particularly those examining the impact of ESG on brand equity dimensions, remain relatively limited^[18-20]. This gap is especially evident in emerging markets, where institutional environments, consumer awareness, and regulatory frameworks differ substantially from those in devel-

oped economies.

The relevance of ESG becomes particularly pronounced in the dairy industry due to its direct connection to environmental sustainability, public health, and social welfare. Dairy production is resource-intensive, involving substantial water consumption, greenhouse gas emissions, and land use, which places considerable pressure on environmental systems^[32]. Consequently, environmental ESG practices in the dairy sector commonly focus on sustainable sourcing, waste management, emissions control, and animal welfare. Firms that demonstrate strong environmental responsibility are more likely to be perceived by consumers as trustworthy and forward-looking, which may positively influence brand evaluations.

Social ESG practices are equally critical in the dairy industry because dairy products are closely associated with nutrition, food safety, and family well-being. Consumers expect dairy firms to ensure high product quality, transparent labeling, fair treatment of farmers and employees, and meaningful contributions to community development^[6]. Social responsibility initiatives related to consumer health, farmer support programs, and community engagement can foster emotional connections between consumers and brands, thereby strengthening brand loyalty and positive brand associations.

Governance practices play a fundamental yet often underexamined role in shaping consumer perceptions in the dairy sector. Strong governance mechanisms, including transparent reporting, ethical leadership, effective quality control systems, and compliance with food safety regulations, are essential for ensuring the credibility of environmental and social claims^[33]. In industries characterized by high information asymmetry and perceived consumer risk, such as food and dairy, governance quality is particularly important for building trust and mitigating concerns related to greenwashing or misleading sustainability communication. In emerging markets such as Vietnam, ESG adoption in the dairy industry is shaped by rapid market growth, evolving regulatory frameworks, and rising consumer awareness of sustainability issues. While leading dairy firms have increasingly incorporated ESG principles into their strategies, empirical evidence on how these practices influence con-

sumer perceptions and customer-based brand equity remains scarce. Existing studies in Vietnam tend to emphasize CSR disclosure or general sustainability awareness rather than examining ESG as a multidimensional construct and its impact on specific branding outcomes. This lack of empirical insight highlights the need for systematic research that investigates the relationship between ESG practices and customer-based brand equity in the dairy industry.

2.3. Customer-Based Brand Equity (CBBE)

Aaker^[34,35] was among the first to propose that brand equity from a customer perspective is composed of four key dimensions: brand loyalty, brand awareness, perceived quality, and brand associations^[36]. According to Aaker^[34], brand equity consists of several key assets that create value for a company, including brand loyalty, brand awareness, perceived brand quality, brand associations, and other proprietary brand assets such as patents, trademarks, and distribution relationships. Among these, brand loyalty, awareness, and perceived quality are considered the most critical, as loyalty drives predictable sales and profit streams, while awareness and perceived quality shape consumer perceptions and overall brand evaluation. Brand associations further enhance the consumer's connection with the brand, whereas other proprietary assets are generally of lesser importance.

Keller^[5] defines CBBE as the differential effect of brand knowledge on consumer response to marketing efforts. This concept emphasizes that brand equity is created when consumers possess strong, favorable, and unique brand associations, leading to outcomes such as higher willingness to pay, brand loyalty, and resistance to competitors. Customer-Based Brand Equity (CBBE) thus refers to the value a brand holds in the minds of consumers, reflected in their perceptions, attitudes, and behavioral responses toward the brand's marketing activities^[5,35,37].

The CBBE framework typically consists of several key dimensions, including brand awareness, brand associations, perceived quality, and brand loyalty^[20,23]. Brand awareness reflects consumers' ability to recognize and recall a brand, while brand associations en-

compass the meanings, images, and values linked to the brand in consumers' memory. According to Zeithaml^[38], perceived quality represents consumers' subjective evaluation of a product's overall excellence, distinct from objective product-based quality. Brand loyalty captures the extent of consumers' commitment to repurchasing a particular brand. Together, these dimensions constitute the foundation of sustainable brand equity.

In the dairy industry, CBBE plays a particularly critical role due to the nature of dairy products as frequently purchased, low-involvement yet high-trust goods. Consumers often rely on brand cues to reduce perceived risk related to food safety, nutritional value, and product authenticity^[13]. As a result, dairy brands with strong CBBE are more likely to gain consumer confidence and maintain long-term market positions. Brand loyalty in the dairy sector is often reinforced through consistent product quality, transparent information, and credible corporate behavior. Empirical studies indicate that perceived quality is one of the most influential dimensions of CBBE in food and dairy markets, as it directly affects consumer satisfaction and repeat purchase intentions^[39]. Moreover, positive brand associations related to health benefits, natural ingredients, and ethical production practices significantly enhance consumers' evaluations of dairy brands. Brand awareness also remains essential in competitive retail environments, where consumers are exposed to a wide range of similar dairy products and must make quick purchase decisions.

In emerging markets such as Vietnam, the development of CBBE in the dairy industry is shaped by increasing consumer sophistication and heightened sensitivity to corporate credibility. Vietnamese consumers tend to associate strong brands with higher safety standards and responsible business practices, particularly in the context of past food safety incidents^[40]. However, despite the growing importance of brand equity in the dairy sector, limited research has examined how CBBE is formed and strengthened through non-traditional branding drivers such as corporate sustainability practices. Overall, the literature highlights that CBBE is a crucial determinant of competitive advantage in the dairy industry, and understanding the drivers of CBBE is essential for dairy firms seeking to build strong, trustworthy,

and sustainable brands in both developed and emerging markets.

2.4. ESG Practices, Customer-Based Brand Equity and Sustainable Agricultural Development

Environmental, Social, and Governance (ESG) practices reflect firms' strategic orientation toward responsible and sustainable value creation. From a stakeholder perspective, firms that address the expectations of multiple stakeholder groups are more likely to generate long-term value and receive favorable stakeholder evaluations^[8, 9]. Complementing this view, signaling theory posits that ESG initiatives provide observable signals of firm quality, credibility, and ethical orientation in markets characterized by information asymmetry, such as agri-food systems where consumers have limited ability to verify production processes and corporate conduct^[20, 24].

Recent years have seen growing attention to ESG among investors, regulators, and the public, leading firms to adopt more stakeholder-oriented strategies and expand nonfinancial disclosures^[33, 41]. Policymakers have also strengthened regulatory frameworks to enhance transparency and accountability in ESG reporting^[42]. A large body of literature has examined ESG disclosure and its implications for stakeholder responses, firm valuation, and market outcomes. Prior studies show that ESG transparency reduces information asymmetry and influences investor and stakeholder perceptions^[1]. In marketing research, sustainability initiatives have been shown to influence consumer trust, brand attitudes, and loyalty^[3, 4]. However, sustainability communication is also associated with concerns about greenwashing and consumer skepticism, particularly when governance mechanisms are weak or disclosures are perceived as symbolic rather than substantive^[43].

In agri-food markets, many product attributes represent credence characteristics that consumers cannot directly verify, making institutional and corporate governance mechanisms central to trust formation^[17, 18]. In this context, ESG practices may function as quality assurance and credibility signals within agricultural value chains, influencing consumer-based brand equity and

coordination among supply chain actors. Accordingly, this study conceptualizes ESG as a multidimensional construct and investigates the direct effects of environmental, social, and governance practices on customer-based brand equity in the Vietnamese dairy industry.

2.5. Hypotheses Development

2.5.1. Environmental Practices and CBBE Dimensions

Environmental practices reflect firms' efforts to reduce environmental impact through sustainable sourcing, emissions control, waste management, and environmentally friendly production processes. In the food and dairy industry, environmental responsibility is increasingly salient due to growing public concern over ecological sustainability and product safety. Environmentally responsible firms are more likely to be recognized and recalled by consumers, thereby enhancing brand awareness and differentiating their brands through favorable environmental associations^[6]. Within the food and beverage sector, and particularly in the dairy industry, firms' environmental practices play a critical role in shaping consumer choice and reinforcing brand legitimacy. Prior research suggests that consumers increasingly prefer healthier food products and are more likely to purchase from companies that embed responsible and sustainable practices into their operations^[17, 18].

Furthermore, consumers often interpret environmental responsibility as an indicator of superior production standards and long-term orientation, which positively influences perceived quality. Over time, consistent environmental practices reinforce consumer confidence and commitment, leading to stronger brand loyalty^[39]. Focusing on environmental issues has gained increasing importance, not only due to ethical obligations but also because it offers a strategic advantage by enhancing customer loyalty and boosting profitability^[12]. This shift is associated with a growing environmental awareness among individuals who are more conscious of critical ecological and biological changes occurring worldwide^[44]. As a result, environmental responsibility has emerged as a significant competitive asset. Many organizations have recognized the benefits of integrating

eco-friendly practices into their corporate social responsibility programs and have launched sustainable products to meet the expanding demand from environmentally conscious consumers^[45]. In signaling terms, such sustained environmental efforts strengthen the credibility of the signals sent to the market, thereby reinforcing positive brand evaluations across multiple dimensions. Accordingly, environmental practices are expected to exert a positive influence on all core components of CBBE. Therefore, environmental practices are expected to positively influence all key dimensions of CBBE. Drawing on these arguments, this study proposes the following hypotheses:

H1a. *Environmental practices positively influence brand awareness.*

H1b. *Environmental practices positively influence brand associations.*

H1c. *Environmental practices positively influence perceived quality.*

H1d. *Environmental practices positively influence brand loyalty.*

2.5.2. Social Practices and CBBE Dimensions

Favorable consumer perceptions of a dairy firm's social and ethical practices play an important role in shaping and strengthening brand equity. From a strategic perspective, sustained engagement in socially responsible activities, such as ensuring food safety, implementing responsible production standards, and supporting local communities, contributes to the development of a credible and reputable brand and should therefore be viewed as a long-term strategic investment. Prior research consistently indicates that ethical and socially responsible firm behavior significantly influences consumer evaluations and brand-related outcomes across different market contexts. Specifically, socially responsible practices have been shown to enhance brand equity by improving brand credibility and reputation^[46], as well as by strengthening brand equity outcomes in service settings where ethical consumerism conditions consumer responses^[47]. In the Vietnamese dairy context, the perceived authenticity of firms' social engagement has been found to reinforce

consumer trust and stimulate advocacy behaviors^[48]. More broadly, evidence from the food and beverage sector suggests that comprehensive engagement with ESG principles strengthens brand trust and deepens consumer firm relationships, highlighting the importance of ethical and social attributes in shaping food consumption decisions. Existing studies therefore underscore the central role of responsible business practices in attracting consumers and enhancing brand equity, particularly in product categories where trust is a fundamental driver of choice^[46, 47].

Within the ESG framework, social practices capture a firm's responsibilities toward key stakeholder groups, including consumers, employees, communities, and supply chain partners, and encompass issues such as product safety, consumer health, fair labor practices, and community involvement. In the dairy industry, the social dimension of ESG is especially salient given the close linkage between dairy products, nutrition, family well-being, and daily consumption. From a signaling theory perspective, firms' social initiatives function as observable signals that communicate ethical commitment, care, and concern for societal welfare, thereby reducing information asymmetry and shaping favorable consumer interpretations^[3]. Firms that consistently engage in social practices are therefore more likely to receive positive consumer evaluations. Empirical evidence further suggests that strong social performance enhances favorable brand associations and perceived quality by reinforcing consumers' beliefs that firms prioritize safety and well-being^[4]. These positive perceptions foster emotional attachment and commitment, which ultimately translate into higher levels of brand loyalty. Accordingly, the social dimension of ESG is expected to exert a positive influence on all key dimensions of CBBE. Based on these arguments, the following hypotheses are proposed:

H2a. *Social practices positively influence brand awareness.*

H2b. *Social practices positively influence brand associations.*

H2c. *Social practices positively influence perceived quality.*

H2d. *Social practices positively influence brand loyalty.*

2.5.3. Governance Practices and CBBE Dimensions

Governance practices reflect the quality of corporate leadership, transparency, accountability, and adherence to ethical and regulatory standards. Strong governance mechanisms are essential for ensuring the credibility and consistency of environmental and social initiatives, thereby reducing consumer skepticism and perceived risk^[1, 33]. In industries characterized by high information asymmetry and potential health risks, such as dairy products, governance quality plays a critical role in shaping consumer evaluations^[17, 18].

From a signaling theory perspective, transparent and ethical governance practices function as credible and observable signals of a firm's integrity, reliability, and long-term commitment to responsible management. Such signals reduce information asymmetry between firms and consumers and enhance brand credibility, which in turn strengthens brand associations and elevates perceived quality^[31]. Moreover, the consistent application of sound governance practices reinforces consumer confidence in a brand's long-term integrity, thereby fostering stronger brand loyalty. Accordingly, governance practices are expected to exert a positive influence on all key components of CBBE.

Prior research provides empirical evidence that corporate governance practices significantly influence consumer-related outcomes, particularly in the food and beverage sector. Effective governance mechanisms enhance food safety management, quality assurance, and ethical oversight, which are critical determinants of consumer trust and brand evaluation in food markets^[49, 50]. In the dairy industry, where products are closely linked to health, nutrition, and daily consumption, governance structures are especially salient in shaping consumer perceptions by ensuring regulatory compliance, consistent production standards, and accountability across the supply chain, thereby reducing perceived risk^[51, 52].

Moreover, transparent and accountable governance practices, including rigorous quality control systems and clear disclosure of production processes, act as credible signals of product reliability and ethical conduct^[13, 41]. These governance-related signals enhance

perceived quality and strengthen favorable brand associations in high credence food categories such as dairy, ultimately influencing consumers' purchasing decisions and brand-related behaviors by reinforcing trust and brand credibility. These governance-related signals enhance consumers' perceptions of quality and reinforce favorable brand associations. As a result, consumers' brand related behaviors in the dairy sector are strongly influenced by the governance mechanisms adopted by firms. When such mechanisms are perceived as open, transparent, and responsible, consumers are more likely to develop trust based relationships with dairy brands, ultimately contributing to the development and strengthening of customer-based brand equity

[34, 45]. Drawing on the above discussion, the following hypotheses are formulated:

H3a. Governance practices positively influence brand awareness.

H3b. Governance practices positively influence brand associations.

H3c. Governance practices positively influence perceived quality.

H3d. Governance practices positively influence brand loyalty.

Figure 1 illustrates the proposed conceptual research model.

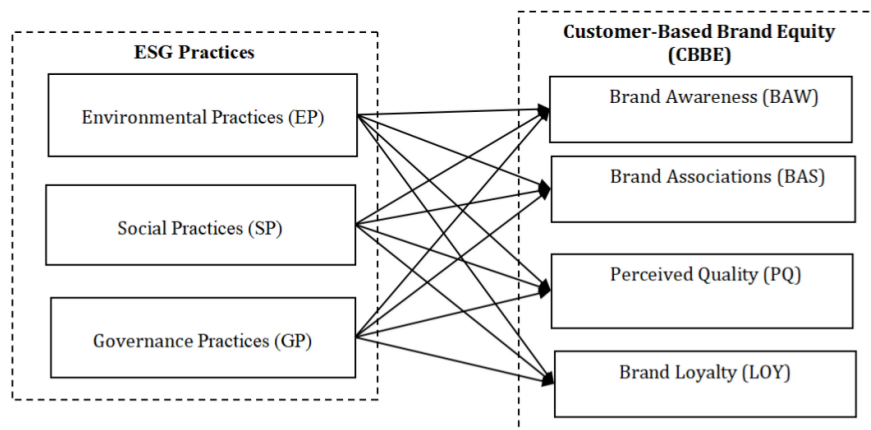


Figure 1. Proposed research model.

3. Methodology

3.1. Measurements

The questionnaire consisted of two main sections. The first section collected respondents' demographic information, while the second section measured the key constructs of the study, including environmental, social, and governance (ESG) practices and Customer-Based Brand Equity (CBBE). All measurement items were assessed using a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree").

The measurement of ESG practices was primarily adapted from the scales developed by Puriwat and Tripopsakul^[2] and Nugroho et al.^[44] which conceptualize ESG as a multidimensional construct encompass-

ing environmental, social, and governance dimensions. To ensure contextual relevance and content validity, a qualitative focus group discussion was conducted prior to the main survey to refine and adjust the measurement items. The focus group consisted of marketing academics, industry practitioners in the dairy sector, and consumers with regular dairy purchasing experience. Participants were asked to evaluate the clarity, relevance, and appropriateness of each item in reflecting ESG practices within the Vietnamese dairy industry. Based on the feedback obtained, minor wording revisions were made to improve clarity, cultural relevance, and ease of understanding, while maintaining consistency with the original conceptual definitions of ESG.

The environmental dimension captured con-

sumers’ perceptions of dairy companies’ efforts to minimize environmental impacts, reduce resource consumption, and manage waste and packaging responsibly. The social dimension reflected firms’ responsibilities toward consumers, local communities, and dairy farmers, including initiatives related to nutrition, social welfare, and community development. The governance dimension assessed perceptions of legal compliance, ethical conduct, transparency, and anti-corruption practices. The refined items were considered suitable for capturing consumers’ perceptions of ESG practices in the context of Vietnam’s dairy industry.

Customer-Based Brand Equity was operationalized

as a multidimensional construct consisting of brand awareness, brand associations, perceived quality, and brand loyalty. Measurement items for CBBE were adapted from established branding literature, particularly Aaker^[35] and Keller^[37]. Similar to the ESG scales, the CBBE measurement items were reviewed and refined through the focus group discussion to ensure that the wording was clear and relevant to dairy consumption behavior in Vietnam. The adjustments helped align the items with consumers’ actual experiences and perceptions, while preserving the theoretical foundations of the original scales. All measurement items used in this study are presented in **Table 1**.

Table 1. Constructs and Items.

Constructs	Code	Items
ESG Practices ^[2, 44]		
Environmental Practices (EP)	EP1	The dairy company X reduces water, energy, and other resource consumption as much as possible without harming the environment.
	EP2	The dairy company X actively uses environmentally friendly packaging and materials.
	EP3	The dairy company X efficiently manages recycling, waste disposal, and by-products from milk production.
Social Practices (SP)	SP1	The dairy company X respects social norms, traditions, and local farming cultures.
	SP2	The dairy company X improves the long-term welfare and nutrition of consumers and communities.
	SP3	The dairy company X contributes to social and economic development, including supporting local dairy farmers.
	SP4	The dairy company X supports charities, nutrition programs, or initiatives targeting underprivileged groups.
Governance Practices (GP)	GP1	The dairy company X fully complies with laws and regulations related to food safety, environmental standards, and labor.
	GP2	The dairy company X ensures transparency and responsibility toward partners, farmers, and shareholders.
	GP3	The ethical principles of the dairy company X have priority over purely economic performance.
	GP4	The dairy company X makes every effort to prevent and avoid corruption in its interactions with government and industry partners.
Customer-Based Brand Equity (CBBE) ^[35, 37]		
Brand Awareness (BAW)	BAW1	I am aware of the dairy brand X.
	BAW2	I know what the dairy brand X stands for.
	BAW3	I have an opinion about the dairy brand X.
	BAW4	I can name the dairy brand X among other brands in this product category.
Brand Association (BAS)	BAS1	Dairy Company X has a distinctive personality.
	BAS2	Dairy Company X is interesting and appealing.
	BAS3	I trust Dairy Company X to follow ethical and sustainable practices.
	BAS4	Dairy Company X stands out from other dairy brands due to its ESG practices.
Perceived Quality (PQ)	PQ1	Compared to other dairy brands, Dairy Company X offers high-quality products
	PQ2	Compared to other dairy brands, Dairy Company X is one of the best in the market in terms of quality and sustainability.
	PQ3	Dairy Company X provides consistent product quality and follows responsible production practices.
Brand Loyalty (LOY)	LOY1	I have reasons to choose Dairy Company X over other dairy brands in Vietnam because of its quality and responsible practices.
	LOY2	I was satisfied with Dairy Company X’s products the last time I used them.
	LOY3	I would buy Dairy Company X again on my next purchase.
	LOY4	I would recommend Dairy Company X to my friends and family because of its quality and responsible practices.

3.2. Sample and Data Collection

This study employed a quantitative survey design to examine the impact of environmental, social, and governance (ESG) practices on Customer-Based Brand Equity (CBBE) in Vietnam’s dairy industry. Data were collected using a structured questionnaire administered both online and through on-site surveys in Ho Chi Minh City, a major consumption hub for dairy products in Vietnam. To ensure the relevance and validity of the sample, respondents were screened based on three key cri-

teria. First, participants were required to be at least 18 years old. Second, they had to have decision-making responsibility in purchasing dairy products for themselves or their households. Third, respondents were required to have prior exposure to or experience with ESG-related programs, campaigns, or communications implemented by dairy companies. Specifically, participants were asked whether they had encountered any initiatives demonstrating a dairy company’s commitment to environmental protection, social responsibility, and ethical governance. Only respondents who answered “yes”

to this screening question were included in the study. This screening criterion was applied to ensure that respondents possessed sufficient awareness to meaningfully evaluate firms' ESG practices. Assessing perceptions of corporate ESG initiatives presumes a minimum level of informational exposure; respondents without such exposure may provide uninformed or arbitrary responses, potentially undermining the validity of the constructs measured. Restricting the sample to consumers who were aware of ESG-related activities undertaken by dairy companies, therefore helped improve the reliability and accuracy of the measurement of ESG perceptions and their influence on consumer-based brand equity. This procedure is consistent with prior studies examining consumer perceptions of sustainability or ESG initiatives^[12]. However, this sampling approach may introduce self-selection bias and may limit the generalizability of the findings to consumers who already possess some level of ESG awareness.

The sample size for the quantitative study was determined based on the requirements of Partial Least Squares Structural Equation Modeling (PLS-SEM), which provides guidelines for ensuring adequate statistical power and model estimation reliability. According to Hair et al.^[53], the minimum sample size in PLS-SEM should be ten times the largest number of indicators of a formative construct or the largest number of structural paths directed at a particular construct. Prior methodological research indicates that sample sizes above 200 are generally sufficient to detect medium effect sizes with acceptable statistical power in PLS-SEM models of moderate complexity^[53, 54]. Therefore, this study collected a substantially larger sample ($n \geq 250$) to ensure adequate statistical power, improve parameter estimation accuracy, and enhance the robustness and generalizability of the findings. Trained interviewers were recruited and instructed on standardized survey administration procedures to minimize response bias. Participants were informed about the voluntary nature of the study, and informed consent was obtained prior to participation. A total of 420 questionnaires were distributed, resulting in 350 returned responses. After removing 70 incomplete questionnaires, 280 valid responses were retained, yielding a valid response rate of

80.0%.

Data analysis was conducted in two stages. First, SPSS version 26 was used to perform descriptive statistical analyses and to assess potential common method bias. Second, Partial Least Squares Structural Equation Modeling (PLS-SEM) was performed using SmartPLS version 3.3.3 to evaluate the measurement model and test the structural relationships between ESG practices and Customer-Based Brand Equity dimensions^[55]. PLS-SEM was selected due to its suitability for analyzing complex models involving latent constructs, its robustness with non-normal data, and its strong predictive capability, making it appropriate for exploratory research in marketing and consumer behavior^[54]. To enrich the interpretation of the quantitative findings, supplementary qualitative insights were obtained through in-depth consultations with three marketing experts in the dairy industry. These experts have extensive professional experience in dairy marketing, brand management, and sustainability initiatives within the agri-food sector. The consultations were conducted in the form of semi-structured interviews to gather expert perspectives on the role of environmental, social, and governance (ESG) practices in shaping brand perceptions and supporting sustainable agricultural development in the dairy industry. The purpose of these expert consultations was not to generate independent qualitative findings but to provide contextual insights that support the interpretation of the quantitative results. Therefore, the insights derived from these interviews were used selectively in the discussion section to complement and contextualize the empirical findings.

Common method bias was assessed using Harman's single-factor test and the full collinearity variance inflation factor (VIF) approach. Harman's single-factor test showed that the first factor accounted for 40.7% of the total variance, which is below the majority threshold, suggesting that CMB (Common Method Bias) is unlikely to be a serious concern^[56]. In addition, all full collinearity VIF values were below the conservative threshold of 3.3, indicating that CMB is not a significant threat to the validity of the results^[57]. To further reduce potential method bias, several procedural remedies were implemented during questionnaire design, including assur-

ing respondent anonymity and minimizing evaluation apprehension. These procedural controls help mitigate systematic response biases and improve the reliability of the self-reported data^[56].

4. Results

4.1. Respondents Profile

A total of 280 valid questionnaires were collected and used for data analysis (**Table 2**). Regarding gender, the sample consisted of 103 males (36.8%) and 177 females (63.2%), indicating a higher participation rate among female respondents. In terms of age, the majority of respondents were above 45 years old (56.4%), followed by those aged 18–25 years (26.4%) and 36–45 years (14.3%). Only a small proportion of respondents

fell within the 26–35 age group (1.1%), while a negligible share reported other age categories. With respect to average monthly income, 35.7% of respondents earned between approximately USD 600–1,200, followed by those earning below USD 300 (29.3%) and USD 300–600 (20.0%). Respondents with an income above USD 1,200 accounted for 15.0% of the sample. Regarding occupation, the largest group consisted of students (31.1%), followed by business owners/self-employed individuals (12.5%), teachers/lecturers (9.6%), and office employees (7.9%). Other occupations, including engineers/technicians, freelancers, homemakers, retirees, healthcare workers, and manual laborers, each represented smaller proportions of the sample. Overall, the demographic profile suggests that the sample is diverse in terms of age, income, and occupation, providing a suitable basis for subsequent empirical analysis.

Table 2. Demographic Profile of Respondents.

Characteristics	Category	Frequency	Percentage
Gender	Male	103	36.8%
	Female	177	63.2%
Age	18–25	74	26.4%
	26–35	3	1.1%
	36–45	40	14.3%
	Above 45	158	56.4%
	Other	5	1.8%
Average Monthly Income	Below USD 300	82	29.3%
	USD 300–600	56	20.0%
	USD 600–1,200	100	35.7%
	Above USD 1,200	42	15.0%
Occupation	Doctor/Nurse/Pharmacist/Healthcare staff	9	3.2%
	Business owner/Self employed	35	12.5%
	Public servant/Government employee	14	5.0%
	Worker/Farmer/Fisherman/Artisan	16	5.7%
	Retired	13	4.6%
	Teacher/Lecturer	27	9.6%
	Engineer/Technician	21	7.5%
	Freelance worker	20	7.1%
	Office staff	22	7.9%
	Homemaker	16	5.7%
	Student	87	31.1%
Total		280	100.0%

4.2. Measurement Model Assessment

In this study, the interpretation of statistical results is grounded in a comprehensive evaluation of the reliability and validity of the measurement model. Reli-

ability is assessed using indicator reliability, Cronbach’s alpha, and composite reliability, all of which reflect the internal consistency of the latent constructs^[54]. Validity is examined through both convergent and discriminant validity. Convergent validity is evaluated using

the Average Variance Extracted, while discriminant validity is assessed based on the Fornell–Larcker criterion^[54, 55].

Reliability analysis: All observed variables demonstrate outer loadings exceeding the recommended threshold of 0.708, with individual item loadings ranging from 0.773 to 0.925, indicating satisfactory indicator

reliability^[54] (see **Table 3**). In addition, Cronbach’s alpha and composite reliability values for all constructs are above the commonly accepted benchmark of 0.70, confirming strong internal consistency and reliability of the measurement scales. These results indicate that the instruments used in this study are reliable for measuring the proposed constructs.

Table 3. Measurement model results.

Constructs	Outer Loadings	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Environmental Practices (EP)	0.872–0.899	0.864	0.867	0.917	0.786
Social Practices (SP)	0.774–0.910	0.879	0.880	0.918	0.736
Governance Practices (GP)	0.830–0.891	0.889	0.893	0.923	0.750
Brand Awareness (BAW)	0.773–0.928	0.896	0.906	0.928	0.765
Perceived Quality (PQ)	0.931–0.940	0.928	0.930	0.954	0.875
Brand Association (BAS)	0.828–0.886	0.886	0.897	0.921	0.744
Brand Loyalty (LOY)	0.819–0.925	0.886	0.889	0.922	0.747

Convergent validity: The results confirm the adequacy of the measurement model in terms of convergent validity. All constructs report Average Variance Extracted (AVE) values well above the recommended threshold of 0.50, ranging from 0.736 to 0.876, indicating that the latent constructs explain a substantial proportion of variance in their observed indicators. In addition, all measurement items exhibit strong outer loadings, further supporting indicator reliability. Collectively, these findings demonstrate that the constructs employed in this study possess satisfactory convergent

validity and are appropriate for subsequent structural model evaluation^[54]. As reported in **Table 3**, the evaluation of the measurement model also includes indicator reliability, scale reliability, and convergent validity.

Discriminant validity: To assess the discriminant validity of the measurement scales, the Fornell–Larcker criterion was employed^[55, 58]. The square roots of the Average Variance Extracted (AVE) values for each construct exceed the corresponding inter-construct correlations, indicating that the measurement scales satisfy the criteria for discriminant validity (see **Table 4**).

Table 4. Fornell-Larcker criterion results.

Constructs	BAS	BAW	EP	GP	LOY	PQ	SP
Brand Associations (BAS)	0.862						
Brand Awareness (BAW)	0.212	0.875					
Environmental Practices (EP)	0.417	0.280	0.887				
Governance Practices (GP)	0.406	0.549	0.376	0.866			
Brand Loyalty (LOY)	0.522	0.345	0.552	0.628	0.864		
Perceived Quality (PQ)	0.334	0.659	0.378	0.744	0.517	0.935	
Social Practices (SP)	0.372	0.385	0.454	0.617	0.645	0.486	0.858

Note: The square root of AVE values are shown as the bold values in the diagonal cells.

4.3. Structural Model Assessment

To test the proposed hypotheses, Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed, using a non-parametric bootstrap resampling procedure with 5,000 subsamples to assess the signif-

icance of the path coefficients. The structural model was evaluated following established PLS-SEM assessment criteria, including the estimation of multicollinearity, path coefficients (β) between exogenous and endogenous constructs, and the assessment of their statistical significance^[54, 55]. The model’s explanatory power

was further assessed using the coefficient of determination (R^2) and predictive relevance (Q^2), while effect sizes (f^2) were calculated to evaluate the relative contribution of each predictor construct to the endogenous variables [54, 57, 59]. The key results of the structural model analysis are presented below.

Multicollinearity Assessment: Multicollinearity was examined by analyzing the Variance Inflation Factor (VIF) values of the latent constructs. According to established guidelines, VIF values equal to or below 3.3 indicate the absence of multicollinearity and suggest that common method bias is unlikely to be a concern [57]. In this study, all VIF values for all structural paths ranged from 1.284 to 1.782, remaining well below the recommended threshold. These results confirm that multicollinearity among the predictor constructs does not pose a concern in the present study.

Estimation of impact coefficients: The estimated path coefficients (β) represent both the strength and the direction (positive or negative) of the relationships between the exogenous and endogenous constructs in the structural model. The results of the PLS-SEM analysis indicate that eight hypothesized relationships are statistically supported, while four hypotheses (H1a, H2a, H2b, and H2c) are not supported (see **Table 5**).

According to the path analysis result (**Table 5**), Environmental Practices (EP) showed mixed effects on the dimensions of customer-based brand equity. Specifically, the influence of environmental practices on Brand Awareness (BAW) was positive but not statistically significant ($\beta = 0.071$; $p = 0.239$), leading to the rejection of H1a. In contrast, environmental practices demonstrated a significant positive effect on Brand Association (BAS) ($\beta = 0.284$; $p = 0.000$), thus supporting H1b. Similarly, environmental practices were found to positively and significantly influence Perceived Quality (PQ) ($\beta = 0.113$; $p = 0.018$), confirming H1c. Furthermore, the effect of environmental practices on Brand Loyalty (LOY) was both positive and significant ($\beta = 0.288$; $p = 0.000$), thereby supporting H1d.

Regarding Social Practices (SP), the results indicated limited impacts on most CBBE dimensions. The effects of social practices on Brand Awareness (BAW) ($\beta = 0.049$; $p = 0.492$), Brand Association (BAS) ($\beta = 0.094$; $p = 0.192$), and Perceived Quality (PQ) ($\beta = 0.002$; $p =$

0.977) were all positive but statistically insignificant, resulting in the rejection of H2a, H2b, and H2c, respectively. However, social practices exhibited a significant positive influence on Brand Loyalty (LOY) ($\beta = 0.312$; $p = 0.000$), providing support for H2d. This finding suggests that social initiatives mainly contribute to strengthening long-term customer loyalty rather than enhancing cognitive or perceptual brand outcomes.

With respect to Governance Practices (GP), the findings revealed consistently strong and statistically significant positive effects across all dimensions of customer-based brand equity. Governance practices significantly influenced Brand Awareness (BAW) ($\beta = 0.492$; $p = 0.000$), Brand Association (BAS) ($\beta = 0.240$; $p = 0.001$), Perceived Quality (PQ) ($\beta = 0.701$; $p = 0.000$), and Brand Loyalty (LOY) ($\beta = 0.327$; $p = 0.000$), thereby supporting H3a, H3b, H3c, and H3d, respectively. Notably, the effect of governance practices on perceived quality was the strongest among all tested relationships, underscoring the pivotal role of corporate governance in shaping consumers' quality perceptions and overall brand equity in the dairy industry.

Table 6 presents the explanatory power and effect sizes of the structural model for the customer-based brand equity (CBBE) dimensions. The model explains a moderate proportion of variance in brand association ($R^2 = 0.251$) and brand awareness ($R^2 = 0.309$), indicating adequate explanatory power for these cognitive brand outcomes. In contrast, the explained variance is substantially higher for perceived quality and brand loyalty ($R^2 = 0.565$ for both constructs), suggesting stronger model performance in explaining evaluative and relational brand outcomes. The adjusted R^2 values are consistent with the corresponding R^2 values, indicating that the model estimates are stable.

All Q^2 values are positive, ranging from 0.171 to 0.485, indicating that the model demonstrates adequate predictive relevance for the endogenous constructs. In particular, perceived quality and brand loyalty exhibit relatively higher Q^2 values, suggesting that ESG dimensions provide stronger predictive capability for evaluative and relational brand outcomes than for cognitive brand dimensions such as brand awareness and brand association.

Table 5. Hypothesis testing results.

Hypotheses	Effect Coefficients	T Statistics	p Values	Results
H1a. Environmental Practices (EP) → Brand Awareness (BAW)	0.071	1.176	0.239	Not supported
H1b. Environmental Practices (EP) → Brand Association (BAS)	0.284	4.301	0.000	Supported
H1c. Environmental Practices (EP) → Perceived Quality (PQ)	0.113	2.357	0.018	Supported
H1d. Environmental Practices (EP) → Brand Loyalty (LOY)	0.288	5.281	0.000	Supported
H2a. Social Practices (SP) → Brand Awareness (BAW)	0.049	0.688	0.492	Not supported
H2b. Social Practices (SP) → Brand Association (BAS)	0.094	1.304	0.192	Not supported
H2c. Social Practices (SP) → Perceived Quality (PQ)	0.002	0.029	0.977	Not supported
H2d. Social Practices (SP) → Brand Loyalty (LOY)	0.312	5.112	0.000	Supported
H3a. Governance Practices (GP) → Brand Awareness (BAW)	0.492	8.471	0.000	Supported
H3b. Governance Practices (GP) → Brand Association (BAS)	0.240	3.459	0.001	Supported
H3c. Governance Practices (GP) → Perceived Quality (PQ)	0.701	15.227	0.000	Supported
H3d. Governance Practices (GP) → Brand Loyalty (LOY)	0.327	6.755	0.000	Supported

Table 6. Explanatory Power and Effect Sizes of the Structural Model.

Endogenous Constructs	R Square (R ²)	R ² Adjusted	Q ²	f ² (EP)	f ² (SP)	f ² (GP)
Brand Association (BAS)	0.251	0.243	0.171	0.084	0.007	0.047
Brand Awareness (BAW)	0.309	0.302	0.223	0.006	0.002	0.213
Perceived Quality (PQ)	0.565	0.561	0.485	0.023	0.000	0.686
Brand Loyalty (LOY)	0.565	0.561	0.405	0.148	0.126	0.149

Effect size analysis further reveals heterogeneous impacts of ESG dimensions on customer based brand equity. Governance practices exhibit the largest effect sizes across the constructs, particularly for perceived quality ($f^2 = 0.686$), indicating that governance related attributes such as transparency, accountability, and responsible management play a critical role in shaping consumers' perceptions of product quality in the dairy market. Governance practices also demonstrate moderate effects on brand awareness and brand loyalty, suggesting that strong governance mechanisms contribute not only to product evaluation but also to reinforcing brand recognition and long term consumer attachment. Environmental practices demonstrate small to medium effect sizes for brand association and brand loyalty, indicating that environmental initiatives primarily contribute to the formation of positive brand meanings and emotional attachment rather than immediate cognitive recognition. These findings suggest that environmental sustainability may function as a differentiation mechanism that enhances consumers' relational connections with the brand. Social practices display negligible effects on brand awareness and perceived quality but small to medium effects on brand loyalty. This pattern suggests that social initiatives, including community engagement

and stakeholder responsibility, may have limited influence on consumers' cognitive evaluations of the brand, yet they contribute meaningfully to the development of trust and long term relational commitment. Overall, the structural model demonstrates satisfactory explanatory and predictive performance. ESG dimensions also play differentiated roles in shaping brand equity, with governance practices emerging as the most influential driver (see **Table 6**).

5. Discussions

This study examines how environmental, social, and governance (ESG) practices influence customer-based brand equity (CBBE) in the dairy industry. The findings indicate that ESG dimensions exert differentiated effects on brand equity components. Governance practices emerge as the most influential driver, followed by environmental practices, while social practices primarily influence brand loyalty. These results suggest that ESG dimensions function as signals with varying strength in food markets characterized by high consumer involvement and substantial information asymmetry. In agri-food sectors such as dairy production, consumers typically possess limited direct knowledge of

production processes and supply chain practices. Under such conditions, ESG initiatives can act as credibility-enhancing mechanisms that reduce perceived risk and strengthen trust in branded food products.

The results provide partial support for the hypothesized relationships between environmental practices and customer-based brand equity. Environmental practices significantly enhance brand associations, perceived quality, and brand loyalty. These findings are consistent with prior studies suggesting that environmentally responsible practices signal superior production standards and a long-term strategic orientation, thereby strengthening favorable brand meanings and quality perceptions in food markets^[39,40]. From a signaling theory perspective, environmental initiatives such as sustainable sourcing, waste reduction, and resource-efficient production provide observable cues regarding firms' commitment to responsible production practices. In agricultural markets, such initiatives are often associated with broader efforts to improve environmental performance across supply chains, including reduced environmental footprints and improved resource management. In the dairy sector, where environmental sustainability increasingly intersects with concerns related to food safety, animal welfare, and public health, these signals can enhance consumer confidence and support the development of long-term brand loyalty.

However, environmental practices do not significantly influence brand awareness. This finding suggests that many environmental initiatives remain embedded within operational processes and supply chain management systems, making them less visible to consumers unless supported by explicit communication strategies. As a result, environmental practices tend to influence evaluative dimensions of brand equity rather than cognitive recall processes related to brand awareness. This pattern is consistent with prior research indicating that sustainability initiatives often shape consumer evaluations of brand meaning and product quality rather than brand recognition itself^[20,30].

The findings also indicate a selective effect of social practices on customer-based brand equity. Social practices significantly enhance brand loyalty but do not significantly influence brand awareness, brand associa-

tions, or perceived quality. This pattern suggests that social initiatives operate primarily through relational and affective mechanisms rather than through immediate perceptual evaluations. Drawing on stakeholder theory, social initiatives reflect firms' commitments to key stakeholders, including employees, consumers, local communities, and upstream suppliers such as farmers. In agricultural supply chains, such initiatives may include programs aimed at strengthening relationships with farming communities, supporting rural development, or improving labor conditions within the value chain. These practices can reinforce the ethical legitimacy of agri-food brands and contribute to stronger emotional connections with consumers. In the dairy context, where products are closely associated with family nutrition and everyday consumption, such relational and ethical signals may foster emotional attachment and moral identification with brands, ultimately strengthening long-term loyalty. From a signaling perspective, social practices generate softer and more value-based signals compared with environmental and governance initiatives, which may explain their limited influence on cognitive brand evaluations but stronger impact on relational outcomes such as loyalty^[46,47].

Governance practices emerge as the strongest determinant of customer-based brand equity in this study. Governance initiatives significantly enhance brand awareness, brand associations, perceived quality, and brand loyalty. This finding supports previous research emphasizing the critical role of governance mechanisms in building consumer trust in food industries characterized by regulatory sensitivity and potential health risks^[48,50,51]. In the dairy industry, governance practices often include mechanisms such as food safety compliance systems, traceability initiatives, third-party certification, and transparent quality control procedures. These governance structures function as highly credible institutional signals of product reliability and operational integrity. From a signaling theory perspective, such practices are difficult to imitate because they require formal systems, regulatory compliance, and organizational transparency. Consequently, governance practices exert a particularly strong influence on perceived quality and consumer trust^[31]. At a broader mar-

ket level, governance mechanisms may also contribute to improving transparency and coordination within agricultural supply chains by linking dairy processors, distributors, and farmers through standardized quality and safety practices.

Beyond firm-level branding outcomes, the findings also highlight the broader relevance of ESG practices for sustainable agricultural market development. In agri-food industries, sustainability initiatives implemented by downstream firms often extend upstream through procurement standards, certification systems, and supplier requirements. When dairy companies incorporate ESG principles into procurement policies and quality management systems, they create market incentives that encourage farmers and suppliers to adopt more responsible production practices. Such dynamics may contribute to gradual improvements in environmental management, resource efficiency, and animal welfare practices at the farm level.

Consistent with these findings, insights from three marketing experts in the dairy industry further highlight the broader role of ESG practices in shaping sustainable agricultural development. According to these experts, ESG initiatives implemented by dairy companies can influence upstream production practices through mechanisms such as sustainability certifications, supplier evaluation systems, and procurement standards. These mechanisms may encourage dairy farmers to adopt more environmentally responsible production practices and strengthen quality management at the farm level.

These expert perspectives reinforce the argument that ESG strategies implemented by downstream firms may extend beyond branding outcomes and contribute to broader transformations within agri-food supply chains. In particular, the experts emphasized that governance mechanisms related to food safety, traceability, and certification play a critical role in building consumer trust while simultaneously improving coordination among processors, distributors, and farmers. These observations are consistent with the signaling perspective adopted in this study, which suggests that credible institutional mechanisms can strengthen the effectiveness of ESG signals in markets characterized by high in-

formation asymmetry. The findings also have implications for public policy and institutional frameworks supporting sustainable agri-food markets. Regulatory systems that strengthen food safety governance, traceability requirements, and certification mechanisms can enhance the credibility of ESG signals communicated to consumers and reduce information asymmetry between producers and consumers.

In summary, this study advances the ESG and branding literature by demonstrating that ESG practices influence customer-based brand equity through differentiated signaling mechanisms in the dairy industry. Governance practices function as the most credible signals of product quality and institutional reliability, environmental practices primarily shape evaluative perceptions related to sustainability and responsible production, and social practices reinforce long-term relational outcomes such as brand loyalty. By linking ESG-driven brand outcomes to agricultural supply chain dynamics and sustainability transitions, this study provides a more comprehensive understanding of how ESG strategies can simultaneously support firm-level branding objectives and broader sustainability transformations within agri-food markets.

6. Conclusion and Implications

This study examined the impact of ESG practices on customer-based brand equity (CBBE) within the Vietnamese dairy industry. The findings indicate that ESG implementation positively influences brand awareness, perceived quality, brand associations, and brand loyalty, with social and governance practices having stronger effects than environmental initiatives. These results suggest that as Vietnamese consumers become increasingly conscious of sustainability and corporate responsibility, ESG strategies play a critical role in shaping brand perceptions and fostering customer loyalty in emerging markets. From a theoretical perspective, the findings support signaling and stakeholder theory by demonstrating that ESG practices serve as important signals shaping consumer-based brand equity in the dairy industry. Governance practices exhibit the strongest explanatory and effect sizes across all CBBE di-

mensions, highlighting their critical role as institutional trust-building signals that reduce uncertainty and enhance consumer confidence. Environmental practices show small to medium effects on brand associations and loyalty, indicating their role in shaping brand meaning and evaluative judgments. Social practices mainly influence brand loyalty, suggesting that social initiatives function as relational signals that foster emotional attachment rather than cognitive brand evaluations. Overall, the results reveal differentiated and complementary signaling roles of ESG dimensions, extending branding and sustainability literature by empirically demonstrating asymmetric ESG effects on brand equity in high-involvement agri-food contexts.

The findings offer several managerial implications for the implementation and communication of ESG practices in the Vietnamese dairy industry. First, firms should integrate ESG initiatives into their overall brand strategy to strengthen customer-based brand equity. Companies need to establish clear and measurable ESG objectives aligned with their brand vision. Leading domestic dairy companies have committed to reducing greenhouse gas emissions, promoting sustainable packaging, and adopting environmentally friendly production practices. By integrating these initiatives into brand communication, ESG practices become strategic tools for building sustainable competitive advantage rather than merely compliance requirements. Such integration enables firms to differentiate themselves in a market where consumers are increasingly attentive to social and environmental responsibility, thereby enhancing brand perception, loyalty, and overall CBBE.

Second, the study highlights the importance of strengthening ESG implementation across environmental, social, and governance dimensions. Although environmental practices showed a relatively weaker effect on CBBE compared to social and governance practices, they remain essential for enhancing brand image. Companies can adopt measures such as reducing plastic packaging, improving waste management, and utilizing renewable energy sources. Social initiatives, including community engagement programs, employee welfare schemes, and fair labor practices for farmers, were found to have the strongest impact on brand percep-

tions and loyalty. Governance practices, such as transparent corporate reporting, third-party audits, and internal ESG oversight mechanisms, can further enhance credibility and foster consumer confidence in dairy companies.

Third, the communication of ESG initiatives plays a crucial role in converting implementation efforts into perceived brand value. As Vietnamese consumers increasingly rely on digital and social media for information, dairy companies are encouraged to use these platforms to convey ESG messages in a clear and engaging way. Effective communication should emphasize transparency and concrete evidence, since consumers tend to trust information that can be verified, including independent certifications, quantified results, and comprehensive ESG reporting. In practice, many dairy brands publish sustainability reports that describe their environmental performance and social responsibilities, which helps to build credibility and trust. In addition, incorporating ESG elements into experiential marketing activities, such as farm tours, product sampling, or campaigns highlighting the social and environmental consequences of consumption, can foster stronger emotional bonds between consumers and the brand.

Finally, continuous measurement and stakeholder engagement are essential components of a successful ESG strategy. Firms should establish key performance indicators (KPIs) linking ESG activities to brand outcomes, including consumer awareness, perceived quality, and loyalty metrics. Feedback mechanisms, such as consumer surveys and market research, allow firms to identify areas for improvement and adapt ESG strategies accordingly. Collaboration with farmers, suppliers, regulatory agencies, and certification bodies ensures that ESG practices are effectively implemented across the value chain while maintaining credibility and compliance with national and international standards. In summary, integrating ESG practices into the strategic, operational, and communicative aspects of brand management allows Vietnamese dairy firms to enhance customer perceptions, strengthen loyalty, and create a competitive advantage in a market increasingly sensitive to sustainability and corporate responsibility. These findings underscore the need for a holistic approach in which

ESG implementation, transparent communication, and stakeholder engagement are mutually reinforcing components of brand equity development.

7. Limitations

Despite these contributions, several limitations should be acknowledged, which also suggest directions for future research. First, the sampling strategy may limit the generalizability of the findings. Respondents were screened to ensure prior exposure to ESG-related initiatives implemented by dairy companies. While this approach helped ensure that participants possessed sufficient awareness to evaluate ESG practices, it may introduce self-selection bias, as individuals who are already attentive to sustainability issues may be over-represented in the sample. Consequently, the findings may not fully represent the perceptions of the broader population of dairy consumers with limited awareness of ESG initiatives. Future research could address this limitation by employing probability-based sampling techniques or by including both ESG-aware and ESG-unaware consumers to provide a more comprehensive understanding of how ESG perceptions influence brand evaluations. Second, the survey-based design limits the ability to draw causal inferences. Longitudinal or experimental research designs could provide stronger evidence regarding the causal and temporal effects of ESG initiatives on brand equity outcomes. Third, this study focused on the dairy industry and collected data from urban consumers in Vietnam, which may restrict the generalizability of the findings to other industries, geographic regions, or rural contexts where levels of sustainability awareness and ESG adoption may differ. Fourth, this study primarily examined the direct effects of ESG components on customer-based brand equity and did not explore underlying psychological mechanisms, such as perceived credibility, trust formation, or perceived risk, through which ESG initiatives may influence consumer perceptions. Finally, this study did not explore potential consumer heterogeneity across demographic segments such as age, gender, and income. Future research could employ segmentation or multi-group analyses to examine how these fac-

tors moderate the relationship between ESG practices and customer-based brand equity.

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Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki and in compliance with current regulations on academic integrity in scientific and technological activities at the University of Finance - Marketing, as stipulated in Decision No. 473/QĐ-UFM-QLKHHTQT, dated March 6, 2025.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

The data presented in this study are available on request from the author.

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Conflicts of Interest

The author declares no conflict of interest.

AI Use Statement

Artificial intelligence tools (Copilot and ChatGPT 5.0) were used solely for language editing and improving clarity and readability. All scientific content, data analysis, and interpretations are the author's own responsibility.

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