

A Study on Impact of Sustainable Supply Chain Practices on Consumer Purchasing Behavior in the Dairy Industry

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Abstract - This research explores how sustainable supply chain practices influence consumer purchasing behavior in the dairy sector. It was found that gender does not have a significant influence on the perception of sustainability when choosing dairy products. Surprisingly, consumers' willingness to pay more for sustainable dairy products is not necessarily related to their awareness of sustainable practices. Furthermore, sustainability awareness does not appear to have a direct impact on how often consumers purchase dairy products. However, there is a striking connection between consumers' concern for the environment and their willingness to pay a premium for sustainably sourced dairy products. These results highlight the importance of sustainable practices in shaping consumer preferences and suggest that increased awareness could increase demand for sustainable dairy products. Further research is needed to explore gender nuances and the complex relationship between sustainability awareness and consumer behavior in the dairy market.

Index Terms - sustainable supply chain practices, organic farming, reduced packaging, environmental, dairy industry.

I. INTRODUCTION

The dairy sector, like many others, has undergone significant change in recent years, reflecting changing consumer preferences and growing environmental awareness. As consumers become more aware of the environmental and ethical impacts of their choices, sustainable supply chain practices are becoming increasingly important in the dairy industry. The purpose of this study is to examine the complex relationship between an organization's sustainable supply chain practices and their impact on consumer purchasing behavior in the dairy sector.

Supply Chain can be defined as the network of organizing, peoples, activities, information, and resources which are to be used for the purpose of production, distribution, and delivering of goods and services to the customers/consumers from the suppliers. Supply Chain Practices are the strategies, processes and activities that an organization/industry implements in order to manage the flows of goods, services, information, and finances from the initial stages of procurement of raw material to the final stages of delivering the end products to the customers/consumers.

Customer Purchasing behavior is defined as the decisions and actions by which the individuals or groups of consumers take while buying goods or services.

Sustainability in the dairy supply chain encompasses a range of practices including responsible feed sourcing, efficient resource management, reducing carbon emissions and ethical treatment of dairy cattle. Today, consumers seek dairy products for more than just their nutritional value; They also look for products that align with their values and beliefs. The aim of this study is to examine the diverse factors that link sustainable supply chain practices and consumer behavior in the dairy sector. By highlighting these connections, it will provide valuable insight to dairy organizations seeking to strengthen their sustainability initiatives, attract environmentally conscious consumers, and navigate the evolving landscape of consumer preferences in the dairy market.

Some of the sustainable supply chain practices are: Transition to Organic farming, Reduced Packaging, waste reduction and recycling, etc.

II. LITERATURE SURVEY

The research by **Muhammad Arwani, Imam Santoso, and Nuria Rahmatin (2018)** addresses risks in the dairy supply chain, with a focus on the environmental aspect, such as the risk of adulteration. They propose a dynamic system model to manage these risks, emphasizing the importance of improving supply chain transparency as a means to reduce the risk of adulteration. Environmental concerns in this context are primarily related to the quality and integrity of dairy products in the supply chain.

Gumataw K Abebe, Ali Chalak, and Mohamad G Abiad's study (2016) investigates farm-level food safety management systems (FSMS) and highlights the significance of practices related to milking hygiene and nutrition in minimizing food safety hazards within the dairy supply chain. It also explores factors influencing the implementation of good agricultural practices (GAP) in the dairy sector. This category primarily deals with health and food safety issues within the supply chain.

The research by **DING, Huiping, FU, Yanan, ZHENG, Lucy, and YAN, Zhu (2008)** focuses on health concerns in the dairy supply chain, particularly related to adulteration and product quality assurance. It underscores the importance of trust and safety in the supply chain. The study by **Ali Mohammadi, Maryam Sahrakar, and Hamid Reza Yazdani (2011)** delves into the role of information technology in enhancing supply chain efficiency and reducing uncertainties, which indirectly contributes to product safety and quality. **R.R. Pant, Gyan Prakash, Jamal A. Farooquiea (2015)** present a framework for transparency, traceability, and information flow in the management of dairy supply chain networks, which emphasizes the role of government regulations in ensuring quality and safety in dairy products. It's important to note that government regulations and policies are fundamental to the dairy supply chain. Regulations

play a crucial role in ensuring the safety, quality, and traceability of dairy products. Government interventions, subsidies, and compliance with international standards impact dairy operations.

Antonio Padula, Arvind Bhardwaj, Sarbjit Singh & Rahul S Mor (2018) Emphasizes the importance of technological innovation, risk management, and global supply chain management practices in achieving food safety, product quality, and economic benefits in the dairy industry, with suggestions for future research directions.

III. OBJECTIVES

- Determine the extent to which these sustainable supply chain practices align (for e.g.: reduced packaging, organic farming, etc.) with consumer expectations and preferences.
- Analyze the impact of sustainable supply chain practices on consumer purchasing decisions.
- Evaluate the level of awareness among consumers in the dairy industry regarding sustainable supply chain practices.
- Investigate consumers' purchasing frequency and awareness of sustainable practices in the dairy industry, assessing how these factors influence their buying behavior and willingness to pay more.
- Provide comprehensive insights into consumer preferences and behaviors toward sustainability in the dairy industry, aiding the development of more environmentally friendly practices.

IV. RESEARCH METHODOLOGY

Descriptive research design is used in the study, which integrates primary and secondary data sources. A structured questionnaire was used to collect primary data, while a variety of books, journals, and magazines were used to collect secondary data. This methodology makes use of both primary insights and previously published literature to enable a thorough analysis of the research issue.

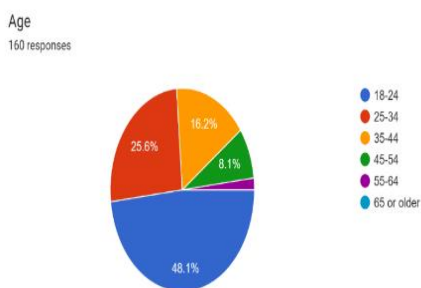
IV.1 RESEARCH DESIGN

The research design for this study employs a blend of quantitative and qualitative methods to comprehensively explore the impact of sustainable Supply Chain Practices on consumer purchasing behavior within the Dairy Industry. Quantitative methodologies, including surveys and data analytics, are utilized alongside qualitative approaches such as interviews and case studies. Primary data collection involved surveying 160 respondents from diverse socio-economic backgrounds and regions of the National Capital Region, selected via convenience sampling, ensuring a broad representation. Secondary data sourced from government reports and industry publications supplements the primary data, providing industry insights. Data collection occurred in January 2024 using a structured Google Form questionnaire, ensuring consistency and efficiency. The sample size of 160 respondents enables robust analysis, while the questionnaire's mix of closed and open-ended questions ensures comprehensive insights into consumer behavior.

IV.2 DATA COLLECTION

The research involves collecting data from 160 participants in the dairy industry. Participants were carefully selected to reflect diverse socioeconomic backgrounds and geographic locations within the National Capital Region. The data collection process involved a structured approach using both quantitative surveys and qualitative interviews to gain detailed insights into consumer behavior. The study examined various factors that influence consumers' purchasing decisions, including product quality, sustainability practices, pricing strategies and brand loyalty. Through this multi-faceted approach, the study aimed to gain an in-depth understanding of the dynamics shaping consumer behavior in the dairy sector, thereby helping industry players make informed decisions.

Age of Respondents



Brand Switching Based on Sustainable Supply Chain Practices

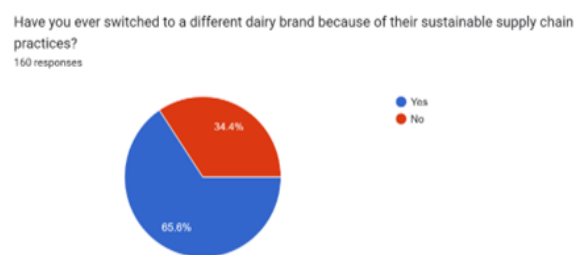


Figure (1) Age and Brand Switching behaviour of respondents based on Sustainable Supply Chain Practices.

IV.3 DATA ANALYSIS

H1: There is a significant difference in the perception of the importance of sustainability in choosing dairy products based on the demographic characteristic of gender.

H2: Consumers who are aware of sustainable supply chain practices in the dairy industry are more willing to pay a premium for sustainably sourced products compared to those who are not aware.

H3: There is a significant positive relationship between consumers' awareness of sustainable supply chain practices and their frequency of purchasing dairy products.

H4: Environmental considerations significantly influence consumers' purchasing decisions when selecting dairy products.

H5: Consumer awareness of sustainable supply chain practices significantly influences their overall perception and evaluation of dairy products.

Reliability and Validity Testing

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	160	100.0
	Excluded ^a	0	.0
	Total	160	100.0

Reliability Statistics

Cronbach's Alpha ^a	N of Items
.705	12

Table (1) Reliability Test Result by SPSS

The Cronbach's alpha for your data is 0.705, which is above the generally accepted threshold of 0.7 for internal consistency reliability. This indicates a moderate to good level of consistency between the components of the measurement instrument.

A Cronbach's alpha of 0.705 suggests that the scale items are fairly consistent in measuring the same underlying construct. This means that the items are likely to reliably assess the concept of interest.

In practice, a Cronbach's alpha of 0.705 means that the scale is reasonably reliable for measuring the desired construct. However, there is still room for improvement and it is always good to aim for greater reliability where possible.

Overall, this level of reliability suggests that the scale items are relatively consistent and reliable in measuring the construct of interest. This ensures that the results you get on the scale accurately reflect the concept you are measuring.

Hypothesis Testing

Cross-Tabulation Chi-square test result as perform in SPSS					
	X ²	df	p	Signi- Level (p-value)	Result
Hypothesis 1	2.304 ^a	4	.680	> 0.05	Rejected
Hypothesis 2	1.152 ^a	1	.283	> 0.05	Rejected
Hypothesis 3	3.664 ^a	1	.056	> 0.05	Rejected
Hypothesis 4	7.532 ^a	1	.006	< 0.05	Accepted
Hypothesis 5	25.536 ^a	4	.000	< 0.05	Accepted

Table (2) Chi-square Test Result by SPSS

Hypothesis 1: The chi-square test result (X² = 2.304, p = 0.680) indicates that there isn't a significant difference in the perception of sustainability importance in dairy product selection across gender demographics. This implies that gender may not strongly influence individuals' views on sustainability when choosing dairy products. Therefore, this hypothesis is rejected.

Hypothesis 2: The chi-square test result (X² = 1.152, p = 0.283) suggests that awareness of sustainable practices in dairy production doesn't significantly impact willingness to pay a premium for sustainably sourced dairy products. Hence, this hypothesis is rejected.

Hypothesis 3: The chi-square test result (X² = 3.664, p = 0.056) indicates that there isn't a significant positive relationship found between consumers' awareness of sustainable supply chain practices and their frequency of purchasing dairy products. This suggests that awareness alone may not be a solo strong driver of purchasing behavior in this context. Therefore, this hypothesis is rejected.

Hypothesis 4: The chi-square test result (X² = 7.532, p = 0.006) shows a significant association between environmental considerations and consumers' purchasing decisions for dairy products. Since the p-value is less than 0.05, this hypothesis is accepted, suggesting that environmental factors do influence consumers' dairy product choices.

Hypothesis 5: The chi-square test result ($X^2 = 25.536$, $p = 0.000$) indicates a significant association between consumer awareness of sustainable supply chain practices and their overall perception and evaluation of dairy products. As the p-value is less than 0.05, this hypothesis is accepted, suggesting that awareness of sustainable practices impacts consumers' perceptions of dairy products.

V. CONCLUSION

An in-depth study of 160 dairy industry participants provided insights into the connection between sustainable supply chain practices and consumer purchasing behavior. A diverse selection of participants from different socioeconomic backgrounds and geographic locations across the National Capital Region ensures a comprehensive representation of the industry.

Using a structured approach to quantitative and qualitative research, you can examine numerous aspects that influence consumer decisions, taking into account product quality, shelf-life practices, pricing strategies, and brand trust. The aim of this multi-faceted analysis is to provide industry players with a detailed understanding of the dynamics of consumer behavior in the dairy sector, thereby helping them make informed decisions.

The statistical analysis revealed interesting results: Gender had no significant influence on the perception of the importance of sustainability when selecting dairy products, suggesting gender neutrality in these considerations. Surprisingly, consumers' willingness to pay more for sustainable dairy products may not be influenced by their awareness of sustainable practices, suggesting a disconnect between awareness and consumer behavior. Furthermore, consumer awareness of sustainable practices may not have a significant impact on the frequency of purchasing dairy products.

However, there is a clear connection between consumers' consideration of the environmental impact of the product and their willingness to pay more for sustainably produced dairy products. These results highlight the key role of sustainable supply chain practices in shaping consumer perceptions and preferences in the dairy sector and highlight the potential for greater demand for sustainably sourced products among environmentally conscious consumers.

Despite these observations, the study noted limitations, including sample size limitations and potential biases in the self-reported data. Going forward, deeper exploration of gender nuances and qualitative insights alongside the employee perspective can improve our understanding of the impact of sustainable practices on consumer behavior, thereby leading to improvements and supporting a more sustainable dairy industry. Through continued efforts to integrate sustainable practices and consumer preferences, the dairy industry can advance toward a more efficient and environmentally friendly future while meeting the needs of consumers and industry stakeholders.

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