

Sentiment Analysis of Consumer Reviews: A Comparative Study of Conventional and Organic Food Products

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Growing concerns regarding health, food safety, and environmental sustainability have encouraged consumers to reconsider their preferences for everyday food products. Traditional staples such as ghee and jaggery, widely consumed in India, are increasingly available in organic variants; however, empirical evidence on how consumers evaluate these alternatives remains limited. This study examines consumer sentiment toward organic and conventional ghee and jaggery by analysing consumer-generated review narratives collected from retail environments in Kolkata. A total of 442 consumer reviews were obtained using a stratified random sampling approach. The textual reviews were pre-processed and analysed using sentiment analysis techniques in R, where sentiment scores were computed using the *syuzhet* package in R. Statistical comparisons were conducted using one-way ANOVA and factorial ANOVA to examine differences in sentiment scores and review length across product categories. The findings reveal that organic products consistently receive higher sentiment scores than conventional variants, indicating more favourable consumer perceptions. Reviews of organic ghee are significantly longer and more positively expressed, suggesting greater consumer engagement and stronger evaluations of product quality and authenticity. Although organic jaggery also receives higher sentiment scores, review length does not significantly influence sentiment intensity for this product category. Overall, the results suggest that consumer sentiment toward organic food products is influenced by both product classification and patterns of consumer expression, although the effect varies across product types. The study highlights the usefulness of sentiment analysis as a methodological approach for understanding consumer perceptions of traditional food products and provides practical insights for marketers and policymakers seeking to promote organic food consumption.

Keywords: sentiment analysis, organic food products, consumer reviews, text analytics, consumer sentiment, conventional food, consumer preference

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1. Introduction

The global shift toward sustainable food consumption has led to an increased interest in organic products, particularly in emerging economies like India, where health and environmental concerns are gaining traction among urban consumers (Verma & Yadav, 2019). India has rapidly expanded its organic agriculture sector, boasting over 4.7 million hectares of certified organic farmland, the largest in Asia, reflecting both domestic policy support and growing consumer demand (Mie et al., 2017). Government programmes such as the National Programme for Organic Production (NPOP) and the Mission Organic Value Chain Development for the North Eastern Region (MOVCD) have played key roles in fostering this growth, alongside policy shifts discouraging chemical-based inputs. The recognition of organic millets during India's leadership in the International Year of Millets (2023) further underscored the country's focus on promoting climate-resilient crops. Organic food, characterised by the absence of synthetic pesticides, fertilisers, and genetically modified organisms, is often marketed as a healthier and environmentally responsible choice (Smith-Spangler et al., 2012). On the other hand, conventional food products are typically more affordable and widely available but may raise concerns over safety, quality, and long-term health effects (Yue et al., 2008).

The contrast between organic and conventional food consumption is not merely functional but psychological, with consumer sentiment playing a pivotal role in shaping market trends and influencing food policy. Sentiment analysis, an area within natural language processing, has emerged as a valuable approach for interpreting public opinion by analysing unstructured text such as customer reviews (Liu, 2012). This method has proven particularly effective in uncovering hidden consumer motivations and preferences across various sectors, including food and retail.

Kolkata, a metropolitan hub in eastern India, presents a compelling context for this inquiry due to its rich culinary culture, varied demographics, and growing health-conscious population (Mukherjee, Das, & Bhattacharya, 2018). While organic food awareness is on the rise in the city, challenges such as higher pricing and limited accessibility continue to influence consumer behaviour (Datta & Chatterjee, 2011).

Moreover, traditional food habits and socio-cultural values may further impact consumer choices and preferences.

Against this backdrop, the present study aims to compare consumer sentiments toward organic and conventional food items, specifically ghee and jaggery, using sentiment analysis of customer reviews. The objective is to assess how perceptions differ across product types, what linguistic patterns signify these preferences, and how these insights can inform product positioning and marketing strategies in the organic food sector.

Despite the growing literature on organic food consumption, most studies rely on survey-based methods to examine consumer attitudes and purchase intentions. Limited research has utilised textual consumer reviews to capture spontaneous consumer sentiment, particularly in emerging markets such as India. Moreover, empirical evidence comparing organic and conventional variants of traditional food products such as ghee and jaggery remains scarce. Addressing this gap, the present study applies sentiment analysis to consumer-generated review narratives to examine differences in consumer sentiment between organic and conventional products.

2. Literature Review

2.1 Sentiment Analysis in Consumer Research

Sentiment analysis, also known as opinion mining, has become an important methodological approach in consumer research for analysing attitudes and emotional responses expressed in textual data. The technique enables researchers to transform unstructured consumer-generated content such as reviews and social media posts into measurable indicators of consumer sentiment (Liu, 2012). With the rapid expansion of digital communication platforms, user-generated reviews have emerged as valuable sources of information for understanding consumer perceptions and product evaluations.

Recent studies demonstrate the increasing relevance of sentiment analytics in marketing and consumer behaviour research. Singh et al. (2022) employed large-scale sentiment analysis to examine consumer discussions surrounding organic foods and reported predominantly positive sentiment related to perceived health and sustainability benefits.

Similarly, Selim (2024) highlighted that sentiment analysis of online consumer discourse can reveal deeper social and cultural motivations underlying food consumption choices. In the context of product evaluation, Rajeswari et al. (2020) found that sentiment scores derived from consumer reviews effectively capture differences in consumer perceptions between organic and conventional products.

Advances in text mining techniques have further strengthened the application of sentiment analysis in consumer research. Machine learning and lexicon-based approaches enable more accurate detection of sentiment polarity and emotional intensity within consumer narratives (Zhang et al., 2022). These analytical techniques allow researchers to identify patterns in consumer satisfaction, product perception, and brand engagement. Consequently, sentiment analysis provides a valuable methodological framework for analysing consumer attitudes toward food products through naturally expressed consumer feedback.

2.2 Consumer Preferences for Organic versus Conventional Foods

The global demand for organic food products has increased significantly in recent years, largely driven by growing consumer concerns about health, food safety, and environmental sustainability. Organic foods are generally perceived as healthier and safer alternatives to conventionally produced foods due to their avoidance of synthetic chemicals and environmentally harmful production practices. Consumers increasingly associate organic food consumption with sustainable lifestyles and ethical consumption practices (Rana & Paul, 2022; Hsu et al., 2023). In addition, trust in certification systems and transparency in production processes play an important role in shaping consumer confidence in organic food markets (Nagaraj & Singh, 2023).

Recent empirical research highlights several key determinants of organic food consumption. Health consciousness and food safety concerns are consistently identified as primary drivers of organic food purchasing behaviour (Tandon et al., 2020; Nagaraj, 2021). Environmental concern also plays a significant role, as consumers increasingly associate organic agriculture with sustainable and eco-friendly farming practices (Matharu et al., 2022).

In addition, consumer trust in certification systems and product authenticity has been shown to influence purchase intentions toward organic products (Molinillo et al., 2020).

Despite these positive perceptions, several barriers continue to influence consumer adoption of organic foods. Higher price premiums, limited product availability, and scepticism regarding certification authenticity often discourage consumers from purchasing organic products regularly (Li et al., 2021). These challenges are particularly evident in emerging markets such as India, where organic food markets are still developing and consumer awareness remains uneven. Nevertheless, increasing health awareness and environmental consciousness continue to stimulate demand for organic food products.

2.3 Sentiment Analysis in Food and Organic Product Research

The application of sentiment analysis in food marketing research has grown considerably as researchers increasingly utilise consumer-generated textual data to understand product perceptions and consumer attitudes. Consumer reviews provide valuable insights into product quality, taste, authenticity, and overall consumer satisfaction.

Recent studies demonstrate that sentiment analysis can effectively capture consumer perceptions toward organic food products. Singh et al. (2022) found that consumer discussions related to organic foods frequently contain positive sentiments associated with health benefits, natural production methods, and environmental sustainability. Similarly, Danner and Menapace (2020) analysed online consumer comments and identified that organic food products generally receive more favourable evaluations than conventional alternatives.

Research also indicates that linguistic characteristics of consumer reviews, such as review length and emotional intensity, can reveal deeper insights into consumer engagement. Longer reviews often reflect stronger consumer involvement and more detailed product evaluations (Zhang et al., 2022). Consequently, combining sentiment scores with textual attributes such as review length allows researchers to better understand how consumers express their perceptions and experiences with food products.

Overall, sentiment analysis offers a valuable methodological approach for examining consumer attitudes toward organic and conventional food products by analysing naturally occurring consumer narratives rather than relying solely on survey-based measures.

2.4 Consumer Perceptions of Traditional Organic Food Products

Traditional food products hold significant cultural and nutritional value in many societies, particularly in countries such as India, where foods like ghee and jaggery have long been integral components of daily diets. With the expansion of organic food markets, these traditional products are increasingly available in organic forms, which has influenced consumer perceptions and evaluations.

Consumers often associate organic versions of traditional foods with greater purity, authenticity, and nutritional value. Studies suggest that organic labelling functions as a quality signal that enhances consumer trust and perceived product credibility (Matharu et al., 2022). As a result, organic variants of traditional foods are frequently perceived as safer and healthier alternatives compared with conventional products.

Recent research also highlights the role of ethical and lifestyle motivations in organic food consumption. Consumers increasingly view organic food choices as expressions of environmental responsibility and sustainable living (Li et al., 2021). These values contribute to favourable consumer attitudes toward organic products and shape positive consumer evaluations.

Despite the growing popularity of organic food products, empirical research examining consumer sentiment toward traditional organic foods using text analytics remains limited. Most previous studies rely on survey-based approaches to measure consumer attitudes and purchase intentions. Therefore, analysing consumer-generated review narratives through sentiment analysis provides an alternative methodological perspective for understanding how consumers evaluate organic and conventional versions of traditional food products.

2.5 Theoretical Foundation

This study draws on signaling theory and expectation–confirmation theory to explain differences in consumer sentiment toward organic and conventional products.

Organic labels function as quality signals that reduce information asymmetry and enhance consumer trust (Aertsens et al., 2009). Consumers often interpret organic certification as an indicator of superior product quality, health benefits, and environmental sustainability. These signals influence consumers' affective evaluations, which are reflected in their textual reviews and expressed sentiments. Furthermore, expectation–confirmation theory suggests that when product performance meets or exceeds expectations, consumers express stronger positive sentiments and engagement in their feedback.

Research Objectives

1. To examine whether there is a significant difference in the length of consumer reviews between organic and conventional versions of ghee and jaggery.
2. To analyse whether consumer sentiment scores differ significantly between organic and conventional variants of ghee and jaggery.
3. To investigate whether consumer sentiment scores vary across product categories and review-length groups, and to assess the interaction effect of product type and review length on sentiment intensity.

Hypothesis of the Study

- H1. There is a significant difference in the mean number of words in the consumer reviews for the conventional and organic versions of products.
- H2. There is a significant difference in the mean sentiment score of consumer reviews between conventional and organic versions of products.
- H3. There is a significant difference in the mean sentiment score across the product class and length of the review.

3. Research Methodology

3.1 Research Design

This research aims to compare the variations in consumer reviews between conventional and organic products, focusing on review lengths and sentiment scores. The study examines two specific products: ghee and jaggery. These products are classified as experience category goods in marketing literature. Both ghee and jaggery have organic variations, which are popular in the Indian market.

The competition is characterised by numerous regional or local brands and a few national or multinational brands. This research involves sentiment analysis of consumer reviews collected through interviews. We gathered review texts from consumers and analysed them by counting the review length and computing sentiment scores for each review. Therefore, this study, with its specific hypotheses and identified variables, fits into the category of a descriptive study (Cooper & Schindler, 2002).

3.2 Sample Size and Sampling Technique

The study employed a stratified random sampling method to ensure a representative sample of consumers from different types of retail environments in Kolkata. The sampling process began by selecting various areas within Kolkata to represent different parts of the city. Each area was then divided into two strata based on the type of retail environment: organic shops and conventional shops. Within each stratum, shops were randomly selected to provide a mix of both organic and conventional retail environments. From each selected shop, consumers were randomly chosen for interviews. This stratified random sampling approach ensured that both organic and conventional retail environments were adequately represented, capturing a wide range of consumer experiences and opinions.

Structured interviews were conducted with the selected participants to gather detailed insights into their preferences and perceptions regarding conventional and organic ghee and jaggery. During these interviews, we collected the review text provided by the consumers. For each review, we counted the review length and computed sentiment scores. The sample reviews for ghee and jaggery break them down by conventional and organic product as a study variable. This classification helped in understanding the differences in consumer reviews between the two categories.

3.3 Pre-processing the Data

The textual review data were pre-processed using RStudio with supporting packages such as *wordcloud* and *wordcloud2*. In line with established text-mining procedures in prior studies (Al-Otaibi et al., 2018; Gaikar & Marakarkandy, 2015), several data cleaning steps were performed to prepare the textual data for sentiment

analysis. The preprocessing procedure involved removing punctuation marks and numerical characters, converting all text to lowercase, eliminating common stop words, and removing extra blank spaces to standardise the textual content. These steps help reduce noise in the dataset and ensure consistency in the text corpus prior to analysis. Following the cleaning process, sentiment scores were computed using the *syuzhet* package in R. The package assigns sentiment polarity scores to words based on a predefined sentiment dictionary. The overall sentiment score for each review was calculated by aggregating the sentiment values of the individual words contained within the review text.

4. Data Analysis

4.1 Summary of Sample Reviews

Table 1 presents the distribution of consumer reviews across product categories and product classifications. A total of 442 consumer review narratives were collected for analysis, comprising 208 reviews for ghee and 234 reviews for jaggery. To enable meaningful comparison between product variants, the reviews were evenly distributed between organic and conventional categories. Specifically, the ghee dataset includes 104 reviews each for organic and conventional variants, while the jaggery dataset includes 117 reviews for each product type. Overall, the final dataset consists of 221 reviews for conventional products and 221 reviews for organic products, representing equal proportions of the total sample. This balanced distribution allows for reliable comparative analysis of review characteristics and sentiment scores between organic and conventional food products.

Table 1: Classification of sample reviews

Product	Product Classification	Regular Reviews	Organic Reviews	Total Reviews
Ghee	Count	104	104	208
	% of sample	50%	50%	100%
Jaggery	Count	117	117	234
	% of sample	50%	50%	100%
Total	Count	221	221	442
	% of sample	50%	50%	100%

4.2 Distribution of Reviews Across Review-Length Categories

To examine the expressive depth of consumer feedback,

the review texts were classified into three categories based on review length, measured by the number of words: less than 5 words, 6–10 words, and more than 10 words. Table 2 presents the distribution of reviews across these categories for both organic and conventional product variants.

The results indicate noticeable differences in review length patterns between product types. In the case of ghee, a larger proportion of organic product reviews fall within the more than 10 words category, suggesting that consumers tend to provide more elaborate feedback when evaluating organic variants. Conversely, reviews for conventional ghee are more frequently concentrated in the shorter review-length categories.

For jaggery, the distribution of review lengths is more evenly spread across categories for both organic and conventional products. Although organic jaggery reviews show slightly higher frequencies in the longer review category, the difference between the two product types is less pronounced compared with ghee. These patterns suggest that consumer engagement in textual expression may vary across product categories.

Table 2: Distribution of Reviews Across Review-Length Categories

Product	Review Length	Organic	Conventional
Ghee	<5 words	30	63
Ghee	6–10 words	19	23
Ghee	>10 words	55	18
Jaggery	<5 words	51	34
Jaggery	6–10 words	16	46
Jaggery	>10 words	50	37

4.3 Hypothesis Testing: Review Length Differences (H1)

Hypothesis 1 examines whether there is a significant difference in the mean number of words in consumer reviews between organic and conventional product variants. A one-way Analysis of Variance (ANOVA) was conducted separately for ghee and jaggery to test this hypothesis.

The results reveal a significant difference in review length for ghee. Reviews for organic ghee were significantly longer than those for conventional ghee, indicating that consumers tend to provide more detailed feedback when evaluating organic variants.

The ANOVA results show a statistically significant difference in mean review length ($F = 18.662, p < 0.001$), supporting the hypothesis for the ghee category.

In contrast, for jaggery, the difference in mean review length between organic and conventional variants was not statistically significant ($F = 2.964, p = 0.086$). Although organic jaggery reviews exhibited slightly higher average word counts, the variation was insufficient to confirm a meaningful difference. Therefore, H1 is supported for ghee but not supported for jaggery.

Table 3 reports the variations in mean review length between organic and conventional versions of ghee and jaggery.

Table 3: Variations in Review Length

Product		Sample Size	Mean Review Length	SD	F-ratio (Significance)
Ghee	Conventional	63	7.18	9.82	18.662 (0.000)
	Organic	55	30.1	53.1	18.662 (0.000)
	Total	118	18.64	31.46	18.662 (0.000)
Jaggery	Conventional	34	12.9	15.4	2.964 (0.086)
	Organic	51	17.4	24.1	2.964 (0.086)
	Total	85	15.15	19.75	2.964 (0.086)

4.4 Hypothesis Testing: Differences in Sentiment Scores (H2)

Hypothesis 2 examines whether consumer sentiment scores differ significantly between organic and conventional versions of the products. One-way ANOVA was conducted separately for ghee and jaggery using sentiment scores as the dependent variable.

For ghee, the mean sentiment score for conventional products was 0.494, while the mean sentiment score for organic ghee was substantially higher at 1.68. The ANOVA results indicate a statistically significant difference between the two product categories ($F = 18.862, p < 0.001$). This finding suggests that consumers express significantly more positive sentiment toward organic ghee compared with conventional variants.

Similarly, for jaggery, the mean sentiment score for conventional products was 0.459, whereas organic jaggery received a higher average sentiment score of 1.24. The ANOVA results also reveal a statistically significant difference ($F = 12.450, p < 0.001$).

These findings confirm that consumer sentiment toward organic variants is significantly more positive than toward conventional products. Accordingly, H2 is supported for both product categories.

Table 4 presents the comparative analysis of mean sentiment scores for organic and conventional ghee and jaggery products.

Table 4: Variations in Sentiment Scores

Product		Sample Size	Mean Sentiment Score	SD	F-ratio (Significance)
Ghee	Conventional	63	0.494	0.748	18.862 (0.000)
	Organic	55	1.68	2.68	18.862 (0.000)
	Total	118	1.087	1.72	18.862 (0.000)
Jaggery	Conventional	34	0.459	1.3	12.450 (0.000)
	Organic	51	1.24	2.03	12.450 (0.000)
	Total	85	0.8495	1.665	12.450 (0.000)

4.5 Factorial ANOVA: Effects of Product Type and Review Length on Sentiment (H3)

To examine whether sentiment scores vary across product types and review-length categories, a two-way factorial ANOVA (2 × 3 design) was conducted with sentiment score as the dependent variable. The independent variables included product classification (organic vs. conventional) and review-length category (less than 5 words, 6–10 words, and more than 10 words).

For ghee, the results indicate that both product classification (F = 18.862, p < 0.001) and review length (F = 3.848, p = 0.023) significantly influence sentiment scores. In addition, the interaction effect between product classification and review length was statistically significant (F = 5.119, p = 0.006). This suggests that the influence of review length on sentiment differs between organic and conventional ghee products. Therefore, H3 is fully supported for the ghee category.

For jaggery, the results indicate that product classification significantly affects sentiment scores (F = 12.45, p < 0.001). However, neither review length (F = 1.408, p = 0.246) nor the interaction between product classification and review length (F = 1.668, p = 0.191) was statistically significant. These findings suggest that consumer sentiment toward jaggery is primarily influenced by product type rather than the length of the review. Consequently, H3 is partially supported for jaggery.

Table 5 summarises the results of the factorial ANOVA examining the effects of product class, review length, and their interaction on sentiment scores.

Table 5: Summary of Factorial ANOVA Results

Products	Source of Variation for Sentiment Score	F-ratio (Significance)	Hypothesis Result
Ghee	Product class	18.862 (0.000)	H3 is fully supported for ghee
	Review word group	3.848 (0.023)	
	Product class* Review word group	5.119 (0.006)	
Jaggery	Product class	12.45 (0.000)	H3 is partially supported for jaggery
	Review word Group	1.408 (0.246)	
	Product class *	1.668	
	Review word group	(0.191)	

4.6 Sentiment Scores Across Review-Length Categories for Ghee

Table 6 presents the distribution of mean sentiment scores for organic and conventional ghee across different review-length categories. The results reveal a clear pattern in which sentiment scores increase with the length of the review for both product types. However, the increase is considerably more pronounced for organic ghee.

For organic ghee, the mean sentiment score rises from 0.438 for reviews containing fewer than five words to 2.7 for reviews exceeding ten words, indicating that longer reviews tend to express stronger positive sentiment toward organic variants. This suggests that consumers who provide more elaborate feedback are likely to report higher satisfaction and stronger favourable perceptions regarding organic ghee.

A similar but less pronounced pattern is observed for conventional ghee, where sentiment scores increase from 0.266 for shorter reviews to 1.38 for reviews exceeding ten words. Although longer reviews also show higher sentiment values for conventional products, the overall sentiment levels remain lower than those observed for organic ghee across all review-length categories.

These findings reinforce the results of the factorial ANOVA, which indicated a significant interaction effect between product classification and review length. The results suggest that consumer engagement, as reflected in review length, amplifies positive sentiment more strongly for organic ghee than for conventional variants. This pattern highlights the stronger emotional and evaluative involvement associated with organic product experiences.

Table 6: Sentiment Score Variations for Ghee

Product Classification	Review Length	Mean Sentiment Score	SD	No. of Reviews
Organic	Less than 5 words	0.438	0.475	30
	6–10 words	0.661	0.796	19
	More than 10 words	2.7	3.32	55
	Total			104
Conventional	Less than 5 words	0.266	0.517	63
	6–10 words	0.424	0.628	23
	More than 10 words	1.38	0.933	18
	Total			104
Total	Less than 5 words	0.352	0.502	93
	6–10 words	0.543	0.759	42
	More than 10 words	2.04	2.83	73
	Total	1.13	1.646	208

4.7 Sentiment Scores Across Review-Length Categories for Jaggery

Table 7 presents the variation in mean sentiment scores for organic and conventional jaggery across different review-length categories. The results indicate that organic jaggery consistently receives higher sentiment scores than conventional jaggery across all review-length groups, suggesting a generally more favourable consumer perception toward organic variants.

For organic jaggery, the mean sentiment score increases as the review length becomes longer, rising from 0.322 for reviews containing fewer than five words to 2.28 for reviews exceeding ten words. This pattern suggests that consumers who provide more detailed feedback tend to express stronger positive evaluations of organic jaggery.

In the case of conventional jaggery, sentiment scores also increase with review length, but the values remain comparatively lower than those observed for organic products. The mean sentiment score increases from 0.013 for shorter reviews to 1.13 for reviews exceeding ten words, indicating a relatively moderate level of consumer sentiment toward conventional variants.

Despite this upward trend in sentiment scores with review length, the factorial ANOVA results indicate that review length does not have a statistically significant effect on sentiment scores for jaggery, and the interaction between product classification and review length is also not significant. This suggests that, unlike ghee, consumer sentiment toward jaggery is influenced primarily by product type rather than the extent of textual expression.

Overall, the findings indicate that organic jaggery generates more positive consumer sentiment compared with conventional jaggery, but the intensity of sentiment is relatively independent of review length.

Table 7: Sentiment Score Variations for Jaggery

Product Classification	Review Length	Mean Sentiment Score	SD	No. of Reviews
Organic	Less than 5 words	0.322	0.586	51
	6–10 words	0.947	0.652	16
	More than 10 words	2.28	2.69	50
	Total	1.218	1.779	117
Conventional	Less than 5 words	0.013	0.654	34
	6–10 words	0.251	1.07	46
	More than 10 words	1.13	1.71	37
	Total	0.433	1.271	117
Total	Less than 5 words	0.169	0.65	85
	6–10 words	0.577	0.878	62
	More than 10 words	1.705	2.198	87
	Total	0.942	1.487	234

4.8 Word Frequency Analysis

To better understand the key themes expressed in consumer reviews, a word frequency analysis was conducted. For conventional products, frequently appearing words tend to relate to general product attributes such as taste and price. In contrast, reviews of organic products frequently include words associated with purity, health benefits, and natural quality. These linguistic patterns further support the quantitative findings that organic products tend to receive more favourable consumer evaluations.

Figure 1 presents the most frequently used terms appearing in reviews of conventional ghee.

Conventional Ghee Reviews



Figure 1: Word Cloud for Conventional Ghee

Figure 2 displays the most frequently occurring words in consumer reviews of organic ghee, highlighting terms associated with purity, taste, and product quality.

Organic Ghee Reviews



Figure 2: Word Cloud for Organic Ghee

Figure 3 illustrates the most common words used in consumer reviews of conventional jaggery, reflecting general product attributes discussed by consumers.

Conventional Jaggery Reviews



Figure 3: Word Cloud for Conventional Jaggery

Figure 4 presents the word cloud for organic jaggery reviews, highlighting expressions related to natural quality, sweetness, and health benefits.

Organic Jaggery Reviews



Figure 4: Word Cloud for Organic Jaggery

5. Findings

H1: Difference in Review Length between Organic and Conventional Products

The analysis reveals a product-specific pattern in review length. For ghee, reviews of organic variants are significantly longer than those of conventional ghee, indicating a higher level of consumer engagement and more elaborate evaluation of organic products.

This suggests that consumers tend to express more detailed experiences when discussing organic ghee, possibly due to heightened perceptions of product quality, purity, and health benefits.

In contrast, the difference in review length between organic and conventional jaggery is not statistically significant. Although organic jaggery reviews show slightly higher average word counts, consumers appear to express their opinions about jaggery in relatively concise forms regardless of product type. Therefore, H1 is supported for ghee but not supported for jaggery.

H2: Difference in Sentiment Scores between Organic and Conventional Products

The sentiment analysis indicates a consistent positive bias toward organic products. Both organic ghee and organic jaggery receive significantly higher sentiment scores compared with their conventional counterparts. This finding suggests that consumers perceive organic variants more favourably, likely due to associations with natural production processes, health benefits, and product authenticity.

The sentiment advantage is particularly pronounced in the case of ghee, where organic variants generate stronger positive emotional responses among consumers. These results provide strong support for H2, confirming that product classification significantly influences consumer sentiment.

H3: Effect of Product Class and Review Length on Sentiment

The factorial analysis reveals that the influence of review length on sentiment varies across product categories. For ghee, both product class and review length significantly affect sentiment scores, and their interaction is also significant. This indicates that longer reviews tend to amplify positive sentiment toward organic ghee, reflecting deeper consumer engagement and more expressive evaluation.

For jaggery, however, review length does not significantly influence sentiment scores, and no interaction effect is observed. Consumer sentiment toward jaggery appears to be driven primarily by product classification rather than the extent of textual expression. Consequently, H3 is fully supported for ghee but only partially supported for jaggery.

Overall, the findings suggest that consumer sentiment toward organic food products is both product-dependent and expression-dependent. Organic ghee emerges as a high-involvement product where consumers provide more elaborate feedback and express stronger positive sentiment. In contrast, while organic jaggery also receives more favourable evaluations, consumer sentiment toward jaggery is relatively independent of review length. These results highlight the importance of considering both product characteristics and patterns of consumer expression when analysing sentiment in food product reviews.

6. Managerial Implications

The findings of this study provide several practical implications for food marketers, retailers, and policymakers involved in the organic food sector.

First, the results indicate that organic variants of ghee and jaggery generate significantly more positive consumer sentiment than their conventional counterparts. This suggests that marketers should actively highlight the health, purity, and natural production attributes of organic food products in their promotional communication. Product packaging, advertising campaigns, and digital marketing strategies should emphasise attributes such as chemical-free production, nutritional benefits, and authenticity, as these aspects strongly influence consumer perceptions.

Second, the analysis shows that organic ghee reviews tend to be longer and more expressive, reflecting higher consumer engagement. Retailers and online platforms can leverage this engagement by encouraging consumers to share detailed reviews and experiences. For instance, companies may implement review-generation strategies such as feedback prompts, loyalty incentives, or user-generated content campaigns. These initiatives can strengthen electronic word-of-mouth communication, which plays a crucial role in influencing purchase decisions in food markets.

Third, the results indicate that review length significantly influences sentiment expression for ghee but not for jaggery. This suggests that marketing strategies should be product-specific rather than uniform across all organic products.

For high-involvement products such as organic ghee, brands may benefit from storytelling-based marketing strategies that highlight product origin, production methods, and nutritional advantages. In contrast, for products such as jaggery, simpler communication focusing on product authenticity and health benefits may be more effective.

Fourth, the consistent positive sentiment toward organic products indicates an opportunity for retailers to expand the visibility and availability of organic variants in retail outlets. Retailers can strengthen consumer confidence by displaying clear organic certification labels, product origin information, and quality assurances. These practices can help reduce consumer scepticism regarding organic authenticity and improve trust in organic food markets.

Finally, policymakers and industry regulators can utilise these findings to promote greater awareness of certified organic food products. Public awareness campaigns emphasising the benefits of organic agriculture and the importance of certification standards can help strengthen consumer trust and encourage the adoption of organic food products. Such initiatives may contribute to the broader goal of promoting sustainable food consumption and supporting environmentally responsible agricultural practices.

The study highlights that consumer sentiment toward organic food products represents a valuable source of market intelligence. By systematically analysing consumer feedback and review narratives, firms can gain deeper insights into consumer expectations and design more effective product positioning and marketing strategies.

7. Conclusion

This study examined consumer sentiment toward organic and conventional variants of ghee and jaggery by applying sentiment analysis to consumer-generated review narratives collected in Kolkata. By integrating text-mining techniques with statistical analysis, the research provides empirical insights into how consumers evaluate traditional food products when organic alternatives are available.

The results reveal a clear positive sentiment bias toward organic products, indicating that consumers generally perceive organic variants more favourably than conventional ones.

In particular, organic ghee generates significantly longer and more positive reviews, suggesting higher levels of consumer engagement and satisfaction. This indicates that consumers tend to provide more elaborate feedback when evaluating organic variants of experience-based food products. In contrast, although organic jaggery also receives higher sentiment scores, the length of the review does not significantly influence sentiment intensity, suggesting that consumer evaluations of jaggery are less dependent on the depth of textual expression.

The factorial analysis further demonstrates that the relationship between review length and sentiment differs across product categories. For ghee, both product classification and review length significantly influence sentiment scores, with a significant interaction effect indicating that longer reviews amplify positive sentiment toward organic products. However, for jaggery, consumer sentiment is primarily driven by product type rather than the length of the review. These findings highlight that consumer sentiment formation varies across product categories, reflecting differences in consumer involvement and evaluation behaviour.

Overall, the study demonstrates the usefulness of sentiment analysis as an alternative methodological approach for understanding consumer perceptions in food markets, particularly in contexts where consumers express opinions through textual narratives. The findings also provide valuable insights for marketers and policymakers seeking to promote organic food consumption by highlighting the importance of product positioning and consumer engagement.

8. Limitations of the Study

Despite its contributions, the study has several limitations that should be acknowledged. First, the analysis is restricted to consumer reviews collected within a single metropolitan region (Kolkata), which may limit the generalisability of the findings to other geographic contexts where consumer awareness and organic food consumption patterns may differ.

Second, the study focuses only on two traditional food products—ghee and jaggery, which limits the scope of the findings. Consumer sentiment toward other organic food categories such as fruits, vegetables, or processed organic products may follow different evaluation patterns.

such as fruits, vegetables, or processed organic products may follow different evaluation patterns.

Finally, while sentiment analysis provides valuable insights into expressed consumer opinions, it may not fully capture underlying motivations or actual purchasing behaviour. Consumer reviews may reflect subjective perceptions that do not always translate directly into purchasing decisions.

9. Scope for Future Research

Future research may extend this study in several ways. First, researchers may analyse larger datasets from multiple cities or regions in order to improve the generalisability of findings and better understand regional variations in organic food perceptions.

Second, future studies may examine a broader range of organic food categories, including dairy products, packaged organic foods, and fresh produce, to determine whether similar sentiment patterns exist across different product types.

Third, the use of advanced machine learning or deep learning techniques for sentiment classification may provide more accurate identification of emotional expressions in consumer reviews. These approaches could capture more nuanced consumer attitudes compared with lexicon-based methods.

Finally, future research may integrate sentiment analysis with behavioural data such as purchase frequency, price sensitivity, or consumer demographics, enabling a more comprehensive understanding of how consumer sentiment influences organic food purchasing behaviour.

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