

Exploring Consumer Sentiment Toward Dairy Milk and Plant-Based Alternatives in the United States

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Introduction

The International Dairy Foods Association estimated the annual U.S. economic impact of the dairy industry at roughly \$780 billion. The U.S. dairy industry currently supports over 3 million jobs, \$198 billion in wages to American workers, \$83 billion in federal, state, and local taxes, and \$8.2 billion in total annual exports (International Dairy Foods Association, 2025).

Additionally, dairy products play a key role in the American diet as they contain vital nutrients for the health and maintenance of the human body, notably calcium, vitamin D (Bailey et al., 2010; Haug et al., 2007; Wolf et al., 2020). Considering the essential role of dairy milk industry and the public health benefit in the U.S., along with the presence of plant-based alternatives in the U.S. marketplace, understanding consumers' perceptions, sentiments and emotions toward both product categories is important. It can inform more effective communication and tailored marketing strategies to maintain or increase the market share. Our study aims to investigate and compare dairy milk and plant-based alternatives consumers' sentiments towards their preferred product in milk industry in the U.S. One major research question guided our study: What are the overall positive and negative sentiments and emotional responses (joy, trust, anticipation, fear, etc.) of dairy milk and plant-based alternative milk consumers in the U.S.?

Theoretical Framework

Emotional appraisal theory suggests that different emotions arise from individuals' evaluations of events, situations, or objects, with appraisal processes shaping emotional responses (Moors, 2020). Emotions serve as motivational drives that can influence consumers' attitudes and purchase decisions. In our study, we investigate eight basic emotions (anger, fear, anticipation, trust, surprise, sadness, joy, and disgust) based on National Research Council Canada (NRC) Emotion Lexicon and two sentiment categories (positive vs negative).

Methods

Our study is part of a larger project that used a nationwide survey to collect consumer data. The survey collected both qualitative and quantitative data about consumers' milk consumption. For the study described herein, we used textual data (qualitative) collected from an open-ended question for our study. The open-ended question asked about thoughts, experiences, or opinions related to the topic of milk or the survey itself. Data were collected from two different samples. The first sample was collected in September 2025 using a Qualtrics consumer panel with the second sample collected in March 2026 also using Qualtrics. Sample one includes 997 dairy milk consumers and 1,005 plant-based alternative consumers. Sample Two consists of 1,849 dairy milk consumers. After excluding blank responses and responses related to the feedback of the survey, we identified 602 comments/participants for dairy consumers (184 from sample one, 418 comments for sample two), and 193 comments for plant-based consumers from sample one. The total sample size for the study described herein was 695, which was used for data analysis. Advanced computational techniques, such as sentiment analysis, were applied to detect the emotional tones of the consumers. We used two lexicons: the AFINN lexicon, a sentiment dictionary that assigns words scores from -5 to +5, and the NRC Emotion Lexicon, which associates English words with eight basic emotions. R software was used for sentiment analysis. We used content analysis to explain the positive or negative consumer sentiment toward milk.

We used open coding to identify recurring concepts and themes underlying positive and negative consumer sentiment, followed by axial coding to organize related codes into broader categories and identify relationships among them.

Results

Using the AFINN lexicon, 81.10% of the comments were positive with 18.9% of the comments being negative for dairy consumers. On the contrary, about 77.70% of the comments were positive were 22.30% of the comments being negative for plant-based consumers. Overall, positive emotions were more prevalent than negative emotions in both groups, suggesting generally favorable perceptions of both dairy and plant-based products. Compared to plant-based consumers, dairy consumers have a higher percentage of positive sentiments. Using the NRC emotion lexicon, trust, joy, and anticipation were the most frequently expressed emotions with anger, fear, disgust, and surprise being less common in both groups. When we identified the topics associated with sentiments using a content analysis, the topics associated with positive sentiments were taste, health related benefits (protein, nutrition, calcium), convenience/availability, familiarity, social norm with negative associated sentiments being health related risks (carbohydrates, prediabetic; gastro-intestinal issues; lactose intolerant; allergies; obesity and heart disease, asthma, growth hormones in milk, calories), animal welfare, environmental consequences and price. Notably for dairy consumers, the health benefits seem to be a major driver. For plant-based consumers, health perception and dietary restrictions, taste perception, environmental considerations, and animal welfare were frequently mentioned, emerging as major influential factors for plant-based consumers.

Conclusions

Positive sentiments were more prevalent than negative ones in both groups, reflecting favorable perceptions of both dairy and plant-based products. As for the specific emotions, trust, joy, and anticipation were the most frequently expressed emotions. Dairy consumers exhibited a higher proportion of positive sentiment, primarily driven by perceived health and nutritional benefits. In contrast, plant-based consumers also expressed firm beliefs of health but environmental sustainability, animal welfare concerns, and dietary restrictions (e.g., lactose intolerance and milk allergies) emerged more frequently, which influences decision-making.

Implications

We found both groups have positive emotions toward milk products, and the positive emotions have potential to be transferred to a stable consumption intention. Notably, nutritional value was a key driver of positive dairy sentiment with environmental, ethical, and dietary considerations having a more prominent role among plant-based consumers. This suggests the need to prioritize health and nutritional messages in daily milk advertising and marketing. As for plant-based alternatives, emphasizing the moral and social responsibility in marketing might be helpful. In addition, given the importance of dietary restrictions among plant-based consumers, the plant-based industry should continue developing function-oriented alternatives that address the needs of specific consumer groups, such as individuals with lactose intolerance, milk allergies, or other dietary requirements. Future research should employ qualitative approaches, such as interviews or focus groups, to gain deeper insights into consumers' perceptions and decision-making processes. Additionally, the relationships between consumer emotions and purchase intentions warrant further investigation to better understand consumption behavior.

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