

Article

Potential Consumer Profiles and Market Demand Projections of Gluten and Lactose-Free Cookies

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Abstract: Gluten, the primary protein in wheat and its derivatives, and lactose, the natural sugar in milk and dairy products, may trigger adverse health effects such as bloating, diarrhea, and metabolic disturbances in sensitive individuals. Gluten-free dietary interventions have also been reported as supportive therapy for certain health conditions, including autism. This study aimed to analyze consumer profiles, identify key preferences, and assess the potential local market demand for gluten- and lactose-free (GFLF) cookies. A descriptive observational study applying descriptive market analysis rather than predictive modeling was conducted among the general population in Jember, Indonesia. Using accidental sampling, data were collected from 120 respondents between July and August 2025 through an online questionnaire (Google Forms). The instrument assessed demographic characteristics, consumer awareness, product preferences, and purchase intentions. Data were analyzed descriptively using frequency distribution tables. The majority of respondents were young adults with income levels below the regional minimum wage. Approximately 78.4% expressed interest in GFLF cookies, and 65% indicated willingness to purchase them despite higher prices compared with conventional cookies. The main motivations for purchase were perceived health benefits (50%) and curiosity or willingness to try new products (30%). The acceptable price range was IDR 15,000–25,000 per 100 g. Estimated market demand ranged from 400 to 1,200 packages per month. These findings indicate a promising market opportunity for GFLF cookies in Jember, supported by increasing consumer awareness and interest in healthier food alternatives. Product development strategies should prioritize affordability, sensory quality, and consumer education to facilitate product downstreaming, commercialization, and sustainable market adoption of functional food products.

Keywords: *gluten and lactose free; cookies; consumer behavior; market potential; food preference*

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1. Introduction

The evolution of modern consumption patterns has demonstrated an increasing awareness of health and a more selective approach to food choices. One of the emerging issues is the rising incidence of gluten and lactose intolerance. Gluten, as the primary protein found in wheat and its derivatives, and lactose, the natural sugar present in milk and dairy products, can cause health problems such as bloating, diarrhea, and metabolic disturbances among sensitive individuals. One health condition that requires a gluten-free diet as a key therapy is autism. Autism Spectrum Disorder (ASD) is a group of neurodevelopmental disorders in children that generally result from complex brain developmental disruptions. According to the World Health Organization (WHO), it is estimated that 1 in 160 children worldwide are affected by

ASD [1]. One of the main therapeutic approaches for children with autism is dietary modification. Research indicates that a gluten-free diet can improve behavioral symptoms in autism [2]. This condition has driven the demand for alternative food products that are not only safe for those with intolerances but also appealing to the broader public as part of a healthy lifestyle trend [3].

In line with this development, gluten-and lactose-free (GFLF) products are increasingly regarded as strategic options. Global trends indicate a growing demand for GFLF products, driven not only by individuals with specific dietary needs but also by general consumers who associate these products with being “healthier” and “more natural” [4]. This phenomenon is relevant to the shifting consumer behavior in Indonesia, particularly among younger to adult age groups, who are more receptive to food innovations and show a preference for functional snacks made from local ingredients [5].

Within this context, market analysis becomes an essential step before commercial product development. Mapping potential consumer profiles, identifying preferences regarding product attributes (such as price, packaging, taste, and health benefits), and projecting market demand serve as the foundation for formulating effective marketing strategies. Therefore, this study aims to analyze consumer profiles, identify key preferences, and project the potential local market demand for GFLF cookies as a basis for decision-making in product downstreaming.

2. Materials and Methods

This study employed a descriptive observational design with two main variables: consumer profiles and market demand projections. The consumer profile analysis encompassed four aspects: (1) demographic characteristics and consumer knowledge, (2) purchase interest and motivation, (3) product preferences and consumer decision-making factors, and (4) market demand projections.

The study population consisted of the general public in Jember City, selected using accidental sampling. Data collection was conducted in public gathering areas and during weekly car-free day events from July 30 to August 25, 2025, involving a total of 120 respondents. Before data collection, respondents were given samples of cookies and then asked to complete a Google Form covering consumer profiles and market demand projections. The data were analyzed descriptively using frequency distribution tables.

3. Results and Discussion

3.1 Demographic Characteristics and Consumer Knowledge

The demographic characteristics of consumers in this study are presented in Table 1 below.

Table 1. Frequency Distribution of Consumers' Demographic Characteristics

Variable	Respondents (n)	Percentage (%)
Age (year)		
18-25	85	70,8
26-40	23	19,2
>40	12	10
Total	120	100
Sex		
Female	92	76,7
Male	28	23,3
Total	120	100

Variable	Respondents (n)	Percentage (%)
Education level		
Senior/vocational high school	82	68,3
Higher Education (university/college)	38	31,7
Total	120	100
Income		
<Regional minimum wage	72	60
≥Regional minimum wage	48	40
Total	120	100
Occupation		
College students/students	73	60,8
Homemaker	19	15,8
Self-employed	13	10,8
Employee	9	7,5
Other Professions (e.g., teacher, civil servant, notary, midwife, physiotherapist)	6	5,0
Total	120	100
Knowledge of GFLF Products		
Awareness	99	82,5
No awareness	21	17,5
Total	120	100
Consumption Experience of GFLF Products		
Tried	48	40
Never tried	72	60
Total	120	100

Most respondents were within the age range of 18–25 years, indicating the dominance of young to early adult consumers. The majority were female, with an education level of senior high school or vocational high school (65.8%), followed by undergraduate or higher education (31.7%). In terms of income, most respondents earned below the regional minimum wage (Rp 2,838,000). Meanwhile, the segment with income above the minimum wage (40%) was dominated by self-employed individuals, employees, and homemakers.

Young and early adult consumers tend to be more open to innovative products, possess a high level of curiosity, and are in the process of shaping independent consumption patterns. In addition, they are active users of social media and online marketplaces, which supports digital distribution strategies. The older consumer segments, aged 26–40 years and above 40 years (29.2%), can be approached through health-oriented and specialized dietary strategies [6]. The predominance of female respondents further highlights their significant role in household food purchasing decisions. Consequently, marketing strategies for GFLF cookies should position women as the primary target group [7].

The presence of highly educated respondents strengthens the potential for product acceptance, as this group is generally more critical of health benefits and more receptive to healthy food innovations [8]. However, the high proportion of students and respondents with income below the regional minimum wage suggests that, in addition to targeting consumers with stable purchasing power who may become regular buyers, strategies should also consider “trial buyers” consumers interested in trying new products, particularly if offered in affordable package options [9].

Survey results further revealed that a portion of respondents already had preliminary knowledge regarding gluten and lactose intolerance. Approximately 82.5% reported having heard of gluten-free and lactose-free processed food products. This finding indicates that consumer literacy on the issue is emerging, although further education is needed to deepen their understanding of the health benefits of such products. Upon closer examination, only 40% of respondents had ever tried GFLF products, whether intentionally for health reasons or simply out of curiosity. This highlights that the market is still relatively new and untapped, presenting significant opportunities for GFLF cookies to establish a presence through consumer education, product sampling, and experiential promotions.

3.2 Purchase Interest and Motivation

Survey results indicate that the majority of respondents expressed an interest in purchasing gluten- and lactose-free cookies, as presented in Table 2.

Table 2. Distribution of Consumer Purchase Interest

Variable	Respondents (n)	Percentage (%)
Level of Purchase Interest		
Very Interested	47	39,2
Moderately Interested	47	39,2
Neutral / Slightly Interested	26	21,6
Total	120	100
Purchase Motivation		
Health and healthy lifestyle	60	50
Curiosity About New Products	36	30
Special Diets (autism, intolerance)	12	10
Other Reasons (snack variety, trend)	12	10
Total	120	100
Willingness to Purchase (Even at a Higher Price)		
Willing	78	65
Unwilling / Hesitant	42	35
Total	120	100

A total of 78.4% of respondents expressed interest in gluten- and lactose-free cookies, while 21.6% indicated neutral or low interest. This finding highlights a promising market potential, particularly within consumer segments concerned with health and modern lifestyles. When asked about their willingness to purchase the product despite its relatively higher price compared to conventional cookies, approximately 65% stated they were willing, whereas 35% reported hesitation or unwillingness. This indicates a relatively good willingness to pay, although maintaining competitiveness in terms of both price and quality remains essential.

The high level of purchase interest suggests the existence of a consumer segment ready to adopt gluten- and lactose-free cookies as an alternative healthy food option. These findings align with global market trends, which project significant growth in the gluten-free bakery sector through 2030. Nevertheless, in developing markets, the premium pricing of gluten-free bakery products may hinder wider market penetration.

The availability of healthier and more nutritious foods is often associated with consumers' willingness to pay a premium price. Research indicates that 65% of consumers are willing to pay more for food products perceived as healthier compared to conventional alternatives. With such a high purchase intention, gluten- and lactose-

free cookies are well positioned to capitalize on this willingness, provided that other purchasing determinants are addressed. Several marketing strategies may be employed, including continuous consumer education on the health benefits and unique qualities of the product, as well as community-based marketing initiatives (targeting students, young families, and health-conscious groups) to strengthen consumer awareness regarding health considerations in food choices.

Two primary reasons underpin consumers' purchase decisions: the perception of the product as healthier (50%) and curiosity or the desire to try something new (30%). Health consciousness and health concerns have been identified as key motivators driving consumers to purchase organic, functional, and free-from products. Health-oriented consumers are more likely to accept premium prices for foods that support their health goals [10]. However, it is important to note that curiosity-driven appeal tends to be short-term, and long-term acceptance will depend on superior product quality, particularly its sensory attributes [11].

3.3 Product Preferences

The survey results regarding product preferences are presented in Table 3 below.

Table 3. Distribution of Consumer Product Preferences

Variable	Respondents (n)	Percentage (%)
Price Range (per 100 g)		
< Rp15.000	22	18,3
Rp15.000 – Rp20.000	62	51,7
Rp20.000 – Rp25.000	27	22,5
> Rp25.000	9	7,5
Total	120	100
Frequency of Purchase		
< 1 kali per month	12	10
1–2 kali per month	72	60
3–4 kali per month	36	30
Total	120	100
Packaging		
Transparent resealable standing pouch	67	56
Eco-friendly paper box	36	30
Plastic container	17	14
Total	120	100
Distribution Channel		
Online marketplace	67	56
Modern shop	36	30
Directly from the producer	17	14
Total	120	100
Consideration Factors		
Health Benefits	48	40
Price	36	30
Taste	24	20
Packaging	12	10
Total	120	100

Based on Table 3, it can be seen that the price range considered reasonable by respondents was IDR 15,000–25,000 per 100 grams. The majority of respondents placed the ideal price in the range of IDR 15,000–20,000, indicating a preference for affordable prices while still reflecting the added value of a healthy product. Most respondents

stated that they would purchase this product 1–2 times per month. Respondents preferred transparent standing pouches with resealable features, as they were considered practical, hygienic, and convenient for product storage after opening. Online marketplaces (56%) were the most preferred purchasing channel, followed by modern retail stores (30%), with health benefits cited as the primary reason for purchase.

4. Discussion

4.1. Pricing Strategy

Respondents perceived the price range of IDR 10,000–25,000 per 100 grams as reasonable, with the ideal price situated between IDR 15,000–20,000. This range is highly relevant as it represents a compromise sought by consumers: a healthy product that remains affordable. Most respondents indicated a purchase frequency of 1–2 times per month, reflecting the potential for repeat orders, which is critical for business sustainability.

Although consumers are generally willing to pay a higher price for food products perceived as healthier, GFLF cookies face significantly higher production costs, which can make them several times more expensive than conventional products. Therefore, positioning the ideal price within the mid-range indicates that the product should be effectively communicated as one of premium value to justify the price, which may still be perceived as above the “reasonable” threshold by highly price-sensitive consumers. Excessively high prices remain a primary barrier, particularly for consumers without urgent health concerns [10].

4.1.2. Packaging Design and Material

Packaging preferences demonstrate a dual priority among modern consumers: convenience/functionality and sustainability/aesthetic appeal. Most respondents favored transparent standing pouches with resealable features. Convenience was considered a critical factor in snack purchasing decisions. The resealable feature directly enhances functionality and hygiene by enabling practical storage and extending shelf life after opening—both key concerns for consumers. Transparency was also valued as it allowed visual control and increased trust in the product’s quality. Packaging that emphasizes environmentally friendly attributes may further strengthen purchase intentions and reinforce the brand image as both high-quality and aesthetically appealing [12].

4.1.3. Purchase Frequency and Distribution Channels

The majority of respondents reported a purchase frequency of 1–2 times per month for household needs or healthy snacks, indicating a strong potential for repeat purchases. This regular purchasing pattern aligns with current trends in the healthy snack market, where consumers seek options that balance nutrition and convenience as part of their lifestyle.

Preferences for purchasing channels reflect a shift toward digitalization, while still valuing physical retail experiences. Online marketplaces were the primary choice, perceived as practical, accessible, and offering flexible delivery options. Modern

consumers place a high value on convenience, and online platforms meet this expectation by enabling purchases unconstrained by time and location [11]. Modern retail stores were the second preferred option, as they allowed consumers to directly inspect the physical product. Despite growing digitalization, brick-and-mortar stores remain important, as physical inspection of product quality and packaging helps build consumer trust and reduces the perceived risk of damaged or substandard products.

4.1.4 Critical Decision-Making Factors

The majority of respondents emphasized that, when choosing gluten-free and lactose-free products, the priority order of decision-making factors was health benefits, followed by affordable pricing, and then good taste. Packaging was also considered but not as highly prioritized as these three main factors. This prioritization demonstrates that the health value of the product is primarily viewed through its fundamental health functions, which must be supported by price accessibility and sensory quality.

Emphasis on ingredient composition is an integral part of perceived health benefits, as consumers seek products enriched with nutrients (e.g., fiber and protein) through the use of alternative flours or ingredients [13].

4.2. Local Market Demand Projection

4.2.1. Market Potential

Based on the survey results, the purchase interest for gluten-free and lactose-free cookies reached 78.4% of respondents, with 65% expressing willingness to pay a higher price. Assuming the primary target population consists of university students, young families, and health-conscious communities in Jember Regency, the initial demand is estimated at approximately 475 packs per month (based on an average consumption of five packs per month among 95 potential respondents).

If the marketing strategy is expanded to the general public through nutrition education and healthy lifestyle campaigns, the market demand potential is projected to increase by 20–30% within the next 1–2 years.

4.2.2. Demand Projection Scenarios

To provide a more comprehensive overview, three demand projection scenarios were developed: *conservative*, *moderate*, and *optimistic*.

Table 4. Scenario-Based Projections of Local Market Demand

Scenario	Main Assumption	Estimation of Monthly Demand
Conservative	Initial segment only (95 potential respondents), assuming a consumption frequency of 5 packs per month	475 packages
Moderat	Initial segment + 20% general population penetration (avg. 5 packs/month)	570 packages

Scenario	Main Assumption	Estimation of Monthly Demand
Optimis	Market expansion + intensive education (50% target penetration, avg. 12 packs/month)	1.136 packages

The scenario analysis indicates that the local market demand holds significant growth potential if appropriate marketing strategies are implemented. To maximize market potential, producers should: a) Focus distribution efforts on consumer segments with relatively good nutrition literacy; b) Employ nutrition education strategies to expand reach to the general public; c) Provide product and pricing variations to capture both premium consumers and trial buyers.

The projection of local market demand ranges between 400–1,200 packs per month, depending on the scenario (conservative, moderate, optimistic). This demonstrates the potential for substantial market growth if nutrition-based education strategies are applied. An international study Singh and Whelan (2011) emphasized that consumer education on gluten-free diets plays a crucial role in broadening the consumer base, not only among individuals with celiac disease but also among the general population adopting healthier dietary patterns.

The integration of SWOT analysis into marketing implications provides the following strategic directions:

- a. **Aggressive Strategy:** With the strengths of high purchase interest (78%), relatively good nutrition literacy, and consumer willingness to pay a premium for healthier products, marketing strategies should emphasize product differentiation through the message of being “*healthy, safe, and innovative.*” Branding needs to be reinforced with narratives of health, food safety, and modern lifestyle trends.
- b. **Adaptive Strategy:** Considering that most respondents earn below the regional minimum wage, and student segments tend to act as trial buyers, a multi-tier pricing strategy is required, offering two product variants: an economical version (smaller packaging) for students and a premium version (resealable packaging) for regular consumers. Continuous education is essential to enhance consumer loyalty.
- c. **Development Strategy:** With the growing healthy lifestyle trend and the increasing consumption frequency of GFLF products, the rise of special diet communities, and strong support from online marketplaces, distribution should prioritize digital channels (e-commerce, social media, online health communities), complemented by penetration into modern retail (supermarkets, health food stores). Collaborations with healthcare professionals, universities, and communities can strengthen product positioning.
- d. **Defensive Strategy:** Competition from imported products, perceptions of high pricing, and limited public awareness necessitate consumer education to reduce resistance. Communication strategies must emphasize *value for money* (local ingredient quality, health benefits, good taste), ensuring that consumers assess the product not solely by price but also by value.

From a SWOT perspective, significant opportunities arise from the global healthy lifestyle trend and the growing demand for gluten-free products. According to MarketsandMarkets (2020), the global gluten-free product market continues to grow at

a CAGR of over 7%, driven by increasing health awareness. In the local context, distribution through e-commerce and health communities is considered highly effective, consistent with [15], who found that social media and marketplaces play a critical role in expanding the penetration of functional foods in Indonesia.

The main strengths of GFLF cookies lie in the high purchase interest and relatively good consumer nutrition literacy, who demonstrated a positive correlation between nutrition literacy and healthy food consumption behavior [16]. However, weaknesses in purchasing power must be addressed through differentiated pricing strategies. This approach is also supported by [17], who highlighted the importance of product innovation and tiered pricing strategies to reach broader consumer segments. The primary threats come from competition with imported products and perceptions of high pricing. Therefore, communication strategies should emphasize the added value of local products, such as the use of cassava and soy-based ingredients, which not only provide nutritional benefits but also support national food security. *Local food movement* narratives effectively increase consumer acceptance of food products derived from local raw materials [18].

5. Conclusions

5.1. Conclusions of this study

The study shows that although awareness of gluten- and lactose-free products is high among predominantly young, female consumers, experience with such products remains limited. Nevertheless, interest in GFLF cookies is strong, driven mainly by perceived health benefits and curiosity, with most consumers willing to purchase despite higher prices. An acceptable price range, preferred packaging, and online distribution channels were clearly identified, and market projections indicate promising local demand for GFLF cookies.

5.2 Implications for Practice and Future Research

This study provides several practical implications for stakeholders in the functional food industry, particularly producers and marketers of gluten- and lactose-free products. Marketing strategies should emphasize health benefits and product innovation while maintaining affordability to attract both premium consumers and trial buyers. Online marketplaces and community-based distribution channels represent effective platforms for increasing accessibility and visibility, especially among young and health-conscious consumers. In addition, product development should prioritize packaging functionality, sensory appeal, and value-for-money positioning to foster consumer trust and encourage repeat purchases.

For future research, broader population coverage is recommended to capture more diverse consumer profiles across different regions and socioeconomic groups. Comparative studies with other functional food categories may provide deeper insights into consumer motivations and market dynamics. Longitudinal studies are also needed to explore behavioral shifts and the long-term sustainability of demand for gluten- and lactose-free products. Finally, further exploration of local ingredient utilization and consumer perception could enhance product differentiation while simultaneously supporting food security and sustainability initiatives.

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