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A Study on Awareness, Nutritional Knowledge, and Milk Product Consumption Patterns among Students of Anand and Vidyanagar City

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The present study investigates the awareness, nutritional knowledge, and consumption patterns of milk and dairy products among students in Anand and Vidyanagar, Gujarat. A structured web-based survey was conducted in February 2023 with a sample of 100 students aged 18–26 years, representing a diverse range of academic institutions. The study aimed to assess students' general awareness of milk's nutritional benefits, their detailed understanding of milk composition (including fat, SNF, and other components), and their actual consumption behaviors. Results revealed that

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87% of students consume milk, with a strong preference for packed milk (79%) over loose milk (51%), and Amul as the most trusted brand (86%). While 77% of respondents recognized milk's nutritional value, detailed knowledge remained limited, with only 27% aware of specific nutrients like minerals, lipids, and sugars. Daily milk consumption was reported by 57% of students, primarily in the morning (76%), with Gold (6% fat) and buffalo milk being the preferred variants. Additionally, 95% of students consumed milk-based products, with high demand for traditional items such as curd, buttermilk, and paneer. Motivations for milk consumption were largely health-driven (60%) or habitual (32%), while non-consumption was primarily due to taste aversion or veganism. The findings underline a positive attitude towards dairy consumption among youth but highlight gaps in detailed nutritional literacy. These insights can inform targeted nutrition education programs and help stakeholders in the dairy sector align product offerings with consumer needs.

Keywords: Milk consumption; nutritional awareness; dairy products; student behaviour; packed milk; milk preferences; health consciousness; Amul brand; SNF awareness; Gujarat youth.

1. INTRODUCTION

Milk is widely regarded as a complete food, rich in essential nutrients such as calcium, protein, vitamins (A, D, B12), fats, and minerals. It plays a vital role in physical growth, bone health, and immune function, especially among young individuals. However, with the rise of processed foods, shifting lifestyle choices, and growing access to plant-based alternatives, the traditional consumption of milk among students has become more variable. This study seeks to understand the patterns of milk and dairy product consumption, as well as the level of nutritional awareness among college students in Anand and Vidyanagar — a demographic that holds significant potential for shaping future consumption trends. Modi et al. (2024), explored how age-specific yoga practices combined with tailored dairy consumption can improve digestive health. Their findings indicate that Each group benefits differently, making this strategy adaptable and effective across life stages. The synergistic relationship between yoga and dairy offers a comprehensive approach to enhancing digestive health across all age groups. By recognizing the specific digestive challenges faced at different life stages, targeted yoga practices and strategic dairy consumption can effectively alleviate discomfort, improve nutrient absorption, and promote holistic well-being.

The world's largest producer of milk is still India. The government has launched a number of initiatives to boost livestock productivity, which has led to a notable increase in milk production. The amount of milk produced in 2021–2022 and 2022–2023 is 222.07 million tonnes and 230.58 million tonnes, respectively, representing a 3.83% yearly rise. Approximately 459 grams of milk per day will be available per person in 2022–2023. From 2011–12 to 2022–23, the milk output and associated yearly growth rate (%) is 3.83%.

India's dairy industry is the biggest agricultural product, accounting for around 5% of the country's GDP and growing at a compound annual growth rate (CAGR) of 6.4% over the previous five years (Invest India, 2024). It is essential to the livelihoods of almost 70 million farmers who work directly in the dairy industry. Dairy products are unique among agricultural products in that they guarantee farmers 70–80% of the ultimate market value, which represents roughly one-third of rural household income.

The top five milk-producing states—Rajasthan (15.05%), Uttar Pradesh (14.93%), Madhya Pradesh (8.6%), Gujarat (7.56%), and Andhra Pradesh (6.97%)—together account for 53.11% of India's total milk production (Invest India, 2024).

According to Modi et al (2025), Gujarat has consistently outperformed the national average in milk production growth, with a 212% increase in production from 5.86 million tonnes in 2001–02 to 18.31.

million tonnes in 2023–24, compared to India's 183% growth. Additionally, Gujarat's share of national milk production rose from 6.95% in 2001–02 to 7.65% in 2023–24. The per capita availability of milk in Gujarat also surpassed the national average, increasing from 418 grams per day in 2009–10 to 700 grams per day in 2023–24, whereas India's per capita availability increased from 273 grams per day in 2009–10 to 471 grams per day in 2023–24. The study also highlights the significant role of Gujarat's cooperative dairy sector, particularly

organizations like Amul, which have driven milk procurement growth, from 44.43 lakh litres per day in 2001–02 to 240.99 lakh litres per day in 2022–23. The shift in Gujarat's milch population composition, with an increasing reliance on buffaloes, is evident from data showing stable buffalo population growth despite a slight decrease in cattle numbers.

India exported $284.65 million worth of dairy products in 2022–2023 (67,572.99 metric tonnes) (Invest India, 2024). The dairy industry's continuous expansion calls for large infrastructural investments in shipping, processing, chilling, and calf feed. The manufacture of dairy products with additional value, organic or farm-fresh milk, and exports also present substantial prospects (Chaudhari et al., 2024).

2. LITERATURE REVIEW

Yun (2006) studied milk consumption patterns, perceptions, and knowledge among 1,195 middle and high school students in Geochang. The study found that over half the students drank milk 5–6 times a week, with higher intake among middle schoolers and male students. Consumption was significantly influenced by factors like gender, parental education, and family structure. While many students believed milk was important, only a third had good knowledge of its nutritional value. Male students showed better perception and awareness than females. The study highlights a gap between consumption behaviour and nutritional understanding, indicating a need for improved health education.

Gholami et al. (2020) investigated public awareness, attitudes, and practices regarding milk and dairy consumption in Ardabil, Iran. The study found that educational level and occupation significantly influenced awareness of milk-related disease transmission and proper consumption practices. However, no significant link was found between income and consumption behaviors. Most families consumed milk in amounts lower than recommended, with boiling and storage practices not always aligning with health guidelines. The study emphasized the need for educational and policy-driven efforts to promote safe and adequate milk consumption in the region.

Hoque et al. (2018) explored how health consciousness, perceived knowledge, and beliefs influence consumer attitudes and purchase intent regarding liquid milk in Bangladesh. Surveying 712 households, the study found that health consciousness significantly impacts perceived knowledge, belief, and attitude but not purchase intent. Belief had a direct positive effect on both attitude and intent to purchase. Despite low perceived knowledge, it still positively influenced purchase decisions. The study also revealed that consumption frequency, income, age, and labelling preference significantly affect purchase intent, highlighting the complex factors shaping consumer behaviour in emerging markets.

Park et al. (2019) analyzed milk consumption patterns and perceptions among Korean adolescents, adults, and the elderly. The study identified age-specific motivations for milk intake—growth in adolescents, meal substitution and bone health in adults, and primarily bone health in the elderly. Across all age groups, brand reputation was the top selection factor, while hygiene, nutrition, and health were both highly important and satisfactorily met. Adults uniquely found price to be a critical but unsatisfactory aspect. These findings highlight key marketing and nutritional focus areas to encourage milk consumption among different age segments.

Wei and Wang (2023) conducted a cross-sectional study on dairy knowledge and consumption behaviour among 2,500 Chinese residents. Although 99.7% acknowledged milk as beneficial, only a small percentage accurately understood its nutritional value or recommended intake. Average daily dairy consumption was below the advised level, with knowledge gaps more pronounced among the elderly, those with lower education, and lactose-intolerant individuals. Purchasing behaviour varied by age group, with younger consumers prioritizing probiotics and older adults favouring low-sugar options. The study highlights the urgent need to improve public education and promote healthier dairy consumption habits in China.

Güler et al. (2021) investigated milk and dairy consumption habits among 361 university students in Turkey. They found that 86.43% of students consumed milk, with little difference between males and females. Although most students drank at least one glass of milk daily, only 18.28% consumed milk regularly every day. Packaged milk was preferred over non-packaged

varieties. Many students who did not consume milk reported no specific reason, often citing simply a lack of habit. The study also showed that gender influenced some consumption preferences but not overall intake. Overall, while milk consumption was common, regular daily intake was insufficient among the students.

Gurjar & Modi (2025) indicate that Gujarat's dairy industry in 2022-23 was dominated by a few key districts, with Banaskantha leading in overall milk production followed by districts like Sabarkantha, Mehsana, Anand, and Kheda The specific factor contributing to the success of leading districts is the dominance of large dairy cooperatives in these districts which operate under Amul. Crossbred cows were the primary contributors to cow milk, while buffaloes played a major role in several districts, especially in Banaskantha and Kheda. Goat milk production, although less significant, was concentrated in districts like Dahod and Kachchh

Bitirak et al. (2008) examined factors influencing milk consumption among primary school children in Ankara. Their study of 335 students found that milk consumption was significantly higher among older students (8th grade), boys, and those who had milk available at home daily. Other positive factors included purchasing milk with pocket money, eating breakfast regularly, and preferring milk over cola. The results suggest that both environmental availability and personal habits strongly affect milk consumption in children. These findings highlight the importance of family and lifestyle factors in promoting healthy dairy intake among young students.

Narayana et al. (2020) studied consumer awareness and attitudes toward functional dairy products in Sri Lanka's Western Province. The research found that although consumers prioritized taste and cost over health benefits, awareness and knowledge of functional dairy products and their ingredients were generally low. Consumer education and media exposure, especially through electronic media, significantly improved awareness. Most consumers expressed dissatisfaction with the current availability of functional dairy products, indicating a strong potential market for new product development. Powdered milk, ice cream, and yogurt were the most requested functional dairy products. These findings suggest that increasing consumer education and product variety could enhance the functional dairy market in Sri Lanka.

Gurjar & Pramith, et al (2025) indicate that Gujarat Dairy Cooperatives, under the Amul brand, have developed a comprehensive and diversified product portfolio of ambient offerings that cater to a wide demographic — from infants to fitness enthusiasts. The Key findings indicate that GCMMF has -Breadth and depth of portfolio across ghee, milk powders, beverages, proteins, chocolates, bakery, and organic products, Strategic alignment with health and wellness trends, such as lactose-free drinks, high-protein products, and sugar-free cookies, Use of ambient packaging formats (tetrapak, PET bottles, cans) to enhance shelf life and convenience, and Multi-channel distribution through General Trade (GT), Modern Trade (MT), e-commerce, and institutional sales, enabling wide accessibility. As a result, it attempts leverage its existing brand and customer base. Further its vast product portfolio exhibits the strong Research and Development capabilities with respect to Product. The product strategy is holistic, integrating nutrition, affordability, tradition, and innovation, thereby cementing Amul's role as not just a dairy leader but a complete food solutions provider in India and select global markets.

3. RESEARCH OBJECTIVES

1. To analyse the demographic profile of student respondents.
2. To assess students' awareness regarding the nutritional value and quality of milk.
3. To examine the milk consumption patterns among students.
4. To explore students' perceptions and attitudes toward consuming and not consuming milk

4. RESEARCH METHODOLOGY

To effectively carry out the study titled "A Study on Awareness, Nutritional Knowledge, and Milk Product Consumption Patterns Among Students of Anand and Vidyanagar city" a structured research design was developed. The research was conducted in February 2023, utilizing a web-based survey as the primary tool for data collection. A structured questionnaire was designed to gather relevant information aligned with the study objectives.

The target population comprised individuals aged 18 to 26 years students from different institutes, representing a key consumer segment for both dairy and dairy alternative products. A random sampling method was employed to ensure that each individual within the defined population had an equal opportunity of being selected. This approach helped minimize selection bias and enhanced the reliability and generalizability of the findings.

A total of 100 respondents participated in the study. The primary data collected from these participants were systematically compiled and analysed using Descriptive Statistical tools. Techniques such as tabulation, graphical representation, and charts were employed to interpret the data effectively. These methods facilitated a comprehensive understanding of consumer awareness, consumption patterns, and perceptions regarding dairy and plant-based dairy alternatives.

5. RESULTS AND DISCUSSION

5.1 To Analyse the Demographic Profile of Student Respondents

The demographic analysis table is crucial as it lays the foundation for understanding the characteristics of the target population. It helps in categorizing respondents based on essential factors like gender, age, education level, college affiliation, and living conditions. This classification ensures that the sample is well-represented and diverse, allowing for more accurate and generalized conclusions. It also enables researchers to identify demographic influences on behaviours, preferences, or attitudes relevant to the study. Furthermore, it supports subgroup analysis and comparison, enhancing the depth and quality of the research. Table 1 shows the data collected.

(a) Gender-wise Distribution: The gender distribution of the survey participants indicates a relatively balanced representation with a slight predominance of female respondents. Out of 100 respondents, 46% are female and 54% are male. This indicates that males form a slightly higher proportion of the participants in the study.

(b) Age-wise Distribution: The majority of respondents (76%) fall in the age group of 18 to 22 years, which typically represents undergraduate students. This is followed by 19% in the 23 to 26 years age group, likely covering most postgraduate students. Only 1% of respondents are above 26 years of age, and 4% are below 18, indicating that the survey predominantly targeted youth and early adults. This age distribution aligns well with the student demographic of Anand city, ensuring that the study results are relevant to student milk consumption behaviour.

(c) College-wise Distribution: Respondents in the study represent a diverse mix of academic institutions in Anand city. The largest group comes from the College of Food Processing Technology & Bio Energy (24%), followed closely by SMC College of Dairy Science (22%). Other colleges such as International Agri-Business Management (15%), CVM University (10%), Bhai Kaka University (10%), BACA (11%), and the College of IT (8%) are also represented. This wide distribution enhances the study's generalizability across different educational backgrounds and academic disciplines.

(d) Residence-wise Distribution: Most of the respondents (73%) reside in hostels, while 22% are day scholars and a small proportion (5%) live in off-campus accommodations. The high percentage of hostel residents suggests a concentrated group with potentially similar food consumption habits influenced by hostel facilities, routines, and peer behaviour. This variable can significantly affect milk consumption frequency and preference due to accessibility and institutional meal planning.

(e) Education-wise Distribution: Regarding educational qualification, the majority of respondents are undergraduates (65%), followed by postgraduates (34%) and a minimal number of PhD students (1%). This breakdown provides insight primarily into the behaviour of early-stage students, offering a foundation for understanding consumption habits across different levels of higher education. The presence of postgraduate and doctoral students also adds depth to the analysis in terms of maturity, lifestyle, and health awareness influencing milk consumption.

Table 1. Demographic Profile of Respondents (n=100)

(a) Gender wise distribution			
Sr No.	**Particulars**	**Frequency**	**Percentage**
1	Male	54	54
2	Female	46	46
	Total	100	100
(b) Age wise distribution			
1	18-22	76	76
2	23-26	19	19
3	Above 26	1	1
4	below 18	4	4
	Total	100	100
(c) College wise distribution			
1	College Of Food Processing Technology & Bio Energy	24	24
2	SMC College Of Dairy Science	22	22
3	B. A. College Of Agriculture, Aau.	11	11
4	College Of Information Technology, Aau	8	8
5	Bhai-Kaka University	10	10
6	International Agri Business Management	15	15
7	Charutar Vidya Mandal University	10	10
	Total	100	100
(d) Residence wise distribution			
1	Hostel	73	73
2	Day Scholars	22	22
3	Off Campus Accommodation	5	5
	Total	100	100
(e) Education wise distribution			
1	Under Graduate	65	65
2	Post Graduate	34	34
3	PHD	1	1
	Total	100	100
(f) Health Consciousness of Students			
1	Highly conscious	72	72
2	Conscious	12	12
3	Moderately	10	10
4	Not conscious	2	2
5	Not at all conscious	4	4
	Total	100	100

5.2 To Assess Student's Awareness Regarding the Nutritional Value and Quality of Milk

Assessing students' awareness regarding the nutritional value and quality of milk is significant as it helps determine their understanding of an essential dietary component. This insight is crucial for promoting informed consumption choices, especially among youth who are future decision-makers and influencers. Evaluating awareness about specific elements like fat, SNF, minerals, and other nutrients provides a clear picture of knowledge gaps and misconceptions. Such analysis can guide targeted educational interventions and health promotion strategies. Ultimately, it supports efforts to improve nutritional literacy and encourage healthier dietary habits among students. Table 2 shows the data collected for this objective.

(a) General Awareness about Nutritional Qualification of Milk: The survey indicates that 77% of students are generally aware of the nutritional qualifications of milk, while 23% are not. This shows a reasonably high overall awareness among students regarding the nutritional importance of milk. However, considering milk is a staple in many diets

and a key source of nutrients, a 23% unawareness level also highlights the need for more targeted educational efforts.

(b) Awareness about Fat Content in Milk: Among the 77 students who were aware of milk's nutritional value, 82% specifically knew about the fat content present in milk, while 17% were unaware. This suggests that fat content is relatively well-known compared to other specific components, possibly because of increasing health awareness and discussions around dietary fats. Still, a small gap remains that could be addressed through more in-depth nutritional education.

(c) Awareness about SNF (Solids-Not-Fat) Content in Milk: Awareness about SNF content is somewhat lower, with 74% of students knowing about it and 26% unaware. SNF includes proteins, lactose, vitamins, and minerals—components vital to understanding milk's nutritional value. The fact that nearly one in four students lacks awareness here suggests a gap in knowledge about the detailed composition of milk.

(d) Awareness about Other Nutritional Components (Minerals, Lipids, Sugars, etc.): A significant knowledge gap is observed in awareness of other nutritional components of milk. Only 27% of students were aware of elements like minerals, lipids, and sugars, whereas 73% were not. This indicates a substantial lack of detailed nutritional understanding, emphasizing the need for focused nutrition education to improve awareness of milk's comprehensive benefits.

Table 2. Students' Awareness Regarding the Nutritional Value and Quality of Milk

(a) Awareness about nutritional qualification of milk among the students (n=100)			
Sr No.	**Particulars**	**Frequency**	**Percentage**
1	Aware	77	77
2	Not -Aware	23	23
	Total	100	77
(b) Awareness about fat content present in the milk among the students (n=77)			
1	Aware	63	82
2	Not-Aware	14	17
	Total	77	100
(c) Awareness about Solid-Not-Fat (SNF) content present in the milk (n=77)			
1	Aware	57	74
2	Not-Aware	20	26
	Total	77	100
(d) Awareness about other nutritional components in milk like (Minerals, lipids, sugar.) (n=77)			
1	Aware	21	27
2	Not-Aware	56	73
	Total	77	100

5.3 To Study the Consumption Pattern of Milk and Milk Products Among the Students

Table 3. Student's consumption pattern of milk in Anand and Vidyanagar, along with their respective percentage and totals

(a) Consumption pattern of Milk of students				
Sr No.	**Particulars**	**Frequency**	**No of Respondents**	**Percentage**
1	Consuming	87	100	87
2	Not-consuming	13	100	13
	Total	100	-	100
(b) Consumption pattern of loose milk among the students				
1	Consume loose milk	44	87	51
2	Not consuming loose milk	43	87	49
	Total	87	-	100

(c)	**Types of consumption of loose milk among the respondents**			
1	Buffalo milk	28	44	64
2	Cow milk	20	44	45
3	Goat milk	4	44	9
4	Mixed milk	1	44	2
	Total	44		
(d)	**Consumption pattern of packed milk among the students**			
1	Consuming	69	87	79
2	Not-consuming	18	87	21
	Total	87	-	100
(e)	**Brand preference of consumption of packed milk among the students**			
1	Amul	59	69	86
2	Mother dairy	10	69	14
	Total	69	-	100
(f)	**Frequency of consumption of Milk among the students**			
1	Daily	50	87	57
2	2-3 times in week	33	87	38
3	occasionally	4	87	5
	Total	87	-	100
(g)	**Preference of time for consuming milk among the students**			
1	Morning (Breakfast)	66	87	76
2	Evening	9	87	10
3	Night	29	87	33
(h)	**Pattern of Milk Consumption with Complementary Food Items**			
1	Plain milk	41	87	47
2	With sugar	15	87	17
3	With turmeric, cocoa or other flavours	15	87	17
4	Mixed with cereals or other foods	6	87	7
5	Bread, biscuits or cookies	7	87	8
6	Other	3	87	3
	Total	87	-	100
(i)	**Preference of variant of milk among the students**			
1	Gold (6% fat / 9 snf)	30	87	34
2	Shakti (4%/ 8.5 SNF)	7	87	8
3	Tea special	3	87	3
4	Buffalo milk	18	87	21
5	Toned milk	2	87	2
6	Taaza milk	6	87	7
7	Cow milk	11	87	13
8	Flavoured milk	10	87	11
	Total	87	-	100
(j)	**Quantity of milk consume by students among the respondents**			
1	Less than 250 ml	51	87	59
2	250-500 ml	30	87	34
3	500-750 ml	5	87	6
4	More than 750 ml	1	87	1
	Total	87	-	100
(k)	**Amont of money spent by students for milk among the students Per month**			
1	Less than 300 Rs	28	87	32
2	300-500 Rs	24	87	28
3	500-700 Rs	13	87	15
4	More than 700 Rs	22	87	25
	Total	87	-	100

(l) Preference of place of purchase Among the students				
1	University dairy farm	5	87	6
2	From local vendor/ Retail shop	17	87	20
3	Supermarket	3	87	3
4	Amul Parlor outlet (APO)	62	87	71
5	Online purchase	0	87	0
	Total	87	87	100
(m) Checking of quality certification while purchasing				
1	Yes	75	87	86
2	No	12	87	14
	Total	87	-	100
(n) Consumption pattern of milk-based products among the students				
1	Consuming	95	100	95
2	Not consuming	5	100	5
	Total	100	-	100

(o) Frequency of purchasing of milk-based product among the students (n=95)

	Milk Based	Very often		often		Moderately		Rarely		Never	
	Products	F	%	F	%	F	%	F	%	F	%
1	Curd	19	20	20	21	31	33	11	12	14	15
2	Yogurt	3	3	5	5	20	21	18	19	49	52
3	Butter	8	8	12	13	29	31	23	24	23	24
4	Cheese	6	6	14	15	27	28	15	16	33	35
5	Paneer	6	6	18	19	33	35	22	23	16	17
6	Butter milk	36	38	22	23	15	16	13	14	9	9
7	Cream	4	4	5	5	17	18	25	26	44	46
8	Milk powder	2	2	4	4	11	12	14	15	64	67
9	Traditional sweets	9	9	11	12	20	21	10	11	14	15

(a) Overall Milk Consumption Among Students: The survey revealed that a significant majority of students consume milk. Out of the 100 respondents, 87 students (87%) reported consuming milk, while only 13 students (13%) stated they do not. This highlights the strong presence of milk in students' dietary routines, likely due to its nutritional benefits, accessibility, and cultural relevance.

(b) Consumption Pattern of Loose Milk: Among the 87 milk-consuming students, the responses were almost evenly divided in terms of loose milk consumption. 44 students (51%) indicated they consume loose milk, while 43 students (49%) reported that they do not. This suggests a mixed perception regarding loose milk, potentially influenced by factors like cost, availability, taste preference, and hygiene concerns.

(c) Type of Loose Milk Consumed: Out of the 44 students who consume loose milk, the most preferred type was buffalo milk, chosen by 28 students (64%). Cow milk was consumed by 20 students (45%), followed by 4 students (9%) who preferred goat milk, and 1 student (2%) who consumed mixed milk. The higher preference for buffalo milk may be due to its richer fat content and creaminess, which are commonly valued characteristics among milk consumers.

(d) Consumption Pattern of Packed Milk: Packed milk appears to be more popular than loose milk among students. Out of the 87 milk consumers, 69 students (79%) reported consuming packed milk, while 18 students (21%) did not. This shows a clear preference for packed milk, likely due to factors such as hygienic packaging, convenience, consistent quality, and longer shelf life.

(e) Brand Preference in Packed Milk: Among the 69 students who consume packed milk, 59 students (86%) preferred the Amul brand, whereas 10 students (14%) chose Mother Dairy. The dominance of Amul as the preferred brand may be attributed to its strong market presence, product quality, and brand trust, especially in student communities familiar with its wide product range.

(f) Frequency of Milk Consumption: When asked about the frequency of milk consumption, 50 students (57%) reported

consuming milk on a daily basis, while 33 students (38%) stated they consume it a few times a week. Only 4 students (5%) consumed milk occasionally. The high percentage of daily consumers reflects milk's role as a regular part of many students' diets.

(g) Preferred Time for Milk Consumption: The majority of students preferred drinking milk in the morning, with 66 respondents (76%) selecting this option. 29 students (33%) consumed milk at night, and 9 students (10%) in the evening. (Note: Respondents could select more than one option, hence totals may exceed 100%.) The data indicates that milk is most often associated with breakfast, a common dietary pattern in many households.

(h) Patterns of Milk Consumption with Complementary Food Items: Students exhibit varied preferences for how they consume milk. 41 students (47%) preferred plain milk, while 15 students (17%) added sugar, and another 15 students (17%) flavored their milk with turmeric, cocoa, or other additives. 6 students (7%) consumed milk with cereals or other foods, 7 students (8%) with bread, biscuits, or cookies, and 3 students (3%) had other methods of consumption. This variation suggests that while plain milk is the most popular, flavored and combined options are also notably present among student preferences

(i) Preference of Milk Variant Among Students: When asked about their preferred type or variant of milk, students showed diverse preferences. The most favored was Gold milk (6% fat / 9% SNF), preferred by 30 students (34%), which suggests a taste for full-cream, rich milk. This was followed by buffalo milk, selected by 18 students (21%), indicating its continued appeal due to high fat content. Cow milk was the choice for 11 students (13%), and flavoured milk appealed to 10 students (11%), highlighting a segment inclined toward taste-enhanced dairy products. Other variants included Shakti milk (4% fat / 8.5% SNF) with 7 students (8%), Taaza milk with 6 students (7%), Tea special milk with 3 students (3%), and toned milk with just 2 students (2%). This shows a clear preference for richer and creamier milk types among students, with relatively lower preference for low-fat variants.

(j) Quantity of Milk Consumed by Students: Regarding the quantity of milk consumed daily, a majority of students reported moderate consumption. 51 students (59%) consume less than 250 ml per day, which might reflect dietary moderation, budget constraints, or other nutritional sources. 30 students (34%) consume between 250-500 ml, indicating a relatively balanced intake. A small fraction—5 students (6%)—consume between 500-750 ml, and only 1 student (1%) reported consuming more than 750 ml per day. The overall trend suggests that while most students do include milk in their diets, high-volume consumption is relatively rare.

(k) Monthly Expenditure on Milk by Students: In terms of financial expenditure, most students reported moderate monthly spending on milk. 28 students (32%) spent less than ₹300, while 24 students (28%) spent between ₹300–₹500. Another 13 students (15%) spent ₹500–₹700, and 22 students (25%) spent more than ₹700 per month. This variation reflects differences in consumption quantity, brand preference (e.g., premium vs. loose milk), and milk variant (full-cream vs. toned). Students with higher consumption volumes or preferences for premium or packed milk variants likely fall into the higher expenditure categories.

(l) Preference of Place of Milk Purchase Among Students: The data clearly indicates that Amul Parlor Outlets (APO) are the most preferred source for purchasing milk among students, with 62 out of 87 respondents (71%) choosing this option. This preference may be driven by the convenience, brand trust, hygienic conditions, and consistent availability of milk at APOs. Other sources include local vendors or retail shops, preferred by 17 students (20%), and university dairy farms, used by 5 students (6%). Only 3 students (3%) purchase milk from supermarkets, and no respondents reported buying milk online. The near absence of online purchases could be due to a lack of platforms, trust issues, or the preference for immediate availability and freshness. Overall, the dominance of Amul outlets shows the brand's strong presence and accessibility in student areas.

(m) Checking of Quality Certification While Purchasing: A large proportion of students are conscious of the quality of milk they consume. 75 out of 87 students (86%) reported that they check for quality certifications or labels while purchasing milk, while only 12 students (14%) do not. This high level of awareness highlights students' increasing concern for food safety and

hygiene, possibly influenced by growing health consciousness and exposure to food education. It also emphasizes the importance of visible certifications like FSSAI, AGMARK, or company seals on milk packets to influence purchase behavior.

(n) Consumption of Milk-Based Products: Milk-based products are highly popular among students, with 95 out of 100 respondents (95%) consuming them and only 5 students (5%) reporting that they do not. This strong inclination toward milk derivatives such as curd, butter, cheese, paneer, ice cream, and flavoured milk points to the versatility of dairy in students' diets. It also suggests opportunities for further product development and marketing in the dairy value-added segment targeted at young consumers.

(o) Frequency of Purchasing of Milk Based Products: frequency of purchasing milk-based products among 95 student respondents, covering each product individually with accurate analysis based on both frequency (F) and percentage (%):

1. **Curd:** Curd is the most commonly purchased milk-based product among students. A combined 74% of students purchase it with varying frequency: 20% very often, 21% often, and 33% moderately. Only 12% purchase it rarely, and 15% never buy it. This indicates that curd is a dietary staple for a majority, likely due to its affordability, nutritional value, and cultural acceptance as a regular food item.
2. **Yogurt:** Yogurt shows relatively low popularity compared to curd. A majority—52%—reported never purchasing yogurt, and 19% said they buy it rarely. Only 3% buy it very often, 5% often, and 21% moderately. This may be due to a perception of yogurt as a luxury or niche item, limited availability, or less familiarity compared to curd in traditional diets.
3. **Butter:** Butter has moderate consumption among students. About 52% of respondents purchase it with some frequency (8% very often, 13% often, 31% moderately), whereas 24% each reported buying it rarely or never. Butter's moderate demand suggests its use in limited quantities for spreading or cooking, likely balanced against dietary and budget considerations.
4. **Cheese:** Cheese is moderately popular but less consumed than butter. 49% buy it either very often, often, or moderately, while 16% buy it rarely and 35% never purchase it. This mixed trend could be due to price, dietary habits, or limited culinary use in daily student meals.
5. **Paneer:** Paneer is widely accepted with 60% of students purchasing it at least moderately (6% very often, 19% often, 35% moderately). However, 23% purchase it rarely and 17% never. Paneer's popularity may stem from its versatility and cultural relevance in Indian cuisine, making it a common item in vegetarian and protein-rich meals.
6. **Buttermilk:** Buttermilk is one of the most frequently consumed milk-based beverages. A large 38% of students purchase it very often, and 23% often, with an additional 16% buying it moderately. Only 14% purchase it rarely, and 9% never buy it. This high frequency may be attributed to its refreshing nature, affordability, and digestive benefits, especially in hot climates.
7. **Cream:** Cream is among the least purchased milk products. Nearly 46% of students never purchase it, and 26% do so rarely. Only 4% buy it very often, 5% often, and 18% moderately. The limited usage of cream in everyday student meals, combined with its relatively higher cost, may explain the low purchase frequency.
8. **Milk Powder:** Milk powder has the lowest purchase rate among all listed products. A significant 67% of students never purchase it, and 15% do so rarely. Only 2% buy it very often, 4% often, and 12% moderately. This reflects a strong preference for fresh milk over powdered alternatives, especially when fresh milk is easily accessible and affordable.
9. **Traditional Sweets:** Traditional milk-based sweets hold moderate popularity. 21% of students buy them moderately, 12% often, and 9% very often, totaling 42% regular consumers. Meanwhile, 11% buy them rarely, and 15% never. Their occasional use likely reflects cultural preferences, affordability, and their association with festivals or special occasions rather than daily consumption.

5.4 To Study the Student Perception on Consuming and Not Consuming Milk

Understanding student perception on consuming and not consuming milk is significant as it reveals

Table 4. Student's Perception on Consuming and Not Consuming Milk

Sr No.	Particulars	Frequency	Percentage
(a) Reason for consuming milk among the students (n=87)			
1	Nutritional benefits	52	60
2	Habit from childhood	28	32
3	Recommendation by family or doctor	2	2
4	Taste preference	5	6
	Total	87	100
(b) Factor influencing the choice of milk among the students (n=87)			
1	Price of milk	6	7
2	Availability	12	14
3	Nutritional value	53	61
4	Brand preference	13	15
5	Family habit	3	3
	Total	87	100
(c) Reason for not consuming milk (n=13)			
1	Not available	2	15
2	Taste	5	38
3	Veganism	4	31
4	Other	2	15
	Total	13	100

the motivations and barriers influencing their dietary behaviour. Identifying reasons for milk consumption, such as health benefits or taste preferences, helps in recognizing positive drivers. Similarly, analysing factors like cost, availability, or personal beliefs that deter consumption highlights areas needing attention. This information is valuable for designing effective awareness campaigns and nutritional programs. It also aids stakeholders in the dairy industry and public health to promote milk consumption based on informed preferences and needs. Student's perception has been shown in Table 4.

(a) Reason for Consuming Milk Among Students: Among the 87 milk-consuming students, the most dominant reason is its nutritional benefits, with 52 students (60%) selecting this. This suggests a strong awareness of milk's health value, including its role in bone development, immunity, and general wellness. Following that, 28 students (32%) reported that drinking milk is a habit from childhood, reflecting cultural or familial routines that have been carried into adulthood. Only 5 students (6%) drink milk for its taste, and 2 students (2%) cited recommendation by a doctor or family member. Overall, the data shows that health benefits and long-term habits are the primary motivators for milk consumption.

(b) Factors Influencing the Choice of Milk Among Students: When selecting the type of milk to consume, nutritional value plays the most significant role, as indicated by 53 out of 87 students (61%). This reinforces the earlier point that health-consciousness is a major driver in milk consumption patterns. Brand preference is the second most important factor, influencing 13 students (15%), followed closely by availability (12 students or 14%). Only 6 students (7%) consider price as a key factor, indicating that many students prioritize quality over cost. Lastly, family habit influences only 3 students (3%), which shows that while habits matter for consumption in general, they are less important when choosing a specific milk variant.

(c) Reason for Not Consuming Milk: Among the 13 students who do not consume milk, the most cited reason is taste, with 5 students (38%) disliking the flavour. This shows that sensory preferences play a major role in food aversions, even for nutritious items like milk. Veganism was reported by 4 students (31%), reflecting an ethical or dietary shift away from animal-based products. Lack of availability and other reasons (like digestive issues or allergies) were each cited by 2 students (15%). This highlights a mix of personal, ethical, and practical reasons behind milk avoidance.

6. MAJOR FINDINGS

1. **High Milk Consumption and Brand Preference:** A significant majority of students (87%) consume milk, with a strong preference for packed milk (79%), particularly Amul (86%). This indicates high brand trust and accessibility.

2. **Health Awareness Drives Consumption:** 60% of students consume milk for its nutritional benefits, and 61% cite nutritional value as the top factor influencing their choice. However, detailed nutritional awareness (like SNF, minerals, and fats) remains limited, suggesting a need for focused nutritional education.

3. **Consumption Patterns and Habits: Most** students consume milk daily (57%), mainly in the morning (76%), and prefer plain milk (47%). The Gold variant (34%) and buffalo milk (21%) are most popular, with 59% consuming less than 250 ml per day.

4. **Strong Preference for Certified and Reliable Sources:** 71% of students purchase from Amul Parlors, and 86% check for quality certifications, reflecting high trust in organized and certified milk sources.

5. **High Usage of Traditional Dairy Products:** 95% of students consume milk-based products, with buttermilk (38% very often) and curd (41% very often/often) being the most preferred. Products like milk powder (67%) and cream (46%) are least consumed, showing a clear tilt towards traditional dairy items.

7. CONCLUSION

The study sampled 100 students from various Anand colleges, mostly aged 18–22 years (76%) and undergraduates (65%). A majority lived in hostels (73%), Notably, 72% were highly health conscious, indicating a well-informed, youthful student demographic**.**

Out of the 100 students surveyed, 77% reported being aware of the nutritional value of milk, Among those 77 students, 82% (63 students) were specifically aware of the fat content in milk, Awareness about SNF (Solids-Not-Fat) content was slightly lower, with 74% (57 students) knowing about it, However, awareness about other nutritional elements like minerals, lipids, and sugar was significantly lower—only 27% (21 students) recognized these components., Despite this, 97% (75 out of 77) of those aware acknowledged the general health benefits of milk his indicates a need for targeted nutritional education to bridge the gap between perceived benefits and detailed understanding**.**

Out of 100 students, 87% consume milk, with 51% (44/87) opting for loose milk and 79% (69/87) for packed milk. Among loose milk users, 64% prefer buffalo milk, 45% cow milk, and smaller percentages choose goat (9%) or mixed milk (2%). This indicates a high overall milk consumption rate, with a notable preference for packed milk and buffalo milk among loose milk users. Among 87 milk-consuming students, Amul is the preferred brand for packed milk (86%). 57% consume milk daily, mainly in the morning (76%). Most students drink plain milk (47%), while 17% each prefer it with sugar or other flavors. The most preferred milk variant is Gold (34%), followed by buffalo milk (21%). In terms of quantity, 59% consume less than 250 ml/day, and 34% consume 250–500 ml. Monthly expenditure varies, with 32% spending less than ₹300 and 25% spending more than ₹700, showing a moderate to high milk consumption pattern among students. The majority of students (71%) prefer purchasing milk from Amul Parlor outlets, followed by local vendors (20%). A strong 86% of students check quality certifications before buying, indicating high awareness and trust in certified sources. A large majority (95%) of students consume milk-based products. The most frequently consumed items are buttermilk (38% very often), curd (41% very often/often), and paneer (54% very often/often/moderately). Products like milk powder (67%) and cream (46%) are the least consumed. Yogurt (52%) and cheese (35%) are rarely or never purchased by most, indicating selective preference for traditional dairy items.

Among milk-consuming students (n=87), the main reason for consumption is nutritional benefits (60%), followed by habit from childhood (32%). The primary factor influencing milk choice is also nutritional value (61%), with brand preference (15%) and availability (14%) playing smaller roles. Among non-consumers (n=13), the leading reasons are taste dislike (38%) and veganism (31%), indicating personal preference and lifestyle choices as key barriers.

CONSENT

As per international standards or university standards, respondents' written consent has been collected and preserved by the author(s).

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

COMPETING INTERESTS

Authors have declared that they have no known competing financial interests or non-financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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