



## RESEARCH ARTICLE

## A Critical Analysis of the Impact of Consumer Attitudes and Perception on Goat Milk Consumption and Influencing Factors

Leyla Hade<sup>1,2\*</sup>, Brahim Hamad<sup>1,2</sup>, Meriem Bellabidi<sup>3</sup><sup>1</sup>Department of Agronomy, Faculty of Life and Natural Sciences, University of El Oued, El Oued, Algeria<sup>2</sup>Laboratory of Hygiene and Animal Pathology, Institute of Veterinary Sciences, University of Tiaret, Tiaret, Algeria<sup>3</sup>Higher School of Saharian Agriculture, El Oued, Algeria**ARTICLE INFO****ABSTRACT**

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**\*Corresponding Author:**

leila.hadef@yahoo.fr ;

hadef-leyla@univ-eloued.dz

The worldwide appetite for meat and milk has increased in tandem with the burgeoning population across the globe. Nonetheless, in many parts of the world including Algeria, goats continue to be the most under-exploited species of livestock. Unfavorable opinions held by consumers about goat's milk, particularly when regarding its hedonistic attributes continue to pose a challenge. Thus, this study aimed to evaluate consumers' behavior with regard to the consumption of goat milk along with identifying the variables influencing these choices. Face-to-face interviews employing a standardized questionnaire were performed with 150 randomly chosen participants. The findings indicated that almost of the participants had consumed goat milk previously. Additionally, goats were considered the most favored cattle for milk consumption, surpassing cows and camels. The majority of the respondents held a positive perception regarding goat milk which can be primarily attributed to its perceived nutritional advantages and consumption preference for goat milk. In contrast, taste and lack of availability were the key elements that impacted the participants' impression and choice of goat milk adversely. The majority of the participants expressed their preference for raw goat milk consumption, devoid of any processing or industrial intervention. The gender of participants and their attitudes, coupled with the lack of availability and frequency of consumption of goat milk were all substantially liable to impact goat milk intake. The present research served as a strong foundation for comprehending consumers' perceptions of goat milk, which can be strategically leveraged for determining future production approaches and sales objectives.

**INTRODUCTION**

A looming surge in demand for animal products, particularly milk and meat, in the global food market including developing nations has been widely acknowledged considering the explosive rise in the global population, accelerating urbanization, and growing size of the middle-class population (Güney and Sangün, 2019; Ngomane et al., 2022; Zulkifli et al., 2023). In addition, milk production has grown at an annual rate of 2.1% over the past ten years, with a predicted 22% rise in 2027 in comparison to the baseline timeframe of 2015–2017 (OECD/FAO, 2018).

As reported by the Food and Agriculture Organization of the United Nations, in 2017, the dairy goat population stood at 218 million globally, producing approximately 18.7 million tonnes of goat milk

which reflects a noteworthy hike of 16% from 2007 to 2017 (FAO, 2019). Regionally speaking, Asia has witnessed the maximal surge in goat milk production (22%), preceding Africa (13%), Oceania (9%), the Americas (5%), and Europe (4%) (Miller and Lu, 2019). This remarkable growth trajectory indicates the noteworthy recognition earned by goats and goat milk production, thus enriching the livestock industry and contributing as a beneficial substitute to fulfill the milk requirements of society in the years to come (Ismail et al., 2022).

Alternatively, the contributive role of goat milk in boosting the national economy and augmenting the nutritional welfare of the public is crucially acknowledged across the globe, especially in multiple developing nations including the Mediterranean, Middle East, and South America (Yangilar, 2013; Clark and García, 2017). The majority of rural families residing in developing nations are engaged in extensive goat raising as vital assets that earn them a multitude of tangible and intangible advantages (Dossa et al., 2015; Bolacali et al., 2017; Kaumbata et al., 2020). Apart from providing food resources like milk and meat and ensuring the availability of food for rural families, goats also serve as an essential source of earnings, savings, insurance, leather, and manure for crop enrichment (Aldosari, 2018; Miller and Lu, 2019; Kaumbata et al., 2020; Icoutchika et al., 2022).

Goats have become the best livestock creatures for impoverished farmers having no land, owing to their multiple benefits across other types of livestock, for instance, their ability to endure harsh environments, their substantially lesser food necessities, their effective exploitation of crop leftovers and grasslands, and their lower financial investments as well as farming expenses (Akinmoladun et al., 2019; Shrestha et al., 2020; Majiwa et al., 2022). For millennia, the recognition of milk as a near-perfect natural food catering to diverse human dietary needs renders it an indispensable part of the humans' dietary regimen across the entire globe including in developing and developed nations (Pal et al., 2017; Idamokoro et al., 2019). Accordingly, a number of studies have emphasized the nutritional significance of goat milk and its derivatives as functional foods ensuring human well-being (Kalyankar et al., 2016; Gebreyowhans et al., 2020; Prosser, 2021).

Goat milk offers a myriad of health benefits aiding in the sustenance of health and well-being, supporting bodily activities, and providing nutritional benefits across all age groups because of its rich nutrient constitution, comprising proteins, vitamins, and minerals (Lad et al., 2017; Csapó and Riskó, 2019). According to prior investigations, goat's milk possesses physicochemical and nutritional similarities to breast milk (Ribeiro and Ribeiro, 2010; Lad et al., 2017), along with a stronger nutritional profile rather than cattle milk (Getaneh et al., 2016; Ismail et al., 2022). Notably, goat milk's easy digestibility can be attributed to its larger percentage of tiny fat globules, shorter fatty acid chain length, and more nitrogen-packed proteins as opposed to its bovine counterparts (Hodgkinson et al., 2018; Ye et al., 2019; Gallier et al., 2020).

Additionally, the latest studies have demonstrated that goat milk comprises trace amounts of nutritional and perhaps bioactive substances that are essential to optimal human metabolism and bodily functions (Nayik et al., 2021; Tolenaars et al., 2021). Furthermore, newborns and individuals with gastrointestinal issues and bovine milk allergies might benefit from switching to goat milk (Park, 2017; Byrne et al., 2021). Additionally, the potential therapeutic applications of goat milk for a variety of illnesses, including cancer, cardiovascular issues, and microbial infections, as well as to boost immunity have been effectively proven (Shrestha et al., 2020). Since the last few years, there has been a noticeable increase in the use and awareness of goat milk and its derivatives in Algeria as well as nations worldwide (Popescu, 2013; Costa et al., 2017; Clark and García, 2017; Miller and Lu, 2019; Paskaš et al., 2020; Zulkifli et al., 2023).

The rearing system for goats in Algerian society has undergone a notable shift. Many rural households, particularly in arid, sub-arid, and mountain regions are engaged in dairy goat farming for milk production because of the rising need for goat milk, which serves as a source of extra

revenue for them (Ouchene-Khelifi et al., 2021; Benaissa et al., 2023). Despite the increasing popularity, goat milk producers in Algeria face challenges in earning higher profit margins due to their poor marketing strategies, inexperience with dairy management, inadequate production levels, limited availability of commercial food products designed specifically for dairy goats, shortage of goat milk processing facilities, and absence of widespread consumer adoption of goat milk. All these issues restrict the readily accessible supply of goat milk in the markets and public awareness regarding its intake. Regardless of these challenges, in Algeria, goat milk production and the relative artisanal activities in Algeria have a deep-rooted history and are critical to the socioeconomic and cultural constitution of households inhabiting rural regions (Boussekine et al., 2020). On the other hand, naturally, fermented goat milk is frequently used to make a wide range of dairy products, including butter, cheese, Jben, Lben, and other derivatives (Leksir et al., 2019; Boudalia et al., 2020; Benamara et al., 2022; Laouadi et al., 2022).

The majority of empirical studies focusing on consumers' perception of goat milk claiming its perceived health and nutritional advantages as the primary drivers of its prospective demand and consumption have been widely acknowledged (Güney, 2019; Güney and Sangün, 2019; Kamarubahrin et al., 2019; Paskaš et al., 2020; Zine-eddine et al., 2021). Nevertheless, prior research from a number of international locations revealed that sensory features like the taste and smell of goat milk are the primary elements that impact its intake adversely (Jerop et al., 2014; Güney and Sangün, 2019; Idamokoro et al., 2019; Paskaš et al., 2020; Zine-eddine et al., 2021). However, several studies noted that the scarcity and higher costs of goat milk in contrast to bovine milk might also play a significant role in influencing consumer choices (Güney and Ocak, 2013; Güney, 2019; Vargas-Bello-Pérez et al., 2022). Furthermore, the latest studies by Idamokoro et al. (2019) have demonstrated that a lack of awareness regarding the health advantages and the absence of behaviors related to goat milk pose significant obstacles to goat milk intake. The strongest deterrent to goat milk and its byproducts' consumption, as noted by Paskaš et al. (2020), Tütenk et al. (2022), and Ranadheera et al. (2019), was consumers' ignorance regarding goat milk.

Conversely, consumer demographics and socioeconomic variables, such as age, sex, family income, educational background, and place of residence, can play a significant role in determining consumers' preferences for goat milk purchase (Güney and Ocak, 2013; Jerop et al., 2014; Idamokoro et al., 2019; Paskaš et al., 2020; Akinmoladun et al., 2023). Extensive research prompted by the surge in demand for goat milk has been conducted worldwide to evaluate customer opinions and tastes regarding goat milk and its dairy byproducts (Güney, 2019; Güney and Sangün, 2019; Idamokoro et al., 2019; Paskaš et al., 2020; Icoutchika et al., 2022; Tütenk et al., 2022).

However, until now, very little is known about Algerian consumers' behaviors and perceptions regarding the intake of goat milk and its fundamental causes. To the best of our understanding, no consumer study has specifically addressed this aspect within the Algerian market. Thus, this research aims to evaluate consumers' behaviors and viewpoints regarding goat milk and investigate the variables influencing their willingness to consume it.

## **MATERIALS AND METHODS**

### **Study area**

The research was performed across three distinct provinces (El Oued, Biskra, and Ouargla) nestled in southeast Algeria from September 2023 to November 2023. These provinces experience Saharan climatic conditions, which is such as limited annual rainfall and greater standard temperatures, particularly in the summer months. Agriculture and animal husbandry are two main industries contributing to the economy of the study area. The University of El Oued, Algeria's Faculty of Life and Natural Sciences Ethics Committee approved the proposal under application reference number

22/2023. Before initiating the survey, participants were apprized of the study goals and explicit approval was acquired from every volunteer participating in this investigation.

### Questionnaire and data collection

The study employed a self-managed, organized questionnaire to examine the consumers' behaviors and viewpoints regarding goat milk. Additionally, data about the variables influencing the customers' intake of this milk was also acquired. The study included 150 participants in total, selected at random with an eclectic mix of sociodemographic traits. The participants were interviewed in person during this survey. To safeguard participant privacy, a distinct and anonymous code was assigned to each questionnaire rather than the names of the responders. The developed questionnaire comprised two primary sections of thirty questions. The initial segment of the questionnaire inquired about the participants' sociodemographic traits. However, the second part of the questionnaire consisted of inquiries concerning consumers' behaviors and viewpoints regarding the intake of goat milk along with their knowledge of its benefits. A variety of open-ended and closed-ended questions were incorporated into the survey. The current experiment's sample population was divided into two groups depending on their prior intake of goat milk or no experience of its intake at all which assisted in determining any causal connections between the intake of goat milk and the influential parameters that were being researched.

### Statistical analysis

To derive meaningful insights from the analysis of the study data, the robust SPSS software package (version 27) was employed. Brief overviews of participant responses were provided, along with a description of the fundamental characteristics of the data using descriptive statistics. The employment of Chi-square or Fisher tests helped in determining any possible critical correlation between the influencing factors under examination and goat milk consumption. Statistical significance was established at the 5% level.

## RESULTS

The participants' sociodemographic characteristics are displayed in Table 1, according to which, 44.7% were women and 55.3% of the participants were men. In terms of age groups, most of the participants (60%) (n = 90) fell under the 18 to 30 year old age range. On the other hand, the percentages for the age categories of 31–40, 41–50, and 51–60 were, respectively, 12.7%, 11.3%, and 11.3%. Alternatively, just 4.7% of respondents were older than 60 years of age. University-level education qualification was held by 67.3% of the participants, with 12.7% having tertiary, 11.3% secondary, and 8% elementary school-level education. The majority of participants (62.7%) resided in urban areas. Regarding the amount of household income, 54% of the participants reported having a moderately adequate income.

**Table 1. Respondents' socio-demographic profile (n = 150).**

Demographic variables	Groups	Frequency (n)	Percentage (%)
Gender	Male	83	55.3
	Female	67	44.7
Age (years)	18-30	90	60.0
	31-40	19	12.7
	41-50	17	11.3
	51-60	17	11.3
	Above 60	7	4.7
Education level	Primary	12	8.0
	Secondary	17	11.3
	Tertiary	19	12.7

	University	101	67.3
	None	1	0.7
Residence	Rural	56	37.3
	Urban	94	62.7
Income level	Acceptable	81	54.0
	Low	69	46.0

Table 2 displays the views of the participants regarding goat milk and their consumption habits. Most of the participants (88%) confirmed prior consumption of goat milk. However, 12% of them had never consumed goat milk. Additionally, it was shown that goat milk (56.7%) was favored over cow (38.7%) and camel (2.7%) milk, respectively. 84% of the participants expressed their favorable perspective towards goat milk. Simultaneously, 10% of them held a negative perspective about this milk. The primary motivation for consuming goat milk among those who had a favorable opinion of goat milk was its nutritional benefits (31%), along with its health benefits (23%) and flavor (13.5%). Conversely, among the individuals who expressed dissatisfaction with goat milk, taste (53.3%) and odor (20%) were found to be the primary deterrents to goat milk consumption. Similarly, of all the survey participants, 28.7% and 22% expressed interest in drinking goat milk, mostly because of its taste and nutritious qualities, respectively. Moreover, out of the entire survey population, 23.3% identified accessibility and 14.7% claimed the cost of goat milk as the most significant reason influencing their rejection of goat milk consumption. Regarding the frequency of goat milk intake, the findings indicated that 31.3% of participants drank it infrequently, and 12% had never tasted goat milk at all. The study revealed that the winter months (36.7%) were the most favored for consuming goat milk, with spring (23.3%), summer (22%), and fall (10%) following suit. Contrastingly, the findings showed that 46.7% of the respondents favored drinking goat milk in the morning over other times of the day. The results also showed that while 33.3% of participants found the price of the product a little too high, the majority of participants (66.7%) considered the goat milk reasonably priced. Consuming raw goat milk was preferred by most participants (67.3%) over goat milk that has undergone any sort of processing treatment like pasteurization. Furthermore, the majority of interview participants (96.7%) utilized goat milk in the production of a variety of dairy goods, such as cheese, butter, cream, and other cheeses and cheese-based items. However, a sizable segment of participants acknowledged the health (98.7%) and nutritional (96%) advantages of goat milk.

**Table 2. Respondents' perception of goat milk and consumption patterns.**

Theme	Responses	Frequency (n)	Proportion (%)
Have you consumed goat milk?	Yes	132	88.0
	No	18	12.0
Which livestock milk do you prefer to consume?	Goat	85	56.7
	Cow	58	38.7
	Camel	4	2.7
	No one	3	2.0
How do you perceive goat milk?	Positive	126	84.0
	Negative	15	10.0
	No opinion	9	6.0
Reason for a positive perception of goat milk?	Nutritional benefits	39	31.0
	Health benefits	29	23.0
	Taste	17	13.5
	Amount of fat and energy	6	4.8
	Amount on	5	4.0

	vitamins		
	Self-production	1	0.8
	No response	29	23.0
Reason for a negative perception of goat milk?	Taste	8	53.3
	Odor	3	20.0
	Previous information on it	2	13.3
	Zoonotic diseases risk	1	6.7
	I haven't consumed it before	1	6.7
What is the main motivation for choosing goat milk?	Nutritional benefits	43	28.7
	Taste	33	22.0
	Health benefits	23	15.3
	Odor	20	13.3
	Color	10	6.7
	Quality	9	6.0
	Viscosity	7	4.7
	Curiosity	1	0.7
	Availability	1	0.7
	Other factors	1	0.7
	No one	2	1.3
What are the main barriers to choosing goat milk?	Availability	35	23.3
	Price	22	14.7
	Zoonotic diseases risk	16	10.7
	Taste	14	9.3
	Management Hygiene concerns	11	7.3
	Odor	10	6.7
	Lack of awareness of its benefits	8	5.3
	Cultural habits	3	2.0
	People intolerance	2	1.3
	Goat rearing reduction	1	0.7
	No response	28	18.7
How often do you consume goat meat?	Daily	31	20.7
	Weekly	37	24.7
	Monthly	17	11.3
	Rarely	47	31.3
	Neverly	18	12.0
At which season do you prefer to take goat milk?	Autmun	15	10.0
	Winter	55	36.7
	Spring	35	23.3
	Summer	33	22.0
	At any one	11	7.3
	No one	1	0.7
At which time of the day do you	Early morning	70	46.7

want to take goat milk?	Afternoon	44	29.3
	Evening	28	18.7
	At any one	3	2.0
	No one	5	3.3
How do you perceive goat milk price?	Acceptable	100	66.7
	Expensive	50	33.3
How do you prefer to take goat milk?	Raw	101	67.3
	After treatment process	47	31.3
	No one	2	1.3
Do you transform goat milk into other by-products?	Yes	145	96.7
	Non	5	3.3
Are you aware of the nutritional benefits of goat milk?	Yes	144	96.0
	Non	6	4.0
Are you aware of the health benefits of goat milk?	Yes	148	98.7
	Non	2	1.3

The impact of the variables under investigation on goat milk consumption is demonstrated in Table 3. The goat milk intake was shown to be substantially ( $p < 0.05$ ) impacted by four factors: availability, behavior, frequency of consumption, and gender. Our analysis clearly showed consumption frequency ( $\chi^2 = 71.468$ ;  $p = 0.000$ ) as the most significant and influential component. However, participants who had never tasted goat milk were less enthusiastic about its consumption rather than participants who reported its prior consumption. Additionally, it was shown that participant's attitude has a significant and meaningful role ( $\chi^2 = 44.681$ ;  $p = 0.000$ ) in influencing their choice regarding goat milk consumption. As a result, people thinking positively about goat milk drank it at higher rates than the ones who thought negatively about it. Our results also indicated that one of the causes for the low consumption of goat milk was its unavailability, which had a significant impact ( $\chi^2 = 4.102$ ;  $p = 0.043$ ). Regarding the gender impact, it was shown that men expressed a greater likelihood ( $\chi^2 = 4.006$ ;  $p = 0.045$ ) of goat milk consumption than women. On the other hand, other parameters like age, income, educational qualification, place of residence, season, and cost that were assessed in our investigation had minimal or no substantial impact ( $p > 0.05$ ) on goat milk consumption.

**Table 3. Result of factors that influence respondents to consume goat milk.**

Variables	Groups	(Yes) n (%)	(No) n (%)	Odds Ratio	( $\chi^2$ ; F)	P-value
Gender	Male	77(92.8)	6(7.2)	1	4.006	0.045
	Female	55(82.1)	12(17.9)	0.357		
Age (years)	18-30	76(84.4)	14(15.6)	1	3.473	0.441
	31-40	17(89.5)	2(10.5)	1.565		
	41-50	15(88.2)	2(11.8)	1.381		
	51-60	17(100.0)	0(0.0)	/		
	Above 60	7(100.0)	0(0.0)	/		
Education level	University	84(83.2)	17(16.8)	1	6.302	0.161
	Tertiary	18(94.7)	1(5.3)	3.642		
	Secondary	17(100.0)	0(0.0)	/		
	Primary	12(100.0)	0(0.0)	/		
	None	1(100.0)	0(0.0)	/		
Residence area	Rural	52(92.9)	4(7.1)	1	1.996	0.158
	Urban	80(85.1)	14(14.9)	0.439		
Income level	Acceptable	72(88.9)	9(11.1)	1	0.132	0.717
	Low	60(87.0)	9(13.0)	0.833		
Attitude	Positive	120(95.2)	6(4.8)	1	44.681	0.000

	Negative	12(80.0)	3(20.0)	0.200		
	No opinion	0(0.0)	9(100.0)	/		
Consumption frequency	Neverly	2(11.1)	16(88.9)	1	71.468	0.000
	Rarely	45(95.7)	2(4.3)	180.000		
	Monthly	17(100.0)	0(0.0)	/		
	Weekly	37(100.0)	0(0.0)	/		
	Daily	31(100.0)	0(0.0)	/		
Season	Autumn	14(93.3)	1(6.7)	1	3.992	0.553
	Winter	50(90.9)	5(9.1)	0.714		
	Spring	30(85.7)	5(14.3)	0.428		
	Summer	29(87.9)	4(12.1)	0.517		
	At any one	8(72.7)	3(27.3)	0.190		
	No one	1(100.0)	0(0.0)	/		
Price	Cheap	91(91.0)	9(9.0)	1	2.557	0.110
	Expensive	41(82.0)	9(18.0)	0.450		
Availability	Yes	46(95.8)	2(4.2)	1	4.102	0.043
	No	86(84.3)	16(15.7)	0.233		

## DISCUSSION

As far as we are aware, this seems to be the first investigation conducted with the intention of understanding local residents' attitudes and beliefs regarding goat milk and delving into potential influences on their choice of consumption in the study region.

The male participants outnumbered females in our survey, which aligns with the findings of Laouadi et al.'s (2018) and Ouchene-Khelifi et al.'s (2021) research endeavors performed in Algeria. Idamokoro et al. (2019) from the central Eastern Cape, South Africa, also emphasized an analogous pattern. This finding may be justified by the research area's population's cultural framework, which is predominantly defined by males who generally forbid women's involvement in activities conducted by foreigners. On the contrary, our study overrepresents younger participants aged between 18 and 30 years, residing in urban regions, with higher education levels (university degrees) because of the higher responsiveness, collaboration, and better comprehension of the purpose of scientific research among these participant groups. As a result, in comparison to the participants of other age, area, and educational level groups, they exhibited higher awareness and openness to participating in the research. These findings, in fact, imply that a large proportion of our research participants were engaged in productive and busy lifestyles and were open to embracing novel procedures and trends. Under such circumstances, Tütenk et al. (2022) claimed that research concentrating on consumers possessing higher educational qualifications can impact positively aiming at enhancing the perception and demand for goat milk and its derivatives.

Most of the people residing in the research region attach a high value to goat milk, as evident in its elevated consumption rate (88% vs. 12%) in their diet regimes. These findings are consistent with a previous study by Benaissa et al. (2023), which identified goat milk as a common meal in Algeria's arid and semi-arid zones. Therefore, the Algerian people's engagement in consuming milk and dairy products is a long-standing custom intertwined with animal-raising practices (Leksir et al., 2019). Likewise, Laouadi et al.'s (2022) research also demonstrated that milk is considered as an indispensable part of daily meals by Algerian urban and rural populations, owing to its calcium richness. Furthermore, it is noteworthy that a significant proportion of the survey participants (66.7% vs. 33.3%) perceived goat milk as an inexpensive and reasonable means of consuming animal protein, making it a suitable substitute for costly meat. However, the awareness of the majority of participants regarding goat milk's nutritional value and health advantages may account for the notable percentage of participants devouring it as determined through our study. Güney (2019) attributed the heightened rate of goat milk and its derivatives' consumption in Turkey to the



growing consumer recognition of its health advantages and convenient availability. According to a similar research by Adewumi et al. (2015), a significant number of Nigerian rural farmers devour goat milk and its byproducts based on their awareness of the nutritional advantages of goat milk. Furthermore, a recent investigation conducted in Malaysia revealed that consumers' growing knowledge of the advantages of goat milk was a major driver of its increasing demand (Ismail et al., 2022). In support of this assertion, previous Moroccan writers have claimed that the majority of the respondents (62.6%) of their research have demonstrated a notable surge in trends of goat milk consumption due to the recognition of its health advantages (Zine-eddine et al., 2021). Our study's observations pertaining to goat milk consumption in the study region and its correlation with participant awareness echo the findings published in Akinmoladun et al.'s (2023) research, claiming that a higher percentage of study participants devoured goat milk and speculated that raising consciousness of these products' beneficial health impacts could increase the number of consumers. According to other research endeavors, goat milk's increased appeal can be primarily attributed to its practical uses, medicinal relevance, and high nutritional content (Pal et al., 2017; Mehmood et al., 2018). Regarding its nutritional qualities, goat milk reigns supreme over cow milk because of its richer protein content and a stronger vitamin profile (B6, Riboflavin, Thiamine, Niacin, and vitamin A) and minerals (Magnesium, Selenium, potassium, Chlorine, Phosphorus, Calcium) (Mal et al., 2018). Furthermore, goat milk can be digested and absorbed conveniently due to its greater concentration of short- and medium-chain SFA and fewer fat globules (Zulkifli et al., 2023). Additionally, goat milk boasts a higher buffering potential and is thus frequently recommended for people with cow milk allergies as well as sensitivity to other food items having distinct medicinal properties (Mal et al., 2018). There is a great deal of variation in the results of global research based on goat milk consumption. In this regard, Serbian researchers Paskaš et al. (2020) found that 24.2% of the study participants had never drunk goat milk. However, a sizable portion (41.78%) of the study participants in the Idamokoro et al.'s (2019) research in South Africa reported non-consumption of goat milk in the past. According to a comparable survey by Ozawa et al. (2009), over 70% of the Japanese population had never tasted goat milk. Likewise, Shrestha et al. (2020) reported that most of the Nepalese population under survey (80.4%) denied including goat milk in their family's dietary habits. Furthermore, Tütenk et al. (2022) discovered that 29% of Turkish residents (from the survey population) did not drink goat milk. These discrepancies are most likely due to participants' long-held perspectives and diverse behaviors across various prior studies, impacted by multiple societies' cultural customs and practices, which undeniably impacted their behavior and intents regarding goat milk.

Our survey provides obvious proof that participants preferred goat milk (56.7%) over cow (38.7%) or camel (2.7%) milk. This result was supported by the notion that a majority of respondents thought goat milk had superior nutritional value and health advantages in comparison to cow milk. For this reason, goat milk is a significant and reasonably priced part of their meals, facilitating vitamins and proteins required to fulfill their nutritional needs and contributing to their overall wellness. According to Laouadi et al. (2022), goat milk was garnering additional popularity (77.42%) over cow milk across rural Algerian households. Goats typically serve as a source of fulfillment of the household's regular requirements of milk and meat in Algerian arid and sub-arid areas (Laouadi et al., 2018). Conversely, the study's assessment of camel milk's considerably lesser recognition might be attributed to its extremely limited supply and expensive cost (400-800 Algerian dinars per liter). The majority of farmers (76.52%) involved in Idamokoro et al.'s (2019) study revealed their preference to drink cow milk instead of goat or sheep milk. Similarly, Costa et al. (2015) observation indicated a preference for fermented cow's milk over fermented goat's milk. Furthermore, it was found by Shrestha et al. (2020) that Nepali consumers' preferred choices include buffalo and cow milk, while Ngoulma (2016) noted that French customers were more willing and inclined towards dairy products, particularly made from cow milk. Our results also

contradicted Paskaš et al.'s (2020) observations highlighting the low popularity of goat milk in contrast to other livestock industries like cattle rearing without any significant impact on the socio-cultural framework. Consequently, the variation seen in previous research on participants' preferences for milk derived from different animal species underscores the influence of the geographical location of the research area and cultural factors on people's decisions regarding goat milk intake (Guney and Ocak, 2013; Tuan et al., 2013).

A large proportion of the survey respondents (84% versus 10%) held a prominent positive attitude regarding goat milk, which was likely connected to the milk's nutritional content and associated health advantages. This result was supported by Djebli et al.'s (2020) findings, which showed that Algeria's goat milk market has been expanding recently, mostly due to the inherent health and nutritional benefits of goat milk, which position it as a potential alternative to cow's milk. In comparison to cow milk, goat milk comprises good components promoting health enhancement, which makes it more digestible, causing fewer allergic reactions (Verruck et al., 2019). According to the results of Jerop et al. (2014), conventional buyers assume goat milk is a medicinal beverage that helps alleviate or avoid illnesses. Goat milk is, in fact, beneficial to the health of newborns and people recovering from illness (Pal et al., 2017). In the meantime, goat milk was valued by the Algerian community as a vital supplier of raw, fermented, and curdled milk of excellent quality, contributing as an essential component of the children's diets (Ouchene-Khelifi et al., 2021). Furthermore, Paskaš et al. (2020) revealed that 40.7% of the respondents affirmed their favorable perception of goat milk, driven by its nutritional content and health benefits. Consequently, goat milk garnered exceptional interest from older people (aged 40-55). Consistent with our findings, Akinmoladun et al. (2023) observed that 77.4% of their research participants exhibited a willingness to recommend goat milk intake, whilst only 8% of participants exhibited an unwillingness to encourage others to goat milk and its derivatives' consumption. On the other hand, the majority of participants (43.5%) in Shrestha et al.'s (2020) research identified cultural prejudice and natural aversion as the primary causes of their refusal to consume goat milk.

According to our research, the main factor (31%) that favorably impacted the respondents' viewpoints regarding goat milk was its nutritional value. This observation aligns with the findings of numerous prior consumer investigations on goat milk, indicating consumers' recognition of the nutritional significance of goat milk as one of the key benefits that encourage its consumption over other types of milk (Guney, 2019; Guney and Sangun, 2019; Kamarubahrin et al., 2019). In a different research, Paskaš et al. (2020) found that participants of 40-54 age range and beyond 55 years old tended to associate the unique nutritional attributes of goat milk with their readiness to devour its additional quantity (65.2%). Additionally, Akinmoladun et al. (2023) found that goat milk's higher nutritional richness was the primary factor leading to its preference over cow milk.

Our research regarded healthiness as another significant factor that produced a favorable impact on respondents' perceptions of goat milk. As a result, in recent years, Algerian people and the global population have gained additional health consciousness and are therefore exhibiting a higher inclination to alter their eating habits and include more nutritious products like goat milk. As claimed by Zulkifli et al. (2023), in recent years, consumers have become acquainted with a new notion related to their food choices, which raises their likelihood of being more mindful of their health and making choices that support wellness. According to Paskaš et al.'s (2020) research, the main factor (66.5%) driving the surge in goat milk and its derivatives' intake is inherent in its health advantages. In an identical vein, the numerous health advantages offered by goat milk have been well-reported in earlier studies. These potential advantages may be crucial in encouraging the promotion and consumption of goat milk (Ngomane et al., 2022; Akinmoladun et al., 2023; Zulkifli et al., 2023). The protein content of goat milk produces a softer curd in the process of digestion, which improves digestive functioning and overall quality of life and encourages

customers to drink goat milk (Güney, 2019). Furthermore, Verruck et al. (2019) emphasized goat milk's versatile utility in a wide range of product manufacturing processes along with serving as a bearer of beneficial constituents such as probiotic bacteria or chemicals. However, compared to the other animals' milk, goat milk was shown to have superior allergenic qualities (Ranadheera et al., 2019). According to Zulkifli et al. (2023), drinking goat milk may alleviate symptoms of lactose intolerance and potentially lower the likelihood of certain illnesses.

Our survey revealed that the goat milk's taste was the primary factor that led to the adverse opinion of the majority of the individuals (53.3%) partaking in our survey regarding goat milk. This result is consistent with other research that demonstrated consumers' unlikelihood to consume goat milk because of its taste (Güney and Sangun, 2019; Idamokoro et al., 2019; Zine-eddine et al., 2021). Customers' reluctance to embrace goat milk can be attributed to its distinct organoleptic qualities, including strong flavor, a vivid scent, and a salty or slightly sweet flavor (Zulkifli et al., 2023). Therefore, the goaty flavor was often cited in earlier publications as one of the main deterrents to ingesting and buying goat milk and its byproducts (Park, 2010; Costa et al., 2014; Paskaš et al., 2020). In contrast to Paskaš et al.'s (2020) research, indicating 22.5% of the participants' rejection of goat milk due to taste concerns, Idamokoro et al. (2019) reported that 20.83% of the customers partaking in their survey disapproved of goat milk due to its flavor. However, our findings diverge from those of Wanjekeche et al. (2016), who found that Kenyan customers found goat milk and its products' flavor and aroma to be rather acceptable. In a similar vein, Güney and Sangün (2019) identified flavor as the primary cause of goat milk consumption.

Another significant factor that influenced the consumers' viewpoints in our study regarding goat milk was its smell. This result aligns with Idamokoro et al.'s (2019) observations, indicating that around 64.58% of the population may be discouraged from consuming goat milk due to its unpleasant smell and innate aversion. Furthermore, according to Paskaš et al.'s (2020) and Akinmoladun et al.'s (2023) analyses, the primary deterrent to devouring goat milk was its smell, with percentages of 42.3% and 29.1%, respectively. Jerop et al. (2014) observed a similar pattern, with consumers' admittance of goat milk's strong smell which renders it a major deterrent to their consumption of goat milk. As a result, consumers were upset with goat milk's pungent smell, which asserted a negative effect on its consumption and led to decreased levels of consumer approval (Savran et al., 2016; Güney and Sangün, 2019; Tütenk et al., 2022).

It is fascinating to note that the majority of the survey respondents (23.3%) cited the scarcity of goat milk as the biggest obstacle to their usage. Furthermore, Paskaš et al. (2020) disclosed that the majority of survey participants highlighted inadequate availability of dairy goat products. This finding is consistent with our study outcomes indicating 23.2% of consumers' perception of the scarcity of goat milk in the market could pose a challenge in buying and consuming goat products. As a result, it was revealed by other research works that the intake of goat milk may also be hindered by its decreased availability (Güney and Ocak, 2013; Jerop et al., 2014; Zine-eddine et al., 2021). Numerous writers have noted that the irregular supply of goat milk stems from seasonal variations in its production (Agreste, 2016; Paskaš et al., 2020). Additionally, multiple reasons have been outlined for justifying the issue of scarcity of goat milk in Algeria. In the meantime, Ouchene-Khelifi et al. (2021) and Laouadi et al. (2022) emphasized the shortcomings in Algeria's raw milk marketing network and noted that the majority of breeders' goat milk was intended for their personal consumption, with just a small percentage selling it to third parties. Additionally, Ouchene-Khelifi et al. (2021) reported that, under ideal husbandry circumstances, a large number of goat breeds raised by Algerian breeders yielded an average of less than 3 liters of milk every day.

Regarding the frequency of goat milk consumption, our survey clearly showed that the majority of participants (31.3%) included people who drank goat milk occasionally. On the other hand, a noteworthy proportion of the survey respondents (12%) had never tasted goat milk before. The

previously identified aspect of unavailability may be associated with this discovery. Conversely, it might imply that these individuals were not acquainted with goat milk. Guney (2019) therefore determined the three biggest obstacles to consumers' use of goat milk and its byproducts, including limited availability, expensiveness, and lack of habitual consumption. Additionally, a separate investigation by Kok-Siew et al. (2017) discovered the substantial impact of neophobia on Malaysian consumers' willingness to purchase goat milk. Previous studies have emphasized the significance of consumers' acquaintance and dietary preferences when it comes to the consumption and purchase of goat milk and its associated dairy goods (Jerop et al., 2014; Paskaš et al., 2020; Zine-eddine et al., 2021). According to Akinmoladun et al. (2023), 29.1% of the survey respondents reported that their lack of acquaintance with goat milk was the primary cause of their rejection of goat milk consumption. Simultaneously, Tütenk et al. (2022) found that the majority of customers hated goat milk because of the lack of habitual consumption (60.3%).

The majority of our survey participants (36.7%) preferred drinking extra goat milk during the colder months of winter. This can be attributed to the greater supply of goat milk in the research location during the winter in comparison to other seasons. In this regard, it was noteworthy to emphasize that the goat birthing seasons in the research region largely ensue from December to March and April to July. Todaro et al. (2015) found that, in contrast to our findings, springtime in Mediterranean regions was the prime time for consuming goat milk. Conversely, other researchers supported our findings regarding the significant decline in the supply of goat milk during the initial months of the summer season and zero or minimal availability in autumn. However, the fact that many of our survey participants favored drinking goat milk with date, which is more readily accessible to them during the winter season at the study location, could also account for their preferred tendency of goat milk consumption during the winter season as determined in our study (dates are harvested in the period spanning end of autumn to beginning of winters).

According to the data collected in our study, 46.7% of the participants expressed their preference to drink goat milk during early morning hours. This choice likely stems from the consumers' belief that early morning consumption of goat milk would boost their energy levels remarkably to empower them to execute their routine affairs. In addition, this practice may have its roots in the fact that the majority of goat breeders in the research region extract milk from their goats during the early morning hours, thus rendering it fresher for intake. Profeta et al. (2022) emphasized the Algerian system of drinking milk usually mixed with coffee as a morning routine.

The majority of our survey respondents (66.7%) considered goat milk as reasonably priced, aligning with the findings of Paskaš et al. (2020), who claimed that 64.8% of survey participants found the cost of goat milk products reasonably affordable. Algerian goat milk is typically sold at 100 DA per liter, according to Ouchene-Khelifi et al. (2021). Therefore, even while the price of goat milk exceeds the cost of other dairy milk, such as cow milk, consumers primarily consider the value of the product against its cost while making decisions regarding the purchase and consumption of goat milk (Guney, 2019; Kamarubahrin et al., 2019; Kubicová et al., 2019). The goat milk's perceived high nutritional value convinces customers to pay a premium to acquire it, anticipating their overall health and wellness (Paskaš et al., 2020; Agustina et al., 2021).

Our survey clearly showed that people preferred to drink raw milk over pasteurized milk that had undergone industrial alteration or additional processing (67.3% vs. 31.3%). In this regard, Laouadi et al.'s (2022) research performed in Algeria revealed that while 74.88% of the entire supply consumed by urban families included commercial dairy products (pasteurized or sterilized milk, powdered milk, yogurt, and lben), 81.56% of the product volume consumed by rural families comprised conventional foods (raw milk and lben). However, Bousbia et al. (2017) revealed that the most favored goat dairy items included pasteurized milk and yogurt. The majority of respondents opined that exposure of the milk to industrial processing diminishes its nutritional

value and health advantages, which accounts for their preference for raw milk intake as evaluated in our study. This assertion was supported by earlier research endeavors, which indicated consumers' inclination to drink raw milk over pasteurized milk due to their strong belief in the nutrient-richness of raw milk (Khalid and Mahrer, 2020; Zakaria et al., 2020). Perera et al. (2019) discovered the parents' readiness to pay an extra amount for raw milk due to their concerns regarding their household's nutritional sufficiency. Additionally, in their research, Ribeiro and Ribeiro (2010) found that a subset of customers strongly believe in the beneficial health effects of raw goat milk, leading to their selection of this milk as their preferred option. However, several studies noted that customers often favored drinking raw milk over pasteurized milk due to cost considerations, as raw milk tends to be less expensive than processed milk (Yayar, 2012; Mehmood et al., 2018). The delivery of fresh or unpackaged milk can be conveniently delivered to the customers' doors without burdening the farmers with additional costs, and it remains more affordable in contrast to packaged or pasteurized milk (Zulkifli et al., 2023).

The high percentage of our study respondents (96.7%) who skillfully transform raw goat milk into other dairy products indicates that the study location's regional customs surrounding this milk were regarded as an essential component of the ethnological, gastronomic, conventional, and cultural heritage of the local population. In fact, a number of earlier studies have demonstrated that Algeria produces a wide range of artisanal dairy products from goat milk, including cheese, lben, jben, rayeb, butter, and others. These products vary according to regional distinctions in terms of both their designation and their production techniques (Leksir et al., 2019; Boudalia et al., 2020; Benamara et al., 2022; Laouadi et al., 2022). Traditionally prepared fermented goat milk is the most well-known and highly regarded product among the majority of the inhabitants living in the research regions. However, it is intriguing to note that in rural regions, this milk is typically turned into Dhane, a costly native product that holds specific significance in curing respiratory illnesses. Furthermore, Boussekine et al. (2020) found that while South Algerian people are engaged in producing Dhane from goat milk, the majority of homes surveyed in Biskra, Ouargla, and El Oued locations prepared Smen/Dhan from goat milk, accounting for 92.75%, 98.68%, and 100% of the total production. According to the observations of prior researchers from various nations, goat milk can be used to produce a wide range of products, such as butter, ice cream, cheese, buttermilk, condensed milk, yogurt, and flavored milk, as mentioned in our study. These products can be used to persuade consumers to purchase healthy products (Costa et al., 2017; Guney and Sangun, 2019; Paskaš et al., 2020).

Respondents of our study showed a noteworthy degree of comprehension of the nutritional (96%) and health (98.7%) advantages of goat milk, probably due to the surging global interest and demand for goat milk and its associated goods in Algeria and other countries in the past few years. As a result, a large body of empirical investigations has validated that goat milk and its products are healthy for people (Mal et al., 2018; Verruck et al., 2019). According to Costa et al. (2013), consumers are now switching from cow milk to goat milk to avoid allergy issues, and are even prepared to pay more for goat milk and its byproducts (Ngoulma, 2015). Zulkifli et al. (2023) highlighted goat milk's potential as a very desirable and nutritious functional product that offers multifaceted advantages to consumers. This conclusion may also be explained by the diversity of information avenues, which include social media sites like Facebook and Twitter, radio and television commercials, product labeling on store shelves, educational enterprises, nutrition agencies, and others, as well as the easy accessibility of these avenues for the majority of the customers. According to Paskaš et al. (2020), the media was the primary source of information for participants regarding goat milk and dairy products. This included television programs (25%) and the Internet (33%), with print media occupying the second position (11.4%). Furthermore, they

regarded information derived from other sources such as personal research and information from acquaintances as less significant. Aligning with our findings, Adewumi et al. (2015) also discovered that a substantial number of Nigerian rural farmers devour goat milk and its byproducts, owing to their knowledge regarding the nutritional advantages of goat milk. However, a sizable fraction (38.10%) of the participants were unaware of the nutritional advantages of goat milk intake, as specified by Idamokoro et al. (2019). Roughly 61.90% of the participants exhibited awareness of these advantages. According to a recent study by Akinmoladun et al. (2023), 42.7% of consumers were unaware of the precise nutritional advantages of goat milk consumption. In the meantime, Shrestha et al.'s (2020) research revealed that 52.9% of households are unaware of the nutritional advantages of goat milk. Likewise, Guney and Ocak's (2013) study in Turkey determined that a sizable portion of the participants were unaware of the nutritional significance of goat milk.

The factor analysis outcomes demonstrated that the participant's sex had a substantial ( $p < 0.05$ ) impact on the customers' behavior regarding goat milk. Therefore, our research clearly proved that males were more inclined to drink goat milk than females. This may be attributed to women's higher perceptivity than males regarding taste and smell, which may have led to a lesser degree of acceptability for goat milk, due to its exceptionally potent taste and smell. This result aligns with the findings of Jerop et al. (2014), who found that male customers had a greater preference for consuming goat milk in contrast to female consumers. Furthermore, Idamokoro et al. (2019) revealed in their research that male farmers significantly ( $p < 0.05$ ) devour more goat milk (62.3%) instead of female farmers (37.6%). According to Wherese, Vargas-Bello-Pérez et al. (2022), males consumed a greater quantity of dairy products derived from goats and sheep rather than females. They attributed this trend to consumption by pointing out that males often linked these foods with well-being and health. Our findings contrasted those of Paskaš et al. (2020), who did not find a considerable disparity ( $p > 0.05$ ) in the amount of goat milk consumed by males and females; however, they pointed toward females' aversion to the smell of goat milk and their perception of goat milk to be of lower quality (42.3 % and 8.4 % vs. 33.3 % and 6.2 %, respectively) in comparison to males. Similarly, Tütenk et al. (2022) observed that while a higher percentage of women (54.5%) consumed goat milk and its byproducts as compared to males (45.5%), the gender exhibited low statistical significance ( $p > 0.05$ ).

Remarkably, our research highlighted the frequency of consumption ( $\chi^2 = 71.468$ ;  $p < 0.05$ ) as the main element impacting the consumers' attitude toward goat milk. It is clear that the individuals with regular consumption routines (daily, weekly, and monthly) exhibited higher consumption rates in contrast to people who drank it rarely or never drank it at all. This discovery could possibly be justified by these groups' unfamiliarity with goat milk and their fear of trying it (neophobia). According to research by Kok-Siew et al. (2017), certain customers may reject goat milk due to neophobia, which manifests itself in many ways such as abstaining from consuming or embracing new items in their dietary habits. An additional intriguing discovery indicated that one of the main causes of the decreased acceptance of few goat milk products relative to comparable items prepared with cow's milk lies in customers' ignorance regarding goat milk (Ranadheera et al., 2019). In a similar vein, Tütenk et al. (2022) found that 60.3% of customers attribute their lack of goat milk consumption to a lack of established habits. However, studies by Ozawa et al. (2009) have demonstrated that the majority of consumers' (> 70%), dietary habits had a discernible impact on their goat milk intake. Indeed, a plethora of prior research has established that the primary deterrent to goat milk consumption is habitual practice (Güney and Ocak, 2013; Ocak and Önder, 2014; Engindeniz et al., 2017; dos Santos Souza et al., 2019). Moreover, customer behaviors like never tasting or not including goat milk in habits might restrict the use of goat milk (Jerop et al., 2014; Zine-eddine et al., 2021).

Our study highlighted the attitude of the participants as another important element that significantly affected ( $p < 0.05$ ) the amount of goat milk consumed. The results demonstrated that the respondents tended to link higher milk intake to favorable opinions about its consumption. Consistent with our findings, Guney (2019) and Rabiei et al. (2021) observed that the strongest barriers to milk consumption were associated with consumers' unfavorable perceptions of its quantity, taste, price, availability, and health advantages. In a different research, Shrestha et al. (2020) noted that most of the participants (43.5%) cited behavioral aspects like cultural prejudice and innate aversion as the primary causes of their distaste for drinking goat milk. In a similar vein, Idamokoro et al. (2019) found that the majority of consumers reject goat milk owing to their adverse perspective rooted in a lack of understanding of its nutritional advantages, a distaste for its flavor, and the effect of cultural prejudice. According to a recent research by Vargas-Bello-Pérez et al. (2022), the reduced use of goat and dairy sheep products by students and the youth was due to the negative perception of these products' pronounced flavor and odor. These researchers also revealed that over half of Denmark's non-consumers consider the pungent taste of goat milk and dairy products as a reason for their rejection of the same. Conversely, preliminary investigations by Güney and Ocak (2013) and Engindeniz et al. (2017) disclosed a positive correlation between the perceived nutritional significance (48.42%) and health advantages (47.96%) with goat milk intake.

It was clearly evident from our research that the accessibility of goat milk had a substantial ( $p < 0.05$ ) impact on its intake. This correlation implied that consumers perceiving the availability of goat milk exhibited higher consumption rates in contrast to people who deemed it inaccessible. Alternatively, a number of variables, including the decreased yield of goats raised in the study regions, self-consumption within households, mismanaged marketing systems, the lack of dedicated sales outlets for dairy goat products in the study locations, and other elements pertaining to livestock administration, may be responsible for the availability constraints regarding goat milk. Consistent with our study findings, a number of earlier investigations have indicated that the primary cause of decreased goat milk production can be attributed to its limited commercial availability (Guney and Ocak, 2013; Güney, 2019; Lawal et al., 2021). Additional research carried out by Zine-eddine et al. (2021) and Icoutchika et al. (2022) considered the limited availability of goat milk as one of the most important variables influencing its intake in Morocco and Benin, respectively. Furthermore, Vargas-Bello-Pérez et al. (2022) noted that non-consumers across Bangladesh, Mexico, and Chile pointed towards the scarcity of sheep or goat dairy products in their home marketplaces which led to their specific demotivation to consume them. Various research findings (Jerop et al., 2014; Lee-Chang et al., 2016) identified a strong association between customers' perceptions of goat milk's availability and pricing and their willingness to buy it.

## CONCLUSION

The present research provides a thorough understanding of consumers' behaviors and perceptions regarding goat milk intake along with the critical variables shaping consumers' behavioral reactions to its consumption. According to the survey, goat milk held a significant place in the diets of the majority of the participants. In summary, the findings indicated that a sizable percentage of participants had a favorable opinion of goat milk, which gave it a higher perceived value in contrast to milk obtained from camels and cows. The key factors contributing to the participants' positive disposition about goat milk and the factors that compelled them to use it were its nutritional and health advantages. However, the main factors contributing to the unfavorable opinion of goat milk were its flavor and stinking smell. The primary barrier to the effective consumption of goat milk is the undeveloped market and unavailability of goat dairy products. According to our study's consumption trends, the majority of the participants preferred to drink raw goat milk over milk that has undergone any processing treatment. However, the study mentioned that the families residing at the study locations were familiar with and frequently

engaged in the artisanal processes associated with goat milk. It is intriguing to note that multiple participants in our survey had enhanced levels of knowledge regarding the health and nutritional advantages of goat milk.

Our study discovered various factors that impacted goat milk consumption substantially such as consumers' behavior, gender, consumption frequency, and availability of milk. Therefore, greater consumption rates were noted among individuals with regular goat milk intake bearing a favorable opinion about it, and who believed in its easy availability and were male rather than female. The results of the investigation may help producers and other industry participants better understand consumer behaviors, choices, and reasonable hopes for this precious commodity. Additionally, a meticulously planned and successful marketing campaign is required to encourage the use of goat milk. Additionally, encouraging consumers to embrace this milk by addressing their worries about its taste and smell and enhancing its nutritional and health benefits might assist in increasing customers' desire to consume it.

Although this study offers valuable insights into consumers' perceptions and behaviors regarding goat milk consumption, some constraints demand consideration; for example, the over-representation of males, young age of participants (18-30 years), individuals with higher educational qualifications, and participants' residences in the urban cities. Hence, this finding necessitates a cautious approach to extrapolation of study findings, considering the small sample size of the participants ( $n = 150$ ). Therefore, it is advised to organize further research with a larger representative sample size.

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## **AUTHORS' CONTRIBUTIONS**

LH: conceptualization, methodology, investigation, formal analysis, writing- original draft, writing-review & editing, resources, visualisation. BH: methodology, investigation, formal analysis, visualisation. MB: investigation.

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## **CONFLICTS OF INTEREST**

The authors declared no conflict of interest.

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