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## PERCEPTIONS AND ATTITUDES TOWARDS GOAT MEAT AND MILK CONSUMPTION IN THE EASTERN CAPE, SOUTH AFRICA

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## ABSTRACT

The increasing demand by the teeming human population on animal agriculture for their daily animal protein intake requires every livestock, including goat products, to be on the menu list. Dismally, consumer acceptance and consumption of any product hugely rest on their behavioural attitudes. This study aimed to assess consumer perception of goat milk and meat in some areas of Eastern Cape Province, South Africa. Structured questionnaires were used to gather information on socio-demographic and economic characteristics and perceptions about goat meat and milk consumption. Also, information about consumer attitudes, their familiarity towards goat products and their awareness of the nutritional qualities of the animal's product were gathered. Data from the 386 consumers selected randomly in Amathole and Buffalo city municipalities were analyzed using Statistical Package for Social Science (SPSS) software. Consumption of animal products was affirmed by 95.5% of the respondents. Respondents' knowledge of goat milk breeds and their willingness to consume the product were 28.6% and 41.7%, respectively. Apart from the goaty odour (29.1%), about 55.8% of the respondents had no specific reason for not consuming goat milk. Many respondents (68.3%) consumed goat meat and had no specific reason for this high consumption pattern other than seeing it as just any other meat (42.2%). Most respondents did not know the specific nutritional benefits of consuming goat milk (42.7%) and meat (70.4%). There was a significant and positive association ( $P < 0.05$ ) between the age of respondents, whether they knew about goat milk, consumption of goat milk and the nutritional benefits. There was a significant association ( $P < 0.05$ ) between the educational level of the respondents and goat milk knowledge and their willingness to consume goat milk. The study findings indicate that a larger proportion of the respondents consumed goat meat and milk. However, there is potential for increasing the percentage of consumers for these products through education about their health benefits.

**Key words:** Attitude, Behaviour, Goat products, Perception, Health benefit, Intake

## INTRODUCTION

Global goat production has witnessed an increase in the past decade. The current population is estimated to be more than 1 billion goats, with the majority (over 96%) found in developing countries, especially in Asia and Africa [1]. Africa's contribution to the global goat population approaches 423 million (41%), and approximately 35 million are from Southern Africa. Their abundance and higher concentration in developing countries, especially the dry areas, rest hugely on their efficient utilization of crop residues and poor pasture, low production cost and adaptability to harsh conditions [2]. Goats, often described as poor man's cows or 'village banks', play an important socioeconomic role by providing cash flow and also serve as a source of credit to meet urgent financial and social obligations. They also serve other purposes, including religious, festive and ceremonial activities [3]. Being an important livestock species, goat provides meat and milk for home consumption, including hides and fibres [3, 4].

Given the projected increase in world population, which is expected to hit over 9.8 billion by 2050 [5], the demand for and consumption of red meat and milk will most likely increase and be additionally fuelled by the expanding global middle-income class [6]. Although health concerns abound by humans consuming red meat, most of these red-meat consumption-reduction campaigns have been greeted with fierce resistance [7]. Similarly, the adoption and consumption of healthier meat types, especially goat meat, have increased [8]. The quality attributes of goat meat are premised on its leanness, low-fat content, and reduced cholesterol and saturated fatty acids [9]. Goat milk is also gaining popularity as an exceptional dairy food due to its unique biological, immunological, medicinal, and nutritional properties [10]. Comparatively, goat milk digests much more readily than cow and human milk, has a greater buffering capacity and is commonly suggested for individuals allergic to cow milk and other food sources with specific therapeutic qualities in medicine [11]. When compared to cow milk, the protein content in goat milk is higher, as well as a better profile of some vitamins (B<sub>6</sub>, Riboflavin, Thiamine, Niacin and vitamin A) and minerals (Magnesium, Selenium, potassium, Chlorine, Phosphorus, Calcium) [11]. According to some studies, the nutritional profile of goat milk is very similar to human breast milk and can be directly used as baby food [12]. Although demand for goat milk products is enjoying increasing awareness and growth, consumer acceptability is very low compared to bovine milk [13]. A study by Güney and Ocak [14] revealed that the respondents were unaware of the importance of goat milk. In another study, the 'goaty' rancid aroma in goat milk was the significant limitation advanced against goat milk consumption [15]. Accordingly, Güney [16] stressed that understanding consumer behaviour towards a particular product is a key

ingredient in marketing. Despite the rise in goat meat sales and increasing awareness of the nutritional attributes of its milk and other by-products [17], consumer perceptions represent a major factor hindering market growth [8]. It was revealed that its association with poverty and unpleasant sensory attributes, including strong odour, strange colour and funny taste, are some negative perceptions of goat meat [18]. According to some authors, other impediments include the perception that meat should only be consumed during certain ritual rites or by certain kinds of people or families [19].

South Africa contributes approximately 3% of Africa's goats and less than 1% of the world's goats. The Eastern Cape Province houses the largest indigenous goats, followed by Limpopo, Kwazulu-Natal and North-West provinces [19]. In the Eastern Cape Province, a greater proportion of these goats are under the management of resource-poor smallholder farmers who are vulnerable to malnutrition due to their inability to afford a balanced diet. Consumption of goat milk and its products is uncommon in most parts of South Africa, including its meat, which is consumed less frequently due to cultural bias, perceived misconceptions and negative appellations. Studies assessing consumers' perceptions of goat meat and milk have been conducted in many countries. However, this is the first study that sought to find out the combined perceptions of consumers towards goat meat and milk, and it differs from that of Idamokoro *et al.* [18] on farmers' perception of goat milk consumption alone. Therefore, the study focuses on assessing consumer perceptions of goat meat and milk in selected areas of Eastern Cape, South Africa.

## MATERIALS AND METHODS

### Study area

This study was conducted in two different communities in Alice and Dimbaza of Amathole and Buffalo cities respectively, Eastern Cape Province, South Africa. Both Amathole and Buffalo City municipalities are located on the central part and east coast of Eastern Cape Province. Alice has a population of 15 143 and is situated at 32°47'0" South and 26°50'0" East while Dimbaza has 21 783 in population and is situated at 32°50'0" South and 27°14'0" East. The climate is highly varied; the west is dry, with sparse rain during winter or summer, frosty winters and hot summers. The study was reviewed and granted approval by the University Research and Ethics Committee (UREC) (Ref: 201917527-AT-FA).

### Sample size and data collection

A sample size (n) of 386 respondents from the study population was determined using the formula by Yamane *et al.* [20] at a confidence level of 95 %. The formula is as follows:

$$n = \frac{N}{1 + N(e)^2}$$

Where e = margin error (5%) and N = population size

The respondents were sampled from Amathole District Municipality (Alice) and Buffalo City (Dimbaza). Respondents were chosen at random from members of the community. A structured, interviewer-administered questionnaire was used to gather information on socio-demographic and economic characteristics and perceptions of goat meat and milk consumption. Information about the attitudes and familiarity towards goat milk consumption and the awareness of the nutritional qualities of goat milk was also gathered. Questions were administered using the native language (IsiXhosa) and English for communication clarity to the respondents. A pilot study was conducted on a selected sample outside the location for effective time management and to help detect any inherent flaws and mistakes.

### Data analysis

Data collected from the study were analyzed using SPSS v.17. A chi-square test was implemented to test whether there were any significant associations between the observed variables, and the analyzed data was viewed to be significant at  $P < 0.05$ .

## RESULTS AND DISCUSSION

### Demographic information of the respondents

The demographic information of the respondents is shown in Table 1. Among the respondents interviewed, a higher number (39.7%) were between the ages of 21 and 40, while the ages of 18-20, 41- 60 and >60 were 12.6%, 26.1% and 21.6%, respectively. Most of the respondents' have their primary source of income mainly from retail business and short time services. The study area is gradually expanding as a semi-urban with several business openings, markets and retail outfits, thus attracting and requiring the services of youths and young adults. This could explain the high percentage of this age bracket in the sampling population. Tada *et al.* [23] stated that young people migrate to areas where opportunities abound, pursue tertiary education aspirations and secure good jobs. Regarding gender, the

number of female respondents (51.3%) was higher than males (48.7%). This higher proportion of female participants willing to consume either goat meat or milk, as recorded in this study, was similar to that of Tütenk *et al.* [21], who observed a higher proportion of female consumer respondents willing to consume goat's milk and dairy products than males in Ankara Province. This could be a result of the domestic chores at home, including cooking which is more vested in the female gender and thus their increased product intake. However, Idamokoro *et al.* [18] and McLean-Meyinsse and Cavalier [22] assessed farmers' perceptions and reported otherwise, attributing this to the difficult task of animal husbandry, which favours the male gender. Most respondents were single (62.3%), followed by married (32.7%). Most of the respondents (71.9%) had up to five people in their households, while others had 6-10 (18.1%) and >11 (10.1%), respectively. About 44.7% of the respondents had high school education, followed by tertiary (31.7%) and primary school (19.1%) education. The major source of income for most of the respondents (84.4%) was monthly salary, and the least was farming produce (5%). Most respondents (84.4%) had an annual income of R10, 000.00, and the least (0.5%) had above R100,000.00. Most respondents (98.5%) were black compared to coloured respondents (1.5%). Christianity (73.4%) was the most practised religion, followed by traditionalist (26.1%) and Islamic (0.5%) religions.

### **Livestock husbandry structure and animal product consumption pattern of respondents**

The Livestock husbandry structure and animal product consumption pattern of the respondents are presented in Table 2. Most respondents (51.3%) kept livestock and sometimes more than one type of livestock (31.2%). A larger proportion of areas in Eastern Cape Province, especially the sampled regions for this study, are characterized by smallholder farming. Their activities range from crop and livestock to mixed farming. Most respondents (95.5%) took animal products like meat, milk, and eggs as part of their family diets.

### **Respondents' perceptions of goat milk and their consumption patterns**

The respondents' perception of goat milk and consumption patterns is shown in Table 3. The result showed that most respondents (62.3%) knew about goat milk compared to the 37.7% who did not know. Regarding understanding a specific breed of goat milk, most respondents (62.3%) did not know about the breed, 9% were unsure, and 28.2% had no knowledge. About 42% of the respondents took goat milk, while others (36.2%) said they could not, and some were unsure (22.1%). When respondents were queried about their willingness to purchase goat milk, the results showed that 35.2% responded affirmatively, 38.7% answered negatively, and 26.1% were uncertain. Moreover, among those who expressed

their reasons, the majority (55.8%) did not provide a specific rationale, while 29.1% cited various reasons, such as being unfamiliar with goat milk. With the information about the benefits of goat milk consumption, most of the respondents (58.3%) indicated an interest in taking goat milk in the nearest future, while others (16.1% and 5.6%) said they would not take goat milk or were not sure if they would, respectively. Among those who said they would take goat milk, the reasons adduced were goat milk is similar to cow milk and hence good (21.6%), goat milk is more nutritious (27.6%), contains fewer allergens (8%), while 42.7% of the respondents of them had no reason at all. Furthermore, most of the respondents (77.4%) said they were willing to advise on goat milk consumption, a few (8%) were not ready to urge people to consume goat milk and its products, while others (14.6%) were not sure. In this study, more than half of the respondents were uncertain or ultimately declined the idea of consuming goat milk, while about one-third were unsure or had never eaten goat meat before. Unfortunately, most of the respondents who were uncertain or ultimately declined to consume these goat products had no specific reason for their disinterest. In a similar study, Ozawa *et al.* [24] revealed that 70% of the Japanese people interviewed have never consumed goat milk. This disinterest is probably linked to the opinions and attitudes that the respondent possesses over time, which has now influenced their behaviour and intentions. Madichie [25] opined that attitude-forming and behavioural dispositions in people come from their pre-existing knowledge and opinion. Surprisingly, the barriers to goat milk consumption, including taboo, diseases, tastelessness and ritual purposes, did not make up more than 20% of the respondents. Sometimes ignorance of the benefits of a particular product (goat milk) and the increased attention given to another product of similar function (bovine milk) and attributes could result in gross under-utilization of the former. According to this study, most respondents were willing to consume goat meat and milk when the benefits and nutritional attributes were explained. However, milk characteristics like odour, taste, colour and smell have significantly influenced consumer acceptability and purchase of goat milk and products [21, 26]. Often, improper milking and processing practices could cause the 'goaty rancid aroma' usually perceived in goat milk. This rancid aroma results from high caprylic, caproic and capric acids in goat milk fat, quickly released from fat globule membranes by lipases under an unhygienic milking environment [27]. The purchasing enthusiasm and willingness of the consumer respondents to buy goat milk was about 35%. Consumer purchasing decisions are sometimes very complex [25]. Hence, influence on consumer attitudes may not be sufficient to drive increased purchasing behaviour. Therefore, motivating factors for increased consumption and purchasing of goat milk and by-products, like its healthiness and nutritional benefits, are very important and should be advanced [28]. Similarly, nutrition value,

price, ease of availability and digestion convenience significantly influence goat milk/by-product purchasing behaviour and consumption [16].

### **Respondents' perceptions of goat meat and their consumption patterns**

The respondents' perceptions of goat meat and consumption patterns is shown in Table 4. Many respondents (68.3%) consumed goat meat and had no specific reason for this high consumption pattern other than they see it as just any other meat (42.2%). Most of the respondents consumed goat meat rarely (41.7%). 27.1% of the respondents do not eat goat meat, and most could not provide specific reason (s) (74.4%). Many respondents (70.4%) were unaware of the nutritional benefits of consuming goat meat. Among the respondents who were unaware of the nutritional benefits of goat meat, a proportion of the respondents (69.8%) were willing to consume it based on the newly acquired knowledge of its nutritional benefits. A significant percentage of the respondents attributed the bad sensory appeal of goat meat as the reason for not consuming goat meat. This finding concurs with Banovic and Sveinsd'ottir [7], who accessed South African youths' perceptions of goat meat consumption. The reports of the Department of Agriculture Forestry and Fisheries [19] revealed general dissatisfaction among consumers in South Africa with goat meat based on the negative perception of its odour. However, other studies hold a different view. For example, respondents who grew up eating goat meat in the US hold positive perceptions about the product, and those across the Western Hemisphere have subtle differences in the meat sensory characteristics, including juiciness, tenderness, odour and aroma [29].

### **Influence of age and educational level of the respondents on their perception of goat milk and meat**

The influence of the age of the respondents on goat milk and meat knowledge and consumption patterns is shown in Table 5. There is a significant association ( $P < 0.05$ ) between the age of respondents, their goat milk knowledge, consumption of goat milk, and the nutritional benefits. However, the association between age and whether they would eat goat meat or are aware of its nutritional benefits was insignificant ( $P > 0.05$ ). The influence of the educational level of the respondents on goat milk and meat knowledge and consumption pattern is shown in Table 6. There was a significant association ( $P < 0.05$ ) between the educational level of the respondents and goat milk knowledge and whether respondents were willing to consume goat milk. Consumption of goat milk and nutritional benefits showed a significant ( $P < 0.05$ ) association. The age and education of the respondents in this study significantly influenced their knowledge about and the decisions to consume either goat milk or meat. A similar result was reported on consumer attitudes

towards goat milk and products [16]. According to Rani [30], the social value of the product and the opinion expressed by the public greatly influence consumers' decisions at 25 than at 65 years. In addition, the demographic factors like age, educational background and gender greatly influence respondents' willingness to consume goat milk [18]. The intrinsic attributes of goat meat and milk, including the health and welfare benefits, are regarded as dominant tools for its marketing [6]. Different researchers widely propagated and advocated this in South Africa [9].

## CONCLUSION, AND RECOMMENDATIONS FOR DEVELOPMENT

According to the study, a substantial portion of the respondents included goat meat and milk in their consumption habits. Nonetheless, the study suggests that there is room for improvement in increasing the percentage of respondents for these products by providing education about their health benefits. However, the percentage of consumers who declined consumption of both products attributed their objections to bad sensory appeal, including odour and taste.

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### Disclosure statement

The authors reported no potential conflict of interest.

**Table 1: Demographic information of the respondents**

Variable	Group	Proportion (%)
Age (yrs)	18-20	12.6
	21-40	39.7
	41-60	26.1
	60-70	21.6
Gender	Male	48.7
	Female	51.3
Marital status	Single	62.3
	Married	32.7
	Divorced	1.5
	Widowed	3.5
Household size	≤5	71.9
	6-11	18.1
	>11	10.1
Educational level	None	4.5
	Primary	19.1
	High school	44.7
	Tertiary	31.7
Source of Income	Monthly salary	27.6
	Farming produce	5.0
	Social grant	20.6
	Other (retail business, services, etc.)	46.7
Annual income	<10000	84.4
	10000-50000	14.1
	50000-100000	1.0
	>100000	0.5
Ethnic group	Black	98.5
	Coloured	1.5
Religion	Christianity	73.4
	Traditionalist	26.1
	Islam	0.5

**Table 2: Livestock husbandry structure and animal product consumption pattern of the respondents**

Variable	Group	Proportion (%)
Do you keep livestock?	Yes	51.3
	No	48.7
Which type of livestock?	Poultry	11.1
	Sheep	1.5
	Goats	4.0
	Pigs	1.5
	Cattle	3.5
	Multiple types	31.2
	None	47.2
Herd size	1-10	13.6
	11-20	17.1
	>21	21.1
	None	48.2
Do you take animal products?	Yes	95.5
	No	4.5
Which type do you take?	Meat	4.5
	Milk	0.5
	Egg	3.0
	More than 1 type	89
	None	1.5
If not, why?	Allergies	9.0
	Sickness	1.5
	None	89.4
How often do you buy milk?	Occasionally	21.1
	Often	62.8
	Rarely	16.1
Which products do you consume?	Yoghurt	3.5
	Cheese	1.5
	Amasi	19.1
	Others	1.0
	More than 1 type	62.9
	None	12.1

**Table 3: Respondents' perception of goat milk and consumption patterns**

Variables	Groups	Proportion (%)
Goat milk breed knowledge	Yes	28.6
	No	62.3
	Not sure	9.0
Can you consume goat milk?	Yes	41.7
	No	36.2
	Maybe	22.1
Can you buy goat milk?	Yes	35.2
	No	38.7
	Not sure	26.1
If not, why?	Taboo	3.5
	Harbours diseases	1.0
	Goat milk unhealthy	1.0
	Not nutritious like cow milk	5.5
	Tasteless	3.5
	Used mostly for rituals	0.5
	Others (goaty odour)	29.1
	No specific reason	55.8
If yes, why?	Similar to cow milk, hence good	21.6
	More nutritious	27.6
	Fewer allergens	8.0
	No specific reason	42.7
Would you consume goat milk and its products based on the explained benefits?	Yes	58.3
	No	16.1
	Not sure	25.6
If yes, which by-products would you prefer?	Amasi	15.1
	Cheese	2.5
	Yoghurt	2.0
	Butter	1.0
	More than one	39.6
	None	39.7
Would you advise other people to consume goat milk?	Yes	77.4
	No	8.0
	Not sure	14.6

**Table 4: Respondents' perception of goat meat and consumption patterns**

Variables	Groups	Proportions
Have you eaten goat meat?	Yes	68.3
	No	27.1
	Not sure	4.5
If yes, any particular interest?	Taste better	25.6
	More nutritious	25.1
	Just like any meat	42.2
	No reason	7.0
If not, why?	Taboo	9.0
	No market	2.5
	More expensive	1.0
	allergens	13.1
	Poor sensory appeal (odour, taste)	74.4
How often do you consume goat meat?	Frequently	2.0
	Occasionally	27.1
	Rarely	41.7
	None	29.1
Will you consume if the benefits are known?	Yes	69.8
	No	26.1
	Not sure	4.0
Are you aware of the nutritional benefits?	Yes	29.6
	No	70.4
Are you willing to consume it as part of your diet?	Yes	73.9
	No	26.1

**Table 5: Influence of age of respondents on their perception of goat milk and meat**

Variable		Age				$\chi^2$	P-value
		<20	21-40	41-60	>60		
Will you take the animal product?	Yes	48	160	82	78	4.868	0.182
	No	6	4	2	6		
Goat milk knowledge	Yes	14	87	75	66	18.961	0.000
	No	33	68	27	16		
Would you take goat milk based on its benefits	Yes	25	73	51	62	12.595	0.050
	No	10	24	15	6		
	Not sure	12	66	30	12		
Can you take goat milk?	Yes	13	43	45	61	29.787	0.000
	No	29	65	35	11		
	maybe	5	47	21	11		
Can you eat goat meat?	Yes	41	103	61	63	7.770	0.255
	No	11	45	31	17		
	Maybe	0	13	1	1		
Aware of the nutritional benefits of goat meat	Yes	13	41	37	23	3.115	0.374
	No	39	121	57	59		

**Table 6: Influence of educational levels of the respondents on their perception of goat milk and meat**

Variables		Education levels				x <sup>2</sup>	P-value
		None	Primary	High school	Tertiary		
Goat milk knowledge	Yes	11	57	97	79	5.278	0.153
	No	5	17	79	45		
Would you take goat milk based on its benefits?	Yes	11	67	87	63	20.669	0.072
	No	1	0	35	25		
	Not sure	3	7	53	35		
Can you take goat milk?	Yes	7	59	65	31	34.064	0.000
	No	9	3	69	39		
	Maybe	0	11	41	33		
Goat meat knowledge	Yes	17	57	109	83	6.381	0.382
	No	7	7	57	33		
	Maybe	1	1	7	5		
Would you take goat meat based on its benefits	Yes	3	19	53	39	6.381	0.382
	No	23	47	117	85		
Can you take goat meat?	Yes	27	63	163	115	1.217	0.749
	No	0	3	11	9		

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