



Consumer Preference for Goat Meat in Sierra Leone

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Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

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ABSTRACT

Meat constitutes one of the primary sources of protein, fat, vitamins, and minerals in the human diet. The worldwide demand for meat and other products from animals has soared. With the increasing demand for meat products, increased meat marketing may boost the capacity to satisfy financial responsibilities and improve living conditions. Comprehending consumer meat consumption patterns will aid the development of small ruminants and the livestock industry. The objective of this study was to assess consumers' preference for goat meat in Sierra Leone. A semi-structured questionnaire was used to collect information from 367 goat meat consumers in four cities in Sierra Leone. The Statistical Package for Social Sciences (SPSS) was used to analyze the data. The result revealed that 57.2% of the consumers liked goat meat to a great extent. The most important reasons for liking goat meat were flavor (53.7%) and taste (23.2%). Most consumers bought goat meat based on price. The level of education ($p < 0.01$) and religion ($p < 0.01$) are the socioeconomic factors that positively influence consumer preference for goat meat. The goat meat cuts preferred the most by consumers are the breast (39.5%), the leg (14.2%), and the shoulder (11.4%). Therefore, disseminating these findings is crucial, as knowledge of present and probable demand would help extension workers educate and encourage farmers to produce what is needed in the market. Thus, this would enhance farmers' access and bargaining power in the market, increasing incomes and improving livestock farmers' livelihoods.

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1. INTRODUCTION

The livestock sector contributes greatly to the economy and livelihood by producing livestock products such as milk, meat, eggs, hides, skins, and wool [1]. The human diet completely depends on meat as one of the main sources of dietary protein, fat, vitamin, and minerals [2,3]. Globally, there has been an increased demand for meat and other animal products [4,5]. The main factors in developing countries are the growth of metropolitan areas, increased incomes, and increased populations [6]. Global meat consumption reached 360 million tons in the past twenty years, representing a 58% increase [7]. The growth in average consumption per person was responsible for the remaining 46% of this increase, while the general population expansion accounted for 54% of the increase [7]. Komarek et al. [8] used scenario-based modeling to show that the average protein demand for red meat, poultry, dairy milk, and eggs would increase by 14% per person and 38% in total across the globe between the years 2020 and 2050 if current trends in income and population continue along a midrange trajectory. South Asia and sub-Saharan Africa had the fastest growth rates per person, coming in at 49% and 55%, respectively. Beyond enabling a food revolution, increasing the demand for meat and other animal products in developing countries has given local smallholder producers significant opportunities as they enter the expanding market [9,10]. The behavior of meat consumers will determine how the livestock industry, specifically the small ruminant industry, will develop [11]. According to consumer theory, tastes and preferences influence how consumers behave and are reflected in the market by how they choose to buy meat with visible and unseen qualities [12]. In addition to family and consumer characteristics, numerous surveys have shown that customers are becoming more interested in the qualities and properties of meat [13,14]. These reservations will probably influence the way customers buy meat [14].

Consumers worldwide are increasingly concerned about their health and are better informed about the effects of the food they eat, especially meat [15]. A new consumer category that wants healthy foods has emerged due to increased consumer awareness [16]. Red meat has certain nutritional benefits but also contains a lot of saturated fat and cholesterol [17]. Due to

the high amount of saturated fat and cholesterol in red meat, excessive intake of red meat and its products is associated with a higher chance of evolving metabolic disorders such as obesity, insulin resistance, metabolic dysfunctions, and related metabolic diseases [18,19]. However, goat meat is healthier than other red meats due to its chemical makeup, which affects its fat content and fatty acid profile [10]. In addition to being a rich human dietary protein source, goat meat is a healthy option due to its relatively low concentration of total fat, saturated fatty acids, and cholesterol. Goat meat chemical makeup promotes health and satisfies consumer demands for nutritious foods, which accounts for its growing popularity and demand [19]. The rise in goat meat popularity and demand is crucial to meeting the need for animal-derived protein sources for human consumption, fuelled by the growth of urban areas, rising earnings, and a desire for a better standard of living. Thus, due to its leanness and advantageous fatty acid profile, goat meat is becoming increasingly popular in the international meat market as health-conscious consumers choose leaner and healthier meat [20].

There is a strong demand for goat meat in Sierra Leone; in certain communities, it is a delicacy [1]. The country's population is 78.5% Muslims who enjoy eating goat meat since goat meat is considered halal in Islam. Some Muslims even use goats for religious sacrifices during Islamic celebrations [21]. Although customers all over the country strongly prefer goat meat, demand for the product consistently exceeds supply. This is due to the livestock industry facing various challenges, such as diseases, a lack of adequate veterinary services, poor animal husbandry techniques, and insufficient amounts of quality feed [6]. Due to the growing interest of customers in purchasing meat products that are both healthier and more environmentally friendly, producers of red meat need to understand customer preferences [22]. However, there is a lack of quantifiable data on consumer demand and preference for goat meat in Sierra Leone. The lack of information and knowledge about marketing small ruminants and their products is a significant issue. Since consumers are the last link in the production chain, it is helpful to understand the variables that influence their behavior patterns. This would make it better for the meat industry to meet customers' expectations, demands, and requirements

[23,24]. There has not been much done on consumer preferences for goat meat or specific research on goat meat consumer behavior in Sierra Leone. This restriction has produced an important informational gap between livestock production and consumption chains, particularly for small ruminants. Therefore, the study's objective is to assess consumer preference for goat meat in Sierra Leone.

2. METHODOLOGY

2.1 Study Area

Sierra Leone is located in western Africa and has a population of approximately 8 million people, covering 71,740 km² in total [21]. Freetown is the country's largest and capital city. Sierra Leone is bordered to the east and northwest by the Republic of Guinea and to the south by the Republic of Liberia. Sixteen districts and five regions comprise the nation (15 agricultural districts). Each district is divided into chiefdoms, each of which is made up of a large number of villages. Sierra Leone has a tropical climate and a diversity of ecosystems, including savannas and rainforests. The country has an arid equatorial climate with two distinct rainy and dry seasons. Although the rainy season begins in May and ends in November, the dry season begins in November and lasts until April. The main economic activity in Sierra Leone is agriculture, which provides more than 75% of all income and represents 47% of the national gross domestic product (GDP) [25]. Agriculture is the foundation of the country's economy and the main source of food, income, and participation in sociocultural and religious traditions for most people. Crop production is the most important aspect of agriculture, followed by raising animals. Agricultural households comprise 57.9% of the total population, of which 73.6% are involved in animal husbandry activities. Chickens make up the majority of Sierra Leone's livestock industry, accounting for 65.2% of all animals kept there, followed by goats (12.3%), sheep (8.7%), cattle (7.0%), ducks (6.0%), and pigs (0.9%). In Sierra Leone, traditional management systems are used to raise livestock [26].

2.2 Sampling Procedure

The exploratory aspect of the study is supported by first-hand information collected from a survey of goat meat consumers in Freetown, Bo, Kenema, and Makeni. Due to their high population, these cities are the main consumers

of livestock products, especially goat meat. The survey was carried out in 2022 between September and November. Study participants were chosen using a practical sampling technique because most goat meat is consumed and purchased regularly. Customers who bought goat meat from traditional retailers, such as street vendors, butchers, slaughterhouses, and weekly markets, were randomly stopped for this study. They underwent a face-to-face interview after making a meat transaction. Although the schedule was written in English, it was carried out in Krio so that respondents could understand it. The responses of 96 Freetown respondents, 88 Bo respondents, 93 Kenema respondents, and 90 from Makeni, out of 100 consumers surveyed in each city, were deemed sufficient for data analysis, and the responses of the other respondents were rejected. Therefore, 367 respondents made up the study sample.

2.3 Data Analysis

Data were collected, processed, and coded in IBM SPSS Statistics-22 for analysis. Using descriptive statistics, such as percentages, frequency distributions, and cross-tabulations, we explored several fundamental facts regarding respondents' consumption and purchasing preferences and their demographic characteristics. Multiple regression analysis (ordinary least squares) was used to identify the socioeconomic factors determining consumers' preference for goat meat. The multiple linear regression model for consumers' preference for goat meat is constructed as follows:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + u$$

Where,

- Y = Consumer's preference
- X₁ = Gender
- X₂ = Age (years)
- X₃ = Level of education (no years of school)
- X₄ = Marital status
- X₅ = Family size
- X₆ = Tribe
- X₇ = Religion
- X₈ = Occupation
- X₉ = Monthly income (Le)
- b₁– b₉ = Regression coefficients
- a = Constant term
- u = Error term

3. RESULTS AND DISCUSSION

3.1 Socioeconomic Characteristics of the Respondents

Table 1 shows the socioeconomic characteristics of the respondents. From this study, the male was 34.1% and 65.9% were female. More than half (61.3%) are between 30 and 49 years old. Most were educated in secondary school (51.0%), and some were graduates (35.4%). Most of them were married (64.6%). About 71.1% of the family size comprised 6 to 10 members. Regarding occupation, the sample was diverse. However, businesspeople and private and public sector employees were relatively common. Most respondents reported their monthly income of 1 to 5 thousand Leones.

3.2 Consumer Preference for Goat Meat

The study findings revealed that consumers liked to consume goat meat, 57.2% liked goat meat to a great extent, and 28.4% somewhat liked goat meat (Table 2). A lower percentage (8.7%) liked goat meat very little, and (5.7%) did not like goat meat. The most important reasons for liking goat meat in Sierra Leone were flavor (53.7%) and taste (23.2%). Goat meat has a richer red color, a rougher texture, and a distinct flavor and smell compared to lamb and mutton [27,28]. The flavor and fragrance of goat meat are complex. These sensory characteristics are influenced by species, age, fat, anatomical position, gender, nutrition, and cooking technique. Consumers can readily identify the fragrance and flavor of meat and evaluate its acceptability [27,28,29]. Customers can recognize marbled patterns and, as a result, distinct flavors in certain muscles and are prepared to pay a premium for the flavor profile that best suits their tastes [30].

In this study, 53.3% of consumers preferred to buy goat meat based on price. Consumers would like to pay less to enjoy goat meat's delicate taste and desirable flavor. Hoffman et al. [31] indicated that consumers' buying behavior depended on the product's quality, price, and promotion. Price is considered the most significant variable when consumers make purchasing decisions [32]. Onurlubaş et al. [33] stated that 75.6% of Turkish consumers consume more red meat if the price of red meat drops. According to Ramrez et al. [34], money is ultimately the most important factor in determining whether an individual consumes

certain foods, such as red meat. However, consumers also preferred food products that were safe, nutritious, and high quality [35], as evident in this study.

3.3 Socioeconomic Factors Determine the Consumer's Preference for Goat Meat

Multiple regression analyses (ordinary least squares) were performed to identify the socioeconomic factors determining goat meat preference (Table 3). The overall model was considered to fit the data having a significant $F(9, 357) = 195.44$, $p < 0.001$, $R^2 = 0.83$. This indicates that 83% of the variation in the factors that determine the preference for goat meat was explained by the independent variables included in the model.

The study revealed that education ($p < 0.01$) and religion ($p < 0.01$) are the positive and significant factor that has a relationship with the preference for goat meat. At the same time, there is a significant negative relationship with gender ($p < 0.01$), age ($p < 0.02$), and occupation ($p < 0.01$). Education was significant, which means that the more educated they were, the more likely they prefer goat meat. Religion is another factor that determines consumer preference for goat meat; that is, a person's religion determines the tendency to prefer goat meat. Muslims comprise 78.5% of the Sierra Leone population, and goat meat is halal in Islam. This is best demonstrated by the "Haji," a religious festival in which Moslems slaughter approximately 34 million sheep and goats in approximately six hours [10]. The findings are partially similar to the findings of Onurlubaş et al. [33] that the main factors that determine the amount of red meat consumed by families in Turkey are the number of family members, the level of education of both spouses, the employment status of both spouses, income and the degree to which the price of red meat has decreased.

3.4 Preferred Consumption Parts of Goat Meat

Table 4 shows that consumers prefer to consume the breast (39.5%), the leg (14.2%), and the shoulder (11.4%) part of goat meat. Many African and Asian studies have strongly preferred cuts in the breast area [29,36]. In contrast, in Western nations, the most popular portions of a goat carcass are the loin, the dorsal trunk, and the hindlimb [37]. Certain consumers

place a high value on hindlimb cuts due to the low carcass fat and high lean content, which is crucial for marketing goat's meat. According to Cubero Dudinskaya et al. [22] study in Europe, the cut of beef, known as the "T-bone," is the most popular option in Finland. The beef T-bone is also the most popular cut in Greece, although lamb chops were a close

second. On the other hand, lamb chops were the most popular cut in Italy, with beef T-bone coming in a close second. In Spain, Turkey, and the United Kingdom, there was a resounding preference for lamb chops over other varieties of red meat. Only in France was the leg of lamb considered the most desirable cut.

Table 1. Socioeconomic characteristics of respondents (n=367)

Variable	Categories	Frequency	Percentage
Gender	Male	125	34.1
	Female	242	65.9
Age	18-29	76	20.7
	30-49	225	61.3
	50 years and older	66	18.0
Education	No education	8	2.2
	Primary	42	11.4
	Secondary	187	51.0
	Tertiary	130	35.4
Marital status	Single	109	29.7
	Married	237	64.6
	Others	21	5.7
Family size	1-5	81	22.1
	6-10	261	71.1
	11 and above	25	6.8
Occupation	Public-sector employees	52	14.2
	Private-sector employees	90	24.5
	Businessmen	162	44.1
	Retired persons	18	4.9
	Students	10	2.7
	Housewives	19	5.2
	Farmer	16	4.4
Monthly income	Less than 1000	19	5.2
	1000-5000	207	56.4
	6000-10,000	88	24.0
	11,000 or more	22	6.0
	No income	31	8.4

Source: Field survey, 2022

Table 2. Consumer preference for goat meat (n=367)

Consumption preference	Category	Frequency	Percentage
Extent of liking	Not at all	21	5.7
	Very little	32	8.7
	Somewhat	104	28.4
	To a great extent	210	57.2
	Good for health	34	9.3
Reason for liking	Nutritious	20	5.4
	Tenderness	18	4.9
	Flavor	197	53.7

Consumption preference	Category	Frequency	Percentage
	Color	13	3.5
	Taste	85	23.2
Factors influencing purchasing	Price	203	55.3
	Easy to purchase	52	14.2
	Packaging	17	4.6
	Grading	30	8.2
	Meat inspection label	65	17.7

Sources: *Field survey, 2022*

Table 3. Socioeconomic factors determine the preference for goat meat

Variables	Regression coefficient	Standard error	T-value	Significant
(Constant)	0.91	0.22	4.19	0.00
Gender (X ₁)	-0.12	0.02	-6.03	0.00
Age (X ₂)	-0.04	0.02	-2.36	0.02
Education (X ₃)	0.12	0.02	5.59	0.00
Marital status (X ₄)	0.01	0.03	0.42	0.67
family size (X ₅)	-0.03	0.03	-1.09	0.28
Tribe (X ₆)	-0.01	0.02	-0.80	0.43
Religion (X ₇)	0.13	0.04	3.382	0.00
Occupation (X ₈)	-0.11	0.01	-8.82	0.00
Income (X ₉)	-0.02	0.02	-1.50	0.13
		R square	Adjusted R square	F
		0.83	0.82	195.44

Source: *Authors' computations, 2022*

Table 4. Preferred consumption parts of goat meat (n=367)

Variables	Frequency	Percentage
Head	9	2.5
Neck	18	4.9
Shoulder	42	11.4
Rib	22	6.0
Loin	26	7.1
Leg	52	14.2
Hind shank	13	3.5
Flank	16	4.4
Breast	145	39.5
Foreshank	11	3.0
Skin	7	1.9
Offal	6	1.6

Sources: *Field survey, 2022*

3.5 Preferred Consumption form of Goat Meat

Fig. 1 shows that most people (55.1%) prefer to eat goat pepper soup, followed by stew (16.6%) and barbecued (11.4%). Most people consumed goat meat in restaurant bars and street markets that prepare the goat meat in the form of pepper soup, stew, and barbecue. There are who sell roasted chicken, beef, and goat meat. Roasted chicken, beef, and goat meat are all available from different street vendors. Consumers have

no choice but to consume it in the most available form.

3.6 Consumption Frequency of Goat Meat

Fig. 2 presents the frequency of goat meat consumption among the respondents. Among them, goat meat consumption was relatively more common three times a week (46.3%). However, 20.7% liked to consume goat meat twice a week, and 14.7% once a week. Goat meat is not frequently cooked at home, except at restaurant bars and street markets. So it is not

easy to consume goat meat every day. According to Cubero Dudinskaya et al. [22] study in Europe, most customers in Finland, France, Greece, Italy, Spain, and Turkey, as well as most consumers in the United Kingdom, report eating beef at least once a month.

3.7 Preferred Consumption Event/ location of Goat Meat

Fig. 3 shows that most of the respondents (57.2%) consumed goat meat in the restaurant,

followed by the night market (16.9%) and at home (15.3%). Some consumed goat meat at festivals, weddings, and business meetings. Goat meat is not always available; the best place to see goat meat is in a restaurant that prepares it in pepper soup, sometimes in a stew. Customers come mainly in the evening to relax and eat goat pepper soup. Some people prefer to buy them at the street market at night, mostly cooked in barbecued form.

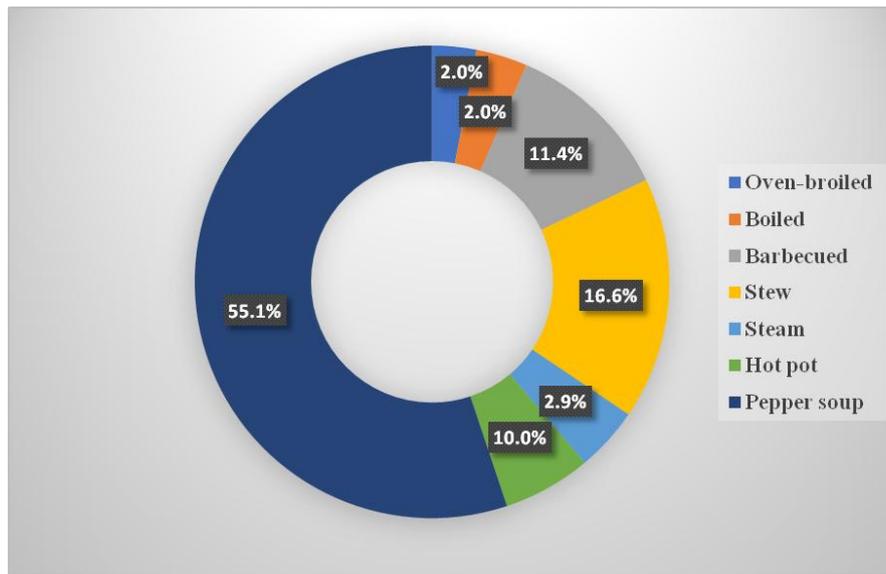


Fig. 1. Preferred consumption form of goat meat

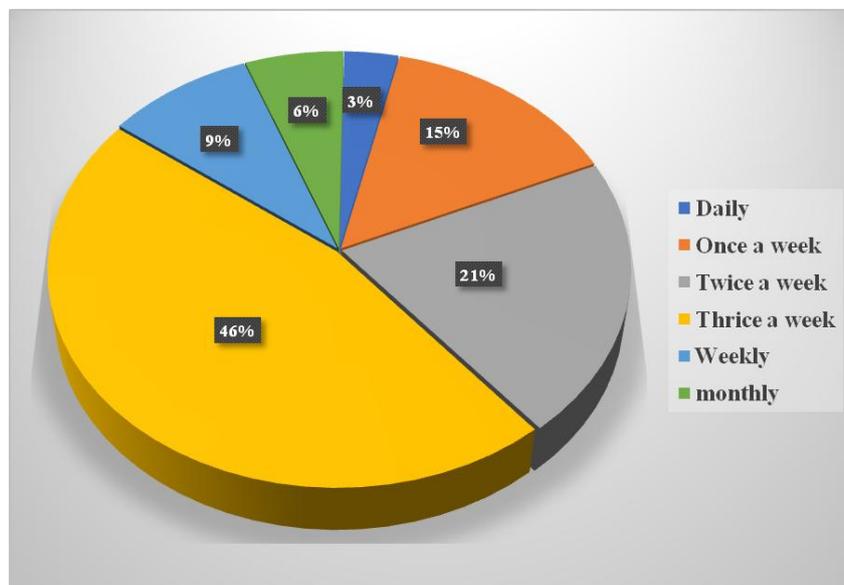


Fig. 2. Goat meat consumption frequency

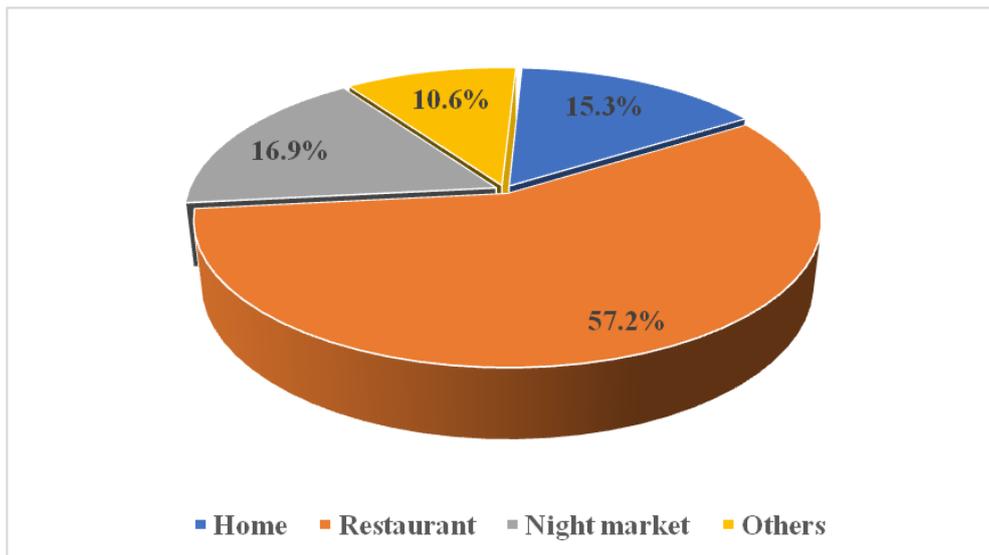


Fig. 3. Preferred Consumption Event/location of goat meat

4. CONCLUSIONS

Most of the consumers liked goat meat to a great extent. The most important reasons for liking goat meat were due to its flavor and taste. Most consumers bought goat meat based on price. Among them, goat meat consumption was relatively more common three times a week. Level of education, religion, sex, age, and occupation are the socioeconomic factors that influence the preference for goat meat. The goat meat cuts preferred the most by consumers are the breast, the leg, and the shoulder. They preferred to eat goat meat, mostly in the form of pepper soup, stew, and barbecued. Therefore, it is crucial to disseminate these findings, as knowledge of the present and projected demand would help extension workers educate and encourage farmers to provide what the market requires. Thus, this would increase farmer market access and bargaining power, raise incomes, and enhance livestock farmers' living standards.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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