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Factors Influencing Consumer Preference for Beef or Chevon in the Northern Region of Ghana

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Abstract
The study examined the influence of husbandry practices and socio-cultural factors on consumers' preference for beef or chevon in the Northern Region of Ghana. A descriptive cross-sectional survey with 410 participants was used in this research. The participants were chosen using the convenience sampling method. The significance of associations was determined by chi-square analysis, and binary logistic regressions were used to asses influence of factors on meat preferences. Out of the 410 respondents, 65.6% were males, and the mean age was 33.5 years. Most of the respondents (59.0%) indicated that their type of meat preference is beef as compared to 41.0% who preferred chevon. The meat type consumers usually purchased was beef as indicated by 62.0% of the respondents. Both age and marital status had a significant association with meat type purchased. Among the husbandry practices, quality and hygiene of animal feeds or watering were significantly associated with meat preference. Age of the respondent predicted meat preference with those within the age group of 35 – 44 years more likely (5.8 times) to prefer chevon than beef as compared to those within the age group of 24 years and below. The results further shows that single respondents were more likely to prefer chevon than beef, when compared with those married. The religion of the respondents predicted meat preference with traditional religious belief more likely to prefer chevon over beef as compared to those from Islamic religious belief. Generally beef was the most preferred meat type with husbandry practices and some socio-cultural factors such as age, marital status and religious practice influencing choice of meat type. It is recommended that farmers on the basis of this study consider animal husbandry practices such as feeding with quality housing very serious in order to attract meat consumers.

Keywords: beef, chevon, husbandry, preference, socio-economic

Facteurs Influant Sur la Préférence des Consommateurs en Matière de Viande de Bœuf ou de Chevon dans la Région du Nord du Ghana

Résumé
L'étude a examiné l'influence des pratiques d'élevage et des facteurs socioculturels sur la préférence des consommateurs pour le bœuf ou le chevon dans la région du Nord du Ghana. Une enquête descriptive transversale avec 410 participants a été utilisée dans cette recherche. Les participants ont été choisis en utilisant la méthode d'échantillonnage de convenance. La signification des associations a été déterminée par l'analyse du chi carré, et des régressions

logistiques binaires ont été utilisées pour évaluer l'influence des facteurs sur les préférences en matière de viande. Sur les 410 répondants, 65,6 % étaient des hommes et l'âge moyen était de 33,5 ans. La plupart des répondants (59,0 %) ont indiqué que leur type de viande préféré était le bœuf, contre 41,0 % qui préféraient le chevon. Le type de viande que les consommateurs achètent habituellement est le bœuf, comme l'ont indiqué 62% des répondants. L'âge et l'état civil ont tous deux un lien significatif avec le type de viande acheté. Parmi les pratiques d'élevage, la qualité et l'hygiène des aliments pour animaux ou de l'abreuvement étaient significativement associées à la préférence pour la viande. L'âge du répondant prédit la préférence pour la viande, les personnes âgées de 35 à 44 ans étant plus susceptibles (5,8 fois) de préférer le chevon au bœuf que les personnes âgées de 24 ans et moins. Les résultats montrent en outre que les célibataires sont plus susceptibles de préférer le chevon au bœuf, par rapport aux personnes mariées. La religion des répondants prédit la préférence pour la viande, les croyances religieuses traditionnelles étant plus susceptibles de préférer le chevon au bœuf que les croyances religieuses islamiques. En général, le bœuf était le type de viande le plus préféré, les pratiques d'élevage et certains facteurs socioculturels tels que l'âge, l'état civil et les pratiques religieuses influençant le choix du type de viande. Il est recommandé aux agriculteurs, sur la base de cette étude, de considérer les pratiques d'élevage telles que l'alimentation, la qualité du logement très sérieuses afin d'attirer les consommateurs de viande.

Mots clés:bœuf, chevon, élevage, préférence, socio-économique.

Introduction

Livestock keeping is an integral part of Ghana's agricultural sector, as well as a vital link in the country's farming and livelihood systems. The meat derived from livestock is a major source of quality protein and amino acids for consumers. It is reported that demand for animal products will double by 2050, mainly due to growing demand in the Global South (NAREN, 2020). The success of this depends on proper animal husbandry practices. Husbandry practices that place emphasis on animal welfare and hygienic animal management practices will play a very significant role in attracting this demand. The Northern regions of Ghana account for about 74.4% of the cattle, 36.5% of the sheep, and 34.5% of goats found in Ghana (Oppong-Anane, 2006; LPIU, 1996). Beef and chevon are protein-rich foods derived from cattle and goats, respectively with high demand in most Ghanaian households. The value chain approach to livestock and livestock products is gradually gaining roots in Ghana (Oppong-Anane, 2016) with consumers becoming very selective in the choice of meat purchased and consumed. Poor husbandry practices were idetified as major barriers in the livestock and meat value chains in Ghana (Oppong-Anane, 2016). The Eurobarometer (2016) reported that European consumers consider information on how animals are treated and under what conditions animals are raised as very key in deciding which products to consume. This has been confirmed by Olynk (2012) who also reported increasing consumer concerns in relation to where their food was produced, who produced it, and when it was sent to the market.

About 60% of all infectious diseases are of zoonotic origin and can be traced back to close contact between humans and animals and with products of animal origin (NAREN, 2020). Poor husbandry practices such as poor housing, unhealthy breed or animals may have the tendency to negatively affect the consumption of animal products. Some socio-

cultural factors such age, marital status and religious beliefs may influence the choice of meat, thereby affecting the value chain. Considering the importance of beef and chevon in the diets of people within the Northern region of Ghana, coupled with the growing concern for meat hygeine and quality, there is the need for a study to investigate the influence of husbandry practices and some socio-cultural factors on consumers' preference for beef and chevon in the Region.

This study was therefore undertaken to determine the influence of some husbandry practices and socio-cultural factors on consumers' preference for beef and chevon in the Northern Region of Ghana.

Materials and Methods

Study Area

The study was carried out in the Nothern Region of Ghana with a total population of 2,479,461 and a total land area of 70,384 square kilometers. It has a population density of 35.2 persons per kilometer square, and an average household size of 7.7 (GSS, 2010). The Northern Region after 2018 referendon consists of Tamale Metropolis, Sagnerigu District, Savelugu District, Nanton District, Kumbungu District, Tolon District, Karaga District, Gushiegu District, Mion District, Yendi Municipal, Saboba District, Tatale District, Zabzugu District, Nanumba North District, Nanumba South District, and Kpandai District.

Northern Region is much drier than the southern areas of Ghana, due to its proximity to the Sahel and the Sahara. The vegetation is dominated by grassland, with clusters of drought-resistant trees such as baobab and acacias. The dry season is between October and April, while the wet season is between May to September with an average annual rainfall of 750 to 1050 mm. Temperatures vary between 14 °C at night and 40 °C during the day. However, the hot Harmattan wind from the Sahara blows frequently between December and the beginning of February (GSS, 2010). The major livelihood activty in the region is the cultivation of food crops and livestock rearing.

Study Design

A descriptive study design was employed in which data was collected to test hypotheses on the influence of the various husbandry practices and socio-cultural factors on consumers' preferences.

Study Population and Sampling

The study was carried out on consumers of beef and chevon who are ≥20 years old in the Districts, Metro and Municiplities of Zabzugu, Tatale, Saboba, Yendi, Savelugu, Tamale Metro, Nanumba North, Nanumba South, Mion, Tolon and Kumbungu of the Northern region of Ghana. The study participants were selected based on the convenience sampling method.

Sample Size Determination

Slovins's formula was used to calculate an appropriate sample size from a population. Slovin's formula was used to find out what sample of a population of 2,479,461 people was involved in the study, with a 95% confidence level. Slovin's formula: $n = N / (1 + N e^2)$, where:

n = Number of samples,
N = Total population and
e = Error tolerance (level)
N = 2,479,461; e = 0.05

Plugging the data into the formula;
$n = N / (1 + N e^2) = 2,479,461 / (1 + 2,479,461 * 0.05^2) = 400$

Data Collection Methods

Primary data was collected through the administration of semi-structured question-

naire which was made up of open and close-ended questions. The questionnaire had three sections which included personal data and household characteristics and meat preference.

Data Analysis

Data entry and analysis were done using Statistical Package for the Social Sciences (SPSS) version 20. The continuous variable like age was presented as means with standard deviation. Categorical variables like sex was presented as proportion. Bivariate analysis was done using Chi-square to determine the relationships between dependent variables (meat preference and actual meat purchased) and independent variables (demographic characteristics and husbandry practices) and analysis for predictors of meat preference was done using the binary logistics regression model.

Results and Discussion

Demographic characteristics of respondents

The results on the demographics of the respondents are presented in Table 1. The age group with the highest frequency was 35-44 years (39%) with the least reported for ages 45 years and above. Males dominated (65.6%) the respondents whilst the majority (58.0%) had tertiary education. The dominant (66.3%) religion was Christianity, with 53.2% of the respondents being married. In terms of employment, the majority (85.6%) were working with a monthly income ranging from 500 Ghana cedis to 4,000 Ghana cedis. The majority of the respondents (49.5%) spent on the average, 5 – 10 Ghana cedis on meat per day (Table 1). The results on the age generally conforms to the age structure of Ghanaian population where majority of the population are the youth (O'Neill, 2012). These results on the dempgraphics align with the pattern of religious affiliations in Ghana's 2010 population census (GSS, 2010).

Meat type preference and the actual meat-type consumers usually buy

Most (59.0%) of the respondents indicated that their meat type of preference is beef as compared to 41.0% for chevon. Additionally, most of the respondents (62.0%) usually purchased beef (Figure 1). Beef is the main source of animal protein in Ghanaian meals (FASDEP, 2002), and preference for it is year-round due to its relatively lower price (Teye and Salifu, 2006).

The most (90.0%) dominant reason for the preference for meat type was the quality of meat followed by the taste (88.3%) of the meat. According to 60.7% of the respondents, reasonable quantity per unit cost influenced their meat preference. Though the buying price determines the quantity of meat one gets, most (56.8%) of the respondents indicated that the price of the meat (56.8%) had no impact on their meat preference. Also, most respondents (75.9%) indicated that religious belief did not influence their meat preference (Table 2).

In terms of the type of meat often purchased, the major reason by majority (86.3%) of the consumers was taste-related, followed by 82.0% because of availability and 81.5% for the perceived nutritional status of the meat. Religious belief according to 75.9% of the respondents did not influence the type of meat purchased (Table 2) and this could be due to the fact that there are no religious barriers to the consumption of beef and chevon in Northern Region, except for pork. The current findings conform to the conclusions made by Mahaboubil-Haq and Adzitey (2016), that beef was the most common type of meat preferred, followed by chicken, chevon (goat meat), mutton, pork, and guinea fowl.

Table 1: Demographic characteristics of respondentsable

		Frequency (n=410)	Percentage (100%)
Age group	24 years and below	78	19.0%
	25 – 34 years	160	39.0%
	35 – 44 years	119	29.0%
	45 years and above	53	12.9%
Sex	Male	269	65.6%
	Female	141	34.4%
Level of formal education	None	53	12.9%
	Primary	17	4.1%
	Junior secondary	35	8.5%
	Senior secondary	67	16.3%
	Tertiary	238	58.0%
Religious affiliation	Islam	88	21.5%
	Christianity	272	66.3%
	Traditional	42	10.2%
	Other	8	2.0%
Marital Status	Married	218	53.2%
	Single	168	41.0%
	Divorced	14	3.4%
	Co-habitation	10	2.4%
Residence	Urban	106	25.9%
	Peri-Urban	132	32.2%
	Rural	172	42.0%
Employment status	Employed	351	85.6%
	Unemployed	59	14.4%
Family size	1-3	173	42.2%
	4-7	157	38.3%
	8 and above	80	19.5%
Amount spent on meat per day	Less than GH¢5.00	88	21.5%
	GH¢5.00 – GH¢10	203	49.5%
	GH¢11 – GH¢20	61	14.9%
	GH¢21 – 30	35	8.5%
	GH¢31 and above	23	5.6%
Income per month	Less than GH¢500	125	30.5%
	GH¢501 – GH¢1000	103	25.1%
	GH¢1001 – GH¢2000	114	27.8%
	GH¢2001 – GH¢3000	56	13.7%
	GH¢3001 – GH¢4000	10	2.4%
	GH¢4001 and above	2	0.5%

Source: Field survey, 2020

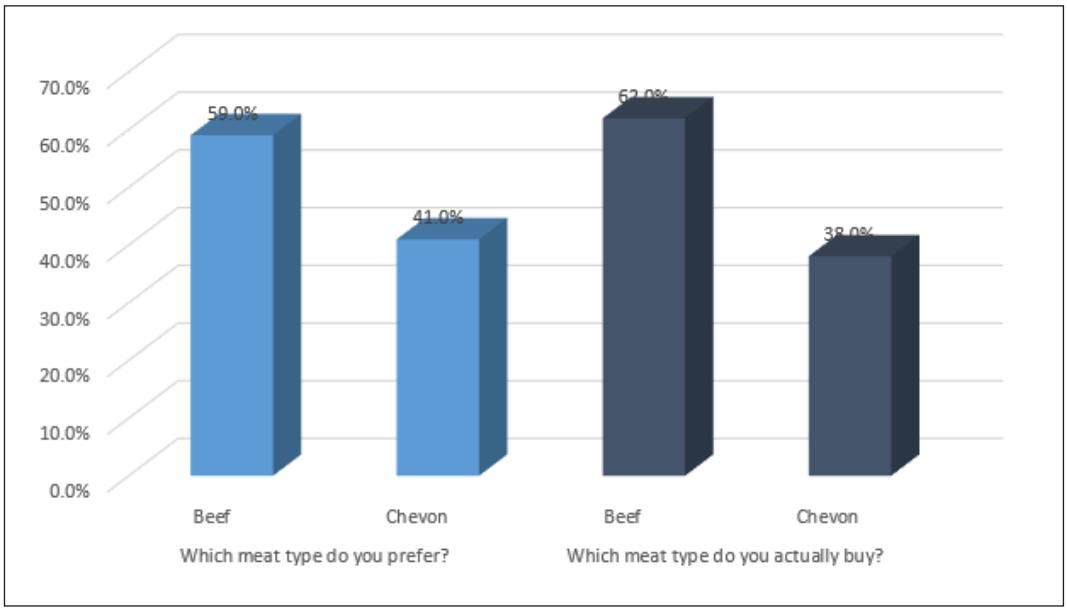

Figure 1: Meat type preference and the actual meat-type consumers usually buy
Source: Field survey, 2020

Some hygiene and animal welfare factors that affect meat preference by consumers in Northern Region

According to majority (59.3%) of the respondents, the way the animal and its product is produced affects their meat (beef and chevon) preference. Most (92.4%) of the respondents indicated that the hygienic conditions of slaughter slabs influenced their meat preference (Table 3). The health status of the animal before slaughtering influenced meat preference as indicated by 91.5% of the respondents. Most meat related bacteria outbreaks are generally associated with contamination along the meat production chain (Chepkemoi et al., 2015). The consumers in this study seem to be conscious of getting infected through the consumption of unwholesome meat, hence the influence of the hygienic condition of the slaughter house on meat preference.

The quality and hygiene of animal feed and water used affected meat preference as confirmed by 84.1% of the respondents (Table 4). With regards to animal housing, the quality of housing for animals and level of exposure to hazardous substances affected 67.6% of respondents' meat preference and cleaning and disinfection of the animal housing premises had an impact on meat preference per 73.4% of the study respondents. The age of the animal (very young or old) influenced the respondents (54.1%) in terms of their meat preference. According to 71.7% of the respondents,' the breed of the animal influenced their meat preference (Table 3). Antje and Ulrich (2017) found that the choice for beef was highly influenced by enhanced husbandry conditions within some cities in Germany. The findings, though preliminary is pointing to a gradual appreciation of animal welfare conditions

Table 2: Reasons for meat-type preference or meat-type consumers usually buy

		Frequency (n = 410)	Percentage (100.0%)
Reasons for meat preference			
Price is a related reason	No	233	56.8%
	Yes	177	43.2%
Quality of meat	No	39	9.5%
	Yes	371	90.5%
Reasonable quantity	No	161	39.3%
	Yes	249	60.7%
Taste related reason	No	48	11.7%
	Yes	362	88.3%
Religious beliefs	No	311	75.9%
	Yes	99	24.1%
Reasons for buying type of meat			
Price related reason	No	232	56.6%
	Yes	178	43.4%
Reasonable quantity	No	169	41.2%
	Yes	241	58.8%
More nutritious	No	76	18.5%
	Yes	334	81.5%
Availability	No	74	18.0%
	Yes	336	82.0%
Taste related	No	56	13.7%
	Yes	354	86.3%
Religious beliefs	No	319	77.8%
	Yes	91	22.2%

Source: Field survey, 2020

Table 3: Some animal welfare practices and meat preference

		Frequency (n = 410)	Percentage (100.0%)
Does the way the animal is produced affect your meat (beef and chevon) preference?	No	167	40.7%
	Yes	243	59.3%
Welfare reason for meat preference			
The quality and hygiene of animal feeds or watering used	No	65	15.9%
	Yes	345	84.1%
Type or method of drugs used for managing animal	No	162	39.5%
	Yes	248	60.5%
The quality of housing for animal and level of exposure to hazardous substances	No	133	32.4%
	Yes	277	67.6%
Cleaning and disinfection of the animal housing premises	No	109	26.6%
	Yes	301	73.4%
Health state of the animal before slaughter.	No	35	8.5%
	Yes	375	91.5%
Hygienic conditions of slaughter slabs	No	31	7.6%
	Yes	379	92.4%
Quality or environment of butchering	No	37	9.0%
	Yes	373	91.0%
The breed of animals slaughtered	No	116	28.3%
	Yes	294	71.7%
Very old animals slaughtered	No	188	45.9%
	Yes	222	54.1%
The very young animal slaughtered	No	188	45.9%
	Yes	222	54.1%

Source: Field survey, 2020

Table 4: Animal housing and salughter house conditions associated with meat preference by consumers in Northern Region

		Which meat type do you prefer			
		Beef	Chevon	X^2	P-value
The quality and hygiene of animal feeds or watering used	No	30	35	5.291	**.021**
	Yes	212	133		
Type or method of drugs used for managing animal	No	94	68	.111	.739
	Yes	148	100		
The quality of housing for animal and level of exposure to hazardous substances	No	79	54	.011	.915
	Yes	163	114		
Cleaning and disinfection of the animal housing premises	No	61	48	.575	.448
	Yes	181	120		
Health state of the animal before slaughter	No	23	12	.708	.400
	Yes	219	156		
Hygienic conditions of slaughter slabs	No	20	11	.418	.518
	Yes	222	157		
Quality or environment of butchering	No	23	14	.166	.684
	Yes	219	154		
The breed of animals slaughtered	No	68	48	.011	.917
	Yes	174	120		
Very old animals slaughtered	No	109	79	.157	.692
	Yes	133	89		
Very young animals slaughtered	No	113	75	.168	.682
	Yes	129	93		

Source: Field survey, 2020

such as quality of feed and water offered as well as animal health and housing conditions on meat quality amongst consumes. This conforms to the report that increasing numbers of consumers and citizens demand ethical production systems and refuse to buy products that do not meet their animal welfare concerns (Broom, 2019). This gradual change in attitude of consumers could enhance animal farm management practices within the traditional farming systems in Ghana and pave way for international acceptability of meat produced from the country.

Sociocultural factors that affect meat preference by consumers in Northern Region

Chi-square analysis was used to identify socioeconomic factors associated with meat (beef and chevon) preference. Two factors identified to be associated with meat preference were: age group of the respondents (X^2 (3, 410) = 20.112, P ≤ 0.001) and marital status (X^2 (3, 410) = 15.491, P ≤ 0.001). The majority (84.9%) of those within the age of 45 years and above preferred beef over chevon, but more (51.3%) of those in the age group of 35-44 years preferred chevon over beef. In terms of marital status, most (92.9%) of those divorced preferred beef to chevon, and more (60.0%) of those in co-habitation relationship preferred chevon to beef. Most married respondents (64%) also preferred beef over chevon. However, the remaining socio-economic factors such as sex, educational level, religious affiliation, residence, occupation, family size, and average monthly income were not significantly associated with meat preference (meat or chevon) (P > 0.05) (Table 4). From the chi-square analysis, quality and hygiene of animal feeds or water used (X^2(2, 410) = 5.291, P = 0.021) significantly influenced meat preference. The remaining factors were not significantly associated with meat preference (beef or chevon) (P > 0.05) (Table 5).

Factors that predicted meat (beef or chevon) preference among respondents

At the two variable analysis stage, the variables found to be significant were further modelled with binary logistics regression to predict meat preference (Table 6). Age of the respondent predicted meat preference with those within the age group of 35 – 44 years more likely (5.8 times) to prefer chevon to beef, as compared to those within the age group of 24 years and below (AOR = 5.83, 95, C.I. = 2.22 – 15.29). Another predictor of meat preference this study identified was marital status, single respondents were more likely (100%) to prefer chevon than beef when compared with those married (AOR = 2.07, 95%, C.I. = 1.11 – 3.86) (Table 6). Also, the religion of the respondents predicted meat preference with traditional religious belief more likely (3.3 times) to prefer chevon over beef as compared to those from Islamic religious belief (AOR = 3.3, 95, C.I. = 1.23 – 8.91).

Conclusion and recommendation

Most of the respondents indicated that their preferred meat type is beef. The purchasing pattern of meat also favored beef over chevon. Age and marital status had a significant association with meat preference. Husbandry practices such as quality and hygiene of animal feeds or watering influenced the preference as well. Respondents within the age group of 35 – 44 years were more likely to prefer chevon to beef compared to those below age 24 years whilst single respondents were more likely to prefer chevon to beef when compared with those married.

Farmers on the basis of this study are recommended to take animal husbandry practices very serious in order for them to maintain their customers.

Table 5: Socioeconomic factors associated with meat preference by consumers

		Which meat type do you prefer				
		Beef	Chevon	X^2	df	P-value
Age group	24 years and below	44	34	20.112	3	**.000**
	25 34 years	95	65			
	35 - 44 years	58	61			
	45 years and above	45	8			
Sex	Male	151	118	2.702	1	.100
	Female	91	50			
Level of education	No education	35	18	9.026	4	.060
	Primary	14	3			
	Junior secondary	15	20			
	Senior secondary	41	26			
	Tertiary	137	101			
Religious affiliation	Islam	60	28	4.325	3	.228
	Christianity	155	117			
	Traditional	22	20			
	Other	5	3			
Marital Status	Married	140	78	15.491	3	**.001**
	Single	85	83			
	Divorce	13	1			
	Co-habitation	4	6			
Residence	Urban	66	40	3.669	2	.160
	Peri-Urban	69	63			
	Rural	107	65			
Occupation	Employed	214	137	3.812	1	.051
	Unemployed	28	31			
Family size	1-3	96	77	2.623	2	.269
	4-7	93	64			
	8 and above	53	27			
Average monthly income	Less than 500	64	61	5.580	3	.134
	501 - 1000 GH	62	41			
	1001 - 2000 GH	70	44			
	2001 GH and above	46	22			

Source: Field survey, 2020

Table 6: Socio cultural factors that predicted meat (beef or chevon) preference among respondents

	SE	Wald	P-value	AOR	95% C.I. for AOR	
					Lower	Upper
24 years and below		**Ref**	.000			
25 – 34 years	.417	3.743	.053	2.240	.990	5.069
35 – 44 years	.492	12.855	**.000**	**5.831**	**2.224**	**15.286**
45 years and above	.596	.074	.785	.850	.264	2.733
Sex (Male Female)	.254	1.756	.185	.714	.434	1.175
No education		**Ref**	.460			
Primary	.772	.013	.910	.917	.202	4.161
Junior secondary	.563	3.184	.074	2.730	.906	8.228
Senior secondary	.509	.681	.409	1.522	.561	4.132
Tertiary	.433	.721	.396	1.444	.618	3.373
Islam		**Ref**	.119			
Christianity	.289	.841	.359	1.304	.739	2.300
Traditional	.506	5.573	**.018**	**3.303**	**1.225**	**8.907**
Other	1.025	.944	.331	2.708	.363	20.207
Married		**Ref**	.024			
Single	.318	5.270	**.022**	**2.073**	**1.113**	**3.864**
Divorced	1.107	2.526	.112	.172	.020	1.507
Co-habitation	.762	1.156	.282	2.270	.510	10.110
Urban		**Ref**	.701			
Peri-Urban	.304	.051	.821	1.071	.590	1.946
Rural	.295	.262	.609	.860	.482	1.534
Occupation (Employed/Unemployed)	.425	1.300	.254	1.623	.706	3.733
Less than GH¢500		**Ref**	.528			
GH¢501 – GH¢1000	.319	.289	.591	.843	.451	1.573
GH¢1001 – GH¢2000	.361	1.142	.285	.680	.335	1.380
GH¢2001 and above	.429	2.094	.148	.538	.232	1.246
The quality and hygiene of animal feeds or watering used (yes/no)	.299	3.147	.076	.588	.327	1.057

The model predicted for chevon over beef (S.E. = Standard Error, AOR = Adjusted Odds Ratio, C.I. = Confidence Interval).
Source: Field survey, 2020

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