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Factors influencing consumer willingness to pay for rabbit meat in the Daveyton and Etwatwa areas of Gauteng province, South Africa

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ABSTRACT

The purpose of the study was to determine the price point at which customers in the study locations are willing to pay for rabbit meat. The data was gathered by administering a semi-structured questionnaire through face-to-face interviews with a randomly selected sample of 382 respondents. The acquired data was analyzed using the Statistical Package for Social Science (SPSS), specifically version 28.0. The researchers utilized the contingent valuation approach to ascertain the consumers' willingness to pay (WTP). The results showed that 83% of the respondents were prepared to pay for rabbit meat if their local meat outlet introduced it. About 43.7% of the respondents rejected the initial bid of R45/kg but accepted the discounted bids; 21% of the respondents accepted both the initial and discounted bids; 16.5% of the respondents only accepted the initial bid; and 18.6% of the respondents rejected both the initial and discounted bids. Furthermore, the results revealed that as monthly income increases, so does the respondents' willingness to pay for rabbit meat. Although respondents showed interest in the purchasing and consumption of rabbit meat, they were not willing to buy the meat at a price of more than R40/kg. This indicates that when the seller introduces the meat to the local meat market in the study areas, they should be price-conscious.

Contribution/ Originality: This study examines the factors influencing consumers' willingness to pay for rabbit meat by employing the contingent valuation method. Similar research has not been conducted in the study area. The study contributes to strategic planning of rabbit meat consumers' markets by estimating the market potential of rabbit meat and prices that consumers are willing to pay for rabbit meat.

1. INTRODUCTION

Consumers are always looking for novelty and variety on the shelves. Hence, many farmers across the globe are involved in producing crops and livestock to meet the dietary needs of humans. Meat consumption forms part of a habitual diet for many consumers, both in developed and developing countries (McAfee et al., 2010). According to Food and Agricultural Organization (FAO) (2014) the most consumed meat types in South Africa are chicken, beef, and pork. South Africans mostly consume meat types such as chicken, beef, and pork. Despite the high nutritional composition of rabbit meat, rabbit meat is not yet a popular substitute for chicken, beef, and pork in other parts of the country. Meat production statistics indicate that South Africa produced about 3.3 million tons of meat in 2016, with 51.4% being chicken, 36% beef, 7.3% pork, and 5.7% mutton (National Agricultural Marketing Council (NAMC),

2017). Consumers have started associating red meat and red meat products with a more negative image (McAfee et al., 2010). This is mainly due to their high content of fat, saturated fatty acids, cholesterol, sodium, and nitrite, which have been associated with an increased risk of developing chronic diseases like obesity, cardiovascular disease, diabetes, and high blood pressure when consumed in large proportions (Wolk, 2017). Rabbit meat has been recommended as a good source of protein, which can alleviate animal protein inadequacies in developing countries (Jabir et al., 2014). Furthermore, Jabir et al. (2014) stated that rabbits have a high rate of reproduction, early maturity, high genetic selection potential, are disease tolerant, and require less space compared to farming with livestock such as cattle, goats, and pigs. However, the consumption of rabbit meat has not penetrated the general populace as a credible substitute for chicken, beef, and pork, which are the most consumed meat types. The rabbit meat market is niche and currently faces challenges, such as a lack of production and marketing information. Therefore, this study analyzed consumer behaviour towards the consumption of rabbit meat, focusing on the consumer's willingness to pay estimation for rabbit meat and determining the factors that influence the willingness to pay for rabbit meat.

2. MATERIAL AND METHODS

2.1. Study Area

The study was conducted in the Daveyton and Etwatwa areas of the City of Ekurhuleni Metropolitan Municipality in the Gauteng Province of the Republic of South Africa. Statistics South Africa (Stats SA) (2018) recorded Gauteng Province's population at 14.7 million in 2017. There is currently one rabbit meat producer located in Etwatwa who farms on a small scale and sells rabbit meat to residents around Daveyton and Etwatwa. There are also other small scale/backyard rabbit meat producers in the surrounding areas. The area has already established rabbit meat consumption. However, the farming operations are still at an early stage.

2.2. Sampling Procedure

The study adopted the method for determining sample size proposed by Krejcie and Morgan (1970), which is currently employed by Rahi (2017). The formula is constructed as follows:

$$s = X^2 NP(1-P) \div d^2(N-1) + X^2 P(1-P)$$

$$s = \frac{3{,}841\ (85\ 000 \times 0.5)(1-0.5)}{(0.05)^2(85\ 000-1) + 3{,}841 \times 0.5(1-0.5)}$$

$$s = \frac{81621{,}25}{213{,}45} = 382{,}39 \approx 382$$

The same sample size of 382 was obtained from the population size of 85 000. The proportionate sampling technique was further used to determine the samples for each of the two study areas. Thus:

Sample size for Daveyton = (40 000/85 000) X 382 = 180.

Sample size for Etwatwa = (45 000/85 000) X 382 = 202.

A random sampling technique was used to select the households to constitute the samples for the two respective study areas. A household list was collected from the municipality and represented on a piece of paper with numbers on it. The lottery was then used to select the 180 and 202 respondents, respectively. Primary data was collected using a semi-structured questionnaire that had both closed-ended and open-ended questions. Collected and fully completed questionnaires were coded and captured in Statistical Package for Social Science (SPSS) version 27, then analyzed.

2.3. Specified Study Model

The contingent valuation method (CVM) was used to analyse the consumers' willingness to pay for rabbit meat. This method is widely used to elicit consumers' willingness to pay for market and non-market goods (Carson, 2000). It is assumed that in a CVM survey, participants make similar choices as those that they would make in an actual market (Banti, 2011). Hence, the contingent valuation method has been applied in studies where the market is not yet

mature and the availability of the product is still limited or does not yet exist (Haab & McConnell, 2002; Organisation for Economic Cooperation and Development (OECD), 2018; Owusu, 2009).

The dichotomous choice format, which is also referred to as the closed-ended method, where respondents answer with a "yes" or "no" when asked if they are willing to pay a stated amount (bid) for a good or service (Calkins, Larue, & Vézina, 2002; Ikeuchi, Tsuji, Yoshikane, & Ikeuchi, 2013) was employed. The dichotomous choice method comprises the single-bounded dichotomous choice and the double-bounded dichotomous choice models. The single-bounded dichotomous choice model has one question where respondents are required to answer with a "yes" or "no" when asked if they would pay an offered bid to secure a particular product (Haab & McConnell, 2002). The double-bounded dichotomous choice model provides respondents with a follow-up question that specifies a lower or higher bid based on their response to the initial bid in the first question (Deely et al., 2022). The single-bounded dichotomous choice model is easy to implement (Gelo & Koch, 2015). This provides less information and implies that the researcher will require a larger sample and stronger statistical assumptions to find the true WTP, making it more expensive to conduct (Organisation for Economic Cooperation and Development (OECD), 2018).

The double-bounded dichotomous choice model has been proven to be more asymptotically efficient, produces less biased estimates, and provides more information about the participants' true WTP than the single-bounded dichotomous choice method (Hanemann, Loomis, & Kanninen, 1991). Several studies Entele (2020) and Huang and Lee (2014) have supported this. These facts led to the use of the double-bounded dichotomous choice.

As indicated, the double-bounded dichotomous choice model is an extension of the single-bounded dichotomous choice model. Following Haab and McConnell (2002), to estimate the double bounded data, the econometric model for the double-bounded data is given as:

$$WTP_{ij} = \mu_j + \varepsilon_{ij}$$

Where WTP_{ij} is the i^{th} respondent's willingness to pay; $j = 1,2$ denotes the first and second answer to the first and second bids; μ_1 and μ_2 are the mean for the first and the second answer and ε_{ij} is the error term. It is assumed that μ_i is dependent on the respondent's characteristic such that, $\mu_{ij} = X_i'\beta_i$ (Haab & McConnell, 2002). The relationship between the i^{th} respondent WTP and the explanatory variables can be rewritten as:

$$WTP_{ij} = X_{ij}'\beta_i + \varepsilon_{ij}$$

Where X_i' the vector of exogenous variables is, β_i is the vector of coefficients and ε_{ij} is the error term.

In a double-bounded dichotomous choice model, a respondent i is requested to state their willingness to pay for a product by providing a *"yes"* or "*no*" answer (where $1 = yes$ and $0 = no$) to a first bid and a follow-up bid, where yes means willing to pay and no means not willing to pay. With reference to Hanemann et al. (1991) suppose B_i denotes the first bid, B_i^P represents the second higher (premium) bid and B_i^D represents the second lower (discount) bid, if the participant accepts to purchase rabbit meat at the first bid and responds with a *"yes"*, then the second bid will be higher than the first bid ($B_i^P > B_i$) and if the participant rejects the first bid and responds with a "*no*", then the second bid will be lower than the first bid ($B_i^D < B_i$). Each respondent's answer falls into one of the four possible outcomes, "yes-yes", "no-yes", "no-no" and "yes-no".

According to Haab and McConnell (2002) this implies that if a respondent says "yes" to the initial bid and "yes" to the follow-up bid, then their maximum $WTP \geq B_i^P$. If the respondent says "no" to the initial bid but "yes" to the follow-up bid, then $B_i > maxWTP \geq B_i^D$. If the answer to the initial bid is "yes" but "no" to the follow-up bid, then $B_i \leq maxWTP < B_i^P$ and if the respondent rejects both the initial and follow-up bid, then their maximum $WTP < B_i^D$.

The response probabilities for the i^{th} respondents are denoted as $\pi^{yy}, \pi^{ny}, \pi^{nn}$ and π^{yn}. Following Hanemann et al. (1991) the likelihood of these four outcomes becomes:

$$\pi^{yy}(B_i, B_i^P) = \Pr(B_i^P \leq maxWTP_i) = 1 - G(B_i^P; \theta) \text{ For yes-yes response.}$$

$$\pi^{ny}(B_i, B_i^D) = \Pr(B_i \geq maxWTP_i \geq B_i^D) = G(B_i; \theta) - G(B_i^D; \theta) \text{ For no-yes response.}$$

$$\pi^{nn}(B_i, B_i^D) = \Pr(B_i > maxWTP_i > B_i^D) = G(B_i^D; \theta) \text{ For no-no response.}$$

$$\pi^{yn}(B_i, B_i^P) = \Pr(B_i \leq maxWTP_i \leq B_i^P) = G(B_i^P;\theta) - G(B_i;\theta) \quad \text{For yes-no response.}$$

Where $B_i$the first is bid, B_i^P is the second higher bid (premium) and B_i^D is the second lower bid (discount). The maximum willingness to pay for the i^{th} individual is represented by WTP_i. The symbol $G(B;\theta)$ denotes the standard normal cumulative distribution function (cdf) with parameterθ. To this study, cdf is assumed to be logistically distributed.

Given N respondents, the likelihood function to the i^{th} respondent is obtained by combining the four probabilities:

$$\ln L(\theta) = \sum_{i=1}^{N}\{ d^{yy} \ln \pi^{yy}(B_i, B_i^P) + d^{ny} \ln \pi^{ny}(B_i, B_i^D) + d^{nn} \ln \pi^{nn}(B_i, B_i^D) + d^{yn} \ln \pi^{yn}(B_i, B_i^P) \}.$$

Where d^{yy}, d^{ny}, d^{nn} and d^{yn} are binary variables such that d^{yy}=1 if the answer is yes-yes and 0 otherwise; d^{ny}=1 if the answer is no-yes 0 otherwise; d^{nn}=1 if the answer is no-no and d^{yn}=1 for a yes-no answer 0 otherwise. B_i is the first bid, B_i^P is the second higher bid (premium) and B_i^D is the second lower bid (discount).

Furthermore, linear regression was used as an analysis model to determine the factors that affect consumer willingness to pay for rabbit meat. Probit model was used to analyse the relationship between the dependent and explanatory variables. The factors affecting consumer's willingness to pay for rabbit meat will be estimated as:

$$Y_i^* = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n + \varepsilon_i.$$

Where Y_i^* is the dependent variable which is WTP for rabbit meat

β_0 a constant term

β_1 to β_n are the coefficient vectors

X_1 to X_n are the vectors of explanatory variables

ε_i is the error term

The model expression was: $WTP = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \varepsilon$.

3. RESSULTS AND DISCUSSION

3.1. Distribution of Consumers Who Are Willing and Not Willing to Pay for Rabbit Meat

Figure 1 shows the distribution of respondents who are willing and not willing to pay for rabbit meat following a general willingness to pay question that was asked before commencing with the bidding process. The health benefits of rabbit meat were explained to the respondents. Following this question, respondents were then asked if they would be willing to pay for rabbit meat should it be introduced in their local meat markets (grocery shops and butcheries). Overall, 83% of the respondents indicated that they would be willing to pay for rabbit meat, and only 17% indicated that they would not buy it. The results are comparable to the findings by Jaramillo-Villanueva, Lopez, de Dios, and Rodriguez (2015), who found that 47.5% of respondents indicated that they were not willing to pay a premium for rabbit meat, while 52.5% reported that they were willing to pay a premium.

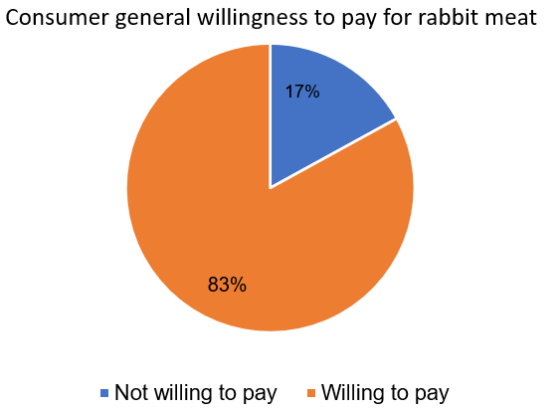

Figure 1. Participants' general willingness to pay (n = 382).

Table 1 shows the frequency with which people are willing to pay for rabbit meat. The highest frequency was for the no-yes responses, where respondents rejected the initial bid but accepted the discounted follow-up bids. This response accounted for 43.7% of the population. Next in line was the yes-yes category. In this category, 21.2% of the respondents accepted the initial bid and the follow-up premium bid. Respondents who said no to the initial bid and no to the follow-up bids (no-no category) accounted for 18.6% of the population, while only 16.5% fall under the yes-no category, where they responded yes to the initial bid but no to the follow-up bid.

Table 1. Frequency of willingness to pay for rabbit meat.

Response category	Percentage	Frequency
Yes-Yes	21.20%	81
Yes-No	16.50%	63
No-Yes	43.70%	167
No-No	18.60%	71
Total	100.0	382

The initial bid was R45/kg. Respondents were then asked if they would be willing to pay for rabbit meat with the initial bid. If the answer was "yes," then a follow-up higher bid was offered. The premium/higher bids were increments of 10%, 20%, 30%, 40%, and 50%. The highest yes answer was reported as the maximum amount the respondent was willing to pay. If the answer to the initial bid was "no", then the initial bid was discounted by 10%, 20%, 30%, 40%, and 50%. Similarly, if the answer to the initial bid was "yes", then the initial bid was increased by 10%, 20%, 30%, 40%, and 50%.

Table 2 shows the distribution of "yes" responses to consumers' initial bids towards various premium levels. About 33.2% of the respondents answered "yes" to the initial bid. The highest premium that respondents were willing to pay was at 10% (R50/kg) for rabbit meat, of which 71.3% of the respondents were willing to pay. When offered a 20% premium (R54/kg), 31.1% of the respondents accepted the bid, while at a 30% (R59/kg) and 40% (R63/kg) premium, 13.3% and 22.5% were willing to pay, respectively. At the highest premium of 50% (R68/kg), only 7.3% of the respondents were willing to pay. The probability of saying yes to the follow-up bid decreases as the price increases in the follow-up question. Similar results were reported in a study by Makweya and Oluwatayo (2018) on consumers' willingness to pay for graded beef. According to a study by Yormirzoev, Li, and Teuber (2021) on the willingness to pay for milk, 67% of the respondents said yes to paying a premium for organic milk, and 68% said yes to paying a premium for all-natural milk. However, for organic milk and natural milk, the probability of saying yes to the initial bid also decreases as the price increases.

Table 2. Distribution of respondents' "yes" to the initial bid.

WTP options	10%	20%	30%	40%	50%	Total
	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)
Premium						
Yes	87 (71.3)	17 (31.1)	4 (13.3)	9 (22.5)	10 (7.3)	127 (33.2)
No	35 (28.7)	36 (67.9)	26 (86.7)	31 (77.7)	127 (92.7)	255 (66.8)

Table 3 demonstrates that different percentages offered price discounts on the initial bid to respondents who declined the initial bid in the follow-up questions. More than two-thirds (66.2%) of the respondents accepted the discounted follow-up bids. When offered a 10% discount (R41/kg), 27% of the respondents accepted the bid. At a discount of 20% (R36/kg), about 67.9% were willing to pay. Respondents who said yes to the 30% discount (R32/kg) accounted for 86.7%. About 77.5% indicated that they were willing to pay for rabbit meat at a 40% discount (R27/kg). The majority of the respondents, 92.7%, agreed that they would purchase rabbit meat at a 50% discount (R23/kg). A study by Makweya and Oluwatayo (2018) also reported similar patterns among respondents. As discounted bids were

presented, about 33.3% of respondents who were offered a discount of 5% for quality beef were willing to pay, and when offered a 25% discount, 100% of the respondents were willing to pay.

Table 3. Distribution of respondents' "no" to the initial bid.

WTP options	10%	20%	30%	40%	50%	Total
	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)
Discount						
Yes	33 (27.0)	36 (67.9)	26 (86.7)	31 (77.5)	127 (92.7)	253 (66.2)
No	89 (73.0)	17 (32.1)	4 (13.3)	9 (22.5)	10 (7.3)	129 (33.8)

To estimate consumer willingness to pay for rabbit meat, the study further employed the double-bounded logit model to estimate the mean WTP. The approach used was adopted from Lopez-Feldman (2012), in which WTP is first estimated without including the explanatory variables. In this case, the WTP is simply a constant.

Table 4 presents the mean WTP estimates for both Daveyton and Etwatwa without explanatory variables. In these areas, there was no significant difference between the mean WTP for rabbit meat. In Daveyton, respondents were willing to pay R38.45/kg for rabbit meat, while in Etwatwa, respondents were willing to pay R1.95/kg more (R40.54/kg). For this study, the overall WTP was equivalent to R40.00/kg. Results show that respondents would be willing to pay R5.00/kg less than the initial amount.

Table 4. Mean WTP for rabbit meat without explanatory variables.

Study area	WTP (R)	Std. err.	Z	P>z
Daveyton	38.45	1.428	26.93	0.000***
Etwatwa	40.56	1.144	35.47	0.000***
Pooled WTP	39.60	0.9008	43.96	0.000***

Note: *** represent significant levels at 10% respectively.

The mean WTP for rabbit meat with explanatory variables for Daveyton, Etwatwa, and the mean WTP for the full model are illustrated in Table 5. Even after including explanatory variables, the overall mean WTP did not change significantly. There is a R0.64 difference between the overall mean WTP without explanatory variables and the overall WTP mean with explanatory variables. Similarly, for Etwatwa, the mean WTP with explanatory variables and without explanatory variables did not vary much, with only a R0.43 difference. For Daveyton, compared with the mean WTP without explanatory variables, the difference between the WTP means was only R1, 75.

Table 5. Mean WTP for rabbit meat in the study areas with explanatory variables.

Study area	WTP (R)	Std. err.	Z	P>z
Daveyton	36.70`	2.738	13.41	0.000***
Etwatwa	40.99	2.377	17.25	0.000***
Pooled WTP	38.96	1.778	21.92	0.000***

Note: *** represent significant levels at 10% respectively.

The results on mean WTP with and without explanatory variables show that consumers are willing to pay for rabbit meat, but only at a discount. This is no surprise, as most of the respondents selected discounted prices for purchasing rabbit meat.

This could also be due to the lack of consumption experience among the respondents. Similarly, Munthali (2013) found that the WTP mean of MK 358.41 was lower than the initial bid of MK 380.00, which was used to assess farmers' willingness to pay for improved common bean varieties in Kasungu and Dedza districts, Malawi.

Table 6. Factors influencing consumer willingness to pay for rabbit meat.

Variable	Coef.	Std. err.	t-stats
Area	0.5959	0.4095	1.46
Household size (No.)	-0.0959	0.1273	-0.75
Gender (1 female, 0 otherwise)	-0.1197	0.4327	-0.28
Age (Years)	0.0009	0.4327	0.05
Marital status (1 married, 0 otherwise)	-0.2362	0.4663	-0.51
Education (1 matric and above,0 below matric)	-0.1328	0.5311	-0.25
Employment (1 employed, 0 unemployed)	0.7728	0.5311	1.16
Religion (1 none, 0 some religion)	-0.2238	0.4217	-0.53
Monthly income (1 less than R5000, 0 from R5001 and above)	-1.1148	0.4038	-2.76***
Meat purchasing responsibility (1 yes, 0 otherwise)	0.5056	0.5490	0.92
Frequency of meat purchasing per month (No.)	0.0377	0.2724	0.14
Amount spent on meat per month (No.)	0.0008	0.4217	1.09
Awareness of rabbit meat (1 aware, 0 not aware)	0.4774	0.5050	0.95
Awareness of rabbit meat health and nutritional attribute (1 aware, 0 unaware)	1.2795	0.5535	2.17**
Past rabbit meat consumption (1 yes, 0 otherwise)	3.4561	0.5535	6.24***
Monthly consumption expectation (1 once a month, 0 otherwise)	2.5385	1.1727	2.16**
Monthly purchasing expectation (1 once a month, 0 otherwise)	1.2689	0.8467	1.5
Constant	1.5	1.6797	-1.56

Note: *, **, *** represent significant levels at 10%, 5% and 1% respectively.
n=382 Prob > chi2 = 0.0000 Log likelihood = -76.559 Waldchi^2 =77.49 df=17.

According to Jaramillo-Villanueva et al. (2015), one of the most significant aspects of product expectations is nutritional information. Health and nutritional awareness of rabbit meat were found to be positive and statistically significant at a 5% level of significance. The results in Table 6 suggest that respondents who are aware of the health and nutritional benefits of rabbit meat are willing to pay for the meat.

Past rabbit meat consumption was significant at the 1% level of significance and had a positive influence on WTP. This implies that previous consumption experience with rabbit meat increases the likelihood of consumer WTP. Similarly, the variable on monthly consumption expectation of rabbit meat was also positive and significant at the 5% level of significance, suggesting that consumers who expressed a desire to consume rabbit meat at least once a month were willing to pay for the rabbit meat. Previous rabbit meat consumption experiences have a positive influence on future consumption (Hoffman, Nkhabutlane, Schutte, & Vosloo, 2004).

Socio-demographic characteristics such as age, gender, education, and household size were not significant in explaining consumer willingness to pay for rabbit meat. Jaramillo-Villanueva et al. (2015) reported similar findings and did not find any influence of gender, age, or family size on WTP. A study by Udomkun et al. (2018) reported that only living area, gender, and age were significant, and factors such as education level and household size did not have any influence on WTP.

4. CONCLUSION

The study concludes that although consumers showed interest in purchasing rabbit meat, they are not willing to buy the meat at a price of more than R40/kg. The findings in this study further revealed that respondents' increase in monthly income did not increase their willingness to pay for rabbit meat. This was expected, as most of the respondents chose discounted bids. This indicates that when introducing the meat to the local meat outlets in the study areas, producers and suppliers must be price-conscious. The majority of consumers have previously consumed rabbit meat, which facilitates its introduction into the areas due to the respondents' familiarity with its consumption. Potential producers and distributors can capitalize on consumers' awareness of rabbit meat's health attributes, past consumption of rabbit meat, and future consumption of rabbit meat.

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Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
Data Availability Statement: Upon a reasonable request, the supporting data of this study can be provided by the corresponding author.
Competing Interests: The authors declare that they have no competing interests.
Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

REFERENCES

Banti, Y. (2011). *The value of impoved water supply service in Motta Town, East Gojiam, Ethiopia: Application of contingent valuation method*. Master's Thesis, Addis Ababa University, Ethiopia.

Calkins, P., Larue, B., & Vézina, M. (2002). Willingness to pay for drinking water in the Sahara: The case of Douentza in Mali. *Cahiers d'Economie et Sociologie Rurales*, *64*(905-2016-70124), 37-56. https://doi.org/10.3406/reae.2002.1689

Carson, R. T. (2000). Contingent valuation: A user's guide. *Environmental Science and Technology*, *34*(8), 1413-1418.

Deely, J., Hynes, S., J., B., Burgess, D., Álvarez-Martínez, J. M., Silió, A., & Finney, G. (2022). Are consumers willing to pay for beef that has been produced without the use of uncontrolled burning methods? A contingent valuation study in North-West Spain. *Economic Analysis and Policy*, *75*, 577-590. https://doi.org/10.1016/j.eap.2022.06.014

Entele, B. R. (2020). Analysis of households' willingness to pay for a renewable source of electricity service connection: Evidence from a double-bounded dichotomous choice survey in rural Ethiopia. *Heliyon*, *6*(2), e03332. https://doi.org/10.1016/j.heliyon.2020.e03332

Food and Agricultural Organization (FAO). (2014). *Sources of meat*. Retrieved from www.fao.org/ag/againfo/themes/en/meat/backgr_sources.html

Gelo, D., & Koch, F. S. (2015). Contingent valuation of community forestry programs in Ethiopia: Controlling for preference anomalies in double-bounded CVM. *Ecological Economics*, *114*, 79-89. https://doi.org/10.1016/j.ecolecon.2015.03.014

Haab, T. C., & McConnell, K. E. (2002). *Valuing environmental and natural resources: The econometrics of non-market valuation*. United Kingdom: Edward Elgar Publishing.

Hanemann, M., Loomis, J., & Kanninen, B. (1991). Statistical efficiency of double- bounded dichotomous choice of contingent valuation. *American Journal of Agricultural Economics*, *73*(4), 1255-1263. https://doi.org/10.2307/1242453

Hoffman, L. C., Nkhabutlane, P., Schutte, D. W., & Vosloo, C. (2004). Factors affecting the purchasing of rabbit meat: A study of ethnic groups in the Western Cape. *Journal of Consumer Science*, *32*(1), 26-34. https://doi.org/10.4314/jfecs.v32i1.52850

Huang, C. H., & Lee, C. H. (2014). Consumer willingness to pay for organic fresh milk in Taiwan. *China Agricultural Economics Review*, *6*(2), 198–211. https://doi.org/10.1108/caer-04-2012-0033

Ikeuchi, A., Tsuji, K., Yoshikane, F., & Ikeuchi, U. (2013). Double-bounded dichotomous choice CVM for public library services in Japan. *Procedia - Social and Behavioural Sciences*, *73*(27), 205–208. https://doi.org/10.1016/j.sbspro.2013.02.042

Jabir, M., Alli-Balogum, J. K., Jibrila, I., Garba, S., Ribah, M. J., & Isa, A. M. (2014). *Preference studies on rabbit meat products: A consumer approach*. Paper presented at the Proceedings 39th Conference Paper. Nigeria Society for Animal Production. 16-19 March 2014. Babcork University, Ogun State Nigeria.

Jaramillo-Villanueva, J. L., Lopez, S. V., de Dios, J., & Rodriguez, G. (2015). Behaviour of consumers and willingness to pay for quality attributes of organic meat rabbit. *Revista Mexicana de Gencia Pecuarias*, *6*(1), 221-232.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, *30*(3), 607-610. https://doi.org/10.1177/001316447003000308

Lopez-Feldman, A. (2012). *Introduction to contingent valuation using Stata*. *MPRA*. Retrieved from https://mpra.ub.uni-muenchen.de/41018/2/MPRA

Makweya, L., & Oluwatayo, I. (2018). *Consumer's preference and willingness to pay for graded beef in Polokwane Municipality, South Africa*. Paper presented at the 56th Annual Conference of the Agriculture Economics Association of South Africa, 25-27 September 2018. Somerset West, South Africa.

McAfee, A. J., McSorley, E. M., Cuskelly, G. J., Moss, B. W., Wallace, J. M. W., Bonhham, M. P., & Fearon, A. M. (2010). Red meat consumption: An overview of the risks and benefits. *Meat Science*, *84*(1), 1-13. https://doi.org/10.1016/j.meatsci.2009.08.029

Munthali, G. T. (2013). *Assessing farmer's willingness to pay for improved common bean seed varieties in Malawi: A case study of Kasungu and Dedza Districts*. Master's Thesis. University of Pretoria, South Africa.

National Agricultural Marketing Council (NAMC). (2017). *A trade review of the South African meat industry trade probe*. Retrieved from https://www.namc.co.za/wp-content/uploads/2018/02/DAFF-NAMC-TradeProbe-Issue-No-70-August-2017.pdf. [Accessed 08-10-2022]

Organisation for Economic Cooperation and Development (OECD). (2018). *Cost-benefit analysis and the environment: Further developments and policy use*. Paris: OECD Publishing.

Owusu, M. A. (2009). *The assessment of market potential and marketing prospects of organic fruits and vegetables in Kumasi metropolis of Ghana*. Master's Thesis University of Science and Technology, Kumasi, Ghana.

Rahi, S. (2017). Research design and methods: A systematic review of research paradigms, sampling issues and instruments development. *International Journal of Economics & Management Sciences*, *6*(2), 1-5. https://doi.org/10.4172/2162-6359.1000403

Statistics South Africa (Stats SA). (2018). *Mid-year population estimates*. Retrieved from https://www.statssa.gov.za/publications/P0302/P03022017.pdf. [Accessed 01-11-2023]

Udomkun, P., Ilukor, J., Mockshell, J., Mujawamariya, G., Okafor, C., Bullock, R., . . . Vanlauwe, B. (2018). What are the key factors influencing consumers' preference and willingness to pay for meat products in Eastern DRC? *Food Science & Nutrition*, *6*(8), 2321-2336. https://doi.org/10.1002/fsn3.813

Wolk, A. (2017). Potential health hazards of eating red meat. *Journal of Internal Medicine*, *281*(2), 106-122. https://doi.org/10.1111/joim.12543

Yormirzoev, M., Li, T., & Teuber, R. (2021). Consumers' willingness to pay for organic versus all-natural milk–Does certification make a difference? *International Journal of Consumer Studies*, *45*(5), 1020-1029. https://doi.org/10.1111/ijcs.12622