

# SOUTH AFRICAN CONSUMER ATTITUDES UNDERLYING THE CHOICE TO CONSUME GAME MEAT

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## ABSTRACT

Currently little is known about the South African game meat consumer market or the underlying attributes driving the choice to consume game meat, limiting the game meat industry's market positioning, growth and ultimately its contribution to food security and economic growth. The study explored attitudes of 1081 consumers through an online survey and structural equation modelling,

to determine which game meat attributes were the strongest predictors of the choice to consume game meat. Health benefits and production ethics have the strongest direct relationship with the choice to consume game meat. Availability indicated a moderate and price a weak direct relationship whereas safety had no significant relationship with the choice to consume game meat. Future game meat marketing campaigns may need to emphasise health benefits and production ethics of game meat to stimulate the consumer market in South Africa. The findings from this study will benefit the game meat industry and advance SDG 2 to improve food security and address zero hunger in South Africa. Implementing the recommendations from this study may change consumers' approach to game meat which will also bring about economic change in South Africa.

**Keywords:**

Health benefits; production ethics; food safety; availability; price; decision-making, Sustainable development goals

**1. Introduction**

The United Nations (UN) Sustainable Development Goals (SDGs) aim towards the elimination of malnutrition, promotion of food security, sustainable economic growth and productive employment while combating the impact of climate change (United Nations, 2021). The advancement of the production and consumption of game meat in South Africa may provide an alternative food source through which hunger can be alleviated and thus aid in advancing zero hunger (SDG2). The game meat industry in South Africa has the potential to grow the economy and therefore contribute to poverty alleviation (SDG1) by extending protein production into the game meat sector and as a result job creation can be advanced that may indirectly impact on food security (Needham, Kotrba, Hoffman & Bures, 2020; South Africa. The Presidency, 2018; Lindsey, 2012). It is estimated that a well-established local game meat industry could create 2 653 direct employment opportunities by 2030 and a further 10 612 indirect job opportunities in supporting industries (Alsson Network, 2021a). Thus, the urgency to grow the South African game meat industry has never been more urgent as South Africa is in need to address unemployment, food security and economic growth if these SDGs are to be advanced.

Urbanisation has resulted in changing consumer consumption patterns and an upsurge in animal protein demand in South Africa (BFAP Baseline, 2021; Kotze & Rose, 2015). Continuous population growth has further resulted in persistent concerns about the ability of Sub-Saharan

Africa to provide sufficient animal protein sources to address food security (UNDESA, 2021; Webb, 2013). By 2020, 66.2% of the Sub-Sahara African population were facing food insecurity (United Nations, 2021). Additionally, erratic climate phenomena in South Africa, such as severe, extended droughts and flooding, have a negative impact on food production, necessitating the implementation of climate-resilient food production systems (United Nations, 2021). With game being better suited than domestic livestock to breed on marginal agricultural land (Taylor, Lindsey & Davies-Mostert, 2015), the South African Department of Forestry, Fisheries and Environment has mandated the development of a national strategy to drive the growth of the game meat industry, resulting in a status quo report and the development of a national strategy for an industry-driven, government-enabled environment. Subsequently an implementation plan has been proposed to develop the industry for economic and employment growth (Alsson Network, 2021a; Alsson Network, 2021b; Alsson Network, 2021c). However, this growth may be dependent on consumer interest in consuming game meat.

Past challenges such as an unregulated supply entering the local market, inconsistent year-round supply, fluctuating prices and varying quality (Janovsky, 2015) remain relevant, causing a relative underdeveloped local game meat market (Alsson Network, 2021a). This is augmented by the unavailability of reliable game meat market data stifling the full potential of the game meat market in South Africa (Alsson Network, 2021a; Janovsky, 2015) that could stimulate investment in the game meat industry. Thus far, the greatest potential of South African game meat market has been in its international appeal. In 2019, South Africa exported game meat to the value of 12 million US dollars, ranking the country 27<sup>th</sup> globally for game meat exports, and produced 86% of the regional exports to other Southern African countries (Alsson Network, 2021a). Owing to unregulated game meat supply entering the market, it is estimated that only 8% of locally produced game meat in South Africa enter the formal retail market in South Africa (Cloete, Van der Merwe & Saayman, 2015) leaving the rest unaccounted for. Unfortunately, as South Africa is no longer free from foot-and-mouth disease, game meat exports are limited (BFAP Baseline, 2021) pointing to the vulnerability of this industry to disease outbreaks. This suggests that there is a need to establish a robust local game meat products market that could assist in advancing food security and job creation within our own borders.

Game meat is still a largely unexplored consumer market in South Africa (Alsson Network, 2021a) The question however remains as to what would attract consumers to game meat and influence their choice to consumer game meat? Very little is known about South African consumers and for that matter non-consumers of game meat and the attitudes toward the choice to consume game meat. Less is known about the attributes of game meat which significantly influence their choice

to consume it. To address this gap survey data gathered by Wassenaar (2016) was revisited and subjected to further data analysis on which this paper is based.

Recently, the apparent need for more South African consumer information, to understand consumer perceptions about game meat in terms of what consumers are willing to pay for (i.e. quality standards, green ecological certifications), consumers' willingness to pay a premium for quality game meat, as well as the main concerns about game meat and motivations for consuming game meat has been identified (Alsson Network, 2021a). Such information is required to develop products that meet the needs of South African consumers and to develop better marketing strategies that will grow the local consumer market. Given this need, the current study seeks to investigate consumers' attitudes toward game meat attributes that drive the choice to consume game meat in South Africa. In so doing, the study contributes to specific consumer-centred development and the positioning of the game meat market to address consumer needs in South Africa.

## **2. Theoretical Background**

Previous research has focused on various aspects of game meat, including carcass yield, the chemical composition, quality, physical, sensory and nutritional characteristics of Southern African game meat (Du Plessis, 2020; Malan, 2020; Needham et al., 2020; Roos, 2020; Hoffman, Mostert, Kidd & Laubscher, 2009b; Hoffman, Mostert & Laubscher, 2009a; Van den Berg, 2009; Hoffman, Smit & Muller, 2008), export, production methods, general retail and restaurant retail (Hoffman & Wiklund, 2006; Hoffman, Muller, Schutte & Crafford, 2004; Radder, 2003), consumer perceptions and knowledge of game meat (Radder & Grunert, 2009; Hoffman, Muller, Schutte, Calitz & Crafford, 2005; Radder & Le Roux, 2005) and industry compliance to food safety standards (Bekker, Hoffman & Jooste, 2011). These studies have not researched the link between attitudes and the choice to consume game meat. Since attitudes influence consumer decision-making and subsequently the choice to consume, knowledge of these attitudes is crucial to reach a better understanding of the South African consumer game meat market.

Wassenaar, Kempen and Van Eeden (2019) have developed an attitude-toward-the-object model, adapted from the Fishbein Attitude model (Fishbein and Ajzen, 1975). Their model compares attitudes of South African consumers and non-consumers of game meat toward specific attributes of game meat. The study identified attributes that contributed to a positive attitude toward game meat and found differences between the attitudes of consumers and non-consumers. While this model identifies attributes that contribute to a positive attitude toward game meat, it assumes that positive consumer attitudes lead to a high likelihood of product usage.

According to this study, sensory characteristics, health benefits, availability, price, meat safety and the production ethics of game meat contribute to the greatest differences between the attitudes of consumers and non-consumers, but it does not reveal the significance of these attitudes towards the attributes that drive the choice to consume game meat.

Attitudes influence the evaluation of alternatives during decision-making (Schiffman & Wisenblit, 2019). Consumers' product preferences are shaped through careful consideration of product features in context of consumers' needs (Kimmel, 2018; Milner & Rosenstreich, 2013). Consumer attitudes are often based on a combination of multiple attributes of the product (Clow & Baack, 2014). Attitudes have direction, intensity and motivational qualities that can propel consumers toward or repel consumers from specific behaviour (Egan, 2020; Iacobucci & Churchill, 2018), although even if positive attitudes prevail other factors could influence the final decision (McDaniel & Gates, 2020; Clow & Baack, 2014).

Literature suggests that the attributes of red meat linked to consumer decision-making include health benefits (Van Wezemael, Caputo, Nayga, Chryssochoidis & Verbeke, 2016), production ethics (Brochado, Teiga & Oliveira-Brochado, 2017; Verbeke, Pérez-Cueto, De Barcellos, Krystallis & Grunert, 2010), safety for human consumption (Niewiadomska, Kosicka-Gebaska, Gebaski, Jezewska-Zychoicz & Sulek, 2021; Wang, Zhu, Chen, Xu & Zhou, 2015), availability (Vermeulen, Schönfeldt & Pretorius, 2015) and price (Vermeulen et al., 2015). However, these attributes have not been applied where consumer-decisions are involved in the choice to consume game meat. It is also unknown which of these attributes have the most significant influence on the choice to consume game meat.

### **3. Conceptual Framework and Hypotheses Development**

In this study, "game meat" refers to the meat of antelope, gazelles and buffalo produced and harvested through extensive or semi-extensive production systems in South Africa (Wassenaar, 2016). The properties ascribed to animals and meat from these systems do not necessarily apply to those of more intensive wildlife production units (Schack, Bergh & Du Toit, 2015; Bothma, Sartorius von Bach & Cloete, 2015; Hoffman & Wiklund, 2006). Furthermore, Wassenaar (2016) determined that sensory characteristics have an important effect on game meat consumption as South African consumers' dislike of the sensory characteristics of game meat would override all other factors under consideration and thus influence the demand and selection of game meat (Radder, 2002; Radder & Le Roux, 2005). Therefore, based on the findings of Wassenaar the relationship between sensory characteristics and the choice to consume game meat is not

explored again in this study. The following hypotheses are set in relation to each of the game meat attributes.

### 3.1 *Health Benefits (HB)*

Research has shown that consumers are becoming more aware of the intrinsic health benefits of food, with protein being considered important for a healthy diet (Vecchio, Van Loo & Annunziata, 2016; BFAP Baseline, 2014). South African consumers generally regard lean red meat as high-quality meat (Vermeulen et al., 2015). The low-fat content of game meat can hold major health benefits for consumers as cardiovascular diseases annually cause the second most deaths, from non-communicable diseases, in South Africa (Heart and Stroke Foundation South Africa, 2014). Hoffman et al (2008) found the cholesterol content of blesbuck (*Damaliscus dorcas phillipsi*) relatively low in comparison to other types of meat. Du Buisson's (2006) study on the muscle differences of blesbuck and springbuck concluded that both species could be marketed as low fat organic red meat sources in comparison with domestic species such as beef, mutton, and pork. A review by Hoffman and Wiklund (2006) included healthiness as a key attribute considered important to consumers, while Hoffman and Cawthorn (2012) found that African ungulate species could contribute as valuable sources of protein. Wassenaar et al (2019) confirmed that this was the general opinion of South African consumers. The question remains whether health benefits drive South African consumers toward the actual choice to consumer game meat, whereby the following hypothesis was set:

**Hypothesis 1 (HB):** Consumer attitudes toward the **health benefits** of game meat have a significant influence on the choice to consume game meat.

### 3.2 *Availability (AV)*

According to Radder (2003), the seasonal availability of game meat was a concern among consumers in the past. Vermeulen et al. (2015) have found that availability, including purchase location, convenience, meat cut and pack size, are important considerations in South Africans' decision-making in red meat consumption. Ampt and Owen (2008) indicate that the convenience of portions available plays an important role in the adoption of venison as consumers prefer to experiment with smaller portions of meat before they purchase bulk cuts. South African retailers indicate that the consumption of game meat is heavily impacted by the lack of reliable, year-round availability (Alsson Network, 2021a). Many South Africans have access to game meat through friends or family who hunt that may also contribute to seasonality of game meat availability. It is not certain whether availability is an actual or a perceived limiting factor in the choice to consumer game meat resulting in the following hypothesis:

**Hypothesis 2 (AV):** Consumer attitudes toward the **availability** of game meat have a significant influence on the choice to consumer game meat.

### 3.3 *Price (PR)*

Affordability is an important consideration affecting South Africans' red meat consumption (Vermeulen et al., 2015). While lower prices are often preferred, price is not always the most important consideration during purchase (Font-I-Furnols & Guerrero, 2014). Consumers often associate price with quality and may assume that a low price indicates poor quality (Vermeulen et al., 2015; Ismail et al., 2012). However, Rekhy and McConchie (2014) have found that while consumers are willing to pay more for high-quality products, there comes a point where price determines final purchase behaviour and can render a product unattainable. Wassenaar (2016) found a high level of uncertainty among South African consumers regarding the price, or value ascribed to game meat, and potentially ascribed this uncertainty to the wide range of pricing strategies observed to access game meat, ranging from purchases through retailers, to obtaining game meat free from family or friends who hunt, thus giving the impression that game meat is neither expensive nor cheap. With such a wide range of access strategies to game meat, Wassenaar (2016) found it impossible to determine the direct monetary value that South African consumers ascribe to game meat. It was expected that attitudes toward price would serve as a predictor of the choice to consume game meat. Consequently, the following hypothesis was set:

**Hypothesis 3 (PR):** Consumer attitudes toward the **price** of game meat have a significant influence on the choice to consume game meat.

### 3.4 *Food Safety (FS)*

In the past, the adulteration of game meat products led to concern and created consumer expectations regarding transparency of meat products (Hempel & Hamm, 2016; Wang et al., 2015; D'Amato, Alechine, Cloete, Davison & Corach, 2013). Unfortunately, D'Amato et al. (2013) have found the reliability of commercial labelling on South African game meat to be poor, which led to negative publicity surrounding game meat in the past. Since meat from extensive wildlife production systems is generally not exposed to growth hormones and antibiotics, it is considered one of the purest forms of red meat available (Bothma, et al., 2015; Schack, et al., 2015). In an increasingly health-conscious society, the demand for safe food of natural origin (free of growth hormones, disease, antibiotics, and other medication) is expected to rise progressively (Schack, et al., 2015). Despite the perceived contribution of organic production methods to food safety (He, Cai, Deng & Li, 2016; Hempel & Hamm, 2016; Marian, Chrysochou, Krystallis, & Thøgersen, 2014), the high prices of organic products have become barriers to purchase (Jo & Shin, 2017;

Marian et al., 2014; Dowd & Burke, 2013). Considering global concerns about food safety and the consumption of wildlife (Niewiadomska et al., 2021; Popoola, Soladoye, Gaudette & Wismer, 2020), it is supposed that attitudes toward the safety of game meat for human consumption may also serve as a predictor of the choice to consume game meat in South Africa.

**Hypothesis 4 (FS):** Consumer attitudes toward the **safety for human consumption (food safety)** of game meat have a significant influence on the choice to consume game meat.

### 3.5 *Production Ethics (PE)*

Globally, consumers experience increased pressure to take responsibility for the consequences of their food consumption behaviour (Brochado et al., 2017; Grunert, 2015). Sustainable utilisation of wildlife is becoming a common management plan to provide incentive and funding for wildlife conservation, while simultaneously controlling wildlife populations (Ljung, Riley & Ericsson, 2015). Studies have found that consumers are increasingly concerned about the living conditions and humane treatment of animals in agricultural production systems (Risius & Hamm, 2017; Gocsik, Brooshooft, De Jong & Saatkamp, 2016; Hansson & Lagerkvist, 2015; Jacques, 2014). More specific to Europe, urban consumers increasingly display a preference for animals to be raised in natural conditions (Jacques, 2014) and place pressure on producers to provide meat in a sustainable manner while adhering to socially acceptable environmental practices (Verbeke et al., 2010). In South Africa trophy hunting and more specific the breeding, keeping, and hunting of animals in captivity have become a point of contention of which the ethical nature of these practices is being questioned (Sommerville et al., 2021). However, Bekker et al. (2010) previously found that South African consumers expected game meat to emanate from free roaming practices, placing more emphasis on the importance of production ethics of game meat. Consumers are sensitive to the conditions in which game is produced and prefer extensive production systems to that of intensive production systems as found by Wassenaar (2016). Based on the number of studies linking meat production ethics to consumer expectations globally, it was predicted that South African consumers are concerned with game meat production ethics, which led to the last hypothesis tested:

**Hypothesis 5 (PE):** Consumer attitudes toward **game meat production ethics** have a significant influence on the choice to consume game meat.

The aim of the study was to determine the significance of the relationships between South African consumer's attitudes toward the health benefits, availability, price, meat safety and production ethics attributes of game meat, and the choice to consume game meat. Further, the study aimed to determine if attitudes toward some attributes held stronger relationships to the choice to



consume game meat than others. If so, it aimed to establish which attributes were the strongest predictors of the choice to consume game meat.

#### **4. Method**

To test the proposed model, data gathered during 2015 and 2016, from a questionnaire developed by Wassenaar (2016), was used to measure the model constructs. The data was analysed using a structural equation modelling approach whereby the structural equation software tool AMOS 28 was applied.

##### *4.1 Research design and data collection*

Wassenaar's (2016) study applied a quantitative approach to data collection and interpretation. Cross-sectional data from across South Africa was collected through an online questionnaire designed using Survey Monkey. The target population for the study was South African consumers, living anywhere in South Africa who has either consumed or not consumed game meat of which the demographic profile of the study sample is discussed in Wassenaar (2016). A combination of convenience, purposive and snowball sampling was used to recruit survey participants through social media (Facebook) and e-mail forwarding. 1081 usable questionnaires were retrieved for the final data analysis. Ethics approval (2014/CAES/121), as reported in Wassenaar (2016), was obtained prior to the commencement of data gathering. Informed consent was obtained on accessing the online questionnaire, after respondents had studied the background information about the purpose of the study, the role of the respondent, confidentiality and anonymity of information given during the survey. Respondents were reminded of voluntary participation and the option to remove themselves from the study at any time without prejudice during the recruitment stage of the study.

##### *4.2 Measurement instrument and questionnaire design*

In the study by Wassenaar (2016) survey questions that measured the attitude of consumers towards various game meat attributes were used to gather data. For the current paper only the attributes that proved reliable (Cronbach  $\alpha > 0.7$ ) and valid in Wassenaar (2016) which were health benefits (HB); availability (AV); price (PR), production ethics (PE) and food safety (FS), excluding promotion and preparation of game meat attributes, were included in the analysis. Animal welfare was reconsidered in relation to the ethical approach to game meat production ethics and was combined to represent an inclusive approach to production ethics in this paper. Respondents indicated their levels of agreement to statements on a five-point Likert scale,

anchored from 1 (disagree completely) to 5 (agree completely). Data gathered through the survey by Wassenaar (2016) was subjected to further data analysis on which this paper is based.

Respondents' attitudes toward the attributes of game meat were tested as the independent variable in each hypothesis with a multidimensional questionnaire: health benefits (HB) utilising a five-item subscale; availability (AV) using a nine-item subscale; price (PR) based on a three-item subscale; food safety (FS) utilising a 17-item subscale; and production ethics (PE) using a 12-item subscale as indicated in Table 1. Not all subscale items were used for each of the attributes in this paper as the scale items with lower internal consistency reliability were excluded as identified by Wassenaar (2016). The relationship between the above independent variables and the dependent variable (choice to consume) was determined through combining the data from consumers and non-consumers of game meat gathered by Wassenaar (2016) to achieve a general attitude towards each of the independent variables.

**Table 1:** Subscale items for each of the game meat attributes

<b>Attribute</b>	<b>Subscale items</b>
<b>Health Benefit</b>	
<b>HB1</b>	Game meat is a lean product
<b>HB2</b>	Consuming game meat lowers your risk of cardiovascular diseases
<b>HB3</b>	Game meat is a nutritious source of protein
<b>HB4</b>	Game meat is high in iron content
<b>HB5</b>	I consume game meat because I believe that it is healthy
<b>Availability</b>	
<b>AV1</b>	Game meat is easily available throughout the year
<b>AV2</b>	Game meat is sometimes available outside the traditional hunting season
<b>AV3</b>	I can obtain game meat from the local butchery
<b>AV4</b>	I can obtain game meat from the local supermarket
<b>AV5</b>	I can obtain game meat from independent producers
<b>AV6</b>	I can obtain game meat by hunting, or from friends or family members who hunt
<b>AV7</b>	Game meat is available in a variety of cuts
<b>AV8</b>	Game meat is packaged conveniently for household use
<b>AV9</b>	The availability of game meat plays an important role in my choice to consume it
<b>Price</b>	
<b>PR1</b>	Game meat is affordable
<b>PR2</b>	Game meat is good value for money
<b>PR3</b>	When I select game or red meat, the price of the different products largely determines my choice
<b>Food Safety</b>	
<b>FS1</b>	Game meat is safe for human consumption
<b>FS2</b>	Game meat is of good quality
<b>FS3</b>	I trust that production standards of game meat complies with food safety regulations
<b>FS4</b>	Organic production methods
<b>FS5</b>	Free from growth hormones
<b>FS6</b>	Free from antibiotics
<b>FS7</b>	Free from pesticide residues

<b>FS8</b>	Sufficient industry standards and regulations
<b>FS9</b>	Traceability of the product
<b>FS10</b>	The expiry date on the packaging
<b>FS11</b>	Organic production methods
<b>FS12</b>	The use of growth hormones
<b>FS13</b>	The use of antibiotics
<b>FS14</b>	Residues of pesticides
<b>FS15</b>	Industry standards and regulations
<b>FS16</b>	The traceability of the product
<b>FS17</b>	The expiry date indicated on the packaging
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<b>Production Ethics</b>	
<b>PE1</b>	Game meat can be produced in a manner that respects animal welfare
<b>PE2</b>	I believe that sustainable harvesting of game is ethical
<b>PE3</b>	I believe game meat production is in harmony with nature
<b>PE4</b>	Game meat production is environmentally friendly
<b>PE5</b>	Game meat production is in accordance with sustainable land use practices
<b>PE6</b>	The utilisation of game meat provides an economic incentive to conserve our wildlife
<b>PE7</b>	Game meat is a valuable natural resource to support local industries
<b>PE8</b>	Game meat is a valuable natural resource to enhance the local economy
<b>PE9</b>	Game meat is a valuable natural resource to increase employment opportunities
<b>PE10</b>	Game meat is a valuable natural resource to ensure food security
<b>PE11</b>	Since game numbers must occasionally be reduced in fenced areas, I do not have a problem harvesting them
<b>PE12</b>	As long as game is harvested in a humane manner, I do not have a problem with eating game meat
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## 5. Data Analysis and Results

### 5.1 Measurement model assessment

In accordance with the two-step procedure suggested by Anderson and Gerbing (1988), prior to testing the hypotheses, confirmatory factor analysis (CFA) was performed to examine reliability, convergent and discriminant validity of the multi-item construct measures. Composite reliabilities (CR) and average variance extracted (AVE) for each construct were computed using the formulae proposed by Fornell and Lacker (1981). Individual coefficient alpha values for the subscales ranged between 0.632 and 0.949. Two items for the price construct were retained after deleting PR3 (Price Cronbach's,  $\alpha=0.775$ ). To ensure convergent validity, items were checked for a priori constructs with loadings  $> 0.5$ , while discriminant validity was checked by average variance extracted (AVE) values to ensure that there were no significant inter-research variable cross loadings (Chin, 1998). The matrix of loadings and cross loadings, which shows how distinct each construct is from other constructs in the model and how overlaps in meaning are avoided in indicators that do not belong to various constructs, further reinforced the convergent and discriminant validity of the constructs (Chin, 2010). The composite reliabilities (CR) are above 0.8 therefore, exceeding the recommended value of 0.7 suggested by Hullan (1999). This indicates

very good, acceptable internal consistency and reliability of the respective measures. By and large, these results provided evidence for acceptable levels of research scale reliability.

However, to guarantee sufficient discriminant validity between the research constructs, the square root of a construct's AVE should be higher than the highest correlation between the construct and other constructs (Chin, 2010). Table 2 shows the square roots of the AVE for the constructs and the correlations among the constructs in the model. This indicates that the model possesses acceptable discriminant validity. The square root of a construct's AVE should be higher than the highest correlation between the construct and other constructs (Chin, 2010).

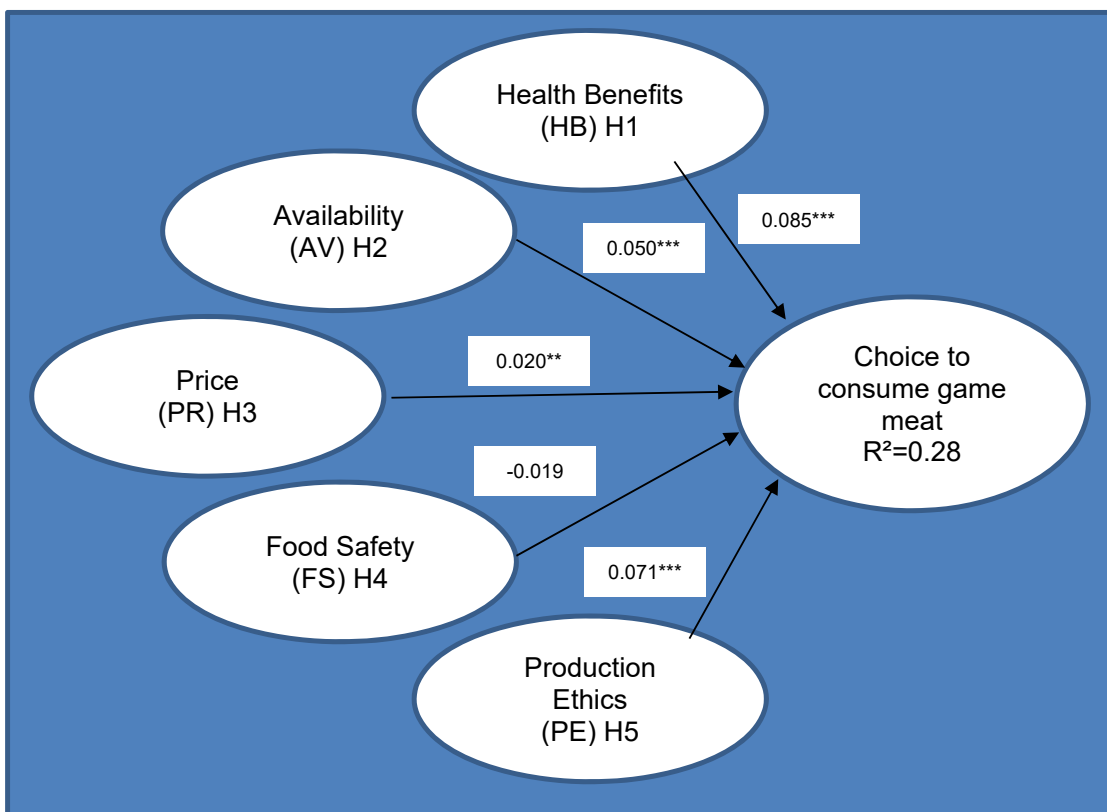
**Table 2:** Inter-construct correlation matrix

		<b>HB</b>	<b>AV</b>	<b>PR</b>	<b>FS</b>	<b>PE</b>	<b>Cons</b>
HB	Health Benefit	<b>0.768</b>					
AV	Availability	0.357**	<b>0.678</b>				
PR	Perceived Price	0.332**	0.334**	<b>0.79</b>			
FS	Food safety	0.422**	0.280**	0.153**	<b>0.775</b>		
PE	Production Ethics	0.582**	0.321**	0.324**	0.396**	<b>0.806</b>	
Cons	Choice to consume	0.464**	0.313**	0.268**	0.206**	0.446**	<b>1</b>

\*\* Correlation is significant at the 0.01 level (two-tailed).

### 5.2 Structural Equation Modelling

Structural Equation Modelling (Maximum Likelihood method in AMOS 28) was used for the data analysis based on the conceptual framework (Figure 1). The model is acceptable in terms of overall goodness of fit. Acceptable model fit is indicated by GFI  $\geq$  0.80; AGFI  $\geq$  0.80; RMSEA values  $\leq$  0.08; IFI, TLI and CFI values  $\geq$  0.90. Overall, the structural model fit was acceptable,  $\chi^2$ /Chi square degrees of freedom (df) = 0.00; Root mean square error of approximation (RMSEA) = 0.3; Comparative fit index (CFI) = 1.000; Tucker-Lewis index (TLI) = 1.000; Incremental Fit Index (IFI) = 1.000; TLI = 1.000; Standardized Root Mean Square Residual (SRMR) = 0.098 and therefore, achieved the suggested marginal thresholds (Hair et al., 2011). This suggests that the model converged well and could be a plausible representation of underlying empirical data structures collected in South Africa.



Note:  $p > 0.05^{**}$ ;  $p > 0.001^{***}$

**Figure 1:** Conceptual model

### 5.3 Testing of the Hypotheses

The results in Figure 1 provide support for the five hypotheses except hypothesis 3. H1 posited a positive, significant relationship between Health Benefits and choice to consume ( $\beta = 0.085$ ;  $p < 0.000$ ), while H2 posited a positive, significant association between availability and choice to consume ( $\beta = 0.050$ ;  $p < 0.000$ ). Results supported hypotheses 1 and 2 by demonstrating that availability of game meat and higher levels of perceived health advantages will enhance consumer choice. The standardised coefficient of price and choice to consume ( $\beta = 0.02$ ;  $p < 0.03$ ) is positive and significant. This is consistent with the prediction of H3 and is supported. Thus, a positive price perception is positively associated with higher levels of choice to consume. The standardised coefficient of food safety and choice to consume is negative and not significant ( $\beta = -0.19$ ;  $p < 0.071$ ). This is contrary to the prediction of H4 and is not supported. Therefore, the stronger the belief in food safety as an attribute, the less likely consumers are to choose game

meat. Finally, the findings in Figure 1 corroborate H5 and the idea that production ethics as a choice criterion, is associated with choice to consume ( $\beta = 0.07$ ;  $p < 0.000$ ). Therefore, H5 is strongly supported.

## 6. Discussion

The results show that rational motives have a greater impact on game meat choice than emotional reasons. It can be assumed that consumers' decisions about their meat consumption are more rational, which suggests that the measurable value characteristics of game meat should be more exposed by producers and sellers on the market. The possibility of choosing to consume game is greater for the people who pay attention to the rational aspects related to the health value, convenience (availability) and price. Health benefits was found to be one of the attributes with the strongest positive associations with choice to consume game meat. While South African consumers consider game meat to be healthy (Wassenaar, 2016; Hoffman et al., 2008), until now it has been unclear whether attitudes toward the health benefits of game meat are related to the choice to consume game meat. With the strongest direct relationship observed to all other attributes, the results prove that health benefits are considered an important determinant of the choice to consume game meat.

While game meat availability has an impact on its consumption, only a moderate relationship between availability and the choice to consume game meat was found. This could indicate that South African consumers perceive game meat to be available, but not necessarily as easily, consistently, and conveniently as they would prefer, further adding to the concern of the relatively low consumption of game meat amongst South African consumers (Sommerville et al., 2021). Therefore, while year-round availability remains a serious concern to producers and retailers (Alsson Network, 2021a), it is not considered to be the most important attribute affecting the choice to consume game meat.

Price has always been an important factor to determine food consumption (Ting et al., 2017; Ting et al., 2018). Value-conscious customers believe that price is important in food consumption (Lai, 2015). In addition, Yee (2015) found that consumers generate a positive attitude toward food when they perceive that the food they consume is value for their money. The study findings reveal that consumers attach importance to saving money when buying game meat and are most probably willing to purchase game meat when they perceive it as affordable (Wang et al., 2015). The results from this study, has established that the attitude toward price is not the most important determining factor in South African consumers' choice to consume game meat. Although at some point consumers do consider price when making their purchase decision (Rekhy & McConchie,

2014), it will not be the most important, consideration when they decide whether to consume game meat.

Various studies have shown that consumers find the absence of growth hormones, antibiotics and pesticide residues, sufficient industry standards and regulations, hygiene, a visible expiry date on the packaging and traceability to be important food safety factors to consider when consuming red meat (Niewiadomska et al., 2021; Popoola et al., 2020; He et al., 2016; Hempel & Hamm, 2016; Wassenaar, 2016; Marian et al., 2014), the results showed no significant relationship between the attitudes towards food safety and the actual choice to consume game meat. To that effect 95% of South African game meat consumers believe it is safe for human consumption (Wassenaar, 2016) resulting in consumer trust in the game meat production systems. Similar claims related to organic products have brought about a higher price perception for these food products which has become a barrier to purchase organic food products (Jo & Shin, 2017; Marian et al., 2014; Dowd & Burke, 2013). This may explain the lack of a significant relationship between attitudes toward meat safety and the choice to consume game meat as consumers anticipate game meat to be safe and therefore not a strong driver in the choice to consumer game meat.

Like other studies (Risius & Hamm, 2017; Gocsik et al., 2016; Hansson & Lagerkvist, 2015; Jacques, 2014), this study has found that consumers want to know that wildlife utilised for human consumption are treated humanely. Consumers believe that the sustainable harvesting of game meat is ethical and provides an economic incentive for wildlife conservation while serving as a valuable resource to support local industries, to enhance the local economy, to increase employment opportunities and to ensure food security (Wassenaar, 2016). Ethical consumption of game meat has been addressed by various researchers, (Grimmer & Miles, 2017; Hempel & Hamm, 2016; Paco & Rodrigues, 2016) of which the ethical use of financial resources may influence the choice to purchase game meat. McEwan, Hughes and Bek, (2015) suggested that although middle-class South African consumers do care about ethical production methods, they may also consider the ethical use of financial resources as an important consideration during product purchases in general. It is important to note that even though production ethics is one of the key issues driving the consumption of game meat, actual consumption/purchase is influenced by the interaction of numerous factors such as costs and convenience/availability of alternative products and a lack of clear and easy-to-understand production ethics labels (Leroy and Praet, 2017). The strong direct relationship between attitudes toward production ethics and the choice to consume game meat confirms that South African consumers take game meat production ethics seriously but may be conscious of ethical spending and decisions related to game meat.

## **7. Industry Recommendations and Future Research**

Since the perceived health benefits of game meat were identified as one of the main driving forces behind South African consumers' choice to consume game meat, it is recommended that the industry continues to build on the good reputation of game meat in marketing strategies. Continuous research is recommended to uncover more potential health benefits of game meat.

It is recommended that the industry invest in establishing a continuous, year-round supply of game meat. The industry will benefit from clarifying the true extent of game meat traded in South Africa to inform business models. However, from a consumer perspective a lack of availability is not considered to be a limiting factor in the choice to consume game meat. Future research to determine consumer preferences related to the types of products, convenient cuts and packaging sizes is suggested.

Owing to the high level of price uncertainty among consumers as found by Wassenaar (2016), the value that consumers ascribe to game meat remains unknown. Research into game meat pricing strategies is highly recommended. Since price has a weak relationship with the choice to consume game meat, the industry needs to consider that marketing strategies emphasizing low prices may not drive product sales. Emphasizing the health benefits and production ethics awareness in marketing campaigns will do more to positively influence the choice to consume the product.

While game meat safety and organic production methods currently show no relationship with the choice to consume by South African consumers, they may ascribe more value to these attributes in the future. Recommended research includes determining South African consumer concerns about organic production methods and their willingness to pay premiums for such certified organic game meat.

South African consumers need to be assured that game is bred and harvested sustainably. It is important for producers to be transparent about production methods, to understand what consumers deem to be ethical and to ensure that those requirements are met. In efforts to increase availability or to cut production costs, the industry is cautioned not to sacrifice the production ethics currently associated with South African game meat. South African consumers place a high value on health benefits and production ethics, and these play an important role in their decision and choice to consume game meat. The close proximity of the values ascribed to these two elements as predictors of the choice to consume may also be indicative of a close relationship between these two elements in the consumer's mind. Tainting the reputation of either



of these two attributes of game meat in the consumer's mind will most likely render any of the other attributes unable to overcome the damage.

## **8. Conclusion**

The current study seeks to investigate consumers' attitudes toward game meat attributes that drive the choice to consume game meat in South Africa. The study has contributed to a better understanding of the game meat attributes that matter most to South African consumers when presented with the choice to consume game meat. In so doing the South African game meat industry can confidently promote the choice to consume game meat by using the health benefits and production ethics as nudging attributes in their marketing strategies as these are the two game meat attributes which needs to be reinforced in the consumer mind to solidify their choice to consume game meat. In addition, the study has provided the South African game meat industry with scientific information on the local consumer market, thereby contributing to the realisation of SDG 2 aimed at promoting food security and addressing zero hunger that can indirectly contribute to local economic growth and employment creation. The needs of the country cannot be addressed through an increased production of game meat alone. It requires consumers to choose game meat as a more favourable protein source thereby utilising game meat products more efficiently.

The study was limited in its exploratory use of the attribute questionnaire which had not been applied by other researchers other than the initial study by the authors, limiting the generalisability of the results to South African consumers only. Due to the limited number of non-consumers of game meat in this study a true reflection of their attitude towards the attributes of game meat cannot be generalised to the broader South African population. However, this establishes the need to conduct research on the non-consumers of game meat if the choice to consume game meat is to be advanced in South Africa to address food security and zero hunger. It is also recommended that further research on the individual attributes of game meat continues to identify consumer differences that may be related to regional contexts, specific game species as well as the socio-economic influence on the choice to consume game meat in relation to the attributes that were used in this study. This might create a broader consumer profile and give the game meat industry in South Africa a better view of the challenges that are related to the attributes of game meat.

## **9. Competing Interests**

No competing interest from the authors in relation to the study.

## 10. Financial Support

Acknowledging financial support from the University of South Africa's Master's and Doctoral Bursary Support Programme.

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