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ASSESSMENT OF GINGER BENEFITS AWARENESS AND WILLINGNESS TO PAY. A CASE OF RURAL HOUSEHOLDS AT NEW FOREST VILLAGE, BUSHBUCKRIDGE LOCAL MUNICIPALITY, MPUMALANGA PROVINCE

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Abstract. Due to a lack of adequate information on ginger's nutritional and medical value to an individual's health, most rural households do not often purchase ginger. Therefore, this study aims to determine the household's awareness and willingness to pay for ginger. A simple random sampling procedure was used to select 53 respondents, and primary data were collected through an online questionnaire. Descriptive statistics and a binary logistic regression model were used for data analyses. Descriptive statistics revealed that the average age of the respondents was 39 years. Also, most respondents (77.4%) indicated they were aware of the health benefits of ginger, and approximately 45.3% indicated that they purchase ginger on a monthly basis. Lastly, most respondents (73.6%) were willing to pay for ginger. Regression estimates showed that gender, cost of ginger and frequency of ginger purchasing influenced rural households' willingness to pay for ginger. Since gender was found to be a significant variable, the study, therefore, recommends that women should be encouraged to purchase functional foods when buying groceries for their households. This may enhance healthy habits and ultimately reduce households' medical expenditure because functional foods can have preventive and corrective impacts for some illnesses.

Keywords: awareness, ginger, Mpumalanga Province, willingness to pay

INTRODUCTION

The rising consumer concerns for good health, enhancement of life expectancy and desire for improved quality of life have necessitated renewed attention to consuming foods with some special medical or health benefits, generally known as functional foods such as ginger (Akerele et al., 2017). For instance, in the presence of the coronavirus (COVID-19) pandemic, which strikes nationally and globally, there is growing consumption of ginger, thus putting this functional food in higher demand at both local and international markets. This is because ginger is highly recommended as a functional food that helps prevent infection and heal sicknesses related to COVID-19 (Nivashni, 2020). However, regardless of ginger's benefits, most rural households do not often purchase ginger due to a lack of adequate information on its nutritional and medical value to health.

Previous studies (Akerele et al., 2017; Kotilainen et al., 2006) indicate that functional foods gain popularity due to consumers' rising concern for good health and enhancement of life expectancy. These functional foods include ginger, basil, and thyme, to mention a few. According to Girgih et al. (2013), the utilization of functional foods is aimed not only to get health benefits

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because these foods can also have preventive and corrective impacts for some afflictions ranging from cardiovascular diseases to cancer, which is a global concern. Moreover, Shoaib et al. (2016, 174) highlighted that 'functional foods such as ginger and garlic provide a way to reduce health cure expenditure which causes economic burden in human society'.

Ginger is among numerous herbs known for its health benefits both in traditional and modern medicines (Teferra, 2015). This is because ginger contains many bioactive components, including gingerol and paradol, to mention a few (Koh et al., 2009). According to Nicoll and Henein (2009), such bioactive components are believed to exert a variety of remarkable pharmacological and physiological benefits like curing numerous sicknesses such as colds, nausea, arthritis, muscle pain, migraine and hypertension. Also, ginger is used throughout the world as a spice or fresh herb for cooking and varieties of other value-added products (Bartley and Jacobs, 2000). Additionally, the study of Remadevi et al. (2016) also indicates that ginger has been used widely as a common household remedy for various illnesses from ancient times. As Shoaib et al. (2016) point out, ginger is commonly available in the market as a fresh product; besides, ginger is also available in dried, pickled, tincture, extract, oleoresin capsules or tablet form. Furthermore, ginger is incorporated into different food items like bakery products, beverages, meat products and many other food items as a flavouring agent with medicinal benefits (Shoaib et al., 2016).

The awareness and knowledge about the health benefits of ginger are crucial in determining consumers' willingness to pay for it. Moreover, the data about consumers' awareness of commodities is an important element for farmers and marketing agencies to successfully plan production to capture a greater market share (Muhummad et al., 2016). Additionally, Vella et al. (2014) report that increasing awareness and knowledge of functional foods, especially among older adults, is vital as it improves the consumption levels of such foods. Although, Annunziata et al. (2015) highlight significant barriers to functional food acceptance and use by older consumers, who are price-sensitive and doubt the reliability of the information provided by manufacturers. However, Güney (2019) argues that consumers often purchase medicinal and aromatic plants in the absence of adequate information concerning the benefits and possible side effects associated with the consumption of these plants.

Medicinal herbs are perceived to be the least expensive and the major source of treating numerous diseases in rural areas (Rahman et al., 2011). Hence, an increase in demand for medicinal herbs is witnessed in both developed and developing countries (Ekor, 2014). In South Africa, it was estimated that 1.9 tonnes of wild ginger, summing up to about 52,000 plants, is annually traded within the country and that the current situation necessitates an alternative supply of ginger plant to meet the demand since the current supply does not match the existing demand for the product (Gatabazi et al., 2019; Van Wyk, 2008). Moreover, Nivashni (2020) reports that the COVID-19 pandemic caused a rapid increase in demand for ginger. As a result, South African ginger suppliers are unable to keep up with demand driven by ginger's perceived health benefits.

However, this study believes that familiarity with the benefits of ginger and consumers' willingness to pay for it is crucial, especially in rural areas where older people head most households. This is because older individuals are likely to suffer from various diseases, whereas some of the illnesses are partially preventable through good eating habits, including the consumption of ginger. In this regard, most rural households do not often purchase ginger due to a lack of adequate information on its nutritional and medical value to an individual's health. Hence, the study aims to determine the household's awareness and willingness to pay for ginger in New Forest Village, Bushbuckridge Local Municipality.

MATERIALS AND METHODS

The study was conducted in New Forest Village, Bushbuckridge Local Municipality of Bohlabela District in Mpumalanga Province. According to Bushbuckridge Local Municipality census 2011 statistics, the population of New Forest was 1,731 people in an area of (1.30 km^2) and consisted of 410 households. The list of households was available from the local municipality Integrated Development Plan (IDP). The population is dominated by Xitsonga speaking individuals, contributing 93.82% (Bushbuckridge IDP, 2017). According to Bushbuckridge IDP (2017), Bushbuckridge Local Municipality is faced with the challenge of inadequate medical services in most clinics due to the poor supply of medication. Hence, the knowledge of ginger's health benefits may act as a supplement due to the inadequate

supply of medicines in the area. Given the above information, better estimations on awareness and willingness to pay for ginger in the study area are required.

A descriptive research design was adopted. Primary data were collected using an online questionnaire composed of closed-ended questions. The questionnaire included three sections. The first one provides information about the socio-economic characteristics of the respondents. The second contains Likert scale questions on the health benefits and availability of ginger in the markets. The last section deals with the willingness to pay for ginger with the use of a Likert scale. A total of 53 households as the sample size was drawn using a simple random technique. This sample size constitutes about 13% of the population size being sampled from the study area; generally, 10% and more from the population is more viable in research when sampling (Taherdoost, 2016). The analysis was done by using Statistical Package for the Social Sciences (SPSS) version 26.

Descriptive statistics were employed to describe the respondents' socio-economic characteristics using frequencies and percentages. Descriptive statistics were also applied to examine awareness of the benefits of ginger consumption, using a Likert scale, while a binary logistic regression model was employed to determine the relationship between households' willingness to pay for ginger and their socio-economic characteristics.

MODEL SPECIFICATION – BINARY LOGISTIC REGRESSION MODEL

The general binary logistic regression model is as specified:

$\text{Log}(P) = In(p_i/(1 - p_i)) = a + \beta_r X_i \ldots \ldots \beta_k X_k + U_i$ (1)

Where:

$In(p_i/(1 - p_i))$ – is the natural log of the odds

p_i – is the probability that the rural households are willing to pay for ginger

$1 - p_i$ – is the probability that the rural households are not willing to pay for ginger

β_i – is the estimated parameter

X_i – is the explanatory variable

U_i – is the disturbance term.

The specification for the binary logistic regression model is expressed as follows:

$$In = \frac{[p(y = \frac{1}{x})]}{[1 - p(y = \frac{1}{x})]} \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 +$$
$$+ \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} +$$
$$+ \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + U_i$$

Where:

β_0 – is the intercept term

$\beta_1–\beta_{13}$ – are regression coefficients

$X_1–X_{13}$ – are the explanatory variables included in the equation, and these variables are described below:

X_1 – AGE…age (actual age)

X_2 – GEND...gender (1 – if the respondent is male, 0 – otherwise)

X_3 – EDL…education level (0 – if the respondent has no formal education, 1 – corresponds to primary education, 2 – secondary education, 3 – tertiary education)

X_4 – HHS…household size (number of people in the house)

X_5 – HIN…household income (monthly household income in South African rands (ZAR)

X_6 – EMPS…employment status (1 – if the respondent is employed, 0 – otherwise)

X_7 – HS…health status (1 – if the respondent is taking any medication, 0 – otherwise)

X_8 – AWNS…awareness (1 – if the respondent is aware of the health benefits of ginger, 0 – otherwise)

X_9 – SA…source of information about awareness (0 – if the respondent is aware of the health benefits of ginger via social media, 1 – television, 2 – radio, 3 – friends and relatives, 4 – general practitioners, 5 – traditional healers)

X_{10} – MS…marital status (0 – if the respondent is single, 1 – married, 2 – widowed, 3 – divorced)

X_{11} – AG…availability of ginger (0 – if ginger is available, 1 – otherwise)

X_{12} – LPG…location for purchasing ginger (0 – if the respondent purchases ginger in supermarkets, 1 – pharmacy, 2 – herbal shops, 3 – street vendors)

X_{13} – FGP…frequency of ginger purchasing (0 – if the respondent purchases ginger daily, 1 –weekly, 2 – monthly, 3 – other).

RESULTS AND DISCUSSION

Socio-economic characteristics of respondents

The results in Table 1 show that the average age of respondents is 39.23, and this is equivalent to 39 years with a minimum age of 22 years and a maximum age of 72 years. Among the sampled households, the average household size was 5.77 per household, with a minimum of 1 member and a maximum of 14 members within a family. The monthly income of respondents ranged from ZAR 0 to ZAR 15,500, with an average of ZAR 4,201.47. Social grants come first in the rank of the sources of income with 49.1% of respondents, followed by salary at 34.0%, while 11.3% of respondents did not specify their source of income, and 5.7% claimed wages to be their source of income.

The results for the socio-economic characteristics of rural households of New Forest Village, Bushbuckridge Local Municipality are presented in Table 1. The results are based on a sample of 53 completed questionnaires administered in October 2020 using an online survey system. From the sample size, 35.8% of respondents were males, and 64.2% were females. The high percentage (64.2%) of females is due to the domination of females within the study area, as outlined by IDP-BLM (2017). Regarding the marital status of the household heads in New Forest Village, those who were single accounted for 83.0%, followed by married respondents at 13.2%, and widowed respondents at 3.8%, no respondent fell under the divorced category.

Concerning the level of education, most of the respondents had tertiary education (45.3%), followed by respondents with secondary education (41.5%), while respondents with no formal education accounted for 11.3%, and the least respondents had primary education (1.9%). The relatively high level of tertiary education is expected to induce the respondent's willingness

Table 1. Descriptive statistics of Socio-economic variables of households at New Forest Village

Variable	Minimum	Mean	Maximum	Standard deviation
Age	22	39.23	72	15.788
Household size	1	5.77	14	3.023
Monthly income	0	4 201.47	15 500	4 263.489

	Outcome	Frequency	Percentage (%)
Gender	male	19	35.8
	female	34	64.2
Marital status	single	44	83.0
	married	7	13.2
	widowed	2	3.8
	divorced	0	0
Educational level	no formal education	6	11.3
	primary education	1	1.9
	secondary education	22	41.5
	tertiary education	24	45.3
Employment status	employed	18	34.0
	unemployed	35	66.0

Source: research data, 2020.

to pay for ginger since more educated respondents are likely to be informed of the health benefits associated with it. Again, of the total respondents, 66.0% were unemployed, and 34.0% were employed. The highest percentage (66.0%) of unemployed respondents correspond with the higher unemployment rate reported in Bushbuckridge Local Municipality (IDP-BLM, 2017).

Awareness of ginger benefits

The respondents were asked whether they knew about the health benefits associated with ginger and its by-products. The results in Table 2 show that 77.4% of respondents acknowledged the health benefits linked to ginger, while 17.0% disagreed that ginger has health benefits. On the one hand, about 5.7% of respondents were not sure if they were aware of ginger benefits or not. The highest percentage (77.4%) of respondents aware of the benefits linked to ginger is likely to affect the respondent's willingness to pay for ginger and its by-products. On the other hand, health conditions are believed to stimulate consumption decisions for medicinal herbs. Given this statement, approximately 75.5% of respondents were not taking any medication, while only 24.5% used medicines for various diseases.

Regarding the source of awareness, most (39.6%) respondents obtained information relating to ginger benefits through social media, while 17.0% received it by word of mouth from relatives and friends. Radio was third in the rank of the source of information, with 15.1% of respondents indicating that they learnt about the health benefits of ginger from the radio. Also, about 7.5% of respondents found the information linked to ginger benefits through general practitioners, while 5.7% obtained it from television, and lastly, about 3.8% of respondents gained this information from traditional healers. These results agree with Wiafe (2015), who report that electronic media contribute the most to spreading awareness of functional foods such as ginger.

Purchasing behaviours of ginger consumers

To determine the purchasing behaviours of rural households concerning ginger, the respondents were requested to indicate one of the four given categories listed in Table 3. Table 3 shows that most respondents (45.3%) purchased ginger on a monthly basis, approximately 20.8% bought it weekly, 7.5% purchased it on a daily basis; lastly, about 26.4% did not specify their ginger

Table 3. Purchasing behaviour of Ginger consumers

Frequency in Ginger purchasing	Frequency	Percentage (%)
Daily	4	7.5
Weekly	11	20.8
Monthly	24	45.3
Other	14	26.4
Location for purchasing ginger		
Supermarkets	40	75.5
Pharmacy	8	15.1
Herbal shops	4	7.5
Street vendors	1	1.9
Availability of ginger in the market		
Available	44	83
Not available	9	17
Cost of Ginger		
More expensive	18	34
Less expensive	35	66

Source: research data, 2020.

Table 2. Ginger awareness benefits

| Variable	Outcome	Frequency	Percentage (%)
Awareness	yes	41	77.4
	no	9	17.0
	maybe	3	5.7
Health status	yes	13	24.5
	no	40	75.5
Source of awareness	social media	21	39.6
	television	3	5.7
	radio	8	15.1
	relatives/friends	9	17.0
	general practitioner	4	7.5
	traditional healer	2	3.8

Source: research data, 2020.

consumption patterns. Descriptive results revealed that about 75.5% of respondents mentioned supermarkets as their primary place to purchase ginger. The pharmacy was rated as the second source of ginger purchases. This could be true to some extent, considering that some respondents obtained their knowledge of ginger benefits from general practitioners.

Furthermore, about 7.5% of respondents purchased ginger at herbal shops, whereas only 1.9% bought it from street vendors. Regarding ginger availability, most respondents (83%) indicated that ginger is available in the market, whereas only 17% considered ginger unavailable in the market. About 66% of respondents believed that ginger is inexpensive, and 34% found it expensive.

Willingness to pay for ginger by New Forest Village households

The results for the willingness to pay for ginger are shown in Figure 1.
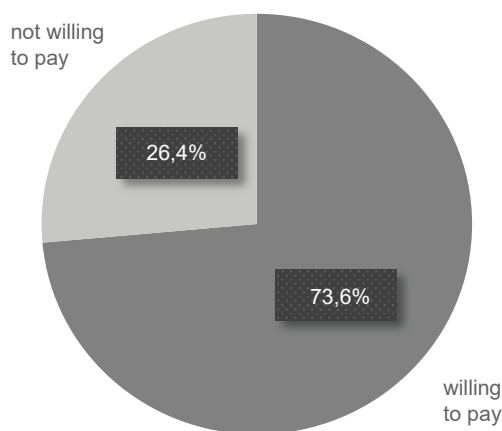
Fig. 1. Willingness to pay for Ginger by New Forest Village households
Source: research data, 2020.

The set price or cost for ginger was ZAR 99.90 per kilogram (Joburg Market, 2020); it was selected in reference to the market price of ginger at the time of data collection. The descriptive results revealed that about 73.6% of respondents from the study area were willing to pay for ginger at the set price or cost, while approximately 26.4% were not willing to pay for it at the set price or cost.

Socio-economic characteristics influencing WTP in New Forest Village

The binary logistic model was used to determine the relationship between households' willingness to pay and their socio-economic characteristics using stepwise regression analysis. The results are shown in Table 4.

From the eight independent variables that were logged in during the analysis, only three were found to be significant. The (–2) log-likelihood of the estimated model was 45.770, implying that the binary logistic model could be relied upon to predict ginger's WTP. A Nagelkerke R square of 0.603 was obtained from the study, indicating that the model explained more of the variation from the independent variables with an overall prediction percentage of 82.7%, as shown in Table 4. The direction of influence for each significant variable is presented below.

Table 4. Binary Logistic regression results of socioeconomic factors influencing households WTP

Variables	B Coefficients	Standard error	Wald statistics	T-value
Intercept	–1.707	2.407	0.503	0.478
Age	–0.038	0.036	1.122	0.290
Gender	1.410	0.832	2.870	0.090*
Educational level	–0.535	0.550	0.947	0.331
Employment status	0.025	0.875	0.001	0.977
Cost of ginger	1.489	0.822	3.277	0.070*
Availability of Ginger	–0.250	1.158	0.046	0.829
Location of purchasing ginger	–0.302	0.651	0.215	0.643
Frequency in ginger purchasing	0.895	0.500	3.202	0.074*
Model summary				
(-2) Log-likelihood			45.770	
Accuracy of prediction: Overall (%)			82.7%	
Pseudo R-square				
Cox & Snell R Square			.502	
Nagelkerke R Square			.603	

* Significant at 10%.
Source: research data, 2020.

Gender

Gender had a positive influence over the WTP of ginger by rural households, and again gender was found to be highly statistically significant at 10% level (0.090). The results suggest that females were more likely willing to pay for ginger than males. Hence, women were more often responsible for purchasing goods and services within the households and keener to keep the household healthy. This finding is also in line with the fact that females show greater concern about their health. The results concur with the study of Salleh et al. (2015), wherein gender was likely to influence consumers' intention to consume functional foods. Based on the results found and the literature, women are more likely to pay or consume functional foods.

Ginger Cost

The cost of ginger had a positive influence over the WTP of the respondents, and again this variable was found to be highly statistically significant at 10% level (0.070). The results indicate that rural households were more likely to pay for ginger as the majority regard ginger as inexpensive. Thus, these results suggest that even low-income rural families were likely to afford ginger. The findings concur with the study of Ali and Ali (2020) concerning factors affecting the consumers' willingness to pay for health and wellness food products, wherein the price had a significant role in the WTP. Based on the study findings and previous reviews, the price of functional foods such as ginger is likely to influence the WTP.

Frequency of ginger purchasing

The frequency of ginger purchasing had a positive influence over the WTP of the respondents, and again this variable was found to be highly statistically significant at 10% level (0.074). These results indicate that the frequency of consuming ginger and its products was likely to influence households' WTP. The results suggest that the frequency of ginger purchasing was directly proportional to the WTP of ginger. These findings concur with the study of Nystrand and Olsen (2020) concerning consumers' attitudes and intentions toward consuming functional foods in Norway, wherein the consumption frequency of functional foods had a significant influence on the intention of consuming functional foods. The study results are also supported by Szakály et al. (2019), who state that consumer purchase patterns significantly influenced WTP for functional foods. Based on the study findings and previous reviews, the frequency of functional foods purchasing is likely to influence WTP.

CONCLUSION AND RECOMMENDATIONS

The first hypothesis of the study stating that rural households in New Forest Village, Bushbuckridge Local Municipality are not aware of the benefits of using ginger is rejected because most respondents indicated awareness of the health benefits associated with ginger consumption based on the study results. The second hypothesis suggested no relationship between socio-economic characteristics and rural households willingness to pay for ginger. Given the study results, the study rejects this hypothesis since the results show that gender was significant.

The study discovered that most of the respondents were aware of the health benefits of ginger through social media. Therefore, the study recommends that marketing agencies or managers should strengthen social media presence as a platform to promote the consumption of ginger by households. Again, the study found gender to be significant; therefore, it is recommended that educational awareness campaigns be initiated so that consumption of ginger is not associated with a specific gender and all genders should be involved. Given the health benefits of ginger in the presence of COVID-19 with ginger proven to immaculate sicknesses associated with this virus, awareness campaigns may enhance healthy habits and ultimately reduce household healthcare expenditure as these foods can have preventive and corrective impacts for some illnesses. Since the cost of ginger and frequency of ginger purchasing was high, it is recommended that ginger producers should improve or increase production to meet the demand of consumers. This may result in consumers not becoming subjected to higher prices where there is a short supply of ginger.

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