Consumer Perception and Willingness to Pay for Packaged Asaana: A Traditional Drink in Ghana

Journal:	*British Food Journal*
Manuscript ID	BFJ-04-2023-0282.R1
Manuscript Type:	Research Paper
Keywords:	Consumers, willingness to pay, packaged Asaana, tobit, Ghana

Figure I: A picture of Asaana drink

Source: Authors' design, 2020.

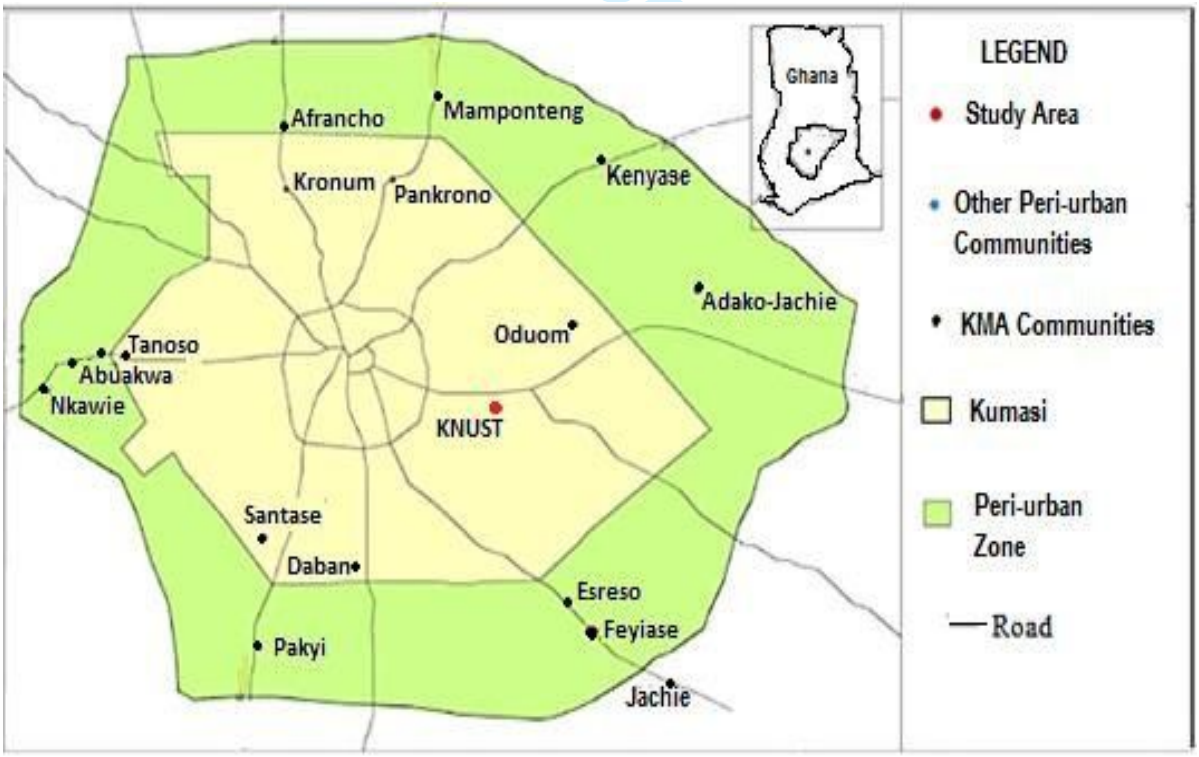

Figure II: Study area of KNUST

Source: Agyemang, 2018.

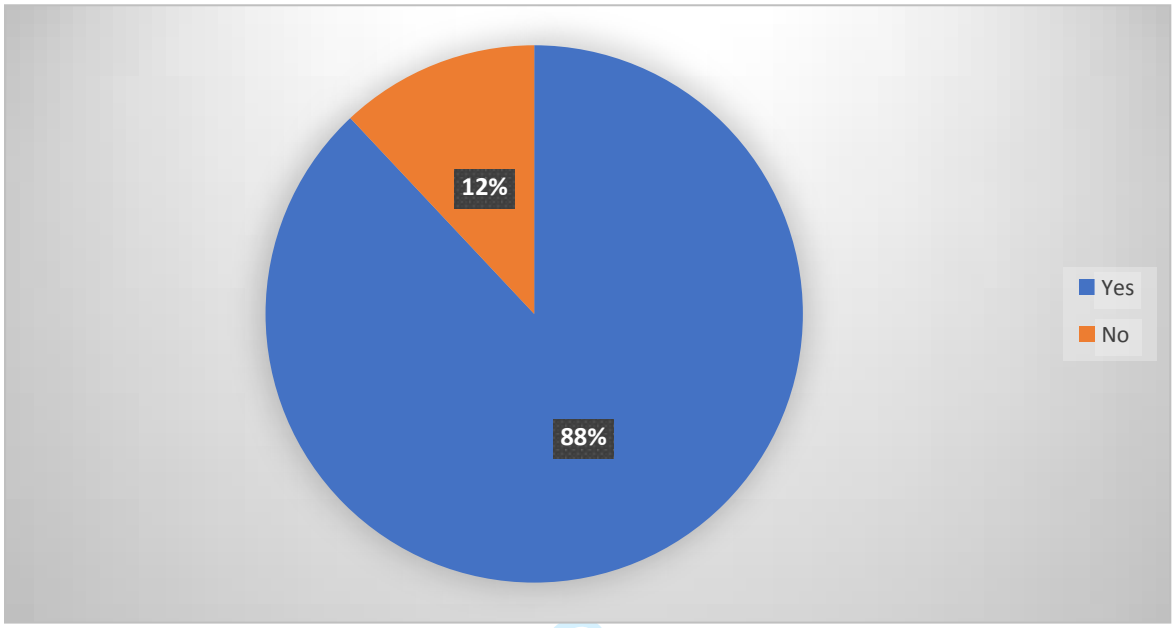

Figure III: Distribution of Consumers' Awareness of Asaana
Source: Field Survey, 2020.

Table I: Sample size respondent

Respondent category	Sample size
Students	159
Teaching staff	96
Non-teaching staff	81
Total	336

Source: Authors' computations, 2020.

Table II: Variables included in the model

Variable	Description	Expected sign
Age	Years	+
Gender	1 if male, 0 otherwise	+
Edu	Years in education	+
Inc	Income level in Ghana cedis where 0=below 200, 1=200-500, 2=501-1000, 3=above 1000	+
Dis	Distance to nearest sale point in kilometre	-
Health	1 if a consumer purchased asaana due to health benefit and 0=otherwise	+
colour	Colour presentation where 1 if agree and 0 if otherwise	+
Tas	1 if Asaana taste good and 0 =otherwise	+
Savings	Ghanaian cedis	+
Nutrition	1 if a consumer purchased asaana due to nutritional benefit and 0 =otherwise.	+
Price	Ghanaian cedis	+
Label	1 if a consumer purchased asaana because of label and 0=otherwise	+

Source: Field survey, 2020

Table III: Socioeconomic characteristics of respondents

Categorical variables	Frequency	Percentage
Gender:		
Male	227	67.6
Female	109	32.4
Religion:		
Christian	313	90.0
Muslim	23	6.8
Ethnicity:		
Akan	221	65.8
Ewe	39	11.9
Ga	32	9.5
Frafra	21	6.3
Dagomba	18	5.4
Gonja	5	1.5
Occupation:		
Students	275	81.8
Non-teaching staff	52	15.5
Teaching staff	9	2.7
Monthly Allowance (GHS):		
Below 200	50	14.9
200 – 500	193	57.4
501 – 1000	76	22.6
Above 1000	17	5.1
Tasted Asaana before:		
Yes	263	78.3
No	73	
How often the consumers consume Asaana:		
Once a week	27	8.0
2 to 4 times a week	36	10.8
Every day	3	0.9
Every month	10	2.9
Rarely	260	77.4

Continuous variable	Mean	S. D	Min	Max
Age	24.99	17.3	18	55
Education	15.32	10.2	0	20
Distance	1.54	0.12	0.5	4.0
Expenditure on food	85.48	19.3	10	700
Expenditure on airtime	17.20	6.94	2	100
Expenditure on utilities	28.46	11.43	0	300
Expenditure on clothing	83.73	40.9	0	600
Expenditure on transport	18.40	6.29	2	300
Expenditure on hair doing	30.79	17.9	0	300
Expenditure on outing	13.53	8.13	0	150.0
Expenditure on stationery	7.25	3.90	0	60.00
Expenditure on toiletries	23.79	16.99	0	200

Monthly savings	78.54	49.23	0	2500.0

Source: Field survey, 2020.

Table IV: Consumers Perception about Asaana

Statements	Agree	Neutral	Disagree	Mean score
Health And Nutritional				
Asaana lowers blood pressure	186 (62.8%)	68 (23.0%)	42 (14.2%)	1.51
Asaana is rich in minerals needed by the body to fight against diseases	213 (71.9%)	51 (17.2%)	32 (10.8%)	1.39
Asaana guards the body against constipation	226 (76.3%)	58 (19.6%)	12 (4.1%)	1.28
Asaana is important for healthy bones and teeth	217 (73.3%)	56 (18.9%)	23 (7.8%)	1.34
Asaana is highly nutritious than other traditional drinks	152 (51.4%)	90 (30.4%)	54 (18.2%)	1.67
Health and nutritional perception index				**1.44**
ECONOMIC				
I am willing to pay more for Asaana due to its health benefits	158 (44.3%)	79 (35.8%)	59 (19.9%)	1.67
I am willing to pay more for Asaana due to its nutritional benefits	179 (60.5%)	68 (22.9%)	49 (16.6%)	1.56
I would buy Asaana if it sells at the same price as other traditional drinks	165 (55.7%)	94 (31.8%)	37 (12.5%)	1.57
I would be willing to buy Asaana if they are well packaged and labeled	217 (73.3%)	58 (19.6%)	21 (7.1%)	1.34
I would be willing to buy Asaana because of its refreshing utility	204 (68.9%)	74 (25%)	18 (6.1%)	1.37
Economic perception index				**1.50**
PRODUCT ATTRIBUTES				
Asaana is tasty	274 (92.6%)	16 (5.4%)	6 (2.0%)	1.09
Asaana is well packaged	99 (33.4%)	125 (42.2%)	72 (24.3%)	1.91
Asaana has a pleasant flavour	213 (71.9%)	58 (19.6%)	25 (8.4%)	1.31
The colour of Asaana meets the required standard	167 (56.4%)	86 (29.1%)	43 (14.5%)	1.58
The product distribution of Asaana is readily available	92 (31.1%)	101 (34.1%)	103 (34.8%)	2.04
Product attributes perception index				**1.60**
Total perception index				**1.51**

Source: Field survey, 2020.

Table V: Amount consumers are willing to pay for Asaana

Response of consumers	Prices	Pooled Sample	
		Frequency	Percent
Yes/Yes	GH₵ 2	103	30.7
Yes/No	GH₵ 1.80	69	20.5
No/Yes	GH₵ 1.50	91	27.1
No/No	<GH₵1.50	73	21.7
Total		336	100

Source: Field survey, (2020)

Table VI: Factors influencing consumers' willingness to pay for Asaana

Variables	Marginal effect	Robust standard error
Age (years)	0.0483***	0.0072
Gender (male)	-0.0934	0.0737
Education	0.0432	0.0461
Income		
200 – 500	-0.0203	0.0674
501 – 1000	0.2004**	0.1002
Above 1000	0.0952	0.2743
Labelling	-0.0428***	0.0129
Price	-0.0236***	0.0110
Savings	0.0090***	0.0030
Health benefits	-0.0440	0.0466
Nutritional benefits	-0.0809	0.0509
Taste	0.0401	0.123
Color	0.0321	0.289
Distance to the nearest sales point	-0.0211	0.0301
Constant	2.3584	0.3283
Observations	336	
F(12, 388)	103.99	
Prob > F	0.000	
Pseudo R^2	0.6825	

*** = 1%, **= 5% and *= 10%. Source: Field Survey, 2020

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Abstract

Purpose

In view of the increasing trend in food policies targeting the promotion of consumer interest in locally produced foods and growing developments in Willingness to Pay (WTP) methodologies, we investigate consumer preference for packaged traditional drink Asaana.

Design/methodology/approach – The study used a simple random sample of 336 consumers to draw on perception index and contingent valuation methods to evaluate consumers' perception of the attributes of packaged Asaana - a traditional maize-based beverage produced in Ghana (also known as Ghana Coca Cola). Tobit regression model was employed to analyse consumers' willingness to pay for the product.

Findings – Analysing the factors that influence consumers' WTP for packaged Asaana using Tobit regression model, the study established the existence of positive health and nutrition, economic benefits and purchasing decision making perceptions for Asaana. While the results further showed that consumers are willing to pay a premium for well packaged Asaana, demographics such as age, income level, labelling, price of the product and savings were found to exert significant influence on consumers' WTP for packaged Asaana. Salient recommendations for food processors and relevant government agencies and food policy implications are identified.

Research limitations/implications – Comprehending WTP provides valuable understanding regarding consumer qualms, actions, and willingness to pay for more secure traditional drinks. In addition, examination of how the different factors influence willingness to pay for local beverages help to boost local beverage production and guarantee employment.

Practical implications – Analysing WTP data for traditional drinks reveals important implications for production, marketing, and public health policies. Certification systems for traditional beverages may be beneficial, and the findings can be used to create public awareness campaigns about the safety of local drinks.

Originality/value – Assessing the WTP among Ghanaian consumers for traditional drinks, specifically *Asaana* is a ground breaking study. The contingent evaluation (CE) and Tobit regression approaches utilized in this research are strong and the results obtained can guide decisions related to traditional drink production, marketing, and the development of public health policies.

Keyword: Consumers; willingness to pay; packaged Asaana; tobit; Ghana.

Paper type – Research paper

1. Introduction

Globally, attempts are made by governments to use local raw materials and traditional methods to ensure self-sufficiency in food production and improvement in the general wellbeing of people. Efforts are made to promote the growth of value-added production in order to boost competitiveness and profitability (Nwaiwu *et al.,* 2020; European Union, 2014). One of the avenues to achieve this goal is to encourage the production of high-quality goods like traditional beverages, which are products made using traditional methods and recognized for their unique sensory characteristics and connection to a specific region or area. These beverages often have a positive reputation, due to factors such as superior taste, nostalgia, and cultural appeal (Darkwah *et al.,* 2020; Balogh *et al.,* 2016; Guerrero *et al.,* 2009). However, the ability of traditional beverages to positively impact farm incomes without relying on subsidies depends on consumers' willingness to pay a premium for these products compared to more affordable alternatives (Nwaiwu *et al.,* 2020; Aksay *et al.,* 2018). The extent of this willingness to pay and the specific attributes that may drive it are currently uncertain.

In Ghana, consumers prioritize quality and affordability when choosing traditional products. According to Danso-Abbeam, Armed and Baidoo (2014), factors such as price, unique characteristics, and socioeconomic factors can impact consumers' preferences for traditional food products in Ghana and other regions. The challenge in Ghana is to produce local drinks that are both accessible and appealing to the country's rapidly expanding population. To compete with imported drinks, which are often superior in terms of visual appearance and other attributes such as bottle size, colour, and aroma, domestically produced drinks must meet high standards of quality and affordability (Davidova *et al.,* 2013; Naseem *et al.,* 2013). To enhance the success of boosting domestic drink consumption, it is crucial to understand the attributes of traditional drinks that influence consumers' preferences (Osei *et al.,* 2021; Abubakar *et al.,* 2015; Danso-Abbeam, Armed and Baidoo, 2014). The promotion of domestic drink production and consumption could be a transformative agenda adopted by the government of Ghana. Foreign drink importation, along with other imported goods, has led to a significant increase in the country's import bill and a negative impact on its balance of payment (Food and Agriculture Organization (FAO), 2018; Green *et al.,* 2020). To mitigate this issue, the government should invest in and promote the consumption of domestically produced drinks. Consumers across the country have diverse product preferences that are largely shaped by their perceptions, prices, and the value they derive from these products (Darkwah *et al.,* 2020; Danso-Abbeam, Armed and Baidoo, 2014). This means that certain factors play a role in determining the consumption of local drinks. By identifying and addressing the unique characteristics of locally produced drinks, the government can effectively reduce the import bill on foreign drinks and achieve its goals (FAO, 2018; Santa, 2014).

The significance of the street food industry in Ghana cannot be overstated. It serves as a source of income and livelihood, employment, food, contributes to the national economy, and supports the growth of local agribusiness industries (Arsene *et al.,* 2020; Otoo *et al.,* 2011; Ababio & Lovatt *et*

al., 2015; Tomlins *et al.,* 2002). However, there are also concerns about the safety of food sold on the street. Studies by Nwaiwu *et al.* (2020) and Obeesi (2010) have shown that many traditional beverages sold on the street are contaminated with microbes and other impurities. Products such as *Palm Wine, Pito, Sobolo, and Asaana*, which are popular in Ghana, have lost their market value due to the lack of proper packaging and labelling. Over the past decade, demand for these traditional beverages has decreased dramatically, resulting in a low supply by street vendors (Frimpong-Mensah, 2016). This decrease in demand has been attributed to the unsanitary conditions surrounding the sales of these products. According to Frimpong-Mensah (2016), about 75% of the vendor respondents were lacking knowledge on safe food handling practices. Furthermore, 87.5% of the vendors were observed to use the same hands for serving food and collecting money, and 75% were not medically certified to sell food. This lack of attention to hygiene by vendors can increase the risk of pathogen contamination and proliferation, potentially leading to illness in consumers (World Health Organization (WHO), 2015). There are few studies on *Asaana* (Osei *et al.,* 2021; Aboagye *et al.,* 2020; Frimpong-Mensah, 2016) and there is no research knowledge on consumers' perception and their willingness to pay for a 'well-packaged' *Asaana*. Thus, this study sought to answer the following research questions: (1) What are consumers' perception on the production and marketing of *Asaana*? (2) Are consumers willing to pay for an improved packaged *Asaana* and at what price are they willing to pay? and (3) What factors affect consumers' willingness to pay for an improved packaged *Asaana*? The main motivation for purchasing *Asaana* in Ghana is its indigenous origin and cultural heritage, as discussed in the following sections. The study aims to provide real evidence to entrepreneurs to facilitate their investment decisions with regards to packaging and labelling of their products in the local beverage industry for their profit maximization goal. Moreover, the application of the results can assist the vendors to decide how to serve the drink while increasing consumer satisfaction.

The rest of the paper is organized as follows. The literature review is the next section. The methodology follows afterwards, and the results and discussions presented in section four. Conclusion and recommendations are presented in the last section of this paper.

2. Ghanaian local beverages - the case of Asaana

According to Ketema *et al.* (1998), traditional beverages are those that are native to a specific region and are made using traditional methods and local, mostly home-grown ingredients. Consumers associate traditional beverages with a strong connection to the past and to a specific local area or country, often evoking fond memories from childhood (Rousham *et al.,* 2020; Cerjak *et al.,* 2014; Rudawska, 2014). The knowledge on how to produce and consume traditional beverages is considered to be passed down from generation to generation, typically within the household (Green *et al.,* 2019; Guerrero *et al.,* 2009). The appeal of traditional beverages lies in their unique sensory attributes (Molnár *et al.,* 2011), which are typically viewed favourably (Osei *et al.,* 2021; Aboagye *et al.,* 2020; Almli *et al.,* 2011). To consumers, authenticity is a key factor

in evaluating the worth of a particular traditional drink (Rudawska, 2014), and those perceived as genuine are considered an integral part of the region's culinary heritage (Guerrero *et al.,* 2009). Pieniak *et al*. (2009) explored the relationship between food choice motivations and attitudes towards and consumption of traditional food products, finding that familiarity and the natural content of food were positively associated with positive attitudes towards and consumption of traditional food (Balogh *et al.,* 2016; Rudawska, 2014). On the other hand, consumers who value convenience and weight control have a negative attitude and reduced consumption of traditional food products (Balogh *et al.,* 2016). Pieniak *et al.* (2009) did not find any significant connection between the degree of importance consumers placed on sensory qualities, price sensitivity, and their attitude and consumption of traditional food products. This could be due to the wide range of traditional food products, making it challenging to associate general attitudes with specific purchases. While traditional food products usually have a strong connection with their place of origin and location, this is not always the case (Verbeke *et al.,* 2016; Aboagye *et al.,* 2020).

Asaana, also known as Ghana Coca Cola, is a popular indigenous beverage in Ghana, made from fermented maize (see Figure I). This refreshing drink is traditionally produced on a small scale for local consumption or for sale on the streets. Originally discovered in the Volta region in Ghana, *Asaana* has now spread throughout the country and is even sold globally (Quartey, 2016; Quartey, Kunawotor, and Danquah, 2014). *Asaana* is a traditional maize-based beverage steeped in local heritage and history (Santa, 2014). Other names for the beverage in Ghana are 'Ahei'(Fante), 'Nmedaa'(Ga) and 'Liha'(Ewe) (Osei *et al.,* 2021; Aboagye *et al.,* 2020). Halm (1977) noted that little research had been conducted on the beverage's production, microbiology, and nutritional value. Safiul Azam et al. (2022) conducted a survey and found that "*asaana*" has a short shelf life of three to six days when stored at room temperature, and is often produced under unhygienic conditions with varying temperature based on the vendor or consumer. This increases the risk of microbial contamination and reduces the storage potential of the product. The production process of "*asaana*" at most processing sites is similar, with the same unit operations being observed at all sites visited. Six to eight processors learned these methods from their families and started their own business despite their education, focusing more on the experience gained (Frimpong-Mensah, 2016). Odah *et al.* (2017) stated that *Asaana* is prepared with fermented corn, water and milk which is optional together with sugar. The content of sugar will depend on the amount of *Asaana* to be prepared. Crushed corn is soaked for three days until it is fermented, it is then cooked for thirty to forty minutes until the foam on top has dried. The corn is strained and the water in which the corn was cooked is poured into a pot with caramelized sugar, then stirred and allowed to cool down (Odah *et al.,* 2017; Quartey, 2016). It is then served with ice cubes and milk. Yiadom (2015) pointed out some nutritional benefits of *Asaana* as it helps in preventing heart conditions, lower blood pressure, and neutral-tube defects at birth. The antioxidants present in corn also act as anti-carcinogenic agents and prevent diseases like Alzheimer (Garg *et al.,* 2021). It also provides minerals such as iron, zinc, and much more essential for regulating normal growth, bone health, and optimal kidney functioning (Musah *et al.,* 2014).

Studies exploring consumer preferences for geographical indications and quality labels have shown that these preferences are varied and diverse (Resano *et al.,* 2012; Verbeke *et al.,* 2016). Train and Weeks (2005) as well as Yahaya et al., (2015) support the use of Tobit model for determining the probability of willingness to pay (WTP). Despite the advantages of the WTP framework, it has not been widely used in the food policy literature, with some exceptions (Balcombe *et al.,* 2010). Most previous studies on WTP in the food industry assume that consumers have fixed price sensitivities and that the moments of WTP are equal to the moments of non-monetary attribute coefficients scaled by the price coefficient. However, this is a strong assumption of homogeneity. Balcombe *et al.* (2010) and Zanoli *et al.* (2013) have explored WTP for specific food attributes, while Campbell and Doherty (2013) investigated adding value to chicken meat. However, these studies do not account for demographic variables and preference heterogeneity. In this paper, we apply a Tobit model that includes socioeconomic variables to better understand the socio-economic and demographic determinants of WTP, following Train (2009).

3. Methodology

3.1 Study Area

The study was conducted at KNUST and its environs in Ashanti region of Ghana. KNUST is located in the Oforikrom district in the Kumasi metropolitan. It has a land size of about eighteen square kilometres. It is found between latitude 6.67° N and 1.5716° W. The target population of interest for this study was students, teaching and non- teaching staff, with the student population of 62346 and 2279 for both teaching and non-teaching staff members where 1357 members are teaching staff and 922 non-teaching staff members (KNUST website, 2020). Figure II illustrated the study area of KNUST.

[insert Figure II here]

3.2 Sample Size and Sampling Technique

In this study, we calculated the sample size for different respondents comprising students, teaching staff and non-teaching staff (see; Table I for details). The decision to focus on the education sector as the target population was made based on the research objectives and the specific context being investigated. By narrowing the scope to the education sector, the study could delve deeper into the dynamics, and opportunities such as marketing of *Asaana* to this particular group. Using the Slovin's sample size formula, the study sample size was calculated as:

$$n = \frac{N}{1 + N(\propto)^2} \quad (1)$$

where n = required sample size; N = population size; α = margin of error (5%). Using a total population of 64,625 which comprises of students, teaching and non-teaching staff of 62,346, 1357 and 922, respectively.

Estimating sample size is specified as:

$$n=\frac{64625}{1+64625(0.05)^2}=397 \quad (2)$$

In all, sample size of 397 respondents was computed. Using the disproportion sampling to select respondents from each category, we selected 40%, 31% and 29% of the students, teaching and non-teaching staff, respectively (Table I). A multi-stage sampling technique was used to select the sample size of each category of respondents. Firstly, proportional sampling was used to select the sample of each category which includes students, teaching and non-teaching staff. Secondly, disproportionate sampling was employed to obtain the sample size for each category. This sampling was used because the survey was conducted among heterogeneous groups and was done to breach the gap between their sample size. Finally, convenience sampling was used to collect data and information from students, teaching staff and non-teaching staff. Overall, 336 respondents were sampled for this study due to incomplete responses.

[Insert Table I here]

3.3 Type and Source of Data

Primary data was used for this study with other supporting secondary information. Primary data was obtained from respondents using a structured questionnaire. The secondary information was accessed through a review of articles, research publications, journals, via the internet, and institutions complement the primary data gathered. Structured questionnaires were administered to collect primary data from the respondents. Both closed and open-ended questions were employed which allowed the respondents to choose from a set of responses given and shared their experiences and also comments where they were required to do so.

3.4 Empirical Strategy

3.4.1 Consumers' perception

The study computed perception indices based on carefully constructed perception statements such as safety, attractiveness, health and education. Descriptive statistical tools such as frequency distribution tables, bar charts and arithmetic mean were used to summarize the characteristics of respondents. A 3-point Likert scale (1= agree, 2= neutral and 3= disagree) was used to measure the perception statements. The mean score was computed using the formula below:

$$\text{Mean score} = \frac{(f_A x1) + (f_N x2) + (f_D x3)}{X} \quad (5)$$

where f_A= frequency of agree; f_N= frequency of neutral; f_D= frequency of disagree; X= the total number of responses to the perception statement. The overall perception index was calculated by summing the estimated mean scores over the number of items or statements (n) using the formula:

$$Perception\ Index = \frac{MS\ PURCHASE + MS\ HEALTH + MS\ NUTRITION}{n} \quad (6)$$

where MS= mean score for each perception statements' category (including nutrition, purchase and health); Purchase= perception on the purchase, Nutrition= perception on nutrition, Health= perception on health. n=number of perception category.

3.4.2 Willingness to Pay (WTP) Estimation

Willingness to pay is a mathematical expression of a change in consumers' utility concerning a product. Change in individual utility may come as a result of changes in some attributes of the product. In dealing with *Asaana*, the stated preference method is most appropriate. The stated preference method may either use open-ended questions or closed-ended questions to deduce consumers' willingness to pay. The use of closed-ended questions allows for an in-depth statistical analysis of data collected. This research employs the dichotomous choice of questions where responses are statistically defined as discrete dependent variables (Hanemann, 1994). The variables are measured on the nominal or ordinal scale. Response from the discrete choice questions can only take these forms, Yes/Yes, Yes/No, No/Yes and No/No.

The double bonded Contingent Valuation Method was used to measure how much consumers are willing to pay for *Asaana*. A base price of Gh¢1.80 was set with the lowest bid being Gh¢1.50 and the highest bid being Gh¢2.00. The use of CVM in previous studies (Hanemann, 1994; Freeman, 2003; Hwang et al., 2023; Pratikto & Rikardo, 2023) is justified as it allows for the exploration of hypothetical scenarios based on the current situation, enabling inquiries into willingness to pay (WTP). CVM facilitates direct calculations of Hicksian welfare concepts such as equivalent and compensating surplus through survey responses, without the need to derive general hypotheses or demand functions. However, it is important to exercise caution and apply appropriate criteria when estimating WTP using CVM. Utilizing CVM in empirical studies, the dichotomous choice question method is commonly employed, and this study followed suit. The consumer's indirect utility function is comprised of both deterministic and stochastic components, as specified:

$$u(W,Y,X) = v(W,Y,X) + \varepsilon_i \quad (7)$$

where Y=consumer's income, X=consumer's socioeconomic characteristics, W =willingness status (thus 1 if consumer is willing to pay and 0 otherwise), ε_i=error term assumed normal distribution.

Previous studies (Hwang et al., 2023; Freeman, 2003; Prah et al., 2023; Pratikto & Rikardo, 2023) have highlighted the importance of utility maximization theory to model the choice of consumers. The theory indicated that an individual consumer chooses a particular product if the expected benefit is greater than cost. Applying this in the CVM, the amount offered to the consumer let say G, the consumer compares their WTP for *Asaana* and the bid amount G. If the consumer's WTP is higher, he/she answer "Yes," and if it is smaller, answer "No," thus maximizing the consumer's utility. If the consumer answers "Yes," he/she is willing to pay for *Asaana*, in which the utility function is $u(1, y-G,X) \geq u(0, Y, X)$. The indirect utility function containing the error term is specified as:

$$\Delta v(G) = v(1, Y-G, X) - v(0, Y, X) \geq \delta), \delta = \varepsilon_0 - \varepsilon_1 \quad (8)$$

From Equation (8), the cumulative distribution function (CDF) of δ is specified as: $F_\delta(.)$, the probability that the consumer will answer "Yes" is the same as the following equation:

$$\Pr\{Yes\} = \Pr(\Delta v(G) \geq \delta\} \equiv F_{\delta}[\Delta v(G)] \quad (9)$$

Based on Equation (9), if $\Delta v(G) < \delta$, then consumer is assumed to be "No." The WTP is specified with the CDF of the error term as $D_{WTP}(G)$. Therefore, the likelihood of consumer will answer "Yes" to the initial bid amount for the Asaana can be specified as:

$$\Pr\{Yes\} = \Pr(WTP \geq G) \equiv 1 - D_{WTP}(G) \quad (10)$$

From Equation (9) and (10), following assumption holds as:

$$1 - D_{WTP}(G) = F_{\delta}[\Delta v(G)] \quad (11)$$

Given that the WTP can have a negative value, thus WTP is negative denote marginal willingness to pay, the mean of WTP is calculated by integrating Equation (10). If the mean of WTP is specified as $\overline{WTP}$, then $\overline{WTP}$ can be computed as:

$$\overline{WTP} = E(WTP) = \int_0^{\infty}[1 - D_{WTP}(G)]dG - \int_{-\infty}^{0} D_{WTP}(G)dG \quad (12)$$

The median WTP is specified as WTP^*, the CDF value of 0.5 which the following equation hold as:

$$D_{WTP}(WTP^*) = 0.5 \quad (13)$$

Consider the situation where it is necessary to apply the condition of positive WTP, the mean of WTP is specified as WTP^+, then WTP^+ is computed as:

$$WTP^+ = \int_0^{\infty}[1 - D_{WTP}(G)]dG \quad (14)$$

Hanemann (1991) argued that double-bounded model theory for CVM is estimated as follows. First, the initial bid amount of the *i*th consumer is defined as G_i, the second-highest bid amount as G_i^H, and the second-lowest bid amount as G_i^L. $G_i^H$is the amount offered when the consumer answers "Yes" to the initial bid amount, and G_i^L is the amount offered when the consumer answers "No" to the initial bid amount. This led to four cases specified as:

$$\begin{cases} T_i^{YY} = 1\{Yes\ to\ first\ bid\ amount, Yes\ to\ second\ bid\ amount) \\ T_i^{YY} = 1\{Yes\ to\ first\ bid\ amount, No\ to\ second\ bid\ amount) \\ T_i^{YY} = 1\{No\ to\ first\ bid\ amount, Yes\ to\ second\ bid\ amount) \\ T_i^{YY} = 1\{No\ to\ first\ bid\ amount, No\ to\ second\ bid\ amount) \end{cases}$$

The above hypothetical scenario is estimated using the log-Likelihood function which is specified as:

$$lnL = \sum_{i=1}^{N}\{T_i^{YY}\ln\left[1 - D_c(G_i^H)\right] + T_i^{YY}\ln\left[D_c(G_i^H) - D_c(G_i)\right] + T_i^{YY}\ln\left[D_c(G_i) - D_c(G_i^L)\right] + T_i^{YY}lnD_c(G_i^L)\} \quad (15)$$

Using the logistic CDF of $F_{\delta}(.)$, when $\Delta v = a - bG$ combined with logistic function, the CDF of the WTP is specified as:

$$D_{WTP}(G) = \frac{1}{1 + \exp(a - bG)} \quad (16)$$

Therefore, estimating the mean and median of WTP using Equation (16) is specified as:

$$\overline{WTP} = WTP^* = \frac{a}{b},\ WTP^+ = \left(\frac{1}{b}\right)\ln[1 + \exp(a)] \quad (17)$$

3.4.2.1 Empirical Model

The factors influencing consumers' willingness to pay for improved packaging for the product *Asaana* was determined. Consumers' willingness to pay an extra cost for *Asaana*, based on

improved packaging, depends on the socioeconomic characteristics and we employed the Tobit regression model. The Tobit regression model can be specified as:

$$Asaana_{cost} = \alpha_0 + \alpha_1 Age + \alpha_2 Gender + \alpha_3 Edu + \alpha_4 Inc + \alpha_5 Dis + \alpha_6 Col + \alpha_7 Tas + \alpha_8 Hea + \alpha_9 Nutri + \alpha_{10} Sav + \alpha_{11} Price + \alpha_{12} Labelin + \varepsilon_i \quad (18)$$

where *Asaana* denotes the extra cost, the consumer is willing to pay for *Asaana* (GH₵) and ε denotes the error term. α_0 is the constant term and $\alpha_1 \ldots . \alpha_{12}$ denote the coefficient of the explanatory variables to be estimated. The description of the variables included in the model as well as the explanation of their expected signs is presented in Table II.

[insert Table II here]

4. Results and Discussion

4.1 Socioeconomic characteristics of respondents

Table III presents an overview of the socioeconomic characteristics of consumers. It was obvious that males formed the majority of the sample size, constituting 67.6% higher than their female counterparts (33.7%). This is because the men are generally inclined to conventional dinks compared to women (Frimpong-Mensah, 2016). A typical respondent was 25 years old with an average year of education and monthly savings of 15.3 years and GHS78.54, respectively. The findings suggest that most of the respondents are educated with the ability to decipher the benefits of drinking traditional beverages like Asaana. Over 90% of the respondents were Christians, and close to 65.8% and 81.8% of the respondent were Akan and students, respectively. Additionally, more than half of the respondents (57.4%) fall within GHS200-500 as monthly income earned and about 10.8% consumed Asaana about 2 to 4 times within a week. Surprisingly, more than two-thirds of the respondents (77.4%) rarely consumed Asaana which signal a need for stimulating consumers to consume Asaana frequently. Furthermore, about 78.3% of the respondents had tasted Asaana before with an average food expense of GHS85.48 and distance to the nearest sales of the Asaana on average is 1.54 kilometres. Moreover, it was clear that the expenses of the respondents were moderately high. For instance, most of the respondents (27.1%) on average spend more on clothing deemed as the highest expenditure with the lowest expenditure item being stationery (2.3%).

[insert Table III here]

4.2 Consumers' Awareness of Asaana

Out of the three hundred and thirty-six consumers interviewed, about 88% of the respondents were aware of *Asaana* whereas only 12% were unaware. This implies that most consumers are more likely to purchase *Asaana* and therefore, need to solicit consumers' perception. Padberg *et al.* (1997) reported consumers' perception of a product depends greatly on their awareness of the product. This perception then determines the rate at which a particular commodity is consumed. In light of this, there is a connection between awareness and perception that is covered in more detail in the following section.

[insert Figure III here]

4.3 Consumers Perception about Asaana

Consumers were asked to provide their thoughts on the attributes of Asaana. The statements were divided into three categories: health and nutritional, economic, and product attributes (Table IV). Results showed that majority of consumers (62.8%) agreed that *Asaana* lowers blood pressure (Aboagye et al., 2020; Yiadom, 2019), 23.0% neutrally agreed, and 14.2% disagreed. Also, most consumers (71.9%) agreed that *Asaana* helps the body against diseases, with 17.2% neutrally agreeing and 10.8% disagreeing with this statement. Following that, 73.3% agreed that *Asaana* is crucial for strong bones and teeth (Aboagye et al., 2020), with 18.9% of them neutrally agreed and 7.8% disagreed with this statement. The statement that *Asaana* is more nutritious than competing products was agreed by more than half of consumers (51.4%), while 30.4% of consumers neutrally agreed and 18.2% disagreed. A consumer education outreach program about the health and nutritional benefits of *Asaana* would be necessary given that the perception index for health and nutrition was 1.44, showing that the majority of consumers were aware of these benefits (Musah et al., 2014; Nwaiwu et al., 2014).

With regards to the economic statements in Table IV, less than half of consumers (44.3%) were willing to pay more for *Asaana* because of its health advantages. Below 30% of the consumers were neutrally in agreement and disagreement, though. About 60.5% of consumers agreed that the nutritional benefits of *Asaana* made them willing to pay more for it, while only about 16.6% disagreed. These two findings demonstrate that consumers will be willing to purchase *Asaana* if they are aware of its nutritional and health benefits. This is consistent with findings of Hao et al. (2011) who opined that the consumption of fermented drinks like *Asaana*, that are rich in probiotics of strengthen the immune system and reduce the risk of infections such as the common cold. While 55.7% of consumers said they would buy *Asaana* if it were offered at the same price as alternatives, about 31.8% and 12.5% were neutral and disagreed with this statement, respectively. Only 12.5% of consumers disagreed, but 55.7% said they would purchase *Asaana* if they were offered. These findings indicate that consumers would purchase the drink more frequently than they currently do if it were more widely available. Few consumers (7.1%) disagreed with this statement, but more than 73.3% of consumers said they would purchase *Asaana* if the products were properly packaged and labeled. This supports Abdul *et al.* (2012)'s findings, which found that packaging elements affected consumers' perceptions of a product and, consequently, their willingness to pay. Besides this, nearly 68.9% of consumers were prepared to purchase *Asaana* due to its revitalizing functionality, but only 25% and 6.1% of consumers neutrally agreed and disagreed with these statements, respectively. The perception index for the economic statement was 1.50, which indicates that consumers had a neutral opinion.

The results on the product attribute statements in Table IV shows that about 92.6% of consumers preferred *Asaana* due to its taste. However, only 5.4% neutrally agreed with this statement while 2.0% disagreed. Surprisingly, only 33.4% of consumers agreed that *Asaana* was well packaged, while 24.3% disagreed and 42.2% were neutral on the same statement. This suggests that the product's packaging is extremely subpar, which may deter consumers from consuming the product.

Less than 8.4% of consumers disagreed, 71.9% agreed that *Asaana* has a pleasant flavor. Remarkably, 71.9% of customers agreed that *Asaana* satisfies the necessary standard; however, 29.1% and 8.4% of customers neutrally agreed and disagreed, respectively. It is interesting to observe that over 34.8% of consumers disagreed with the statement that *Asaana*'s products are easily accessible, while 31.1% and 34.1% agreed and neutrally agreed, respectively. This claim implies that there is very little *Asaana* production and that consumers do not frequently encounter it on the market. Consumers' perception of *Asaana's* product attributes is indifferent, based on the perception index of 1.60. This could be possible because consumers don't know enough about the features of the products that have affected how they perceive them when making purchases. Following the overall perception index of 1.51, consumers' perceptions of all perception statements about the *Asaana* were neutral. This is good news especially for organizations that support small-scale local beverage producers in Ghana. The aforementioned findings are consistent with Abdul *et al.* (2012)'s suggestions that government should support periodic training and educational programs on local beverage production while lessening importation of foreign beverages.

[insert Table IV here]

4.4 Consumers' Willingness to Pay for an improved packaged Asaana and prices they are willing to pay

The price that consumers are willing to pay for *Asaana* is summarized in Table V. The result demonstrates that many consumers would buy *Asaana* if it was offered at the same cost as alternatives. At the instant, 300ml of *Asaana* cost GHS1.00. Consumers (30.7%) who answered Yes/Yes were prepared to spend GHS2.00 on 300ml of *Asaana*. Consumers (20.5%) who answered either Yes or No were willing to pay GHS1.80 for 300ml of *Asaana*. Further, about 21.7% of the consumers were not willing indicating No/No pricing of *Asaana* at GHS1.50. The results indicate that, given all the necessary factors that affect consumers' willingness to pay for local beverage consumption, the local beverage industry—from production to processing and marketing—could be a huge source of relief for the nation. By lowering Ghana's high import costs for beverages, this could support local production. Additionally, it's important to increase consumer willingness, trend, and intensity given the government's push to increase consumption of drinks "made in Ghana".

[insert Table V here]

4.5 Factors that affect consumers' willingness to pay for an improved packaged Asaana

Table VI describes the factors affecting consumers' willingness to pay for *Asaana*. To determine the factors that influence consumers' willingness to pay for *Asaana*, a Tobit model was employed. The Tobit model assumed same factors affecting both the decision and intensity of consumers' willingness to pay simultaneously (Tobin, 1958). Based on the results, factors such as age, income level, price, labelling, and savings significantly influence willingness to pay for *Asaana*. Age variable has a positive and significant influence on willingness to pay at 1% significance level. This implies that as age increases by a year, the more consumers' willing to purchase. Plausibly, *Asaana* is a traditional drink with long history associated with older people preferred as a source of nutritional booster and hence, are more willing to purchase compared to younger people who are inclined to modern drinks. The results also indicate that the youths consume less of traditional

drinks than modern drinks due to the less prestige usually associated with local drinks. During the survey, it was observed that the youth generally did not want to be seen drinking conventional beverages in front of their peers. This is consistent with Nimoh, Prah and Boansi (2022) who opined that older people have a higher propensity to purchase traditional products in Ghana.

According to classical microeconomics, demand for typical goods is a positive function of income. In other words, as income rises, so does the demand for a given good. In this study, it is similar that as income increases, willingness to pay for *Asaana* increases. In Ghana, local beverages are typically seen as belonging to "poor households" and more contemporary beverages to "rich households." It is not astounding that the finding discovered a positive association between income and willingness to pay because, typically, middle-class consumers have a higher likelihood to prefer local beverages while high-income consumers have a greater tendency to prefer foreign beverages. In order to encourage high-income individuals to consume local drinks, it is crucial that sellers pay attention to the product attributes. Savings variable has a positive and significant influence on consumers' willingness to pay for *Asaana*. This is was statistically significant at 1% indicating that the higher the savings of the consumer, the higher the willingness of consumers to pay for *Asaana*. This supports the findings of Boccaletti and Nardella (2000) revealed that WTP was positively and significantly related to savings. However, Abubakar et al. (2015) argued that higher savings people are more reserve when it comes to purchasing of local drinks. They believed the processes of local products are questionable and requires critical assessment by the standard board authority. Furthermore, the probability of willing to purchase *Asaana* decrease if there is no additional labeling of the product. This was significant at 1% and suggests that consumers are more conscious of *Asaana* labelling because poor labelling decrease their willingness to pay for *Asaana* by 4.2%. This supports the findings of Loureiro and McClusky (2003) which indicated that consumers were not willing to pay for unlabeled products. This indicates that consumers are willing to pay more for products that are well labeled. Moreover, price variable has a negative and significant influence on consumers' willingness to pay for *Asaana*. At 10% significance level, implies that an additional increase in price will lead to a decrease in consumers willing to pay for the product by 2.03%. This confirms that consumers are more sensitive to price variations because they tend to patronize local beverages more at a low price. Our findings also follow the classical law of demand which states that "consumers demand more at a lower price and less at a higher price.

[insert Table VI here]

5. Conclusion and Recommendations

To meet the nation's consumption demand for imported beverages, improve the standard of living for the producers and consumers, and reduce the cost of imported beverages, investment in the production of local beverages, particularly in Ghana, is necessary. However, traditional beverages with high quality standards that suit consumer preferences should still receive attention. The study examined consumers' perceptions and willingness to pay for *Asaana*. From the study, local beverage consumption especially, *Asaana*, at least in comparison to studies conducted in other

regions of the country (Aboagye et al., 2020; Darkwah et al., 2020), is lower in the study area. Although the majority of consumers (88%) are aware of *Asaana*, their perception of its health and nutritional advantages, as well as its economic and other advantages, is neutral. Although there are benefits to some product attributes and economic perceptions of *Asaana*, investing in these features (such as quality, well-packaged, taste, color, etc.) is a crucial first step that will allow locally produced *Asaana* to successfully compete against foreign - made beverages. The local beverage market will become less vulnerable to the whims of the global beverage market if there is a focus on the quality standards of traditional beverages. Currently, the beverage market in Ghana is valued at approximately GH¢3.85 billion and most consumers in Ghana allocate a weekly beverage budget of less than GH¢50 (Nwaiwu *et al.,* 2020; Osei et al., 2021). Therefore, expanding the local beverage market has a great potential to improve small-scale producers' standard of living. Empirically, age, income level, monthly savings, price and labeling factors, continued to play a significant role in determining the factors influencing consumers' willingness to pay for *Asaana*. Amazingly, the study found a consensus of the classical effect of income on demand. The study therefore, recommend producers to advertise and promote *Asaana* because the majority of consumers are unaware of the product generally and only buy it for its reviving flavor. Additionally, to make the grain more desirable to producers, more investment should be made throughout the value chain of traditional beverages, especially at the processing stage. Furthermore, one of the tools for increasing the demand for traditional beverages could be an advertisement. Advertising can complement the product being marketed and affect demand for the good without altering consumers' preferences (Norman *et al.,* 2008). Moreover, consumers generally place a higher value on a good or service that is publicized because they like knowing that the product they purchase is seen by many people through television, radio, and billboards. As a result, it is imperative on the government to create massive awareness through advertising to increase the purchase of traditional beverages. While the quality of local beverages, particularly *Asaana*, must be improved to compete with imported beverages, the price must be low because consumers are usually price-sensitive.

It is essential to recognize that every study has its own set of limitations, and it is necessary to take these into account when interpreting the findings. In this particular study, several limitations should be considered. First, it is important to acknowledge that the study was conducted in a single district within the Ashanti region of Ghana. Consequently, caution should be exercised when generalizing the findings to other districts or regions. To gain a more comprehensive understanding, future studies could adopt a multi-district approach, encompassing a broader geographical area within the Ashanti region. This would provide more diverse insights and enhance the overall validity of the research. Secondly, the study focused exclusively on students, teaching staff, and non-teaching staff within the study area. To gain a more comprehensive perspective, future studies could consider incorporating household-level data and exploring the perceptions and factors influencing willingness to pay for improved package Asaana. By broadening the participant pool and considering household dynamics, a more holistic understanding of the subject matter can be achieved.

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