Determinants of intensity of utilization of Baobab products in Kenya
Collins Kiprotich¹, M. Muendo Kavoi¹ and Dagmar Mithöfer²

Abstract: Baobab tree is central to livelihoods of majority of rural communities living in marginal areas of Kenya in the wake of climate change, low agriculture productivity and falling food security. This study examined factors influencing intensity of utilization of baobab products in Kenya. Data on socio-economic, demographic characteristics, and attitude toward baobab pulp were collected from 353 consumers in rural and urban markets. Descriptive were used to describe consumer characteristics. Zero-truncated Poisson regression was used to analyze factors influencing intensity of utilization of baobab products. Exploratory factor analysis was used to assess the attitudes of consumers toward baobab pulp. The model results revealed that education level \((p < 0.01)\) and household size \((p < 0.01)\) negatively influenced the intensity of utilization, while years of product usage \((p < 0.01)\), and awareness level \((p < 0.01)\) had a positive influence. Exploratory factor analysis generated four factors that explained 61.16% of the total explained variance. “Availability, affordability, and income value” factor had the highest factor loading in the analysis, while “Trust and nutritive value” factor had the second highest loading. The study findings recommend strategies that could promote baobab utilization. This include; ensuring that baobab products are available, accessible, and affordable. Likewise, sustained product packaging, certification, and labeling are essential. Other promotional approaches include community nutritional

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PUBLIC INTEREST STATEMENT
The potentials of baobab fruit tree in improving local diets and livelihoods in Kenya remain largely untapped and underutilized. Many parts of the tree (such as the fruits, leaves, or the seeds) can be used as a food supplement. The fruit pulp in is rich in a nutritional point of view due to its high contents of vitamin C and minerals as well as pre-biotic and antioxidant properties. However, little attention has been given to their nutritional or economic value. There is a need to invest in campaigns to strengthen the current awareness and knowledge on the use of novel tree species. Increased utilization of baobab tree can contribute to food security, health and to livelihood diversification. This study identified key factors influencing intensity of utilization and consumers' attitudes. These factors would inform policy makers on the possible points and interventions which can be employed to enhance utilization and appreciation of the novel tropical fruit tree.

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training and information dissemination through both formal and informal education.

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1. Introduction

Baobab (Adansonia digitata L.) occurs as a natural deciduous plant in arid and semi-arid regions of Kenya. The tree species is widespread in two growing belts covering Kitui, Kilifi, Kwale, Taita Tavetta, Makueni, Tharaka Nithi, and Lamu counties. These regions happen to be the hotspot of food and nutritional insecurity and rising poverty level. The tree holds a high market potentials and substantial contribution to household food and nutritional security, income, and livelihood generation. Many parts and products from the tropical tree are used as food. Especially in marginal rural areas of Kenya experiencing falling resilience to nutritional security (Muok, 2019). For instance, baobab fruit pulp is regarded as an excellent nutrient source. The pulp is enriched with vitamin C (ascorbic acid 300 mg per 100 g pulp), calcium (307 to 2640 mg/100 g dw), lipids (11.6 to 33.3 g/100 g dw), carbohydrates (61.94 ± 0.701 g/100 g dw), and proteins (2.20 ± 0.220 g/100 g dw) (Alercia, 2013; Vertuani et al., 2002; Chadare et al., 2008; Muthai et al., 2017a). With regard to its vitamin content, the pulp is used for pre-biotic and antioxidant functions (Bosch, et al., 2004). Due to its exceptionally nutritional value, baobab fruit pulp and pulp-related products has gained popularity and use in West African countries. For instance, Hausas community in Nigeria use baobab leaves and pulp for soup (Yazzie, et al., 2002). In Senegal, Ghana and Benin baobab-based meals are consumed daily. These include leaves and fruits which are sold on local markets (Buchmann et al., 2010). Nordeide (1996) documents great appreciation and utilization of baobab in Southern Mali; over 100 rural households, 26% used baobab leaves in the rainy season, and 56% in the dry season and out of over 150 urban households, 6% used baobab leaves in the rainy season and 13% in the dry season. Despite their nutritional benefits, income generation and medicinal value observed in west and southern African, the production, trade, and consumption remain low to guarantee such benefits in Eastern Africa. The importance of the tree remains unappreciated particularly in Kenya. There exist a smaller number of value chain actors as well as products in both local and urban markets. The wonder fruit tree remains underutilized and underexploited (Gebauer et al., 2016). This is due to factors related to socio-economics, cultural values, human attitudes, and lack of consumer awareness on their benefits.

A number of studies in Africa have examined knowledge, use of baobab and their determinants. However, a handful of these have focused on Western African countries and a few on East African countries. Majority of the studies focusing on use of baobab in western African include Zahra’u et al. (2014), Omotesho, et al. (2013), Kamatou, et al. (2011), Buchman et al. (2010), Caluwé et al. (2009), Sidibe and Williams (2002). Naturwissenschaften and Kahlheber (2004) document that baobab consumption is linked to cultural identity and social wellbeing. Furthermore, knowledge and awareness on benefits of baobab is spreading evenly in Burkina Faso. The results are contrary to Nigeria where a negative socio-cultural belief held upon by consumers on baobab products and low awareness level presents a strong constraint toward its utilization (Omotesho et al., 2013). Such negative cultural beliefs and low level of awareness on benefits have undermined the utilization of the fruit tree. Of the few studies that have focused on Eastern Africa include Muthai et al. (2017b); Fungo et al. (2016); Mwema et al. (2012). None of the studies focused specifically on intensity of utilization of baobab products. While Jäckering et al. (2019) focused on value chains on baobab products in Eastern and Coastal parts of Kenya. The author emphasized
much on the product markets and value chains and less emphasis on determinants of baobab
products utilization.

Various initiatives to improve awareness and consumption baobab are being undertaken across
Kenya. They include recognizing the tradeoff between preservation of traditions, cultures and
social norms, and the benefits derived from utilizing the trees, promoting local processing, and
marketing (Leakey et al., 2005). They aim to reach both urban and rural consumers through
community-based sensitization programs, mass media both formal and informal educational
programs. However, these initiatives are constrained by lack of documented theoretical framework
and empirical evidence on determinants and interventions that enhance utilization of baobab. The
underlying model in this study will help to understand the determinants of the intensity of
utilization. This study inform policy makers on the possible points and interventions, which can
be employed to enhance utilization and appreciation of the novel tropical fruit tree. Further, the
study will contribute to understand the process of market development for an underutilized crop
and will provide recommendations for further development of the economic potential of the crop
and supply chains. The main objectives of the study were to determine the factors influencing
intensity of utilization of baobab and the attitudes of consumers toward baobab pulp in Kenya.

2. Methodology

2.1. Data sources and sampling

A purposive multistage sampling approach was used in selecting respondents. In the first stage,
purposive sample of Nairobi, Kitui, and Mombasa counties in Kenya was obtained. Mombasa and
Nairobi urban, markets were chosen to represent urban consumers and Kitui rural township market
was chosen to represent rural consumers. Kitui is the rural market within the baobab-growing belt,
while Mombasa and Nairobi are some of the final urban markets where both processed and
unprocessed baobab products from different production zones are sold.

Cochran (1977) proportionate to size sampling formula was used to determine the sample size.
The formula arrived at a sample of 353 respondents distributed proportionately resulting to 51
respondents in the rural market and 303 respondents in the urban markets. Figure 1 shows the
map of the study areas.

Figure 1. Map of study areas.
Data were obtained through a consumer survey interview conducted in September and October 2018 using a structured questionnaire. Respondents were interviewed at the point of purchase after purchasing baobab products. Respondents were interviewed to obtain information on socioeconomic and demographic characteristics, awareness, and usage of a variety of baobab products, and medicinal and nutritional value of the tree. Finally, they were subjected to nine statements testing their attitudes on baobab pulp.

The data were then cleaned, coded, and entered into Statistical Package for the Social Sciences (SPSS) and Stata computer program for analysis.

2.2. Analytical framework

Many studies on product utilization and demand are based on utility demand function, and are mainly concerned with the link between number of products utilized and socio-economic variables related to the consumer. Intensity of utilization on tropical fruit tree products is modeled using frequency of the number of products consumed. In the past, count data modeling has found its way useful in empirical studies on consumer demand. The focus of count models is to establish the influence of covariate factors on frequency of the dependent variable. Poisson and Negative Binomial models are the standard models for analysis of responses with non-negative variables. Zero-inflated Negative Binomial and Zero-inflated Poisson are preferred in analysis dealing with responses of excess zero (Greene, 2008; Winkelmann, 2007). Zero-truncated Poisson is used to model responses with no zeros. This study focused on consumers of baobab products therefore value responses did not occur. Therefore, standard Poisson and Zero-truncated Poisson was used for this study.

2.3. Empirical model specification and variables

Zero-truncated Poisson distribution is defined as the probability distribution,

\[ p(y_i > 0 | x) = \frac{\exp(-\mu) \exp(-y_i)}{y_i(1 - \exp(-\mu))} \quad y_i = 1, 2, \ldots \]  

(1)

The derived log-likelihood for the above distribution function is

\[ LL(\mu; \beta; x) = y_i \log(\mu) - \mu - \log(y_i + 1) - \log(1 - \exp(-\mu)) \]  

(2)

The log-likelihood expression above is parameterized in terms of the linear predictor \( x \).

where \( \mu = e^{x\beta} \), which results to;

\[ LL(\beta; x) = y_i x \beta - e^{x\beta} - \log(y_i + 1) - \log(1 - e^{x\beta}) \]  

(3)

Cameron & Trivedi, (1999) recommend robust standard errors for Poisson models. Differentiating equation above will give a basis for robust score calculation shown below;

\[ y - \exp(x\beta) - \frac{\exp(x\beta) \exp(-\exp(x\beta))}{1 - \exp(-\exp(x\beta))} \]  

(4)

Where \( y = \) Number of baobab products the respondent has utilized over the last one year.

\( x = \) Covariate factors/Explanatory variables.

\( \mu = \) Poisson distribution means.

\( \beta = \) linear predictor of random variable response.

Therefore, the functional form of Zero-truncated Poisson model estimated used was;
Number of baobab products the respondent has utilized (usage score) = f (income, education level, years of product consumption, household size, distance to product market, awareness level, group membership)

Table 1 shows description of variables hypothesized to influence intensity of utilization.

### 2.4. Attitudes toward baobab pulp
Success in realizing increased utilization on baobab product depends on various factors. They include socio-economic and demographic characteristics, market factors, consumer attitude, and behavior toward baobab pulp attributes. Consumer attitude toward a product has a huge implication on product and market development. It represents the consumers’ feeling about a product and behavioral intention toward a product. The scope of this study was to employ exploratory factor analysis to add a scope to our knowledge on underlying factors influencing consumers’ attitude toward consumption of baobab pulp.

### 3. Results and discussions

#### 3.1. Socioeconomic characteristics of rural and urban baobab consumers
Socioeconomic characteristics of rural and urban consumers varied as shown in Table 2. On average, rural consumers were significantly elderly but less educated. Rural consumers had more household members and low household aggregate income. On average, awareness on the diversity of baobab products and product use was largely same in both urban and rural market segments. While years of product consumption was significantly higher (mean 11.2) in urban consumers compared to rural consumers (mean 8.56).

The average distance to the preferred product source was on average 7 km for rural consumers and 8.47 km with urban consumers. Significant difference was also observed when rural consumers and urban consumers were compared in terms of access to credit and gender.

### Table 1. Description and expected sign of variables included in the intensity of utilization models

| Variable           | Definition and their measure                                                                 | Expected Sign |
|--------------------|------------------------------------------------------------------------------------------------|----------------|
| **Dependent variable** |                                                                                                  |                |
| Intensity of utilization. | Number of baobab products that a consumer has utilized over the past one year. (count variable) |                |
| **Independent variables** |                                                                                                  | ±              |
| Age                | Age of the respondent in years (Continuous variable)                                             | ±              |
| Household size     | Number of members in the households (Continuous variable).                                       | +              |
| Household income   | Aggregate income in Ksh (Continuous variable)                                                    | +              |
| Market Distance    | Distance to preferred product market in kilometers(Continuous)                                  | -              |
| Years of product usage | Years of product usage (Continuous variable).                                                   | +              |
| Education level    | Number of years spent in school (Continuous variable)                                            | +              |
| Awareness level    | Number of the products the respondent is aware of (count data).                                 | +              |
Overall, 56.4% of the interviewed consumers were female while 43.6% were males. Credit access was a challenge in the study area, 64.0% of the consumers in rural markets did not access any credit support, while 36% managed to acquire credit. The situation was largely same in urban markets. 60.1% of urban consumers did not access the credit facilities while 39.9% obtained credit.

### 3.2. Factors influencing intensity of utilization of baobab products in rural and urban markets of Kenya

In order to examine the factors influencing intensity of utilization of baobab products among urban and rural consumer, models for count data that takes the number of products consumed as dependent variable was used to fit a standard Poisson regression and Zero-truncated Poisson regression. The results from the models are shown in Table 3. The Prob>chi² test statistic shows that Poisson and Zero-truncated Poisson models fitted the data well (p-value = 0.000 and 0.000).

#### Table 2. Socio-economic and demographic characteristics rural and urban baobab consumers

|                         | Mean |                | t—ratio | sig |
|-------------------------|------|----------------|---------|-----|
| **Continuous**          |      |                |         |     |
| Age of the consumer (years) | 36.88| 30.81          | 31.67   | 3.45***| 0.001 |
| Household size          | 4.52 | 3.68           | 3.80    | 2.64** | 0.009 |
| Consumers’ HH income (KES) | 47,540.00| 79,247.19 | 74,756.09| -1.25 | 0.211 |
| Market distance in (Km) | 7.00 | 8.47           | 8.26    | -1.04 | 0.299 |
| Years of product consumption | 8.56 | 11.29         | 10.90   | -1.73* | 0.085 |
| Education level         | 9.22 | 11.22          | 10.94   | -3.31*** | 0.001 |
| Product awareness score | 5.92 | 6.18           | 6.14    | -0.42 | 0.672 |
| Total score for usage   | 4.24 | 4.15           | 4.16    | 0.20  | 0.842 |
| **Categorical variables** |      |                |         |     |
| Gender                  |      |                |         |     |
| Female                  | 80.0 | 52.5           | 56.4    |       |       |
| Male                    | 20.0 | 47.5           | 43.6    |       |       |
| Total                   | 14.2 | 85.8           | 100.0   | 13.22*** | 0.000 |
| Group membership        |      |                |         |     |
| No                      | 30.0 | 37.6           | 36.5    |       |       |
| Yes                     | 70.0 | 62.4           | 63.5    |       |       |
| Total                   | 14.2 | 85.8           | 100.0   | 1.076 | 0.300 |
| Credit access           |      |                |         |     |
| No                      | 64.0 | 60.1           | 60.6    |       |       |
| Yes                     | 36.0 | 39.9           | 39.4    |       |       |
| Total                   | 14.6 | 85.8           | 100.0   | 0.278 | 0.598 |

*, **, ***; Significant levels at 10, 5, 1%, respectively.

Two-tailed t-test was used to determine significance difference in continuous variables between rural and urban consumers.
Pearson Chi square-test was used to determine relationship in categorical variables between rural and urban consumers.

Overall, 56.4% of the interviewed consumers were female while 43.6 were males. Credit access was a challenge in the study area, 64.0% of the consumers in rural markets did not access any credit support, while 36% managed to acquire credit. The situation was largely same in urban markets. 60.1% of urban consumers did not access the credit facilities while 39.99% obtained credit.
respectively. The mean deviance and the Pearson chi-square ratio were used to assess the goodness of fit of the standard Poisson model. The estimated Deviance and Pearson ratios are shown below.

Deviance/degree of freedom = 251.5626/344 = 0.7313

Pearson/degree of freedom = 240.7841/344 = 0.6999

These results showed that both ratios are significantly smaller than 1 indicating that there is evidence of under-dispersion. Hence, the standard Poisson model does not fit the data well. Table 4 shows the results of Akaike’s information criterion (AIC) and Bayesian Information Criterion (BIC). Lower values of either Akaike’s Information Criterion (AIC) or Bayesian Information Criterion (BIC) indicate a better fit (Ismail & Jemain, 2007). Zero-truncated Poisson model had the smallest value of both AIC and BIC, suggesting that it is statistically superior to the other model. Consequently, the discussion on Table 3 below is based on results from Zero-truncated Poisson model.

This study had earlier hypothesized that the level of income, education level, group membership, household size, and distance to the product market, product awareness level, group membership, and access to credit facilities has no influence on intensity of utilization of baobab products. However, some of the variables were found to be significant in explaining the intensity of utilization of baobab products.

Education level significantly \( (p <0.01) \) and negatively influenced the intensity of utilization of baobab products. This implies that the more the number of the years spent in formal education by the respondent the less likely that the consumer will continue utilizing baobab products. A unit

| Table 3. Factors influencing intensity of utilization of baobab products |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| Variable        | Coef. Std. Err | \( P > |t| \) | Coef. Std. Err | \( P > |t| \) |
| Income level    | -0.0052 0.0320 | 0.8700         | -0.0024 0.0337 | 0.9430          |
| Education level | -0.0223*** 0.0067 | 0.0010        | -0.0251*** 0.0070 | 0.0000          |
| Years of product usage | 0.0080*** 0.0021 | 0.0000        | 0.0086*** 0.0022 | 0.0000          |
| Household size  | -0.1181*** 0.0425 | 0.0050        | 0.1402*** 0.0448 | 0.0020          |
| Market distance | 0.0001 0.0006 | 0.9230         | 0.0000 0.0006 | 0.9560          |
| Awareness level | 0.1006*** 0.0047 | 0.0000        | 0.1065*** 0.0049 | 0.0000          |
| Group membership | 0.0324 0.0596 | 0.5870         | 0.0389 0.0638 | 0.5420          |
| Access to credit | 0.0194 0.0541 | 0.7200         | 0.0292 0.0569 | 0.6080          |
| Constant        | 0.9989 0.3230 | 0.0002         | 0.9168 0.3404 | 0.0070          |

Number of obs = 353

LR chi2(8) = 510.94
Prob > chi2 = 0.0000
Pseudo R2 = 0.2756
Log likelihood = -671.59109

Number of obs = 353

LR chi2(8) = 540.45
Prob > chi2 = 0.0000
Pseudo R2 = 0.2930
Log likelihood = -652.11069

*, **, ***, Significant levels at 10, 5, 1%, respectively.
increase in education level was expected to reduce the intensity of consumption by 2%, although
the resulting change is generally small. Probably this is because the popular product was Mabuyu
(candies) and was predominantly consumed as snack by school going kids. As people get older,
they tend to get out of consuming baobab sweets and snacks. Similar results were observed by
Fungo et al. (2016) in a study on purchase and consumption of nutrient-rich forest products in
Cameroon.

The association between years of product usage and intensity of utilization was not only positive
but significant ($p < 0.01$). An increase in years of consumption by a unit was likely to increase the
intensity of utilization of Baobab by 1%. This finding was not expected since longer periods of
product consumption creates satiation due to diminishing utility.

Awareness on the product as well as its use was found to be positive and significantly ($p < 0.01$)
influenced the intensity of utilization of baobab. An increase in awareness level by a unit would
contribute to an increase in the intensity of utilization by 10%. This finding was in agreement with
the study expectation. Consumers who are informed on a variety of products are likely to consume
more. Results from Omotesho et al. (2013) complement this finding, consumers who were aware
on baobab products and their benefits were more likely to put into use. Household size significantly
and negatively ($p < 0.01$) influenced the intensity of utilization. Large households were less likely to
put into use baobab products. This results is against priori expectation were an increase in
household size was expected to increase intensity of utilization.

### 3.3. Consumers’ attitude toward consumption of baobab pulp in Kenya

Consumer attitude and perception is pervasive and universal. It has a huge implication on new
product development and consumption pattern. Positive attitudes and perception on organic foods
or natural food ingredients promote efficient utilization, while negative attitudes reduce the like-
lihood of consuming a product. This study employed exploratory factor analysis to explore con-
sumer attitudes toward baobab pulp in Kenya. Factor analysis is mathematical procedures for the
simplification of interrelated measures to discover latent factors in a set of variables (Child, 2006).
Exploratory factor analysis reduces the measurable and observable variables into fewer latent
variables that share a common variance and are unobservable. In order to extract these latent
variables, principal component analysis with Varimax rotation was employed.

Prior to extraction Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett’s test was run
to ensure the suitability of conducting factor analysis. The KMO obtained was 0.41 and Bartlett’s,
test of Sphericity $\chi^2 (55) = 148.53$, $p < 0.001$. This indicate that the correlation between the
variables was sufficient for PCA KMO>0.5 is an indication of large partial correlation, However, it
is important to realize that baobab pulp market in Kenya is nascent stage and still developing.
Expectations are that there are still some facets of the market, which are not fully functional hence
few aspects of statistics and economic theory may not yet be applicable. Therefore, the market
data collected showing KMO of 0.41 compared to cut point of 0.5 were remotely considered to be
marginally appropriate for factor analysis. An Eigen-value greater than one rule was applied in
identifying the number of factors. The variables that had large loadings on the same factors were
grouped together as shown in Table 5.

| Model               | Obs. | ll(null)  | ll(model) | df  | AIC   | BIC   |
|---------------------|------|-----------|-----------|-----|-------|-------|
| Zero-truncated Poisson | 353  | -922.33   | -652.11   | 9   | 1322.22 | 1357.02 |
| Standard Poisson    | 353  | -927.06   | -671.59   | 9   | 1361.18 | 1395.98 |
Three attitude variables concerning availability, affordability, and income value to local were loaded on factor 1 with the cross-correlation coefficients of 0.90, 0.80, and 0.60, respectively. This factor was termed “availability, affordability, and income value” of baobab pulp because these variables involved product affordability, availability, and income value loads higher in this factor compared to other attitudinal statements. Factor 1 accounted for 18.80 % of the total variance. Such high scores in this factor implies that it is important to consider baobab products pricing, placement and increasing purchase price for producers and local traders for efficient utilization.

Factor 2 was “trust and nutritive value” which had cross correlation coefficients of 0.77, 0.60, 0.55, and 0.54 respectively. These statements focused mainly on consumer trust and product taste, nutritive value, and cultural perception. This factor was indicative of the importance maintaining consumer trust and product taste as well as nutritional value. The factor accounted to 14.79% of the total variance. This is in consonants with Thøgersen (2007a) who reported that attitudes toward organic food consumption depend primarily on beliefs about consequences. Baobab pulp is mostly utilized for medicinal purposes as well as organic food supplement in the upper markets like Karen. Therefore, trust and its nutritive value is of great concern.

| Factor and item description | Factor Loading | % Variance explained |
|-----------------------------|----------------|---------------------|
| **Factor 1. Availability, affordability, and income value** | | 18.80 |
| Baobab pulp prices are very affordable | 0.901 | |
| Baobab pulp products are readily available in my local market | 0.796 | |
| Consuming baobab pulp products improve incomes for the locals | 0.603 | |
| **Factor 2. Trust, taste and nutritive value, cultural perception** | | 14.79 |
| Consumption of baobab pulp food products is a poor man’s diet | 0.773 | |
| I do not trust how baobab pulp food products are processed | −0.599 | |
| Baobab pulp products are tasteless | 0.548 | |
| Baobab pulp provide enough nutrients necessary for my body | −0.544 | |
| **Factor 3. Cultural values and health difference** | | 14.00 |
| Our cultural values influence the consumption of baobab pulp related products | 0.787 | |
| Baobab pulp make a difference in my health | 0.648 | |
| **Factor 4. Age and freshness** | | 13.47 |
| Baobab pulp is good for all age groups | 0.677 | |
| I consume baobab pulp food products simply because of their freshness | −0.605 | |
| **Total variance explained** | | 61.06 |

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
Factor 3 was “cultural values and health difference.” Two items with close correlation coefficient of 0.79 and 0.65, was loaded into this factor. This attributes focused on the influence of cultural values on baobab pulp consumption and the health difference it has on consumers’ body. This factor accounted for 14.00% on the total variance. The fourth factor had cross correlation coefficient of 0.68 and 0.61. This statement was labelled “age and freshness” and it accounted for 13.7% of the total variance. The cumulative percent of variance for all the four factors explained was 61.06%. Exploratory factor analysis pointed out key factors that influence consumer attitude toward baobab pulp. These are product availability, pricing, and producers’ income value. These are essential during product development and promotion.

4. Conclusion and recommendation

The purpose for this study was to determine the factors influencing intensity of utilization of baobab products and attitudes toward baobab pulp consumption. Poisson regression models were used to assess the determinant of intensity of utilization while exploratory factor analysis was employed in analysis of consumers’ attitudes. The data used were collected through consumer interviews using pretested questionnaires from 353 consumers in Kitui, Nairobi and Mombasa markets of the in Kenya. The market segments were purposively selected to represent both urban and rural consumers in Kenya.

The study found that the factors influencing intensity of utilization of baobab products included education level of the consumer, years of product usage, household size, distance to the product market, and product awareness level. Intensity of utilization on baobab products was negatively influenced by education level and household size. Awareness level and years of product usage positively influenced intensity of utilization of baobab products.

The attitude of consumers toward consumption of baobab pulp was mostly positive. Consumer expressed positive attitude toward baobab, which is depicted by results from exploratory factor analysis. Exploratory factor analysis produced four factors. “Availability, affordability, and income value” factor had the highest factor loading in the analysis, while “trust and nutritive value” factor had the second highest loading.

To enhance increased utilization of baobab products, there is a need to ensure that baobab products are available, accessible, and affordable. Likewise, sustained product packaging, certification, and labeling is essential. Labeling creates awareness on the nutrients available in the baobab product while packaging and certification builds trust on quality of the products. Other promotional approaches include community nutritional training and information dissemination through both formal and informal education. Such promotional activities will raise consumer awareness and ultimately increase utilization.

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