

Consumer willingness to pay for introduced dessert bananas in Uganda

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Introduction

- Dessert bananas (Gros Michel and Sukali-Ndizi) form a large fraction of export bananas in Uganda (IDEA, 1998).
- They are highly susceptible to *Fusarium* wilt (Kangire *et al.*, 1999).
- high yielding and resistant hybrids; KABANA 3H and KABANA 4H, introduced from *FHIA* center as FHIA 17 and FHIA 23 resp

Kabana 3H(FHIA 17) as dessert



The problem

- found acceptable dessert with farming communities (Nowakunda *et al.*, 2000).
- information on their acceptable sensory attributes and consumer's willingness to pay for them on market lacking.
- Knowing the dessert qualities acceptable to the market will enable research to develop banana cultivars with acceptable end-user attributes

Objectives of the study

1. To determine acceptable sensory attributes of the introduced dessert bananas
2. To determine the effect of introduced dessert banana attributes and consumer characteristics on willingness to pay them

Methods

- The study was conducted among urban consumers and traders in markets within Kampala city.
- A multistage simple random & Purposive sampling procedures were used
- Sample size
 - 80 urban Consumers from Lubaga, and Nakawa divisions
 - 40 traders from Nakawa, Nakasero, Wandegeya and Kalerwe markets.

Samples & Data

► **Banana Materials :**

- Source: From farmer fields
- Ripening: Naturally ripened Researcher/ Contact traders
- Packaged: Labeled boxes & distributed (Feb- August '05).

► **Data**

- Socio-economic: age (yrs), education (no of yrs), gender (m/f), income (annual earnings), and household size (no).
- Sensory (scale 1-5): skin colour, pulp colour, taste, flavour, texture, acceptability and implicit prices, actual market prices .
- A structured questionnaire.

Analytical methods

- ✓ Objective 1: Sensory data were analyzed by ANOVA procedure to estimate the mean scores of attributes using SAS software.
- Means separation: Significant means were separated using a Pair wise t-test comparison of the least square means.
- ✓ Objective 2: Ordinary Least square means(OLS) of analysis for Hedonic Pricing Model, measuring willingness to pay using STATA software.
- Diagnostic tests: Multicolliniarity (VIF), Omitted variable bias (hettest).

Analytical Methods Cont'd

- ▶ Willingness to pay: The Hedonic Pricing Model.
- A hedonic pricing model was estimated for each of the 4 dessert banana types:

$$P_i = f(V_i, C_i, A_{wi} + e)$$

P_i = The price that consumers were willing to pay for dessert variety

V_i = A vector of implicit prices for variety attributes including skin colour, pulp colour, texture, taste.

C_i = A vector of consumer characteristics including, age, education, income, sex

A_{wi} = Awareness of introduced dessert bananas

e = error term.

Analytical methods cont'd

- The relationship between the willingness to pay for dessert banana varieties and their determinants was specified as:

- $$IP_i = B_0 + B_1 skcoli + B_2 pcoli + B_3 tasti + B_4 flvi + B_5 texi$$
- $$+ B_6 awri + B_7 ageresi + B_8 educhd + B_9 inci + B_{10} sexhhdi$$
- $$+ B_{11} hhsizei + \text{error} \dots \dots \dots 2$$

Where, IP_i = the price of dessert variety consumers were willing to pay in Ug sh.

- B_0 = constant;
- B_1 -- B_{11} = Parameters estimated

Results

Table 1: Socioeconomic characteristics of urban dessert banana consumers

| Variables | Overall mean(n=124) |
|---|----------------------------|
| Age of household head in years | 37.5 |
| Formal education of house hold head (years) | 9 |
| Household size | 5 |
| Number of children | 3 |
| Monthly Household Income per hold (Ush) | 139,266 (U.S \$87.04125) |

Awareness of bananas

Table 2: Responses (%) of consumers' awareness of introduced dessert bananas

(n=124).

% of sample that was aware of introduced dessert bananas

Dessert type

| | |
|--------------------|-----------|
| Cavendish | 25 |
| Gros Michel | 57 |
| KABANA 3 H | 37 |
| KABANA 4 H | 22 |

Sensory scores

Table 3: Mean sensory scores for the dessert banana attributes for introduced bananas by urban consumers in Kampala district

| Cultivar type | Skin colour | Pulp colour | Taste | Flavour | Texture | Acceptability |
|---------------|-------------------|--------------------|-------------------|-------------------|-------------------|-------------------|
| Gros Michel | 4.23 ^a | 4.32 ^a | 4.48 ^a | 4.38 ^a | 4.38 ^a | 4.36 ^a |
| Cavendish | 3.39 ^c | 3.72 ^{cb} | 3.93 ^b | 3.97 ^b | 3.63 ^b | 3.74 ^b |
| KABANA 3 H | 4.35 ^a | 3.99 ^b | 3.35 ^c | 3.14 ^c | 3.64 ^b | 3.22 ^c |
| KABANA 4 H | 3.88 ^b | 3.65 ^c | 3.62 ^c | 3.38 ^c | 3.54 ^b | 3.30 ^c |
| C.V (%) | 29.53 | 21.26 | 23.87 | 0.23 | 24.13 | 28.43 |
| F. Value | 29.52*** | 16.07*** | 34.53*** | 47.22*** | 22.27*** | 30.77*** |

NB: Means with the same letter in the same column are not significantly different at (P<0.05)

Scale: 1=Very bad, 2 =Bad, 3= Fair 4=Good 5= Excellent.

Weighted mean rank scores of introduced dessert banana varieties

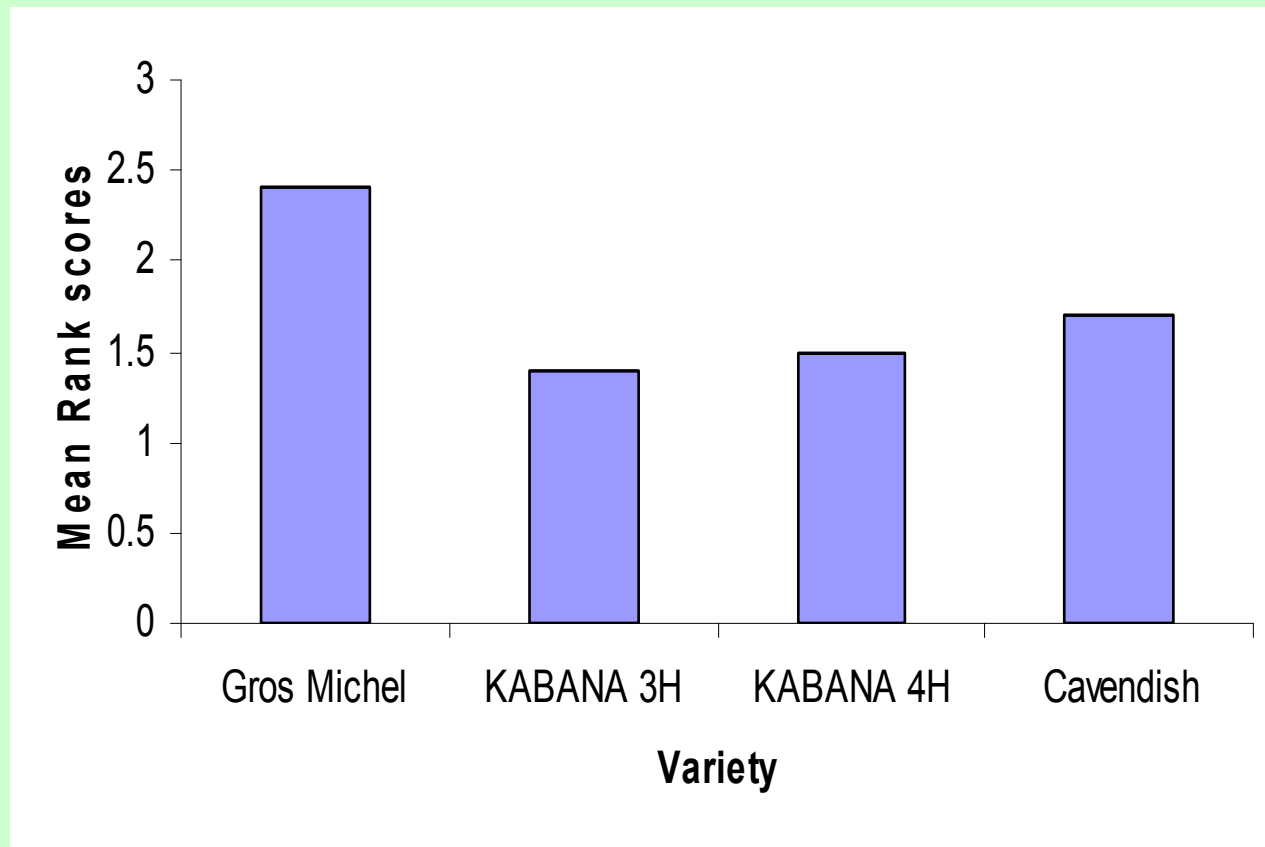


Table 4 : Hedonic pricing model results showing consumer x-teristics & dessert attributes influencing willingness to pay for introduced bananas

| Variable | Cultivar type | | | |
|----------------|---------------------------|-----------------------------|----------------------------|---------------------------|
| | Cavendish Coefficients | Gros Michel Coefficients | KABANA 3 H Coefficients | KABANA 4H Coefficients |
| Household size | 0.17 | 0.32** | 0.27* | 0.11 |
| Taste | 0.11** | NA | 0.20** | 0.13 |
| Texture | 0.01 | 0.21 | 0.02 | 0.23*** |
| Skin colour | -0.09 | -0.12 | 0.23* | -0.08 |
| Pulp colour | -0.08 | 0.19 | -0.07 | -0.08 |
| F test | 2.23** | 2.41** | 2.17** | 2.05** |
| R ² | 0.21 | 0.21 | 0.23 | 0.17 |

Values in parenthesis are the t-values, ***, **, * mean significance at 1%, 5% and 10%, respectively

Conclusions

- Three of the introduced dessert banana varieties (KABANA 3 H, KABANA 4 H & Cavendish-Williams) had acceptable consumer and market attributes.
- Willingness to pay for introduced dessert banana varieties dependent:
 - on size and composition of the household size
 - the taste, skin appearance and texture.

Recommendations

- Breeders could improve the new high breeds' attributes to the level of the skin appearance for KABANA 3H, taste for CAVENDISH and texture for Gros Michel since these were found to affect consumer acceptance.
- Need to impact Fusarium resistance genes especially through biotechnology to landrace dessert banana (Gros Michel) since it is still the most preferred dessert banana.
- Research to establish actual demand and supply in both local and regional markets, essential marketing logistics, costs and profitability.

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