*Council for Scientific and Industrial Research*

# Food Research Institute

# *Report on Price Sensitivity and Consumer Acceptability of Rice in Ghana*

**FRI/NRI Rice Quality Improvement Project Report**

**By**

**Tomlins, K. I., Manful, J. T., Gayin, J., and Kudjawu B. D**
**(2004)**

# Report on price sensitivity and consumer acceptability of rice in Ghana

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## Abstract

Rice (prototype, local and imported) was evaluated by 109 consumers in the unpacked form for acceptability and affordability. The most acceptable rice comprised the prototype, imported parboiled and imported US No 5 followed by the local white and lastly the locally sold parboiled rice. This suggests that there is potential for the prototype rice providing a suitable marketing strategy is employed and the benefits to producers and traders are real. Most consumers interviewed ate rice either every week or every day and purchased imported white rice (5kg) every month from local markets. The most common dish containing rice was jollof. The majority (70%) said they had received information (through TV and radio) promoting rice and that promotions were reported to emphasise taste, quality and nutritional benefits. However, only 45% were aware of the potential benefits. Most consumers (87%) mentioned they would like to receive more information and that the most popular medium mentioned was the TV (GBC and TV3 stations) followed by radio (Peace FM, ADOM FM and Joy FM stations). Compared to the other similar types of rice commonly sold in Accra, the mean price of the prototype estimated by the consumers was Cedi 7773 which was similar to imported US raw rice. As the score for acceptability of rice judged by consumers increased, the affordability decreased. More detailed inspection suggested that there were two groups of consumers; those who expressed low affordability with price and those who expressed high affordability with price. The least affordability group of consumers scored the lowest priced rice (local parboiled) as more acceptable while the high affordability group found the higher price rice samples (local white and US No 5) to be more acceptable suggesting real behavioural differences. Inspection of the two groups with respect to affordability suggested that the higher affordability group were younger, more likely to be working full time, have additional sources of income, more likely to own their accommodation (13% for low affordability, 24% for high affordability), live in detached accommodation as opposed to a compound or a flat, have achieved a higher level of education, own a vehicle, purchase rice at the supermarket or minishop, purchase larger quantities at a time and have received information promoting rice. This suggests that the prototype rice would probably sell at a lower price (between Cedi 5667 and Cedi 7250) in the markets if sold in the unpackaged form. The prototype rice would be anticipated to sell at a higher price (between Cedi 8833 and Cedi 10417) if targeted at the higher affordability group. However, this study does not indicate the proportion of consumers in Accra who belong to the low and high affordability groups or the additional packaging and marketing costs required to reach these groups.

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# 1. Introduction

Consumer acceptability of rice has previously been investigated in Ghana (Tomlins et al 2004). This indicated that acceptability of rice differed and that this was mostly influenced by the brown colour of the cooked rice and paddy in the raw rice. Segmentation of the consumers showed that the majority preferred all the rice samples while smaller groups either did not like the brown colour or the reverse. As a result of these findings, an improved parboiled rice was developed using new technologies that improved the parboiling process, was easier to use by rural producers and consumed less fuel hence protecting the environment.

This study reports new work which confirmed that the improved parboiled rice is more acceptable to consumers and approaches that were applied to estimate the local marketing approach including a price that the improved product could be sold at. Psychometric tests of consumers were also used to predict purchasing behaviour of consumers.

# 2. Materials and Methods

## 2.1 Samples

Five samples of rice selected for the study and some characteristics are as follows:

a) US (United States) imported raw rice (US No 5) - widely available in Ghana
b) US imported parboiled rice (Tilda) - premium product limited to a few supermarkets
c) Parboiled rice purchased in Accra, Ghana - average quality local product that has undergone limited sorting and clean-up
d) Local raw rice purchased in Accra, Ghana - average quality local product that has undergone sorting and clean-up
e) Improved parboiled rice produced in the Northern region –quality local product that has undergone sorting and clean-up

## 2.2 Cooking method for sensory testing

Rice samples (300 g) were washed in water (300 ml) of water and drained for five minutes. The samples were cooked in 450 ml boiling salted water (3 g salt in 1000 ml water) until the rice was soft in a rice cooked (Iris, details of make of rice cooker and cooking times). Cooked rice was kept in a heated box (60°C ±5°C) for up to one hour until served to the sensory panel.

## 2.3 Consumer methodology

The consumer interviews were carried out in four stages to elicit socio-economic information, acceptability of raw rice, the price of the improved parboiled rice and affordability of rice.

Stage 1

Socio-economic information

Consumers (105) were interviewed Accra, in Ghana using the method of central location testing. Consumers were selected according to income group, gender and ages from 18 to 70 years.

During testing, raw rice samples were presented to consumers. Consumers scored the acceptability of rice using a 9-point hedonic box scale (Meilgaard *et al.*, 1987) from 'dislike extremely' to 'like extremely'. The six cooked rice samples were coded with 3-figure random numbers and presented simultaneously, but in random order, to each consumer on white paper plates.

After scoring the acceptability of the rice, consumers were interviewed. This recorded information on gender, age, occupation, how often they consumed rice, where they eat rice, which rice they prefer to purchase (local or imported), their preferred staple and who purchases rice in their household. The interview lasted about 30 min.

## 2.4. *Sensory methodology*

The same rice samples prepared for the consumers were scored by a semi-trained sensory panel using a modified version of quantitative descriptive analysis (QDA) since standards were not provided (Meilgaard *et al.*, 1987; Bainbridge *et al.*, 1996). The sensory panel (10 panellists) was conducted at the Food Research Institute (FRI), Accra, Ghana under controlled temperature (air conditioned) and lighting. The panel was comprised of staff from the Food Research Institute who had been screened for perception of the basic tastes (sweet, sour, bitter and salty), familiarity with the product and ability to determine differences between rice samples. Sensory attributes for uncooked (visual and odour) and cooked (visual, odour, taste and texture) rice were generated during a preliminary focus group session guided by the panel leader. A total of 16 uncooked and 14 cooked sensory attributes were developed for which the group had a consensus. Sensory attributes generated for the uncooked product were uniform colour, black specks, white heads, yellow colour, brown colour, cream colour, brightness, translucence, clean appearance, chalky appearance, unshelled paddy (not completed hulled), whole grain shape (as opposed to broken), long shape, oval shape, size and slender. Sensory terms for the cooked rice were brown colour, yellow colour, whitish appearance, black specks, uniform appearance, typical rice odour, sweet taste, sour taste, creamy flavour, sticky texture, grainy texture and hard texture.

The six rice samples were tested in triplicate by the panel over a three day period and the order in which they were cooked was random. At each session, three rice samples (coded with 3-figure random numbers) were served in random order to each panellist (there were two sessions on each of the three days). Samples (40 g) were close to room temperature (25°C to 30°C) and panellists rinsed their mouth with mineral water before tasting each sample. Intensity was scored on a 100 mm unstructured scale, anchored with the terms 'not very' at the low end and 'very' at the high end.
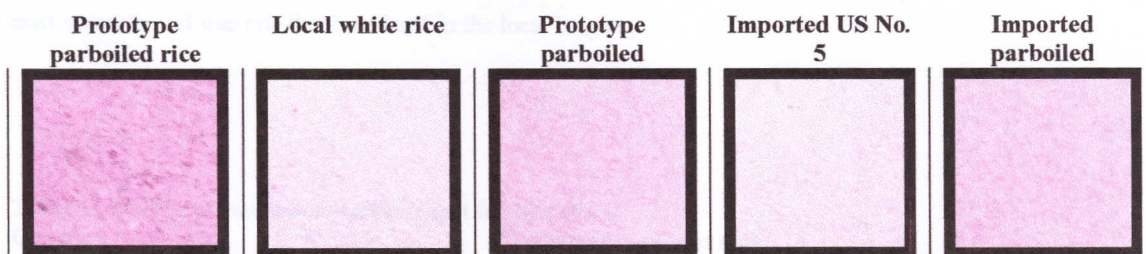
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## 2.6. Data analysis

Analysis of variance (ANOVA) or Kruskal-Wallis as appropriate, correlation analysis, stepwise regression, principal component analysis (PCA; covariance), cluster analysis (agglomerative hierarchical clustering using Wards methods and k-means optimised using the within group variance) and internal preference mapping were computed using SPSS (version 11.5) and XLSTAT (version 6.1 v3.1).

## 3. Results and discussion

The visual appearance of the rice samples is shown in figure 1. These samples were scored for sensory attributes by the sensory panel and for acceptability by consumers. Acceptability of the prototype rice was compared with other rice sold in local markets, supermarkets and minishops (for example shops situated at petrol/gasoline/filling stations). The rice samples were compared in the unpackaged form because rice is most commonly sold in open containers (margarine tin, American tin and sacks) in local markets in Accra. Increasingly, however, rice is sold in a packaged form in supermarkets and minishops but this form was not evaluated.

**Figure 1: Visual appearance of rice samples used in the sensory and consumer testing**

| Prototype parboiled rice | Local white rice | Prototype parboiled | Imported US No. 5 | Imported parboiled |
|---|---|---|---|---|



*Socio-economic profile of consumers interviewed*

A total of 109 consumers were interviewed at two locations in Accra (market and at the Food Research Institute, Accra; figure 2). The mean responses from the consumers are given in table 1. The weighting of the consumers was towards the female gender (69 %) because the majority of people purchasing rice at markets in Accra were female.

**Figure 2: Consumers being interviewed in Accra**

| Consumer interviews in a market in Accra | Consumer interviews at the Food Research Institute |
|---|---|
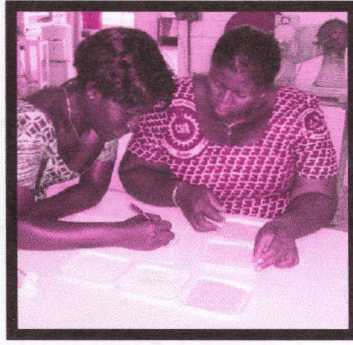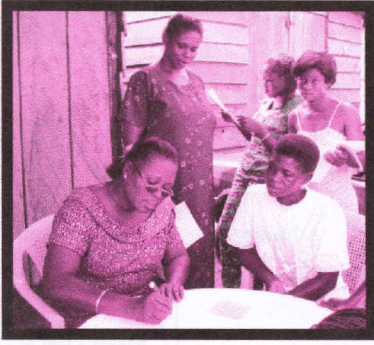
The consúmers varied in age group (91% between 25 and 64 yrs), employment, ethnic group (71% Akan and Ewe) and income status (the majority rented their accommodation, lived in compound accommodation with more than five people, did not own a vehicle and had received elementary education).

The majority ate rice either every week or every day and purchased imported white rice (5kg) every month from local markets. The most common dish containing rice was jollof.

Considering how consumers obtained information about rice, the majority (70%) said they had received information (through TV and radio) promoting rice. Promotions were reported to emphasise taste, quality and nutritional benefits. However, only 45% were aware of the potential benefits.

Considering promotion strategies for the improved rice, most (87%) mentioned they would like to receive more information and that the most popular medium mentioned was the TV (GBC and TV3 stations) followed by radio (Peace FM, ADOM FM and Joy FM stations). The most popular radio station mentioned was one that broadcast in the local language.

**Table 1: Profile of consumers interviewed for this study**

| Question / observation | Consumer response (%) | | | | | |
|---|---|---|---|---|---|---|
| Gender | Male | Female | | | | |
| | 30 | 69 | | | | |
| Age | 15 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | 65+ |
| | 4 | 39 | 29 | 23 | 3 | 0 |
| Working status | Working full-time | Studying | Working part-time | Retired | Other | |
| | 78 | 7 | 4 | 1 | 10 | |
| What is your main employment? | Government | Self-employed | Non-government | Other | | |
| | 51 | 29 | 11 | 7 | | |

| Additional sources of income? | Yes | No | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 71 | 16 | | | | | | |

| Is your accommodation? | Rented | Owned | Other | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 68 | 18 | 14 | | | | | |

| What type Is your accommodation? | Compound | Flat | Detached | Other | | | | |
|---|---|---|---|---|---|---|---|---|
| | 61 | 18 | 12 | 8 | | | | |

| How many people live in your house? | 1 | 2 | 3 | 4 | 5+ | | | |
|---|---|---|---|---|---|---|---|---|
| | 5 | 3 | 9 | 18 | 61 | | | |

| Are you the head of the household? | Yes | No | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 33 | 63 | | | | | | |

| Marital status. Are you? | Married | Single | Separated | Divorced | Widowed | | | |
|---|---|---|---|---|---|---|---|---|
| | 69 | 27 | 3 | 1 | 1 | | | |

| Are you the main grocery shopper in your household? | Main purchaser | Joint purchaser | No | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 53 | 18 | 27 | | | | | |

| What is your ethnic group? | Akan | Ewe | Ga | Frafra | Dagonba | Gonja | Dagarti | Other |
|---|---|---|---|---|---|---|---|---|
| | 41 | 30 | 14 | 3 | 1 | 1 | 1 | 8 |

| What is your religious faith? | Traditional | Christian | Islam | Other | | | | |
|---|---|---|---|---|---|---|---|---|
| | 95 | 2 | 1 | 0 | | | | |

| What is your achieved level of education? | None | Elementary / JSS | Secondary / SSS | Vocational | University | Other | | |
|---|---|---|---|---|---|---|---|---|
| | 11 | 38 | 14 | 8 | 17 | 10 | | |

| Do you own any of the following (tick all that apply) | TV | Radio | Fridge | Vehicle | Bicycle | Motorbike | | |
|---|---|---|---|---|---|---|---|---|
| | 78 | 72 | 69 | 11 | 10 | 3 | | |

| How often do you eat rice? | Every day | Every week | Every month | Rarely | | | | |
|---|---|---|---|---|---|---|---|---|
| | 43 | 51 | 1 | 4 | | | | |

| What type of rice do you eat? (tick all that apply) | Imported white | Local white | Local parboiled | Imported parboiled | Other | | | |
|---|---|---|---|---|---|---|---|---|
| | 84 | 23 | 18 | 6 | 1 | | | |

| Where do you purchase rice (tick all that apply) | Market | Supermarket | Minishop | Other | | | | |
|---|---|---|---|---|---|---|---|---|
| | 80 | 26 | 18 | 5 | | | | |

| How often do you purchase rice? | Every day | Every week | Every month | Rarely | | | | |
|---|---|---|---|---|---|---|---|---|
| | 9 | 34 | 50 | 6 | | | | |

| What quantity of rice do you purchase at a time? | American tin | 25kg bag | Margarine tin | 50 kg bag | Other | | |
|---|---|---|---|---|---|---|---|
| | 31 | 30 | 17 | 15 | 5 | | |

| Which meals do you eat that contain rice (tick all that apply) | Jollof | Plain | Waakye | Emotuo | Fried | Rice water | Other |
|---|---|---|---|---|---|---|---|
| | 88 | 82 | 70 | 62 | 57 | 54 | 6 |

| Which is your favourite meal that contains rice? | jollof | plain rice | Emotuo | waakye | fried rice | rice water | red red | rice & stew |
|---|---|---|---|---|---|---|---|---|
| | 41 | 26 | 11 | 10 | 7 | 3 | 1 | 1 |

| Are you aware of the benefits of eating rice? | Yes | No | | | | | |
|---|---|---|---|---|---|---|---|
| | 54 | 45 | | | | | |

| Have you received information promoting rice before? | Yes | No | | | | | |
|---|---|---|---|---|---|---|---|
| | 70 | 26 | | | | | |

| If yes, when and how? | Radio | TV | Newspapers | Magazines | Other | | |
|---|---|---|---|---|---|---|---|
| | 50 | 50 | 13 | 1 | 2 | | |

| What were they promoting about rice? (tick all that apply) | Taste | Quality | Nutritional benefit | Price | Recipe | Convenience | Other |
|---|---|---|---|---|---|---|---|
| | 50 | 45 | 43 | 16 | 6 | 4 | 4 |

| Would you like to know more about rice? | Yes | No | | | | | |
|---|---|---|---|---|---|---|---|
| | 87 | 4 | | | | | |

| Do you read any of the following newspapers? (tick all that apply) | Daily Graphic | Ghanaian Times | Chronicle | Daily Guide | Statesman | Daily Dispatch | Freepress | Other |
|---|---|---|---|---|---|---|---|---|
| | 57 | 23 | 16 | 11 | 7 | 5 | 4 | 10 |

| Do you watch any of the following TV stations? (tick all that apply) | GBC | TV3 | Other | | | | |
|---|---|---|---|---|---|---|---|
| | 76 | 76 | 45 | | | | |

| Do you listen to any of the following radio stations (tick all that apply) | Peace FM | ADOM FM | Joy FM | Radio Gold | Choice FM | Happy FM | Vive FM | Obonu FM | Other |
|---|---|---|---|---|---|---|---|---|---|
| | 83 | 56 | 47 | 34 | 30 | 18 | 12 | 12 | 10 |

| If you were to receive more information about rice, which would be best for you? | TV | Radio | Newspapers | Magazines | Other | | |
|---|---|---|---|---|---|---|---|
| | 66 | 53 | 11 | 2 | 1 | | |

*Consumer acceptability*

Consumers were invited to evaluate the acceptability of the rice samples in the raw form. This method was selected because this is how the majority of consumers were observed to evaluate rice sold in markets in Accra.

Of the rice samples evaluated analysis of variance showed that the consumer cceptability significantly differed (P<0.05) and the least significant different test indicated three groups of acceptability (Table 2). The most acceptable rice comprised the prototype, imported parboiled and imported US No 5. The second group consisted of the local white and the last group being the locally sold parboiled rice. Since the prototype rice was in the most preferred group, there is potential providing a suitable marketing strategy is employed and the benefits to producers and traders are real.

**Table 2: Mean values for consumer acceptability**

| Rice type | Mean | Std. Deviation |
|---|---|---|
| Prototype | 7.68ab | 1.522 |
| Imported parboiled | 7.44abc | 1.845 |
| Imported US No 5 | 7.05bc | 1.862 |
| Local white | 6.32d | 1.837 |
| Local parboiled | 4.31e | 2.455 |

*Price of improved rice suggested by consumers*

Consumers judged the price of prototype rice by comparing it with prices of rice currently sold in markets in Accra (figure 3). The mean price of the local parboiled rice, local white rice, imported US No. 5 imported parboiled rice is given in Table 3.

**Figure 3: Interviewer with consumer who is judging the price of the prototype rice**
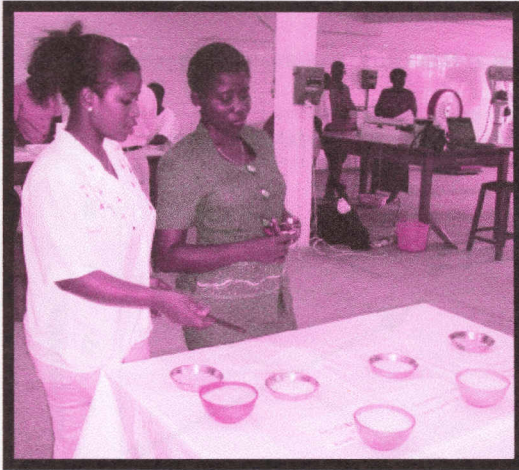
**Table 3: Price (Cedi/kg) for rice locally purchased in Accra**

| Rice type | Price (Cedi/ kg) | | |
|---|---|---|---|
| | Mean | Minimum | Minimum |
| Local parboiled | 3183 | 3000 | 3367 |
| Imported US No 5 raw | 9000 | 9000 | 9000 |
| Local white raw | 6300 | 5600 | 7000 |
| Imported parboiled | 38350 | 38350 | 38350 |

Consumers rated the price of the prototype rice relative to the given prices for the local parboiled, local white rice and the imported US No. 5. The imported parboiled rice was excluded because this was a niche rice that sells at a price well above the others. Considering all of the consumers interviewed, the mean price for prototype was Cedi 7773 which varied between Cedi 2500 and Cedi 12000.

Consumers were also asked to score the affordability of the local parboiled, imported US No 5 and local white raw rice samples. The affordability of the rice samples significantly differed (ANOVA; P<0.001) and the affordability along with the consumer acceptability scores is illustrated in figure 4. This shows that as the price increases, the affordability decreases while the acceptability increased. Interestingly, while the acceptability of the prototype was the highest it was rated as more affordable than the US No 5.

**Figure 4: Changes in consumer acceptability and affordability with market price of rice in Accra, Ghana**
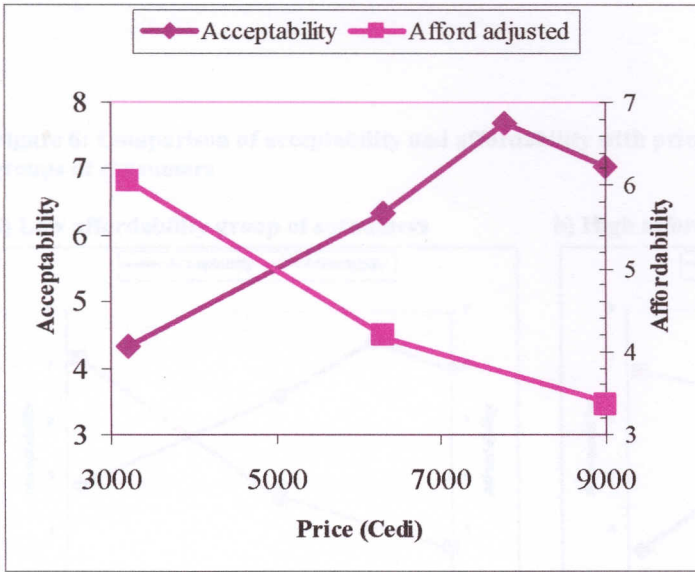


## Variations in price sensitivity among consumers

A histogram of the frequencies of consumers rating affordability with increasing market price of rice indicated two maxima (figure 5). The lower affordability group was in the range cedi 2500 and 8042 and the higher in the range of Cedi 8042 and 12000.

**Figure 5: Histogram showing frequency of consumers rating affordability with increasing market price for rice.**
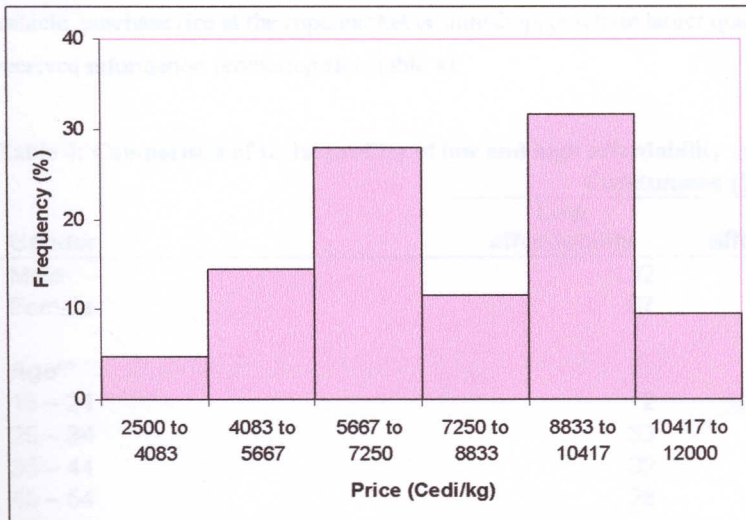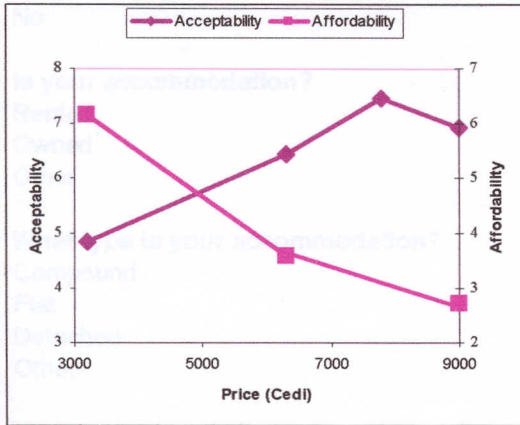


The two groups of consumers (low and high affordability) were compared with respect to how they scored the acceptability of the rice samples evaluated (figure 6). In general, the low affordability group of consumers scored the lowest priced rice (local parboiled) as more acceptable (ANOVA; P=0.012)
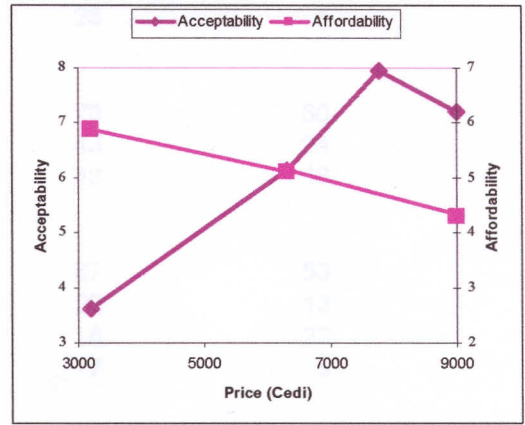
while the high affordability group found the higher price rice samples (local white and US No 5) to be more acceptable.

**Figure 6: Comparison of acceptability and affordability with price of low and high affordability groups of consumers**

**a) Low affordability group of consumers**

**b) High affordability group of consumers**

Inspection of the two groups with respect to affordability suggested that the higher affordability group were younger, more likely to be working full time, have additional sources of income, more likely to own their accommodation (13% for low affordability, 24% for high affordability), live in detached accommodation as opposed to a compound or a flat, have achieved a higher level of education, own a vehicle, purchase rice at the supermarket or minishop, purchase larger quantities at a time and have received information promoting rice (table 4).

**Table 4: Comparison of social profiles of low and high affordability groups of consumers**

|  | Consumers (%) | |
| --- | --- | --- |
| **Gender** | Low affordability | High affordability |
| Male | 32 | 29 |
| Female | 67 | 71 |
|  |  |  |
| **Age**** |  |  |
| 15 – 24 | 2 | 7 |
| 25 – 34 | 33 | 47 |
| 35 – 44 | 32 | 24 |
| 45 – 54 | 28 | 16 |
| 55 – 64 | 3 | 2 |
| 65+ | 0 | 0 |
|  |  |  |
| **Working status*** |  |  |
| Working full-time | 72 | 87 |
| Studying | 7 | 0 |
| Working part-time | 5 | 9 |

| | | |
|---|---|---|
| Retired | 2 | 0 |
| Other | 15 | 2 |

### What is your main employment?

| | | |
|---|---|---|
| Government | 47 | 58 |
| Self-employed | 12 | 11 |
| Non-government | 32 | 24 |
| Other | 7 | 7 |

### Additional sources of income?

| | | |
|---|---|---|
| Yes | 63 | 82 |
| No | 25 | 4 |

### Is your accommodation?

| | | |
|---|---|---|
| Rented | 73 | 60 |
| Owned | 13 | 24 |
| Other | 13 | 16 |

### What type Is your accommodation?

| | | |
|---|---|---|
| Compound | 67 | 53 |
| Flat | 22 | 13 |
| Detached | 5 | 22 |
| Other | 7 | 9 |

### How many people live in your house?

| | | |
|---|---|---|
| 1 | 7 | 2 |
| 2 | 3 | 2 |
| 3 | 5 | 13 |
| 4 | 23 | 11 |
| 5+ | 55 | 69 |

### Are you the head of the household?

| | | |
|---|---|---|
| Yes | 38 | 27 |
| No | 58 | 69 |

### Marital status. Are you?

| | | |
|---|---|---|
| Married | 70 | 67 |
| Single | 23 | 31 |
| Widowed | 2 | 0 |
| Separated | 3 | 2 |
| Divorced | 2 | 0 |

### Are you the main grocery shopper in your household?

| | | |
|---|---|---|
| Main purchaser | 55 | 51 |
| Joint purchaser | 17 | 20 |
| No | 25 | 29 |

### What is your ethnic group?

| | | |
|---|---|---|
| Akan | 43 | 38 |
| Ewe | 33 | 27 |
| Ga | 10 | 20 |
| Frafra | 2 | 0 |
| Dagonba | 0 | 2 |
| Gonja | 3 | 2 |

| | | |
|---|---|---|
| Dagarti | 2 | 0 |
| Other | 7 | 9 |

**What is your religious faith?**

| | | |
|---|---|---|
| Traditional | 0 | 0 |
| Christian | 97 | 93 |
| Islam | 0 | 4 |
| Other | 2 | 0 |

**What is your achieved level of education?**

| | | |
|---|---|---|
| None | 10 | 13 |
| Elementary/JSS | 47 | 27 |
| Secondary/SSS | 12 | 18 |
| Vocational | 12 | 2 |
| University | 8 | 29 |
| Other | 7 | 11 |

**Do you own any of the following (tick all that apply)**

| | | |
|---|---|---|
| Radio | 97 | 93 |
| TV | 77 | 80 |
| Fridge | 70 | 67 |
| Bicycle | 18 | 0 |
| Vehicle | 8 | 16 |
| Motorbike | 3 | 2 |

**How often do you eat rice?**

| | | |
|---|---|---|
| | 0 | 0 |
| Every day | 37 | 51 |
| Every week | 58 | 42 |
| Every month | 2 | 0 |
| Rarely | 3 | 4 |

**What type of rice do you eat? (tick all that apply)**

| | | |
|---|---|---|
| Imported white | 22 | 13 |
| Local white | 25 | 20 |
| Local parboiled | 82 | 87 |
| Imported parboiled | 7 | 4 |
| Other | 0 | 2 |

**Where do you purchase rice (tick all that apply)**

| | | |
|---|---|---|
| Market | 80 | 80 |
| Supermarket | 22 | 31 |
| Minishop | 13 | 24 |
| Other | 3 | 7 |

**How often do you purchase rice?**

| | | |
|---|---|---|
| Every day | 7 | 11 |
| Every week | 42 | 24 |
| Every month | 45 | 58 |
| Rarely | 5 | 7 |

**What quantity of rice do you purchase at a time?**

| | | |
|---|---|---|
| 1kg (Margarine tin) | 22 | 11 |
| 2kg (American tin) | 35 | 27 |
| 25kg bag | 23 | 31 |

| | | |
|---|---|---|
| 50 kg bag | 10 | 22 |

## Which meals do you eat that contain rice (tick all that apply)

| | | |
|---|---|---|
| Jolloff | 87 | 89 |
| Plain | 72 | 69 |
| Waakye | 60 | 64 |
| Emotuo | 78 | 87 |
| Fried | 57 | 58 |
| Rice water | 55 | 53 |
| Other | 8 | 2 |

## Are you aware of the benefits of eating rice?

| | | |
|---|---|---|
| Yes | 56 | 57 |
| No | 44 | 43 |

## Have you received information promoting rice before?

| | | |
|---|---|---|
| Yes | 55 | 63 |
| No | 45 | 37 |

## If yes, when and how?

| | | |
|---|---|---|
| Radio | 47 | 56 |
| TV | 48 | 53 |
| Newspapers | 12 | 16 |
| Magazines | 0 | 2 |
| Other | 2 | 2 |

## What were they promoting about rice? (tick all that apply)

| | | |
|---|---|---|
| Taste | 35 | 53 |
| Quality | 5 | 7 |
| Nutritional benefit | 5 | 16 |
| Price | 40 | 64 |
| Recipe | 37 | 56 |
| Convenience | 15 | 18 |
| Other | 2 | 7 |

## Would you like to know more about rice?

| | | |
|---|---|---|
| Yes | 83 | 91 |
| No | 7 | 0 |

## Do you read any of the following newspapers? (tick all that apply)

| | | |
|---|---|---|
| Daily Graphic | 52 | 64 |
| Ghanaian Times | 23 | 22 |
| Chronicle | 8 | 27 |
| Daily Guide | 5 | 9 |
| Statesman | 5 | 4 |
| Daily Dispatch | 12 | 11 |
| Freepress | 2 | 7 |
| Other | 5 | 16 |

## Do you watch any of the following TV stations? (tick all that apply)

| | | |
|---|---|---|
| GBC | 70 | 84 |
| TV3 | 77 | 76 |
| Other | 43 | 47 |

**Do you listen to any of the following radio stations (tick all that apply)**

| | | |
|---|---|---|
| Peace FM | 80 | 87 |
| ADOM FM | 32 | 27 |
| Joy FM | 53 | 60 |
| Radio Gold | 22 | 13 |
| Choice FM | 40 | 27 |
| Happy FM | 45 | 49 |
| Vive FM | 13 | 11 |
| Obonu FM | 15 | 9 |
| Other | 8 | 13 |

**If you were to receive more information about rice, which would be best for you?**

| | | |
|---|---|---|
| TV | 63 | 69 |
| Radio | 57 | 49 |
| Newspapers | 13 | 9 |
| Magazines | 3 | 0 |
| Other | 2 | 0 |

Where * = significant at P<0.010, ** = significant at P<0.050

**Conclusions**

Rice (prototype, local and imported) was evaluated by 109 consumers in the unpacked form for acceptability and affordability. The most acceptable rice comprised the prototype, imported parboiled and imported US No 5 followed by the local white and lastly the locally sold parboiled 1 . This suggests that there is potential for the prototype rice providing a suitable marketing strat  is employed and the benefits to producers and traders are real.

The majority of consumers interviewed ate rice either every week or every day and purcha ed imported white rice (5kg) every month from local markets. The most common dish containing rice  as jollof. Considering how consumers obtained information about rice, the majority (70%) said they had received information (through TV and radio) promoting rice. Promotions were reported to emphasise taste, quality and nutritional benefits. However, only 45% were aware of the  ential benefits. Considering promotion strategies for the improved rice, most (87%) mentione  hey wou d like to receive more information and that the most popular medium mentioned was the TV (GBC and TV3 stations) followed by radio (Peace FM, ADOM FM and Joy FM stations).

Compared to the other similar types of rice commonly sold in Accra, the mean price of the prototype estimated by the consumers was Cedi 7773 and this varied between Cedi 2500 and Cedi 12000. Compared to acceptability, as the score for acceptability of rice judged by consumers increased, the affordability decreased.

Inspection of a frequency histogram of affordability and price suggested that there were  wo groups of consumers; those how expressed low affordability with price and those who expressed h gh affordability with price. The least affordability group of consumers scored the lowest priced rice (local parboiled) as more acceptable while the high affordability group found the higher price rice samples

(local white and US No 5) to be more acceptable suggesting real behavioural differences. Inspection of the two groups with respect to affordability suggested that the higher affordability group were younger, more likely to be working full time, have additional sources of income, more likely to own their accommodation (13% for low affordability, 24% for high affordability), live in detached accommodation as opposed to a compound or a flat, have achieved a higher level of education, own a vehicle, purchase rice at the supermarket or minishop, purchase larger quantities at a time and have received information promoting rice.

This suggests that the prototype rice would probably sell at a lower price in the markets if sold in the unpackaged form. The prototype rice would be anticipated to sell at a higher price if targeted at the higher affordability group. However, this study does not indicate the proportion of consumers in Accra who belong to the low and high affordability groups or the additional packaging and marketing costs required to reach these groups.

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