

Consumer Perceptions, Knowledge and Preferences for Aromatic Rice Types in Ghana

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Abstract: Even though rice forms a major part of the Ghanaian diet, locally produced rice is not patronized as it should. A survey of 390 rice consumers was conducted in Accra, Ghana to ascertain consumer perceptions, knowledge and preferences for aromatic rice as a basis for quality improvement of local rice. Results showed that most consumers (94.9%) were more familiar with imported rice and this was reflected in their patronage patterns. The reasons why consumers did not patronize locally cultivated rice are poor post harvest handling, non-availability, and the generally perceived poor quality. The few (29%) who consume local rice do so out of the perception that it is inexpensive and has better nutritional quality. Both cooked and raw attributes of rice influence consumer preference. Whilst the appearance of raw rice (Friedman rank mean = 2.86) was critical to consumers' choice, taste and aroma determined consumer preference for cooked rice; being ranked 4.96 and 4.46 respectively. [Nature and Science 2010;8(12):12-19] (ISSN: 1545-0740).

Key words: rice; preferences; perceptions; consumer knowledge; aromatic

1. Introduction

Rice (*Oryza sativa*, L.) is a staple food for nearly one half of the world's population (Zhou *et al.*, 2002). It has become a staple in Ghana and much of West Africa where it serves as an important convenience food for urban consumers (Tomlins *et al.*, 2007). Although production of rice has more than quadrupled between 1961 – 2003 from 3 million to 13 million tons, this phenomenal increase has failed to adequately keep pace with the rise in demand for rice as over 50% of sub-Saharan Africa's rice needs is still being imported (Kueneman, 2006; Nwanze *et al.*, 2006). This growth, according to Nwanze *et al.* (2006), is attributable to the changing preferences of consumers in the sub region. The authors point to the irony that in West Africa even though 20 million farmers are involved in rice farming and about 100 million people are dependent on it directly for their livelihood there is still an influx of imported rice on almost all the urban markets.

According to information from the Statistical Research and Information Directorate of the Ministry of Food and Agriculture in Ghana (SRID, 2006), rice registered the highest demand deficit of 215,000 metric tonnes among selected crops in Ghana in the year 2006. In the same year, computations by the Ghana statistical service indicated a custom value of imported rice of GH¢ 108,523,136 compared to a significantly low amount of GH¢ 1,186 of exported rice (computations from the Ghana Statistical Service, 2006). This reflects a fall in the nation's rice

self-sufficiency status and a consumer penchant for imported rice. Such heavy reliance on food imports as seen in rice has serious implications for food security, incomes and poverty reduction. The high level of rice consumption means that an increase in production of local rice will improve the food security situation since it will be available at affordable prices and also lead to higher incomes for farmers and hence reduce poverty.

The establishment of the Ghana Rice Inter-Professional Body (GRIB) is one of several attempts by the government to revamp the local rice industry. One of GRIB's current pursuits is the quality aromatic rice program which involves the development of markets for raw milled aromatic (aromatic) rice for big consumer centers. The intent of this venture is to select and promote the best domestic aromatic (perfumed) varieties to be grown by farmers to capture the huge market demand for aromatic rice in the country; and hence promote the patronage of local rice. Some of the domestic aromatic rice varieties currently in Ghana are Marshall, Ex-Baika, Aromatic Short, Basmati Pusa and Jasmine 85. In order to promote the consumption of locally produced rice, the quality characteristics should match those of the imported brands. There is, therefore, the need to have information on the perceptions and preferences of consumers for aromatic rice as a basis for the improvement of local rice. This study sets out to ascertain consumer perceptions, knowledge of and preferences for aromatic rice types in Ghana.

2. Methodology

A survey of rice consumers was carried out by administering semi-structured questionnaires to randomly selected and willing respondents in the Accra Metropolis. Based on the method described by Moore and McCabe (1993), a sample size of 384 was obtained using a margin of error of 5%. A sample size of 390 respondents was finally used for the study. Although self administration of the questionnaire was encouraged, in situations where the respondent could not fill out the questionnaire independently field assistants were available to help them write out their responses (in a language of mutual understanding) as accurately as possible. The locations for sampling of respondents in the survey included the central, northern, southern, eastern and western parts of Accra

in order to make the data representative of the population in Accra.

Data entry and analysis were done using SPSS (version 16.0). Frequencies were generated for the variables and significant associations were tested at $p \leq 0.05$ using Chi-square.

3. Results and Discussions

3.1 Socio-economic characteristics of respondents

Three hundred and ninety (390) respondents made up of 191 males and 199 females took part in the survey (Table 1). The gender distribution of 49% males and 51% females reflects the male to female ratio of the population of Accra according to the last population census (www.ghanadistricts.com/regions).

Table 1. Socio-economic characteristics of respondents in a consumer survey of domestic and imported aromatic rice varieties in the Accra Metropolis, Ghana ($n=390$).

<i>Demographic variable</i>	<i>Percent (%)</i>	<i>Number of respondents</i>
<i>Age Range</i>		
15 – 19	7.2	28
20 – 29	58.2	227
30 – 39	24.4	95
> 40	10.3	40
Total	100	390
<i>Marital Status</i>		
Single	68.2	266
Married	29.0	113
Divorced	1.3	5
Widowed	1.5	6
Total	100	390
<i>Formal Educational Level</i>		
No formal education	2.5	10
Below Senior High School	10.0	39
Senior High School	32.1	125
Tertiary	55.4	216
Total	100	390
<i>Household Size</i>		
1 – 3	33.1	129
4 – 6	47.9	187
7 – 9	14.1	55
> 9	4.9	19
Total	100	390
<i>Major Occupation</i>		
Unemployed	5.7	22
Self-employed	19.2	75
Private Sector	26.4	103
Civil Servant	20.8	81
Student	27.9	109
Total	100	390

The greater majority of the respondents (97.5%) had some form of formal education. Only a small fraction (2.5%) of the respondents did not have any form of formal education.

The average household size (47.9%) was between 4 - 6 people. Apart from students (27.9%) and a few (5.7%) who were not involved in any gainful employment, the rest of the respondents (66.4%) were engaged in one form of income generating activity or the other. Even though there was a great diversity in the socio-economic background of the respondents, they had fairly uniform and near unanimous perceptions and opinions in their choice about rice as a food.

The popularity of rice among people of different socio-economic backgrounds as seen from this survey is because it continues to satisfy the need for an inexpensive and convenient food above the perishable traditional staples like cassava in the urban centers (FAO, 2005).

3.2 Patronage of rice in the Accra metropolis

The results of the survey indicate that most of the respondents are regular consumers of rice (Table 2). More than half (66.7%) of the number of respondents consumed rice at least twice a week.

About 80% of these regular consumers purchase rice from the open markets/shops. Rice is bought in quantities from as little as "two margarine tins" (400g) to as much as 50kg. Generally, however, rice is often bought in 5kg and 25kg quantities mostly in the open markets and the shops/stores. Since most of the respondents (about 63 %) either hardly or occasionally eat cooked rice sold at the food service points; it presupposes that they eat home cooked rice. This also implies that they buy the raw rice from the sales outlet and, therefore, their specific preferences regarding raw rice will very much determine their choice of purchase of a particular rice brand on the market.

Table 2. Consumer patronage patterns of rice (both aromatic and non-aromatic) in the Accra Metropolis ($n=390$).

<i>Variable</i>	<i>Percent (%)</i>	<i>Number of respondents</i>
<i>Frequency of eating rice</i>		
Once a month	3.1	12
Twice a month	2.6	10
Four times a month	9.7	38
Eight times a month	17.9	70
More than eight times a month	66.7	260
Total	100	390
<i>Where do you buy rice from?</i>		
Supermarket	20.3	79
Open Market	35.1	137
Shop or Store	44.6	174
Total	100	390
<i>How much uncooked rice do you buy at a time?</i>		
Two (2) Margarine Tins (400g)	12.6	49
Between 2 – 5 Margarine Tins	8.5	33
One Bowl (2.2kg)	7.7	30
5kg Bag	25.4	99
10kg Bag	4.1	16
25kg Bag	25.6	100
50kg Bag	16.2	63
Total	100	390
<i>Frequency of eating already cooked rice</i>		
Daily	5.6	22
Once a week	9.0	35
More than once a week	22.1	86
Occasionally	27.9	109
Hardly	35.4	138
Total	100	390

Table 3. Imported aromatic rice brands on the markets in the Accra Metropolis and their patronage by consumers (n=390).

<i>Variable</i>	<i>Percent (%)</i>
<i>Have you bought imported aromatic rice before?</i>	
Yes	94.9
No	5.1
Total	100
<i>Imported Brands</i>	
Tiger	17.2
Sultana	30.2
Uncle Bob	2.2
Royal feast	24.5
Gino	2.2
Savannah	4.3
Neat	3.6
Sunbird	1.8
Phoenix Jewel	4.3
Special lady	3.6
Others	6.1
Total	100
<i>Purchase of aromatic rice within six months</i>	
Once per month	28.5
Twice per month	21.3
Once per week	11.3
Once in 3 months	18.7
Once in 6 months	16.2
Don't buy	4.1
Total	100

3.3 Patronage of imported aromatic rice

The survey also sought to bring to the fore the brands of imported aromatic rice sold in the Accra Metropolis as well as consumer patronage patterns (Table 3). Results show the presence of a wide array of imported aromatic rice types on the Ghanaian market. The high patronage of imported aromatic rice among rice consumers in the Accra metropolis is depicted by a high percent (94.9%) of respondents affirming to having bought aromatic rice. Almost half (49.8%) of the respondents buy their required quantities at most twice in a month. Only a small fraction (5.1%) of the consumers said they have never bought imported aromatic rice. High preference for imported over locally produced rice has been confirmed by an earlier study and this has been attributed to factors like variations in physical characteristics, nutritional quality and cooking and pasting behaviors (GLG-SOFRENCO, 1997). The imported rice brand most patronized by consumers is Sultana (Table 3). This, together with Royal Feast and Tiger Brand, were the three most preferred imported aromatic rice brands among consumers as revealed by their cumulative high percentage (72%) of consumer preference. This indicates that these imported brands

are those with attributes that meet consumer preference.

3.4 Consumer patronage of local rice

Patronage of local rice is very poor in Accra. As much as 71.0% of the respondents admitted that they do not purchase local rice (Figure1).

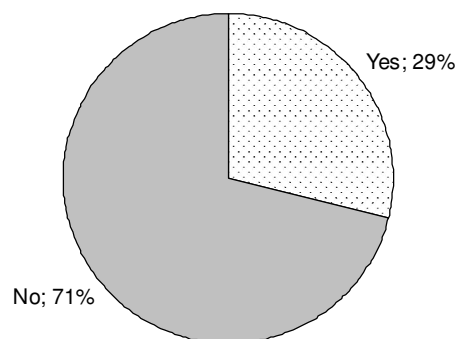


Figure 1. Consumer purchase of local rice varieties in the Accra, Ghana (n = 390).

Table 4. Consumer patronage of local rice in the Accra Metropolis ($n=390$).

<i>Variable</i>	<i>Percent (%)</i>	<i>Number of respondents</i>
<i>Reason for choice or otherwise of local rice</i>		
Cheap/available	7.7	30
Nutrition	2.8	11
Not available	21.0	82
Preference	17.2	67
Poor quality	33.1	129
Expensive	0.8	3
Other reasons	4.1	16
No specific reason	13.3	52
Total	100	390
<i>Where do you eat your local aromatic rice?</i>		
Home	88.2	82
Restaurant	3.2	3
Fast Food Joint	5.4	5
Others	3.2	3
Total	100	93
<i>Availability of local aromatic rice</i>		
Easily Available	13.1	57
Hardly Available	80.0	312
Not Sure	6.9	27
Total	100	390

The reasons for this observation are as shown in Table 4. More than 50% of the respondents attribute their non patronage of local rice to poor quality and the fact that local rice is not readily available on the urban market. A significant proportion of the respondents (13.3%) will not eat local rice for no particular reason. Only a few respondents (0.8%) indicated concern about the cost of local rice on the market as a basis for non-purchase of the commodity. The few who buy locally grown rice, however, do so out of preference and the perceived high nutritional quality of local rice.

Household size was significantly ($p<0.05$) associated with purchase of locally cultivated rice (Figure 4). Larger household sizes generally tended to buy local rice in order to save some money.

3.5 Consumer knowledge and patronage of local aromatic rice

The majority of respondents (71.0%) do not know of any locally cultivated aromatic rice type in the country (Figure 2). Only few people (22.1%) acknowledged having eaten locally cultivated aromatic rice (Figure 3). About 24% of the respondents also acknowledged having eaten local rice but are not sure if it was local aromatic rice. A similar study on knowledge and preference of aromatic rice

by people living in Indonesia, the Philippines, Japan and Korea was undertaken by Hori *et al.* (1992). It was shown by the authors that people in the Philippines and Indonesia were familiar with the rice, but surprisingly, none of the respondents in the capitals of Korea and Japan was aware of aromatic rice, although a lot of cultivars are grown in many places in Japan. This is partly because the rice type is not frequently used in the local dishes.

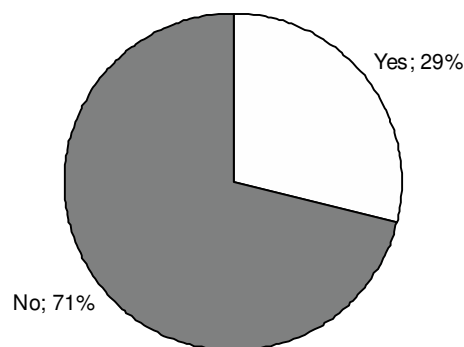


Figure 2. Consumer knowledge of local aromatic rice varieties in the Accra, Ghana ($n=390$).

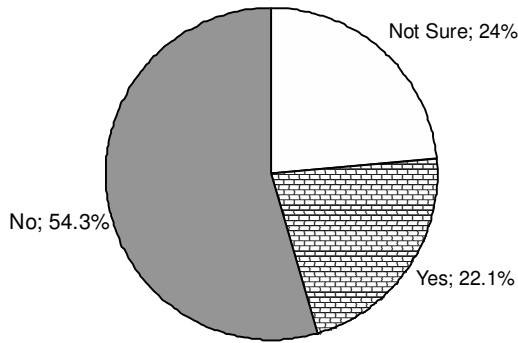


Figure 3. Consumption of local aromatic rice in Accra, Ghana (n=390).

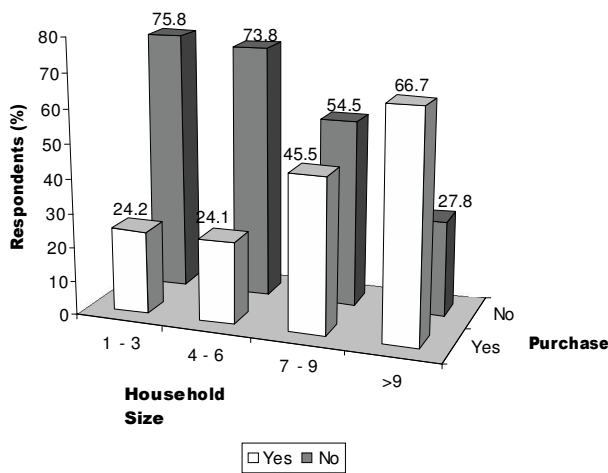


Figure 4. Consumer patronage of local rice based on household size in a survey of local and imported aromatic rice in Accra Metropolis (n = 390).

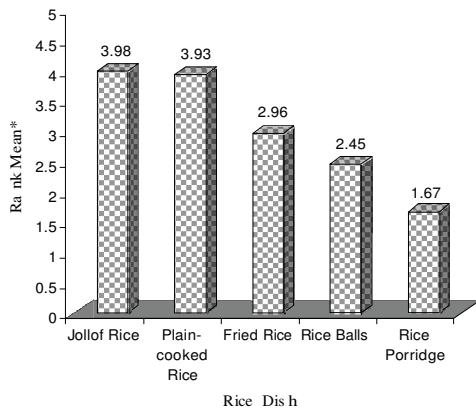


Figure 5. Consumer ranking of common rice dishes in a consumer survey of local and imported aromatic rice in Accra, Ghana (n = 390).

*Maximum rank mean is 5.0

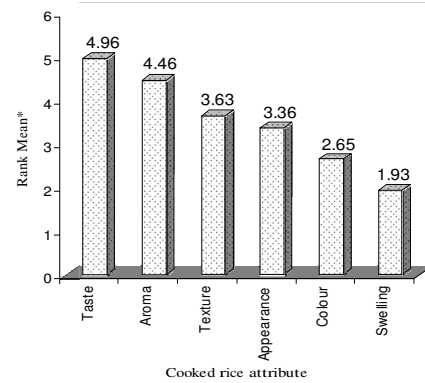


Figure 6. Consumer ranking of the cooked rice attributes used to judge rice quality in a survey of local and imported aromatic rice in Accra, Ghana (n = 390).

* Maximum rank mean is 6.0

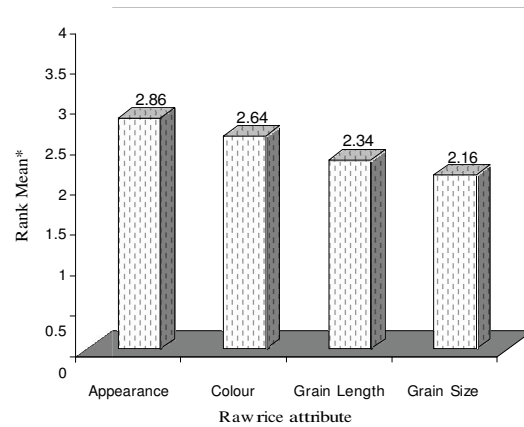


Figure 7. Consumer ranking of the raw rice attributes used to judge rice quality in a survey of local and imported aromatic rice in Accra, Ghana (n = 390).

* Maximum rank mean is 4.0

The study was replicated in Britain and the findings were entirely different. There, the consumers knew the aromatic rice types, had a high preference for it and ate it frequently through patronage of ethnic foods in restaurants (Hori *et al.*, 1996).

A large proportion of respondents (80.0 %) indicated that the local aromatic rice is not easily available. The fact that local aromatic rice is not readily available could explain its absence in the restaurants, and most consumers who said they eat it (21.0%), therefore, do so at home.

3.6 Preference for raw and cooked rice

Rice is used in a wide range of food products in Ghana, and the most common include jollof rice, rice balls, rice porridge, fried rice and plain-cooked rice. The various rice products are

fundamentally different in their appearance and characteristics: plain rice is boiled rice with each rice grain still whole and independent of the other, while 'rice balls' and 'rice porridge' may have the rice grains completely or partially broken in the product. Consequently, consumers' ratings of rice will be based on its functionality either as a food commodity, or as an ingredient. Many consumers ranked jollof rice as the most preferred dish (Friedman rank mean: 3.98 out of 5.0). Rice porridge was least preferred as indicated by a low Friedman rank mean (Figure 5). The rank means for the dishes were significantly ($p < 0.05$) different indicating that choice of a particular dish is tied to consumer preference.

The cooked rice attribute most preferred by consumers and which they normally use to judge rice quality was the taste (Figure 6). Consumers would eat a particular rice dish largely due to its taste (rank mean = 4.96 out of 6.0) and not the degree to which it swelled (rank mean = 1.93 out of 6.0). Though there were significant differences between attributes' rank means, those for aroma and texture closely followed taste in terms of order of preference. The data suggest that taste, aroma and texture were the three most critical attributes of cooked rice consumers seek.

Attributes of raw rice are also very important to consumers as revealed by the significant differences observed in their rank means ($p < 0.05$). Consumers are more concerned about a positive appearance of the raw rice than the grain size, grain length and colour (Figure 7). A positive appearance in this context means absence of black specks, uniformity of grains, absence of white bellies (chalkiness) and foreign materials like stones in the rice. This is a challenge to rice local farmers and millers to ensure that the consumer is supplied with milled rice with a high visual appeal and excellent physical characteristics.

4. Conclusion

The high frequency of consumption of rice in a variety of products including plain rice, jollof rice, fried rice, rice balls and rice porridge makes it an important staple in the diet of the people in Accra. This study, however, reveals that knowledge and consumption of the local rice in general and local aromatic types in particular is very limited. Many consumers in the city are more familiar with imported rice than local ones and this is reflected in their patronage pattern.

Prominent among the reasons people do not patronize local rice are poor post harvest handling (which is known to result in the presence of stones and other foreign materials in the milled rice), uneasy access and poor quality of rice produce locally. On the other hand, those who consume local rice do so out of

preference, perceived good nutritional quality and relatively lower cost of local rice.

Both cooked and raw sensory attributes dictate consumer preferences. The physical appearance of raw rice sold on the market is the most critical attribute that influence consumer preference. But the appearance of cooked rice – though important – does not determine consumer preference as much as the taste and aroma of the cooked rice. Among the many imported aromatic rice types on the market in Accra, the Sultana and Royal Feast are the brands highly patronized by consumers.

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