

Rice consumption by rural households in Al Taleea district, Babylon province , Iraq

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Abstract

Rice is widely consumed worldwide. Rice consumption studies can provide an essential information that help in developing the best strategies for rice production and display. The study was conducted in Babylon Province, Iraq; to investigate rice consumption of rural household. Four hundred rural household were randomly selected to respond to the questionnaire by personal interview from 1-20 August 2023. Major households consumed imported rice, five times or more per a week, consumed 0.5 - 1 kg each time. Aroma, taste, cooking time, expands well when cooked and degree of whiteness was the most attributes prefer in rice. Rice consumption increased in holidays and occasions, and affected by family size and monthly income. An effective strategy is needed to increase local rice production and enhance its physical, chemical and nutritional properties.

Keywords: attribute; consumer; food; Iraq; rice ; preferences.

Introduction

Rice (*Oryza sativa* L.) is a major food crop, ranking second to wheat among the most cultivated cereals in the world (Tefera et al., 2023), and has the third-highest production quantity among cereal crops (Nakajima et al., 2023). World rice cultivated area in 2022 is 158 million hectare produced 521 million tones , with a consumption of 500 million tones (FAOSTAT, 2023) .

In Iraq, the area cultivated with rice in 2022 was 385000 hectare produced 11600 tones. (CSO, 2023).

Many studies have been done in different regions of the world to analysis household consumption of rice (Abukari et al., 2019; Asngari et al., 2019; Bobah et al., 2019; , Ajayi, & Ajiboye, 2020; Asngari et al., 2020; Ekanem et al., 2020; Nwachukwu & Achike,

2020; Widayanti et al., 2020; Julkhaidar et al., 2021; Amfo et al., 2022; Mayorga et al., 2022; Oladejo, 2022; Oluwakemi et al., 2022; Piao et al., 2022; Samat et al., 2022; Onuwa & Dalla, 2023), which analyzed the type of rice consumed, daily consumption quantities, and attributes preferred by consumers.

rice consumption studies can provide an essential information that help in developing the best strategies for rice production and display. Very few studies regarding rural household rice consumption have conducted in Iraq in general and in the research area in particular, therefore, there is a need to know about rural household consumption of rice: type and amount of rice consumed, frequency of rice consumption, attributes that prefer in rice, factors affecting rice consumption. The

study conducted with the following objectives: 1) identify type of rice consumed; 2) identify frequency and amount of rice consumption; 3) identify attributes that prefer in rice; 4) identify times when rice consumption increased; 5) identify factors effecting rice consumption.

Materials and Methods

The study was carried out in AL-Talyaa District in Babylon Province, located in south central Iraq, between 32.7° and 33.8° N and 43.42° and 45.50° E. Babylon Province is located in the Middle of Euphrates provinces. The population of AL-Talyaa district is 40567 ,about 78.73% of whom (31941) live in rural areas within 4000 family (CSO, 2021). 400 family (10 % of total families) were randomly selected , a housewife from each family was chosen to respond to the questionnaire by personal interview from 1-20 August 2023..

The instrument used was a two-part questionnaire comprising socio-economic characteristics and rice consumption. The socio-economic characteristics included age, education level, family size, and monthly income. The consumption of rice included four aspect; Type of rice consumed, factors influence of rice type preference, rice

frequency eating, amount of rice consumed and time that rice consumption increasing.

Content validity of the questionnaire was established by a panel of experts in fields of agricultural marketing, economic and extension. A pilot study was conducted to establish reliability of the instrument. Cronbach's alpha (a reliability coefficient of 0.93) was established, indicating the instrument used was reliable and valid.

Data were analyzed using frequency, percentage, mean (M), standard deviation (SD), using SPSS ver. 22, (SPSS Inc., Chicago, IL).

Result and Discussion

Type of rice consumed

Result in table1 illustrate that major of rural household (58.5%) consumed imported rice, followed by 22% consumed locally rice , while 19.5% consumed both locally and imported rice.

Perhaps, the reasons for the high demand for imported rice are due to: limited supply of local rice, the good qualities available in imported rice, and equipping of imported rice to families by the Ministry of Commerce. Oluwakemi et al. 2022; Gbigbi, 2019; Onu, 2018, indicated that most families consume imported rice.

Table1. Type of rice consumed

Rice types	n	%
Local	88	22.0
Imported	234	58.5
Both	78	19.5
Total	400	100

Frequency and Amount of Rice Consumption

The amount of rice a person consumes is affected by a number of factors, including: the person's age, the price of rice, and dietary habits.

It is certain that household consumption of rice is affected by the number of its members and their ages. Result in table 2 indicate that 17% of the household in the study area

consume less than 0.5 kg each time they cooked rice, 45.6% consume amount of rice ranging from 0.5 – 1 kg, and 36.5% consume rather than 1 kg. With an average of 0.825 gm consumed each time. In Madagascar the per-capita annual rice consumption estimated at 157 kg (Nikiema et al., 2023), in Bangladesh the average per-capita rice consumption rate is 144.5 kg/year (Yunus et al., 2019), it is 116 kg/ year in Senegal (USDA, 2023a), 74 kg/ year in Peru (USDA, 2023b), , 18 kg/ year in Pakistan (USAD, 2023c). By comparing the Iraqi family's consumption of each meal with the annual per capita consumption in some countries, we see a clear decline in the

individual and Iraqi family's consumption of rice.

As for the number of times rice consumption during the week, results of the study showed that the majority of the households (61%) consume rice five times or more per a week, 22% four times per a week, followed by 11.5% thrice per a week, 3.5% twice per a week and 2% once per a week. This clearly confirms that rice is an essential food item in the Iraqi table. Sisang et al., 2019, found that 61% of respondents consume rice 2-4 times a week, Oluwakemi et al. 2022, found that 32% of household consume rice daily, While Ojo et al., 2019, pointed that 61.9% of respondents consume rice 2-3 days/ week.

Table2. frequency and amount of rice consumption

Consumption frequency	rice consumed each time(kg)						Total	
	< 0.5		0.5 – 1		> 1			
	N	%	N	%	N	%	N	%
Once per a week	0	0.0	3	0.75	5	1.25	8	2.0
Twice per a week	4	1.0	5	1.25	5	1.25	14	3.5
Thrice per a week	17	4.25	12	3.0	17	4.25	46	11.5
Four times per a week	12	3.0	32	8.0	44	11.0	88	22.0
five times or more per a week	35	8.75	134	33.5	75	18.75	244	61.0
Total	68	17.0	186	46.5	146	36.5	400	100

M= 0.825, SD= 0.337

Attributes that consumers prefer in rice

product have a combination of attributes or characteristics that have significance in determining the degree of acceptability of that product to the consume (Yang and Lee, 2019; Maina, 2018).

Consumers from different regions, countries, cities, and urbanization levels are heterogeneous with respect to the attributes of rice quality (Custodio et al., 2019).

There are many attributes used by consumers to check out rice quality. Results in table 3 showed that aroma was the most important

Each rice attribute preferred used by household in the study area.

Among the grain quality traits, aroma is the key characteristic that influences the rice price in both national and international markets (Cyprien et al., 2023; Hui et al., 2022; Zakaria & Shu, 2020). Aromatic rice varieties are often more preferred by consumers (Yu et al., 2023; Michael and Fortunato, 2018) . Laizer et al., 2018; Obih and Baiyegunhi, 2017: found that aroma was the first attribute.

Taste is a quality characteristic influencing household's preference of rice. Rice varieties that have a distinctive taste are in great demand. Varieties have smooth taste are currently the most widely consumed (Huang et al., 2023). Result in table 3 showed that 93% of respondents put taste as the second rice attribute preferred. Abukari et al., 2019; Agbas & Roel, 2019; Wahyudi et al., 2019 found that most of the respondents chose taste as the most important attribute.

Cooking quality of rice plays major role in consumer's preference for any cultivar (Saika et al., 2019). The time required to cook rice grains to the softness preferred for human consumption varied across varieties (Zohoun et al., 2018). Consumers prefer rice varieties that have shorter cooking time (Wahjuningsih et al., 2023; Demont et al., 2017). Consumer in Iraq preference of long grain rice due to its taste, purity, and ability to cook easily (USDA, 2023d). High percentage (90%) of households considered cooking time as one of the most important attributes they prefer in rice. Twine et al., 2023; Ogunleke & Baiyegunhi, 2019 found that most

household confirm cooking time as one of the preferred attributes.

Rice grain length and breadth will expand at cooking (Thi et al., 2020). Rice varieties grain differs in their ability to expand at cooking. People prefer to eat rice that expands more (Ejaz et al., 2020). Consumers prefer rice that exhibit volume expansion (Custodio et al., 2019). Result in table 3 showed that 88.75% of consumer prefers rice variety that expands well at cooking. Julkhaidar et al., 2021; Custodio et al., 2019 found that high volume expansion rice is preferred by consumers.

Whiteness is an indicator of the phenotype of rice grain (Kim et al., 2022). White rice consumption is preferred all over the world (Yilmaz, 2023) because of its better palatability and cooking performance (Li et al., 2021). Rural household in AL-Taleea district placed the degree of whiteness in fifth rank among the attributes that consumers prefer in rice, which was approved by 88% of them. Mayorga et al., 2022 found that whiteness is attribute that Costa Rican consumers use to define good quality of rice.

Table 3. Attributes preferred by consumers in rice

Attribute	n	%
Aroma	400	100.0
Taste	372	93.0
Cooking time	360	90.0
Expands well when cooked	355	88.75
Degree of Whiteness	321	80.25
% brokenness of grains	308	77.0
Cleanness from foreign materials	277	69.25
Colour	267	66.75
Grain size	252	63.0
Packaging	198	49.5

Time when rice consumption increased

The amount of food a family consumes is affected by a number of psychological, social, economic and environmental factors (Blow et al., 2019; Monterrosa et al., 2020; Imtiyaz et al., 2021). Which means that these amounts may increase at certain times and decrease at

other times than the general rate. Rural family rice consumption will increase at some times, 65% of the respondents indicated that the family's consumption of rice increases on holidays and occasions, 32% on Friday, while 3% believe it is the same every day (table 4).

Table4. time when rice consumption increased

Time	n	%
The same every day	12	3.0
Friday	128	32.0
holidays and occasions	260	65.0
Total	400	100

Factors effecting rice consumption

consumption is affected by educational attainment, family size and monthly income (table 5). The highest average rice

Rural family rice consumption was among the largest families, while the lowest average rice consumption was among the smallest families.

Table 5. Characteristics of respondents and rice consumption

Variable		Categories	N	%	rice consumption(kg)				
					< 0.5	0.5 – 1	> 1	M	F test
Age	M= 41.3, SD= 8.2	< 30	80	20.0	18	38	24	0.788	3.605
		30 – 50	206	51.5	34	91	81	0.859	N.S
		> 50	114	28.5	16	57	41	0.860	
Education		<Secondary	114	28.5	23	45	46	0.649	23.796*
		Secondary	208	52.0	20	112	76	0.885	
		University	78	19.5	25	29	24	0.744	
Family size	M= 8.5, SD= 3.2	≤ 5	60	15.0	47	13	0	0.358	219.88*
		6 – 10	234	58.5	21	133	80	0.876	
		> 10	106	26.5	0	40	66	1.061	
Monthly income (million IQD)	M= 1.12, SD= 1.1	< 1	158	39.5	12	84	62	0.908	59.354*
		1 – 2	154	38.5	23	56	75	0.919	
		> 2	88	22.8	33	46	9	0.614	

Conclusion and Recommendation

The majority of rural families tend to consume imported rice due to insufficient local production and the deterioration of its physical, chemical and nutritional qualities. These families consume rice almost all days of the week, this consumption increases on

holidays and occasions, and affected by family size and monthly income. An effective strategy is needed to increase local rice production and enhance its physical, chemical and nutritional properties.

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