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Consumers' Preference and Attitude Towards Dried *Corchorus olitorius L.* in Ibadan Metropolis, Oyo State, Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Aims: To examine consumers' preference and attitude towards dried *Corchorus olitorius L.* leaves in Ibadan metropolis, Oyo state.
Study Design: Cross-sectional survey
Place and Duration of Study: Ibadan North-West, Ido and Akinyele LGAs in Ibadan metropolis, Oyo state, Nigeria, between March 2023 and August 2023.
Methodology: A structured questionnaire was used to collect data from 170 consumers selected through a two-stage random sampling technique. Descriptive statistics and probit regression analysis were used for data analysis.
Results: Most respondents were females (72.9%), married (51.8%), within the age range of 26-35 years (39.4%), had 1-5 household members (72.9%) and tertiary education (77.6%). 63.5% were aware of dried *C. olitorius L.,* but 60% had not consumed it before, mainly due to unavailability. 20.6% preferred dried leaves. Packaging, aroma, colour and texture were key attributes considered for purchase. Sex, household size and income significantly influenced preference.

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Conclusion: There is low preference for dried C. olitorius L in the study area. Creating awareness and appropriate marketing is needed to improve attitude and demand. Suitable packaging should also be developed to retain product quality attributes.

Keywords: C. olitorius L.; awareness; consumers' knowledge; consumers' behavior; seasonal availability.

1. INTRODUCTION

Corchorus olitorius L. is a green leafy vegetable popular among food enthusiasts for its distinctive taste and texture [1]. It offers several health benefits and contains high levels of dietary fiber which aids digestion while promoting healthy bowel movements [2]. It is an indispensable ingredient in many traditional Nigerian dishes due to its unique flavour, paired with numerous nutritional benefits [3]. Additionally, its leaves are widely consumed as a nutritious vegetable in many Asian and African countries including Nigeria [4]. The availability and distribution of indigenous leafy vegetables vary with the seasons of the year [5]. Fresh jute mallow has a very short shelf-life of 2-3 days at ambient temperatures [6]. Leafy vegetables including *C.olitorius L.* deteriorate very rapidly after harvest and therefore require adequate and proper postharvest handling and processing to preserve the quality after harvesting. Adugna [7] noted that losses are recorded as high as 50% in vegetables between rural production and urban consumption as a result of poor infrastructure and other structural constraints such as storage and processing facilities characterizing the marketing system. Kitinoja et al. [8], also reported high postharvest losses of over 50% in leafy vegetables from field to the market while Kinyuru et al. [9] reiterated that high postharvest losses of over 50% in leafy vegetables are attributed to various biological and environmental factors.

To make the leafy vegetables available to consumers both in the rural and urban areas all year round, there is a need for processing and storage of the leafy vegetables which will increase the shelf-life without reduction in its nutrient availability. Therefore, reducing postharvest losses through appropriate postharvest technologies for fresh and processed products would increase food availability to the growing world population [10].

This calls for processing techniques like drying to preserve quality, reduce losses and ensure year round availability to consumers. Drying is one of the oldest food preservation techniques known to mankind [11,12]. It reduces moisture content inhibiting microbial growth and enzymatic reactions thereby increasing shelf-life [13]. Studies show that drying helps retain substantial amounts of nutrients like vitamin C, provitamin A, minerals, antioxidants and dietary fiber in leafy vegetables [14]. Solar drying is the most common method used by small holder farmers in developing countries like Nigeria as it requires low capital investment [15-17].

Understanding consumer preference is key to the success and sustainability of Agricultural/Horticultural value chains of any food product. There is limited literature on consumer perspectives regarding dried jute mallow leaves in Oyo state and Nigeria. Past empirical studies on *Corchorus olitorius L.* focused on consumers' willingness to pay for fresh detached mallow leaves [18]. The study revealed that 69% of the respondents were willing to pay a 60% premium per bundle of detached Mallow leaves, giving high prospect for consumers' demand and consumption for processed mallow leaves. Most other studies are on agronomic performances such as Olaniyi and Ajibola [19] and Law-Ogbomo and Osaigbovo [20] and Amin *et al.,* [21].Therefore, a better understanding of consumer preference and attitudes towards dried *C.olitorius L.* leaves is needed to understand and facilitate its processing and promote the development of the value chain in Nigeria.

Understanding preference, attitudes of consumers will facilitate commercial drying and packaging initiatives for jute mallow. It will also promote utilization of the nutritious dried leaves, thereby enhancing food and nutritional security. Consequently, the present study intend to fill the gap of insufficient information on consumers' attitude to dried mallow leaves. The objective of the study therefore is to examine the knowledge, preferences and attitudes of consumers towards dried jute mallow in Ibadan, Nigeria.

2. MATERIALS AND METHODS

The study was carried out in Ibadan Metropolis. Ibadan is the capital of Oyo State, the biggest City in Nigeria and sub-Sahara Africa. It has population of 2,550,593 (Nigeria population Census, 2006). The city is located on the Southern Western part of Nigeria, lying between latitude 70 and 90N of the equator, longitude 30E and 50E of Greenwich Meridian.

Primary data was obtained using a structured questionnaire. The respondents were selected using a two-stage random sampling. The first stage involved the random selection of three local government areas in Ibadan metropolis, which are Ibadan North-West, Ido and Akinyele LGAs. The second stage involved the random selection of 170 respondents from the selected local government areas. The data were collected on socio-economic data of the respondents, the knowledge and behavior of the respondents towards dried mallow leaves. Descriptive statistics was used to describe the socio-economic characteristics of the respondents and preference for the dried Mallow leaves while probit regression analysis was used to determine the factors affecting the respondents' attitude to dried Mallow leaves.

3. RESULTS AND DISCUSSION

3.1 Socioeconomic Characteristics of the Respondents

Table 1 result revealed that most of the respondents were female (72.9%), married (51.8%) and were within the age group of 26-35 years (39.4%). The average age of the respondents was 33 years indicating that they are within the active age group and may be willing to explore innovation. Most of the respondents had 1-5 members in the household (72.9%) with average of 4 members per household. Majority of the respondents had tertiary education level (77.6%) and were civil servants (38.2%) with average income of ₦70,829.41.

3.2 Consumers' Awareness of Dried Mallow Leaves

Table 2 result shows that most of the respondents buy *C.olitorious L.* leaves in fresh form (97.6%). Findings revealed that most of the respondents in the study area were aware of dried Jute mallow leaves (63.5%) mostly from their respective homes (35.3%). Some of the respondents have consumed dried mallow leaves (40%) in their homes (32.9%). The major reason for not consuming dried *C.olitorious L.* was due to the fact that the leaves were not available in their locations (45.3%). Only 18.8% of the respondents have bought dried mallow leaves (18.8%) because it was comfortable for them to use.

3.3 Consumers' Preference for Dried Mallow Leaves

Table 3 result shows that a higher percentage of the respondents (78.2%) do not prefer dried mallow leaves. This may be due to the fact that consumers have not had contact with dried mallow leaves in the market and those that preferred it were drying by themselves to prevent losses and make it available when the fresh mallow leaves is unavailable for consumption. 80% of the respondents would go for dried mallow leaves in the absence of fresh leaves while 88.8% and 90.6% of the respondents were of the opinion that dried mallow leaves would reduce perishability and scarcity problems respectively. 137 of the respondents representing 80.6% accepted that processing mallow leaves into dry during the on-season would bring more profits during the off-season.

3.4 Attributes Considered by Consumers When Purchasing Dried Jute mallow Leaves

In Table 4, survey examined the attributes of people towards purchasing of dried mallow leaves and it was found that the packaging, colour, texture and aroma were key factors considered, with packaging being the most important to the respondents, ranking 1st. The texture was the least important to the consumers, thereby ranking 4th whereas aroma and colour had the same mean score of 3.82 and 3.82 respectively. This showed that the consumers are most likely to buy the dried mallow leaves as long as it has appropriate packaging.

3.5 Factors Determining the Consumers' Preference for Dried Mallow Leaves

From the result in Table 5, the probit regression analysis, three variables were found to significantly affect consumers' preference for dried mallow leaves, which are Sex, Household size, and Income. Sex is statistically significant at 1% level with a positive coefficient indicating that the females tends to have higher preference for

Table 1. Socioeconomic characteristics of the respondents

Variables	Category	Frequency	Percentage	Mean
Gender	Male	46	27.1	
	Female	124	72.9	
Marital status	Single	73	42.9	
	Married	88	51.8	
	Divorced	2	1.2	
	Widowed	7	4.1	
Age (Years)	≤25	50	29.4	
	26-35	67	39.4	
	36-45	30	17.6	33
	46-55	15	8.8	
	>55	8	4.7	
Household size	1-5	124	72.9	
	6-10	46	27.1	4.40
Educational level	No formal education	8	4.7	
	Primary education	7	4.1	
	Secondary education	23	13.5	
	Tertiary education	132	77.6	
	No formal education	8	4.7	
Primary occupation	Civil servant	65	38.2	
	Self employed	30	17.6	
	Student	29	17.1	
	Trading	6	3.5	
	Unemployed	9	5.3	
	Others	31	18.2	
Total Income	<10,000	12	7.1	
	10,001-80,000	105	61.8	
	80,001-150,000	41	24.1	
	150,001-220,000	4	2.4	₦70829.41
	220,001-290,000	4	2.4	
	>290,000	4	2.4	

Source: Field survey, 2023

Table 2. Consumers' awareness of dried mallow leaves

Variables	Frequency	Percentage
In which form do you usually buy Mallow Leaves?		
Dried leaves	1	0.6
Fresh leaves	166	97.6
Both	2	1.2
None	1	0.6
Aware of dried Jute Mallow leaves		
Yes	108	63.5
No	62	36.5
If yes, where did you see it? (n=108)		
Aware but have not come across it	3	1.8
Business page	1	0.6
Food exhibition	6	3.5
Food vendors	6	3.5
Friend / Family members	23	13.5
Home	60	35.3
Market	2	1.2
Social media	1	0.6
Supermarket	6	3.6
Have you eaten cooked dried Mallow leaves before now?		
No	102	60.0
Yes	68	40.0
If yes, where did you eat the cooked dried leaves? (n=67)		
Family	1	.6
Food exhibition	2	1.2
Food vendors	5	3
Friend	3	1.8
Home	56	32.9
If No, why? (n=88)		
Don't know about it	1	0.6
Haven't come across it	7	4.1
Haven't got the chance to try it	1	.6
I prefer fresh	3	1.8

Variables	Frequency	Percentage
Not available	77	45.3
Not interested	8	4.7
Tasteless	3	1.8
Uncertain about the outcome	1	0.6
If yes, why did you buy? (n=32)		
Available	7	4.1
comfortable to use	17	10.0
Not expensive	3	1.8
Packaging	5	2.9
If no, why? (n=140)		
I don't like it	3	1.8
I don’t personally buy vegetable	2	1.2
I Make it myself	2	1.2
I prefer to dry it myself	1	.6
No reason	5	2.9
Not available	118	69.4
Not fresh	1	.6
Not in charge	2	1.2
Prefer fresh	2	1.2
Very expensive	2	1.2

Source: Field survey, 2023

Table 3. Consumers' Preference for Dried Mallow Leaves

Would you prefer dried mallow leaves to fresh?	Frequency	Percentage
No	135	79.4
Yes	35	20.6
Could scarcity/unavailability make you go for dried mallow leaves if available?		
No	34	20
Yes	136	80
I think problem of perishability would reduce with this processing method		
No	19	11.2
Yes	151	88.8
I think problem of scarcity during dry season would be solved		
No	16	9.4
Yes	154	90.6

Source: Field Survey, 2023

Table 4. Attributes Considered by Consumers When Purchasing Dried Jute Mallow Leaves

Constraint	Mean score	Rank
Packaging	3.86	1st
Aroma	3.82	2nd
Colour	3.82	3rd
Texture	3.78	4th

Source: Field survey, 2023

N.B: Aroma was ranked higher than the colour because it has a lower standard deviation

Table 5. Factors Determining the Consumers' Preference for Dried Mallow Leaves.

Preference	Coef.	Std. Err.	Z	P>|z|	[95% Conf. Interval]	
Sex	.9575739	.3466791	2.76	0.006***	.2780954	1.637052
Marital Status	.0419638	.2330821	0.18	0.857	-.4148687	.4987963
Age	.0240502	.016132	1.49	0.136	-.007568	.0556683
Household size	-.2629089	.0823491	-3.19	0.001***	-.4243102	-.1015075
Education	-.1221331	.177214	-0.69	0.491	-.4694661	.2252
Occupation	-.0994762	.083398	-1.19	0.233	-.2629333	.0639809
Income	-7.85e-06	3.51e-06	-2.23	0.025**	-.0000147	-9.65e-07
Awareness	.0134825	.2562459	0.05	0.958	-0.4887502	.15157151
_cons	-1.079169	1.055786	-1.02	0.307	-3.148472	.9901333

Number of obs = 170
LR chi2 (9) = 26.97
Prob > chi2 = 0.0007
Log likelihood = -75.581019
Pseudo R2 = 0.1514
Source: Field survey, 2023

dried mallow leaves. This is because women are the ones that mostly go to the market to buy food items. Household size, which is also statistically significant at 1% level, indicate a strong likelihood of a real relationship with preference while its negative coefficient indicates that larger household sizes are associated with lower preference for the dried mallow leaves. This is because, families with higher number of people in the household consume more servings of mallow leaves per meal as compared to families with smaller number of people in the household who tends to preserve the excesses by drying. Income was also found to be statistically significant at 5% level and has a negative coefficient indicates that the lower the

consumers' income, the higher their preference for the dried mallow leaves. This could be as a result of them buying in excess when the price is lower and then process to dried mallow leaves which would be available to them all year round when it is more expensive in the market.

4. CONCLUSION AND RECOMMENDATION

There is low preference for dried mallow leaves in the study area (20.6%).The important attributes that may be considered by consumer when purchasing dried *C.Olitorius L.* were packaging, aroma, colour and texture. Based on the empirical findings of this study,public awareness and appropriate marketing information needs to be improved on so that attitude of people towards dried mallow leaves would improve, thereby increasing the demand, especially during the lean season of production of the commodity. Additionally, appropriate packaging should be developed that will preserve the colour and aroma of the product.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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