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Consumer Perception and Preference on Coating on Fruits in Ilorin West Local Government Area of Kwara State, Nigeria.

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Abstract

This study was conducted to investigate the consumer perception and preference of edible coatings on fruits in Ilorin West local government area of Kwara State. Simple Random Sampling Technique was employed, while primary data through structured questionnaire, also there are 380 questionnaires dully completed. Descriptive, Chi-squared, and Probit Model Statistics were utilized. The results show that at one time or the other, all the respondents consumed raw and fresh-cut fruits, 63.9% consumed frozen-cut fruits, and 43.5% consumed canned fruits. The preference of consumer shows that only raw fruits and fresh-cut fruits were totally preferred. On consumers' perception of edible coatings and films, all the respondents were aware of edible fruits coatings or films. However, 95.7% of the respondents would buy packed fresh-cut fruits coated with edible coatings and films if the National Food and Drug Agency publicly declare the approval of the coatings. The Probit model shows that none of the demographic variables were responsible for whole-raw-unprocessed fruits and fresh-cut fruits consumption. Age, level of education, household size, household employment status, and total income were the determinants of frozen fruits consumption in the area, while age, household size, household size, and total income determined the consumption canned fruits.

Keywords: Consumer Perception, Edible Coatings, Fruits, Consumer Preference.

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Introduction

Fruits and vegetables present an important part of the human diet in almost any culture of the world. There is also a long tradition in the view that fruits and vegetables should be consumed because of their nutritional and health benefits. Eating a variety of fruits and vegetables ensures an adequate intake of most micronutrients, dietary fibre and essential non-nutrient substances. Despite these positive nutritional and health aspects, consumption rates of fruits and vegetables are still low or insufficient in many countries (Sandrine, 2005). Regular consumption of fruits and vegetables could help prevent cardiovascular diseases and certain cancers, principally of the digestive system (WHO, 2002). However, a recent WHO/FAO expert consultation report (2003) states that the overall daily consumption of fruits and vegetables is 100 g underneath recommended intake. Therefore, it is of a great importance to know in detail what the expectations of consumers are towards fruits and vegetables. Therefore, health promotions have been initiated recommending eating at least five portions of fruits and vegetables per day. However, as daily experience shows, such initiatives to improve the nutritional quality of our diet have been proven unsuccessful when the products to be promoted did not meet sensory qualities as well as many other consumer expectations. This would mean over the long term, that the consumer will like, accept and select fruits and vegetables beyond the mere health-driven argumentation.

Although food choice is complex and is influenced by a lot of interrelating factors, many studies indicate the key importance of freshness for food in general and for fruits and vegetables in particular. It has been shown that the meaning of freshness is complex and depends on the professional area considered. However, since it is the interpretation of freshness by the consumer that determines purchasing behaviour, it may be postulated that the only relevant definition of freshness is the one given by consumers. Surprisingly, only limited research has been carried out to date with the aim of investigating the consumer understanding of this word. According to Ragaert, *et al.*, (2004) in Belgium, around 200 consumers rated the importance of different factors influencing the purchase and consumption of minimally processed vegetables and packaged fruits. Freshness was the most important factor both at purchase and at consumption, followed by labelled shelf life date and taste.

In this study, 10 to 14 middleclass housewives were drawn from a sensory panel. The authors asserted that the opinion of highly discerning and skilled housewives would be more valuable than those of naïve consumers (Fillion and Kilcast, 2000). It has been postulated that in the wake of globalisation of food systems consumers have become alienated from the origin of the food they eat, and that this has had consequences on how they view their food (Torjusen *et al.*, 2001). Fischler (1980) stated that many consumers have begun to view their food as "unidentifiable edible objects, devoid of origin or history...without identity". Moreover, we were not aware of any study on consumer perception and preference on coating on fruits in Nigeria as at this conduction of this report. Although freshness presents one of the main attributes of consumer choice of fruits and vegetables, in spite of its importance, the understanding and perception of freshness by the consumer so far has not been studied. Also quick deterioration, bulkiness, poor postharvest handling, and lack of storage facilities among many others has led to inequitable distribution of fruits and vegetables of Nigeria at large.

The objectives of the research were to determine the socio-economic characteristics of fruits consumers; identify the frequency of fruits consumption in the study area; compare Consumer Preferences of Fresh-Cut fruits over Other Fruits types; investigates the Consumer Preference of Edible Coatings on fruits; and determine the effects of socio-economic variables on the consumer's preference of fruits and their knowledge about edible coatings and films.

Materials and Methods

This study was carried out in Ilorin West local government area of Kwara State. The state was created in 1967. Ilorin is the headquarters of Kwara State. Ilorin has an area 105 km² and a population of 364,666 as at 2006 population census. Simple Random Sampling Technique was used in this survey. The population of the study consist of both male and female, Adult and young, married and singled of the study area. 400 respondents were interview for the purpose of this study using structured questionnaire. Primary data was collected through the use of questionnaire by interview scheduled which involved contact relationship with the respondents in order to get proper and accurate data. Descriptive and inferential analytical tools were used. Descriptive tools include Tables, Frequencies, and percentages. They were to analyse the socio-economic characteristic and perception and preferential information of the respondents. The inferential l statistics employed are Chi-squared and Probit Model. Probit and Ordered Probit Analyses were used to determine the effects of socio-economic variables on the consumer's preference of fruits and their knowledge about edible coatings and films. Probit Analysis is used for studying data with a binomial distribution (yes/no response) and Ordered Probit is used for studying data with multinomial response variables that are inherently ordered in nature.

Results and Discussion

The results of the socio-economic characteristics are presented in Table 1. The results on the gender revealed that 52.2% of the respondents were female while 47.8% were male. The most of the respondents were below 30 years of age (65.2%), and 41-50 years falls on the 17.4% of the respondent, and 21.7% of the respondents were from age group of 31-40. The distribution based on the level of education shows that 82.6% of the respondents have tertiary education while other 17.4% are secondary school holders. In case of their marital status, 56.5% of the respondents were single; only 43.5% are married. In term of their family size, 47.8% of the respondents were of 6-8 family members, 39.1% were of 3-5 family members, 8.2% of the respondents were of less than 3 family members while 4.3% of the respondent were of greater than 12 family size member. The employment status of the respondents shows that 60.9% were civil servant and 39.1% of the respondents comprises of other occupations.

The distribution of household income presented in Table 1, 39.1% respondents of generates less than ₦20,000 naira monthly, 30.4% generates between ₦50,000 and ₦99,999 monthly. More so, 17.4% generates ₦150,000 – ₦199,999 monthly, as 8.7% generates ₦100,000 – ₦149,999 monthly, while only 4.3% generates ₦200,000 monthly.

The Table 2 show the frequency of consumption of raw fruits, 82.6% of the respondents consume fruit most frequently. While only 17.4% of the respondents consume fruits more frequently. This signifies that though the rate of fruits consumption is considerably high in the study area, yet it is not well consumed and the fruits with value additions were less consumed. However, the consumption rate of fresh-cut fruit shows that 52.2% of the respondents consume fresh-cut fruits most frequently, 30% of the respondent consumes fresh-cut fruit at lesser rates, while 13.0% of respondents consume most frequently and only 4.3% of the respondent consumes frequently. This shows the importance of freshness of fruit over frozen and canned fruits. The result of frozen-cut fruits shows that 29.0% of the respondents consume frozen-cut fruit least frequently, while 36.1% never consumed it at all. 21.7% of the respondents consumes frequently, while 28.7% of the respondents consumes more frequently and most frequently. This shows that, most people don't like frozen-cut fruits. On the side of canned fruits, 56.5% of the respondents never consume canned fruits, while 19.4 least frequently consume. Only 24.1 consume canned fruits frequently in the study area.

Data analysis below shows that about 60.9% of the respondents preferred fresh-cut to canned .the reasons being freshness, natural taste/flavour, More nutritious and better utility. About 73.9% of the respondents preferred fresh-cut to frozen cut. The main reasons being freshness, natural taste, no additives added and better utility. Even they said, they are ready to pay higher price in buying fresh-cut over frozen-cut fruits. Also about 60.9% of the respondents sometimes prefer fresh-cut to raw fruits, 26.1% prefer raw unprocessed to fresh-cut while 13.0% prefer fresh-cut to raw fruits. There was no tangible reason their preference. The results of chi-squared analysis are presented in Table 3 for the preference of frozen and canned fruits. Chi-squared could not run the test for whole-raw and fresh-cut fruits because they both have 100% preference and not enough variation is found as a basis for comparison. The preference of frozen and canned fruits were not significant ($p > 0.05$). This shows that the respondents in the study area prefer eating whole-raw and fresh-cut fruits to frozen and canned fruits, probably as a result of their high cost. This also supports the employment status and household monthly income which were significant in the Probit model.

All the respondents agreed they heard about edible fruits coatings or films. up to 26.1% of respondents said that ,they knew apple, pawpaw, orange and pineapple were coated with edible coating materials, 17.4% of respondent said they knew cashew was coated with edible coating materials, also, another 17.4% of respondents said they knew apple, mango and orange were coated as usual, while 13.0% said they knew orange, other said apple, cashew, lemon, and pear were coated, 8.7% agreed that, apple, pear and orange were coated, and 4.3% of respondent said they knew apple was coated edible materials. Most of the respondents opined that the benefit of edible coatings were that it makes the fruit to last longer, safety, gives better appearance, better quality and better nutrition. However, about 73.9% of the respondents said they would buy fresh-cut fruit coated with edible films save for consumption. And 95.7% of the respondents said they would buy fresh-cut fruit coated with edible films if the Food and Drug Agent approved the coating. Also 43.5% of the respondents were willingly which to pay higher price for coated fresh-cut compare to raw fruits while about 39.1% of the respondent willing to pay the same price for both coated fresh-cut and raw fruits. And 17.4% of the respondents were willing to pay lower price for coated fresh-cut compare to raw fruits

The Probit model could not run the analysis for whole-raw and fresh-cut fruits because, all the respondents consumed whole-raw and fresh-cut fruits, and there were no basis for comparison. The results of Probit model (Table 7) revealed the respondents' consumption of whole-raw, fresh-cut, and frozen, and canned fruits as; 100% consumed whole/ raw/unprocessed and fresh-cut fruits, while 43.5% consumed frozen and canned fruits. The likelihood functions were -9.836576, and -8.445334 for frozen and canned fruits respectively. This high Log likelihood function shows that the model has a good fit. The results for the frozen fruits show that age (at $p > 0.05$), level of education (at $p > 0.05$), household employment status (at $p > 0.01$) and total income (at $p > 0.01$) were statistically significant with positive coefficients, while household size was also significant at $p > 0.05$ but with negative coefficient as predicted. This implies that increase in age, level of education and monthly income will lead to increase in the consumption of frozen fruits in the study area. While, increased in the household size will cause a reduction in the rate of frozen fruits consumption. This may be as a result of more none-food expenses such as education, clothing, among many others. The results for canned fruits revealed that, among all the demographic variables, only age of respondents, household size, and total income were statistically significant at $p > 0.05$, $p > 0.1$ and $p > 0.1$ respectively with positive coefficients except household size with negative coefficient as predicted.

Conclusion and Recommendations

This signifies that increase in age and monthly income of the household members will result in an increase in the level of consumption of canned fruits in the study area. While, the rate of canned fruits consumption reduces with increase in the number of people living in a household.

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Tables

Table 1: Socio-economics and demographic characteristics

Socio-Demographic Characteristics		Percent
Gender	Female	52.2
	Male	47.8
Age	Under 18 yrs	17.4
	18-30 yrs	43.5
	31-40 yrs	21.7
	41-50 yrs	17.4
Level of education	Secondary Education	17.4
	Tertiary Education	82.6
Marital status	Single	56.5
	Married	43.5
Family size	< 3	8.7
	3 – 5	39.1
	6 – 8	47.8
	> 12	4.3
Employment status	Civil Servant	60.9
	Others	39.1
Household income	Less than ₦20,000	39.1
	₦ 20,000 - ₦ 49,999	-
	₦ 50,000 - ₦ 99,999	30.4
	₦ 100,000 - ₦ 149,999	8.7
	₦ 150,000 - ₦ 199,999	17.4
	₦ 200,000 and Above	4.3

Source: Field survey, 2012

Table 2: Frequency of fruits consumption

Frequency	Raw	Fresh-Cut	Frozen	Canned
Never	-		36.1	56.5
least frequently	-	30.4	29.0	19.4
Frequently	-	4.3	13.4	15.4
more frequently	17.4	13.0	11.1	-
most frequently	82.6	52.2	9.6	8.7

Source: Field survey, 2012

Table 3: Comparing consumer preferences of fresh-cut fruits over other fruits

		RAW	FROZEN	CANNED
PREFERENCE	No	26.1	8.7	4.3
	Sometimes	60.9	17.4	34.8
	Yes	13.0	73.9	60.9

Source: Field survey, 2012

Table 4: Reasons for preferences of fresh-cut fruits over other fruits

	RAW		FROZEN		CANNED	
REASON						
	Nil	26.1	Nil	8.7	Nil	4.3
	Safer	6.1	freshness	13.0	Freshness	7.7
	less waste and undesirable cut generated	10.3	Natural taste	4.3	more nutritious	9.7
	better utility	8.3	more nutritious	13.0	freshness, natural taste, and more nutritious	21.7
	safer and defects easily detected through transparent packaging	4.6	freshness and more nutritious	4.3	freshness, natural taste, more nutritious, and no additives added	8.1
	less waste and undesirable cut generated and visual quality	5.8	freshness, natural taste, and more nutritious	13.0	freshness, natural taste, more nutritious, and better utility	30.4
	better utility, less preparation time, defects easily detected through transparent packaging, and visual quality	19.7	freshness, natural taste, no additives added, and better utility	26.1	natural taste, more nutritious, more convenient, and better appearance	18.1
	safer, better utility, serving portion, defects easily detected through transparent packaging, and visual quality	19.1	natural taste, no additives added, more convenient, and better appearance	17.4		

Source: Field survey, 2012

Table 5: Comparing consumer preferences of fruits.

	Raw	Fresh-cut	frozen-cut	Canned
Chi-Square values	-	-	.391	.391
Degree of freedom	-	-	1	1
Significance level	-	-	.532	.532

Source: Field survey, 2012

Table 6: Consumer perception of edible coatings on fruits

	Response	Percent
Awareness	Yes	100.0
Fruits aware	Apple	4.3
	Cashew	17.4
	Orange	13.0
	apple, mango, and orange	17.4
	apple, pear, and orange	8.7
	apple, cashew, lemon, and pear	13.0
	apple, pawpaw, orange, and pineapple	26.1
Benefits	last longer	26.1
	better quality	13.0
	better nutrition	8.7
	last longer and better appearance	21.7
	last longer and better quality	8.7
	safety, last longer, better quality, and better nutrition	21.7
Interest in fresh-cut coated	No	26.1
	Yes	73.9
Interest in fresh-cut coated after NAFDAC approval	No	4.3
	Yes	95.7
Price willing to pay	Lower	17.4
	Same	39.1
	Higher	43.5
	Total	100.0

Source: Field survey, 2012

Table 7: Coefficients and probability values of the demographic variables for consumption of Fruits

MLE Coefficients for Fruits		
Variable	Frozen	Canned
Constant	-58.70764301 (-0.978)	-2.250430050 (-0.774)
Sex	61.91582993 (0.478)	1.271632843 (1.156)
Age	43.82119614 (2.391)**	1.865090883 (2.083)**
Level of Education	0.02587521618 (2.347)**	0.6862720247 (1.060)
Marital status	-57.90559520 (-1.434)	2.487803533 (1.376)
Household size	-28.94530838 (-2.521)**	-1.356502300 (-1.731)*
Employment status	21.74386251 (2.565)***	-.1187043452 (-0.357)
Total household income	14.39108028 (2.782)***	1.821621546 (1.907)*
Log likelihood function	-9.836576	-8.445334
Restricted log likelihood	15.74617	15.74617
Chi-squared	31.49235 (7)	14.60168 (7)**

Source: Field survey, 2012

Note: LIMDEP Analytical tool was used to carry out the probit model

The values in the parenthesis are their respective t-values

*signifies that the variable is statistically significant