FACTORS INFLUENCING NOODLE CONSUMPTION AND NUTRIENT INTAKE OF NIGERIAN UNIVERSITY UNDERGRADUATE STUDENTS

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ABSTRACT
This study aimed at determining factors influencing noodle consumption and nutrient intake of noodle consumers among Babcock University undergraduate students. Multistage random technique was used to select 325 respondents and a well- structured questionnaire was used to obtain information on the socio- economic and dietary intake of the respondents. The 24- hour dietary recall was analysed using Total Dietary Assessment software. The result shows that more females (71.7%) participated in the study and many of the respondents (78.8%) were in the age range of 19 – 22years. Factors responsible for noodle consumption among the respondents include; non-satisfaction with cafeteria food (47.4%), easy affordability (22.2%), ease of preparation (25.5%) and tight schedule (4.9%). 21.8% consumed noodle daily while 47.1% of the respondents consumed it three times in a week. The respondents consumed noodle at any time of the day with 26.2 % consuming in- between meals and many eat it in the evening (41.5%). Consumption of carbohydrate and fat is high (% Recommended Dietary Allowance for carbohydrate being 165.01 for females and 175.92 for male) while fibre consumption is low (% Recommended Dietary Allowance being 45.56 for female and 29.76 for male) among the two genders. Intake of vitamin A, vitamin C, folate, vitamin B12, zinc and calcium was poor among the respondents.
Keywords: Instant Noodle Nutrient intake Recommended Dietary Allowance

INTRODUCTION
Noodles appear to have originated from Japan in the 1950s and today, are produced in over 80 countries [1]. They are instant foods made from wheat by drying and by precooking. They are often fused with oil and sold with a pack of seasoning powder. Dried noodles are usually eaten after being cooked or soaked in boiling water for 2-5 min, while precooked noodles can be reheated or eaten straight from the packet [2]. Among convenience foods, instant noodles have long been popular worldwide due to their reasonable price, taste and ease of preparation. Instant noodles are often criticized as unhealthy or junk food as it is high in carbohydrate but low in fiber, protein, vitamins and minerals. They are typically fried as part of the manufacturing process, resulting in high levels of saturated fat and/or trans-fat [3]. Thus, the challenge with instant noodles is that being a packaged manufactured food; it is high in artificial trans-fat while also containing chemical preservatives [4]. However, in response to public health concerns, manufacturers have made efforts to lower the sodium and fat content of instant noodles [5], Convenience and affordability are important factors contributing to instant noodles increasing popularity. Despite its ancient origins, noodle has undergone considerable evaluation and migration, as the products

become increasingly globalized [6, 7], noodles are now a worldwide meal. This research will survey the factors influencing instant noodle consumption and nutrient intake of private university undergraduate students as there is dearth of information on noodle consumption pattern and how it affect nutrient intake of young adults in Nigerian universities.

MATERIAL AND METHOD

This research was carried out at Babcock University Ilishan- Remo which is located in the South Western region of Nigeria. The university operates cafeteria system which provides a wholesome lacto-ovo vegetarian diet. Three hundred and twenty- five (325) respondents in residence were drawn from different departments within the Institution. The departments were randomly selected from a list of all the departments in the Institution. Respondents were selected using multistage sampling technique and simple random technique. Both male and female participated in the study. The data was collected using a validated structured sectionalized questionnaire. The questionnaire has information on personal data, socio-economic characteristics and dietary and food intake pattern as well as 24-hour dietary recall. Portable anthropometric stadiometer was used to measure height (m) of the respondents and digital weighing scale was used to measure the weight in Kg [8].

DATA ANALYSIS

The data generated was analysed using SPSS version 20.0 and the results were expressed using descriptive statistics such as means, standard deviations, percentages and frequencies.

RESULTS AND DISCUSSION

The socio- economic status of the respondents is as shown in Table 1, there were 28.3 % male and 71.7 % female respondents. Most of the respondents were between the ages of 19-22 years (78.8 %).The monthly allowance of the majority of the respondents (44.8%) was between 11,000 and 20,000 naira. Many of the respondents were in their third and fourth year of their study when their eating habit in school is expected to have been established.

Table 1: Socio- economic characteristics

	Frequency	Percentage
Sex		
Male	92	28.3
Female	233	71.7
Age		
19-22	256	78.8

23-26	69	21.2
Monthly allowance		
≤10,000	111	34.2
≤20,000	162	49.8
>20,000	52	16.0
Year of study		
100		
200	21	6.5
300	33	10.2
400	72	22.2
500	169	52.0
	30	9.2

Fig. 1 presents different reasons students in residence in the school consumed noodles and there were four main reasons the respondents in this study consumed noodles. Though they were expected to eat in the cafeteria but greater percentage (47.4%) of the students in residence consume noodles when they were not satisfied with cafeteria food and so regarded noodle as an alternative to main meal to be consumed in the cafeteria. The price of noodle has been found to be a strong factor for noodle consumption [9] and consumers' main considerations in purchasing, aside the quality of the product [10]. Thus it was not surprising to found that 22.2% of the respondents consumed noodle because it is easily affordable. Others ate because of its ease of preparation (25.5%) and 4.9% ate noodles due to tight schedule. These observations are corroborated by the report of Ohm *et al.* [9] that instant noodles worldwide popularity among convenience foods is due to their reasonable price, taste and ease of preparation.
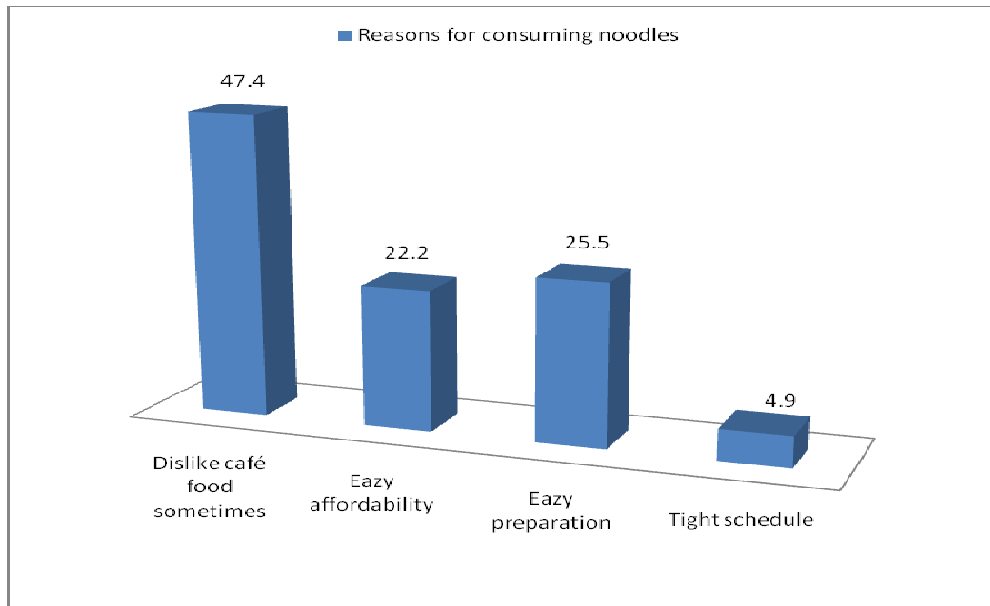
Fig 1: Reasons for consuming noodles

Table 2 show the noodle consumption pattern of the respondents. It was found that majority of the respondents (69.2%) consumed 120g of noodle as a serving with only 9.2% consuming noodle twice a day. The 120g/serving/ day was less compared to 304.1g/day/person reported by Chung *et al.* [11] for the Americans. It was also observed that 21.8% consumed noodle daily and 47.1% consumed noodle three times in a week. This observation is comparable to what was reported by Akanbi [12] that 29.1% consume noodle daily while 34.0% consume three times a week. It was eaten anytime of the day as 25.5% eat it for lunch, 41.5% for supper and 26.2% eat in- between meals.

Table 2: Noodle consumption pattern of the respondents

	Frequency	Percentage
Packet-size of noodle consumed		
Small size(70g)	70	21.5
Super Pack(120g)	225	69.3
Hungry man size (220g)	30	9.2
Frequency of consumption		
Twice a day	30	9.2
Daily	71	21.8
Three times a week	153	47.1
Twice a week	54	16.6

Once a week	17	5.2
Time of consumption		
Breakfast	22	6.8
Lunch	83	25.5
Supper	135	41.5
In- between meals	85	26.2
Place of consumption		
School cafeteria	59	18.2
School dormitory	241	74.2
School food outlets	25	7.7

Table 3: Mean energy and nutrient intake for female respondents

Nutrients	Range	Mean± SD	RDA	RDA%
Calorie(Kcal)	1117.02-3002.49	2487.94 ± 485.98	2200	126.33
Protein (g)	10.96- 96.56	53.09 ±21.84	46	154.13
Carbohydrate(g)	94.40- 623.33	214.52 ± 110.45	130	165.01
Fibre(g)	0.00- 34.67	11.39 ±9.60	25	45.56
Fat(g)	2.20- 91.52	33.13 ±19.70	13.1	252.90
Vitamin A(mg)	0.00- 8514.00	825.64 ± 1613.02	700	117.94
Vitamin C(mg)	0.00- 312.77	25.87 ±75.57	75	34.49
Folate(mg)	0.00- 642.10	189.69 ± 171.46	400	47.42
Vitamin B12 (mg)	0.00- 6.38	1.13 ± 1.41	2.4	47.08
Calcium(mg)	0.38- 1820.25	366.38 ± 398.15	1200	30.53
Zinc(mg)	0.01- 12.00	6.67 ± 3.06	12	55.58
Iron(mg)	3.22- 27.06	12.62 ±6.43	15	84.13

Table 3 and 4 presents the results of the 24- hour dietary recall. The mean calorie, carbohydrate, protein, fat, fiber, vitamin A, vitamin C, folate, vitamin B_{12}, calcium, zinc and iron was computed and compared with the recommended dietary allowance (RDA).

Table 4: Mean energy and nutrient intake for male respondents

Nutrients	Range	Mean± SD	RDA	RDA%
Calorie(Kcal)	1146.65 - 3430.56	2014.80± 456.77	2900	107.38
Protein(g)	22.22 - 90.92	48.39± 19.75	58	83.43
Carbohydrate(g)	103.05 - 439.43	228.70± 100.63	130	175.92
Fibre(g)	.00- 30.31	11.31± 10.05	38	29.76
Fat(g)	11.89-101.02	42.38± 28.09	18.1	234.14
Vitamin A(mg)	35.66-7697.08	1065.49± 1673.75	900	118.38
Vitamin C(mg)	.00-75.00	10.50± 23.42	90	11.66
Folate(mg)	.00-522.50	176.86± 164.70	400	44.21
Vitamin B12(mg)	.00-4.68	1.23± 1.40	2.4	51.25
Calcuim(mg)	17.82-1000.00	349.15± 302.02	1000	34.91
Zinc(mg)	2.23-14.80	8.36± 3.09	11	76
Iron(mg)	5.76-21.66	12.50± 4.62	8	156.25

Percentage of the nutrients consumed compared to the recommended daily allowance (%RDA) for female respondents was 126.33, 165.01, 154.13 and 252.90 for calories, carbohydrate, protein and fat. Also, % RDA for male respondents was 107.38, 175.92, 83.43 and 234.14 for calories, carbohydrate, protein and fat respectively. Calorie consumption was higher in female respondent than the male respondent and relative contribution of fat and protein to calorie was higher for the female respondents. Recommended dietary allowance for calories, carbohydrate, protein and fat was met and exceeded by both male and female respondents except for protein which was low for male respondents. These findings corroborate the report of Khattak *et al.* [13] who reported higher calorie intake of female respondents than the male respondents. Intake of vitamin A, vitamin C, folate, vitamin B$_{12}$, zinc and calcium was poor among the respondents. However, intake of iron was high among the male respondent (% RDA being 156.25) compared to the female respondents ((% RDA being 84.13). This finding is in agreement with the report of Park *et al.* [14] who reported a significant lower intake of calcium, iron, vitamin A, niacin, and vitamin C among instant noodle consumption group compared with those in the non- instant noodle consumption

group. Their study further revealed that consumption of instant noodles may lead to excessive intake of energy and fats which is also depicted in the present study. Fiber consumption was also found to be low (% RDA being 29.76 for male and 45.56 for female) when compared with the RDA [13]. Noodle is low in fibre [3] and the rate of consumption of noodles among the respondents may be a contributory factor to their low fiber consumption. BMI classification (though other factors may also contribute) of the respondents is presented in Table 5. Among the female respondents 60.1% were normal, 8.2% were overweight and 18.0% were obese while 13.7 % were underweight. However, 56.5% of the male respondents were normal, 19.6 % were overweight and 23.9 % were obese. The level of overweight and obesity observed among the respondents could be attributed to high consumption of carbohydrate, fat and protein among the respondents. The results of this finding is in agreement with the reports of Chinedu and Emiloju [8], He *et al.* [15] and Hong et al [16] who reported prevalence of overweight among young adults.

Table 5: BMI Classification of the respondents by gender

BMI(kg/m²)	Female		Male	
	Frequency	Percentage	Frequency	Percentage
Underweight(<18.5)	32	13.7	-	-
Normal(18.5-24.9)	140	60.1	52	56.5
Overweight(25-29.9)	19	8.2	18	19.6
Obese(30-40 and above)	42	18.0	22	23.9
Total	233	100	92	100

CONCLUSION
Noodle is consumed at any time of the day especially from mid –morning to late in the night. Its consumption affected nutrient consumption of the respondents with an increased consumption of carbohydrate and fat. Intake of vitamins and minerals like vitamin A, vitamin C vitamin B12, folate, iron, calcium and zinc are reduced.

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