

Ethnic Attitudes towards Snail-meat Intake during Pregnancy and Other Correlates of Snail-Meat Consumption among Pregnant Women Attending Antenatal Clinics in Ibadan, Nigeria

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ABSTRACT

Background: Snail-meat is probably the greatest subject of food prohibitions in several African climes and beyond. These prohibitions fuel deficiencies of micronutrients which contributes significantly to maternal morbidity and mortality. Yet, motivations of consuming prohibited foods such as snail-meat are seemingly non-existent.

Objective: This study was designed to examine ethnic attitudes towards snail-meat intake during pregnancy and other correlates of snail-meat consumption among pregnant women attending antenatal clinics in Ibadan, Nigeria.

Method:

Using cross-sectional design, four-hundred copies of a structured questionnaire were administered to randomly selected respondents. Multi-item measures were used to assess variables. Data were analysed using One-way ANOVA and Spearman rank correlation-coefficient.

Results: Univariate analysis shows that 62.3% of respondents have consumed snail-meat since they became pregnant. Age, marital status, religion and ethnicity have no significant effects on snail-meat consumption ($p > 0.05$) but education did ($p < 0.05$). Health motivation, convenience, sensory appeal, ethnic attitudes and willingness-to-consume are significantly and positively related to snail-meat consumption but price is significantly and inversely related to same ($p < 0.05$). Food insecurity and financial capacity maintained insignificant relationship with this consumption ($p > 0.05$).

Conclusion: Having decreased education is predisposing towards increased snail-meat consumption. Perceived importance of health benefits accruable from snail-meat consumption, perceived ease at which snail-meat could be accessed/prepared, snail-meat's attraction to the senses, cost, ethnic group's disposition towards the consumption of snail-meat during pregnancy and stimulus to consume snail-meat during pregnancy are significant social phenomenon maneuvering snail-meat intake among pregnant women in the study area.

Keywords: Snail, consumption, ethnic group, health motivation, convenience

Introduction

Food taboos are unwritten strong social prohibitions against certain foods. It is most probable that various forms of food taboos are created and respected in virtually all religions and human societies. There are infinitely diverse

justifications for prohibiting foods including "not wanting to look like a food item, special place of food item in myth or history, food item perceived as dirty, predatory, humanlike etc." (1). Some of the prohibitive rules may be specific about

“phases of the human life cycle and may be associated with special events such as menstrual period, pregnancy, childbirth, lactation, etc.” (1). It is apparent that the complexity of justifications for the existence of food taboos has attracted complex models of making sense of same.

One of the most perceptible theories of food taboos is the ecological approach which presupposes that taboos conserves prohibited foods (2). Meyer-Rochow (1) also advanced the functionalist approach to food taboos which underscores that there is inherent wisdom in the origins of food taboos. The logic could be resource conservation, health maintenance/optimization and all are functional in context. Apart from the protectiveness of food taboos, they also enhance group cohesiveness as they are elements of group identity. Moreover, they serve class interests by reserving certain foods for more powerful sub-populations such as men as opposed to women (3). Indeed, food taboo is a phenomenon of immense social significance, while it has scientific connotations and implications.

A notable subject of food taboos in several African cultures and beyond is snail-meat consumption. In many African climes including Nigerian ethnic groups such as the Yoruba, Igbo, Hausa, Ishan, Isoko, the consumption of snail-meat among pregnant women is culturally abhorred. The slow and saliva-producing nature of snails makes it open to being detested for consumption by especially women embedded with a new human being. Such detestation is understandable in African settings where the birth of children, especially healthy ones, is celebrated with absolute exhilaration. Ekwochi *et al.* (4) examined food avoidance based on taboos among mothers in a southeastern Nigerian community and reported that snail-meat was the most avoided food during pregnancy. Yet, snail-meat has been reported to be excellent source of protein. Imevbore and Ademosun (5) as well as Engmann *et al.* (6) reported that the edible part of snail-meat contains 88.37% and 82.96% protein respectively. Other scholars including Babalola and Akinsoyinu (7); Uboh, Ebong and Mbi (8) as well as Adeola *et al.* (9) have reported that snail-meat contains calcium, magnesium, zinc, iron, and it is very low in fat. Indeed, the consumption of snail-meat among pregnant women in a

resource-poor country like Nigeria cannot be overemphasized. In addition to sub-optimal antenatal care, sub-optimal nutrition during pregnancy is a major factor leading to poor obstetric outcomes (10). These outcomes including low birth weight (LBW), anaemia, rickets, and worst of all, maternal and neonatal mortality, are most prevalent in Sub-Saharan Africa (11). The focal nutritional challenges confronting resource-poor women include deficiencies of micronutrients, such as iron, folate, calcium, vitamin D and vitamin A (11), for which optimum consumption of snail-meat can ameliorate. Iron deficiency alone is a central challenge of maternal and infant morbidity especially in developing countries. In Nigeria, iron deficiency has been reported to range from 44–64% among pregnant women (12, 13, 14). Protein of plant rather than of animal origin is more generally consumed, and this results in low intake of dietary iron (15, 16). Yet, there is increased need for iron and other micronutrients for optimum body functioning during pregnancy.

Certainly, the factors undermining maternal health during pregnancy and subsequent pregnancy outcomes are deeply rooted in the substructure as well as the superstructure of the society. Poverty which predominantly affects women, women empowerment and poor female education are very relevant factors affecting maternal health and pregnancy outcomes. Moreover, cultural factors that manifests in the form of food prohibitions is considerably problematic for maternal health. While there are several studies reporting various foods prohibited and consumption of same among pregnant women in Nigerian context (17, 18, 19, 21, and 22), studies focusing on these foods to underscore the multidimensional factors affecting their consumption among pregnant women is seemingly non-existent. Therefore, this study was designed to examine ethnic attitudes towards snail-meat intake during pregnancy and other correlates of snail-meat consumption among pregnant women attending antenatal clinics in Ibadan, Nigeria.

Methods

Design/ Study Population /Target Population

The design of this work was cross-sectional survey using the people of Ibadan as the population of study while pregnant women attending antenatal

clinics were specifically targeted. Ibadan is the capital city of Oyo state, which is one of the six states of southwestern Nigeria, the motherland of the Yorùbá people. However, several ethnic nationalities reside in the state. Oyo state has 33 Local Government Areas (LGAs) of which 5 make up the Ibadan metropolis. These are Ibadan North, Ibadan North-East, Ibadan North-West, Ibadan South-East and Ibadan South-West LGAs.

Sampling procedure

According to the National Population Commission (23), the total number of women in the five Local Government Areas that make up the Ibadan metropolis was 676,592. Pregnant women attending antenatal clinics were assumed to be 50% of this figure. The total population (N) figure for this study was therefore 338, 296. With the use of sample size calculator, the required sample size (using a confidence level of 95% and a confidence interval of 4.9) is 400. Hence, 400 copies of the questionnaire were administered among randomly selected respondents

Information obtained from the website of Oyo State Hospitals Management Board (<https://oyostate.gov.ng/hospital-management-board/#1496766324011-9a9b63ef-a38a>) indicates that there are fifteen State hospitals in Ibadan metropolis. These hospitals were designated as sampling units. Eight of these were randomly selected and approached. Lists of registered pregnant women were used as sampling frames from where 50 respondents were systematically drawn. Prospective respondents were reached on antenatal days and their informed consent to participate was sought.

Instrument of data collection

Data collection was conducted using structured questionnaire. This was translated into Yorùbá language to enable prospective respondents with limited literacy participate in the study. Hence, the instrument was administered via structured interview among this category of respondents while it was self-administered among highly literate respondents. Respondents were highly respected. Basic details of the study were explained to participants and their anonymity was guaranteed before their acceptance to participate in the study. Respondents were requested to append their signature on the introductory part of the questionnaire, as a way of documenting their

informed consent. Data collection took place between August and October 2019. Response rate was 100%.

Variables of Study and their Measurements

Snail-meat consumption

This was defined as the level of respondent's snail-meat intake. This intake was assessed with a four-item author-constructed index which questioned history of snail-meat consumption during pregnancy (see table 2 for items in this index). Respondents were to be affirmative or otherwise and these were scored 1 and 0 respectively, making possible total score to range from 0 to 4. The internally consistency of this index as assessed with Cronbach alpha was 0.717.

Health motivation in snail-meat consumption

This is respondents' evaluation of perceived importance of health benefits of snail-meat consumption. It was assessed with a six-item author-adapted version of the six-item sub-scale of the motives underlying food choice questionnaire (24). Examples of items in the scale are: "it is important I consume snail-meat because— snail meat contains a lot of vitamins and minerals; snail meat is good for my skin/teeth/hair/nails etc." Responses included "strongly agree, agree, disagree and strongly agree" and were scored 1 to 4. Total score could range from 6 to 24, with greater score implying greater health motivation to consume snail-meat. The Cronbach's alpha (0.786) indicate that these items were internally consistent.

Convenience of snail-meat consumption

This was defined as the perceived ease at which snail-meat could be accessed and prepared. It was assessed with a four-item author-adapted version of the five-item convenience sub-scale of the motives underlying food choice questionnaire (24). Examples of items in the scale are: "it is important I consume snail-meat because— snail-meat can be bought in shops close to where I live or work; snail-meat can be cooked very simply". Responses to the items were "strongly agree, agree, disagree and strongly agree" and were scored 1 to 4. Total score ranged from 4 to 16, with higher score indicating stronger convenience of snail-meat consumption. Cronbach alpha was 0.715.

Sensory appeal of snail-meat

This is respondents' evaluation of snail-meat's attraction to their senses. It was measured using a four-item author-adapted version of the four-item sensory appeal sub-scale of the motives underlying food choice questionnaire (24). Examples of items in the scale are: "it is important I consume snail-meat because— snail-meat has a pleasant texture; snail-meat smells nice". Respondent's options of responding were "strongly agree, agree, disagree and strongly agree". These were scored 1 to 4 with higher score indicating stronger sensory appeal. Total score ranged from 4 to 16. Cronbach alpha was 0.724.

Price of snail-meat

This is perceived cost in the choice of consuming snail-meat. Price was assessed with a three-item author-adapted version of the three-item price sub-scale of the motives underlying food choice questionnaire (24). Some of the items in the scale are: "it is important I consume snail-meat because— snail-meat is cheap; snail-meat is good value for money". Respondents could respond by selecting "strongly agree", "agree", "disagree" and "strongly disagree". These were scored 1 to 4 with higher score indicating stronger perceived cost. Total score ranged from 3 to 12. Cronbach alpha was 0.786.

Ethnic attitudes towards snail-meat intake during pregnancy

This is respondent's appraisal of their ethnic group's disposition towards the consumption of snail-meat during pregnancy. The variable was measured with a four-item author-constructed scale assessing how respondent's ethnic group responds to snail-meat consumption during pregnancy. Items in the scale included "it is important for pregnant women to consume snail-meat among people of my ethnicity"; "it is a taboo to consume snail during pregnancy among the people of my ethnic group". Response categories ranged from "strongly agree" to "strongly disagree". These were scored 1 to 4 with higher score meaning more favourable attitude of respondent's ethnic group towards snail-meat consumption during pregnancy. Possible score ranged from 4 to 16. Cronbach alpha was 0.652.

Willingness to consume snail meat during pregnancy

This willingness was defined as respondent's stimulus to consume snail-meat during pregnancy. It was assessed with a four-item author-constructed scale assessing the extent to which respondents have no reason not to consume snail-meat during pregnancy. Examples of items in the scale are "I look forward to eating snail-meat even in my current pregnant state"; "eating snail-meat will fit well into my existing pregnant-state diet". Responses included "strongly agree", "agree", "disagree" and "strongly disagree", and were scored 1 to 4. Higher score implied stronger willingness to consume snail-meat consumption during pregnancy. Possible score ranged from 4 to 16. The internally consistency of this scale as assessed with Cronbach alpha was 0.864.

Food insecurity

Food insecurity was defined as insufficiency of foods owing absolutely to limited financial capability. Food insecurity was assessed with author-adapted version of the 4-item women's hunger sub-scale (25). One item that produced negative item-total correlation was deleted, making the Cronbach's alpha value to increase from 0.352 to 0.748. An item in the scale is "do you eat less than you think you should because you don't have enough money for food?" Responses included 'never, sometimes and always' and were scored 0-2. Respondents' total score could range from 0 to 6.

Financial capacity

Financial capacity was defined as respondent's description of their current monetary wherewithal. It was assessed with a single item requiring respondents to select a phrase that best described their current financial capacity. Responses included "not enough, incurring debt; not enough, without debt; enough, without savings; enough, with little savings and enough, with lots of savings". These were scored 1 to 5, with increasing score implying higher financial capacity.

Socio-demographic variables

Age, marital status, religion and ethnicity were assessed nominally. Information on number of biological children that respondents already have

was assessed with an open-ended question. Information on respondent's highest education qualification was also collected nominally but respondents were categorized into four as respondents having no formal education; low education (having primary and school certificate); medium education (having post-secondary education and first degree) and high education (having postgraduate degree).

Study hypotheses

The general null hypotheses tested are as follows:

Ho¹: There is no significant difference in the mean score of snail-meat consumption across sub-groups of age, marital status, education, religion and ethnicity.

Ho²: There is no significant relationship between pairs of snail-meat consumption, health motivation in snail-meat consumption, convenience of snail-meat consumption, sensory appeal of snail-meat, price of snail-meat, ethnic attitudes towards snail-meat intake during pregnancy, willingness to consume snail meat during pregnancy, food security, and financial capacity.

Data analyses

Distributions of data were assessed using frequency counts and percentages. Kolmogorov Smirnov test (for normalcy) indicated that all interval-level data did not deviate significantly from normal distributions ($p > 0.05$). Homogeneity of variance across sub-groups of demographic variables was tested using Levene's test. One-way analysis of variance (ANOVA) was used to assess significant differences in means across sub-groups of age, marital status, education, religion and ethnicity. Test for linearity was conducted to examine appropriateness of using R and R^2 , which were used as measures of effect size. Post hoc test (LSD) was used to identify homogenous sub groups. Spearman rank correlation coefficient was used to assess relationship between pairs of interval-level variables. All data analyses were accomplished using Statistical Package for Social Sciences (version 22).

Study limitations

Pregnant women attending antenatal clinics were targeted but there is poor use of antenatal services in Nigeria generally. Hence, the results are hardly generalizable to the larger population

of pregnant women in Ibadan, southwestern Nigeria.

Results and Discussions

Table 1 shows that majority (60.3%) of respondents aged between 26 and 35. This was followed by the 16-25 sub-group who constituted 20.8% of respondents. Those aged above 35 were 10.8% while a noticeable proportion of respondents (8.3%) refused to disclose their age. An overwhelming majority of respondents (95.3%) were married. The proportion of respondents who were single (2.3%), divorced (1.8%) and widowed (0.8%) is rather marginal. Respondents having low (42.8%) and/or medium education (47.3%) were predominant. A noticeable proportion of respondents (6.3%) did not disclose their educational qualification. Christians were predominant (55.0%) but the proportion of Muslims (43.5%) was close to Christian's. Most respondents were Yorùbá (88.0%) but Igbo women (8.7%) were notably represented in the study. Apart from these two, five other ethnic groups were also represented in the study. Most respondents (28.8%) already had a child but this was closely followed by respondents who had not had any child before (27.0%). About a fifth (21.0%) of respondents had two children, 11.8% had three and 4.5% had four children. Two respondents had five children. This distribution reflects the typical high population growth of sub-Saharan Africa. The distribution of socio-demographic profile of respondents is presented on table 1.

Snail-meat consumption among respondents

The mean score \pm standard deviation of snail-meat consumption is 1.76 ± 1.40 (min.= 0, max.= 4). This mean is fair but it is less than the mid score when scores are arranged from the minimum to the maximum score. This is still understandable considering that snail-meat is just an option out of a range of animal products that respondents could choose from. The standard deviation shows that respondents' score was very diverse. Percentile analysis of items in the index of snail-meat consumption shows that 62.3% of respondents have consumed snail-meat since they became pregnant. This percentage reduced to 43.0 and 19.5 when respondents were asked if they consumed snail-meat in the last one month and in the last one week. About

Table 1: Socio-demographic Profile of respondents

Socio-demographic characteristic		Frequency	Percentage
Age*	16-25	83	20.8
	26-35	241	60.3
	36-45	43	10.8
	46-above	0	0
	Missing	33	8.3
Marital Status	Single	9	2.3
	Married	381	95.3
	Divorced	7	1.8
	Widowed	3	0.8
Education	No Formal Education	10	2.5
	Low Education	171	42.8
	Medium Education	189	47.3
	High Education	5	1.3
	Missing	25	6.3
Religion	Islam	174	43.5
	Christianity	220	55.0
	Traditional	4	1.0
	Missing	2	0.5
Ethnicity	Yorùbá	352	88.0
	Igbo	35	8.7
	Hausa	4	1.0
	Others**	9	2.3
Number of Biological Children	0	108	27.0
	1	115	28.8
	2	84	21.0
	3	47	11.8
	4	18	4.5
	5	2	.5
Missing	26	6.5	

* The mean age was 29.4 (minimum = 19, maximum = 42), standard deviation = 5.07.

**Esan, Urhobo, Edo, Efik.

half of respondents (45.3%) consider themselves to be good consumers of snail-meat during pregnancy. These distributions are consistent with previous findings. Ademuyiwa and Sanni (22) studied consumption pattern and dietary practices of pregnant women in Ogun State, southwestern Nigeria and reported that 42% of their respondents consumed snail-meat occasionally while 32% never consumed it. Eze and Okeke (19) also understudied the

consumption patterns of iron and vitamin A rich foods among pregnant women in Enugu State, Nigeria and reported that snail-meat was never consumed by 49.5% of their respondents. Similarly, Ekwochi *et al.* (4) examined food avoidance based on taboos among women who had carried at least one pregnancy to term in Enugu, southeastern Nigeria. They found that only 37% of their respondents avoided some foods in pregnancy

due to food taboos. These distributions have generally impressed the idea that prohibitions against snail-meat consumption during pregnancy has partially waned in the study area and other areas. Otherwise, pregnant women are no longer taking such prohibitions into serious consideration. However, there is still large room for improvement in consumption rather than avoidance of certain foods such as snail-meat. The item analyses of items in the index of snail-meat consumption are presented on table 2.

also consistent with a finding obtained from a partially-relevant study of Oluleke *et al.* (27), who examined avoidance of foods due to cultural taboos among pregnant women attending primary health care centers in Ile-Ife, southwestern Nigeria. Oluleke *et al.* (27) found that respondent's age was not a significant factor associated with such avoidance. In addition, the finding of Ekwochi *et al.* (4) is also relevant here. Ekwochi *et al.* (4) similarly examined food avoidance based on taboos among women who had carried at least one pregnancy to term in Enugu, southeastern Nigeria. The result of their

Table 2: Percentile analysis of items in the index of snail-meat consumption*

s/no	Items	YES (%)	NO (%)	No response (%)
1	Have you consumed snail meat since you became pregnant?	62.3	31.5	6.3
2	Have you consumed snail meat in the last one month?	43.0	52.8	4.3
3	Have you consumed snail meat in the last one week?	19.5	76.8	3.8
4	Do you consider yourself a good consumer of snail during pregnancy?	45.3	49.8	5.0

*The mean \pm SD of snail consumption = 1.76 ± 1.40 , minimum = 0, maximum = 4, standard deviation = 1.40

Effects of socio-demographic characteristics on snail consumption

Age and snail-meat consumption

Ho: There is no significant difference in the mean score of snail-meat consumption across sub-groups of age.

Snail-meat consumption was highest among respondents aged between 26-35 (mean= 1.80). This was closely followed by the 16-25 and 36.45 age sub-groups whose mean scores were 1.76 and 1.73 respectively. The result of ANOVA indicates that there is no significant differences in these mean scores ($p > 0.05$). Hence, Ho is accepted. Age has no significant effect on snail-meat consumption among respondents in the study area. This finding is similar to the findings of Adejo, Mohammed and Aliu (26) who examined preference for snails compared to other meats in Kogi State, mid-central Nigeria and found this to be insignificantly related to age. Current finding is

binary logistic regression shows that age (≤ 30 years vs. > 30 years) was an insignificant predictor of this avoidance. Indeed, age is not a socio-demographic factor to reckon with in matters of food avoidance or snail-meat consumption among pregnant women.

Marital status and snail-meat consumption

Ho: There is no significant difference in the mean score of snail-meat consumption across sub-groups of marital status.

Consumption of snail-meat was highest among married respondents (mean= 1.81) while it was higher among singles (mean= 1.50). The mean consumption score among widowed respondents was 1.0 while it was nil among divorced respondents (mean= 0). The result of ANOVA indicates that there are significant differences in these mean scores ($p < 0.05$). However, the result of Levene's test threatens the validity of this significance ($p < 0.05$), because it did not indicate

homogeneity of variance across sub-groups of marital status. Hence, it cannot be concluded that marital status significantly affects snail-meat consumption among respondents. Therefore, H_0 is accepted. This result is similar to the result obtained in a somewhat-relevant study cited earlier. Marital status was found to be insignificantly associated with avoidance of foods due to cultural taboos (27). It was also found to be insignificantly related to preference for snails compared to other meats in Kogi State, mid-central Nigeria (27). Marital status is another socio-demographic variable that is not significantly relevant in snail-meat consumption.

Education and snail-meat consumption

H_0 : There is no significant difference in the mean score of snail-meat consumption across sub-groups of education.

Respondents with no formal education consumed snail-meat the most (mean = 2.12) and this was followed by those with low education (mean = 2.02). Snail-meat consumption was lower among respondents with medium education (mean = 1.61) and lowest among those with high education (mean = 0.66). These descriptive statistics are very instructive. They indicate increasing snail-meat consumption with decreasing education. The result of ANOVA indicates that there are significant differences in these mean scores ($p < 0.05$), and the result of Levene's test upholds the validity of this significance ($p > 0.05$). Hence, H_0 is rejected. Education has effect on snail-meat consumption among respondents. Result of post-hoc test indicates that the respondents with no formal education and low education are significantly different from those with medium and high education ($p < 0.05$). Therefore, decreased education has significant effect on increased snail-meat consumption.

Similar result was reported by Oluleke *et al.* (27) in their study examining avoidance of foods due to cultural taboos among pregnant women attending primary health care centers in Ile-Ife, southwestern Nigeria. Although the study of Oluleke *et al.* (27) is not directly relevant to snail-meat consumption, they reported that respondent's education was a significant factor associated with avoidance of foods owing to cultural taboos. In addition, Ibrahim *et al.* (28)

reported that education significantly and negatively predicted fish consumption among Nigerian adults. Indeed, current findings are interesting considering that one would expect increasing education to reduce snail-meat consumption among pregnant women. Perhaps, social circumstances of respondents with lower education are more predisposing to snail-meat access in the study area. This intuition prompted a mini-analysis of an item that was used in the assessment of convenience of snail-meat consumption. This item was about how snail-meat could be bought in shops close to where respondents lived or worked. Respondents who agreed and strongly agreed with this statement were 160 (40%) and 61 (15.25%) respectively. Out of those who agreed, 70.7%, 25.2%, 4.1% and 0% had no formal education, low, medium and high education respectively. In a similar fashion, 75.0% and 25.0% respondents who strongly agreed with the statement in question had no formal and low education respectively. None of the respondents who had medium or high education strongly agreed that snail-meat could be bought in shops close to where they lived or worked. The notion that social circumstances of women with lower education could be more predisposing to snail-meat access is certainly an interesting focus for further study.

However, the result of the binary logistic regression by Ekwochi *et al.* (4) shows that educational attainment (university/equivalent vs. non-university degree/equivalent) was an insignificant predictor of food avoidance based on taboos among mothers in Enugu, southeastern Nigeria. This is probably an effect of measurement differentials between Ekwochi *et al.* (4) and the current study. The effect of education on snail-meat consumption is linear ($p < 0.05$). The extent of this effect as assessed with R is -.233, R^2 is .054. Hence, 5.4% of the variation in snail-meat consumption is accounted by education.

Religion and snail-meat consumption

H_0 : There is no significant difference in the mean score of snail-meat consumption across sub-groups of religion.

Muslim respondent's snail-meat consumption was highest (mean = 1.89) and Christian's was higher (mean = 1.70). This consumption was nil

among practitioners of traditional religion. There were no significant differences in these mean scores ($p > 0.05$). Hence, H_0 is accepted. Religion had no significant effect on snail-meat consumption among respondents in the study area. Oluleke *et al.* (27) earlier cited, also found that religion was not significantly associated with food avoidance among a cohort of pregnant women receiving antenatal services in southwestern Nigeria.

Ethnicity and snail-meat consumption

H_0 : There is no significant difference in the mean score of snail-meat consumption across sub-groups of ethnicity.

Snail-meat consumption was highest among Hausa respondents (mean = 2.00); higher among Igbo respondents (mean = 1.96) but lowest among Yoruba respondents (mean = 1.80). There were no significant differences in these mean scores ($p > 0.05$). Hence, H_0 is accepted. Ethnicity had no significant effect on

snail-meat consumption among respondents in the study area. This is another interesting finding indicating significant similarity in the response of Nigerian ethnic groups towards snail-meat consumption during pregnancy. The summary of results obtained in the assessment of effects of socio-demographic characteristics on snail consumption is presented on table 3.

Relationship between snail-meat consumption and other variables

Health motivation in snail-meat consumption and snail-meat consumption

H_0 : There is no significant relationship between health motivation in snail-meat consumption and snail-meat consumption

The Spearman rank correlation coefficient (r) on table 4 shows that health motivation in snail-meat consumption is significantly, positively and fairly related to snail-meat consumption ($r = .231, p < 0.05$). Hence, H_0 is rejected. Therefore,

Table 3: Effects of age, marital status, education, religion and ethnicity on snail consumption

Socio-demographic variable	Sub-groups	Mean	Levene's test for homogeneity of variances		ANOVA		Test for linearity		R	R ²
			Levene's statistic	p value	F statistic	p value	F statistic	p value		
Age (in years)	16-25	1.76	0.996	.370	.064	.938	-	-	-	-
	26-35	1.80								
	36-45	1.73								
Marital status	Single	1.50	13.21	.000	4.19	.006	-	-	-	-
	Married	1.81								
	Divorced	0.00								
	Widowed	1.00								
Education	No formal education	2.12	3.15	.051	2.30	.000	19.92	.000	-.233	.054
	Low	2.02								
	Medium	1.61								
	High	0.66								
Religion	Islam	1.89	7.05	.001	4.07	.018	-	-	-	-
	Christianity	1.70								
	Traditional	.00								
Ethnicity*	Yoruba	1.80	1.791	.169	.164	.986	-	-	-	-
	Igbo	1.96								
	Hausa	2.00								

*The "others" sub-category was excluded from this analysis.

the stronger the perceived importance of health benefits accruable from snail-meat consumption, the more the snail-consumption among pregnant women attending antenatal clinics in Ibadan. This showcases the significance of health motivation in consumption patterns. Naughton, McCarthy and McCarthy (29) also found that health motivation was significantly and positively related to healthy eating among Irish adults.

Convenience of snail-meat consumption and snail-meat consumption

Ho: There is no significant relationship between convenience of snail-meat consumption and snail-meat consumption

Table 4 also indicates that convenience of snail-meat consumption is significantly, positively and fairly related ($r = .183, p < 0.05$) to snail-meat consumption. Hence, Ho is rejected. The perceived ease at which snail-meat could be accessed and prepared is a significant factor influencing snail-meat intake among pregnant women. The greater the ease, the more the consumption. Convenience is a central phenomenon in food consumption and food business in modern world (30). Marquis (31) found convenience to be the most important food motivation among a group of Canadian students. Ibrahim *et al.* (28) also found convenience to be significantly and positively related to fish consumption in Ibadan, southwestern Nigeria.

Sensory appeal of snail-meat and snail-meat consumption

Ho: There is no significant relationship between sensory appeal of snail-meat and snail-meat consumption

Sensory appeal of snail-meat is another significant, positive and fair correlate of snail-meat consumption ($r = .198, p < 0.05$). Hence, Ho is rejected. Respondents' evaluation of snail-meat's attraction to their senses is a significant influencer of snail-meat intake. The more the attraction, the more the consumption. Similar findings in an American sample indicates that taste was a most important determinant of food choice (31). In addition, Krešić, Herceg and Lelas (33) found that sensory appeal was the most vital motivation for the selection of dairy beverages in a Croatian sample.

Price of snail-meat and snail-meat consumption

Ho: There is no significant relationship between price of snail-meat and snail-meat consumption

The Spearman rank correlation coefficient (r) on table 4 shows that price of snail-meat is significantly, inversely and fairly related to snail-meat consumption ($r = -.177, p < 0.05$). Hence, Ho is rejected. Therefore, the higher the price, the lesser the snail-consumption among pregnant women attending antenatal clinics in Ibadan. This reflects the significance of price in snail-meat intake. Cost has been reported as a significant influencer of food choice in an American sample (32) and among a group of Canadian students (31). Price/cost negatively predicted fish consumption among residents of Ibadan, southwestern Nigeria (28). In accordance with the dictates of classical economics, snail-meat consumption responded significantly and negatively to price among pregnant women. This underscores the importance of widespread production of snails to increase supply and subsequently lead to price reduction to induce intake in this population.

Ethnic attitudes towards snail-meat intake during pregnancy and snail-meat consumption

Ho: There is no significant relationship between ethnic attitudes towards snail-meat intake during pregnancy and snail-meat consumption

Table 4 also indicates that ethnic attitudes towards snail-meat intake during pregnancy is significantly, positively and fairly-strongly related ($r = .331, p < 0.05$) to snail-meat consumption. Hence, Ho is rejected. It is instructive that ethnic group's disposition towards the consumption of snail-meat during pregnancy is found to be a significant factor influencing snail-meat intake among pregnant women. The more favourable this attitude is, the more the snail-meat consumption.

This finding is rather counter-expected, considering scholarly concerns over the effect of traditional food taboos on pregnant women's consumption of snail-meat in particular, and certain foods in general. Univariate findings in this current study has also shown that 62.3% of respondents have consumed snail-meat since

they became pregnant. In addition, Maduforo (20) examined the influence of food taboos on the feeding practices of pregnant women in Imo, southeastern Nigeria and reported that only 15% of respondents adhered to these taboos. Similarly, Maduforo and Nwosu (21) similarly researched into food superstition and feeding practices of pregnant women receiving antenatal services in a tertiary health institution in Ituku/Ozalla, southeastern Nigeria. They reported that superstitions were held on certain foods including snails. About 29% of their respondents acknowledged these superstitions while just 19% of same still respect such superstitions in making food choices. The problem of food taboos especially as it concerns pregnant women certainly exists but ethnic attitudes towards snail-consumption during pregnancy in particular appears not to be a huge public health problem any longer. Ibrahim *et al.* (28) also reported that ethnic valuedid not predict fish consumption in Ibadan, southwestern Nigeria ($p > 0.05$). There is a good indication that ethnic orientation on food motivation/choice is attenuating in contemporary times.

Willingness to consume snail meat during pregnancy and snail-meat consumption

Ho: There is no significant relationship between willingness to consume snail meat during pregnancy and snail-meat consumption

Willingness to consume snail meat during pregnancy is another significant, positive and fairly-strong correlate of snail-meat consumption ($r = .360$, $p < 0.05$). Hence, Ho is rejected. Respondents' stimulus to consume snail-meat during pregnancy is a significant influencer of snail-meat intake. The more the stimulus, the more the consumption. This finding is in support of Roos's (34) empirically-deduced position affirming the greater significance of 'willingness-to-consume model' which is subjective, as opposed to an objective 'ability-to-consume model'.

Food security and snail-meat consumption

Ho: There is no significant relationship between food security and snail-meat consumption

Food security was found to be insignificantly related to snail-meat consumption ($r = .098$, $p > 0.05$). Hence, Ho is accepted. So, food insufficiency due to limitedness of financial capability is not a significant factor influencing

the consumption of snail-meat among pregnant women. The consumption of snail-meat is independent of food security status. So, it is not necessarily because pregnant women have sufficient foods that makes them consume snail-meat. This is very instructive, and it indicates the relevance of readiness to consume snail-meat as opposed to ability to pay for snail-meat among pregnant women.

Financial capacity and snail-meat consumption

Ho: There is no significant relationship between financial capacity and snail-meat consumption

Financial capacity was also found not be significantly correlated with snail-meat consumption ($r = .044$, $p > 0.05$). Hence, Ho is accepted. This is another very instructive finding. Respondent's monetary wherewithal is not a significant factor prompting the consumption of snail-meat among pregnant women. This is consonant with the finding of Adejo, Mohammed and Aliu (26), who examined preference for snails to other meats in Kogi State, mid-central Nigeria and reported this preference to be insignificantly related to income. This finding similarly pervades the notion that readiness to consume snail-meat is more important than ability to pay for snail-meat among pregnant women. The summary of results obtained in the analysis of the relationship between snail-meat consumption and other variables is presented on table 4.

Conclusions

The mean snail-meat consumption and percentile distributions of items assessing snail-meat consumption demonstrate that prohibitions against snail-meat consumption during pregnancy has become partially waned among pregnant women in the study area. It appears that many pregnant women are no longer taking such prohibitions into serious consideration. Still, there is considerable vacuum in the consumption of snail-meat among pregnant women in the study area.

Age, marital status, religion and ethnicity have no significant effects on snail-meat consumption, making these socio-demographic variables to be irrelevant in matters of snail-meat consumption among pregnant women in the study area. However, education, specifically, decreased education has significant effect on increased snail-meat consumption. This indicates that

Table 4: Relationship between snail-meat consumption and other variables

Snail consumption			Snail consumption		
Snail consumption	Spearman's r	1	Snail consumption	Spearman's r	1
	p value	.000		p value	.000
Health Motivation in Snail-Meat Consumption	Spearman's r	.231*	Ethnic Attitudes Towards Snail-meat Intake During Pregnancy		.331*
	p value	.001			.000
Convenience of Snail-Meat Consumption	Spearman's r	.183*	Willingness to Consume Snail Meat During Pregnancy	Spearman's r	.360*
	p value	.004		p value	.000
Sensory Appeal of Snail-Meat	Spearman's r	.198*	Food Security	Spearman's r	.098
	p value	.002		p value	.122
Price of Snail-Meat	Spearman's r	-.177*	Financial Capacity	Spearman's r	.044
	p value	.005		p value	.510

*Significant correlations

perhaps, social life and circumstances of pregnant women with lower education are more favourable to snail-meat access and consumption in the study area. This is suggested for further study.

The stronger the health motivation in snail-meat consumption, the more the convenience of snail-meat consumption, the more the sensory appeal, the lesser the price, the more favourable the ethnic attitudes towards snail-meat intake during pregnancy, the stronger the willingness to consume snail meat during pregnancy, the more the snail-meat consumption among pregnant women attending antenatal clinics in Ibadan. However, food insecurity and financial capacity are not relevance variables in the consumption of snail-meat among pregnant women.

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