

Acceptability and Constraint of Snail Meat as Source of Animal Protein among Inhabitants of Lafia Metropolis, Nassarawa State Nigeria

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Abstract – This study examined the acceptability of snail as source of protein among inhabitants of Lafia metropolis of Nasarawa state, Nigeria. One hundred and twenty questionnaire were administer to the respondents and the data was analyze through descriptive statistics. The socio demographic characteristics of respondent's shows that males had the highest percentage (74.2%) while 25.8% were female and age group 28-37 recorded the highest (40.8%). Majority (54.2%) of the respondents are unmarried while 45.8% are married with majority of them having an tertiary qualification The major occupation of the respondents shows that majority (32.5%) are civil servants, followed by 26.7% which are students and the least are hunter with 4.2%. Majority (55.8%) of the respondents are Muslim while 44.2% were Christian. The finding revealed that majority of the respondents are willing to buy and eat snail meat with mean value 3.99. The constraints associated with consumption of Snail meats showed that cost (Price) of snail meat scores the highest mean value of 4.12 and I do not eat Snails because my people do not eat it is the least with a mean value of 3.98. The Preference of Snails meat compared to meat from other animal sources revealed that beef recorded the highest (1.63 mean value), followed by Fish with mean value of 1.57 and Snail meat is the least with mean value of 1.26. This study recommend that awareness creation on the nutritional benefits of Snail meat consumption is necessary to enlist more consumer.

Keywords – Acceptability, Constraint, Snail, Protein, Meat

I. INTRODUCTION

Snails are bilaterally symmetrical invertebrates with soft segmented exoskeleton in the form of calcareous shells. They belong to the *phylum Mollusca* and *class gastropoda* that have coiled shells in the adult stage, and when the word snail is used in a general sense, it includes; sea snail, land snail and fresh water snail which belong to the group of invertebrates.

Snail is one of the earliest known types of animals in the world. There is evidence that snail evolved more than 600 million years ago (Ayodele and Asimalowo, 1999). Snail is a small soft creature with a hard shell on its back that moves very slowly and often eats garden plants. Snails are the largest groups of mollusks constituting the largest animal groups after arthropods (Cobinah, 2003). Snail is the second largest

animal kingdom comprising about one hundred thousand living species. The genera *Archachatina achatina* and *Archachatina marginata* are the edible land snails which can grow to be 15 inches (38cm) from snout to tail, and weigh 1 kilogram. The largest living species of sea snail is *Syrinx aruanus* which has a shell that can measure up to 35 inches (90cm) in length, and the whole animal with the shells can weigh up to 18 kilogram (Cobbinah *et al.*, 2008). Land snails habitat ranges from the dense tropical high forest in southern Nigeria to the fringing riparian forests of the derived guinea savanna, (Odebode, 1999; Adeniyi *et al.*, 2013). In West Africa, snails dwell mostly in humid forest areas from where there are gathered by villagers for consumption and other uses (Ademosun and Omidiji, 1999). It is a popular meat of many Nigerian in the rural areas, in the rainforest belt where it is collected from the wild. The potential for its domestication and commercialization in the country has not been fully exploited, although many studies have shown that snail farming could highly be profitable and productive business (Amusan and Omidiji, 1999). The availability of some edible types of snail in Nigeria, their population and acceptability nationwide, consumer preference for snails over meat from other animal sources, the potential for export, including the emerging technology for their production have largely contributed towards the present renewed interest in snail farming (Akinnusi, 2000). Snail meat has been consumed by humans throughout the world since prehistoric times (Cobbinah, 2003). The interest in snail farming around the world arises from snails' high quality protein and medicinal value. For instance, protein from snail meat is said to be very rich in all essential amino acids such as lysine, leucine, arginine and tryptophan (Emevbore and Ademosun, 1998). Snail meat has been found to be higher in protein content (37 – 51%) compared to that of guinea pig (20.3%), poultry (18.3%), fish (18%), cattle (17.5%), sheep (16.4%) and swine (14.5%). Iron content (45 – 59mg/kg), low in fat (0.05 – 0.08%), sodium and cholesterol level (Bayode, 2009).

In addition to the nutritional value, snail is known to have medicinal properties and usage. Eating of snail meat has a medicinal value in treating some diseases such as whooping cough, ulcer, asthma, hypertension, kidney related diseases and also used as suppressant in stroke treatment (Odebode 1999). Odebode (1999) further reported that snails meat are also used in traditional medicine in the preparation of concoctions for various cases like reduction of pains and blood loss in pregnant women during delivery in Nigeria. Snails have become an important source of income to some farmers who dwell in the forest areas; they collect the snails in the wild and selling them at premium prices along the road

side and at some rural and urban markets. Protein malnutrition is a major challenge to most developing countries especially in Africa. This has informed the need for man to explore the use of other sources in the wild in order to meet his body requirements (Ebabhamiegbho *et al.*, 2013). In Nigeria, it is now accepted that the use of mini-livestock such as snails, rodents and other small livestock in the wild can substantially improve the living conditions of people in urban and rural areas by acting as a valuable source of protein supplement to diet as well as generating additional income (Ezeama *et al.*, 2007). Studies have shown a relative good acceptability of snail consumption and snail production in the southern parts of the country but little or no information in this regard in the northern part of Nigeria and Nassarawa metropolis in particular. Therefore, Information obtained from this study will create the awareness towards increased production and marketing of snails, for farmers to establish profitable innovative and sustainable activities thus increasing their economic power while at the same time conserving biodiversity. The study will also provide information on the level of acceptability of snail consumption in the study area.

II. METHODOLOGY

A. Study Area Description

This study was conducted in Lafia metropolis of Nasarawa State. Lafia is located between 8°-9° East of the Greenwich meridian and latitude 8° -9° North of the equator. In terms of vegetation, the area lies largely within the guinea savannah ecological zone. It's raining season starts from March/May to October (Lafia municipal council information unit, 2018). The study area has an annual average rainfall of about 1,288 mm and an average temperature of about 32°C (Nasarawa State agricultural development project, 2018). Sandy-loams and clay fine sand silt are found in Fadama areas. The major occupation of the people includes cultivation of vegetables crops like tomatoes, hot pepper, garden eggs etc. (statistical Data of National Population Commission, 2006), indicated that the study area has a total population of 478,809 people consist mainly of the following tribes: Kanuri (Barebari), Alago, Hausa, Fulani, Migili, (Koro) Eggon (Mada dutse), Gwandara etc. The area is made up of thirteen districts among which are Lafia central, Lafia east, Lafia west, Lafia North, Agyaragu, Akunza, Assakio, Shabu, and Kwandere. The council shares boundaries with the following local government area: Doma in the west, Obi in the south, Quan'pan in Plateau state in the east and finally Nasarawa Eggon in the north.

B. Method Of Data Collection

A pre-tested questionnaire was administer purposively to the respondents to elicit information. Section A of the questionnaire covered the demographic characteristics of the respondents while section B, C, D and E covered the acceptability of snail meat as source of animal protein amongst the respondents; constraint associated with consumption of snail meat; awareness of nutritional benefits of snail meat; consumer preference of consumption of snail meat.

C. Data Analysis

Data obtained was analyzed using descriptive statistics were results are expressed in tables, frequency and percentage.

III. RESULTS AND DISCUSSIONS

A. Results

The socio demographic characteristics of respondents is shown in table1, most of the respondents were males (74.2%) while 25.8% were female. Age group 28-37 recorded the highest (40.8%), followed by 18-27 years with 35.0% and the least were 48 and above with 36.7%. The highest percentage (54.2%) of the respondents are unmarried while 45.8% are married. The table revealed the level of education of the respondents in which 39.2% of the respondents are NCE/ND holders, followed by secondary certificate with 32.5% and the

least were first school leaving certificate with 12.5%. The major occupation of the respondents shows that majority (32.5%) are civil servants, followed by 26.7% which are students and the least are hunter with 4.2%. Majority (55.8%) of the respondents are Muslim while 44.2% were Christian. Table2, revealed the acceptability of Snail meat in Lafia metropolis, the high mean of 3.99 were recorded among respondents who are willing to buy and eat snail meat, followed by those who have tasted snail meat before with a mean value of 3.97 and the least are Snails are sold in Lafia metropolis with a mean value of 3.92. The constraints associated with consumption of Snail meats is presented in Table3, cost (Price) of snail meat scores the highest mean value of 4.12, followed by I do not eat Snail meat frequently because I hardly see it in my area with a mean value of 4.11 and I do not eat Snails because my people do not eat it is the least with a mean value of 3.98. Table4, present the awareness of the nutritional value of Snail meat, Snail meat are rich in good quality protein scored the highest mean value of 3.97, followed by Snail meat is rich in minerals essential for good health and Snail meat is good for treating anaemia in children and pregnant women scored a mean of 3.92 and 3.79 respectively. The Preference of Snails meat compared to meat from other animal sources is revealed in table5, in which beef recorded the highest (1.63 mean value), followed by Fish and Goat meat with mean vale of 1.57 and 1.52 respectively and Snail meat is the least with mean value of 1.26.

Table 1: Demographic Characteristic of the Respondents

Demographic	Variables	Frequency	Percentage (%)
Gender	Male	89	74.2
	Female	31	25.8
Age Group	18-27	42	35.0
	28-37	49	40.8
	38-47	21	17.5
	48 and Above	7	36.7
Marital Status	Married	55	45.8
	Unmarried	65	54.2
Level Of Education	Primary	15	12.5
	Secondary	39	32.5

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Major occupation	NCE/ND	47	39.2
	HND/Bsc	19	15.8
	Farmer	15	12.5
	Craftsman/Business	29	24.2
	Hunter	5	4.2
	Civil servant	39	32.5
Religion	Student	32	26.7
	Christianity	53	44.2
	Islam	67	55.8
Total		120	100.0

Table2: Acceptability of Snail Meat in the Study Area

Variable	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree		Mean	Remark
	f	%	f	%	F	%	F	%	F	%		
Snail are sold in Lafia metropolis	0	0	11	9.2	27	22.5	31	25.8	51	42.5	3.92	6 th
Cooked Snail meat is sold in Lafia	0	0	0	0	14	11.7	44	36.7	58	48.3	3.94	5 th
Willingness to buy and eat snail meat	0	0	0	0	8	6.7	21	17.5	91	75.8	3.99	1 st
Tasted snail meat before	0	0	0	0	13	10.8	34	28.3	73	60.8	3.97	2 nd
Snail Meat is delicious	0	0	0	0	0	0	51	42.5	69	57.5	3.96	3 rd
My family members eat Snail meat	0	0	0	0	0	0	59	49.2	61	50.8	3.95	4 th

Table3: Constraints Associated with Consumption of Snail Meat in the Study Area

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Rank
Culture of my ethnic group prohibits consumption of snail meat	F (%) 20(16.7)	F (%) 32(26.7)	F (%) 34(28.3)	F (%) 14(11.7)	F (%) 20(16.7)	3.99	10 th
My religion prohibits consumption of snail meat	12(10.0)	24(20.0)	34(28.3.0)	30(25.0)	20(16.7)	4.02	9 th
Snail meat has unpleasant taste	2(1.7)	20(16.7)	11(9.2)	49(40.8)	38(31.7)	4.04	7 th

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Snail meat has unpleasant appearance	0(0.0)	0(0.0)	21(17.5)	40(33.3)	59(49.2)	4.08	4 th
Snail meat has unpleasant flavor	0(0.0)	20(16.7)	21(17.5)	38(31.7)	41(34.2)	4.05	6 th
Snail meat is dirty	8(6.7)	22(18.3)	35(29.2)	27(22.5)	28(23.3)	4.03	8 th
Slimy secretion produced by snails is hard to get rid of before cooking	0(0.0)	0(0.0)	20(16.7)	39(32.5)	61(50.8)	4.09	3 rd
I do not eat snails because I have not done it before	0(0.0)	11(9.2)	28(23.3)	31(25.8)	50(41.7)	4.07	5 th
I do not eat snail meat frequently because I hardly see it in my area	0(0.0)	0(0.0)	11(9.1)	37(30.8)	72(60.0)	4.11	2 nd
I do not eat snail because my people do not eat it	21(17.5)	25(20.8)	48(40.0)	11(9.2)	15(12.5)	3.98	11 TH
I cannot afford price of the snail	0(0.0)	0(0.0)	0(0.0)	38(31.7)	82(68.3.0)	4.12	1 st

Table4: Awareness of Nutritional Benefits of Snail Meat

Variables	Mean±SD	Rank
Snail Meat is low in fat content and is good for those with heart problem	3.80±1.58	3 rd
Snail Meat is rich in minerals essential for good health	3.92±1.54	2 nd
Snail Meat is good for those managing diabetes	3.75±1.65	5 th
Snail Meat is good for treating anaemia in children and pregnant women	3.79±1.62	4 th
Snail Meat is rich in good quality protein	3.97±1.34	1 st

Table5: Preference of Snails Compared to Meat from Other Animal Sources

.Meat Type	Mean±SD	Rank
Snail	1.26	8 th
Fish	1.57	2 nd
Goat	1.52	3 rd
Pork	1.35	5 th
Dog	1.31	6 th
Beef	1.63	1 st
Poultry	1.48	4 th
Bush meat	1.29	7 th

B. Discussion

Driven by increasing consumer demand for nutritious, healthier, safer, and more environmentally friendly food products, the consumption of snails has increasingly assumed significant position in recent years in Nigeria. It is against this backdrop that this study examined the acceptability of snail as source of protein among inhabitants of Lafia metropolis of Nasarawa state, Nigeria. Most of the respondents were male, this is in line with the words of Ayodele and Asimalowo, (1999) and Emmanuel (2016) that men consume snails than the women folk. Because in some areas snail meat is forbidden for pregnant women. Also the highest percentage of the age group are youths, this implies that younger people consumes snails more than their elderly counterpart. This could be due to the fact that snail can be scout and freely picked from the forest without spending a dime. Age is one of the important factors which can positively or negatively affect the acceptability and consumption of snails. This affirms the findings of Cobbinah *et al.*, (2008) that the younger ones are more willing to accept and consume snails compared to their elderly folks. In terms of education, most of the respondents had one form of education or the other. Education plays a greater role in every facets of life including consumer preference as it helps the consumer to know the nutritional and health implication of what they eat. This was in agreement with the finding of Emmanuel, (2016). Akinnusi, (2014) believes that illiteracy and lack of information on nutritional composition and health benefits could make acceptability and consumption of snails relatively difficult. It was reflected that 32.5% and 24.2% of the respondents were civil servants and business man respectively, this was in accordance with Emmanuel, (2016) that occupation plays a major role in consumer preference; farmers could be disposed to scouting and picking snails from the forest in their day to day farming activities. On the other hand, traders could also consume snail significantly as it can be bought by the road side handy at cheaper rates. The constraints associated with consumption of snail meat submitted that culture and religion did not prohibit consumption of Snail meat. Rather, respondents agreed that, they had eaten Snail meat in the past and their family members also consumed Snail meat. Also respondents acknowledge that Snail meat is rich in good quality protein and minerals that are essential for growth and maintenance of good health. They also agreed that Snail meat has low fat content and is good for those with heart problems, diabetes and is required in management of anaemia. Ranking of consumer preference of the commonly available meat sources compared to Snail meat shows that majority of the

respondents preferred beef meat and fish over Snail. This result has demonstrated a low preference rating to Snail meat which can be attribute to consumer behavior that is a complex phenomenon which is subjected to many factors. It has been observed that *Archachatina marginata* is generally accepted for consumption among the people in Southern Nigeria, there is a strong cultural discrimination in the consumption of *Achatina achatina* by some tribes in some Southern Nigeria (Malik *et al.*, 2011). This findings in this research also corroborates Malik *et al.*, (2011) who observed poor rating of Snail meat in the sensory evaluation among residents of Minna in the North-Central Nigeria, compared to chicken, beef and rabbit meat. It is confounding how in spite of the awareness of nutritional benefits of consuming Snail meat and the absence of cultural and religious restrictions on its consumption among the majority of inhabitants of Lafia metropolis. The poor preference can also be due to the high cost of Snail meat and the scarcity/unavailability of Snail Market in the study area.

IV. CONCLUSION

The low animal intake in Nigeria has remained a major nutritional problem especially for the low income and nonwage earners. The outcome of the research shows that that residents of Lafia metropolis generally have accepted Snail meat. This is because snail meat is a cheap source of animal protein supply for consumption. Taking into cognizance the relative advantage of snail meat over other animals, there is need for effective extension education to bring about positive changes in the behavior of people towards the acceptability and consumption of snails meat. In spite of awareness of the value of consuming Snails, inhabitants of Lafia metropolis rated Snail meat very low on the preference list among others meat sources. This study recommend that awareness creation on the nutritional benefits of Snail meat consumption is necessary to enlist more consumer.

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