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Consumer Preference and Quality Expectation of Oyster Mushroom Black Hot Pepper Sauce "*Shito*"

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Abstract

This study was aimed at determining consumer preference and quality expectation of black hot pepper sauce "*shito*" in general as a basis for developing oyster mushroom black hot pepper sauce. A structured questionnaire was administered to 103 respondents in Takoradi Technical University, Takoradi, Ghana. Respondents preferred onion (4.94), oil (4.86), powdered pepper (4.50), mixed spices (4.51) ginger (4.50), salt (4.46), garlic (4.27) and tomato puree (3.99) as their ingredient to be used for their black hot pepper sauce. Respondents expected their sensory quality attributes of black hot pepper sauce to be after taste (4.18), tastiness (3.17), spiciness (3.11) and mouthfeel (2.93). Conclusively respondents are willing to patronize black hot pepper sauce "*shito*" produced from oyster mushroom (81%) and recommended that oyster mushroom black hot pepper sauce be produced in commercial quantities.

Subject Areas

Food Science & Technology

Keywords

Oyster Mushroom, Consumer Preference, "*Shito*", Black Hot Pepper Sauce, Quality Expectation

1. Background

"*Shito*" is a Ghanaian convenience black hot pepper sauce commonly consumed with other foods. It is made from vegetable oil, onion, ginger, tomato puree,

dried pepper, smoked fish powder, smoked shrimp powder, stock cube, and spices. To make the sauce, the ingredients are combined and fried in oil. It has a wide range of applications in the food business, with a focus on condiments. "*Shito*" is preferred over other spicy sauces as a condiment [1].

Mushroom is an exceptional home of nourishment, stimulant, medication and nutritive diet being created and consumed all over the world. Mushrooms are opulent in crude fibre, protein, vitamins, minerals, contain low fat, calories and no starch. They offer high quality carbohydrates enhancing the human well-being [2]. Mushrooms are a delicacy with clear food esteem. They have anyway obtained business status practically everywhere in the world because of their temperament of being attractive and the popularity of their dishes in the enormous lodgings and cafés [3]. There are impressive varieties of taste and appearance. Showcasing capability of dried mushrooms is restricted, however the taste gets more grounded in the wake of drying [4]. The costs of mushroom changes because of the differing demand for them and the expanded demand for ready-to-eat nourishments. Mushrooms are measured as substitute for meat and their dietary value is equivalent to numerous vegetables. Mushroom budding is a probable activity to transform waste into greatest nutritional food with great protein transformation competence. The world production of mushroom is about 40 million tones contributed by China, USA, The Netherlands, Poland, Spain, France, Italy, Ireland, Canada and UK [2]. Food production establishments have an appeal for cut mushrooms and stores are selling an expanding number of bunches of cut new mushrooms. The mushroom business supplies around 5% to 25% of its new yield as cuts [5].

Over the 1999-2001 periods, mushroom cultivators sold a normal of 859 million pounds which is 3.89986×10^8 kg [6]. The estimation of the 2001-2012 strength mushroom crops in the United States added up to $37 million, up 12% from the 2000-2001 seasons. Once more, deals volume of mushrooms in the United Kingdom was 4.03 million pounds a 11% from 9% in the 2014 with just 51 cultivators delivering 1.94×10^6 kg [7]. In Ghana likewise, singular mushroom ranchers are making between GH¢5.00 to GH¢20.00 or more daily and selling about 10 kg every week [8]. Ladies are specialists in the utilization, preparation and promotion of vegetables including mushrooms. This is on the grounds that, these are basic assets to continue the family and guarantee great soundness of the family. The business of selling mushroom is a financial endeavor for individuals, particularly ladies having minimal capital, restricted admittance to land and working under work requirements. The livelihoods they get from this endeavor contribute fundamentally to food security at the family unit level and empower ladies to accomplish a level of monetary autonomy inside the family spending plan [9].

Mushrooms have numerous restorative properties, for example, cell reinforcement, antimicrobial and anticancer demonstrated by logical examinations [10]. Also, 90% - 95% of the mushrooms are water and so are dietary supple-

ments [11]. Additionally, mushrooms have low fat and high protein, subsequently, making this gathering of nourishments more appealing. Particularly in this sense, mushrooms can be proposed to close the protein absence of veggie lover individuals. Mushrooms are favored for it's restorative, and wholesome purposes. Before the year 2000, the cost of mushrooms was lower than that of meat, fish and a few vegetables. Additionally, after 2010, the inclination for mushrooms had expanded dully halfway to the deficiencies in meats and the imports in fish. Moreover, [8] referenced that the desire for mushroom may have been because of its promptly accessible particularly in the country and perimetropolitan networks.

[12] added that the accessibility of dried and powdered mushrooms in the different shopping centers and the numerous notices on their dietary benefit may have added some nibble to the expanded utilization and acceptability of mushrooms. [4] additionally placed that the acknowledgment of mushrooms as diets add something to the shading, smell or aroma and the flavor of the food. The investigation additionally referenced the introduction of nourishments that have mushrooms. That is mushroom add to the introduction by making the food more alluring to consumers [4], the value, nourishment, simple accessibility, restorative properties, bundling and flavor as the most significant factors that impact consumers or customers to acknowledge or lean toward mushrooms over different vegetables of different items.

The oyster mushroom is delicate and susceptible to spoilage within a day of harvest. This is a constraint that fresh oyster mushroom distributors and marketers encounter. As a result, this study was aimed to examine consumer's preference and quality expectation of oyster mushroom black hot pepper sauce "*shito*".

2. Methodology

2.1. Study Design

A survey was conducted by administering a structured questionnaire. Respondents were sampled randomly and purposively based on respondents' knowledge on the topic in Takoradi Technical University, Takoradi, Ghana, specifically Department of Hospitality Management. Respondent included students, lecturers and supporting staff using [13] sample size determination table as seen in **Table 1**; a population of 140, the sample size to use is 103, hence 103 respondents were used.

The questionnaire comprised of multiple choice, ranking and dichotomous questions and was pretested before administering. The pretesting of the questionnaire was conducted with five (5) respondents, and the necessary modification were made before the final administration. The questionnaire was self-administered and designed to evaluate consumer preference and quality expectation of "*shito*" in general as a bases for developing oyster mushroom black hot pepper sauce "*shito*".

Table 1. Proportionate allocation of respondents.

Status	Actuals of Respondents	Prop Allocation	Prop Allocation	Prop Allocation	Total Prop Allocation
Students	115	84			84
Lecturers	20		16		16
Supporting Staff	5			3	3
TOTAL	**140**				**103**

2.2. Data Analysis

Data was analyzed using Statistical Package for Social Sciences (SPSS) version 22. Graphical representations were done by Microsoft Excel.

3. Results and Discussion

3.1. Demographic Data of Respondents

Table 2 presents the gender of respondent. The gender distribution was skewed toward females (85%) and (15%) being males. This could be due to the fact that, respondents involved in the study were from the Department of Hospitality Management which is a female dominated Department because of the program being offered.

According to Table 3, majority of the respondents were 40 years and below. This gives an indication that significant number of respondents were in their youthful age.

Table 4 presents the marital status of respondents, majority (74%) were single whiles (1%) was a widow and the rest married. This can be attributed to the fact that the most respondents were students.

In relation to the status (rank) of respondents, majority (82%) were student as they form the highest population of the university, (15%) were teaching staff whiles the remaining represent the non-teaching staff as shown in Table 5.

3.2. Black Hot Pepper Sauce "*Shito*" Preference and Quality Expectation

In terms of ingredient preferences, respondents were asked to rank the importance of some ingredients needed in their black hot pepper sauce, as shown in (Table 6). Majority (94%) of respondents ranked onion (4.94) as the most important ingredient needed in their black hot pepper sauce, followed by oil (4.86) which is also most important. This means that onion is consumed all over the world due to their distinct flavor [14]. Powdered pepper, mixed spices, and ginger were the next most popular ingredients, with mean values of (4.61, 4.51, and 4.50) for each, which respondents felt to be highly significant. This could be due to the fact that, in addition to their flavor-enhancing and spicy properties, these substances have an antimicrobial effect on food [15]. Tomato puree, with a mean

Table 2. Gender distribution of respondents.

Gender	N	Frequency (*f*)	Percentage (%)
Gender	**103**		
Male		15	15.0
Female		88	85.0
TOTAL	**103**	103	100

Table 3. Age distribution of respondents.

Age	N	Frequency (*f*)	Percentage (%)
Age in years	**103**		
Below 18		0	0.0
18 - 20		1	1.0
21 - 30		77	75.0
31 - 40		15	14.0
41 - 50		8	8.0
51 - 60		2	2.0
Above 60		0	0.0
TOTAL	**103**	103	100

Table 4. Marital status of respondents.

Marital Status	N	Frequency (*f*)	Percentage (%)
Marital Status	**103**		
Single		76	74.0
Married		26	25.0
Divorced		0	0.0
Widow		1	1.0
TOTAL	**103**	**103**	**100**

Table 5. Status (rank) of respondents.

Status (Rank)	N	Frequency (*f*)	Percentage (%)
Status (Rank)	**103**		
Teaching Staff		16	15.0
Non-teaching staff		3	3.0
Student		84	82.0
TOTAL	**103**	**103**	**100**

Table 6. Preference of ingredients used for black hot pepper sauce.

I/N	Ingredients	Rating					Mean
		VI 5 *f* (%)	IM 4 *f* (%)	N 3 *f* (%)	NP 2 *f* (%)	NVI 1 *f* (%)	
1	Onion	97 (94)	6 (6)	0 (0)	0 (0)	0 (0)	4.94
2	Ginger	62 (60)	35 (34)	4 (4)	0 (0)	2 (2)	4.50
3	Garlic	52 (50)	35 (34)	10 (10)	4 (4)	2 (2)	4.27
4	Tomato Puree	47 (46)	28 (27)	16 (16)	4 (40	8 (7)	3.99
5	Powdered Pepper	71 (69)	26 (25)	4 (4)	2 (2)	0 (0)	4.61
6	Oil	89 (86)	14 (14)	0 (0)	0 (0)	0 (0)	4.86
7	Mixed spices	63 (62)	34 (32)	4 (4)	0 (0)	2 (1)	4.51
8	Salt	60 (58)	39 (38)	0 (0)	0 (0)	4 (4)	4.46

Scale: 1 - 1.49 = NVI (Not very Important), 1.5 - 2.49 = NP (Not Preferred), 2.5 - 3.49 = N (Neither important or not important), 3.5 - 4.49 = IM (Important), 4.5 - 5 = VI (Very Important).

value of (3.98), is the least recommended ingredient. Anecdotal information suggests that omitting tomato puree from black hot pepper sauce preparation has little influence on the final result.

Sensory quality of food is an important factor that consumers consider when deciding whether or not to eat. Spiciness, mouth feel, tastiness, and aftertaste were all considered when determining the sensory quality expectation of black hot pepper sauce. From Figure 1, the results show that, respondents prefer their black hot pepper sauce to have sweet aftertaste with the mean value of (4.18), neither tasty nor very tasty (3.17) for taste, either spicy or not spicy (3.11) for spiciness and the least expectation was mouthfeel which was neither smooth nor rough (2.93)

When respondents were asked to indicate their willingness to patronize black hot pepper sauce prepared from oyster mushroom; it was seen from (Figure 2) that, a greater percentage (81%) of respondents would like black hot pepper sauce made from oyster mushrooms. The results indicate that, black hot pepper sauce made from mushrooms would be patronized when produced in commercial quantities. The results from this study is in line with [16] research which found that consumers preferred black hot pepper sauce made from soybean much more than that made from shrimp powder. In another study by [17], consumers preferred *shito* made from snail powder to that made from shrimp powder. The inference from these findings is that, consumers are willing to try different varieties of black hot pepper sauce on the market provided the taste meets their expectations.

Table 7 indicates the responses of factor that affects respondents' patronage of oyster mushroom black hot pepper sauce. It can be seen that, taste, appearance,

Figure 1. Sensory quality expectation of black hot pepper sauce. Scale spiciness: 1: Not very spicy; 2: Not spicy; 3: Neither spicy or not spicy, 4: Spicy; 5: Very spicy; Mouthfeel: 1: Very smooth; 2: Smooth; 3: Neither smooth nor rough; 4: Rough; 5: Very Rough; Tastiness: 1: Not very tasty; 2: Not tasty; 3: Neither tasty nor very tasty; 4: Tasty; 5: Very tasty; Aftertaste: 1: Not Very Sweet; 2: Not Sweet; 3: Bitter; 4: Sweet; 5: Very Sweet.

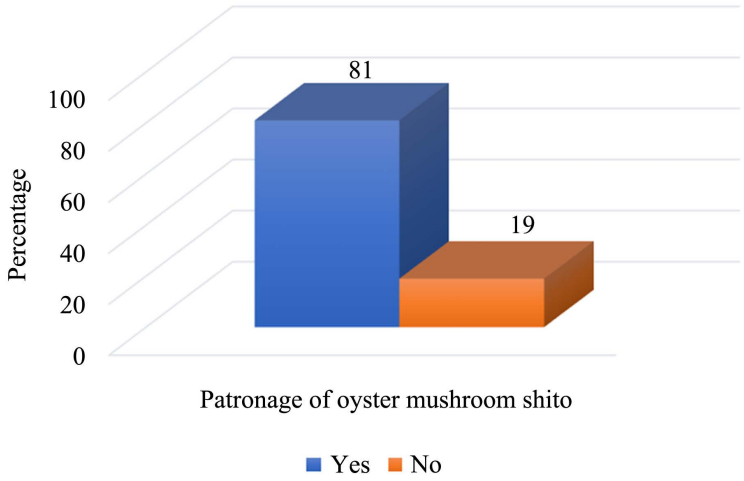

Figure 2. Consumer willingness to patronize oyster mushroom black hot pepper sauce.

texture, aroma, packaging, colour and spiciness with the representation of (71%, 65%, 53%, 53%, 51%, 51%, 49%, 41%) respectively are all very important in factors affecting respondents' patronage. Price and drying method used for mushrooms are also considered important with the percentage of (39% and 34%) respectively. The result gives an indication that, all the factors used are of much importance to customers with it having varying percentages in its representation. This as opined by [18], explains the culinary attributes of Oyster mushroom in the preparation of different dishes. Accordingly, they can be additionally accessed in dried structures, taste very great and have an exceptionally serious substantial flavor. This attributes can be used to generalize the views of respondents in this study.

Table 7. Factors affecting respondents' patronage of oyster mushroom black hot pepper sauce.

I/N	Factor	Rating					Mean
		NVI 1 *f* (%)	NI 2 *f* (%)	N 3 *f* (%)	IM 4 *f* (%)	VI 5 *f* (%)	
1	Drying method use for mushroom	14 (14)	16 (15)	10 (10)	35 (34)	28 (27)	3.48
2	Price	8 (8)	5 (5)	10 (9)	40 (39)	40 (39)	3.99
3	Packaging	2 (2)	2 (2)	8 (8)	38 (37)	53 (51)	4.35
4	Aroma	4 (4)	4 (4)	2 (2)	38 (37)	55 (53)	4.35
5	Colour	4 (4)	6 (5.5)	6 (5.5)	37 (36)	50 (49)	4.23
6	Taste	2 (2)	0 (0)	2 (2)	26 (25)	73 (71)	4.64
7	Appearance	2 (2)	2 (2)	2 (2)	30 (29)	67 (65)	4.54
8	Texture	6 (6)	0 (0)	8 (8)	34 (33)	55 (53)	4.31
9	Spiciness	6 (6)	14 (14)	7 (7)	33 (32)	43 (41)	3.93

NVI = Not very Important, NI = Not Important, N = Neither important or Not Important, IM = Important, VI = Very Important.

The result from Figure 3 shows respondents preferred oil to be used in their black hot pepper sauce preparation. It can be seen that more than half (54%) preferred sunflower oil, followed by olive oil and coconut oil (23% and 21%) respectively. The least preferred oil was canola oil (2%). It can be concluded that, sunflower oil was the oil mostly preferred by consumers for the preparation of respondents' oyster mushrooms black hot pepper sauce. The role of oil in frying process is to develop the flavor, texture and aroma acceptability in fried products [19].

Figure 4 shows the results of the state of oil respondent want to be used in the preparation of their oyster mushroom black hot pepper sauce and overwhelmingly (96%) stated they want fresh oil to be used for their sauce. The state of an oil in the preparation of black pepper sauce is very important to many *shito* lovers in Ghana. This is because the oil has the tendency of affecting the flavor, colour and safety of the end product. As stated by [20] in their study, oxidation and hydrolysis reaction occurs during frying or cooking processes which by-products such as alcohols, cyclic compound, polymers, dimers and free fatty acids are produced and have adverse impact on human health. The usage of over degraded oil containing hazardous secondary oxidative products and ingestion of altered frying oil has amplified in many food chains worldwide [21]. This has prompted consumers to be very particular on the type of food they are consuming into their bodies.

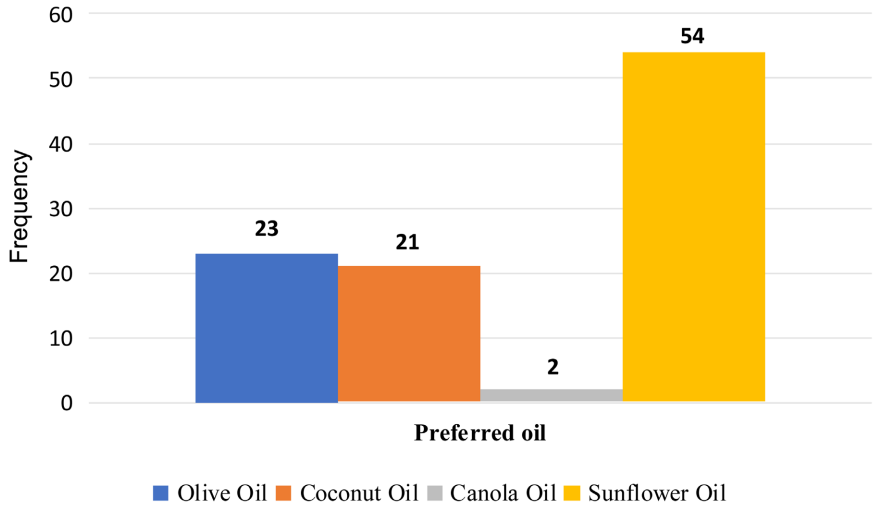

Figure 3. Consumers preferred oil to be used in black hot pepper sauce "*shito*" preparation.

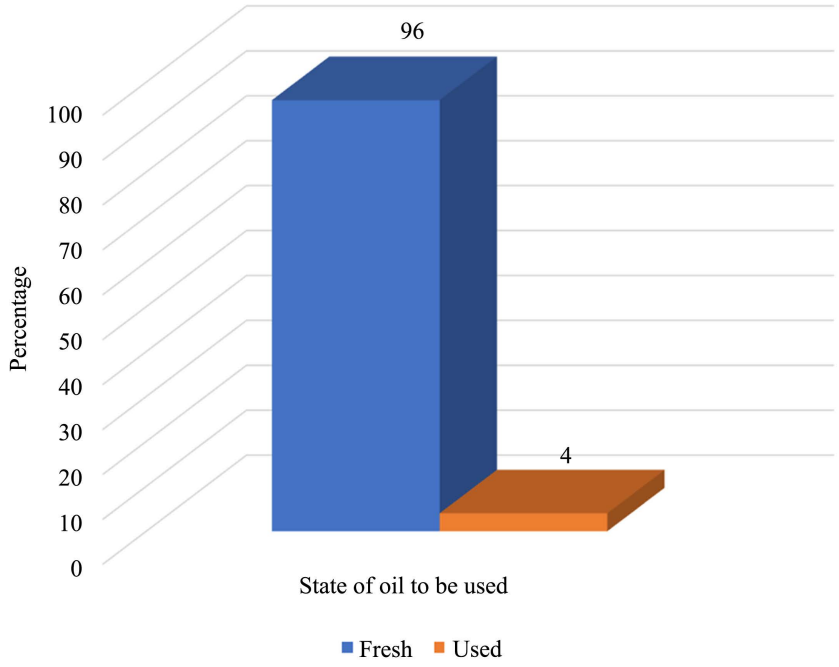

Figure 4. State of oil to be used for oyster mushrooms black hot pepper sauce.

4. Conclusions and Recommendations

Findings from the study concludes that consumers' preference and quality expectation of black hot mushroom pepper sauce (*shito*) is very encouraging as majority of respondents (81%) preferred it to that made from shrimp powder. Again the methods used to process the mushroom for the preparation of the sauce as well as the price at which the sauce is to be sold were all considered important determinants of consumers' expectations.

This study would help in the commercialization of oyster mushroom black hot pepper sauce thereby; increasing the utilization of mushrooms, creating em-

ployment and reducing post-harvest losses of mushrooms in Ghana. Further works can be done on the production of black hot pepper sauce (*shito*) made from oyster mushroom and its microbial loads.

Conflicts of Interest

The authors declare no conflicts of interest.

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