

**RELATIONSHIP BETWEEN TESTED ORGANOLEPTIC QUALITIES
AND THE CONSUMPTION PATTERN FOR SELECTED POULTRY
MEAT TYPES IN THREE NIGERIAN CITIES**

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ABSTRACT

The relationship between consumption pattern, consumers' preference and sensory quality ratings for some selected Nigerian poultry meat types (local chicken, exotic chicken, guinea fowl, duck and bush fowl) were investigated. While the consumption pattern and consumers' preference were assessed through a field survey using a structured questionnaire, the organoleptic quality rating were carried out by thirty carefully screened panel on a 9-point hedonic scale. The study revealed the fact that exotic chicken was the most consumed poultry meat in Nigeria, followed by local chicken, guinea fowl, duck and bush fowl in that order. Consumption of duck, guinea fowl and bush fowl was constrained by availability, cost and taboo. Local chicken meat was the most preferred, followed by guinea fowl, bush fowl, exotic chicken and lastly duck in that order. Interestingly, in the laboratory sensory rating of the poultry meat types, guinea fowl had the greatest acceptability, followed by bush fowl, local chicken, exotic chicken and lastly duck. This order of ranking could be attributed to the colour and flavour palatability trait scores and the fact that most respondents prefer slightly tough meat to soft ones.

Key Words: Poultry meat types, organoleptic qualities, consumption pattern.

INTRODUCTION

In Nigeria, the protein intake of an average person falls short of the Food and Agricultural Organisation (FAO) recommendations. The level of animal protein consumption in present Nigeria is not certain, however, 1980 figure put it at 6.5g of the 46.7g total crude protein intake per day (Marquis, 1984). The demand for animal protein far exceeds the supply (Olatunbosun, 1971). David-West (1978) therefore concluded that in order to meet the minimal animal protein needs of the average Nigerian from local sources, it would be necessary to increase the production level by as much as 500%. Attainment of this is far from being achieved till now. There is therefore the need to explore local avian sources to complement the existing level of protein intake in Nigeria.

Approximately 8,600 species of birds are known in the World today (Perrin and Cameron, 1978) and only a dozen of these species can be regarded as being successfully domesticated which are referred to as poultry (Banerjee, 1989). Although recently, efforts have been geared towards domesticating and development of new species with improved qualities from semi-wild birds (Ayorinde and Ayeni, 1987; Ayorinde, 1987), it is useless to domesticate wildlife for meat supplies without first finding out whether human beings would choose to eat the species or not (Lenner and Donald, 1966). Moreover, all over the developed world, there are documents of peoples' preference for available varieties of meat in their market. For instance, the Japanese are known to have a high preference for quills, whereas there is dearth of information on the relationships of Nigerian intake preference and quality of meat types available in the market.

This paper examined the consumption pattern of Nigerians for selected poultry meat types: local and exotic chicken (*Gallus domesticus*; guinea fowl (*Numida mealegrus galeata pallas*), duck (*Anas sparsa*) and bush fowl (*Francolinus bicalcaratus*). This was done by determining consumers'

preference, organoleptic qualities and factors constraining the consumption of these meat types.

MATERIALS AND METHODS

Meat samples for the organoleptic assessment: Birds used included local chicken, exotic chicken, guinea fowl, duck and bush fowl.

Sensory Evaluation:

Sensory tests were carried out on the thigh portion of the poultry boiled for 40 minutes by a carefully selected thirty-man panelist invited from the University community (which consisted of students, academic and non-academic staff). They rated the samples for tenderness, juiciness, flavour, colour and overall acceptability on a 9-point hedonic scale.

Field Survey:

Consumption pattern and preference for the birds' meat samples were obtained by the means of structured questionnaires, which were administered to a randomly selected sample of 120 respondents in Ilorin, Ibadan and Lagos. Though the cities selected typify urban Nigeria, however, the study could not spread nationwide due to the limitation of research funds. The survey was carried out between March and July, 1992.

Since the study was to relate sensory quality scores (better assessed by elites) with consumption pattern, the survey aspect of the study was focused on the elites in the urban setting. The questionnaire elicited information on respondents demographic and socio-economic characteristics, such as age, income, religion and level of education. Other information included proportion of income spent on meat and food generally, preference for the different types of poultry meat and their actual consumption pattern. Factors associated with the consumption pattern of the meats were also solicited.

Socio-economic and demographic data were analysed using frequency distribution. Analysis of variance and Least significant difference between sample means were determined using Duncan Multiple Range Test (Duncan, 1955) for the sensory qualities analyses.

Rating scales were used to rank the consumption pattern and preference of respondents for the poultry meat types.

RESULTS AND DISCUSSION

Table 1 shows some demographic and socio-economic characteristics of respondents. Majority of respondents (88.3%) came within the young and middle age class. Only 11.7% were above 50 years. It was also found that majority of the respondents (94.2%) were literates with only 5.8% having no formal education though the high level of literacy is not reflective of the national literacy figure (40% literacy). The figure obtained could be accounted for because of the urban nature of the studied area. This is reinforced by the occupation of respondents which was mainly elitist.

In terms of household size, a large proportion of respondents (66.7%) had between four-nine members. About 3% even had between 10 and 12 members. Only about one third had between one and three members. Size of household is likely to have influenced the consumption pattern of poultry meat. This is because a small family size is likely to spend a higher proportion of its income on purchase of meat.

According to Table 2, majority of respondents (83.3%) are low/middle income earners as they earned between N300 and N2,800 monthly. The table also reflects that the higher the income the more the amount spent on poultry meat. This may imply that income is one of the factors limiting the consumption of poultry meat.

Analysis of the field survey revealed that only 28% of the respondents kept poultry birds with majority of them (67.7%) keeping exotic chicken. None of them kept guinea fowl and bush fowl. About 26.5% kept local chicken while only 6% kept duck.

The consumption pattern of the birds is shown in Table 3. It reveals that exotic chicken was most consumed, followed by local chicken, guinea fowl and duck in that order. Bush fowl was the least consumed.

Further analysis offered the factors limiting the consumption of each bird (Table 4). Results show that exotic chicken was least constrained as it was readily available at reasonable cost. Duck had most factors limiting its consumption with cost being the most limiting. It also had the highest constraint due to taboo. It is also constrained by its dirty habits. Consumption of guinea fowl and bush fowl were also constrained to a great extent, with cost and availability being the most limiting factors for guinea fowl and bush fowl respectively. The local chicken enjoyed similar qualities as exotic chicken but constrained by smallness in size.

In the absence of these constraints respondents were asked to rank the birds in order of preference. Results obtained is presented in Table 5. Local chicken was the most preferred, followed by guinea fowl, bush fowl, exotic chicken and lastly duck in that order. Exotic chicken that ranked first in actual consumption, ranked fourth in preference.

In laboratory organoleptic assessment, guinea fowl ranked first, followed by bush fowl, local chicken and exotic chicken. Duck, just as in consumption preference took the rear (Table 6). It is interesting to note that the most consumed bird (exotic chicken) also ranked fourth in the laboratory acceptability test. This order of ranking could be attributed to the colour and flavour palatability trait scores and the fact that most respondents prefer slightly tough meat to soft ones. The tougher the meat the longer it stays in the mouth and the better for most Nigerian consumers.

CONCLUSIONS

In conclusion, the findings of this paper imply that respondents generally consume birds that are readily available and cheap but at the same time without constraints of taboo, dirty habits and smallness in size. Cost was observed to be the most important singular constraint on consumption of the birds, which implies that if good quality 'rare birds' could be made readily available at reasonable

price, their consumption will improve. Guinea fowl has the greatest potential in this direction. Therefore effort should be geared towards domestication of the wild birds, improvement on the management of local chicken and breeding for improvement of the eating quality attributes of duck. Meat preferences of people represent their likes and dislikes and should guide meat producers and processors in their attempt to satisfy consumers.

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Table 1: Socio-economic and demographic characteristics of respondents

Characteristics	Percentage distribution
Ages (years):	
21 - 30	35.00
31 - 40	30.00
41 - 50	23.33
51 - 60	6.67
61 - 70	5.00
Educational Level:	
Formal Education	
Primary school	18.33
Secondary school	26.67
Post-secondary	40.84
Others	8.33
No formal education	5.83
Household Size:	
1 - 3	30.01
4 - 6	38.33
7 - 9	28.33
10 - 12	13.33

Source: Field Survey, April 1992.

Table 2: Monthly income distribution and proportion spent on food and meat

Income Class*	Percentage distribution of respondents	Average Percentage of expenditure spent on poultry meat
₦		
300 - 800	33.3	12
801 - 1300	20.0	14
1301 - 1800	16.7	16
1801 - 2300	5.0	17
2301 - 2800	8.3	24
2801 - 3300	6.7	27
3301 - 3800	5.0	29
> 3800	5.0	32

Source: Field Survey, April 1992.

*Data was collected before the recent 45 percent increase in workers wages came into effect. Officially one US dollar exchanged for 18.60 Nigerian Naira in April 1992.

Table 3: Consumption, pattern of the poultry meat

Rank	Local Chicken	Exotic Chicken	Guinea Fowl	Duck	Bush Fowl	Ranking
First	10	95	15	0	0	Exotic chicken
Second	60	25	26	9	0	Local chicken
Third	45	0	60	14	1	Guinea fowl
Fourth	5	0	19	80	6	Duck
Fifth	0	0	5	7	107	Bush fowl
Do not take the meat	0	0	3	10	6	
Total Score*	435	575	402	245	122	

Source: Field Survey, April 1992.

*Rated on a 6-point rating, scale (5=First and 0=Sixth).

Table 4: Constraints limiting the consumption of poultry meat types

Type of Meat	Availability*	Cost*	Taboo*	Dirty habit*	Size*
Local chicken	30.8	37.5	-	14.7	4.38
Exotic chicken	17.5	30.0	-	-	-
Guinea fowl	53.3	63.3	2.5	-	-
Duck	43.3	60.0	11.7	15.0	-
Bush fowl	48.3	25.8	7.6	-	12.50

Source: Field Survey, April 1992.

*Percentage of respondents that was constrained by the factors.

Table 5: Consumers' preference for the poultry meat types

Rank	Local chicken	Exotic chicken	Guinea fowl	Duck	Bush fowl	Ranking
First	20	15	40	7	38	Local chicken
Second	49	24	21	11	15	Guinea fowl
Third	28	39	18	18	17	Bush fowl
Fourth	15	25	24	41	15	Exotic chicken
Fifth	8	17	14	33	29	Duck
Do not like it at all	0	0	3	10	6	
Total	418	353	400	248	360	

Source: Field Survey, April 1992.

*Rated on a 6-point rating scale (5=like very much and 0=no likeness).

Table 6: Sensory quality scores of palatability traits and overall acceptability

Poultry meat types	Sensory quality scores*				Overall acceptability
	Colour	Flavour	Tenderness	Juiciness	
Local chicken	6.6 ^c	6.9 ^b	6.4 ^c	6.5 ^b	6.8 ^b
Exotic chicken	5.8 ^b	6.2 ^a	7.8 ^d	7.9 ^c	6.6 ^b
Guinea fowl	6.9 ^c	7.8 ^c	6.0 ^{bc}	6.2 ^a	7.4 ^c
Duck	5.3 ^a	5.9 ^a	5.4 ^a	5.8 ^a	6.0 ^a
Bush fowl	6.6 ^c	7.2 ^b	5.9 ^b	6.0 ^a	7.0 ^{bc}

Source: Laboratory sensory tests, April 1992.

Figures with different superscripts along the row indicate significant difference ($P < 0.05$). Higher values indicate greater preference.

*Rated on a 9-point hedonic scale, 9=Extremely like, pale, tender or juicy; 1=Extremely dislike, deep, tough or dry.