


Proceeding Paper

# Qualities and Origins of Out-of-Home Food Products: Midday Meals in the Cities of Southeastern Gabon <sup>†</sup>

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**Abstract:** The place of local products in out-of-home catering and the growth of non-communicable metabolic diseases in sub-Saharan Africa raise questions. To identify the influence of the economic and social environments on this phenomenon, this study analyzes the foods and consumers concerning the main meal of the day. A survey of 180 customers from seventy-three catering establishments in the province of Haut Ogooué in southeastern Gabon was conducted. They were interviewed between 11 a.m. and 6 p.m. over a month using a semi-structured questionnaire providing socio-demographic variables, foods, side dishes, cooking methods, prices, and food additives consumed in restaurants and at home. The results show that clients are disadvantaged young people ( $30.3 \pm 9.7$  years) who consume animal proteins that are less available at home. Low prices, imported food, proximity, the availability of food additives rich in oils and salts, and the possibility of consuming local side foods explain the success of out-of-home catering. The cooking and consumption patterns are conducive to the development in the long-term of non-communicable metabolic diseases.

**Keywords:** out-of-home food; food origins; rent economy; non-communicable metabolic diseases; foods additives; Gabon



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## 1. Introduction

Two phenomena impact food consumption in Gabon and elsewhere in sub-Saharan Africa. Urbanization promotes changes in eating habits through the extension of out-of-home catering [1]. This leads to an increase in non-communicable metabolic diseases, such as diabetes and high blood pressure, and food imports [1–3]. This first phenomenon is common in African cities. The second is the rent economy, which, without being exclusive to Gabon, is nevertheless characteristic of this country and is marked by the excessive cost of living due to insufficient local agricultural and manufacturing production. The weakening of local production is a consequence of the country's dependence on the exploitation of natural resources such as oil and manganese. This makes Gabon a country open to international trade, particularly for food products [4,5]. Deprived of control over its food, this highly urbanized country (90%) is subject to fluctuations in world foods prices, which penalizes consumers and local production [6,7]. Despite the limitations of local food production chains and competition from imported foods, ref. [8] showed that African food products find their place in the rapid growth in urban food demand on this continent. These include energy sources such as millet and sorghum in the Sahelian zone and roots and tubers such as cassava, yams, and bananas in the wetlands. At the time of consumption, these food products accompany the main food, often presented with a sauce. But this may not be the case in Gabon, because in addition to particularly low agricultural production,

this country, like other rent economies, is marked by an excessive cost of living, so local products suffer from a lack of competitiveness in the face of often subsidized imports [5]. This study compares food consumption at home and outside the home in two cities in the interior of Gabon, which are relatively isolated and have a lower level of penetration of imported food than coastal cities. The work concerns the midday meal, considered the most important in Gabon. It will contribute to enriching the debate on the influence of social and economic contexts on urban eating behaviors in sub-Saharan Africa [9].

The research questions are as follows: (i) What is the profile of out-of-home catering customers and what are their consumption behaviors? (ii) What is local food products' importance in this sector of activity? (iii) Does out-of-home catering promote food imports and create favorable conditions for the growth of non-communicable metabolic diseases?

In particular, this research aims to (i) establish a socio-demographic profile of out-of-home catering customers; (ii) list the foods and side foods consumed at and outside the home, specifying their nature, origins, and cooking methods; (iii) identify the reasons for the use of out-of-home food; and (iv) analyze the possible effects of out-of-home catering on the risk of developing non-communicable metabolic diseases.

## 2. Methods

### 2.1. Study Area

This study was conducted in the province of Haut Ogooué in southeastern Gabon, a country in central Africa. Data were collected in the cities of Franceville and Moanda, located over 600 km from the city of Libreville, which is the capital and the largest city in Gabon. The two cities represent a total population of 194,694 inhabitants, including 129,694 for Franceville [10]. The geographical coordinates of those cities are Franceville: Latitude:  $-1.6999$ , Longitude:  $13.5818$   $1^{\circ}41'60''$  S,  $13^{\circ}34'54''$  E and Moanda: Latitude:  $-1.6505$ , Longitude:  $13.2303$   $1^{\circ}39'2''$  S,  $13^{\circ}13'49''$  E. The agricultural sector of Gabon, excluding industrial crops (oil palm, sugar cane and rubber), represents less than 2% of the gross domestic product (GDP), while it occupies just over 20% of the country's households [11].

### 2.2. Data Collection and Analysis

This research was conducted during the month of April 2023 and gathered a sample of 180 customers chosen randomly among the customers of these restaurants, themselves selected from all the districts in the cities of Franceville and Moanda from 73 catering establishments in the two cities. A semi-structured questionnaire with seventeen variables was administered between 11 a.m. and 6 p.m. and each interview lasted less than 10 min. Other variables were entered from the answers obtained; they concerned the local or imported origin of the main components of the dishes consumed (foods and side dishes) at home or outside and their level of pre-processing at acquisition [8]. The collected data were entered into an Excel spreadsheet and passed to R Studio R version 4.2.1. In addition to the descriptive statistics that were made (mean, percentage, and standard deviation), two kinds of statistical tests were used (Khi 2 and Student test).

## 3. Results and Discussion

### 3.1. Socio-Demographic Profile of Out-of-Home Catering Customers

Table 1 summarizes the variables describing the socio-demographic profile of out-of-home food service customers in the cities studied.

Table 1 shows that out-of-home catering is very present in the two cities selected and is dominated by street braise called "Nike or Charly" in reference to the elbow of chicken wings that they braise, which are reminiscent of the Nike sportswear brand. The clients of these establishments are mostly young single men. They have a mostly secondary level of study and eat in these establishments more than twice a week, spending a sum close to USD 2.8 each time. It is quite clear that it is not only the poorest, but also the mass of urban workers who are engaged in self-employment (30.0%) or formal and informal workers

(31.7%). Significantly, women who eat away from home are significantly younger than men and belong to households that are statistically larger.

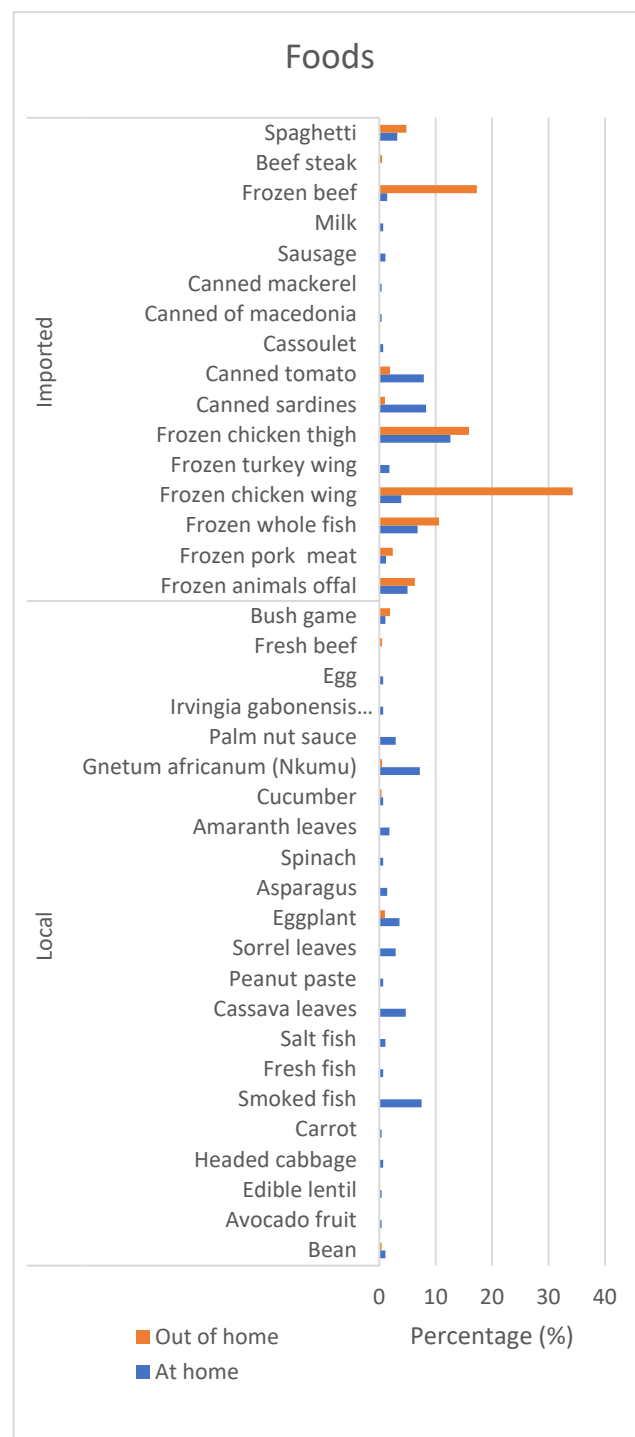
**Table 1.** Socio-demographic profile of out-of-home catering customers in the towns in Haut Ogooué in Gabon.

Variable	Modality	Membership or Average	Percentage (%)	p-Value
Type of restaurant	Street braise (Nike or Charly)	107	59.4	
	Cafeteria (Back turned)	50	27.8	
	Classic restaurant	23	12.8	
Sex	Man	109	60.5 **	0.004621
	Woman	71	39.4	
Age (year)	Man	32.9 ± 10.5 *		0.07131
	Woman	26.3 ± 6.6		
Socio-professional category	Student	33	18.3	2.83 × 10 <sup>-5</sup>
	Unemployed	23	12.8	
	Worker	57	31.7 ***	
	Self-employed	54	30	
	Executive	13	7.2	
Marital status	In a couple	74	41.1	0.01707
	Single	106	58.9 **	
Household size	Man	3.4 ± 2.0		6.75 × 10 <sup>-5</sup>
	Woman	5.3 ± 2.2 ***		
Educational attainment	None	5	2.8	2.20 × 10 <sup>-16</sup>
	Primary	33	18.4	
	Secondary	107	59.8 ***	
	University	33	19	
Price of the dish (USD)	Street braise (Nike)	1.7 ± 0.60	59.4	2.2 × 10 <sup>-16</sup>
	Cafeteria (Back turned)	2.6 ± 0.9	27.8	
	Classic restaurant	3.5 ± 1.4 ***	12.8	
Attendance (number of times/week)	Man	3.1 ± 2.527 ***		0.000134
	Woman	1.8 ± 1.797		

Error thresholds: \*\*\* 1%; \*\* 5%; \* 10%.

Three points can explain these results: the low prices, the physical accessibility of these restaurants, and the need for clients to ingest enough protein. Indeed, street braises offer the cheapest dishes at USD 1.73 and represent 59% of restaurants.

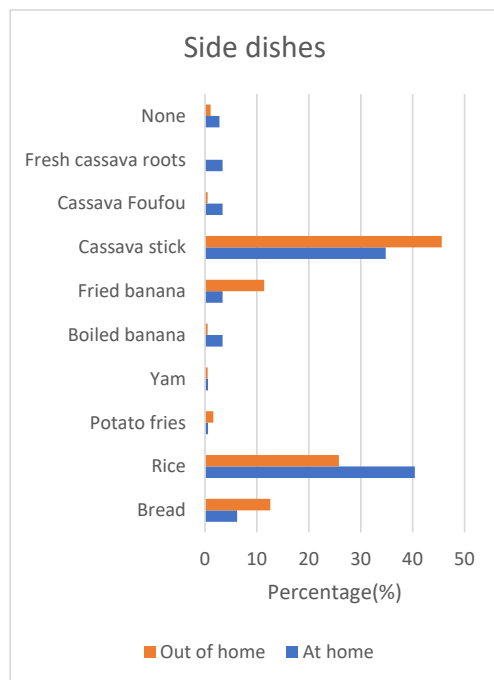
The success of street braises and cafeterias, 88% of the restaurants visited, is linked to the food offered. They almost exclusively offer meat and fish, which reflects the need for their customers to ingest animal proteins that they would not have enough access to in their homes (Figure 1). These results are similar to those of [12], who worked on the consumer preferences and quality indicators of "Dibiteries", i.e., street restaurants that offer fresh braised beef in Dakar (Senegal). These researchers showed that men under 40 who are unemployed or who earn their living from manual work and who stopped their studies before university are the main customers of dibiteries.



**Figure 1.** Proportions and origins of food consumed in homes and outdoors in the towns surveyed in Haut Ogooué.

### 3.2. Foods, Side Dishes, and Additives Consumed at Home and Outside

Figures 1 and 2 show the proportions of food and side dishes consumed by respondents in the towns in Haut Ogooué at home and outside. Table 2 compares some specific characteristics of the foods, side dishes, and food additives used in catering at home and outside.



**Figure 2.** Side dishes consumed in homes and outside in surveyed towns in Haut Ogooué, in percentages.

**Table 2.** Some specific characteristics of foods, side dishes, and food additives added in catering at home and outside, in percentages (%).

Characteristics	At Home	Out of Home
<b>Origin</b>		
Imported food	58.2	95.2
Imported side dishes	49.1	40.8
<b>Pre-processing level</b>		
No	18.2	15.5
Weak	57.9	78.3
Average	11.4	1.7
High and ultra	12.5	4.4
<b>Cooking method</b>		
Boil and or choke	61.5	25.6
Boil and/or choke and/or fry	25.9	1.7
Braise	0	62.2
Fry only	12.6	10.5
<b>Contains fiber</b>		
	42	6.7
<b>Added food additives</b>		
None	43.3	1.5
Salted concentrate and Mayonnaise	3	23.9
Salted concentrate and Chili sauce	0	1.5
Mayonnaise and Chili sauce	10.4	13.4
Mayonnaise, Salted concentrate, and Chili sauce	0	25.4
Chili sauce	28.4	1.5
Other combinations	14.9	32.8

Low-processed frozen cuts and the offal of farm animals imported from all over the world dominate in this part of Gabon both at home (76.1%) and outside it (93.8%). But they are consumed more outside the home (95.2%) than at home (58.2%). Among the imported foods consumed in restaurants, frozen poultry is the largest by volume, with 34.3% and 15.9% representing the shares of chicken wings and thighs, respectively. Frozen chicken meat is followed by cattle and fish meat at 17.3% and 10.6%, respectively (Figure 1).

Regarding local foods, only bush game, eggplant, and *Gnetum africanum*, colloquially called «Nkumu», are consumed in the restaurants surveyed. In homes, smoked fish, «Nkumu», and cassava leaves are the most consumed.

Regarding side dishes with the foods that are consumed (Figure 2), local products dominate in out-of-home catering (59.2%) and at home (50.9%). The flagship product in both cases is cassava stick, which accompanies 45.6% of dishes taken outside the home and 34.8% of those taken at home (Figure 2). Rice is consumed 14.6% more often at home compared to its consumption outside the home, while the opposite was found for cassava sticks, which lose 10.8% of their relative share from restaurants to homes.

Table 2 shows that out-of-home catering is an important driver of food imports for this country, mainly for animal proteins. There are significant differences between the food consumed in the home and outside. In restaurants, food contains almost no fiber, and it is mostly cooked by braising. In addition, the use of food additives rich in salt and oils is systematic in restaurants (98.5% of customers).

Among food additives, mayonnaise, salted concentrate (magic flavor), and chili sauce are by far the most used in out-of-home catering. Customers of these establishments consume these food additives simultaneously and 65.7% of the respondents added these three flagship products together or omitted only one of the three, while only 1.5% of these customers added only the salted concentrate and 4.5% the mayonnaise alone.

### 3.3. Reasons for Using and Disease Risks Associated with Out-of-Home Catering

There is an economic cause and another related to the quality of the dishes offered. Data show that local food tends to be more consumed in restaurants by people belonging to the largest households and in homes by single people.

The least favored social categories, represented by workers, self-employed persons, and students, consume imported food more than others in both cases and are more represented between customers. The good quality of the dishes consumed is the reason most frequently cited by out-of-home catering customers to explain the choice of a particular establishment (41.2% of responses). This is followed by the low cost and proximity of these locations to customers' homes and their proximity to the workplace. But the analyses carried out show, rather, that it is the specificities of this diet linked to its richness in fat, salt and its culinary practices which explains it. And this diet is associated with the long-term risk of non-communicable metabolic diseases for consumers. Thus, the risk of disease associated with out-of-home catering come from the characteristics of this activity, which are as follows: (i) an over-representation of meat (70.8%) in the dishes consumed; (ii) cooking methods that use much oil and salt (72.7% of dishes); and (iii) a systematic use of food additives that are concentrates of fat and salt (98.5% of customers). This particularly promotes obesity and high blood pressure because many of these food stores are in the extensions of drinks stores that are open until very late in the evening.

## 4. Conclusions

This work compared the foods consumed during the main meal of the day at home and outside in secondary cities of Gabon. It showed that out-of-home catering customers are relatively disadvantaged young people looking for animal proteins, largely imported, that they have difficulty accessing in their homes. This is especially true for the women who eat in these institutions. They are even younger (26 years on average) and belong to the largest households. The cooking method, the food additives available during consumption, and the individualized access to local side dishes clearly distinguish out-of-home catering

from that performed in homes. The customers themselves evoke the good quality, the low prices, and the ability to choose the establishment where they will eat.

The products offered, the cooking methods, and the way of serving them in this out-of-home diet run the risk of regular customers developing non-communicable metabolic diseases.

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