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Household food consumption and consumers dietary profile in the District of Abidjan

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Abstract

In Côte d'Ivoire, food consumption is of particular importance, given that it is closely linked to the challenges of nutrition and public health. The objective of this work was to evaluate food consumption and establish typical consumer profiles within the Abidjan District. This food consumption assessment takes place in two stages. The first step consisted of carrying out a 24-hour food consumption recall and the second step consisted of assessing consumption (Food Consumption Score) and household dietary diversity (Household Food Diversity Score). A survey was conducted among 927 households with an average size of 4 members per household. The majority of households were headed by men (60.50%). It appears that 81.75% of households had an acceptable Food Consumption Score and 92% of households had a high Household Food Diversity Score. The average number of food groups consumed by households in this survey is 5.97. This study showed that the dietary profile of the population consisted of spices/condiments, cereals, roots and tubers, oils/fats/butters, other vegetables, fish/seafood, meats.

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Introduction

As a determinant of nutritional status and health, food consumption is a major concern of the Sustainable Development Goals adopted by the United Nations (FAO, 2017). It is understood as a food ration providing the body with a certain quantity of energy evaluated in calories and a certain number of nutrients necessary for its balance (Friedman *et al.*, 2017).

Across the world, major changes are occurring in eating habits, even in the consumption of basic foods towards more diverse diets (John, 2010). These changes in food consumption at global and regional levels have far-reaching health consequences. In Côte d'Ivoire, food consumption is of particular importance, given that it is closely linked to the challenges of nutrition and public health (PNMIN, 2016). The cultural diversity of Côte d'Ivoire is reflected in the variety of dietary habits, but it can also lead to nutritional disparities. Rapidly changing urban lifestyles, demographic transitions, and socioeconomic changes have led to substantial changes in traditional dietary habits (Moyabi and Affeli, 2013; Tabutin and Schoumaker, 2020). This nutritional transition exposes the population to increased risks of malnutrition, with potential consequences on the prevalence of noncommunicable diseases such as obesity, diabetes and cardiovascular diseases (Popkin, 2001; Philippe, 2014). Furthermore, its current food system is full of inequalities and problems that prevent adequate food security for all and have consequences on individuals (Lançon and Boyer, 2019).

Thus, the in-depth analysis of food consumption becomes crucial to understand contemporary dynamics and develop appropriate strategies aimed at promoting a balanced and nutritious diet. However, there is very little data in Côte d'Ivoire. Knowledge of information on food consumption in the Abidjan District is necessary to inform actors working in the field of food security to better guide their intervention strategies. It is with this in mind that the present study was initiated to evaluate food consumption and establish typical consumer profiles within the Abidjan District.

Materials and methods

Investigation framework

The study took place in the municipalities of the Abidjan District : Abobo, Adjamé, Anyama, Attécoubé, Bingerville, Cocody, Koumassi, Marcory, Port-Bouët, Treichville and Yopougon. These sites were selected by the INS (National Institute of Statistics) in Côte d'Ivoire.

Type of study, target population and sampling

A qualitative interview study (Marie-Claude *et al.*, 2003) on food consumption was carried out from August to December 2021 ; it is a cross-sectional survey with an analytical aim which concerned all typical groups of the population in the District of Abidjan. Data were collected through individual interviews with household members. In this study, the sampling plan provided for a geographical stratum (District of Abidjan), 40 enumeration zones and 25 households to be interviewed per enumeration zone, for a total of 1000 households in 11 communes of Abidjan. Different survey sheets in the form of questionnaires were developed in order to collect information. This is the sheet socioeconomic and demographic, the 24-hour qualitative recall sheet, the frequency of food consumption and the consumption and food diversity indicator sheet.

Socio-demographic and economic profile of households

A structured questionnaire was used to capture information on household socio-demographic and economic characteristics such as gender, age, area of residence, marital status, ethnic group, education level and household profession. The questionnaire was administered through face-to-face interviews with household members.

Consumption and dietary diversity indicators

The food consumption score was used to reflect dietary diversity, frequency of consumption as well as nutritional intake relative to the products and food groups consumed by a household. This score is the sum of the frequency of consumption of each food group (capped at 7 days) multiplied by the weighting coefficient of the food group. For the present study, the household food consumption score (FCS) was

calculated using the following formula (Kennedy *et al.*, 2010 ; Sossa *et al.*, 2016).

$$\text{Score} = \text{cereal} \times \text{cereal} + \text{bean} \times \text{legume} + \text{alegume} \times \text{vegetable} + \text{afruit} \times \text{fruit} + \text{aanimal} \times \text{animal} + \text{asugar} \times \text{sugar} + \text{milk} \times \text{milk} + \text{aoil} \times \text{oil}$$

With: ai = Weight attributed to the food group.

xi = Number of days of consumption relative to each food group (≤ 7 days).

As for the dietary diversity score, the survey consisted of listing, on one day except the day of the festivity, all the dishes, sauces, snacks (nibbles) and drinks consumed the day before. This assessment of food consumption takes place in two stages. The first step is to perform a 24-hour food intake recall. The 24-hour qualitative recall was used to assess the dietary diversity of individuals from different households. All food and drinks consumed by the respondent during the 24 hours preceding the interview were recorded (Tran *et al.*, 2000). Indeed, as part of this work, the list of food groups (16 groups) selected for carrying out the survey was that based on the subdivision of food groups carried out by the FAO (Kennedy *et al.*, 2012). During this questioning, the foods and drinks consumed are identified, underlined in the list where each food group appears. Then, the coefficient 1 is assigned in the column next to each group for which at least one of the elements has been underlined or enter "0" in this column when it is proven that no food from this group was consumed. The second step consists of calculating the Household Dietary Diversity Score (SDAM). The SDAM is designed to provide an indication of households' economic access to food. It therefore includes foods that require household expenditure, such as condiments, sugar and sweet foods, or even drinks. Calculating the household dietary diversity score required merging 16 food groups into 12 groups. This involves adding up all the coefficients in the columns next to each group of which at least one of the elements has been underlined.

Consumer dietary profile

Participants described their daily eating habits, including the number of meals they consume, usual meal times, and the composition of their meals. The frequency with which they shop for food, as well as

their preferred places to buy food products (supermarket, local market, specialty stores, etc.) and particular preferences depending on different situations (meals at home, at work, in restaurants, etc.) was also explored.

Statistical analysis

Data analysis was carried out using XLSTAT 2022 software. A descriptive analysis made it possible to describe the different socio-demographic characteristics of the households. This analysis also made it possible to describe the distribution of household food consumption scores, dietary diversity scores (individual and household), the frequencies and proportions of consumption of food groups rich in specific nutrients and the types of food groups. food consumed. The results of the analyzes concerning the quantitative variables are presented in the form of number, mean, standard deviation, and graphical representation. The qualitative variables were presented in the form of number, percentage and graphical representation .

Results

Socio-demographic and economic profile of the households studied

Table 1 presents the socio-demographic characteristics of the households. It was finally collected information from 927 households with an average size of 4 members per household. Of the 927 households that constituted the sample, 60.50% were headed by men and 39.50% by women. Among the heads of households, 59.40% were married, 63.84% were educated and 84.15% resided in urban areas. The average age of household heads is 32.80 ± 11.17 years with 66.7%. More than half of heads of households are self-employed (50.49%). Structuring the population surveyed according to sex gives a number of 1763 women and 1945 men, i.e. a sex ratio of 1.10 with an average age of 28.50 ± 18.46 years. The population studied is made up of 572 children (0 to 9 years old) or 15.44% of the total number. There were 649 adolescents aged between 10 and 17 years old, representing 17.51% of the sample and 18.77% of young people aged between 18 and 25 years old, with a total of 696 people. Adults and the elderly were represented in the sample with respective percentages

of 40.84% and 07.44%. Among the respondents, 47.50% belonged to the AKAN ethnic group, 63.02% were educated and 54.69% were unemployed.

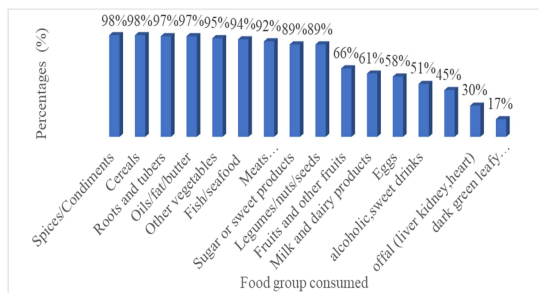


Fig. 1. Distribution of the frequency of consumption of different food groups in households in the District of Abidjan

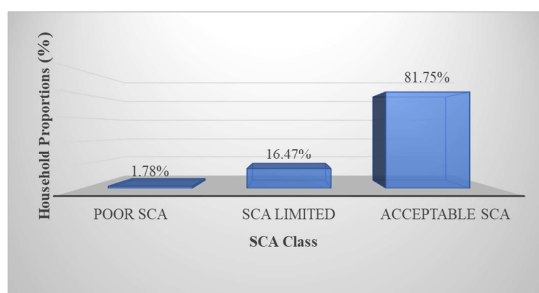


Fig. 2. Distribution of households according to household food consumption score (SCA) class in the Abidjan District

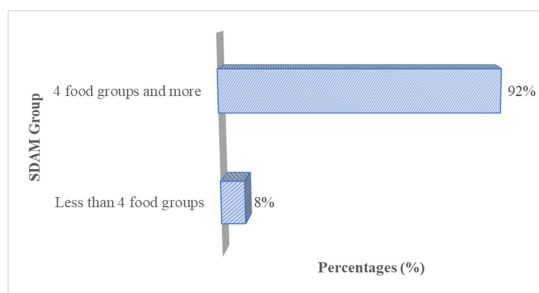


Fig. 3. Distribution of households according to the dietary diversity score (SDAM) in households in the District of Abidjan

Food consumption frequency of the 16 food groups

The daily consumption frequency of the different food groups is presented in Fig. 1. It first reveals that the food groups composed of spices/condiments and cereals were used by almost all of the respondents (98%). Then come Roots/tubers and oils/fat/butter (97%), Other vegetables (fresh tomatoes, fresh or dried okra, eggplant, etc.) (95%), fish/seafood (94%).

The frequencies of consumption of meat (beef, chicken, mutton, etc.), sugars or sweet products and legumes/nuts were 92% and 89% respectively. All these foods constitute the basis of the household diet. Food groups such as: fruits/other fruits, milk and dairy products, eggs, alcoholic / sweetened drinks , vegetables and tubes rich in vitamin A , offal (liver , kidney , heart) and dark green leafy vegetables are consumed at frequencies respectively 66 % , 61 % , 58%, 51%, 45%, 30% and 17%.

Food consumption score (FCS) of households in the Abidjan District

Fig. 2 shows the household food consumption score (FCS). It appears that households with an acceptable SCA (81.75%) were more numerous compared to other SCAs (limited SCA (16.47%) ; poor SCA (1.78%)).

Distribution of the Household Dietary Diversity Score (HDAM)

Most households (92%) or a total of 853 households had a high SDAM (consumption of 4 food groups or more on the day before the survey) and only 8% (74 households) of them had a low SDAM (consumption of less than 4 food groups on the day before the survey) (Fig. 3). Fig. 4 presents the average diversity score of the population of Abidjan. It appears that the average number of food groups consumed by households in this survey is 5.97. The distribution by number of food groups consumed indicates that 13.9% of individuals consumed more than 6 foods, 40.80% of individuals consumed 6 food groups and only 35% of individuals consumed less than 6 food groups food.

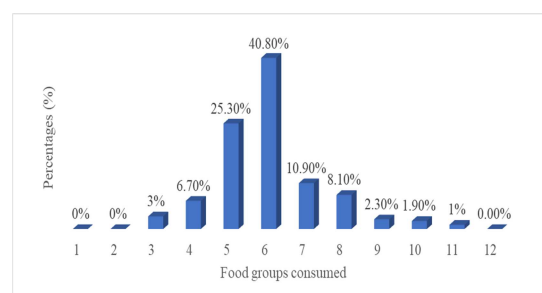


Fig. 4. Distribution of household dietary diversity in the Abidjan District

Table 1. Sociodemographic and economic characteristics of households

Features	Categories	Frequency (N=927)	Percentage (%)
Heads of households			
Sex	Male	561	60.50
	Feminine	366	39.50
Age	19-25	45	04.90
	26-59	618	66.70
	60 and over	264	28.40
Place of residence	Urban	780	84.15
	Rural	147	15.85
Marital status	Bride)	550	59.40
	Divorced/Separated	23	02.47
	Widower widow	32	03.46
	Bachelor	322	34.63
Ethnic group	Akan	440	47.46
	Krou	79	08.52
	Northern Mande	226	24.38
	Southern Mande	80	08.63
	Voltaic (Gur)	57	06.15
	Non-Ivorian population	45	04.85
Educational level	Unschoolled	307	33.17
	Traditional teaching	28	02.97
	Primary	124	13.36
	Secondary	275	29.69
	Superior	193	20.79
Professional status	Frame (high/medium/single)	206	22.27
	Self-employed	468	50.49
	Housewives	4	04.95
	Unemployed/retired	206	22.27
Household water source	Faucet	803	86.63
	Well	23	02.47
	Mineral water	101	10.89

Table 2. Consumption profile of typical groups in the Abidjan District

Infants (0 to 6 months)	Children (7 months to 9 years)	Teenagers (10 to 17 years old)	Youth (18 to 25 years old)	Adults (26 to 59 years old)	The elderly (60 and over)
Cereals	Cereals	Cereals	Cereals	Cereals	Cereals
Sweets	Sweets	Sweets	Sweets	Sweets	Sweets
Milks and Dairy Products	Milks and Dairy Products	Milks and Dairy Products	Milks and Dairy Products	Milks and Dairy Products	Milks and Dairy Products
	Spices/condiments	Spices, condiments, Drinks	Spices, condiments, Drinks	Spices, condiments, Drinks	Spices, condiments, Drinks
	Oil/fat/Butter	Oil/fat/Butter	Oil/fat/Butter	Oil/fat/Butter	Oil/fat/Butter
	Meat/offal	Meat/offal	Meat/offal	Meat/offal	Meat/offal
	Pisces	Pisces	Pisces	Pisces	Pisces
	Vegetables	Vegetables	Vegetables	Vegetables	Vegetables
	Roots and tubers	Roots and tubers	Roots and tubers	Roots and tubers	Roots and tubers
	Eggs	Eggs	Eggs	Eggs	Eggs
	Legumes/Nuts	Legumes/Nuts	Legumes/Nuts	Legumes/Nuts	Legumes/Nuts
	Fruits	Fruits	Fruits	Fruits	Fruits

Dietary profile of population consumers

Table 2 presents the food consumption profile of typical population groups in the Abidjan District. These different food groups define the dietary profile of consumers. The staple foods for all households are generally cereals (rice, bread and donuts) as well as root tubers “attiéké”, “ placali ”, “alloco” and “foutou”).

Discussion

The objective of this research was to evaluate food consumption and establish the dietary profiles of consumers within the Abidjan District.

Socio-demographic characteristics indicate that households are mainly headed by men (60.50%) compared to 39.50% by women. On average,

households are made up of 4 members. The average age of household heads is 32.80 ± 11.17 years; 47.46% belonged to the AKAN ethnic group, 63.84% were educated and 50.49% were self-employed. These results are similar to those observed in the General Population and Housing Census (RGPH) (INS, 2022). A proportion of 39.50% of households are headed by women. This can be explained by the dissolution of a marriage or the disappearance of a husband who makes the woman head of the household, often in the absence of male adults, and therefore in a single-parent family. In terms of the distribution of the frequency of consumption of the different food groups, it appears in this study that almost all of the respondents had consumed almost all the food groups the day before the survey. These results represent the food profile of the population of the Abidjan District. Cereals (rice), roots and tubers (cassava) constitute the basis of the diet of the households surveyed. The classic consumption model is therefore based on the complementarity that exists between these two commodities. The preponderant presence of cereals in the diets of Ivorian households is explained by the fact that cereals are at the heart of food sovereignty in West Africa, more precisely in Ivory Coast. This consumption of cereals was also confirmed by the work of Macauley and Ramadjita which showed that cereals such as sorghum, millet, wheat, corn and rice are essential basic foods for the majority of the population. from Senegal (Macauley and Ramadjita, 2015).

The groups of other vegetables (eggplant, okra, tomato, onion, etc.) and dark green leafy vegetables are the vegetables generally used as an ingredient in making sauces to accompany basic foods. For the vast majority of households, they prepare their dishes with oil/fat/butter as well as spices/condiments (pepper, salt, broth). Furthermore, the fish and seafood group represents the primary source of animal protein for these urban populations. In fact, fish are easy to access and available to all budgets. This fish consumption is also highlighted by the results of a survey carried out by the Ocean World Academy of Japan (OWAJ) in 2016. According to Shiraiishi *et al.* (2015), the consumption of fishery products in Côte

d'Ivoire is constantly increasing each year. The analysis of the frequency of food consumption made it possible to identify the foods that were rarely consumed and the most used by the population. The 16 food groups are consumed at relatively varied frequencies.

The household food consumption score was acceptable (81.75%). It follows that the food consumption score reflects access to food and food consumption at the household level. This result is lower than that found by ENSAS in February 2016 in Senegal which shows that 83.1% of Senegalese households have acceptable food consumption (ENSAS, 2016). The average dietary diversity score of the Ivorian population is 5.97. This average dietary diversity score for the Ivorian population means that on average, individuals consume a relatively limited variety of different foods. These individuals consumed more than four different food groups in the 24 hours preceding the survey. The dietary profile of this group is composed of cereals, roots and tubers, fruits and vegetables, fish and seafood, oils and fats, sweets and spices, condiments, drinks. This result is consistent with that of Béhibolo *et al.* 2018 with an average of 5.87 and the PAM and MINADER where the surveyed population expresses satisfactory dietary diversity which is 5.79 (PAM & MINADER, 2020). Because the population of the city of Abidjan has a more diversified diet. According to the WHO classification, the populations of the city of Abidjan have a stunting value of less than 20%, therefore considered acceptable (CNN, 2015). Of course, having a higher dietary diversity does not guarantee that micronutrient needs will be met if the quantity of these foods taken is very low compared to dietary recommendations.

But we must recognize that low dietary diversity has a negative impact on health by promoting the double burden of malnutrition. 8% of households had a low SDAM. This low dietary diversity in these areas is due to problems of availability, accessibility and attachment to food customs which are elements that can weaken dietary diversity.

Conclusion

The objective of this study was to evaluate food consumption and establish typical consumer profiles within the Ivorian population. The majority of households were headed by men (60.50%). Most of the households surveyed have acceptable consumption and dietary diversity. However, some households have poor and limited food consumption. Analysis of the results shows that the individual dietary diversity score is on average 5.97. The staple foods for all households are generally cereals such as rice and bread as well as root and tuber crops such as “attiéké”, “placali ” and “foutou”). Given that food occupies a central place in Ivorian culture, further work concerning the eating habits and potential pathological profiles of the Ivorian population must be carried out in urban and rural areas in order to better monitor the quality of food and promote optimal health both physically and psychologically in Côte d'Ivoire.

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