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Article

Urban food availability and consumption in Grand Lomé, Togo: A household perception analysis

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Abstract: Introduction: Food well-being of the population is one of the priorities of the Togolese government, which relies on the agricultural investment and food security Programme to increase national food production. In addition, the country relies on food imports to make up the shortfall. At the same time undernourishment and malnutrition remain high among the country's population. This research analyzes food supply and its implications for household consumption in Grand Lomé, Togo. **[**Methods**]** The methodology used documents, a survey of 963 heads of household randomly sampled households and semi-structured interviews with 10 households and with Togolese food safety agency (ANSAT). Quantitative data were processed and analyzed using Excel spreadsheets *R* and *R*-Studio, while content analysis was applied to the verbal applied to the verbal statements collected. **Results:** Firstly, the results show that domestic agricultural production contributed an average of 91% of food supply between 2014–2017. The deficit is made up by food imports, which rose from 13.5% in 2014 to 15.4% in 2017. This translated into an acceptable food energy consumption of 2337 Kcal/head/day in 2017. Secondly, 81% of respondents recognize a strong food presence at consumer markets, except that the chi-square test applied to the data at the 5% threshold shows (p-value $< 2.2 \times 10^{-16}$), indicates that this satisfaction is a function of place of residence. Despite this, persistent shortages affect more staple crops, livestock and dairy products, leading households to deprive themselves and buy food at affordable prices. Finally, we observe non-diversified diets marked by regular consumption of "cereals/legumes", vegetables and beverages to the detriment of "tubers/roots", "meat/fish", "fruit" and "dairy products". **Conclusion:** This research shows that food supply, although adequate, is not sufficient to ensure balanced, nutritious and culturally appropriate food consumption by urban households. **Recommendations:** To meet these challenges, the central government, in collaboration with urban communes and consumer advocates, must mobilize resources to create urban agricultural farms, strengthen food protection systems, distribute staple products directly to households and limit the importation of food that is hazardous to health.

Keywords: food; consumption; availability; Grand Lomé, Togo

1. Introduction

Food availability remains a fundamental dimension in guaranteeing food security in a given territory. According to the Food and Agriculture Organization of the United Nations (FAO), it refers to the quantities of food products (whether raw, processed or semi-processed, including beverages) available at retail level for consumption by a country's population during a reference period (FAOSTAT, 2019). In fact, food availability exists when food supply (which is the sum of domestic food production and imports) enables eaters to satisfy their energy requirements and food preferences

for a healthy and fulfilling life (FAO, 1996). This can be physically observed from the presence or scarcity of food products on the various consumer markets, and is measured by the FAO Food Balance Sheet method, which calculates the domestic and imported food supply expressed in kilocalories (kcal) per person per day over a reference period. Availability can also be obtained from household-level surveys, focusing on the acquisition of foodstuffs or the final use of what has been purchased (Conforti et al., 2017). The interests of food supply sufficiency range from satisfied, diversified and nutritious food consumption for consumers. On the other hand, the spatio-temporal irregularity of food supply due to climatic hazards or the deficiency of storage, transport and marketing infrastructures, negatively influences food prices, the acquisition of food on markets and therefore food consumption (Diallo et al., 2022). In this case, food choices are made on the basis of foodstuffs that are more available, cheaper and fairly priced for the end consumer.

In West Africa in general, daily energy availability per capita has risen sharply from 1945 kilocalories in 1980 to 2661 kilocalories in 2019 (FAOSTAT,2019). This evolution is explained by a satisfactory level of agricultural production, reinforced by an increase in international rice and wheat imports. However, alongside this overall caloric intake on which decision-makers focus, almost 110 million people in this region do not have a diet adequate to their nutritional needs: 58 million people are underweight, 22 million of whom live in cities; among the other 52 million overweight people, urban dwellers over the age of 15 dominate (van Wesenbeeck, 2018). Among the factors contributing to this double nutritional burden are low dietary diversity and widespread consumption of cheap but nutrient-poor imported starches (rice and wheat) (Allen and Heinrigs, 2016; Bricas et al., 2016).

At the same time, local staple crops, according to a joint study by the Organisation for Economic Cooperation and Development (OECD) and the FAO, are the main source of energy for more than 962 million people. They provide livelihoods for many small-scale farmers and also contribute to the nutritional security of populations (OECD and FAO, 2016). In particular, the production of root and tuber is concentrated in West Africa, where per capita consumption exceeds that of all cereal products (OECD and FAO, 2016), reflecting consumer preferences. These staples, processed and consumed in various forms (dough, porridge, couscous, French fries, fritters, patties), are increasingly appreciated and widely consumed in urban centers. But these local products are often more expensive than imported foodstuffs from countries that heavily subsidize their farmers (Bricas et al., 2016). Their availability remains limited in cities due to the negative impact of extreme climatic events on rain-fed crop productivity (Roudier et al., 2011). In addition, the dwindling connections between town and country due to the isolation of agricultural production basins, insufficient means of transport, the defective state of roads, as well as non-viable marketing channels (Djurfeldt, 2015; Nabagou and Kpotchou, 2024a), often prevent small farmers from accessing urban markets. Moreover, it has been shown that in sub-Saharan Africa, the adoption of high-input technologies and crop productivity are inversely proportional to the travel time required to reach urban centers (Dorosh, 2012). All these factors, which contribute to the complexity of exchanges between players in the food chain, lead to a decline in the supply of local products and therefore their low consumption in cities, where imported manufactured products of lesser

nutritional value are widely available (Djurfeldt, 2015; FAO et al., 2023; Moustier, 2017). Thus, certain food groups are more likely to be consumed in cities because they are either grown close to urban centers, or because of their affordable prices (Bricas et al., 2016; Lemeilleur et al., 2020; Moustier, 2017).

In Togo, apart from logistical factors, the instability of local food supplies is linked above all to the weakness of agricultural financing. According to the Ministère de l'Agriculture, de l'Elévage et de la Pêche (MAEP), the percentage of public resources invested in agriculture in Togo rose from an average of 5.5% between 2003–2007 to 7.4% during the 2008–2009 period; between 2010–2015, this percentage fell to 6.5%, representing a 3.5% deviation from the Maputo commitments, which require African states to allocate 10% of their budgets to the agricultural sector. Food processing remains the most neglected sector, all the more so as between 2011–2016, only 0.3% of bank credit was allocated to the agro-industrial sector, and this rate too had fallen to 0.2% in 2017. As a result, national food production is growing slowly. This situation gives rise to highly contrasted food availability, which varies according to the type of food. Average annual growth in crop production fell from 3.12% between 2002–2007 to 3.55% between 2010–2015. There was also a small increase in animal production, rising from 6.52% between 2002–2007 to 6.72% between 2010–2015 (MAEP, 2017). Nevertheless, over the last few decades, the implementation of the main food security policy (PNIASAN) has led to an improvement in agricultural production. With the exception of rice, harvests of other cereals and legumes (corn, sorghum, beans, soybeans) have been declared surplus. Tuber and root crop production reached 2,235,296 tons, with increases of 2.52% for yams, 2.32% for sweet potatoes, 1.42% for cassava and 1.40% for taro. Fruit production reached 560,000 tons in 2017, while vegetable production rose from 21,687 tons to 37,215 tons between 2013 and 2017 (MAEP, 2017). This feat is still not enough to cover needs, so the shortfall is made up by imports. For example, 1,219,624 tons of food products will be imported into Togo in 2022, according to the Institut National de la Statistique et des Études Économiques et Démographiques (INSEED, 2022).

In order to guarantee sufficient and permanent food availability in the Grand Lomé, which is home to over 63% of Togo's urban population (INSEED, 2022), the State has put in place the policy of food protection. This mechanism, which only concerns cereal production, has been steered primarily by the National Food Security Agency (ANSAT) since 2008. This institution purchases and stocks cereals and pulses (maize, rice, sorghum, beans) from farmers' association. In the times of shortage, stocks are released onto the market to regulate prices and combat speculation. Nevertheless, the precarious food situation does not spare the Grand Lomé. Literature on food security in this conurbation points to gaps between needs and supply in terms of access to healthy, nutritious food products. These shortcomings are leading to price inflation for basic products. Between December and March 2018, the price of maize (2.5 kg), which varied between 400 and 500 FCFA, rose from 700 to 900 FCFA in the same period in 2023 ($1USD is equivalent to FCFA 600 X0F the currency of French-speaking West Africa). Beans, which remain the most widely consumed legume, will rise from 1200 to 2400 (2.5 kg) between 2018 and 2023. As for local rice, the average price per kilogram of unhusked rice rose by 20% over the period from 17 February to 29 February 2020, according to the Agricultural Statistics, IT and Documentation

Department (DSID). This high cost of local production is driving low-income urban households to turn more to imported commodities that are more available and affordable (Kpotchou, 2018; Lomet and Bricas, 2017) in a bid to escape hunger.

Yet, in a sustainability approach, food offers are called upon to be both sufficient, healthy, nutritious and culturally acceptable (FOA, 2019) to ensure consumer well-being. To promote "sustainable diets" in urban areas, it is important to understand the characteristics of food supply and consumption, and the needs of urban dwellers. Despite this, few studies have been carried out on the availability of food in urban areas in Togo. The baseline study carried out by the DSID in 2019 based on the FAO's Food Balance Sheet approach concludes that food availability is sufficient, translating into acceptable food energy consumption. However, nutritional pathologies are on the rise in Togo. The 2023 World Hunger Index reveals the seriousness of hunger in Togo, ranking it 88th out of 116 countries, with 21.1% of people undernourished compared with only 16.1% in 2021 (Von Grebmer et al., 2023). The recent Multiple Indicator Cluster Survey (MICS 6) reveals that the prevalence of chronic malnutrition in children under 5 reached 23.8% while wasting rose from 4.8% in 2010 to 6.5% in 2014. Grand Lomé has the highest number of people living with chronic diseases such as hypertension, type 2 diabetes, overweight and obesity (INSEED, 2017). Faced with these findings, I wonder about the real impact of food availability on the consumption of urban households that do not produce their own food and are more dependent on the market for food. Clearly, this conclusion on food availability (DSID, 2019), does not fully reflect the realities experienced by urban consumers, particularly those in Grand Lomé. Moreover, according to several studies, Food Balance Sheet approach cannot really measure food consumption but rather food availability. Yet, availability does not describe real changes in food consumption especially as not all households have equitable access to food availability (Ambagna and Dury, 2016; Deaton and Drèze, 2009; de Haen et al., 2011). Hence the importance of this work which, through a household perception survey, aims primarily to analyze the impact of food offers on household consumption in Grand Lomé, Togo.

Specifically, the paper aims to:

- determine the current state of food supplies and the resulting consumption of food energy;
- assess urban dwellers' perceptions of the availability of food products on consumer markets in Grand Lomé;
- measure household consumption levels in Grand Lomé according to food groups.

2. Materials and methods

2.1. Area of study

The research takes place in Grand Lomé, the capital of Togo, located between longitudes 1°00′ and 1°50′ and latitudes 6°40′ and 6°10′ North. Grand Lomé is one of the largest cities in the Economic Community of West African States (ECOWAS) (**Figure 1**). The city covers an area of 90 km^2 and is bordered to the south by the Atlantic Ocean, to the north by the Zio and Avé prefectures, to the east by the prefecture of Lacs and to the west by the Aflao-Ghana border. It is subdivided into two (02) prefectures (Golfe and Agoè-Nyivé) and comprises thirteen (13) communes

(**Figure 1**). The territory enjoys a Guinean-type climate with two rainy seasons, average annual cumulative rainfall of between 800 and 900 mm/year and relative humidity ranging from 80–90%. However, agriculture is disappearing in this city where the urbanized area is growing faster than the urban population (Kanda et al., 2017). This situation considerably reduces food production and therefore makes the city dependent on imports. Grand Lomé remains Togo's most populous city with a galloping demography. Its population, which was 1,477,660 in 2010, almost double by 2022 to 2,188,376 (INSEED, 2022). This macrocephaly is the result of its extreme attractiveness due to its potential in terms of port, airport and university infrastructures as well as major vocational training schools. The Harmonized Survey of Household Living Conditions (EHCVM) shows that inequalities in poverty are more marked in urban areas (0.374) than in rural areas (0.331). Poverty particularly affects 12.5% of households in Grand Lomé while 87.9% of the city's population derive their livelihood from informal activities (small businesses, handicrafts, motorcycle cabs, etc.) which generate less cash income to cope with social and economic shocks. Thus, the average annual food expenditure per household in this city is estimated at just 349,290 FCFA, equivalent to $580.29 USD (INSEED, 2018).

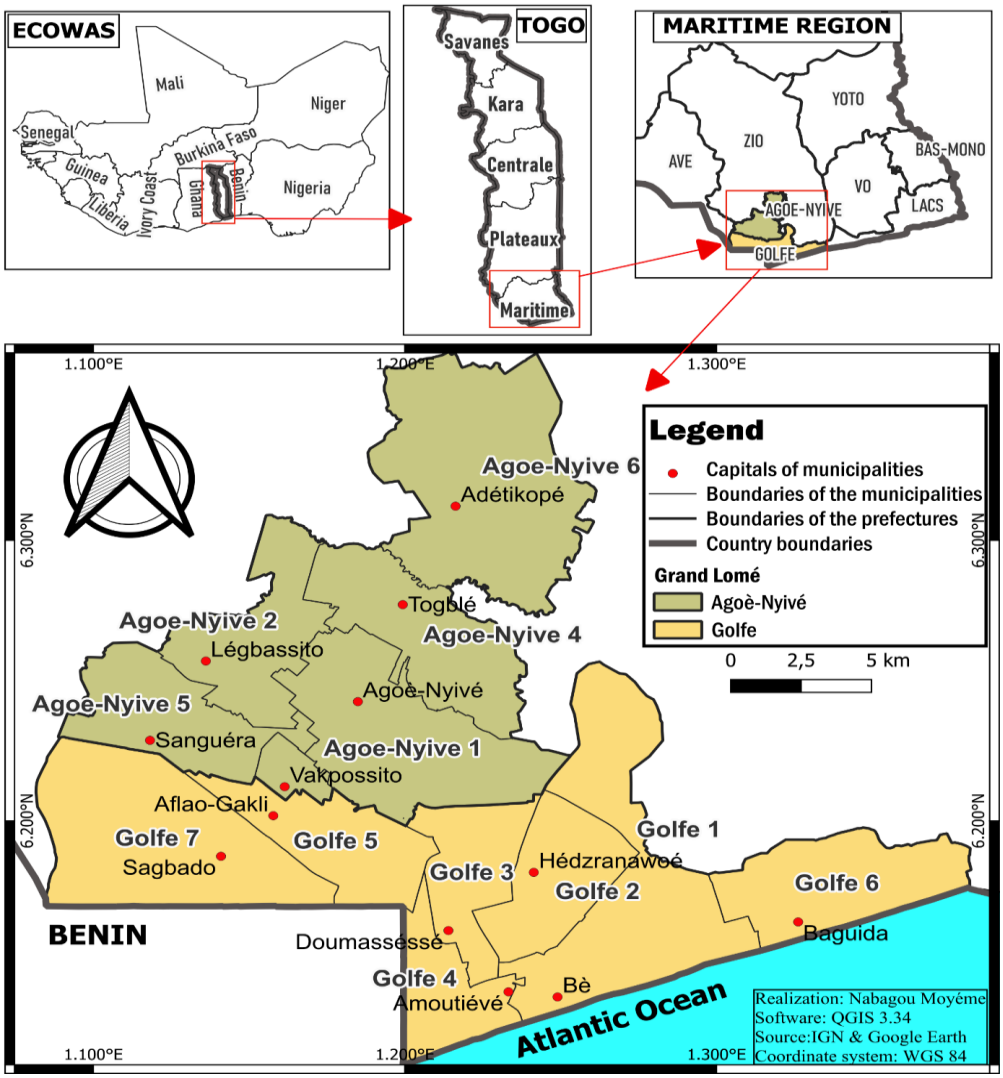

Figure 1. Map of Grand Lomé showing its prefectures and communes.

2.2. Data collection and processing

A combination of quantitative and qualitative data collection methods was used to gather the information needed to achieve the objectives of this study. The survey population consisted of consumers (heads of household) in Grand Lomé and institutions in charge of food and nutritional security.

2.2.1. Quantitative survey

Sampling

The quantitative survey designed to gather consumers' views on food offers concerned only heads of households in Greater Lomé. This choice of heads of household is explained by the fact that they incur expenses to feed the family. As a result, they have more information about household food consumption. Heads of household were selected for interview using random sampling. The sample size was determined using Daniel Schwartz's statistical formula, presented as follows: let "n" be the sample size:

$$n = \frac{[(z_a)^2 \times P(1-P)]}{d^2}$$

With Z_a: deviation set at 1.96 corresponding to a confidence level of 95%; *d*: margin of error set at 6% and *P*: proportion of households per commune.

Out of a total of 533,930 households in Grand Lomé, 963 households were surveyed in the 13 communes of Grand Lomé. The number of respondents per urban commune was calculated using data from the 2022 Fifth General Census of Population and Housing. The breakdown of respondents is shown in the **Table 1** below:

Table 1. Distribution of respondents by commune in Grand Lomé.

Commune	Number of households	Number of households surveyed	Proportion (%)
Agoè-Nyivé 1	77,379	132	14
Agoè-Nyivé 2	31,260	59	6
Agoè-Nyivé 3	11,599	23	2
Agoè-Nyivé 4	37,666	70	7
Agoè-Nyivé 5	30,511	57	6
Agoè-Nyivé 6	26,877	51	5
Golfe 1	85,744	144	16
Golfe 2	33,208	62	6
Golfe 3	12,870	25	2
Golfe 4	38,010	71	7
Golfe 5	41,642	77	8
Golfe 6	44,283	81	8
Golfe 7	62,881	111	12
Total	533,930	963	100

Questionnaire design

The questionnaire is composed of several types of question and is structured into three main sections: Section 1 deals with the identification of respondents' socio-

demographic characteristics; Section 2 concerns the assessment of household perceptions of food availability, and Section 3 focuses on the measurement of household food group consumption levels.

The questions designed to measure consumption of the various food groups were adapted using the Food and Nutrition Technical Assistance (FANTA) model. This is a tool developed by the United States Agency for International Development (USAID) and widely used to collect data on household food consumption in developing countries. It is used to determine the level of food insecurity based on the frequency of consumption by food group over a given period. A 7-day consumption recall period recommended by FAO (2018) was adopted in this research. Otherwise, respondents were asked to recall the number of different food groups consumed in their household during the week preceding the survey. The choice of this tool lies in its ability to inform and guide policies aimed at strengthening household food and nutrition security. The following **Table 2** illustrates the criteria used to measure food consumption in Grand Lomé.

Table 2. Criteria for measuring food consumption using the FANTA method.

	Frequency of consumption/week	**Appreciation**
Food group	Never = less than 1	Non-consumption
	Rarely = 1 to 2	Low consumption
	Sometimes = 3 to 4	Medium consumption
	Often = 4 to 5	High consumption

Source: FANTA Project (2007), adapted by the authors.

In all, the questionnaire was administered to 963 households in 65 neighborhoods with 5 neighborhoods per municipality. The choice of individuals to administer the questionnaire in each commune was voluntary. In other words, the interviewers entered the houses to interview the heads of household who were willing to listen to the interviewer. Indirect administration (face-to-face) was preferred and was carried out by a team of seventeen (17) people, including fourteen (14) interviewers, two (02) supervisors and one (01) coordinator. Data collection took place from August 05 to September 25, 2022 in Grand Lomé.

2.2.2. Qualitative survey

Documentary research

Documentary research was carried out at the library of the Université de Lomé, at the documentation center of Togo's National Food Safety Agency (ANSAT), and on scientific information platforms such as Web of Science and Google Scholar. Thematic and selective reading enabled consultation of books, scientific articles and study reports relating to food security issues in urban areas. Information on household living conditions as well as on agriculture and food supply was drawn from the main national surveys and studies.

Semi-structured interviews

The interviews concerned only two types of stakeholders: households and ANSAT. Two interview guides were drawn up according to the information sought

from each type of stakeholder. The first was used to interview 13 heads of household, one from each urban commune. The latter, made up of 8 women and 5 men, was chosen on a voluntary basis. Women were more available than men. These 13 interviewees, met in their respective places of residence, were interviewed about the characteristics of food offers, purchasing patterns and food consumption, as well as views on food governance in Grand Lomé. The second guide provided an opportunity for discussion with resource people from ANSAT. This public institution was chosen because of its mission to protect staple foods, in particular local cereals such as corn, sorghum, rice and beans. The interviews took place between 10–30 October 2022.

2.2.3. Data processing and analysis

The map of the research area was drawn up by the authors on the basis of the shapefile of Togo's common geographic reference system. Microsoft Excel was used to organize the quantitative data. The information was analyzed using R-Studio software following the pursued objectives. Certain accuracies were achieved through Chi-square and interdependence tests between variables. The content analysis applied to the raw empirical data collected through the interviews was based on the similarity and regularity of the respondents' statements. These verbal statements were synthesized and the essential ideas retained.

3. Results

3.1. Status report on food supply and energy availability in Togo

Majority of food consumed in Grand Lomé comes from the hinterland (national production) and imports from Togo. The following **Table 3**, extracted from the results of the Food Reports of Togo, presents the inventory of offers in different food products. In general, the results highlight that food supply is sufficient enough to meet the needs of all Togolese people.

Table 3. Food supply trends between 2014 and 2017 in Togo.

Food self-sufficiency rate (%)				
Food group	2014	2015	2016	2017
Overall total	96	89.6	89.3	88
Vegetable products	97.86	91.34	91.12	89.55
Animal products	71.68	64.96	70.51	74.39
Fish products	20.8	22.4	26.2	25.2
Food Import Dependency Rate				
Overall total	13.5	13.4	14.1	15.4
Vegetable products	11.70	11.35	12.3	13.63
Animal products	40.67	49.23	44.71	42.74
Fish products	77.5	77.9	73.8	74.8

Source: DSID, 2019.

According to the data in **Table 1**, the general level of the Food Self-Sufficiency Rate is gradually decreasing, going from 96% in 2014 to 88% in 2017. We also see that plant products which are largely produced locally (national level), decreased from

97.86% in 2014 to 89.55% in 2017. The share of imports in this food availability is low but not negligible. Unlike domestic agricultural production which is declining, the overall total of imports has rather increased (from 13.5% in 2014 to 15.4% in 2017). Food deficit is more accentuated for fishery products with import dependency rates increasing from 73.8% in 2016 to 74.8% in 2017. Domestic agricultural production thus contributed on average to 91% of food availability between 2014–2017. The consumption of food energy resulting from these availabilities can be read in the **Figure 2** below.

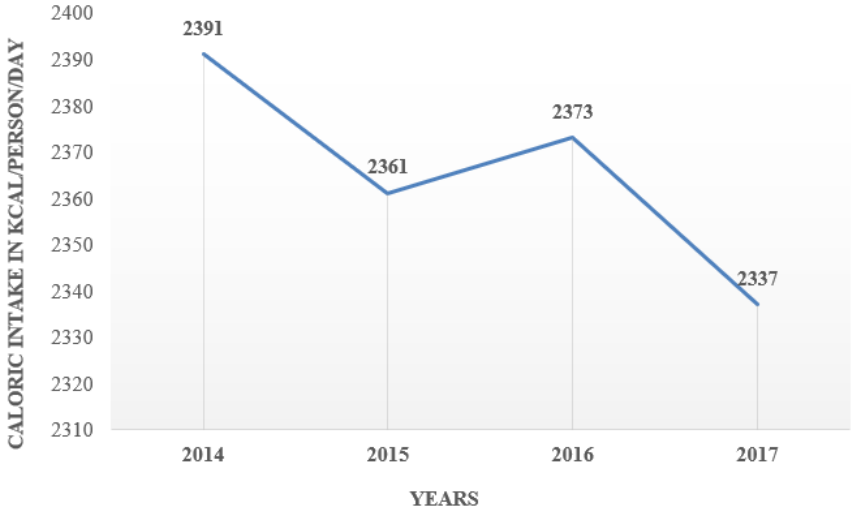

Figure 2. Change in caloric intake between 2014 and 2017.
Source: DSID, 2019.

Despite sufficient food availability (**Table 3**), we observe a gradual decline in calorific consumption going from 2391 Kcal/head/day in 2014 to 2237 Kcal/head/day in 2017. Nevertheless, this result remains acceptable because exceeding the caloric threshold alert of the Permanent Interstate Committee for the Fight against Drought in the Sahel (CILSS) which is 2100 Kcal per head per day (regional standard). How is this food availability perceived by households in Grand Lomé?

3.2. Urban dwellers' perception of food availability on the markets of Grand Lomé

3.2.1. Presentation of individuals surveyed

At the end of the surveys, out of a total of 963 heads of households surveyed, there was a predominance of women (57.52% women compared to 42.48% for men). Since the choice of individuals to administer the questionnaire was made voluntarily, this predominance of women in the sample means that they cooperated more with the investigators. This great willingness of respondents to listen to the investigators was also more noted in the municipalities of Golfe 1 (10.5%) and Agoé-Nyivé1 (9.5%) where we observed a high number of respondents. Furthermore, we observe a predominance of artisans (31.04%) and traders (22.03%), the majority of whom work in informal activities in Africa which bring in little monetary income. On the other hand, there are many individuals who have received formal education, led by respondents with a secondary level (37.92%), followed by those who have completed

higher education (28.71%). The following **Table 4** better illustrates the identity of the respondents.

Table 4. Socio-demographic characteristics of the respondents.

Indicators	Proportion (%)
Gender	
Female	57.52
Male	42.48
Municipality of residence	
Agoè-Nyivé 1	9.5
Agoè-Nyivé 2	6.6
Agoè-Nyivé 3	6.6
Agoè-Nyivé 4	6.6
Agoè-Nyivé 5	7.2
Agoè-Nyivé 6	6.6
Golfe1	10.5
Golfe 2	8.2
Golfe 3	8.4
Golfe 4	8.9
Golfe 5	7.5
Golfe 6	6.6
Golfe 7	7
Profession	
Self-employed	6.25
Craftsman	31.04
Trader	22.03
Student	14.30
Retired	3.50
Employee	17.58
Other	5.30
Level of education	
Not educated	19.18
Education through literacy courses	2.33
Primary	11.86
Secondary	37.92
University	28.71

Source: field survey, August–September 2022.

3.2.2. Correlation between food availability and area of residence of respondents

The market plays a crucial role in food supply of the city of Grand Lomé. Thus, the sufficient presence of food products in food stores partly determines food security of city dwellers. Based on consumer views, this section determines an overview of

food availability. Overall, we can see in **Figure 3** below that households in Grand Lomé are less worried about food availability problems.

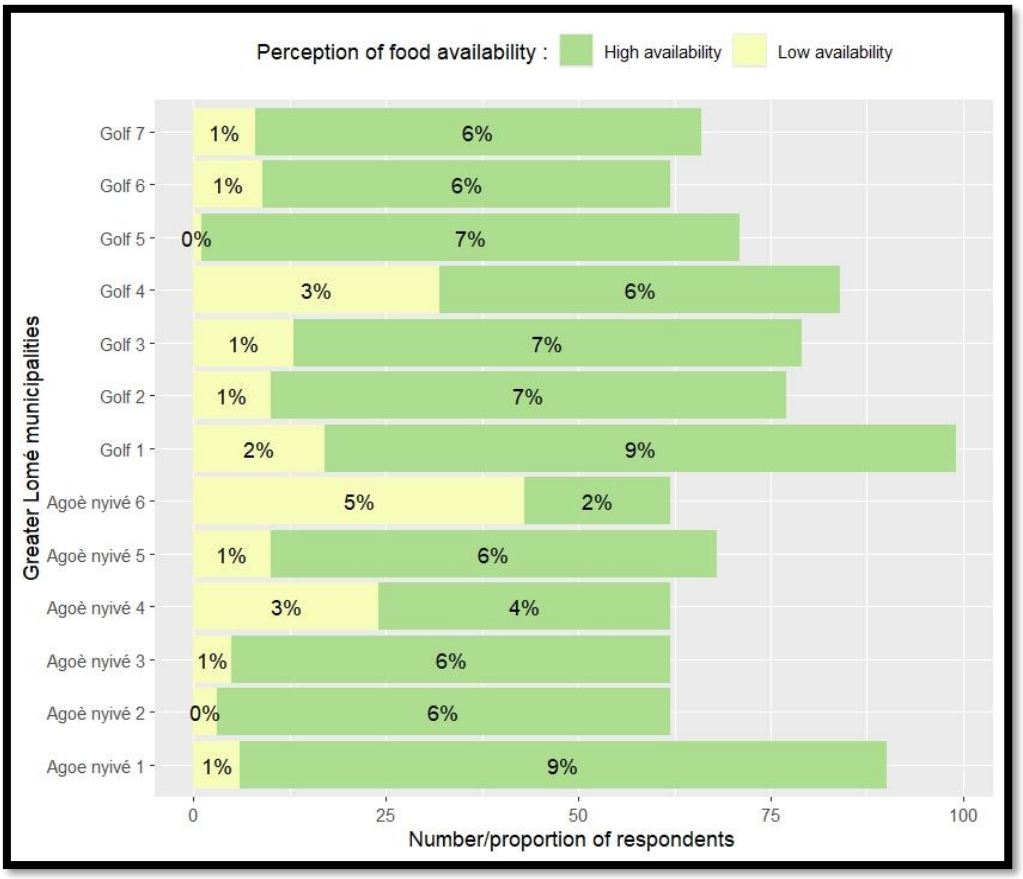

Figure 3. Assessment of food availability depending on the area of residence in Grand Lomé.

Analysis of **Figure 3** shows that a large proportion of respondents (81%), regardless of their area of residence, recognize a high level of food availability on the markets in Grand Lomé. However, the difference observed in the respondents' opinions is highly significant according to the area of residence, as the chi2 test applied to the data at the 5% threshold shows p-value < 2.2×10^{-16}; this p-value in no way allows us to accept the H0 hypothesis. In particular, it is in the commune of Agoè-Nyvè 6 that people complain most about low food availability. This low food availability may be linked to the fact that the neighborhoods in which they live do not offer enough suitable food outlets. In this case, the limited availability of food in certain neighborhoods would be the result of the failure of city-wide food distribution systems. If the majority of people surveyed believe that food is physically available in markets, are they all sufficient to maintain an adequate diet?

3.2.3. Perceptions of food shortage in Grand Lomé

Although most people recognize the existence of food availability, food shortage is also part of everyday household life in Grand Lomé. Responses to a multiple-choice question aimed at identifying food groups experiencing seasonal shortages show that food availability varies by food group. Foods most affected by shortage can be seen in **Figure 4** below:

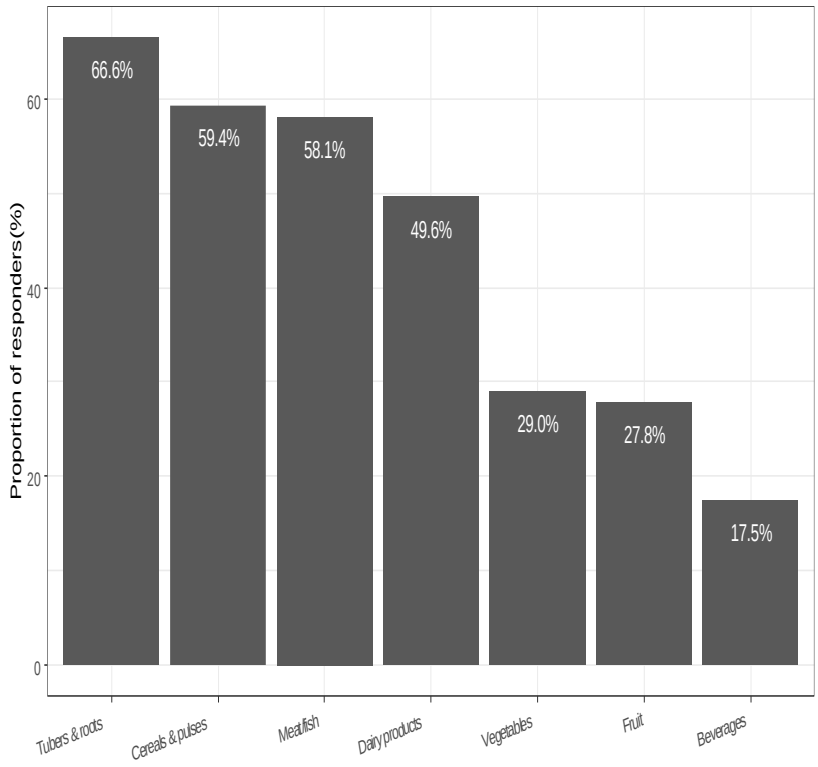

Figure 4. Perception of the most insufficient foods in Grand Lomé.

According to the data, the largest number of consumers (66.6%) indicate that "tubers/roots" are most affected by shortages. Next come "cereals/legumes" and "meat/fish", with 59.4% and 58.1% of respondents respectively confirming instability. Dairy products occupy the fourth place with 49.6% of households. Vegetables and fruit have average availability, with 29% and 27.8% of households respectively confirming this. Finally, "beverages", with only 17.5% of responses, have a high availability compared to the other food groups. In fact, given that plant products are sufficiently produced locally (**Table 3**), we should be seeing positive perceptions of the high availability of basic products. However, the opposite is true. As a result, the limited presence of the main energy foods (tuber/root, cereal/legume, meat/fish) on markets may reflect their lower consumption compared to other food groups. Similarly, with a self-sufficiency rate in animal products of 74.39% in 2017 (**Table 3**), the supply of "meat/fish" is far from meeting the demand of urban consumers. On the other hand, the average availability of fruit and vegetables may lead city dwellers to consume more of them while the wide availability of "beverages" may favor their high affordability, and thus create public health problems. What impact do these differences in food availability have on the consumption of each food group?

3.3. Measuring consumption by food group

This section measures the frequency of consumption of each food group during the seven days preceding the survey. For purposes of comparison, respondents' responses on the consumption of each food have been grouped together in **Figure 5** below. In general, the information indicates a wide disparity in food consumption.

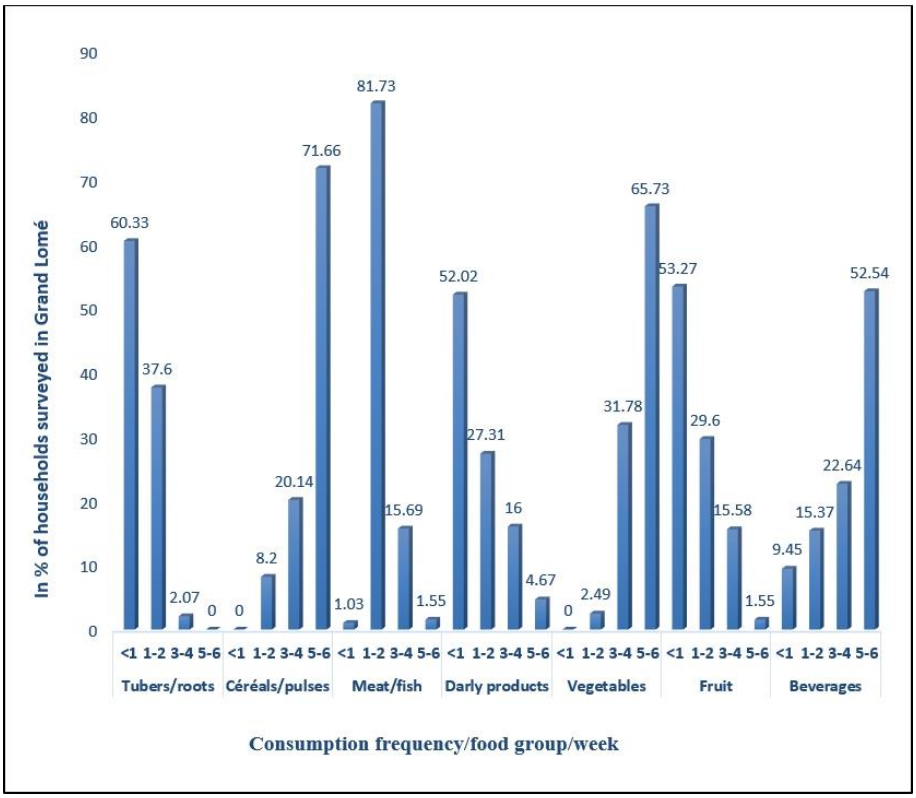

Figure 5. Household consumption of food groups/week.

According to **Figure 5**, foods that have not been eaten at all by more than half the sample (< 1 meal) during the week preceding the survey were tubers/roots (60.33%), dairy products (52.02%) and fruit (53.27%). Foods with low consumption (between 1 and 2 intakes per week) are firstly "meat/fish" with 81.73% of respondents, followed by "fruit" (29.6%) and finally "dairy products" with 27.31% of respondents. Foods with the highest consumption (between 5 and 6 meals a week) were cereals/legumes, vegetables and beverages, with 71.66%, 65.73% and 52.57% of respondents respectively. Indeed, the low consumption of "tubers/roots", which are typically local products, can be explained by the fact that this food group suffers more from shortages than "cereals/legumes" (**Figure 4**). Furthermore, this difference in consumption between staple products can also be explained by the fact that cereals most consumed in urban Togo (rice, wheat) are largely imported. However, imported foodstuffs are readily available and therefore affordable for low-income households which make up more than half of our quantitative survey sample (53.07% of craftsmen and shopkeepers). "Meat/fish" and "dairy" groups were also perceived as insufficient by consumers (**Figure 4**). This confirms the fact that many households consumed them at low levels (**Figure 5**). Although "vegetables" and "fruit" were indicated as having average availability, only "vegetables" were actually consumed. As for "beverages", the representation of their high availability (**Figure 4**) goes hand in hand with their high consumption at household level. In short, the majority of households have a low level of dietary diversity characterized by monotonous consumption of cereals, vegetables and beverages to the detriment of tubers/roots, meat/fish, dairy products and fruit. As a matter of fact, food consumption in Grand Lomé is based on economic

rationality (Boudon, 2009) where products that are more available and therefore less expensive are consumed to a much greater extent.

3.4. Results of individual semi-structured interviews

When interviewed on 12 October 2022 about the current status of its mission to protect staple food products, ANSAT claims to have made a satisfactory assessment and has enabled a stable availability of staple cereals on consumer markets in Grand Lomé. However, the institution points out that the cultivation of staple products is highly dependent on rainfall. This means that their availability is restricted at any given time of the year due to climate change. The management of tubers/roots in particular remains complex, requiring considerable investment in post-harvest infrastructures such as warehouses, cold stores and processing plants. However, according to ANSAT, the country does not have sufficient resources to invest in this area. It further states that food transportation to the city is not well organized and transport difficulties contribute to losses of perishable foodstuffs and therefore accentuating food shortages in the city.

The 13 consumers interviewed were unanimous on the fact that food is available in the markets. According to them, all you have to do is go to the market to find a variety of food products and everyone can buy what they need, provided they have the necessary financial means. This information supports the quantitative results on the general level of food availability (**Table 3**; **Figure 3**). However, 11 out of the 13 respondents deplore the fact that foodstuffs that are most available and therefore economically accessible to them are imported products that are not nutritious or tasty. Following this statement, purchasing patterns vary according to the availability of food products, and eaters adapt to shortage by depriving themselves or consuming less expensive and non-preferred foods. This qualitative result justifies food consumption patterns of households in Grand Lomé which are in line with the economic rationality observed earlier (**Figure 5**). The causes of the limited availability of local foods are divergent. Contrary to ANSAT's view that climatic variability and logistical failures are responsible for the limited availability of local food products in urban areas, more than half of consumers (7 out of 13) attribute this situation to agricultural underdevelopment in general and in particular to the lack of expanding cultivated land. Other respondents (8 out 13) converge with regard to grain management. According to them, not only are the authorities exporting grain, they are also failing to control traders who take food out of the country and those who hide some quantities produced with the intention of maximizing profit. In a nutshell, consumers have made it possible to detect food governance problems. It is clear that these consumers have figured out some of the obstacles of food disparities in Grand Lomé, and as a result, future initiatives to improve urban food availability have a strong chance of winning their support.

4. Discussion

The present research carried out in the city of Grand Lomé in Togo and which aimed at analyzing food supplies and their impact on household consumption. Has come up with the following results. Firstly, there has been a sufficient supply of food,

largely from domestic production. This leads to an acceptable consumption of food energy. However, more than a quarter of Togolese have caloric intakes below their energy requirements, while nutritional pathologies are on the rise in cities (INSEED, 2017; Von Grebmer et al., 2023). This observation remains general for West Africa in general where the strong increase in daily energy availability per capita cohabits with poor nutrition, dietary patterns lacking diversity as well as silent hunger (Bai et al., 2023). Precisely, malnutrition which reached 40% of the region's urban population, results in the growth of overweight and obesity problems that now affect 35% of the adult population living in cities (van Wesenbeeck, 2018).

In general, these food problems are not totally due to a lack of food since the second result of our research discovers that the perception of a strong food presence on the markets of Grand Lomé is dominant. This positive perception can be explained by the importance of domestic food production, i.e., 88% in 2017 (**Table 3**) and the strong dominance of informal food shops in this city (Nabagou and Kpotchou, 2024b). Indeed, the collection of agricultural produce from the countryside to Grand Lomé and small-scale food processing and distribution to households are daily activities of women. This represents 51.6% of the city's total population. In addition, given that the city is home to one of West Africa's most important port, the fluidity of food imports through this infrastructure can also promote high food availability in this urban area. Studies on this issue unanimously show that food availability problems are less prevalent in African cities (Karg et al., 2016; Lemeilleur et al., 2020; Theriault, 2018). This resilience stems from the work of small rural farmers, but also from traders who have their own information and collection network for foodstuffs that they transport to the cities (Janin, 2019). The contribution of imported products to food supply of African countries is not negligible. Although a low figure (i.e., 15.4% in 2017) is put forward in this research, the views of urban consumers in interviews support the hypothesis of the abundance of imported food on the markets of Grand Lomé to the detriment of local products as was the case in Mali and Morocco (Lemeilleur et al., 2020; Theriault, 2018). Moreover, the gradual increase in food imports from 7% in 1961 to 25% in 2011 in West Africa, Cameroon and Chad provides ample evidence of the importance of imports in maintaining food security in Africa (Bricas et al., 2016).

In reality, growing food insecurity in African cities stems from the lack of adequate food supplies to meet the needs of eaters. With regard to the level of supply, more than half of the respondents felt that "tubers/roots", "cereals/legumes", "meat/fish" and "dairy products" were insufficient. Less than 30% of the respondents indicated vegetables and fruit while less than 20% for beverages. This feeling of low availability of the first four food groups that is also shared by other studies, stems from underproduction, the seasonality of crops as well as weak processing (Bricas, 2016; Osei-Kwasi et al., 2021; Raheem, 2021). In Togo, apart from market gardening which takes place in the off-season, staple products are still dependent on rainfall. This means that local food supply cannot be adapted to demand. Tuber/root crops in particular (yams and manioc) are highly valued in urban areas but according to the department in charge of commodity protection, they require a fair amount of financial resources, which the State does not yet have. The same applies to livestock and dairy products, which are not protected in any way. Even the implementation of the cereal storage

mechanism does not seem to fully guarantee their sufficiency on the markets (**Figure 4**) because of reasons of climatic variability and market speculation faced by this product group. Similarly, the cereal exports highlighted in this study, and also reported in Azerbaijan, Singapore, Austria, Georgia and Hungary (Vasa et al., 2020), had also contributed to a negative impact on food security in these respective countries. Given the economic poverty of most urban households in Africa (INSEED, 2020; Millégo, 2020), these conjunctural and structural constraints contribute to the rise in the price of healthy food; and this may justify the practices of deprivation and recourse to cheaper foods reported not only in our research, but also in other urban contexts (Osei-Kwasi et al., 2021; Sankara et al., 2023).

Furthermore, a trend in urban food availability that emerges in the literature is confirmed in this research. Perishable products are very often grown close to cities. As a result, with few intermediaries and a strong relationship between producers and buyers, these perishable products are more available and therefore more affordable in the city. Less perishable products, on the other hand, come from far-flung areas with numerous intermediaries and various forms of contractualization between actors in the food chain which is why the latter very often suffers from shortages in cities (Djurfeldt, 2015; Lemeilleur et al., 2020; Moustier, 2017). The same observations made in Ghana, Nigeria, Uganda and Namibia revealed the limited presence of local cereals (millet, sorghum, local rice) on urban markets; and this situation led to a reduction in the consumption of these local crops in these respective cities (Raheem, 2021). The case of Grand Lomé also corroborates this observation, especially as “tubers/roots”, “cereals/legumes” and a large proportion of livestock products, which are less perishable and widely cultivated inland, are perceived by a large proportion of city dwellers as insufficient, compared with vegetables, fruit and beverages.

In a context where African public policies focus on increasing agricultural production to the detriment of infrastructure development and the organization of downstream value chains (FAO, 2013), this agricultural regionalization does not augur well for the availability of local food in cities. Indeed, given the fragility of marketing channels and the absence of reliable transport, storage and preservation infrastructures, transporting food over long distances is not only costly, but also generates significant food losses during the journey (Nabagou and kpotchou, 2024a). Especially when it comes to products such as tubers/roots, fruits and mass-consumption vegetables like tomatoes, which have no protection measures at national level, the lengthening of the food chain on the one hand lowers prices for small producers, and on the other raises food prices in urban centers (FAO, 2013). In the end, low-income urban consumers, who make up more than half of our sample, find it difficult to consume local produce. In fact, with growing urbanization marked by an increase in the number of poor people reaching around 46% in African cities (UN Habitat, 2010), the decline in the availability of domestic production in general (**Table 3**) is leading to a redefinition of eating habits in favor of imported industrial products from the long supply chain (Anderson, 2015; Bai et al., 2023; Kpotchou, 2018; Nabagou and Kpotchou, 2024a).

The role of local products in maintaining food security for African populations is well established. In the Kwazulu Natal province of South Africa, a significant correlation was detected between the consumption of traditional food and the degree of household food security (Ngidi, 2023). To this end, greater attention to local staple

production and many other crops produced locally and processed differently would guarantee healthy food consumption in African cities (Raheem, 2021; Theriault, 2018). Our study therefore highlights the importance of developing the production of foods (such as tubers and roots) that are part of people's culture. This remains an opportunity for job creation and development of the local food economy. Above all, with a resolve to relocate these basic productions close to cities, sustainability objectives can be achieved, notably the reduction of imported foods in favor of the promotion of local produce (Berton-Ofouémé, 2017). Alternative food models should also be promoted following the example of Intelligent Urban Agriculture (IUA) which, through circular metabolism, transforms household waste into compost for use in urban agricultural farms. This model, which has enabled a number of cities to achieve sustainable goals (Saci and Berezowska-Azzag, 2021), would also enable the city of Grand Lomé, which generates almost 800 tons of waste every day, to produce its own food locally and reduce its dependence. On the other hand, a subsidy granted particularly to farmers in domestic commodity chains (Hammoudi et al., 2015) will help to improve food availability in West Africa; and thus, lower food prices, which are 30% to 40% higher than in the rest of the world at equivalent levels of per capita income (Allen, 2017). Similarly, food security can be improved in Greater Lomé by building an efficient grain transport system and strengthening inter-regional cooperation, as was done in China's Yangtze River Economic Belt (Sadan and Amuda, 2024). As recommended for the tomato (Nabagou and Kpotchou, 2024a) and livestock (Kongue and Sokemawu, 2017) sectors, basic agricultural commodities, especially tubers/roots, whose production is concentrated in the north of the country, also need to be reorganized in order to shorten supply chains. Today, the growth in small-scale processing of soya into various by-products (soya milk, cheese, meat) throughout West African cities is an indicator of the low consumption of livestock products (Kpotchou, 2020). A project for the industrial processing of this legume, which is widely exported to Togo, will help fill the deficit in animal and dairy products observed in this study.

Finally, the consequence of these dietary disparities is regular consumption of "cereals/legumes", vegetables and beverages, to the detriment of "tubers/roots", "meat/fish", dairy products and fruit. From the previous result (**Figure 4**) and the interviews conducted, we understand that this difference in consumption is essentially linked to the level of availability of each offer, which thus influences food prices. Urban dwellers are therefore more inclined to engage in the acquisition and therefore, consumption of foodstuffs that are affordable to them, as has been the case in other urban studies (Bricas, 2016; Kpotchou, 2018; Osei-Kwasi et al., 2021; Theriault, 2018). On West African urban markets in general, it emerges that fruit, vegetables, animal products and dairy products are relatively expensive compared with staple foods (Allen, 2017; FAO et al., 2021; Herforth, 2020). These findings may partly justify the low consumption of these food groups in this research. On the other hand, it is important to qualify that not all staples are affordable and their prices vary according to their area of origin. In fact, local cereals (maize, sorghum, local rice, etc.) which face stiff competition from imported cereals (rice and wheat) are very expensive. As a result, these foreign staples dominate the starch ration of urban dwellers in Africa (Bricas, 2016). Thus, the high consumption of "cereals/legumes" to the detriment of "tubers/roots" (which are typically local crops) observed in our

research can be explained by the fact that imported cereals contribute to increasing the availability of this food group on the markets. Similarly, with urban and peri-urban agriculture being reduced to market gardening in Grand Lomé (Kanda et al., 2017), as has also been the case in African's major cities (Lemeilleur et al., 2020; Moustier, 2019), this may facilitate the good availability of vegetables and therefore their high consumption observed in our research.

On the other hand, there is also a tendency to replace the consumption of "fruits" with "drinks". Like vegetables, fruit cultivation (avocado, papaya, banana, citrus, pineapple) is in full swing in Togo and their main production areas are close to major urban centers (FOA, 2017). However, their availability is reduced for reasons of crop losses and massive export to the West and to other countries in the sub-region. In 2017 for example, out of a total production of 560,000 tons of fruit, losses reached 270,000 tons and 30,265 tons were exported (INSEED, 2022). Facing these shortcomings, people are flocking to all kinds of drinks (alcoholic, adulterated, energy, carbonated, sweetened and artificially sweetened), some of whose provenance escapes the authorities (Nguz and Kazia, 2016). With 35 centiliters of sweetened drink at 200 F CFA against a kilogram of pineapple or mango at 1000 F CFA in times of shortage, urban consumers prefer to turn to manufactured beverages at the risk of their health. Africa therefore finds itself in the paradoxical situation of exporting its natural fruits (sources of vitamins, minerals, fiber, antioxidants and energy), only to import beverages on a massive scale. Yet the contribution of these beverages to the resurgence of cardiovascular disease, overweight, obesity and diabetes is widely endorsed by the World Health Organization (WHO, 2017). It is imperative to regulate food imports in general and beverages in particular, whose dangerousness is approved by many scientists.

5. Conclusion and recommendations

The results of this research show, firstly, that the level of supply is sufficient to satisfy the needs of city dwellers. Secondly, the high level of food availability is recognized by the majority of the respondents although this perception is linked to the area of residence. However, food shortages persist, affecting more staple crops (notably tubers and roots), livestock products and dairy products. Finally, these disparities in availability influence household consumption, with high consumption of "cereals/legumes", "vegetables" and "beverages" at the expense of "tubers/roots", "meat/fish", "dairy products" and "fruit". Research shows that sufficient food supply alone cannot guarantee sustainable nutrition in cities. It is therefore imperative to ensure that food availability goes beyond quantitative targets in order to also meet qualitative needs. In other words, the configuration of food supplies must enable city dwellers, whatever their social position, to enjoy food consumption that is diversified, locally proximate, economically equitable and culturally acceptable. This is not yet the case in this research. Clearly, it is not possible to conclude that food consumption in Grand Lomé is sustainable given the fact that food availability does not meet sustainability objectives. To meet these challenges, the research proposes the following actions to urban actors (the State, local authorities and civil society).

- Develop policies to protect tubers/roots in the same way as local staple cereals;

- Strengthen institutional arrangements for the storage and control of cereal and fruit production to limit food outflow and massive exports;
- Promote urban farms for the production of staple foods (tubers, roots, corn, rice, beans) to increase their availability in Grand Lomé. The use of climate-smart techniques in these farms will enable the production of off-season foods;
- Revitalize food governance by developing strategies for the direct distribution of basic agricultural products to households at reduced cost, without going through the market;
- Adopt a policy of free circulation (zero-rating) of low-availability local products (tubers, roots, cereals, legumes, local livestock products and fruit); raise import taxes on high-availability foodstuffs (imported meat and dairy products, imported canned foods, alcoholic beverages and highly sweetened fruit).

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