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DIETARY DIVERSITY OF HOUSEHOLDS AND LEVELS OF FOOD SECURITY IN THE MUNICIPALITY OF ABOMEY-CALAVI

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ABSTRACT

Populations have access to a variety of foods, at more or less affordable costs, which condition different states of food security. The objective of this research is to analyze the diversity of household food consumption in order to identify food security levels in the commune of Abomey-Calavi.

The methodological approach adopted consisted of data collection, processing and analysis of the results. The survey was conducted among 442 households selected in the urban cores of each of the nine arrondissements of the Commune. The tools and materials used for the data collection consisted of the questionnaire, the interview guides, GPS and digital cameras. The results were analyzed using the Consolidated Food Security Indicator Approach (CARI).

The results show that cereals constitute the main daily diet for 99% of households. The food consumption score indicates three levels of household food consumption namely acceptable food consumption, borderline food consumption and poor food consumption which concentrate 54%, 27¨% and 19% of households respectively. The Food Security Index determined by the CARI approach allowed us to distinguish four levels of food vulnerability in Abomey - calavi: Food Security (42%), Borderline Food Security (30%), Moderate Food Insecurity (25%) and Severe Food Insecurity (3%).

Keywords: Abomey-calavi (Benin); Urbanization; Food Security; Foodkey Words: Abomey-calavi ; Urbanization ; Food Safety; Food.

1. INTRODUCTION

Around the world, countries are experiencing remarkable demographic and spatial growth. For T. Vigninou (2010, p.13), the growth of cities is part of a general movement of urbanization of our planet. According to T. R. G. Kadjègbin (2014, p.21), population growth has been identified by most local actors as the most important factor in vegetation degradation in sacred and community forests. For L. D. Ahomadikpohou (2015, p.13), it leads to an increase in food needs and leads to competition for space between agricultural, pastoral and forestry activities. The phenomenon of urbanization has consequences for several sectors of the economy. Among these, food supply is a very sensitive area, given not only its important role in meeting the food needs of urban households, but also the importance of the food budget in the consumption expenditure of these households. (E. C. Mitchikpèp.7)

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With a population density of 87.2 inhabitants/km², Benin's population is predominantly rural, however, 44% live in urban areas (AGVSA 2017, p. 10)

In Benin, the number of people exposed to malnutrition for a long time remains worrying. The diagnosis presented in SCRP (Growth Strategy for Poverty Reduction in Benin) reveals that nutritional insecurity is structural in Benin (CPRS, 2007; p. 28).

On average, 14.1% of Beninese households still have inadequate food consumption, including 2.4% poor food consumption. There are more households with inadequate consumption in rural areas (18.5%) than in urban areas (9.2%), (AGVSA, 2017, p. 31). Despite a slow but steady improvement in the global food security situation, the situation in sub-Saharan Africa remains of great concern. It is the most vulnerable region in terms of food security (L. D. Ahomadikpohou, 2015, p.16).

A tour of the literature, without distinction of disciplines, reveals that the authors in their research on food in Benin, and particularly in urban areas, have become more accentuated, either on the risks in terms of public health posed by the phenomenon; either on the interesting response it offers to the constraints of professional life; or also on the economic interest it offers as a sector of activity providing jobs (M. G. Aholou et al, 2019, p 353).

The municipality of Abomey-Calavi has experienced rapid urbanization in recent decades with a strong degradation of agricultural areas and an increase in agglomeration. Between 2002 and 2013, the area of plantations increased from 2,144 hectares to 1010 hectares, or 52% of the arable land transformed for the benefit of the agglomeration (C. M. E. Capo, 2016, p.53). A very varied and diversified food offer is offered to urban households in the municipality. This situation raises the problem of dietary diversity in improving household food security.

1.1 Research Methodology

The methodology adopted for this research includes: data collection and processing and analysis of the results.

1.1.1 Data collected

The data collected are demographic data from the National Institute of Statistics and Economic Analysis that made it possible to determine the sample surveyed and to see the evolution of the population from 1979 to 2013 and to make projections.

Data on household food consumption (necessary for analysis of frequency of consumption, food diversity and feeding times and locations of rationers); data on household economic vulnerability and data on asset depletion and compensation mechanisms applied are also collected from urban households in order to establish the state of food security in the Commune of Abomey-Calavi.

1.1. 2 Data collection techniques

To achieve the objectives, three data collection techniques were used: direct observation, questionnaire surveys and individual interviews. Direct observation made it possible to observe the growth of the population, the land use through the witnesses of residential relocations and the overcrowding of inhabitants and to apprehend the state of environmental degradation.

1.1.3 Sampling

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The sample method used is random selection. The households were selected from the urban centres of each of the nine districts of the commune. These households surveyed are those who have lived at least two years in the municipality of Abomey-Calavi.

The sample size was calculated using Daniel Schwartz's (1995) formula. It was determined on the basis of INSAE RGPH4 data according to the following formula: $\mathbf{X= Z\alpha\ 2\ x\ pq/i^2}$

- X= sample size; Zα = 1.96 reduced deviation corresponding to a α risk of 5%; I^2 margin of error which is equal to 0.05; p = n/N; with p = proportion of urban households by district.

A total of 442 households, 5 resource persons are surveyed.

1.1.4 Data Collection Tools and Materials

As part of investigations, several investigative tools are used. These are the interview guide administered to the structures andresource persons, a digitized questionnaire which made it possible to collect information from households and the observation guide. With regard to the equipment used, a digital camera for shooting, a GPS (Global Positioning System) camera for taking geographical coordinates and Android smartphone phones in which the household questionnaire was encoded were used.

1.1.5 Processing and analysis of results

The data collected were processed according to the methodology of the CARI approach. The Consolidated Food Security Indicator Approach (CARI; Consolidated approach to reporting food security indicators) was developed by WFP to address food security in all its dimensions. This approach allows food security indicators to be combined in a systematic and transparent manner with the aim of establishing an explicit classification of households. On the basis of CARI, each household surveyed is classified according to a composite food security index (Food Security Index) into four categories: Food Safety (SA), Food Safety LImitated (SAL), Food Safety (MIA) or Food Security (HAI).

The data processed with the STATA 15.1 and TABLEAU software are classified according to well-defined scores for each of the food security indices.

The classification algorithm takes into account the household's current food consumption and its potential to sustain its consumption in the future. As shown in Table I below, the food insecurity index results from the combination of the diversity and frequency of household food consumption over the past 7 days, non-food coping strategies over the past 30 days, and the household's share of spending on food.

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Table I: Global food security index in the Commune of Abomey-Calavi

Domain		Indicators	1	2	3	4
Current status	Food consumption	Food consumption score	Acceptable food consumption		Limit food consumption	Poor food consumption
adaptability	Economic vulnerability	Share of food expenditure	Less than 50% of spending on food	50% to 65% of spending on food	65% to 75% of spending on food	More than 75% of spending on food
	Asset depletion	Coping strategies	Stress strategies	Stress strategies	Crisis strategies	Emergency strategies
Food Security Index			Sécuritéalimentaire	Sécuritéalimentairelimite	Moderate food insecurity	Severe food insecurity

Source : WFP, 2018

Within the two domains (current status and survivability), the average of the indicator scores is calculated to establish the summarized indicators at the household level. The average of the summarized indicators is then calculated to establish the general classification of household food security.

The last row of the reporting table presents the overall results for the population as a single indicator: *the Food Security Index (FSI).* Table II below provides a description of the four categories of the food security index.

- ✓ Food Consumption Score (FCS)

It is the most widely used food security indicator. It represents dietary diversity and nutritional intake of households. The FCS is calculated by inspecting how often households consume food products from different food groups during a 7-day reference period.

Where

FormuleFCS = ∑xi * ai

- FCS Food Consumption Score
- xi Food consumption frequencies = number of days each food group was consumed in the past 7 days
- ai Weight of each food group

- ➢ The required data is collected according to the usual foodstuffs consumed;
- ➢ Foods are grouped into standard food groups to which weights have been assigned according to their nutritional value;

- ✓ Food vulnerability

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Household food consumption is defined according to the food consumption score (FCS). An SCA<21 corresponds to a poor food consumption, 21<SCA<35 for a limited food consumption and an SCA>35 for an acceptable food consumption. Inadequate food consumption corresponds to limited or poor food consumption.

Economic vulnerability is measured using the indicator 'share of food expenditure'. This indicator is based on the assumption that the larger the share of the budget devoted to food within a household's budget (relative to other goods/services consumed), the more economically vulnerable the household is. Data on food and non-food expenditure for the last thirty days prior to the day of the survey were collected to establish the share of food expenditure. The formula used is as follows:

$$\text{Part dépenses alimentaires} = \frac{\text{food\_monthly}}{\text{food\_monthlyfood\_monthly} + \text{nonfood1\_monthly} + \text{nonfood2\_monthly}}$$

Food monthly: the sum of food expenditure (cash and credit) plus the total value of food consumed that was not purchased.

Add up short-term non-food expenses (30 days); The variable 'nonfood1_monthly' is obtained.

3. Add up long-term non-food expenses (6 months), excluding 'savings'; Divide this by 6. The variable 'nonfood2_monthly' is obtained.

4. Divide 'food_monthly' by the total of the sum of 'food_monthly', 'nonfood1_monthly' and 'nonfood2_monthly'. The result obtained is the indicator 'share of food expenditure'.

- ✓ Survivability based on livelihoods / depletion of assets

The Livelihood-Based Survival Strategies indicator is calculated from a series of questions about households' experiences of livelihood stress, including asset depletion in the 30 days preceding the survey.

All strategies are classified into three general groups, including stress, crisis and emergency.

- Stress strategies, such as borrowing money or spending savings, indicate a reduced ability to cope with shocks in the future due to a decrease in resources or an increase in debt.
- Crisis strategies, such as the sale of productive goods, directly reduce future productivity, including human capital formation.
- Emergency strategies, such as selling land, affect future productivity but are more difficult to reverse or are more dramatic.

Households engaged in routine economic activities that do not include any of these strategies are considered food **secure** for this indicator.

2.PRESENTATION OF THE STUDY ENVIRONMENT

Figure 1 shows the geographical location of the municipality.

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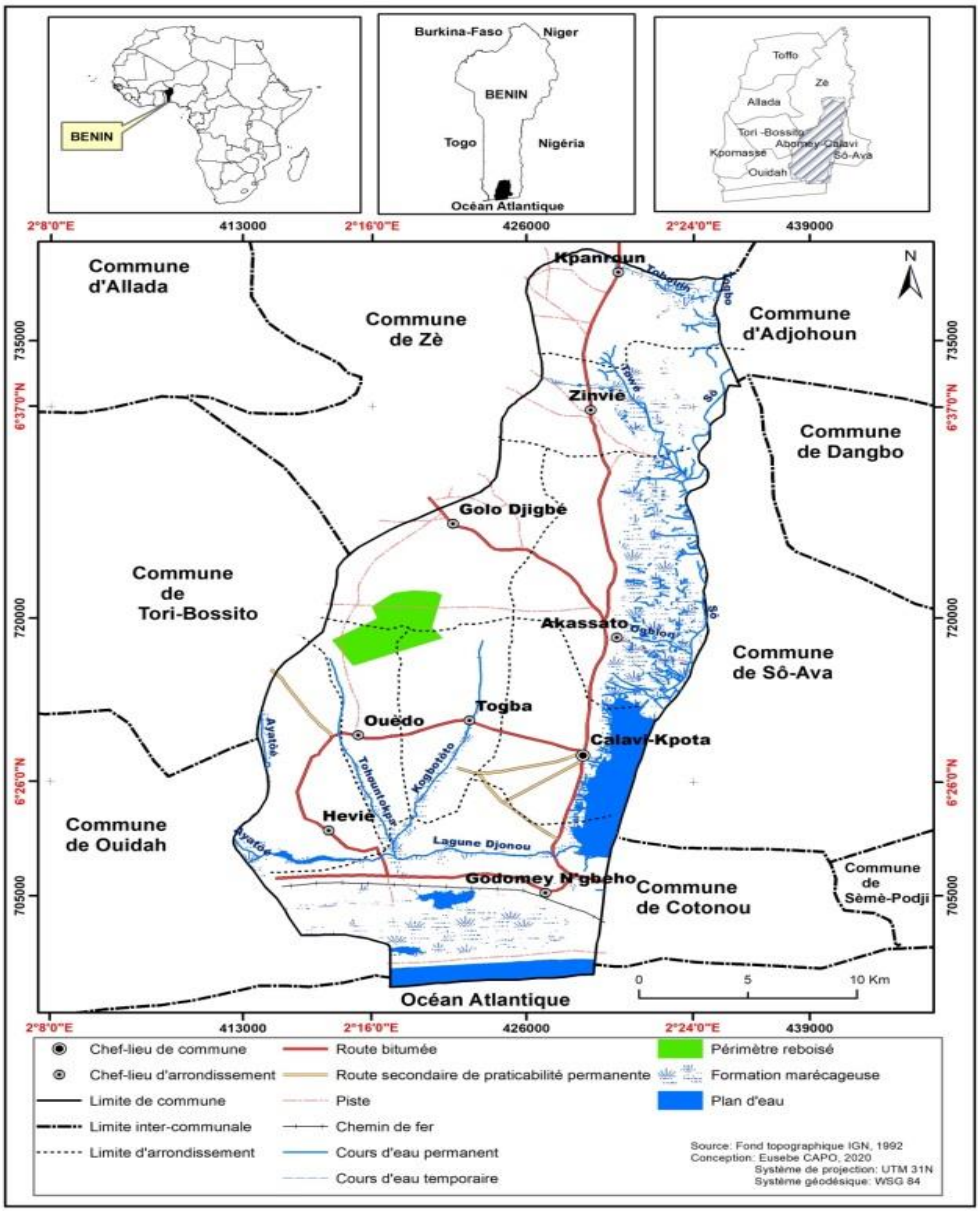

Figure 1 : Geographical location of the Commune of Abomey-Calavi

The Commune of Abomey-Calavi is located in the southern part of the Republic of Benin. It is between 6°19'20" and 6°42'51" north latitude and between 2°11'45" and 2°25'15" east longitude. It is bordered to the north by the Commune of Zè, to the South by the Atlantic Ocean, to the East by the Communes of Sô-Ava and Cotonou and to the West by the Communes of Tori-Bossito and Ouidah. It covers an area of 539 km² representing 0.48% of the national area of Benin Baloubi (2013, p.11). The geographical situation of the commune favours human settlement and the development of various economic activities.

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3.RESULTS

3.1 Evolution of the population of the municipality of Abomey-Calavi

The population of the commune of Abomey-Calavi', like that of other cities in Benin, is increasing steadily from year to year. Population censuses carried out in the country indicate that the number of inhabitants of the commune has increased from 60,786 inhabitants in 1979, to 656,358 inhabitants in 2013.

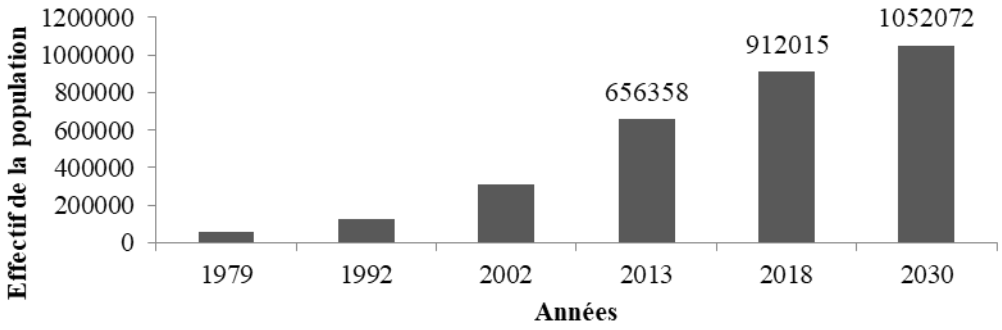

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Figure 2: Evolution of the population of the municipality of Abomey-Calavi 1979 to 2013
Source : INSAE, RGPH4-2013

The population increased from 60,786 in 1979 to 126,507 in 1992, an average annual growth rate of 5.8 per cent between the two years. In 2002 it was 307,745 inhabitants, an average annual growth rate of 9.30% and 656,358 inhabitants, an average annual growth rate of 6.7% in 2013. This increase leads to an extension of the city.

3.2 State of food security in the Commune of Abomey-Calavi

The state of food security was analyzed through the types of activities and monthly household income, the Food Security Index, the categorization of districts by area according to their food security status, consumption according to the food consumption score and the food consumption situation of households.

3.2.1 Types of activities and monthly household income

The data collected also provide information on the income of the households surveyed according to the types of generating activities they carry out. They are illustrated in Figure 3.

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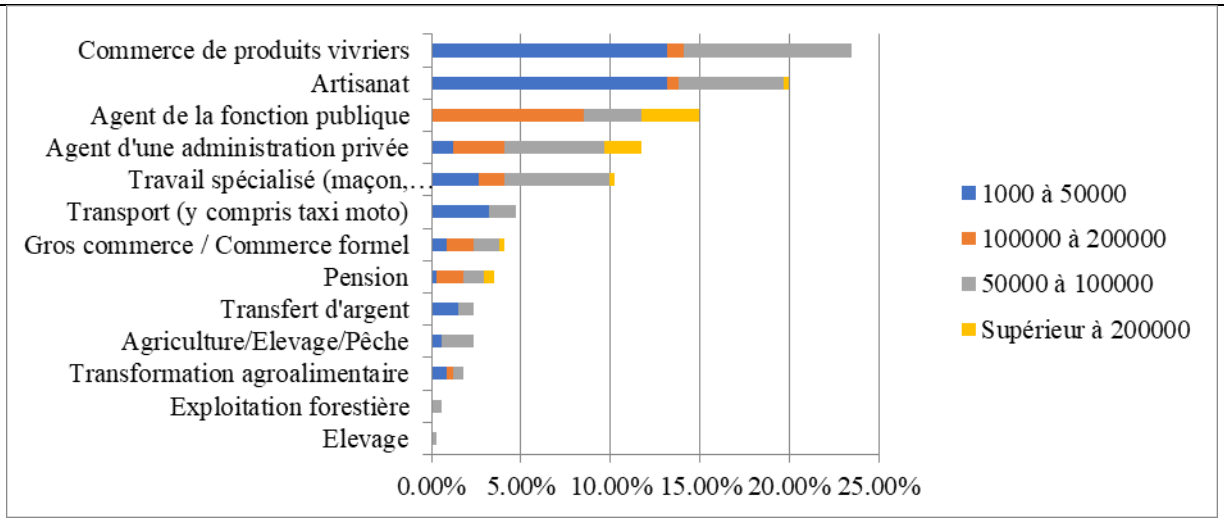

Figure 3: Household Income
Source: Field survey, Juillet 2020

Food traders, craftsmen, civil servants, private administration agents and other specialized work have a large monthly income margin of between CFAF 50,000 and CFAF 100,000 . The peculiarity is that civil servants and those in the private administration receive an income of more than CFAF 200,000 and live in urban and peri-urban areas. A small proportion (less than 1%) of households engaged in wholesale trade and residents also receive an income of more than CFAF 200,000. Households in these activity type categories are less vulnerable to food insecurity and have easy access to food. They are more represented in urban than rural boroughs.

3.2.2 Food security index in Abomey-Calavi

The analysis of household vulnerability is made through the description of the different indicators according to two domains that made it possible to constitute the CARI reporting table (Table II).

Table II: Food security classification according to the CARI method

Domain		**indicators**	**Food security**	**Limit food security**	**Moderate food insecurity**	**Severe food insecurity**
Current status	Food consumption	Food consumption score	Acceptable 54%	0%	Limit 27%	Poor 19%
Adaptability	Economic vulnerability	Share of food expenditure	Part < 50% 5%	50-65% 89%	65-75% 2%	>75% 5%

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	Asset depletion	Livelihood-based survival strategies	No 69%	Stress 15%	Crisis 8%	Urgency 8%
Food Security Index			**42%**	**30%**	**25%**	**3%**

Source: Field surveys, Juillet 2020

The analysis of Table II shows that 42% of households are food secure (FS). Thesehouseholds are able to meet their basic food and non-food needs without using survival strategies that could jeopardize their livelihoods. In addition, 30% of households are inimitated food security (SAL). They have just adequate food consumption without resorting to irreversible adaptation strategies; 25% are food insecure (MDI) and 3% of households are food insecure (HAI) are characterized by very poor food consumption and are experiencing a very significant loss of their livelihoods which will lead to significant deficits in their food consumption.

3.2.3 Categorization of boroughs by zone according to their food security status

These results raise the interest of categorizing boroughs according to their urban, peri-urban and rural characteristics and food security indices. The categorisation of the arrondissements of the municipality of Abomey-Calavi has been made into three zones and the cumulative food security indices of the districts of each of thezones are calculated and presented.

- Zone 1 consists of the central urban districts (Abomey-Calavi and Godomey) of the municipality of Abomey-Calavi;
- zone 2 consisting of the districts (Akassato, Hêvié, Ouèdo and Togba) adjacentto those of zone 1;
- Zone 3 consists of rural districts (Glo-Djigbé, Kpanroun, Zinvié) and peripheral to those of zone 2.

Figure 4 presents the rates of household food security indices by area.

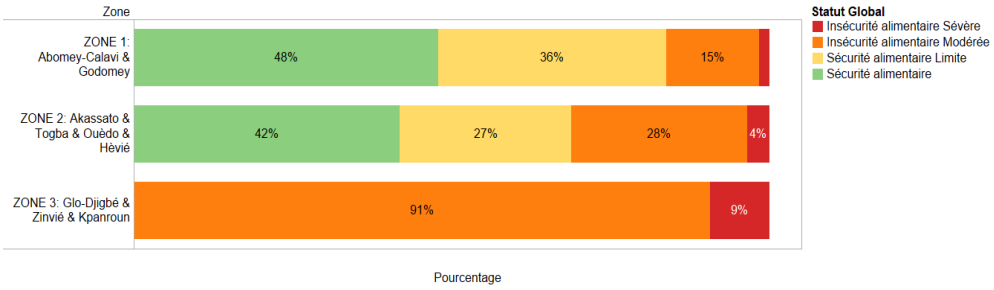

Figure 4: Status of household food security by area
Source: Field surveys, July, 2020

The analysis of Figure 4 shows that food security (SA) and limited food security (SAL) households are located in zones 1 and 2. No household is in a situation of Food Security (SA) and Limit Food Security (SAL) in zone 3 . Food security affects 2% and 9% of households in

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zones 1 and 3 respectively. There is a high proportion (91%) of food insecure households in zone 3. is higher than Zone 2 (28%) and Zone 1 (15%). Zones 1 and 2 are those with the most food security households with 48% and 42% respectively. No household is food insecurein zone 3.

These results show that households in urban and peri-urban areas are less vulnerable to food insecurity than households in rural areas.

3.2.4 Typology by food consumption score

In the municipality of Abomey-Calavi, 54% of households have acceptable food consumption , 27% have a limit consumption and 19% have a poor food consumption. A categorization of the households surveyed according to their food consumption was made on the three predefined areas.

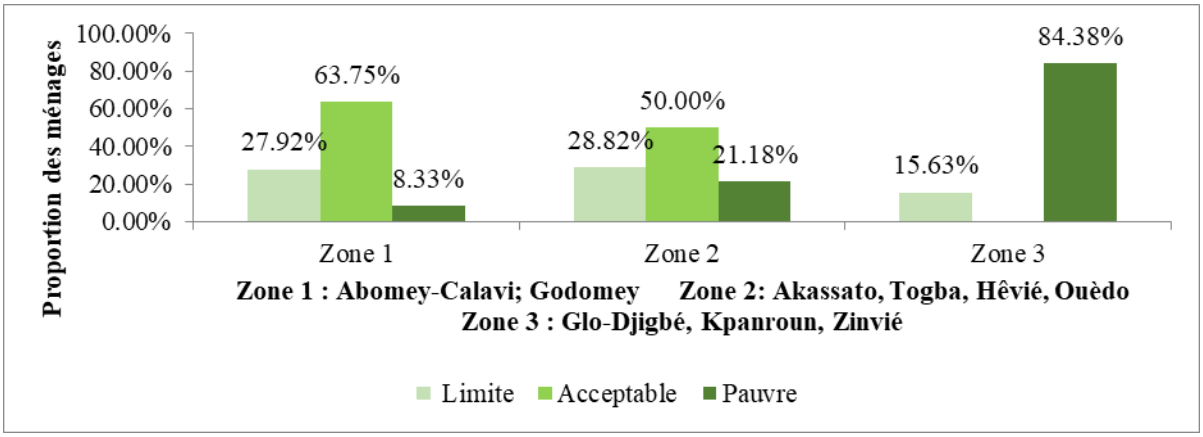

Figure 5: Household Food Consumption Status
Source: Field survey, July 2020

The analysis of the figure shows that more than 50% of households in zones 1 and 2 have acceptable food consumption. As a result, food consumption is more diversified in urban boroughs than in peripheral boroughs. These households invest less than 50% of their income in food expenditures, which provides them with financial resources to meet non-food expenses. On the other hand, no household has an acceptable food consumption in zone 3, which also holds the record for households with a poor consumption (84.38%) alongside households with a limited food consumption (15.63%). This situation shows that food consumption in rural districts is not very diversified. These households invest more than 75% of their income in food and the rest in non-food expenditure. Peri-urban districts are characterized by households with acceptable food consumption (50%) than other households with limited (28.82%) and poor (21.18%) food consumption.

3.2.5 Household food consumption situation

3.2.5.1Food groups consumed by households / Dietary diversity

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Different food groups are consumed by households in the municipality of Abomey-Calavi. Figure 6 shows the different food groups consumed over the 7 days preceding the day of the survey according to the average number of days consumed by each of its groups.

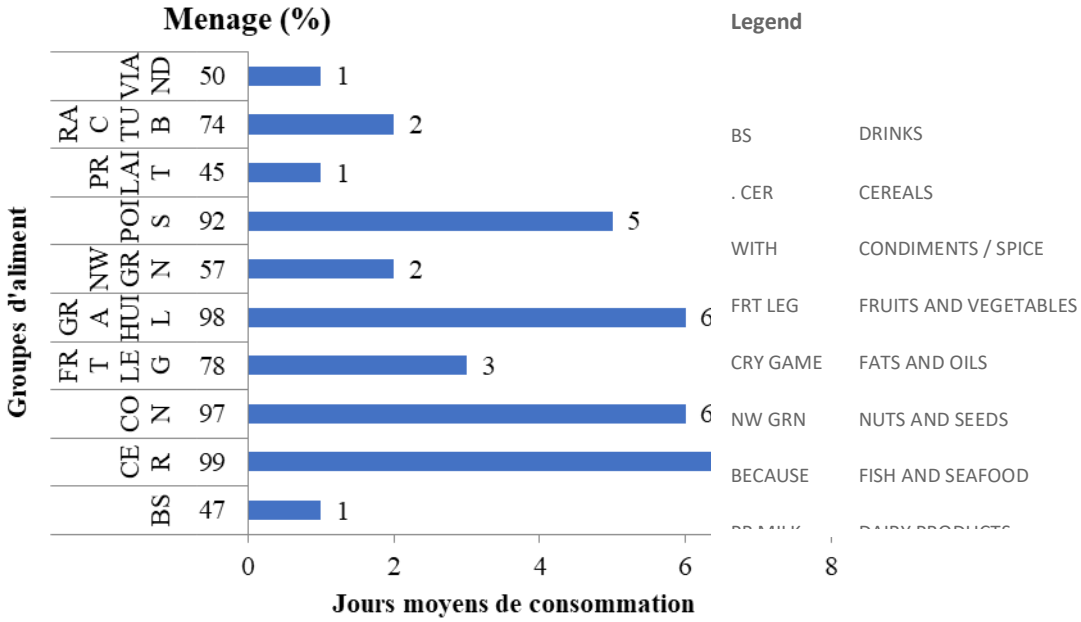

Figure 6: Food groups consumed by households
Source: Field surveys, July 2020

Data were collected by inquiring about meal type and meal composition. The results show that the foods consumed are specific by zone even if a trend towards standardization has been observed. Foods such as corn paste, corn porridge, rice, cooked or fried yams, gari, frying, tomato sauce, okra and vegetables occupy a dominant position in food patterns in all districts in both urban and rural areas. As the main source of protein, the results show that fish, in fried form, is the most widespread. The consumption of fruit was not systematically mentioned by the respondents, except for a few rare cases observed especially in urban areas.

These foods are grouped into standard food groups. Food groups such as, cereals; fats and oils; condiment / spices; Fish and seafood are consumed by more than 90% of households. Cereals are part of the daily diet of households. They are consumed during the seven days by 99% of households. They are followed by food groups consisting of fats oils, condiments / spices consumed for 6 days by almost households and 92% of households consumed fish and seafood products over 5 days. The rest of the groups such as dairy products; Meat; nuts and seeds; fruits and vegetables; drinks are consumed on average 3 days out of 7 days of food consumption. Access to food is conditioned by its availability in the household environment as well as the economic power of the latter.

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3.2.5.2 Food Supply Sources

Household sources of supply vary from markets (45%) to street (24.2%) to street vendors (20%). A small proportion of households (6.2%) live from their own production. The sources of supply accessed by different categories of households according to their food security status are shown in Figure 7.

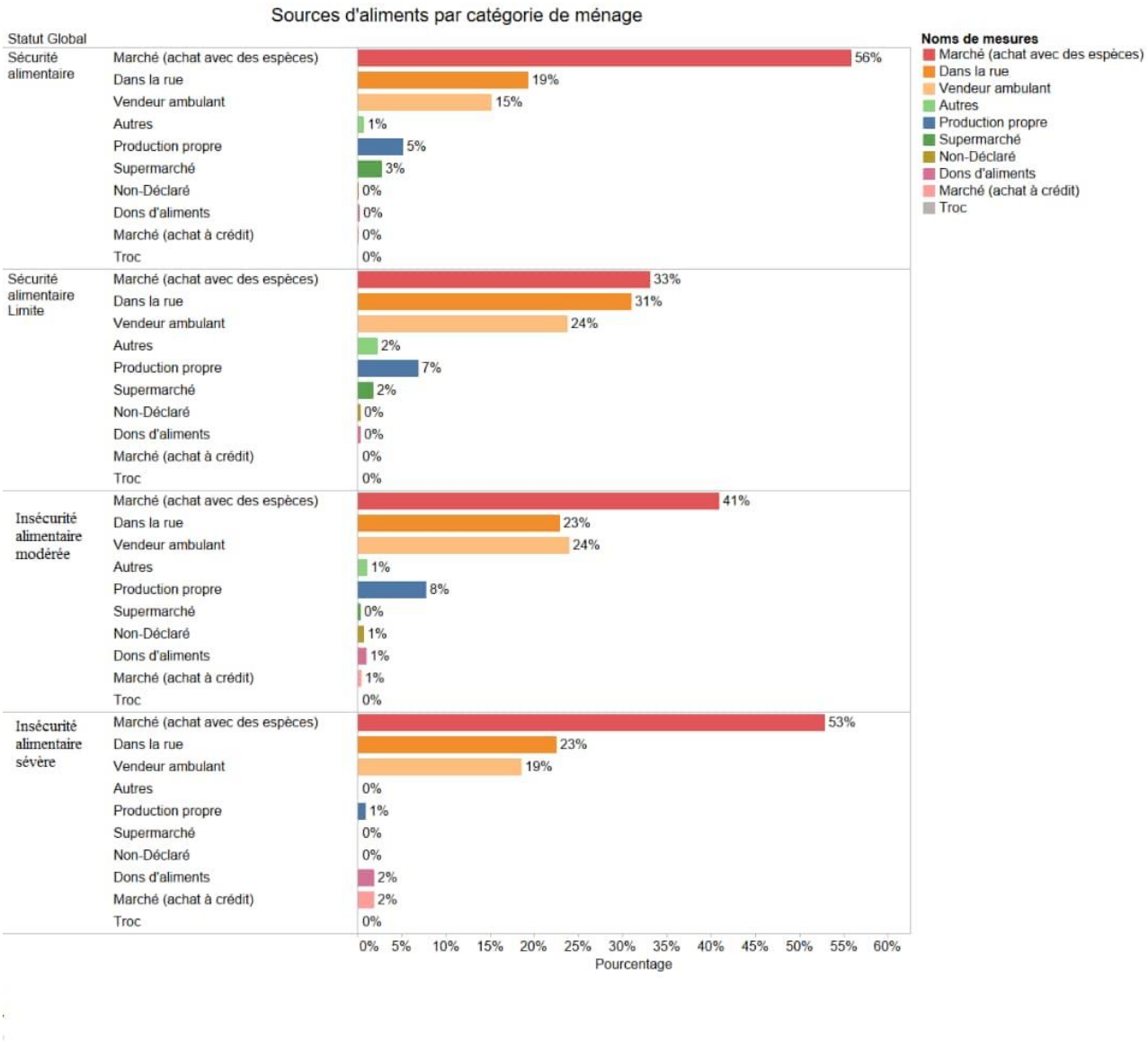

Figure 7 : Household Source of Supply

Source: Field survey, July 2020

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From the analysis in Figure 7, six main modes of food supply emerge in the study area: markets, street, street vendors, clean production and food donations. Supply in markets is the most dominant mode regardless of the level of food security with 56%, 53%, 41% and 33% respectively for households in Food Security, Severe Food Security, Moderate Food Insecurity and Borderline Food Insecurity. Street shopping follows with 31%, 23%, 23% and 19% for households in Limit Food Security, Moderate Food Insecurity, Moderate Food Insecurity and Food Security respectively. Supplies from street vendors occupy 24%, 24%, 19% and 15% respectively for households in Limit Food Security, Moderate Food Insecurity, Severe Food Insecurity and Food Security. Own production as a source of supply follows in small proportion in households in Food Insecurity, Food Security Imitation and Food Security for 8%, 7% and 5% respectively. It is only1% in food insecure households. Food donations are present in households in Food Insecurity and Food Insecurity in very small proportions for only 2% and 1% respectively. Only food security and food security households imitate themfrom supermarkets.

3.5.2.3 Food consumption by Area

A classification of the different food groups consumed by zone according to food safety status was made in order to determine what are the different characteristics in each of the zones. This classification makes it possible to make a comparison between food access according to whether households are in urban (Zone 1), peri-urban (Zone 2) and rural (Zone 3) areas. Figures 8, 9 and 10 illustrate the results of this classification.

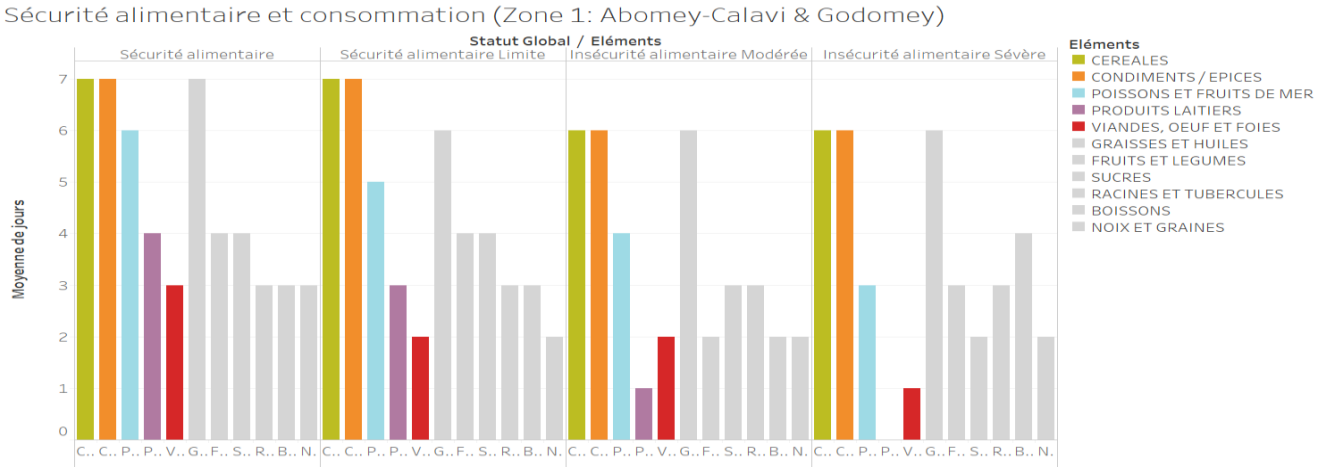

Figure 8 : Food Groups Consumed in Zone 1

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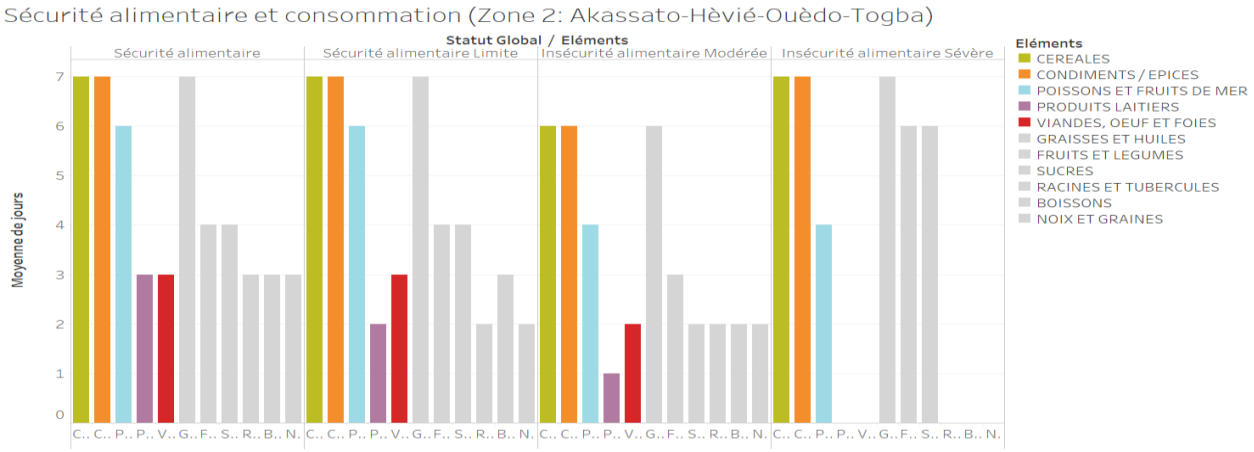

Figure 9 : Food Groups Consumed in Zone 2

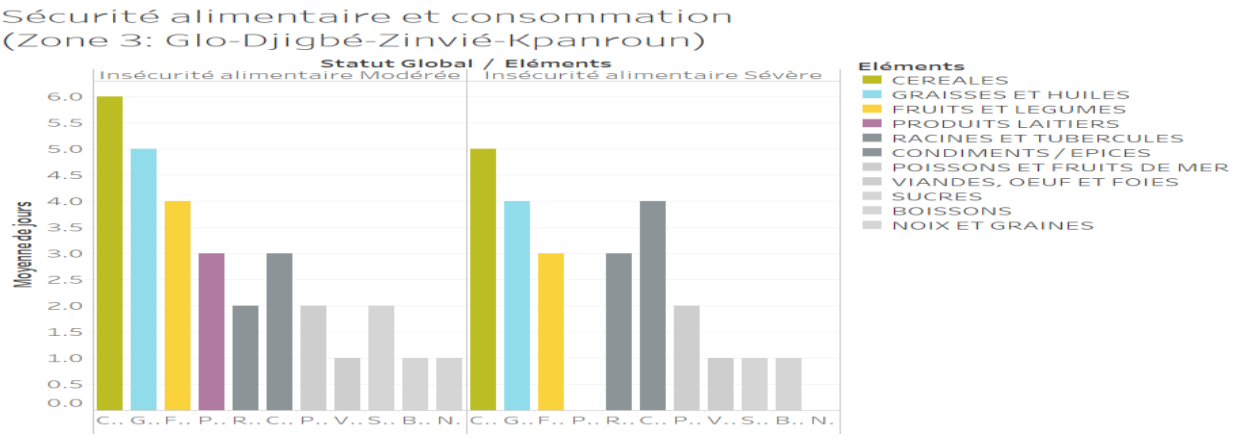

Figure 10 : Food Groups Consumed in Zone 3

The analysis of the figures makes it possible to say that in households in a situation of food security, limited food security and moderate food insecurity in the urban and peri-urban districts of zones 1 and 2, consume almost the same food groups with the same trends. The frequencies of the number of days of consumption are highest for cereal, condiments/spices, fat and oil products (between 6 and 7 days of consumption out of the last seven days preceding the day of the survey). The households concerned have a good availability of energy necessary for physical activities, maintenance of body temperature and various internal functions of the body. Oils and fats are concentrated forms of energy. Whole grains of cereals also provide oil to the diet, but a significant portion of this oil can be lost if the germs are discarded before milling.

Food secure households in urban and peri-urban areas (Figure 9), by having a daily intake of energy foods, if they do not have significant physical activity, are exposed to overweight, caused by an exaggerated accumulation of fat in the body. Even if, from a financial point of view, they have easy access to food to be safe from food insecurity, they are still spared if their energy intake exceeds the need expressed by the body.

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Fruits and vegetables, and sugars are consumed on average 4 days out of 7 by households in SA, SAL and on average 3 days out of 7 by households in IAM and IAS in zones 1 and 2. Households in these cases have a moderate intake of vitamins provided by fruits and vegetables including vitamin C.

Consumption of dairy products is lowest in zones (2 and 3) with a downward trend in the average number of days consumed in food-secure households to severely food insecure households. Indeed, in zone 1, households in SA, SAL, IAM, IAS have respectively 4; 3 ; 1 and 0 as the average number of days of consumption of dairy products and respectively 3; 2 ; 1 and 0 in zone 2. This explains why food-secure households have a good consumption of dairy products, which are a good source of protein necessary for good growth and maintenance of the body.

In the first two zones (1 and 2), households in a situation of severe food insecurity do not consume dairy products and also foods such as meats, eggs and livers (only 1 day out of 7 days of consumption for households in HAIs in the urban area). Members of these households are exposed to stunting and various diseases if the body is not well maintained and suffers from severe protein deficiency.

The households surveyed in the districts of zone 3 are in a situation of moderate and severe food insecurity. For these households, the changing trends in the number of average days of food consumption are almost the same for the food groups consisting of cereals, fats and oils, fruits and vegetables. They have a good intake of energy foods. The notable difference between these two categories of households is that dairy products are not consumed by severely food insecure households. They are very exposed to stunting, especially for children. Thereis also a high consumption of foods derived from roots and tubers; condiments/spices of households in IAS than households in IAM (5 and 6 days as the average number of days of consumption). These households very often take cassava flour (Gari), consumed mixed with water, or accompany bean dishes. Their diet is rich in starch and fiber (main source of energy) and in low proportion of vitamins A and C.

It should be remembered that throughout the municipality, households in food security consume 7 days out of 7 products derived from cereals, condiments / spices and high consumption (on average between 6 to 7 days / 7) of foods based on fat and oils; fish seafood. They eat a more varied and nutritious diet than food insecure households. Food insecure households are deficient in dairy products, especially for severe cases (Figure 11) and have a very undiversified diet.

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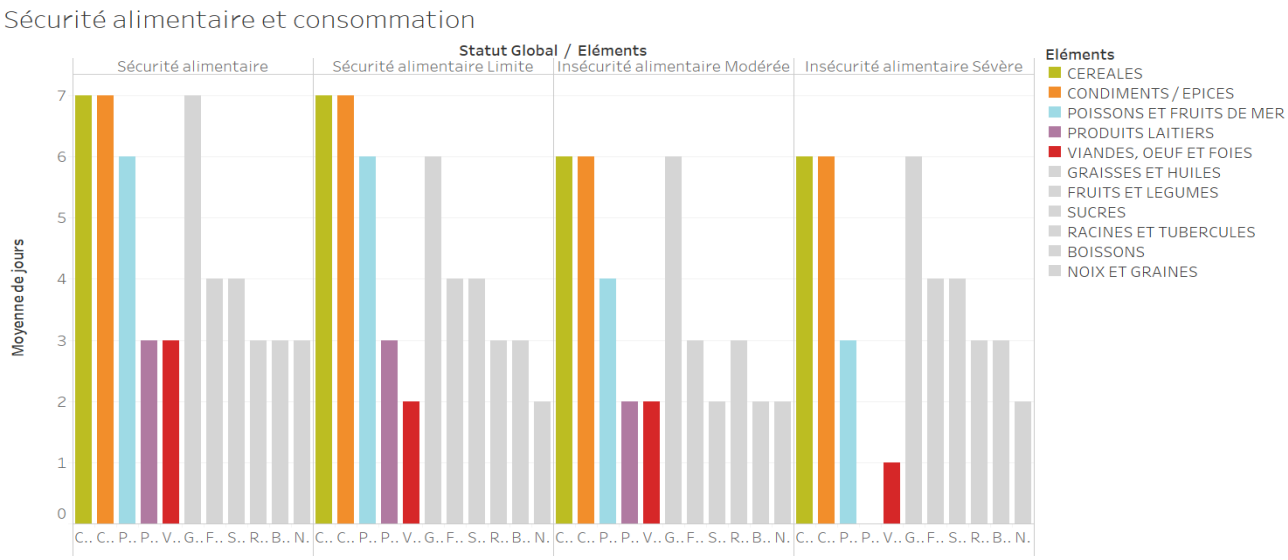

Figure 11: Food Groups Consumed by Household Food Security Status
Source: Field surveys, July 2020

The analysis of Figure 11 shows thathouseholds in an AMI and HAI situation do not consume any of the food groups fully for 7 days, their frequency is six days at most for food groups such as cereals, condiments/spices and fats and oils. The rest of the food groups are consumed on no more than 4 days out of 7. Providing dairy, meat, egg and liver products to food insecure households and making food deficit available to these households will improve their food and nutritional security status. However, SA and SAL food security households regularly consume the different food groups except meats, eggs, nuts and seeds, roots and tubers consumed no more than 4 days out of 7. The latter must be made available to these households to ensure that they have sustainable access to food so as not to end up in deficit.

3.5.3 Meal organization

Eating habits were examined in two parts: the types and number of meals taken by individuals. The results show that the three common meals (breakfast, lunch and dinner) are taken by almost all respondents. Table III shows the distribution of household members according to their participation in different meals over the three days preceding the day of the survey.

Table III: Distribution of household members by meal attendance

Meal time	Ate at home	Eating out	Other	Did not eat	Total
Morning	55,58%	15,23%	12,75%	16,44%	100,00%
Midday	47,96%	29,41%	12,90%	9,73%	100,00%
Evening	81,15%	4,90%	13,27%	0,68%	100,00%

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Avg	61,56%	16,52%	12,97%	8,95%	100,00%

Source: Field surveys, July 2020

It emerges from the reading of this table that the consumption of meals on wheels is the most dominant in households regardless of the time of day. It represents respectively 55.58%, 47.96%, 81.15% respectively for morning, noon and evening meals. Households are more accustomed to consuming evening meals at home than outside. More than 81% of respondents eat meals at home.

The time of day when the meal is most consumed outside the home is noon for lunch. 29.41% of respondents eat out compared to 15.23% and 4.90% respectively for morning and evening meals away from home.

Morning meals are not always taken by all households. Only 16.44% of households surveyed reported not eating morning meals (Figure 12).

The data collected on the organization of meals for the day took into account the three days of food consumption preceding the day of the survey. The average is calculated in order to assess the share of meals eaten at home, away, other places or households that have not consumed meals at all. Figures 12; 13 and 14, make it possible to spread the realities of meals taken over the three days and the average ofs households who consume their meals at home or not and those who do not consume them at all.

- ***Breakfast***

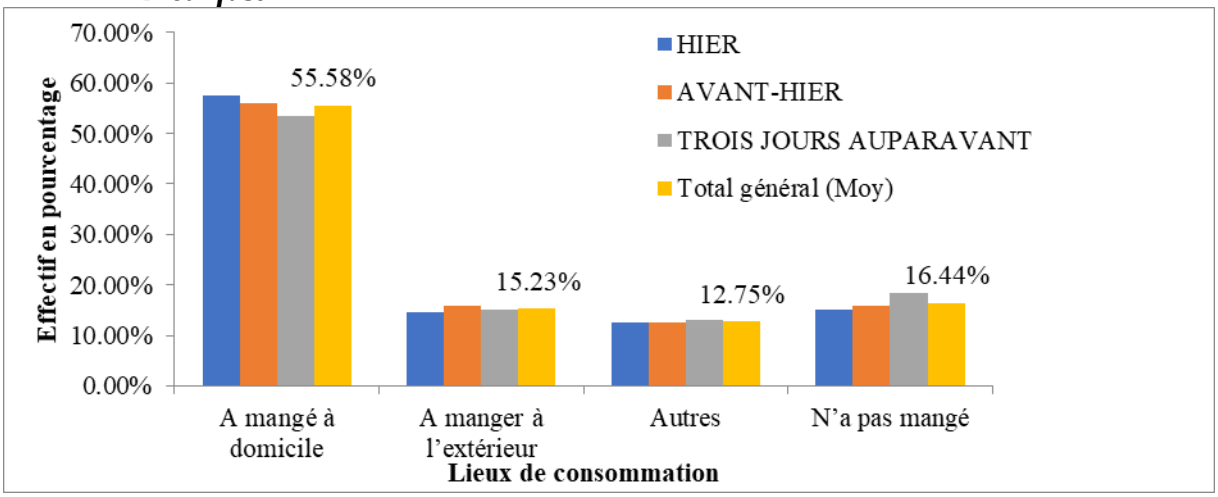

Figure 12: Places where household meals are consumed at breakfast
Source**:** Field surveys, July 2020

Breakfast is consumed more at home by households, i.e. more than 55% of households surveyed.

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- ***Lunch***

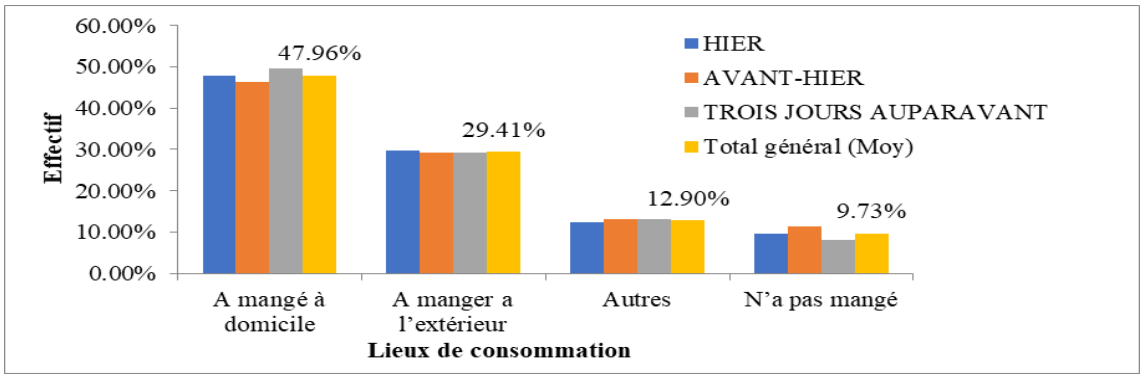

Figure 13: Places where household meals at lunch are consumed
Source**:** Field surveys, July 2020

From the analysis of Figure 13, it appears that lunchis consumed less at home. The reason for this is that most household members are away from home for daily activities. Although the proportion of people who consume meals at home remains the highest (47.96%), there is an increase in the number of meals eaten out of the way of about 30% compared to other times of food consumption of the day.

Lunch times are quite variable. Formerly consumed around 1 p.m. at the exit of the offices, this meal is now consumed a little earlier between 12 and 14 hours since the return to non-continuous hours in the administrations. Consumption outside the home remains significant, affecting about one in eight people.

- ***Diner***

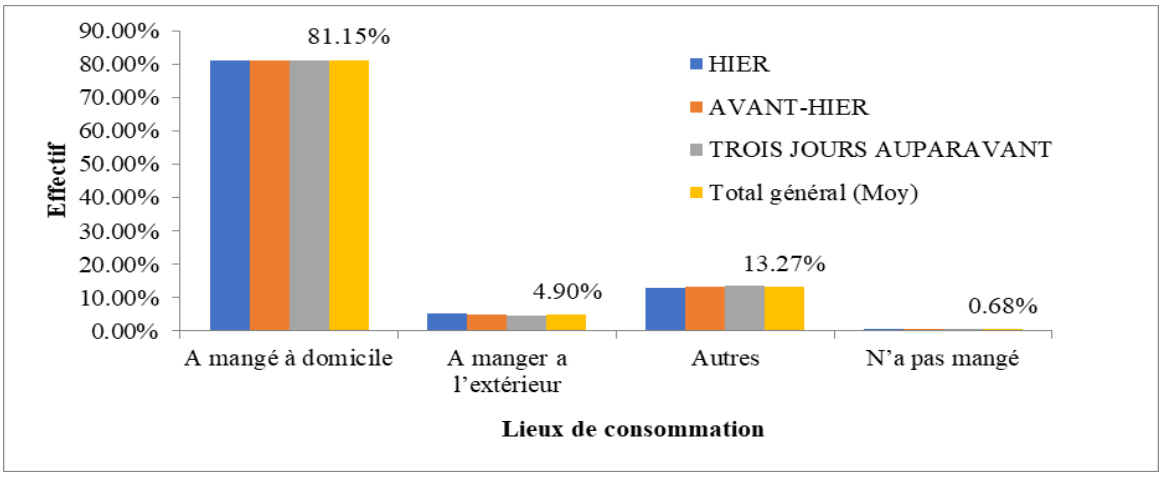

Figure 14: Places where evening meals are consumed
Source: Field surveys, July 2020

The interpretation of Figure 14 makes it possible to say that not all households deprive themselves of the evening meal as can be seen for other meal times. Less than one percent of

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households surveyed do not have an evening meal. The meals taken by the majority of households are based on cereals, especially maize, which is processed into a paste accompanied by tomato sauces or vegetables.

The evening meal is consumed after dark. It brings together, more than at other times of the day, the members of the consumption unit since only about 19% of people say they have not taken this meal at home. The organization of meals therefore punctuates the commercial activity. Purchases of products for domestic preparations are mainly made in the morning for the preparation of midday and evening meals. The sale of ready-to-eat products or dishes on the street or in restaurants begins in the morning and continues until the afternoon. It is less in the evening, the main occasion of family meals.

4.DISCUSSION

Urban growth, due to demographic dynamics within cities and migration of rural populations to cities, causes both the increase in the food needs of the population and the decrease in agricultural areas around cities (S. Dauvergne, 2011, p.41). The urbanization process continues beyond agglomerations on agricultural land, which contributes to land saturation. Similarly, according to (L. D. Ahomadikpohou, 2015, p.13), population growth leads to increased food needs and leads to competition for space between agricultural, pastoral and forestry activities. The Abomey – calavi does not escape these phenomena.

According to CILSS (2004, p.4), depending on the country, the consumption of tubers and roots (cassava, sweet potato, yam, potato), legumes (dried beans, especially ground peas), meat, poison, milk or vegetables occupies a prominent place in the food ration of populations. On the other hand, other product groups also tend to emerge from consumption. In this context, we can mention vegetable products, fruits and vegetables, legumes, vegetable oils, fish, tubers. These results are similar to those found in this research.

Maize, according to the results of this research, is the most consumed by households in the municipality of Abomey-Calavi. The same is true in some cities of Abomey, Bohicon, Cotonou, Lokossa and Porto-Novo, where maize comes first and is often consumed in the form of paste (Mitchikpè et *al*, 2003, p.17).

At the same time, some habits remained. In this research, households with acceptable food consumption eat almost daily cereals or tubers, vegetables, proteins of animal or vegetable origin, fats. These results are similar to those presented in AGVSA (2017, p. 34) for the country as a whole.

The results of this research are similar to those in the report of the baseline study on food security and nutrition. Urban households face less food insecurity. In March 2008, only 1% of urban households were severely food insecure compared to 8% in rural areas and 7% of urban households were moderately food insecure compared to 18% in rural areas (CSA, 2019, p.10).

The results of this research show that, in Abomey-Calavi, food security affects 42% of households, food security limits 30% of households, food insecurity limits 25% of households and 3% of households are severely food insecure. These figures compared to those from the AGVSA (TBS, 2017 p.59) have changed. Indeed, in 2017, food security affected 77.2% of households; Mild food security 17.3%, moderate food insecurity 5.5% of households and 0% of

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households are severely food insecure 0%. We note that household food insecurity is growing. In the communes of Glazoué and Dassa-Zoumé, on the other hand, no household is food secure. The calculated average gives 42.66% prevalence of moderate food insecurity for the two study communes while that of severe food insecurity gives 07.1% prevalence for all two communes R. G. Kadjegbin (2014, p. 182).

5.CONCLUSION

The analysis of food security in this research focused on urban households in the Commune of Abomey-Calavi. It is in a context of strong pressure on natural resources and increase in the surface area of the agglomeration and a plurality of income-generating activity that this research was carried out in order to highlight the state of household food security, the different groups consumed, incomes, sources of supply.

Consumption of food groups is insufficient and poorly diversified to meet the needs of food insecure households. Low consumption derived from food groups such as: milk, egg, meat is observed among food insecure households. Households in urban boroughs are the most diverse food and have a good state of food security. The meal is consumed according to the three standard moments (breakfast, lunch and dinner) by households. Dinner is the most consumed meal at home and lunch, the least consumed meal at home. Maize is the staple food used in the composition of household meals in the Commune of Abomey-Calavi. Improving food security indicators ensures an acceptable state of household food security and enables them to have sustainable access to food.

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